

GEMÜ® news

THE GEMÜ GROUP A STRATEGY THAT BRINGS US TOGETHER

Product news

Innovations

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Commitment and initiatives

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

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Dear readers,

As we reported in previous issues, we have undergone organizational and strategic restructuring over the last few months. We can already see the first fruits of these initiated measures.

The first six months of 2017 have developed very satisfactorily after a record-breaking year throughout the Group in 2016. This shows us that the processes have already begun to take hold and that we are heading in the right direction. A big thank you at this point to the entire GEMÜ team for their tireless dedication.

Our Asian subsidiaries have also experienced strong growth in the last few months. This gave us good reason to pay a visit not only to our largest foreign subsidiary, GEMÜ China, but also to our newest subsidiary, GEMÜ Japan. The working practices in this small team are already very professional. The staff's high level of dedication and commitment have led to a very successful start-up. At this point, we would also like to express our heartfelt thanks to our colleagues in Japan for this fantastic launch.

Another important topic currently on our agenda is the expansion of our Production and Logistics Centre in Kupferzell. Works for what has become known as the surface technology centre (OTZ) are in full flow and are running according to schedule. In our next issue, we will report in more detail

on the expansion, and on how these further milestones will help us to be even better equipped for the future.



Gert Müller
Managing Partner
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GEMÜ IS BREAKING NEW GROUND GROUNDBREAKING CEREMONY FOR THE NEW OTZ

On 20th February, the ground-breaking ceremony for GEMÜ's new surface-technology centre (OTZ) took place in the Hohenlohe business park.

Important pioneers of the project were gathered there to witness the groundbreaking ceremony. The leading worldwide manufacturer of valves, measurement and control systems from Ingelfingen is breaking entirely new ground with the surface processing centre and is therefore setting standards for continuous further development at GEMÜ. "This increase in expertise is the only way that we can deal with the challenges of the market," says Gert Müller, Managing Partner. District Administrator Dr Matthias Neth praised the medium-sized company's close connections to home and their quality requirements, and sees this as the winning recipe for the future. Mayor

Stefan Neumann: "We are delighted with GEMÜ's commitment to the Hohenlohe business park. It shows that the foundation of the joint authority 25 years ago was the right decision and means that we are still in a position to offer a home to the global market leaders in our region to help them to achieve consistent growth." He wished them well with the construction work on behalf of his colleagues Mayor Markus Knobel from Waldenburg and Mayor Joachim Schaaf from Kupferzell. The construction represents the biggest milestone to-date for the global market leader in the area of surface processing, reported Matthias Fick, Head of Production and Logistics.

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THE BIG SPECIALIST FOR SMALL QUANTITIES GEMÜ 567 BIOSTAR® CONTROL



GEMÜ 567 BioStar® control
(3A-Version)

The GEMÜ 567 BioStar® control valve is the new, safe solution for media controls from 0.08 to 4.1 m³/h. The sealing takes place via a PTFE diaphragm with PD technology (plug diaphragm), which combines the advantages of a diaphragm valve with those of a globe valve. This valve is available with linear control characteristics and with equal-percentage control characteristics.

Aseptic diaphragm valves are frequently used as control valves for sterile applications. This means that small volumes can only be controlled with an inadequate level of accuracy, or not at all. The new 2/2-way diaphragm globe valve with regulating needle or regulating cone fills these gaps. The actuator is sealed by an FDA-compliant and USP Class VI compliant PTFE diaphragm. In combination with a spring washer, this ensures that the seal is permanently temperature-resistant, meaning that the diaphragm need not be re-tightened. In comparison with bellows valves, cleaning the valve is significantly improved by the hygienic construction.

Further special features include the optional integration of a bypass function and the potential installation of the diaphragm globe valve in a multi-port valve block (GEMÜ M-block®). In the bypass version, the angle valve body can be designed with a manually operated bypass or with a pneumatically operated bypass. Both versions allow for easier cleaning and greater flows.

If the GEMÜ 567 BioStar® control is integrated into an M-block®, several functions can be implemented in the smallest of spaces. In addition, the space requirement is reduced considerably, and the installation and welding effort are reduced.

The valve is also optimally equipped when it comes to hygienic safety: It meets both the standards of the EHEDG cleaning test and the standards in accordance with the American 3A definition.

The control valve is used, for example, for dosing small quantities in the beverage industry for in-line mixers (for example, for vitamins, dyes and other additives), for controlling sterile steam and air (for example, for DIP processes) or for controlling the inflow and outflow of bioreactors in the pharmaceutical industry.

The GEMÜ 567 BioStar® control is available in the nominal sizes DN 8 to DN 20. The body is manufactured, as standard, from block material with a grade of surface finish of Ra 0.4 µm. In addition to the PTFE diaphragm, another seal made from FKM is used. One exception here is the 3A version, for which the complete sealing and control element consists of one piece or material (PTFE).

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SINGLE-USE DIAPHRAGM VALVE ESTABLISHED ON THE MARKET

In future, there will be a larger selection of versions of the world's first controllable single-use diaphragm valve – GEMÜ SUMONDO®.

GEMÜ, the leading manufacturer of valve designs for the pharmaceutical industry, has established the first controllable single-use diaphragm valve on the market – the GEMÜ SUMONDO®. In addition to a pneumatically operated version, the product range also includes a version with a handwheel for manual operation.

Due to increasing customer demand, the range has been expanded in the area of associated valve bodies. With a third diaphragm size, another high-performance member has been added to the product range: The largest valve of its type to-date, with up to 1". This means that applications can be handled for which higher medium flows and precise controllability are indispensable.

Produced and packaged in the cleanroom, the single-use valves comply with all requirements for pharmaceutical processes. Yet the application possibilities do not stop there. In other areas too, such as in research centres and laboratory facilities, the valves become a cost-efficient and, above all, safe solution. The risk of cross contamination is considerably reduced, cleaning costs are significantly reduced, and plant downtimes are reduced to a minimum. Even with smaller batches and more frequent changes of media, the advantages of the SUMONDO valve quickly become apparent and prove themselves in terms of cost.

The GEMÜ single-use solution outperforms conventional pinch valve systems in a large number of cases. The controllability becomes considerably more precise, and the flow rates remain constant even with intensive use. With GEMÜ SUMONDO®, it becomes possible to implement entirely new process functions in single-use applications – functions that could not be implemented with conventional systems. This includes processes for mixing, dosing and distributing media or controlling the transmembrane pressure in a plant. And this is always precise, reproducible and, if required, also automated – thanks to a pneumatic actuator. Alternatively, the manual actuator is of course retained and, with a robust plastic handwheel and definable stroke, it guarantees reliable opening, closing and precise setting of the volumetric flow.



GEMÜ SUMONDO®
manually operated

GEMÜ SUMONDO®
with pneumatic actuator and
GEMÜ 1434 µPos controller

The underlying idea of the GEMÜ SUMONDO® valve can be summarized as follows: A valve body for single use and an actuator for repeated use. With this combination, the foundation is laid for cost-effective processes of the highest quality. The optional instrumentation completes this valve solution and makes it intelligent. This means that, thanks to GEMÜ's modular system, various positioners and process controllers can be easily integrated.

If you look at the outside of the valve, you notice that some new connection sizes with various connection types are available. These range from 1/4" to 1", from the clamp connection to the hose barb. Both for new and existing systems, this offers the operator completely new opportunities: A more flexible system design and a wider scope of controllability – with flow rates of 0.5 m³/h to 12 m³/h.

However, it is not just the outside of the valve that has changed – innovative developments inside the valve have produced something from which the user can benefit: The optimized seat contour and the modified diaphragm material will, in future, guarantee the usual perfect fit, maximum tightness

and an even longer useful life for the valve body.

The requirements and demands placed on the plant design will also increase in the future. With GEMÜ SUMONDO®, the operators of single-use systems already have a future-proof solution at their disposal – one that impresses thanks to its safety, quality and efficiency.

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CONTROL VALVE FOR PHARMA AND FOOD

MOTORIZED DIAPHRAGM VALVE FOR ASEPTIC PLANT SECTIONS

GEMÜ 649 is the new and reliable solution for precisely controlling media in filling and testing systems, in high-purity media production and in distribution systems, as well as for auxiliary processes such as heating and cooling systems and for drying systems.

With type 649, GEMÜ is launching a motorized diaphragm valve for sterile and hygienic applications. The valve was designed specifically for controlling media with high purity requirements, such as aqua purificata (AP), high purified water (HPW) or water for injection (WFI), in compliance with the regulatory codes of the pharmaceutical industry and the food and drink industry, and will be available in nominal sizes from DN 6 to DN 150. With actuating speeds of up to 6 mm/s (depending on the actuator size), GEMÜ is expanding the range of and offering an alternative to the existing pneumatically driven GEMÜ 650 and GEMÜ 660 (filling valve) diaphragm valves with an even more precise control characteristic of $\pm 0.1\%$. The tried and tested and EHEDG-certified seal system is also used.

Using the electric actuator offers particular advantages in systems where no compressed air is available, in systems which are intended for mobile use or in systems where a cost-intensive supply of sterile air would be required.

In remote mode, the actuator can be operated using both standard signals (digital/analogue inputs/outputs) and via an interface with an integrated web browser (eSy-Web). eSy-Web can be used to check and adapt the actuator data without additional software or link several actuators together. The energy supply to the actuator can be protected against power failures by an optional emergency power supply module. The GEMÜ 649 is additionally supplied with an integrated manual override, a mechanical position indicator and an electrical status and position indicator.

The innovative DC motor is based on the hollow shaft principle. Since the motor operates with no brushes and commutation is performed without sensors, the motor parts do not wear, resulting in a longer service life. At the same time, a compact design could be implemented, meaning that the

PRODUCT COMPLIANCE AND PRODUCT SUITABILITY

- ⇒ FDA
- ⇒ USP
- ⇒ Regulation (EC) No. 1935/2004 on materials and articles intended to come into contact with food
- ⇒ Regulation (EC) No. 10/2011 on plastic materials and articles intended to come into contact with food
- ⇒ Pressure Equipment Directive 2014/68/EU
- ⇒ Machinery Directive 2006/42/EC
- ⇒ EMC Directive 2014/30/EC
- ⇒ Hygienic design according to DIN 11866
- ⇒ Protection class IP 65

PRODUCT DETAILS

- ⇒ Body materials: Including investment cast body made from 1.4435 and forged body made from 1.4435/F316L or 1.4539; other body materials available on request
- ⇒ Internal surface finishes of the body up to $Ra \leq 0.25 \mu m$
- ⇒ Valve body versions: Tank bottom valve body for containers and bioreactors, 2/2-way body for piping, T body for piping, sampling and distribution and mixing functions, multi-port body for dosing, distribution and mixing functions and for block and bleed
- ⇒ Connections: Clamp, flange, threaded sockets, threaded spigots, spigots

valve can be compared to pneumatic actuators and an additional control assembly.

The nominal sizes DN 32, DN 40 and DN 50 will be available from the sales launch, while other sizes will be released over the course of the year.



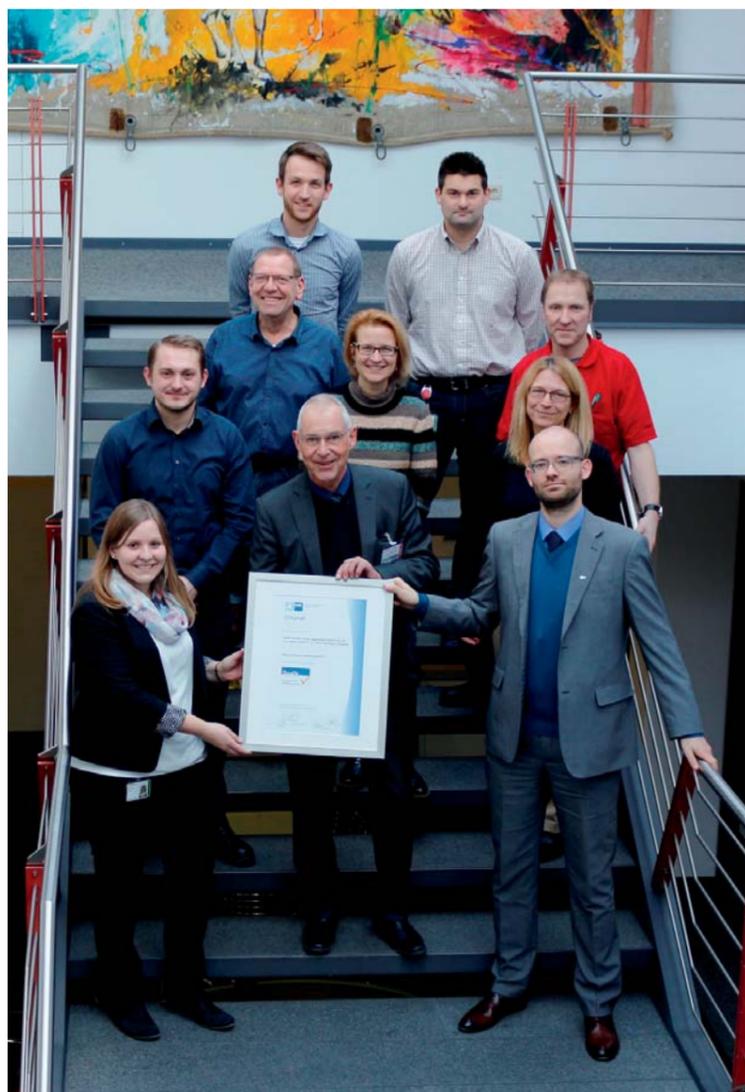
GEMÜ 649 eSyDrive®
with forged body



GEMÜ 649 eSyDrive®
with investment cast body



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DUALIS SEAL 2017

REPEATED AWARD FOR OUTSTANDING TRAINING

With the Dualis seal from Heilbronn Franken ICC, the high level of training quality at GEMÜ was once again recognized.



The Dualis seal was launched by Heilbronn Franken ICC in 2014 in order to increase the awareness and attractiveness of training organizations. "The Kocher valley has always been renowned for its great interest in educational work," says Franz Henschel, Head of the

ICC Schwäbisch Hall Office. GEMÜ was therefore also one of the pilot companies to take part in the launch of the certificate. And still today, in a time of demographic changes and skills shortages, GEMÜ is looking for qualified trainees. A recognized certification cannot do any harm. In spite of this, the Dualis seal for trainers at GEMÜ is by no means just a piece of paper. Rather, they see it as a "guideline" that provides them with support in the overall improvement and further development of training quality. In recognition of the outstanding training quality, Moritz Scherzer, Dualis Project Coordinator at the ICC and Franz Henschel awarded GEMÜ the Dualis certificate for the second time. In the future too, the trainers at GEMÜ want to "live by" the seal and continuously further develop education and training.



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PROCESSING INDUSTRY 4.0 PAPERLESS MAINTENANCE OF VALVES



Processing industry 4.0 has made a name for itself at GEMÜ: CONEXO generates all kinds of added value for the entire process plant, and for the plant designer and operator alike. Procedures can be simplified, the structure of management improved and processes optimized.

Pilot plant at Bioengineering AG: All diaphragm valves and multi-port valve blocks are equipped with RFID chips.



We read about it everywhere, the subject is on everyone's lips, new developments are flooding the market, everyone wants to be the first and to offer customers added value – we are now in the midst of the Industry 4.0 revolution, with new findings, solutions and visions virtually on a daily basis. The area of valve designs also has many links to the use of Industry 4.0: Procedures can be simplified, the structure of management improved and processes optimized. This is why GEMÜ talks of "Processing industry 4.0" and does not restrict itself to the mere networking of intelligent plant components, but is instead creating all kinds of added value for the entire process plant with GEMÜ CONEXO, and for the plant designer and the plant operator alike.

Operating plants as cost-effectively as possible is playing an increasingly important role in industry. This requires all components to be optimally adapted to each other, operating conditions and procedures in the plant to be understood and down times to be kept as low as possible. With the latter, the maintenance of plant components, such as valves, is a strong influencing factor in particular. In this case, any way in which the procedure, documentation and management can be simplified, and any kind of support which can be provided to prevent errors is essential and can help reduce unplanned down times and therefore increase the availability and process reliability of a plant. In this context, simplification means reducing the complexity of documentation and management and therefore saving time, for example. Support during maintenance means digitally providing all information relevant to maintenance directly at the location where maintenance is performed. GEMÜ has developed a system to achieve this: With GEMÜ CONEXO, the valve components, such as the valve body, actuator and diaphragm, as well as the valve itself and therefore the entire operating media site, are all equipped with an RFID chip, which means that their electronic identifiers cannot be detached or effaced. This not only enables components and wearing parts to be clearly traced electronically, but also improves identification in the field. Using an RFID reader, the CONEXO pen, you can select all information associated with the valve or component on site, and view it on a tablet via the CONEXO app. This means that documentation and test reports relating to the plant component are available in digital format at all times. It is therefore also possible, for example, for the plant operator to call up information about the most recent maintenance work directly on site. Furthermore, the CONEXO app makes digital maintenance support possible. The fitter is assigned the maintenance task electronically on their tablet and can clearly identify the valve to be serviced and can perform the maintenance work. A digital record of who performed maintenance and at what time is therefore also automatically created. While performing actual maintenance, the fitter is guided through the process by the CONEXO app. The old and new diaphragms are both scanned, which is made possible by the integrated RFID chip. They can be clearly identified in this case too, which ensures that the correct components are used. The diaphragm remains clearly traceable – even after being removed. The condition of the diaphragm can then be documented. To do so, the fitter is requested by the system to evaluate the old diaphragm and can use the "photo documentation" to photograph the diaphragm on the tablet if required. This means that wearing parts are assessed electronically and can therefore also be evaluated systematically.

The CONEXO pen and app communicate via Bluetooth, and all the information collected during maintenance is saved offline on the tablet. This information is then transmitted via WLAN to the CONEXO portal, a portable server application, where it can be recorded and analyzed. This portal is CONEXO's central management unit and is ideally installed at the operator's premises. All relevant information is combined here. A history function can be used to compare all maintenance reports. You can manage sites, plant sections, components and maintenance tasks, analyze them across different sites and transmit data to the customer's maintenance software via interfaces. Direct communication with the ERP system is also possible.

CONEXO

Previous error sources during maintenance

For plant operators, CONEXO not only simplifies procedures and documentation, its supporting functions can additionally be used to prevent errors. Although all procedures are technically optimized, defined and validated in pharmaceutical production, the world of maintenance, which is frequently still analogue, hides potential error sources: Errors may occur during manual work, spare parts may be mixed up, maintenance plans and reports may be damaged and may get dirty, the fitter may work on the wrong operating media site, may service it twice or unintentionally not at all. Even if the maintenance report, completed by hand, was compiled correctly, it still cannot be processed electronically or evaluated. All these problems can be prevented with the new ability to ensure traceability, clear identifiability in the field and maintenance support. There is also the option to call up and view assembly instructions and assembly videos for the relevant valve on site, which can minimize errors during maintenance itself. In future, this will make maintenance safer and more transparent, and make the electronic recording of maintenance work possible, which increases system availability and process reliability.

Pilot plan

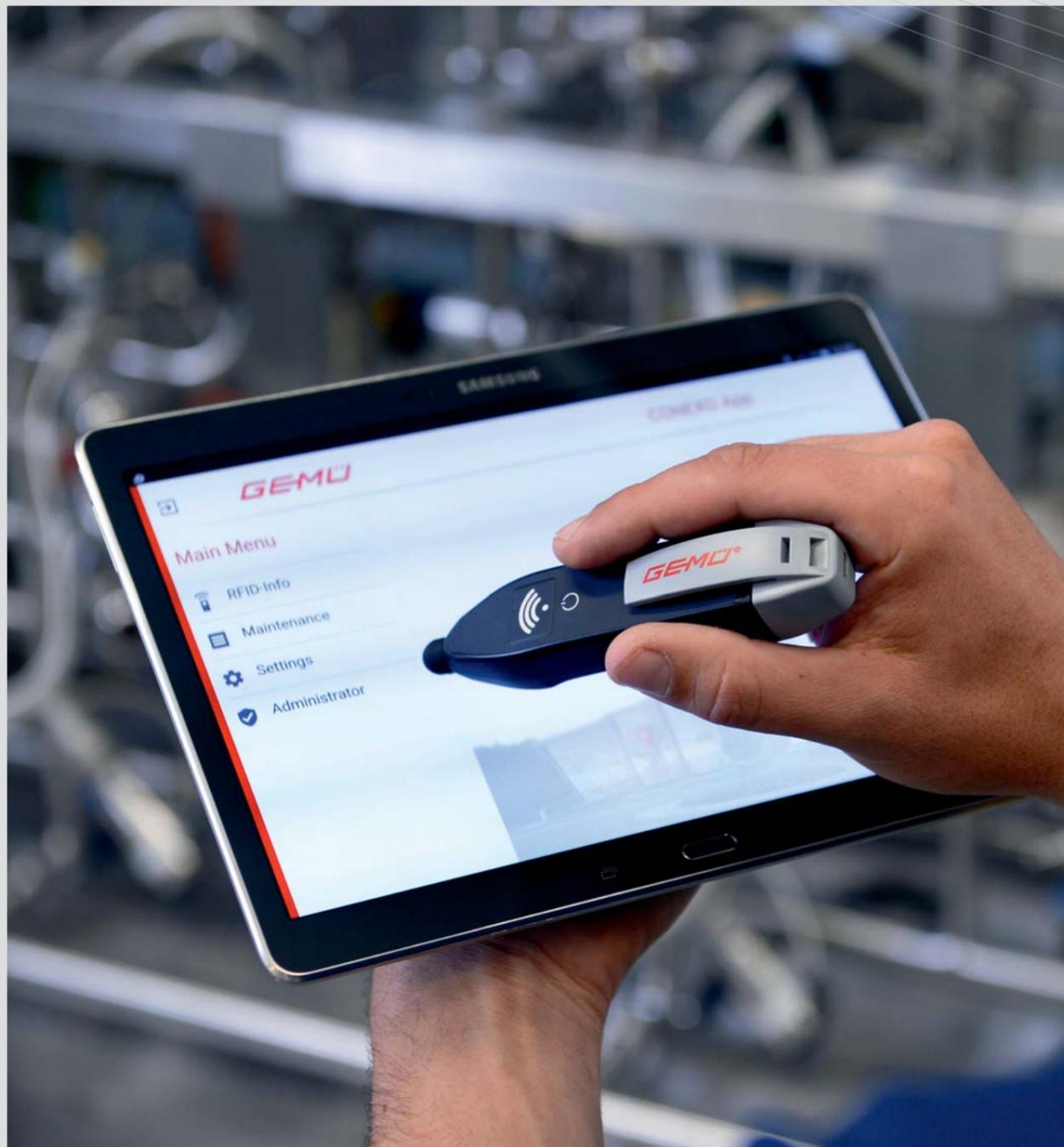
This comprehensive system benefits not only the plant operator, but also even the plant designer where FAT, SAT and IQ are concerned: This significantly reduces the costs, time and complexity involved, as all the necessary documents relating to the valve – qualification reports, test reports and other relevant documentation – are available in digital format and can be managed. In addition, valves can be easily identified in the field and information can be accessed on site.

While searching for a plant designer for one of the first pilot plants, Swiss company Bioengineering AG presented itself as an ideal and reliable partner, with whom GEMÜ maintains extensive and extremely successful collaboration. As a manufacturer of hygienic design plants, it specializes in the planning, design and construction of all sizes of bioreactors and fermentation plants. In view of the age of Industry 4.0 in particular, one of Bioengineering's major concerns is being able to offer its customers new options for digital management and intelligent networking in this precise area in future, in order to generate added value.

Bioengineering planned and manufactured a laboratory-sized bioreactor with a total volume of 30 litres, in which all stainless steel diaphragm valves and multi-port valve blocks from GEMÜ are equipped with CONEXO. Andreas Strehler, CTO at Bioengineering, sees a strong trend in these future issues: "Providing innovative and integrated solutions to offer our customers the best support we can, while incorporating the entire life cycle of a plant – that is our overarching service concept." Strehler believes that this type of system also brings major advantages in terms of the traceability and documentation of components and the planning and documentation of service operations. In particular, the combination of process data from the BioSCADA process control system with CONEXO offers many options in terms of preventative maintenance, and therefore increases system availability. He emphasizes that: "In future, the documentation of maintenance and planning, and regulation of servicing procedures, can all be stored electronically." For Strehler, the crucial factor is that other components in a plant, such as agitators, probes, motors, pumps, hoses and pressure gauges, can be integrated into the system.

A variable system for the future

CONEXO was designed as an open system, which means that other components and wearing parts in a plant, which are provided with an RFID chip, can be managed in addition to valves. In addition, interfaces to all common ERP, SCADA and maintenance systems can be established. This allows processes for maintenance management, future-oriented maintenance and spare parts management and procurement to be effectively interlinked. Since plant components are becoming more intelligent and communicate with one another, factors which influence the service life of spare parts, for instance, can be determined with increasing accuracy. This results in new opportunities to bring plants increasingly close to achieving optimum operation.



All relevant information can be displayed on a tablet on site. The touchscreen stylus on the CONEXO pen makes tablets easy to use in cleanrooms too, for example.

To record the condition of the diaphragm after removal, the fitter can photograph and evaluate it. This means that the information is stored digitally and can therefore be evaluated systematically.

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SUCCESSFUL FIRST YEAR MANAGEMENT TEAM VISITS GEMÜ JAPAN



Our newest subsidiary, GEMÜ Japan, has just successfully completed its first year. This was an excellent occasion for the company management to pay a visit to GEMÜ Japan.

"We are very proud of the successful launch of GEMÜ Japan and, along with the local staff, we are very excited about the fantastic start of this subsidiary," says Gert Müller, Managing Partner. There was a small celebration of the GEMÜ Japan launch during the management visit. Following tradition, the red ribbon was cut after a short speech by Gert Müller in front of the building in Nagoya which houses the GEMÜ

subsidiary. "The hard-working team here at GEMÜ Japan, which has been established for a year now, has seen great success in conveying the GEMÜ spirit to customers," explains Gert Müller. This trip was his first to the island nation. "Japan is an amazing country with a beautiful landscape and very friendly people. I loved the cleanliness and orderliness, particularly on the roads. There's no traffic chaos, even in a city with over a million inhabitants, such as Tokyo. I was also impressed with their excellent command of the English language," reports Gert Müller. It's not just the GEMÜ Group who are benefiting from the establishment of the Japanese subsidiary; customers in Asia are also seeing the advantages of the changeover from commercial partner to subsidiary. Just like in Germany, the subject of Industry 4.0 is very current in Japan at the moment. "We foresee great potential for GEMÜ CONEXO in the Japanese market," says Gert Müller.

GEMÜ ROADSHOW IN THE "PALACE OF THE PARLIAMENT"

We visit customers throughout Europe with our roadshow.

Our presence at the Expoapa in Bucharest was a special occasion for GEMÜ. Along with our national commercial partner, Thomas Medelsky – the driver for the roadshow – presented our innovations in water treatment at the exhibition. The event took place within the impressive halls of the "Palace of the Parliament" – one of the largest buildings in the world.



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INTRODUCING THE SEMICONDUCTOR BUSINESS SEGMENT



We presented our Pharma, Food & Biotech and Industry business units in the last two editions of GEMÜnews. Alongside these business units (BU), the Semiconductor, Service and Medicine business segments (BS) have also been developed based on our new business area strategy. Mr Burkhard Müller, head of the Semiconductor business segment, responded to a few questions on his business segment in the following interview.

GEMÜnews: Mr Müller, please tell us a little bit about yourself:

Burkhard Müller: My name is Burkhard Müller, I am 56 years old, I have been happily married for many years and have worked at GEMÜ since 1995. I studied process engineering at the University of Stuttgart with a focus on mechanical procedures as well as plastics technology. I started at GEMÜ as product manager and my first project was the CleanStar metal-free PFA HP valve. After change management in 2016, I officially became the Head of the Semiconductor business segment at the start of 2017.

GEMÜnews: Could you please give us a brief overview of your business segment? (Core tasks)?

Burkhard Müller: Almost everyone comes into contact with the products our end customers manufacture several times a day. It might be typical consumer products such as a smartphone, a flat screen television or LED lighting at home, or even the display on the car dashboard. Using our plant components, our end customers manufacture semiconductors, which are then installed in consumer goods such as these as well as in industrial machines. The Semiconductor business segment focuses on our customers in the semiconductor industry. The semiconductor market is based in the key countries of the USA, Taiwan, Korea, Singapore, Malaysia and, increasingly, China. The dynamic technological progress of the semiconductor market aside, the semiconductor industry is characterized by stringent requirements in terms of service life and resistance as well as regarding the purity of the components.

GEMÜnews: What are the three main core tasks that the business segment is taking over?

Burkhard Müller: Close and, therefore, direct international collaboration with the corresponding teams in the national organizations. This ensures that market development will be monitored accurately and new requirements will be detected early on. In addition, close collaboration on projects which often transcend borders, with the participation of end customers, designers and plant designers from different countries, and sometimes even different continents. We are setting up our sales and service organization accordingly, supported by our project group. With major projects, the project group supports the sales department internally during the offer phase as well as the customer once the order has been awarded. Another major task is developing customized solutions for the iComLine product range and implementing the project follow up.

- ⇒ Another significant factor for achieving success in the semiconductor sector is to spend a great deal of time with the end customer in order to complete specification work. This is why we are establishing a strong application management team.
- ⇒ A third important area is the close collaboration with our other business units, as their products are also used by our semiconductor customers. This includes, for example, stainless steel valves in high-purity solvent supply and plastic diaphragm valves in the water treatment of a semiconductor plant. Our product management is therefore in regular contact with the product management teams of the other two business units.

Apart from the usual core tasks of a business unit, it is particularly important to us in the Semiconductor business segment to constantly monitor the development of the market. This is the reason we were very happy to take over the challenging and exciting task of developing the battery storage area of application. The manufacture of modern batteries is a very interesting area of application with high growth potential for using fluid handling components, for example in lithium-ion battery production and electrolyte filling.

GEMÜnews: What has changed as a result of the restructuring for the Semiconductor business segment? (Advantages, challenges)?

Burkhard Müller: The world is changing faster than ever. And so are we. Only if we adapt we will be able to operate successfully in the future. Thanks to the new organizational structure, GEMÜ has created an organization which enables us to respond more quickly to the specific requirements of our customers and to offer them perfectly aligned and customized solutions. What have been the main changes for us? -- The main change is that we now have global responsibility for implementing the higher-level strategy and, after consultation with the customer and the national teams, can put the measures required into practice without any unnecessary interfaces.

I would summarize the three main advantages of the new structure as follows:

- ⇒ To be able to speak to customers directly/customers have direct contact with our segment specialists

- ⇒ Agreed strategy, prices, national organization/team who understand our segment customers, integrated and specialized sales
- ⇒ Quick decisions, short communication paths, fewer interfaces

The three main challenges currently facing us:

- ⇒ Leading the national teams. We are used to internal professional management, but this can conflict sometimes with supervisory management in other countries.
- ⇒ Market penetration represents a further challenge, which we are looking forward to facing with our extensive product range. We want to place our products in all areas of a plant and consequently to increase our market share.
- ⇒ Building up the business segment: In addition to the day-to-day business, the sales structure must be defined, personnel must be put in place, appointments must be made and new employees trained. This all doubles the workload, but we are happy to take it on as it is an investment for the future.

GEMÜnews: Where are you specifically focusing your efforts?

Burkhard Müller: The six key objectives determine our strategy, measures and actions in the Semiconductor business segment:

- ⇒ Strengthen international organization and responsibilities
- ⇒ Market-driven organization
- ⇒ Focus on profitable gaps in the market
- ⇒ Optimized communication and transparency
- ⇒ Innovation orientation

We follow the global team strategy in order to achieve these objectives by enabling direct communication with and between the national teams. We do this by defining priorities globally, coordinating cross-country projects and global pricing, improving the cost structure of our existing products and developing the roadmap for new development products based on specific market requirements.

The locations of our customers are distributed globally. This means that international collaboration and coordination are very important factors for success which we want to focus on from the very beginning. We can meet this challenge head-on thanks to global sales coordination and the global semiconductor team, consisting of staff from the business segment and the segment specialists from our subsidiaries. Another focus for this year is to continue to establish and develop our own sales organization. This includes another external sales advisor for Germany as well as an internal sales team which is the first point of contact for external sales advisers and for the national subsidiaries.

Last but not least, we are continuing to speed up product amendments and to implement new products so that we can continue to offer our customers a competitive range of products for the future. In this context, we are focusing on optimizing our current revenue driver, the CleanStar series, as well as continuing to develop the customized iComLine valve system with motorized actuators. Our range of system solutions, such as solutions for flow, pressure and temperature control, is also being expanded.

GEMÜnews: Now we have found out a little more about your responsibilities at GEMÜ, what does Burkhard Müller do when he is not at work? What hobbies do you have?

Burkhard Müller: I spend my spare time with my wife. We share a particular love of travelling to distant countries and like to get to know the country and the people under our own steam, usually by car. Trips to Myanmar, Costa Rica and Panama have been some highlights of the last few years. In 2015, I fulfilled a lifelong dream together with three friends. We initiated, planned and enjoyed a "boys' trip" riding on Harleys through the States. We covered approximately 3000 km along the coast and through the desert and mountains in two weeks. It was a fantastic experience! When I'm at home with my wife, we enjoy doing sport together, working in the garden or going out with friends. Maintaining and looking after our house and garden and its many plants and trees always keeps us busy. We both love animals, so our garden is also a little "green haven" where insects, birds and hedgehogs can make themselves at home.

I am content – both personally and professionally – and have been able to achieve my targets in my career to date, so I was very happy to take on this new challenge and am working with all my strength to continue to ensure success together. A good team is very important and, while setting this up is demanding, I am also enjoying it very much. If we work together and remain focused, we can achieve great things with our global team – there is a lot to measure, control and regulate.

DISTRIBUTION VALVE WITH MODULAR BODY CONCEPT

GEMÜ 553

Machining centres are CNC-controlled machine tools that are equipped with a tool magazine and an automated tool change device for the use of multiple machining tools. The cooling lubricant is distributed via a new, compact and modular GEMÜ valve concept.

Milling machines are used for machining using circular single blade or multiple blade tools. Milling machines can be differentiated from machining centres by the integration of an automatic tool changer with connected tool magazine. Milling machines and machining centres can also be used for manufacturing technologies other than milling. A general classification of machining centres has become accepted that is based on the installation position of the main and working spindle. Generally speaking, a differentiation is made according to the position of the tool spindle in horizontal and vertical milling machines and/or machining centres. Machining centres with a horizontal and vertical spindle are subdivided according to their frame design into the console, bed and portal designs. The console stand design is only found on smaller machine tools due to use with masses to be moved in a vertical direction. Bed milling machines are used for machining heavy workpieces since with this design the table sits on a fixed machine bed.

Machining centre design

A key trend for the development of machining centres was the concept of being able to use multiple tools in the machine for various machining tasks. This required the development of NC and CNC control for the machine tools in order to be able to perform multiple workflows in the machine automatically and one after the other. Modern versions of machining centres also include automated workpiece changers, all-over machining of workpieces in one clamping position, rough and precise machining one after the other and, as the latest trend, a connection for multiple machining applications such as milling, turning, grinding and honing in one machine and in one clamping position.

Modern machining centres enable a substantial reduction in process costs, machining and lead times, theoretical accuracies and precision, as well as a significant increase in manufacturing quality. In addition to the layout of the main spindle, the tool integrated in the machine at the same time and the workpiece change devices, machining centres are subdivided according to the number of NC axes. These include both linear axes and rotation axes, whereby these can be rotary and tilting axes, which in a machining centre perform the tool and workpiece movements along the movement axes.

Using cooling lubricants

In modern metalworking processes, cooling lubricants continue to be an essential aid. By using cooling lubricant, the surface finish of the workpiece is improved, the machining speed is increased and the service life of the tools is extended. Operating costs can be effectively reduced. Cooling lubricants are primarily used to lubricate, flush and clean the machining location. Water-based cooling lubricants and non water-soluble cooling lubricants are used depending on the machining task. These are applied to the relevant location during or after the machining process in the required quantity using a machine control system – or manually to some extent – depending on the requirements and design of the machining centre.

Case study: Hermle machining centre

Hermle AG, based in Gosheim in Baden-Württemberg, represents high-performance, highly innovative machining centres that occupy a leading position both in Germany and abroad. They stand for a far-reaching and close-meshed sales and service network and for worldwide presence with over 25,000 successfully installed machines.

In the new 5-axis simultaneous machining centres of types C 52 U and C 52 U MT, up to 2000 kg of heavy workpieces can be machined. During this process, the new, modular distribution valve – the GEMÜ 553 – is used to distribute the cooling lubricant. The compact design of this valve means that a great deal of space can be saved. Reduced installation time and increased process reliability are further advantages here. Several actuators control the entire coolant system in the machining centre.



Modular valve body concept

Modern and compact valve solutions are much in demand in plant engineering, for use in a wide range of applications. In addition to demanding requirements in terms of pressure and temperature, modular-style and expandable valve solutions are becoming increasingly popular. Through their adaptability to individual situations, a high level of flexibility can be achieved for a range of different applications with the modular GEMÜ 553 distribution valve. The GEMÜ 553 series consists of high-quality, stainless steel investment cast bodies that can be very easily connected together in series using a tried-and-tested seal system. In terms of the actuator unit, pneumatic actuators in stainless steel or plastic and manual operators made of plastic are available from the GEMÜ modular system. These can, depending on requirements, be used in combination with a widely varied range of accessories, such as electrical position indicators, combi switchboxes and/or pilot valves.

Versatile application possibilities

Thanks to the diversity of combination options, as well as the technical properties it possesses, the valve can be deployed for a variety of different processes. In this regard, it can be used in applications where an extremely wide variety of different media are distributed, mixed or collected. In the mixing function, media with different properties can be mixed together, such as hot and cold water. In the collection application, a same medium is guided in the back flow to a common outlet. In the distribution function, a medium is guided to a variety of different consumers. With the aid of a universal module, it is possible to integrate temperature and pressure measuring directly into the process. Furthermore, media can be separated along the

pipe train. As a result, it is possible to control the flow of two media or types of media (e.g. liquid or gaseous) independently of one another via the same valve configuration.

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PRODUCT RANGE ADJUSTMENT

PLASTIC DIAPHRAGM VALVES WITH ELECTRIC ACTUATOR

Motorized diaphragm valves equipped with the latest generation of plastic valve bodies.

As part of the continuous adjustment of the product range of GEMÜ's plastic diaphragm valves, the motorized valve types have now also been adapted to the new generation of valve bodies. This has been established in the market for some time now thanks to the manually and pneumatically operated types GEMÜ R677 and R690. The valve bodies in the R-series for the plastic diaphragm valves stand out thanks to their good flow capability. As a result, among other things, it was possible to significantly reduce the size of the actuator for the pneumatically operated GEMÜ R690 valve in comparison with its predecessor.

The motorized GEMÜ S680 and GEMÜ 693 valve types have now also been equipped with these valve bodies, whose geometry has been optimized. The plastic diaphragm valves that have been adjusted in this way are now available under the names GEMÜ R680 and GEMÜ R693.

The GEMÜ R693 valve can be ordered in the nominal sizes DN 32 to 50. Nominal sizes DN 15 to 25 will soon follow. This means that all of the diaphragm sizes from 20 to 40 are covered. In addition, the customer can use all of the body and diaphragm materials that they are already familiar with from the GEMÜ R690.

The motorized actuator on the GEMÜ R680 stands out in particular thanks to its lightweight and compact design. This valve is available in the nominal sizes DN 15 to 25. As possible materials for the medium-wetted components, you can choose from PP, PVC, ABS or PVDF for the valve bodies, and EPDM or PTFE for the diaphragms. As a possible connection, you can choose from various versions of union ends.



GEMÜ R680



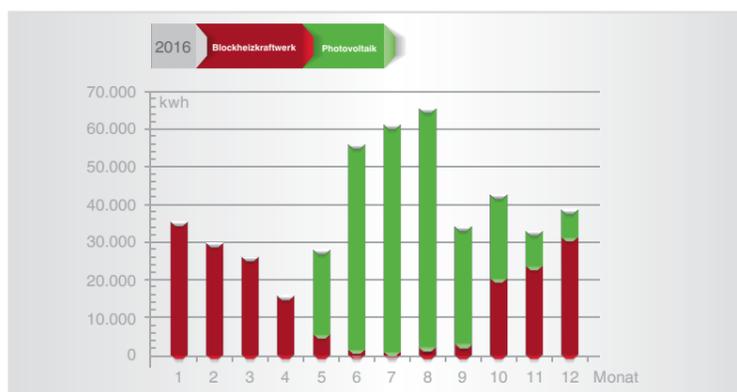
GEMÜ R693

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SUCCESSFUL ANNUAL BALANCE

PHOTOVOLTAIC PANELS ARE PRESERVING THE ENVIRONMENT



Just over a year ago, on 13th May 2016, the photovoltaic panels on the roof of the PLZ-E in Kupferzell started to produce electricity.

With 1518 solar modules, it is designed to produce approximately 390,000 kWh/year. The balance for the first year corresponded almost exactly to this planned value. From May 2016 until April 2017, 380,000 kWh of power was generated. That amounts to 37 per cent of the power consumption at the PLZ-E site. The electrical energy demands for the heating pump system, the ventilation systems, the generation of cold air to cool the machines and provide air-conditioning in the hall and the energy for generating compressed air is covered in this way by the solar energy – which is great for the environment. The remaining power is fed into the network as it cannot be used by us over the weekends. By changing over to renewable energy sources, GEMÜ has now reduced its CO2 emissions by approx. 234 tonnes annually.

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TRADE FAIRS 2017

NATIONAL | INTERNATIONAL

Drinktec	11.09. – 15.09.	München (DE)
MSR Spezialmesse		
Niedersachsen	13.09.	Braunschweig (DE)
Semicon Taiwan	13.09. – 15.09.	Taipei (TW)
Powtech	26.09. – 29.09.	Nuremberg (DE)
PPMA Total Show	26.09. – 28.09.	Birmingham (GB)
WEFTEC	30.09. – 04.10.	Chicago, IL (USA)
Przemysl Farmaceutyczny	01.10.	Warsaw (PL)
Expoquimia	02.10. – 06.10.	Barcelona (ES)
HI	03.10. – 05.10.	Herning (DK)
MSV Brünn	09.10. – 13.10.	Brünn (CZ)
Bioproduction	17.10. – 18.10.	Dublin (IR)
Chemistry	23.10. – 26.10.	Moscow (RU)
MSR Spezialmesse Südost	25.10.	Landshut (DE)
Aquarama	26.10.	Leuven (BE)
China-Pharm	07.11. – 10.11.	Peking (CN)
DIAM	08.11. – 09.11.	Bochum (DE)
A3P	14.11. – 16.11.	Biarritz (FR)
Semicon Europa	14.11. – 17.11.	Munich (DE)
Pharmtech	21.11. – 24.11.	Moscow (RU)
CBST	22.11. – 24.11.	Shanghai (CN)



PRECISE FILLING OF LITHIUM-ION BATTERIE



Trade fair model
GEMÜ iComLine®



In the energy storage market, lithium-ion batteries are considered to be a cost-effective solution. Automated valve systems from GEMÜ make a contribution towards implementing filling solutions which further optimize series production.

Cost reduction and optimized performance profile

Thanks to its high energy density, lithium-ion technology is seen as a highly efficient electrochemical store and is therefore also used for new applications, such as actuator technology in hybrid and electric vehicles. Customer acceptance is significantly dependent on falling procurement costs and acceptable mileage and range. For this reason, all well-known battery manufacturers have test facilities where lithium salts are processed and filled.

Process parameters and automation

Media such as lithium salts, sodium bromide or lithium polymers have chemical and mechanical properties that make industrial treatment significantly more difficult. To prevent crystallization and gas diffusion, a continuous pressure must be maintained in numerous systems. This requires the use of automation-capable components which have consistent, calculable reaction times. For some customers, GEMÜ therefore implements a multi-port valve block from the iComLine® product range, which monitors and controls the preset process parameters using a tested adapter set with a positioner. The standard regulating cone made of PTFE, which is optimally designed to seal off the medium and separate it from the actuator, has a linear stroke which enables high cycle duties and fast, clearly definable reaction times.

GEMÜ, ALL FROM A SINGLE SOURCE

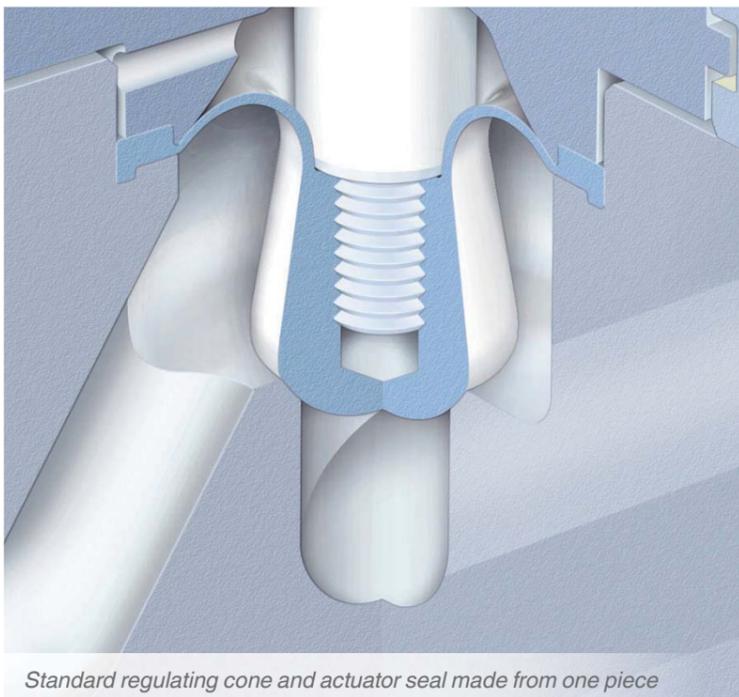
AN OVERVIEW OF LINEAR VALVES

Draining the components and cleanability of the components

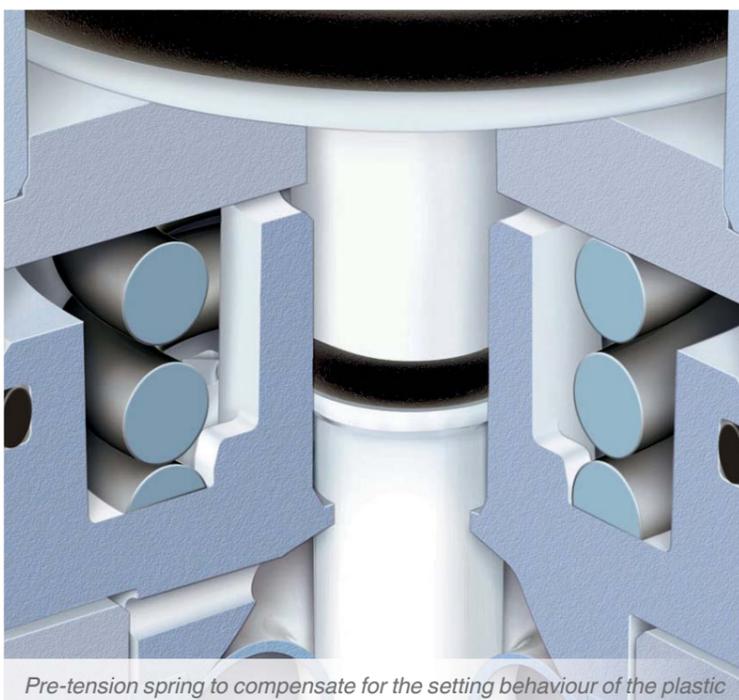
Filling the cells with liquid electrolyte is a process step which is critical to successful battery production, as a precise filling level must be reached. A networked system of piping, tubes and optimally draining valves enable the precise filling level to be reached and, at the same time, minimize the maintenance required by the battery filling system. An optimized draining system for electrolyte filling as well as integrated cleaning processes help to prevent the crystallized particles from remaining, thereby protecting the entire system. This extends the service life of the individual components, which leads to a reduction in the cost of the filling process. With a corresponding seat contour, the seal geometry of the standard regulating cone and a pre-tension spring which acts on the standard regulating cone, the valve system described meets these requirements – with up to 5 million cycle duties.

Versatile valve system solutions

Depending on the medium and process parameters, alongside the PTFE multi-port valve blocks described, multi-port valve blocks made of different materials are also used. For the testing facilities described, for example, a stainless steel multi-port valve is used alongside the iComLine® valve system. The advantage here is that this valve block can also be successfully operated under vacuum pressure.



Standard regulating cone and actuator seal made from one piece



Pre-tension spring to compensate for the setting behaviour of the plastic

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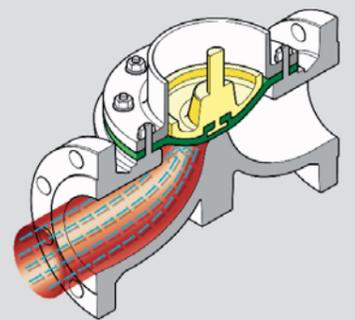
In the section "GEMÜ – all from a single source" of this issue of GEMÜnews, the principle of linear valves is explained in more detail.

A distinction is made between diaphragm valves and globe valves. The diaphragm valve is the practical all-rounder among valves and can be used for countless applications in all industrial sectors. Globe valves are ideal for fast cycle duties, higher temperatures and control applications.

LINEAR VALVE

Diaphragm valve

The diaphragm valve is practically the all-rounder among the valves; it can be used for countless applications in all industrial sectors. One of its major advantages is that only two components come into contact with the working medium – the diaphragm and the valve body. In the closed position, the diaphragm is pressed onto the sealing weir of the valve body and can therefore shut off up to 10 bar operating pressure. The media wetted inner geometry is designed to keep flow turbulences as low as possible, and there is almost no opportunity for product deposits or sediment, which means that it is very easy to clean. The diaphragm valve is known for its "minimal deadleg" valve type. The EHEDG certified diaphragm sealing system makes it ideal for use in the food and beverage industries, as well as for the biotechnology and pharmaceutical industries. The large material selection also means that it is ideally suited for corrosive, abrasive or high viscosity media, which are often found in the chemical industry and environmental engineering, or in processing industries. It is also used in water treatment, whether as a simple process water for heating or cooling circuits, for the manufacture of drinking water or the production of ultra pure water for microelectronics or semiconductor production. In addition to the previously described conventional weir-type diaphragm valve, there is also a full bore diaphragm valve, which provides practically unhindered through flow in the open position. This makes it the ideal choice for highly abrasive media with a high solid matter content. Typical areas of application include mining, manufacture and processing of wood pulp, paper, granules, plaster, cement, etc.

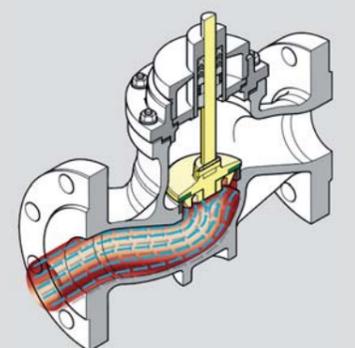


Diaphragm valve in closed position

Globe valve

Globe valves are ideally suited for the control and regulation of mechanically pure, chemically inert or slightly corrosive liquids, gases or vapours.

This involves a gasket, generally made of PTFE, pressing against a seal seat, which then blocks the volumetric flow. A differentiation is made between straight seat and angle seat globe valves. The straight seat globe valve is often used for larger diameters and is also available in 3-way design, making it very good for mixing or switching tasks. A straight seat globe valve is also to be preferred where the valve is subjected to high stresses due to high flow velocities and regular readjustments. This is due to the more even distribution of force on the valve spindle. Angle seat globe valves are lighter and more compact and have a comparatively higher flow rate (Kvs value). All standard versions are already suitable for medium temperatures up to 180 °C and operating pressures up to 40 bar. In modified designs, temperatures of up to 300 °C can be handled without difficulty. The good mechanical properties of the globe valve design are particularly well suited to high cycle duties, filling and dosing applications. They are also the first choice for industrial or sterile steam generation and distribution.



Globe valve in closed position

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"EXEMPLARY CONSTRUCTION" ARCHITECTURE OF THE EUROPEAN PRODUCTION AND LOGISTICS CENTRE IS RECOGNIZED

The "Exemplary construction" award scheme honoured the architecture of GEMÜ's European Production and Logistics Centre in the Hohenlohe business park.

Out of 68 submitted works, the seven-person judging panel of the Baden-Württemberg Chamber of Architects, under the patronage of District Administrator Dr Matthias Neth, determined which buildings were worthy of prizes. Both the developers and the architects were honoured. Michael Frey from Schmelzle + Partner in Hallwangen is responsible for the intelligently designed architecture of the European Production and Logistics Centre (PLZ-E). The judging panel praised the simple cubic building structure in particular, as well as the openness and permeability which pervades the administration and production departments and thus creates a pleasant working atmosphere in all departments. The façade and the clear colour and material selection were also highlighted. The fact that the building does not have a rear also caught their eye.

GEMÜ Managing Directors Gert Müller and Stephan Müller accepted the certificate and plaque on 24th January 2017 as part of the opening of the accompanying exhibition. "We are delighted with the award from the Baden-Württemberg Chamber of Architects. The conceptual design of the PLZ-E impressed us right from the outset. The modular construction means that all areas can be expanded depending on requirements. Of course, the external



appearance of the building is also important to us. We therefore developed a corporate design for the façade and, since then, this design has been applied all over the world," says Gert Müller.

In February 2017, the groundbreaking ceremony took place for the second section of the building. This will add a new surface-technology centre to production which seamlessly fits into the overall concept – not only from an architectural point of view, but also from a functional and logistical point of view.

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FA-MI-LI CHINESE GEMÜ MASCOT

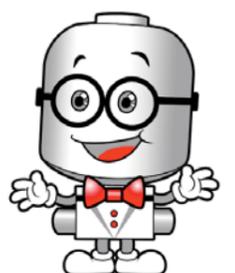


Hi, I'm Mr. Fa-Mi-Li. In Chinese my name is "阀米力". „阀" (Fa) means "Valve", "米" (Mi) means "GEMÜ", and "力" (Li) means "Powerful". I was born in GEMÜ China in January 2017 around the same time as the release of the "GEMÜ Valve World V2.0" app. I look just like a GEMÜ metal diaphragm valve, aren't I cute and handsome? 😊

I'm the ambassador of the "GEMÜ Valve World" app and my mission is to advertise the app for the GEMÜ brand and product promotions in China. The "GEMÜ Valve World" app has 4 sections: the GEMÜ world/product quick finder, tool box, authorized user center, and online order/inquiry function; all of which make it easy and convenient for customers to get close to GEMÜ.

Although I am less than six months old, I'm already popular with the staff and core agents of GEMÜ China and I've attended 2 important exhibitions: Semicon China 2017 and 2017 CIPM (China International Pharmaceutical Machinery). Visitors to the exhibitions were very interested in GEMÜ products and also in the app that I introduced, so I made hundreds of new friends there. I am so proud of my job and will work hard for GEMÜ Valves!

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