

GEMÜ news

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MEETING
CHALLENGES

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Innovations

Application reports

Apprenticeship and working

Commitment and initiatives

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

EDITION 01.2022

Dear Readers,

the challenges caused by the coronavirus pandemic and the current dynamic and sensitive geopolitical situation have had a great effect on business in the first half of 2022. We have been able to master these challenges successfully thanks to our diversified product range, the great commitment of our staff, close collaboration with our business partners, and the trust of our customers.

Even though the pandemic is not completely over, the coronavirus restrictions are slowly being lifted step by step. On the other hand, the Russian war of aggression against Ukraine has been putting a strain on the world economy since the end of February. The war is exacerbating supply shortages affecting companies since the coronavirus pandemic even further. This has an effect on the entire supply chain. We are investing in new technologies, activating second sources and taking many additional measures to ensure ongoing reliable delivery – and we are very happy that our customers are also continuing to pursue their objectives and make investments.

It has only been possible to overcome the latest challenges because the entire GEMÜ team all over the world has been working as one with every single employee giving their very best for our customers. This experience makes us feel optimistic that we will continue to master the situation well.

With our eyes on the future, a new modern company headquarters is currently being built in Hohenlohe business park. Not only GEMÜ employees but also our customers will benefit from it. It has now been more than a year since the groundbreaking ceremony and we are very happy to be on schedule with the construction. We are already looking forward to when we move into the new GEMÜ headquarters in 2024 and can welcome our customers there.

We would like to say a big thank you from the entire management team to all members of staff for their amazing dedication and outstanding service. Many thanks also to all business partners and customers for the loyalty and



trust you have shown. We will continue to do everything within our power to remain a reliable partner supplying first class products and solutions.

We look forward to continuing trusting collaboration.



Gert Müller

Managing Partner



Stephan Müller

Managing Director

GEMÜ RECEIVES AWARD TOP EMPLOYER 2022

Once again, FOCUS-Business has listed GEMÜ as one of Germany's top employers in the Industry category.

The fact that GEMÜ employees are very satisfied with their employer is reflected by the company's current ranking among the best 1000 employers, as revealed by FOCUS-Business on 19th February 2022.

The business magazine commissioned research institute FactField to conduct an online survey throughout Germany, analysing more than 550,000 online assessments of over 38,000 employers. This research concerned companies with a minimum of 500 employees, a site in Germany and an average rating of at least 3.5 stars from a minimum of 50 employee assessments. Using these criteria, the 1000 best employers in the country were chosen and listed in the FOCUS ranking by category.

Once again, the GEMÜ Group has been recognized as one of the country's top employers for 2022 in the Industry category. With approximately 1200 employees at three sites in the German state of Baden Württemberg, around 2200 employees worldwide and positive feedback from employees, the company met all of the criteria.

"We're delighted that GEMÜ has been listed as one of Germany's top employers again. This reaffirms our efforts to always advance our welcoming corporate culture. We

believe that it's important that employees can successfully contribute and we can work together towards a common goal for the benefit of our customers," says Gert Müller, Managing Partner of the GEMÜ Group.

 Norbert Neumann
Corporate Communication
Team Leader/ Press Officer
norbert.neumann@gemue.de

FOCUS

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TWO YEARS OF THE CORONAVIRUS PANDEMIC

INTERVIEW WITH GERT MÜLLER, MANAGING PARTNER AT GEMÜ

The pandemic really took over in the last two years and continues to affect day-to-day work massively. Managing Partner Gert Müller explains the greatest challenges for GEMÜ.

Mr Müller, can you remember when you first heard of SARS-CoV-2 and what you thought at the time?

I first heard of SARS-CoV-2 in December 2019 in a conversation with the Managing Director of our subsidiary in China. Thanks to my very vivid memory of SARS 1, I immediately thought, "Oh dear Gert, this does not sound good". Unfortunately, I was right.

What measures did GEMÜ take as it became clear that the coronavirus outbreak could develop into a pandemic?

At GEMÜ, we very quickly decided to follow strict measures. We founded the Corona Taskforce for this purpose. We have had hand disinfection devices in all buildings since the "swine flu" outbreak in 2009. We were able to continue to implement and further expand the hygiene concept with the contactless hand disinfection devices. We also introduced social distancing measures right from the start, distributed facemasks to all the staff, set up plexiglass screens as partitions and initiated mobile working. At the beginning of the pandemic we managed with returned laptops that we still happened to have in the company. Thanks to our digitalization strategy, we had the required software infrastructure even before the coronavirus outbreak and were able to transition to working from home practically seamlessly. However, a major challenge at the beginning was the broadband required for data transmission here in Kochertal. But I can reassure our customers, a lot has happened here in Swabia in the meantime. The connections are stable and we can now leave the cameras switched on. 😊

What do you think were the greatest challenges for GEMÜ?

I think one of the big challenges was that the federal and state governments often communicated new coronavirus regulations at very short notice and we had to implement them promptly. And quickly creating a hygiene concept was new territory for us at first. We generally had to implement a lot of measures all at once in a short period of time. This included working from home, organization and distribution of facemasks, creating notices for maintaining social distancing, designing and displaying information boards or even defining where plexiglass partitions needed to be erected. Of course, all these problems could be solved. It was just that the time factor was so critical. Added to that was the fact that there was a significant lack of facemasks and disinfectants especially at the start of the pandemic due to the great demand. But with time, we got better and were usually one or two steps ahead of the government regulations.

The world was suddenly in a type of shock-induced paralysis when the

pandemic broke out. People got ill and companies had to close, destabilizing the supply chain, in turn creating supply problems and material scarcity. The pandemic showed us that some business strategies need to be scrutinized. This included the demand for greater store facilities and a stronger focus on securing supply availability. In this situation, we had the advantage as a flexible family-owned enterprise of having short decision-making processes which meant that we could quickly reorganize our strategy.

Presumably, the pandemic will change the economy and society in the long-term. What effects do you foresee for the future?

We recorded a slump at the start of the pandemic and felt the effects of the fluctuations in demand in the market; however, this stabilized throughout the year. From an economic point of view, the business developed well for us during the second year of the coronavirus pandemic – and this upward trend continues. I am very thankful to our customers for this, who put their trust in GEMÜ and our products. I currently foresee a positive trend for the coming months as well. However, this does of course depend on how the geopolitical situation develops as well as its effects on the world economy. We are already seeing how interest rates are rising, making investments more expensive. Other challenges, such as the demand for skilled workers, goods and services will be greater problems for the economy in future. I believe energy costs will continue to rise. Sustainable and renewable energy will become more and more important to counteract this. This is why we have already significantly improved our CO2 footprint in the last two years thanks to digitalization and investments in new technologies. We will continue to focus on subjects concerning sustainability in future as well. We are equipping every new building with photovoltaic systems and heat pumps, for example, and are consistently pursuing our objective to gradually continue to reduce our CO2 footprint. Future independence from fossil energy sources is also at the top of our agenda. We want to keep up our delivery capacity in future as well, no matter what challenges we face in energy politics.

The pandemic also had a direct effect on our working methods. We have gained a wide range of experience with working from home thanks to the pandemic. Personally, I was quite sceptical about working from home, but we have had some very positive experiences with it in the meantime which will play an important role in future as well. We have also used the pandemic to redefine working processes and to prepare for the subject of "New Work". It will change the way we work together at GEMÜ even once the pandemic is over.

We have stopped implementing several coronavirus measures at GEMÜ since the beginning of May 2022. However, some changes are here to stay, as they have become the norm in society. Personally, I like to greet someone with a smile 😊 and not shake hands. We would carry on with that if it were up to me.



All members of staff pulled together and helped carry the measures. This meant that we were able to tackle the challenges of the pandemic and I am confident that we will continue to overcome the difficulties together in future. I would like to offer special thanks to the Corona Taskforce who were thrown into the deep end and had to become experts in crisis management within a very short space of time. Hats off, Corona Taskforce!

 **Ivona Meißner**
Corporate Communication Advisor
ivona.meissner@gemue.de

LEAN PRODUCTION, ENVIRONMENTAL PROTECTION AND DIGITALIZATION

AWARD FOR GEMÜ CHINA

In January 2022, GEMÜ China was recognized by Shanghai's Minhang District as an influential company for this district in 2021. The company was honoured with an award for the significant contribution that GEMÜ China has made to the development of the regional economy.

This award highlights the progressive technology, the innovative capacity and the customer- and application-oriented nature of the Chinese subsidiary of GEMÜ Valves Co., Ltd., which is distinguished by lean production methods and a high degree of digitalization, in addition to championing environmental protection through its low-carbon approach.

The award additionally recognizes GEMÜ China's participation in almost all COVID-19 vaccination projects in China during the coronavirus crisis in 2021. The GEMÜ subsidiary has also successfully overcome many



challenges in relation to a shortage of personnel and material. Consequently, it has fulfilled its social responsibilities and also contributed to ensuring that GEMÜ products were able to be supplied on time.

 **Agnes Zhou**
Marketing Supervisor GEMÜ China
agnes.zhou@gemue.com.cn



GEMÜ CELEBRATES THE TOPPING OUT OF ITS NEW HEADQUARTERS

In April GEMÜ held a topping-out ceremony for its new headquarters at the Hohenlohe business park.

The GEMÜ Group started construction work for its new headquarters at the Hohenlohe business park just over a year ago. The shell of the building was completed in April.

To mark the occasion, Gert Müller, Managing Partner at GEMÜ, invited all of the companies involved in building the shell, along with designers, architects, mayors and the GEMÜ construction team and their families to the topping-out ceremony.

In his short speech, Gert Müller particularly thanked the tradespeople who had worked on the new building in any wind and weather. The GEMÜ Managing Partner also mentioned a few impressive figures. For example, about 50 companies take part in the construction of the new headquarters. During the peak phases of constructing the shell, up to 35 workers, tradespeople and other people involved were working on the construction site at the same time. Following Gert Müller's speech, site manager Jürgen Schmitt gave the traditional topping-out speech, thanking the client on behalf of Stauch and asking for God's blessing of the new building.

A particular highlight was when Michael Frey, from architectural firm Schmelzle & Partner, presented Gert Müller with a time capsule. The time capsule contains objects that are typical of the time and it is buried in the ground in order to preserve and document the present day for future generations.

The hundred guests were then provided with sustenance by a food truck, grill chicken van and mobile espresso bar.

"The topping-out ceremony for our new headquarters is an important milestone for GEMÜ and represents a major step towards the future. We're well on schedule and are looking forward to moving in to our new, state-of-the-art company headquarters in two years' time," says Gert Müller, Managing Partner of the GEMÜ Group.

Norbert Neumann
Corporate Communication
Team Leader/Press Office
norbert.neumann@gemue.de



THE GEMÜ FAMILY CONTINUES TO GROW FOUNDATION OF GEMÜ IBERICA

With the foundation of GEMÜ Iberica S.L., GEMÜ is continuing to grow. The 28th subsidiary of GEMÜ commenced operations on 1st July 2022.

By providing direct support to the Iberian market, the new arm of the business aims to attract new clients and strengthen relationships with existing ones, and to set the course for future growth on the Iberian peninsula.



GEMÜ Iberica

The managing director of the new GEMÜ subsidiary is Angel Puentes, who has been providing support to GEMÜ customers in Spain and Portugal together with his team since 1st July 2022. The team members have procured an office in the greater area of Barcelona as part of the new foundation. We wish Angel Puentes and his team a good start and all the best for this new challenge!

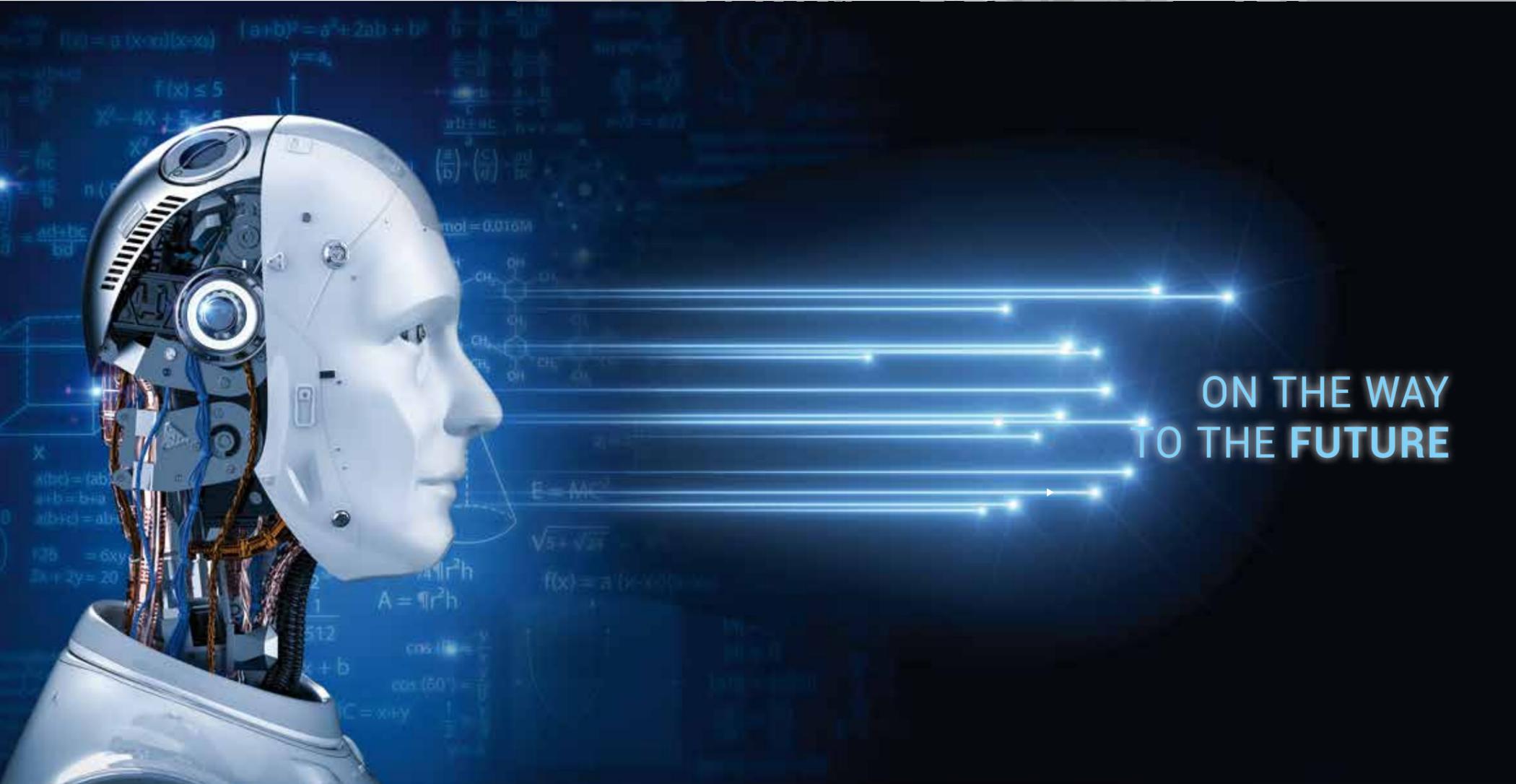
Patrick Dorsch
Management Advisor
patrick.dorsch@gemue.de

Angel Puentes
Managing Director GEMÜ Iberica
angel.puentesbabiano@gemue.es

TRADE FAIRS 2022 (INTER)NATIONAL

Abwasser und Umwelt	06.07.	Weilburg (DE)
Battery Experts Forum	12.07. – 14.07.	Frankfurt (DE)
Semicon West USA	12.07. – 14.07.	San Francisco (US)
Interpex Japan	13.07. – 15.07.	Tokyo (JP)
Clean Show	30.07. – 02.08.	Atlanta (US)
ISPE Singapore	17.08. – 19.08.	Suntec City (SG)
ACHEMA Event	22.08. – 26.08.	Frankfurt (DE)
Drinktec	12.09. – 16.09.	Munich (DE)
Semicon Taiwan	14.09. – 16.09.	Taipei (TW)
Ilmac Lausanne	28.09. – 29.09.	Lausanne (CH)
ISPE Boston Product Show	01.10.	Boston (US)
Farmaforum Spain	05.10. – 06.10.	Madrid (ES)
WEFTEC USA	10.10. – 12.10.	New Orleans (US)
China Brew China Beverage	12.10. – 15.10.	Shanghai (CN)
Processteknik Sweden	18.10. – 20.10.	Göteborg (SE)
Foodtech DK	01.11. – 03.11.	Herning (DK)
Semicon Europa	15.11. – 18.11.	Munich (DE)
CPHI / P-mec India	29.11. – 01.12.	Delhi (IN)
Inchem Plant Show Japan	07.12. – 09.12.	Osaka (JP)
Semicon Japan	14.12. – 16.12.	Osaka (JP)

Subject to changes due to the Corona Pandemic!



ON THE WAY
TO THE FUTURE

THE TRENDING TOPIC OF AI QUO VADIS, ARTIFICIAL INTELLIGENCE?

In the context of Industry 4.0 and IoT (Internet of Things), digitalization and autonomization in combination with the future-oriented topic of artificial intelligence are key challenges for innovations. The application of state-of-the-art technologies combined with the ingenuity of innovative companies form the basis for continual success.

GEMÜ works on these challenges in the context of forward-looking projects to actively contribute to the development of the technology. Predictive maintenance, artificial intelligence (AI) and autonomous production are terms that hold plenty of promise. But they also provoke plenty of questions, such as: Is artificial intelligence merely an over-hyped concept? How ready are the technologies to be actually used in applications? And which tasks are they able to solve?

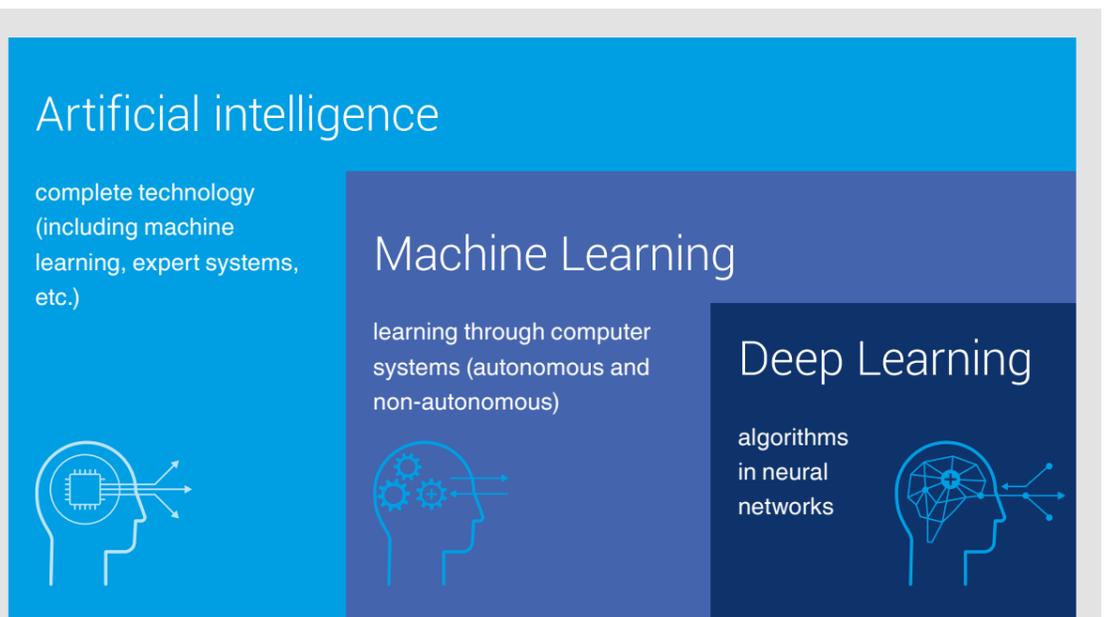
Is artificial intelligence merely an over-hyped concept?

Artificial intelligence solutions have already been around for a long time. The adjacent timeline shows examples of this, from the chess computer produced by IBM to the humanoid robots of Boston Dynamics and Google's Go algorithm. Miniaturizing the required performance capability and making a wide range of applications available has taken some time to implement. This experience definitively shows that artificial intelligence isn't just a short-term hype.

Experts believe that autonomization – and, by extension, artificial intelligence – will be of benefit to humans, and such solutions are already being deployed in many cases today. The responsible use of artificial intelligence does present a challenge, but these obstacles are not insurmountable.

The acatech (Deutsche Akademie der Wissenschaften [German Academy of Sciences] / Kagermann et al. 2016b) substantiates this view with specific forms of intelligence that technical systems do not possess:

"Despite their capabilities, autonomous systems are only able to support humans in many areas of decision-making and problem-solving, and will by no means replace them. This is because, in all significant technical advances, they lack everyday intelligence, social-emotional intelligence and intuition. Humans specify the main goal, and the system then independently plans and executes the necessary steps according to the situation and within its scope of action in order to achieve this goal."



From chess computer to GO algorithm





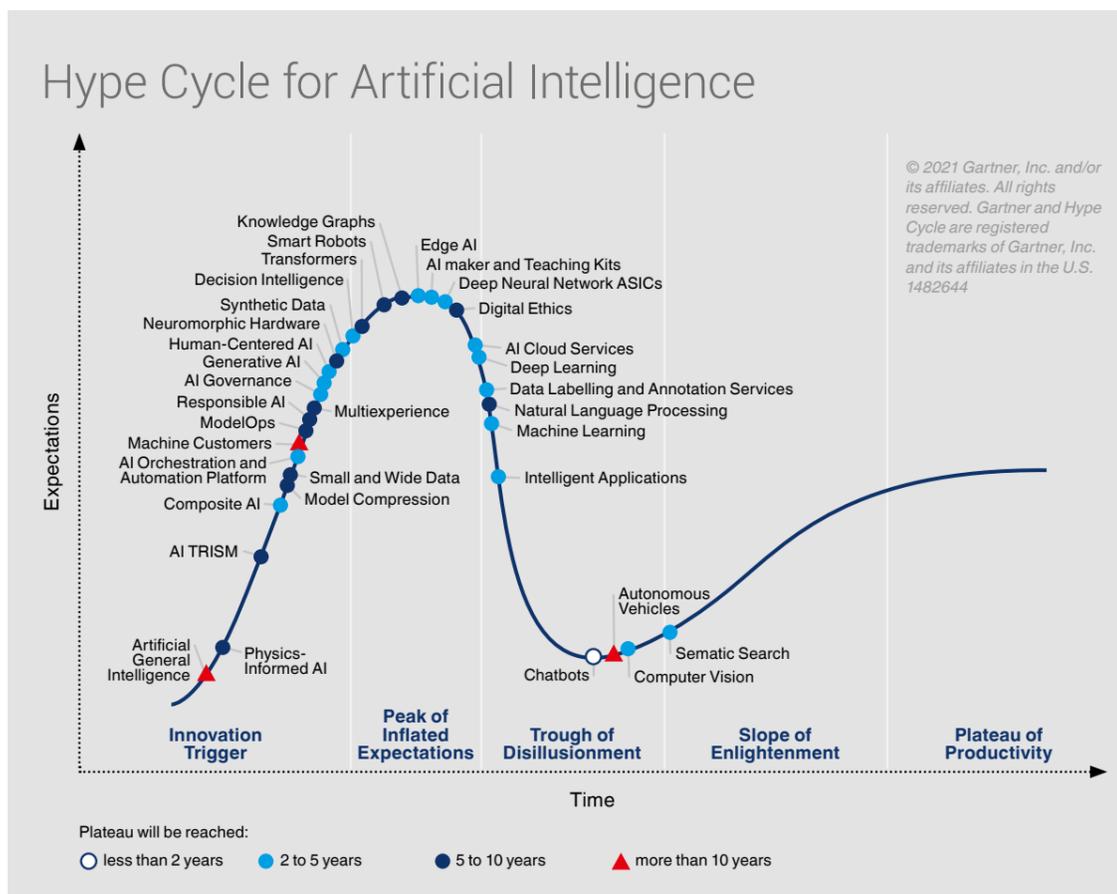
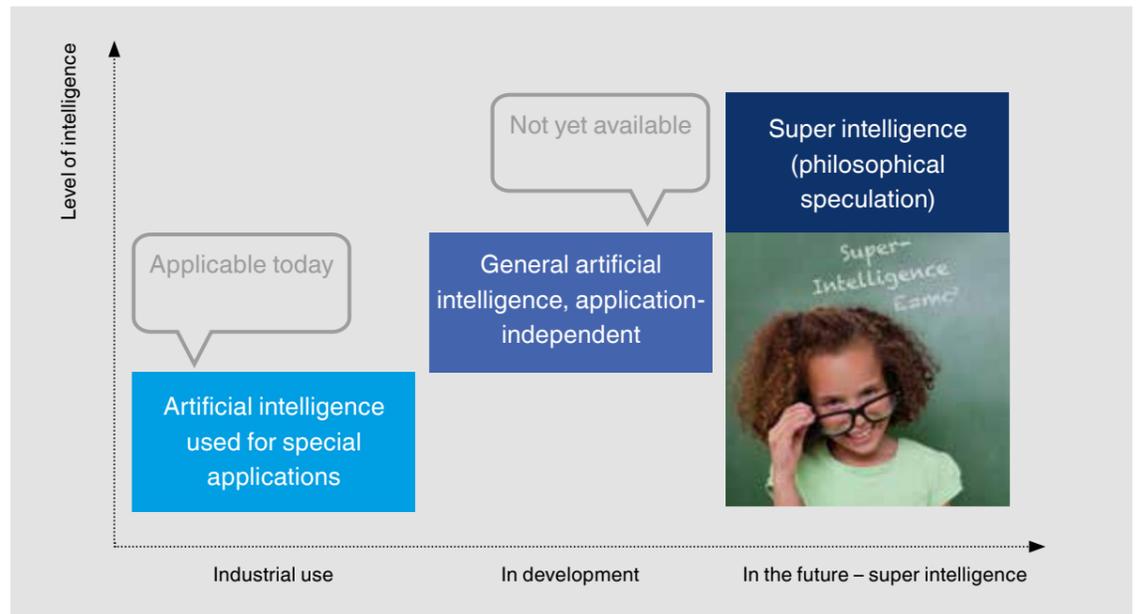
In doing so, decisions taken by machines, in autonomous production and by artificial intelligence systems, are based on one thing above all: Data, data and yet more data. It can therefore be justified that data capture, data analysis and the targeted selection of data from representative data for the training of neural networks are expected to become permanently required components of future work.

Artificial intelligence requires representative data

Without representative data that is used responsibly, AI and automation would be scarcely conceivable.

"Representative data" means that the data for training neural networks must have an intersection with the subsequent application that is representative for the corresponding application.

This is also evident in the dominant trends of the Gartner hype cycle for AI. The Gartner artificial intelligence hype cycle for 2021 outlines AI-specific innovations that are in various phases of maturity, adoption and hype. (Image: Gartner).



The graphic shows the degree of artificial intelligence in relation to availability (timeline)

can provide timely information regarding predictive maintenance, which in turn optimizes production uptime.

And what lies ahead – quo vadis, artificial intelligence?

Autonomous production is the primary objective of Industry 4.0 activities. Artificial intelligence provides the required assistance here to allow machines to make decisions in a trustworthy, organized and coordinated manner.

This nevertheless requires organizations and employees to adapt and participate in the development process. For the employees of the future, data handling will be even more important than is already the case today. Data engineers, data analysts and data scientists will be required to efficiently process the stages of data acquisition through to its processing and use this to produce solutions and added value for users.

Companies are being confronted with an unprecedented abundance of technological, social and regulatory influences. For example, artificial intelligence, autonomization, the Internet of Things and 5G (fifth-generation mobile networks) are becoming ubiquitous and influencing existing architectures, since they are having to develop alongside the new technologies of the future. Or, to put it another way: The time has now come to lay the foundation for next-generation architectures that will be compatible with the new developments.

The digitalization of the last few years will make way for the potential of the data that has become possible with these rapidly growing technologies. This will also stimulate the "cognitive enterprise".

Exciting times lie ahead.

We too are making use of state-of-the-art technical solutions to open up added value for users – the likes of which have never been witnessed before – and to solve the challenges and problems posed by the future applications of GEMÜ's customers.

We are already making use of artificial intelligence – sometimes deliberately, sometimes without even knowing it. It is palpable, and has already been playing a role in our lives for some time. If used responsibly, it can support us in our work and prove a helpful companion.

Gartner sees four dominant trends here:

- ⇒ Operationalization of AI initiatives
- ⇒ Efficient use of data, modelling and data processing
- ⇒ Responsible AI
- ⇒ Data for AI

Gartner sees the driving force and reason behind these trends as companies' key focus on increasing the speed with which PoCs (proofs of concept), i.e. the feasibility of an idea, are carried over into production.

Why AI and AI solutions are only now becoming practicable

The representation of the hype cycle and dominant trends of AI match other estimates from experts.

There are three conspicuous changes in this regard that positively influence an AI application:

- ⇒ **Speed:** The increase in Industry 4.0 practices and IoT solutions is simplifying the possibilities for generating large quantities of data in an adequate amount of time.
- ⇒ **Certainty:** Relates to the quantity of determined data that has since become available for real objects/products, in order to achieve the required level of detail for the digital reproduction.
- ⇒ **Ability to learn:** The presently available machine learning techniques now allow learning from available data records and the opportunity to refine models. This makes it possible to develop a general model that can then be individualized through learning.

For general reference, the area of industrial use circled in light blue is already proving to be helpful and supportive. Put simply: Existing knowledge can be prepared for specific areas of application and the algorithms can be made available for evaluation. The next step involves researching and developing solutions for how new knowledge can be economically acquired in a purely machine-based fashion. What is correct and what would be incorrect? These are the things that are being worked on and researched.

One practical example of this is support for servicing. With sufficient data and selected application-specific algorithms, it is possible to create added value and benefits for the maintenance sector, such as predictive maintenance for smart valves for the detection of wear. The evaluation of operating data for the valves combined with representative data for the application environment



Werner Flögel
Consultant
Officer Strategic Innovation
werner.flögel@gemu.de

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74653 Ingelfingen-Criesbach
Phone +49 (0) 7940/123-0
gemu-news@gemu.de
www.gemu-group.com

Editors:
Ivona Meißner (GEMÜ)
Birgit Seuffert (factum.adp)

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THINK TANK AND TRAINING ENVIRONMENT THE WORKSTATION OF THE FUTURE

All GEMÜ production plants pursue the common objective of satisfying market and customer requirements as efficiently as possible. To do so, the production and logistics infrastructure is permanently and globally in further development. In order to align the conceptual design of the future assembly environment with actual conditions and to test automation processes, a workstation of the future was set up in the Production and Logistics Centre (PLZ) in Kupferzell in the middle of subassembly and valve production.

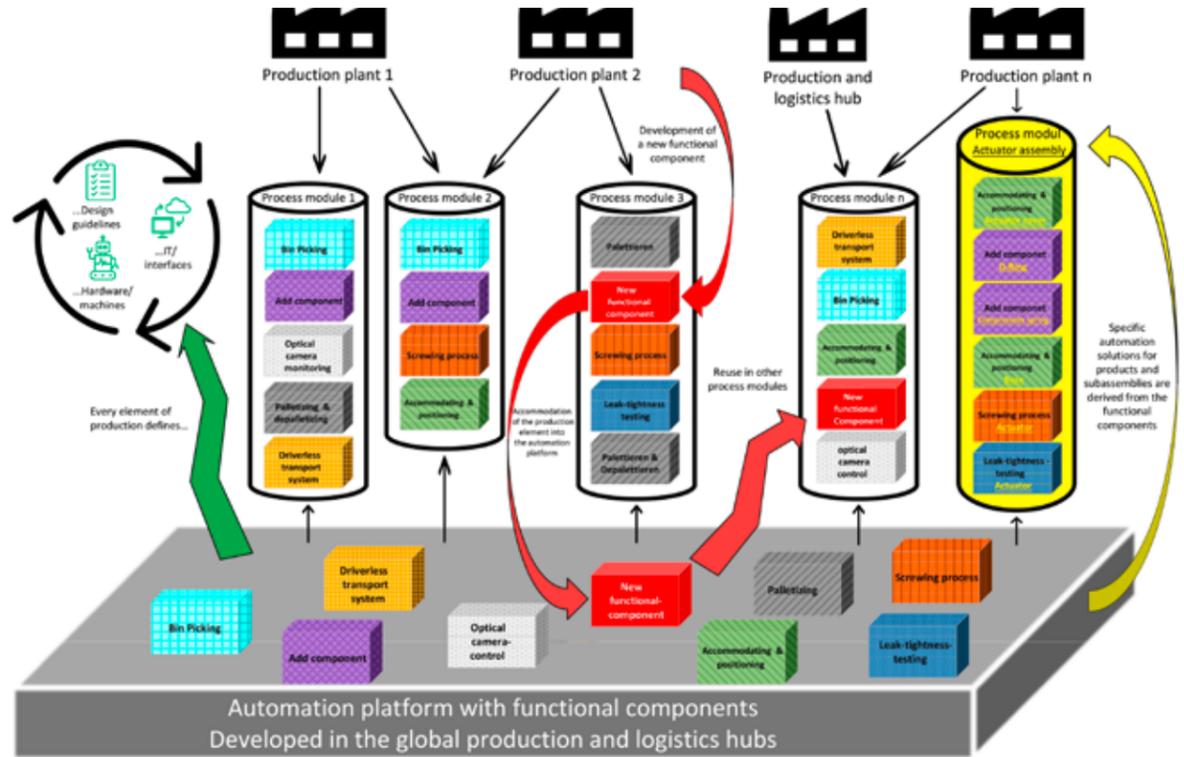
The latest technologies make a significant contribution to efficient order processing with delivery reliability in the current and complex working environments of subassembly and valve production where the product diversity of GEMÜ is processed every day.

The workstation of the future in PLZ consists of flexible assembly workstations where GEMÜ employees work together with a collaborative robot. The most varied of production situations can be simulated thanks to the modular construction of the work tables. The reason for selecting the Production department as the location was the desire to create a point of contact for all interested parties, as well as for testing to series maturity under real conditions. The workstation of the future should be developed with the participation of everyone who would like to make a contribution. Ideas for process enhancement as well as ergonomic or technological aspects are to be equally considered. Moreover, the workstation of the future should not just be a think tank, but also a training environment.

Modular design principle

So-called functional modules are developed and tested at the workstation of the future. As the processes in subassembly and valve production are often similar despite the product variety, automation functions can be rolled out across other comparable cross-site processes in line with the modular design principle once an automation function has been developed and established in practice. The functional modules of the automation platform are developed by the Global Operations departments depending on the department-specific specialization, and can be reused and reconnected together in series depending on the process requirement.

In the context listed above, the workstation of the future in subassembly and valve production must be understood as a module, securing the future of the PLZ as a highly efficient manufacturing site for high-quality products with customized attributes.



Nicole Riegler-Kurz
Senior Head of Department
Subassembly & Valve Prod.
nicole.riegler-kurz@gemue.de

SOLUTIONS @ ACHEMA PREPARATIONS ARE IN FULL SWING

It is that time of year again - from 22 to 26 August 2022: the ACHEMA trade fair in Frankfurt am Main will welcome experts and prospective customers from all over the world with a unique range of topics, exciting subjects and new event formats.

GEMÜ will offer visitors a hybrid live experience this year at the ACHEMA trade fair. The GEMÜ trade fair stand will entice you with many fascinating digital interactive offers, connecting its on-site presence with the GEMÜ Digital Showroom. The ACHEMA 2022 trade fair is the kick-off for the GEMÜ concept of expanding physical trade fairs with a digital presence. This means that the GEMÜ Digital Showroom facilitates the interactive exchange with visitors and offers prospective clients access to specialist talks and live presentations when they cannot be on-site physically.

However, the digital offer is no substitute for the live experience that visitors encounter at the on-site trade fair stand. Prospective clients can look



forward to a modern, lively trade fair design with many digital interaction options and a highly motivated team on-site in Frankfurt.

One focus topic of GEMÜ's trade fair stand is the solutions offered by digitalization. GEMÜ will present the valve designs of the future with innovative operator and sensor system concepts as well as practical training options using VR. Some of the highlights include trending topics such as electrification and products such as the new two-wire controller GEMÜ 1441 which can be operated and parametrized via the app.

All products at the trade fair stand are given digital product labels. This gives prospective clients product-specific information via QR codes. The trade fair experience is rounded off with a virtual plant tour, offering insights into the production departments of GEMÜ.

Come and see us in hall 8, stand F4 and immerse yourself in the GEMÜ world – live on location or live online!

Ivona Meißner
Corporate Communications Advisor
ivona.meissner@gemue.de

Thomas Schmeißer
Team Leader for Trade Fair
Communication
thomas.schmeisser@gemue.de

ENERGY OF THE FUTURE? HYDROGEN – A HIGHLY REGARDED ELEMENT

Germany and Europe are aiming to become greenhouse-gas-neutral by the middle of this century, according to the political goals of the German Federal Government and the European Union. This will require an almost 100% reduction in greenhouse gas emissions across all sectors by the year 2050. To achieve this goal, there will not only need to be fundamental changes in how energy is supplied in the industrial, transport and construction sectors, but the overall structure of the economy will also require transformation. Experts from the fields of science, business and politics have come to view hydrogen as the key to achieving long-term climate goals. The element is therefore set to become an important pillar in the transition towards new energy sources.

Whether used as rocket fuel, process gas in fuel production or as a basic element in fertilizers, hydrogen is already employed in many applications today. When it comes to the energy system, however, hydrogen has only played a minor role thus far. This is now set to change – albeit with some delay: The Federal Government wishes to speed up the growth of the market and has adopted a "National Hydrogen Strategy" for this purpose. As a starting point for the hydrogen market, the strategy foresees a requirement of between 90–110 TWh of hydrogen in Germany for the year 2030. Up to five gigawatts of electrolysis output is intended to be produced in Germany for this. The focus of usage will be in the industrial and transport sectors.

In the international sphere too, hydrogen has now attracted considerable attention as an energy source: Hydrogen strategies are also being pursued in Germany's neighbouring countries of the Netherlands and France. Japan and China have set themselves ambitious goals as well. There are many reasons behind these actions. In addition to the progressive decarbonization of energy sources and industrial processes, key drivers also include security of supply, resource efficiency and industrial-political objectives.

What actually is hydrogen?

Hydrogen is one of the foundations that makes up our lives. The element occurs in all living organisms and is available practically without limitation. As the lightest atom (14.5 times lighter than air), its symbol occupies first place on the periodic table. Hydrogen predominantly occurs in connection with chemical compounds such as water, acids or hydrocarbons. Being a particularly reactive element, it is not naturally encountered in its pure form. Since the manufacture of hydrogen requires primary energy to be expended before the molecules can be separated, the element is classed as a secondary energy source. Hydrogen is a colourless, odourless and tasteless substance. The energy content of 1 kg (compressed) hydrogen is 33 kWh. To put this into perspective: One litre of diesel has an energy content of 10 kWh.

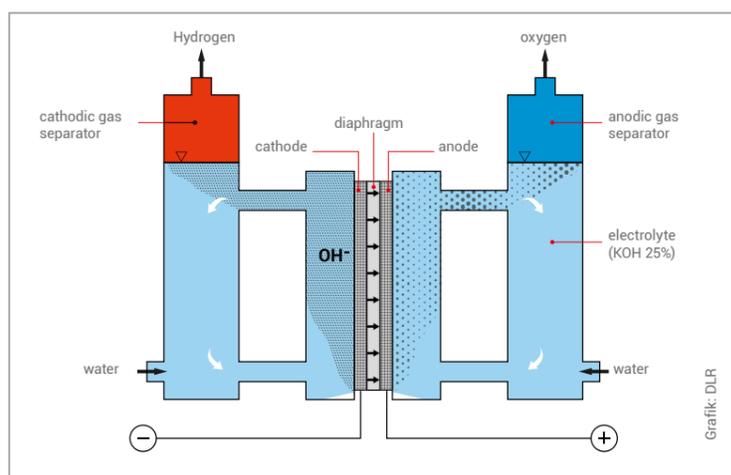
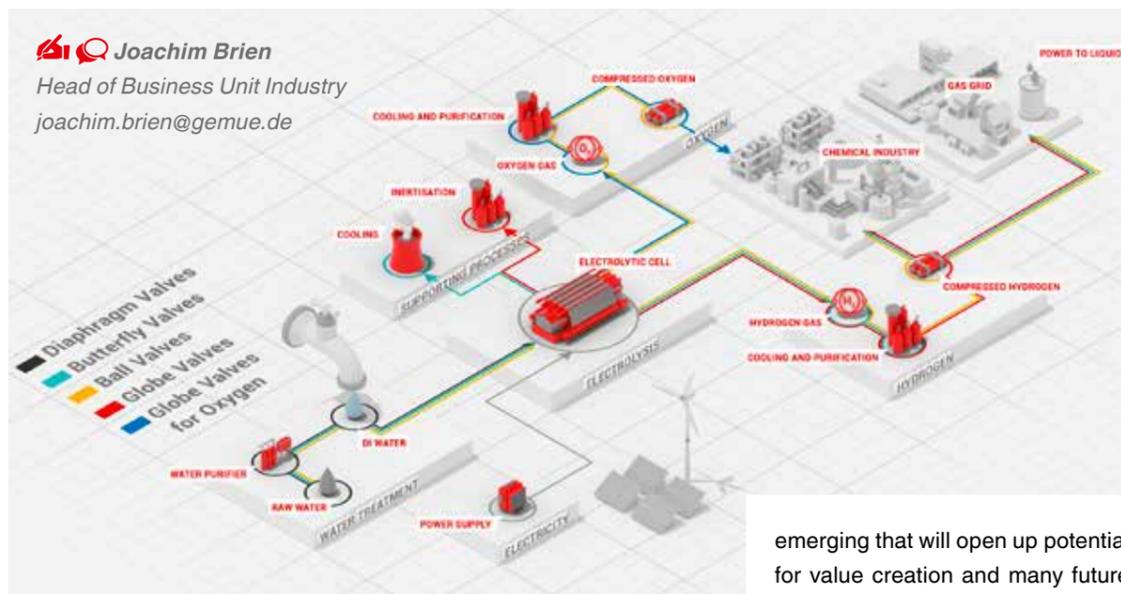
How is hydrogen manufactured?

The terms "green", "blue", "grey" or "turquoise" hydrogen do not describe any optical properties of the energy source, but rather make use of the broad mix of the colour palette to denote the method of manufacturing. A distinction is made between the manufacturing methods of electrolysis, steam reforming and methane pyrolysis. Approx. 60 TWh of hydrogen per year is currently produced in Germany, the majority of which uses fossil energy sources such as natural gas, oil and coal. Only 5% of this is green hydrogen produced from electrolysis plants.

In the process of electrolysis, water is broken down into hydrogen and oxygen by means of an electrical current. Hydrogen forms on the side of the cathode, and oxygen on the side of the anode. What's of particular interest to GEMÜ: The processes of alkaline electrolysis (AEL) and polymer electrolyte membrane electrolysis (PEMEL) represent application possibilities for valves.

Alkaline electrolysis (AEL)

Alkaline electrolysis is the oldest and most widely used technology. In the electrolysis cells, the electrodes are separated from one another by means of a diaphragm. Caustic potash solution serves as an electrolyte. This method is distinguished by relatively inexpensive materials, many years of operational experience, and moderate load behaviour.



Polymer electrolyte membrane electrolysis (PEMEL)

Another form of hydrogen electrolysis technology is PEM electrolysis. This technology uses the diaphragm in a dual function as both a separator for the anode/cathode and as a solid electrolyte. Therefore, other than water, no chemicals are required. This type of electrolysis has a compact design and good load change behaviour, which is an important factor when using solar and wind energy. Due to the high-quality materials used, however, the method is more expensive than AEL.

What is the potential of hydrogen?

Green hydrogen is the crude oil of tomorrow. This flexible energy source is an indispensable asset for the energy revolution and will open up new markets for German companies. Moreover, hydrogen can also be transported and used in a chemically converted form such as ammonia (NH₃) or methanol.

Be it industry, transport or the heating sector: We need green energy in all areas of our lives in order to achieve our climate goals. For this, we also need to be able to bring renewable energy sources into fields of application that are difficult or even impossible to electrify. This is in addition to the fact that Germany will continue to be dependent on energy imports in the future. Nevertheless, we want to end our dependency on suppliers of fossil energy sources – natural gas, crude oil, coal. Hydrogen makes it possible to import green energy from regions of the world that are more favourable for solar and wind power. By doing so, we will also be able to diversify our energy imports at the same time.

Prospects for the future?

German industrial enterprises, from small start-ups to large energy companies, already have a great deal of expertise in the production and further processing of hydrogen. Thanks to its recently presented hydrogen strategy, Germany is proving to be a pioneer in this regard. Of the approx. EUR 35 billion that has been announced for green stimulus measures by governments worldwide, more than half of this has come from the Federal Republic of Germany. There is an enormous amount of potential here. What sets Germany apart from other countries are aspects such as its industrial capabilities in the fields of gases and plant engineering.

All this is not only of great significance for energy politics and the attainment of climate-related goals. A medium to long-term market worth billions is

emerging that will open up potential for value creation and many future job opportunities. One European study estimates that more than 5.4 million jobs and an annual turnover of EUR 800 billion could be present in the Europe-wide hydrogen industry by 2050.

Placing focus on the power generation and environmental systems sector at GEMÜ

Due to the current situation, countries all around the world are rethinking their energy sources, dependencies and security of supply. In combination with global climate targets to substantially reduce CO₂ emissions, this is placing a great deal of focus on the energy sector – and this is also the case at GEMÜ and the Industry business unit. Through the newly founded management market segment, the business unit is building up an offensive with clear objectives and a roadmap of how to confront the requirements in this market. In close coordination with its sales division and subsidiaries, GEMÜ is monitoring the progress of targeted initiatives at the European level.

Early successes have justified the Industry business unit's strategy of placing emphasis on dealing with the trending topics of hydrogen, power-to-X (PtX), power-to-gas (PtG) and power-to-liquid (PtL).

For PEM electrolysis in a container design of an OEM, GEMÜ supplied ball valves (type B42) as well as globe valves (type 530) for the hydrogen part and lined diaphragm valves (type 620) and PTFE butterfly valves (type 491) for DI water.

Another start-up company uses GEMÜ products for a power-to-liquid procedure. For this, in addition to ball valves and globe valves, the customer also uses motorized globe valves from the GEMÜ product range.

This shows that there are indeed prospects for the future. Nevertheless, we still have tasks to accomplish in relation to valves in larger nominal sizes. We're ready to take on the challenge!



CONSISTENTLY ON THE ROAD TO CLIMATE NEUTRALITY SUSTAINABILITY AT GEMÜ

For us, acting in a sustainable manner means using the earth's finite resources responsibly. For many years, GEMÜ has already been capitalizing increasingly on green engineering and environmental protection.

We intend to set a good example, namely by raising awareness of sustainability among all employees and upholding our responsibility to society. Small steps count just as much in this regard as large projects: It all helps us to act a little more sustainably.



CO₂ neutrality

A reduction of CO₂ emissions depends very significantly on voluntary and consistent economic actions in industrial countries. For this reason, GEMÜ is offsetting greenhouse gas emissions that could not previously be reduced, and that have been caused by the business activities of GEMÜ and by the activities of wine-making and the Schlosshotel Ingelfingen, by acquiring 7528 climate protection certificates in both 2021 and 2022.



Photovoltaic systems

Since 2016, GEMÜ has been installing photovoltaic panels on the roofs of its manufacturing sites on a large scale. These panels contribute to covering GEMÜ's own electricity requirements. This is not only taking place in Germany, but is also currently underway at GEMÜ Switzerland in Emmen and is being implemented each time a manufacturing site is expanded.



Combined heat and power plant

Up to 70 kW of heat and 50 kW of power can be generated with the combined heat and power plant erected in 2013. According to the principle of power-heat-link, the heat-regulated system serves primarily to extract electrical energy.



100% power from hydropower

The power that is not generated independently is fully procured from hydroelectric power. GEMÜ is minimizing its consumption of fossil fuels, and has therefore been relying on northern European hydropower for 100% of its power in locations in Germany since the beginning of 2022.



Adiabatic cooling

In order to optimize the working conditions for employees and prevent the machinery from overheating, GEMÜ has switched the cooling system of its manufacturing plant in Criesbach to adiabatic cooling. A system for heat recovery enables the exploitation of the waste heat for full heating of the company premises up to an outside temperature of -4 °C.



e-smarts for journeys between operating sites

GEMÜ has resolutely set its sights on ensuring that electric vehicles are available to transport personnel between sites. Consequently, since the launch of the Green Move 2012 project, nine e-smarts have been deployed that have a total annual mileage of almost 30,000 km.



JobRad for employees

175 employees are already riding a combined total of 227 bicycles across the country with a GEMÜ JobRad, making a valuable contribution to the environment.



EV charging stations for employees

In-house EV charging stations with 100% green electricity support the users of e-bikes and electric cars on the way to work and on the path to an emissions-free future.



Wertwiesen charging point

In 2015, GEMÜ agreed on a cooperation with the city of Künzelsau, and has since then been promoting the Wertwiesen electric charging point.



Flowering meadow

In 2020, GEMÜ took on the sponsorship of a 2000 m² flowering meadow in Mulfingen-Ochsental for the first time. This commitment has been continued ever since. Through this, GEMÜ is making an important contribution to the preservation of biodiversity in its home region.

Recycled paper

GEMÜ prints exclusively on recycled paper that has been manufactured from waste paper, cardboard or carton. Up to 60% less energy is consumed in the manufacture of recycled paper compared to "normal" paper.



Water dispensers

GEMÜ installed its first professional water dispensers back in 2009. Members of staff can make use of these at any time. This not only saves the hassle of having to bring along a bottle, but also helps to preserve the environment.



Digital invoices and product information

As part of the GEMÜ digitalization strategy, invoices were switched to being sent out to customers in PDF format via e-mail in 2021. Product information and operating instructions are now also only available digitally. The documents that are included with dispatched products contain information and a QR code with a link to a website where the customer can download the complete set of instructions. This transition to digital-only formats has considerably reduced our paper consumption.

Eva Hanselmann

Corporate Communications Advisor
eva.hanselmann@gemue.de

Sustainability coordination circle

sustainability@gemue.de

TRENDSETTER 2021 F.A.Z. INSTITUTE GIVES GEMÜ AN AWARD

GEMÜ was named a "2021 Trendsetter of German Economy" by the F.A.Z. Institute and awarded second place in the measurement systems category.

The F.A.Z. Institute bestows this accolade on companies who have demonstrated great success and pioneering spirit in aligning their strategic decisions and plans with global megatrends and thereby branching into new business areas.



To this end, the future-focused institute defined twelve megatrends – including health, mobility and even the "silver society", incorporating the effects of demographic change – that are having a long-term impact on the business areas companies operate in.

The F.A.Z. Institute, together with the IMWF Institute for Management and Economy Research, then assessed more than 20,000 companies and brands between August 2020 and July 2021 to establish how successful they were in aligning with megatrends. Scoring an impressive 96.8 out of a possible 100 points, GEMÜ won the second prize in the measurement systems category.

"The '2021 Trendsetter of German Economy' award motivates us to keep on developing new ideas, entering new markets and setting new trends. It is our goal to lead the way in developing innovative products and forward-thinking solutions in order to cement our long-term contribution to society and the economy," explains Gert Müller, Managing Partner of the GEMÜ Group.

Norbert Neumann
Corporate Communication
Team Leader/Press Officer
norbert.neumann@gemue.de



LARGE MAINTENANCE JOB

DIAPHRAGM MAINTENANCE FOR OUR CUSTOMER BIOTEST

The correct installation and predictive maintenance of valves, measurement and control components are important prerequisites for efficient operation and optimum operating cycles for a plant. Regular maintenance procedures from the GEMÜ after sales service team are essential in order to optimize service life and maintain the quality of a plant.

In September 2021, the GEMÜ customer Biotest, who provides plasma protein products and biotherapeutic drugs and is active worldwide, commissioned the GEMÜ Service team for the first time with the maintenance of a total of 2,800 valves at short notice.

To date, plant designers who are also GEMÜ customers had carried out the maintenance at Biotest. For this reason it was important to GEMÜ not to be in competition with the plant designers offering these services, nor to turn down the inquiry from the GEMÜ end customer.

In this case it was possible to fulfil both requirements, as this was an unscheduled maintenance for which the maintenance partner Biotest had approached at short notice had no capacity. There was an open discussion on how to implement the project with two large plant designers whose plant components also needed maintenance. Due to the short notice, both plant designers agreed to GEMÜ carrying out the maintenance and were happy about the open communication and loyalty from GEMÜ.

Good preparation

A variety of requirements and regulations must be observed to be allowed access to a pharmaceutical company and have permission to carry out tasks on pharmaceutical system:

- ⇒ Registration forms must be completed, usually online, and confirmed during a subsequent visit with an ID card for identification
- ⇒ Briefings concerning general GMP location regulations, safety rules and codes of conduct must be discussed beforehand and confirmed with a concluding test
- ⇒ Risk assessments for the work to be carried out must be submitted.
- ⇒ Cleanroom training in accordance with the regulations of GMP, DIN ISO, VDI as well as related to the location are required beforehand
- ⇒ Documentation training for correct documentation of the maintenance work

The following questions must be clarified and/or the following points must be taken into consideration to be well prepared for the maintenance procedure:

- ⇒ Which tools, which measuring and testing instrument and which spare parts are needed?
- ⇒ All transport boxes must be mobile and not too heavy, as you often have to move between rooms or even floors and space conditions are often cramped
- ⇒ A Covid 19 hygiene set is also part of professional preparation as standard
- ⇒ For this extensive maintenance procedure, GEMÜ also introduced maintenance stickers to identify the valves that have already been serviced

On-site

Once all the utensils had passed through the material lock, the in-house logistics team had transported the disinfected tools to the corresponding



workstations, and the GEMÜ service personnel had put on the clothes supplied by the customer, we still needed work approval.

For this, the plant must be secured, free of media, depressurized, rinsed and fully emptied.

Despite professional preparation and work approval, a few pipes were still filled with liquid, getting some of the maintenance technicians wet.

Another challenge was the size of the plant as well as the different valve installation locations. It takes a lot of time until the approvals are available so that a maximum of two to three valves could be serviced per hour.

Surprises

Even with the best planning, maintenance always turns up surprises. For example, the tank bottom valve had been removed from an ethanol container that had been approved for maintenance. As the container was not empty, ethanol leaked and triggered a gas alarm. The basement had to be completely evacuated. Approx. two hours later, the danger had passed and the maintenance team could re-enter the rooms and continue work.

They also had to take great care with the compressed air process cable which was under pressure. As compressed air was needed in the adjacent container system for ongoing operations, only a partial section could be released which required special precautionary measures.

Some parts of the system are also hard to access so that up to six valves had to be removed to reach the valve that needed servicing. After completing each partial section, an acceptance process and a random test was carried out. At the end of the maintenance, the team carried out an OK check and a wet run (simulation run with water).

GEMÜ was on-site with 13 service technicians. Waiting for the plant to be secured as well as the delayed maintenance approvals caused unscheduled wait times over and over again – with no change to the final deadline. The GEMÜ team compensated for this with overtime and short bursts of intensive work so that they were able to stick to the final deadline successfully.



BASIC INFORMATION

- ⇒ 2,800 valve seats
- ⇒ 13 service technicians at work
- ⇒ Time available: 10 working days
- ⇒ Different buffer stores, filter presses, cleanroom systems were serviced
- ⇒ In the meantime, Biotest has commissioned four further maintenance jobs



Markus Hammel
 Head of Department
 Service Department
 markus.hammel@gemue.de



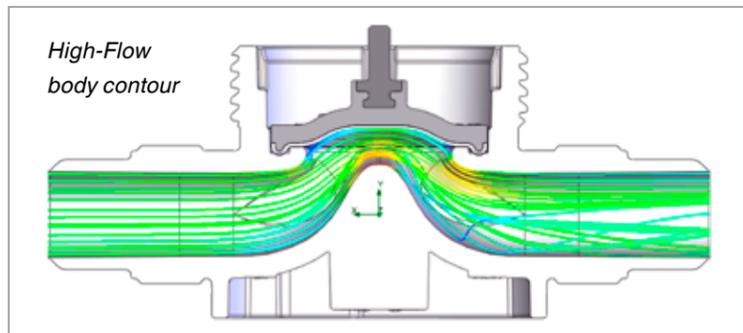
GEMÜ CLEANSTAR SERIES IS SETTING STANDARDS NEW ACTUATOR SIZE

For many years, the semiconductor industry has been successfully using high-purity diaphragm valves from the GEMÜ CleanStar series all over the world. GEMÜ customers appreciate the advantages of the design and the multitude of possible applications due to the sophisticated graduation of actuator sizes 1 to 3. In line with the market, GEMÜ is rounding off the CleanStar series with the development of the new actuator size 4, setting new standards in terms of flow.

The GEMÜ CleanStar series is characterized by many benefits. The central union nut creates a reliable joint between the actuator and valve body, and does so completely without the use of metal parts. The high-flow contour of the body ensures high flows with simultaneous low-stress media channelling. It also minimizes dead space and does not specify a flow direction. The exterior parts of the actuator display very good chemical resistance due to the use of PVDF. In addition, media-wetted parts made of PFA or PTFE facilitate use in ultra pure applications.

CleanStar series is completed

Thanks to the advantages mentioned above, the GEMÜ CleanStar series has been one of the preferred valves in the supply and distribution sectors of semiconductor factories for a long time now. In these production departments, the service life and particularly the Kv value, in other words the achievable flow, play important roles. For this decisive parameter, actuator size 4 with up to 30% more flow clearly sets itself apart from competitor products. With a Kv value of 73.5 m³/h (1,225 litres/min) the GEMÜ CleanStar series has a unique selling point for the connection sizes 1½" and 2" and is ideally suitable when polishing, cleaning or wet etching processes have to have large supplies of chemical quantities. Distribution systems, so-called manifolds which require very high flows, can now also be used to even greater potential with products from the tried and tested GEMÜ CleanStar series.



Mega trends simplify the demand for semiconductors

You can compare a mega trend to an avalanche in slow motion. Initially, it develops slowly and only affects a few small areas of life. However, as it fully comes into its own, it causes extensive, sometimes fundamental changes. In terms of the semiconductor industry, several mega trends such as e-mobility and digitalization are driving the demand for semiconductor products. To cover the need, gigantic semiconductor factories are being developed all over the world where increasingly greater media quantities are being regulated and dispatched. On the one hand, GEMÜ is responding to these needs with the expansion of the GEMÜ CleanStar series to a new total of four actuator sizes. On the other hand, operators of existing semiconductor productions also expect increasingly higher flows, particularly at supply level, from the valves they are using in their supply tanks (tank supply).

With immediate effect, GEMÜ customers can implement an even greater variety of applications while saving costs and resources without having to go without the reputable and market-tested CleanStar design.

 **Damian Steuer**
Business Development Manager
BU Semiconductor
damian.steuer@gemue.de

 **Frederik Trudel**
Head of Department Business
Development Management
BU Semiconductor
frederik.trudel@gemue.de



GEMÜ CleanStar C60 series



GEMÜ CleanStar C67 series



SINGLE-USE VALVES ENSURE SAFETY

The trade magazine **PharmaTec** has summarized interesting questions from the market and information from the **Pharma, Food and Biotech** business unit into a technical paper regarding single-use components.

Bye-bye, stainless steel: More than two-thirds of all new biotechnological processes use single-use bioreactors. It's no wonder, since the disposable bag processes provide maximum flexibility, safety, and are also frequently a step ahead in matters of sustainability. But what's the situation with regard to positioning elements and components of fluid technology? How does the single-use valve function and what needs to be taken into account when using these miracle bags? These questions and other interesting ones are answered in the technical paper published in **PharmaTec**, a special publication from **Process** (approx. 24,000 copies in circulation).

This contribution can be found on our website at:
https://www.gemu-group.com/en_EN/technical-contributions/



PRODUCTION TECHNOLOGY CONEXO RFID TAGS AUTOMATION AND INDUSTRY 4.0 PROJECT

As part of the implementation of the Conexo strategy, the RFID design was selected as the identification medium. Close to 2,000 Conexo RFID TAGs are produced daily in a specially developed, fully automated plant.



The production process starts with the carrier entering the loading station. A fully automated robot first removes the single components from the storage bin and checks them for pre-defined quality features with the help of a camera system. Using a wide range of sensor technologies, the RFID-TAGs are prepared for the following production steps or rejected if variations in quality are found. Once the RFID-TAGs have been encapsulated with the

pick-up points, it is time for the next process step in a specially manufactured curing oven. Then all RFID-TAGs are subjected to quality control. This ensures that only faultless parts enter the production where they are welded with the stainless steel valves.

The Conexo design is integrated in the Non Stainless Steel department using a laser welding process that is specifically adapted to GEMÜ. A closer look at the encapsulated Conexo TAGs illustrates the complexity in this production technology for creating such faultless, delicate weld seams for joining electronic components. The welding strategy is a special feature. Using a very thin laser spot, the Conexo tag is also encapsulated in split seconds in high-alloy stainless steel with a small tolerance window.

Compliance with the stringent quality demands is a particular challenge. The heat and energy input during the welding process must be kept as low as possible so that the delicate electronic components are not damaged. In addition, the weld seam must be free of cracks and inclusions and may not display any irregularities.

In the course of a continuous series inspection, the weld seams are checked for flaws and other abnormalities in the GEMÜ laboratory. Furthermore, the weld seams are subjected to a genuine hardness test in the form of a salt spray test, investigating corrosion resistance under extreme conditions. A specially developed loading concept pairing carrier and delivery trolley facilitates machining of the series production parts with low lead times and maximum process reliability.

Further automation and Industry 4.0 projects are planned in future for the Conexo laser welding process for upstream and downstream production processes. The cleaning process for welding preparation, for example, is to be implemented using an innovative, resource-saving procedure. In addition, batches will be transferred into the ERP system during the automated initialization process using camera control. This is the first step in creating a digital twin. Thanks to the continuous further development of the processes and procedures, we are able to get a little better every day, contributing to the consistently high quality standard of the GEMÜ products.

The GEMÜ manufacturing sites in China and USA use this welding strategy as well to fit the Conexo TAGs in the stainless steel valve bodies. The launch in China was only implemented at the start of this year. The laser welding system planned in the Non Stainless Steel department including the production expertise developed alongside were transferred. Due to the special circumstances caused by the coronavirus pandemic, procurement, commissioning and process qualification of the entire laser welding procedure in China were all carried out exclusively virtually. The production process and the plant periphery, such as the fixture and loading concept could be transferred smoothly in regular cross-departmental online meetings in collaboration with the Special Engineering department, quality management and the project leader of GEMÜ China, enabling a successful production launch. The global production expertise thus created at the GEMÜ locations is mirrored in a worldwide uniform GEMÜ standard.

GO&SCM
Parts Production, GO&SCM
Plastics Technology Centre

NEW VARIETY OF GEMÜ ESYLITE MOTORIZED ACTUATOR

GEMÜ is expanding its valve selection for the GEMÜ eSyLite motorized actuator with three further valve types. With the larger selection of electrical valves, plant engineers and operators find a tailor-made solution even more easily.

In addition to the GEMÜ R629 eSyLite plastic diaphragm valve that already exists, the GEMÜ 629 diaphragm valve with stainless steel body and the GEMÜ 519 and 529 globe valves are now also available for simple, motorized open/close applications.

A total of four GEMÜ eSyLite valves now offers plant engineers and operators the opportunity of operating electrically driven plants more efficiently than before. In plants in which, for example, solenoid valves of large nominal sizes consume a relatively large amount of electricity, the GEMÜ globe valves from the eSyLite series are a cost-effective alternative. With low switching cycles and medium switching speed, they take on shut-off tasks just as precisely as solenoid valves, while at the same time scoring points when it comes to operating costs with their low electricity consumption. The GEMÜ eSyLite series also opens up new opportunities for plant optimization for applications where there have so far been no affordably priced alternatives to electrical ball valves. Automation with the new eSyLite valves, for example, can thus be further advanced. Where pneumatic

	GEMÜ R629 eSyLite	GEMÜ 629 eSyLite	GEMÜ 519 eSyLite	GEMÜ 529 eSyLite
Type of product	Diaphragm valve with plastic body	Diaphragm valve with stainless steel body	Globe valve with metal body	Angle seat globe valve with metal body
Nominal sizes	12 to 50	4 to 40	15 to 50	15 to 80
Media temperature	-10 to 80 °C	0 to 100 °C	-10 to 180 °C	-10 to 180 °C
Sterilization temperature	-	max. 150 °C (stainless steel distance piece)	max. 180 °C	max. 180 °C
Operating pressure	0 to 6 bar	0 to 6 bar	0 to 40 bar	0 to 25 bar
Actuating speed	3 mm/s			
Duty cycle	30 %			

valves could not previously be used, and manual valves were relied on instead, a motorized alternative is now available with which the plant can be automated cost-effectively.

The new valves complete the GEMÜ eSyLite series. The robust and self-locking motorized linear actuator has a safety switch-off function including overload protection. A manual override and an optical position indicator are integrated as standard. The valves are optionally available with the GEMÜ eSyLite actuator, with the GEMÜ 1215 electrical position indicator or with an integrated emergency power supply module.

Sarah Mann
Marketing Team Leader
Business Unit Industry
sarah.mann@gemue.de

Dominik Berger
Product and Application Manager
Electronic Product & Application
dominik.berger@gemue.de

A SIGNIFICANT MILESTONE

COMPLETION OF THE VALVE SERIES

OF THE MOTORIZED GEMÜ eSY ACTUATORS

Dominik Berger is a Product and Application Manager at GEMÜ who is overseeing the latest generation of motorized actuators. In this interview, he talks about his motivations regarding the project, the added value that motorized valves provide and the trend towards electrification in plant engineering.

Mr Berger, we recently read in a press release that GEMÜ is bringing three additional eSy valves to market. Why should this news be taken as much more than a simple product launch?

The launch of the GEMÜ 519 eSyLite and GEMÜ 529 eSyLite globe valves and the 629 eSyLite diaphragm valve marks the completion of the eSy platform. With this, all the major valve types are now available across the three actuator series of eSyLite, eSyStep and eSyDrive – more specifically, diaphragm valves made of plastic, diaphragm valves made of metal, and straight seat and angle seat globe valves.

When did GEMÜ come up with the idea of the eSy actuators?

GEMÜ has focused on electrically operated valves from the very beginning. The GEMÜ type 200 launched in 1964 was not just the first electromagnetic process valve made of plastic on the market, but also served as the impulse for the foundation of the company. The first motorized valve – the GEMÜ 618 launched in 1984 – represented another milestone in the company's history. The eSy series was created to enhance GEMÜ's existing actuators and technologies to a new, innovative level. The idea underpinning this range is a platform with multiple, consistent series of actuators.

The market launch of the first eSyDrive valve in 2017 served as the starting signal for the eSy actuators. Five years later, now that we have the three actuator versions of eSyDrive, eSyStep and eSyLite, and a total of 18 valve assemblies, the platform is finally complete – for the time being, at least.

The new series include technical innovations and numerous functions. Many additional functions that were previously laborious to design and could only be configured with difficulty are now integrated into the actuators as standard and can be easily adjusted via standardized interfaces such as IO-Link or a browser. This includes the stroke limiter, for example. These innovative technical concepts called for ample expertise in various areas during their development.

You mentioned that the project required expertise in various areas. Which disciplines were involved?

Primarily, it was down to research and development. Alongside our mechatronics technicians, who orchestrated the interaction of the motorized actuator and the linear movement, the electronics and software development divisions were specifically called upon to implement the new functions and consequently provide added value for our customers. We were also faced with new challenges when it came to production: Components for energy-saving actuators need to be manufactured with precision.

In the current phase of the market launch, we are not only drawing on the support of engineering, but also product management and sales, seeing as we have completely replaced the old series with the new portfolio. These divisions are driving the changes to the portfolio and changeover work at customer locations.

The motorized eSy actuators are available in three designs: The basic actuator eSyLite, the universal actuator eSyStep and the premium version eSyDrive.

What's behind this concept?

We want to be able to offer the right valve with the right actuator for any respective application. For simple open/close applications, the GEMÜ eSyLite series is intended precisely as an alternative to pneumatically driven valves and solenoid valves. If feedback or other settings such as a stroke limiter or position control are required, our GEMÜ eSyStep universal actuator is the right choice. By contrast, complex and demanding applications can be realized with the GEMÜ eSyDrive premium actuator. This offers a wide range of configurations and setting options. The actuator can be used either for open/close applications or alternatively as a positioner and process controller.



What added value do motorized valves offer?

There is a great deal of advantage and added value. At the present time in particular, in light of significant increases in energy prices, motorized valves result in considerable energy savings compared to pneumatic valves. Lower installation effort and expenditure is required for new plants, since only electrical power is needed for the actuation. The compressed-air infrastructure is omitted altogether. Furthermore, motorized valves provide higher accuracy for control applications in particular, and there is no stick-slip effect.

What does the valve of the future look like? Will motorized actuators squeeze the pneumatic variants out of the market?

I currently believe that both valve types, pneumatically and electrically driven, have their place on the market. This is because every application has different requirements that call for a suitable actuator design. However, the proportion of electrical valves is set to increase significantly, in part thanks to the aforementioned advantages. In the future, valves will become more intelligent, and even pneumatic valves will be further electrified and equipped with additional functions. Through this process, the obstacles that are holding back the transition from electrified pneumatics to motorized valves will continue to be reduced further.

I reckon that the proportion of electrical valves in plant engineering is increasing and taking on the same level of significance as the pneumatics as a minimum.

Given that the eSy series is now complete, are there any future plans for the project?

There's still some exciting things to come. Naturally, we're not going to rest on our laurels now, but will instead get back to work on the next generation of motorized actuators. The state of the art is continually developing and there are new technologies that could be deployed in actuators. Even though our current eSy actuator platform has already made plenty of information available for smart factories, it is the actuators of the future that are set to satisfy the significant megatrends of Industry 4.0 and predictive maintenance.

An overview of all electrical GEMÜ valves can be found at:

https://www.gemu-group.com/en_EN/valve-designs/electric-valves



Dominik Berger
Product and Application Manager
Electric Product and Application
dominik.berger@gemu.de



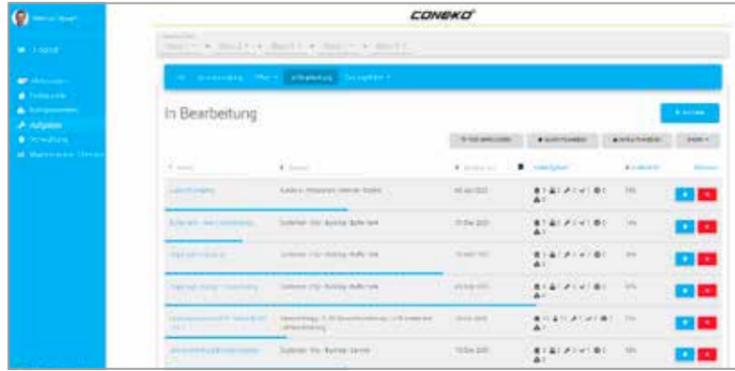
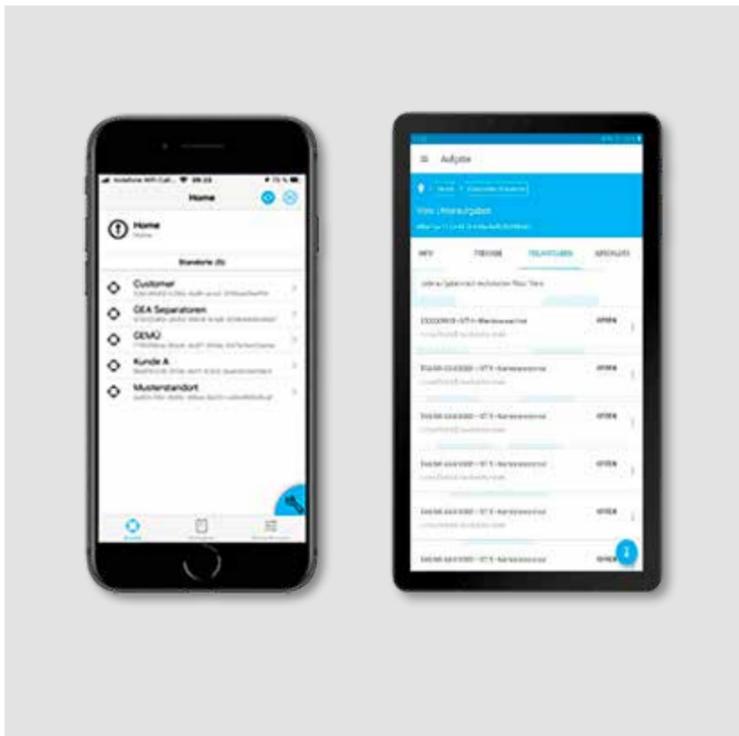
CONEXO 2022

AN APP THAT YOU'RE ALREADY ACQUAINTED WITH – IN A NEW DESIGN

After 200,000 lines of code, 1500 files, 5411 commits, 2771 unit tests, 536 UI tests and 415 pull requests/code reviews on Android, and 191,304 lines of code, 2069 files, 3520 commits, 1931 unit tests, 115 UI tests and 239 pull requests/code reviews on iOS – not to mention many hundreds of hours of development work – the new CONEXO app was finally ready for launch in 2022.

"The developers have done a super job," agree COO Marcus Ripsam and Product Owner Thomas Volpp.

The native development in the Android and iOS operating systems meant that operating-system-specific features could also be addressed. This means that there will be differences in how the two apps are operated in future. Nevertheless, users will be able to find their way around much easier and will be able to operate the app more intuitively, in way that is familiar to how they are guided through other apps.



"It was difficult at first. After years of joint work on a single app via a multi-platform framework, we suddenly had to build up our knowledge again from scratch," reports Senior iOS Software Engineer Tobias Hofner. "Our team of developers was given the opportunity to build up our skills through courses and put this knowledge to the test on some initial simple apps. After that, we got down to business: We divided ourselves up into two teams and then had to program for a specific operating system."

It's not only the user interface that has changed, however. Extra functions have now been added as well – for example, in the "Tasks" area (formerly "Maintenance procedures"), where the range of possible steps for a template has been expanded. When a task has been created and started, the current progress can be viewed directly in the overview in the portal. If a note is created, the user now has the option to send a notification to other users. The user to be notified not only receives a message in the overview, but is also notified via e-mail.

The scope of identification options has also been expanded. The CONEXO system can now also be operated with QR codes, in addition to the RFID chips that been used up to now.

To group users together, teams can now also be created and assigned shared rights or specific tasks to work on. This means that it is no longer necessary to assign a single specific person to a task.

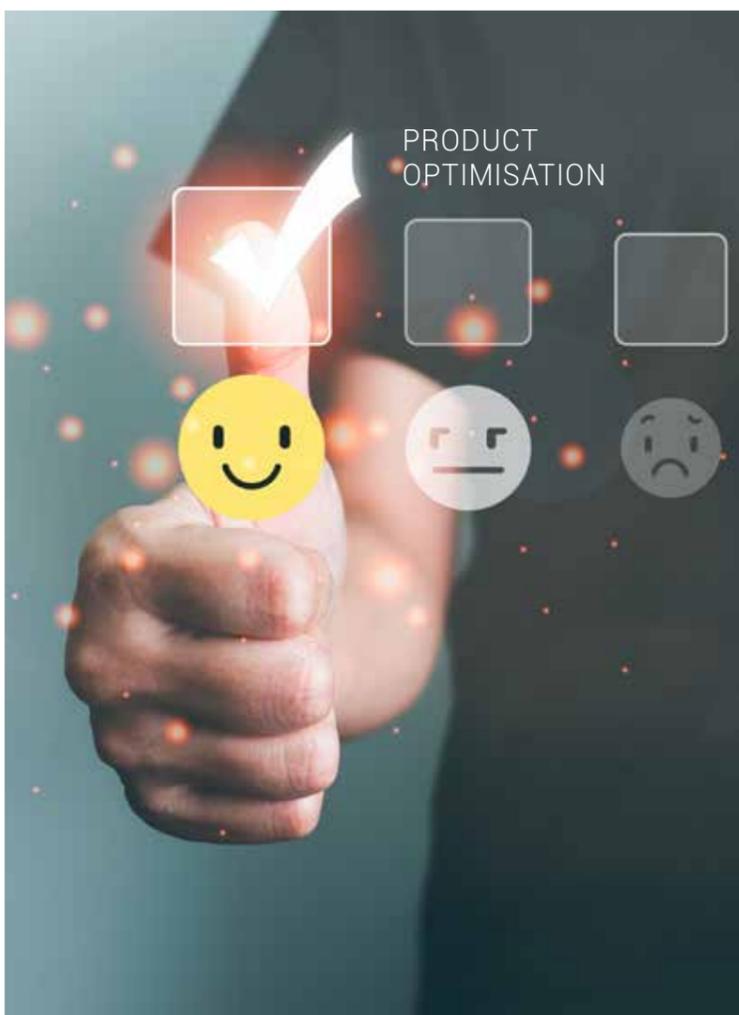
And last but not least: To make the different lists easier to read, the viewing options for each list can be adjusted individually. What's more, a simpler search function has been introduced: It is now also possible to search for free text in the individual columns.

It's not just these perceptible changes that have been implemented, though – improvements have also been made "under the hood". "Due to the use of the framework, the CONEXO app V1 did not run with continuous stability. We've been able to correct this through native development. The 2022 CONEXO app is not only stable, but also performs better and is more adaptable," explains Solution Architect and Senior Software Engineer Andreas Bender.

Initial feedback from customers has been consistently positive. CONEXO 2022 represents a step forwards for inevo. As one of its early adopters, GEMÜ's maintenance division has already tested and used the beta version of CONEXO 2022, with successful results.

Although plenty of work has been done to improve the app, its development is by no means over: Employees and customers alike will no doubt already be thinking of ideas and expansions that can be gradually implemented in future versions.

Marina Dege
Commercial Management
marina.dege@inevo-solutions.com



GEMÜ 9428

WITH HIGHER PROTECTION CLASS AVAILABLE WITH IMMEDIATE EFFECT

As of the beginning of 2022, the tried and tested GEMÜ 9428 motorized quarter turn actuator with its unique Scotch yoke gearbox is available in a new and improved housing.

Significant optimizations have been made in the area of the sealing edge. The new housing design now has exterior unions and a foamed seal. In addition, the optical position indicator has been sealed all around as part of the redesign.

The improved housing reliably protects the actuator in outdoor use against environmental influences such as dust and rain.

Thanks to the optimizations, the protection class of the actuator was able to be elevated to the IP67 standard. In order to satisfy the requirements of the higher protection class, the existing connectors have also been replaced with impact-resistant and robust IP67 connectors.



Hendrik Kunze
Product & Application Manager
Electronic Products & Applications
hendrik.kunze@gemue.de



NEW CONTROLLER BASED ON TWO-WIRE TECHNOLOGY

EXPANSION OF THE PRODUCT RANGE

The new GEMÜ 1441 cPos-X series unites the advantages of the simple commissioning and operation of the GEMÜ 1434 µPos positioner with the customized and extensive configuration options of the GEMÜ 1436 cPos integrated positioner and process controller with an operating interface using state-of-the-art engineering – in particular in environments with two-wire wiring.

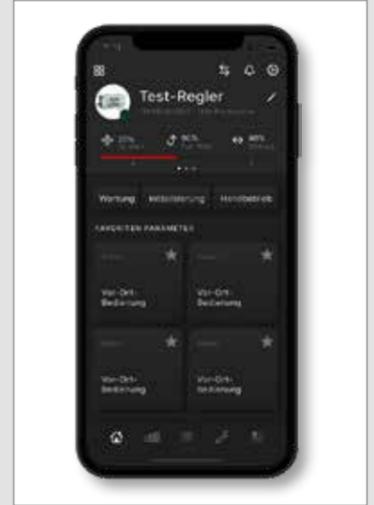
GEMÜ already offers a wide range of positioners and process controllers for pneumatically operated valves, which have, however, to date required a separate supply voltage in addition to a signal source. A power supply unit was consequently always required in addition to the signal specification. This is referred to as three-wire or four-wire wiring (three-wire = common earth for signal and supply). With the newly developed GEMÜ 1441 cPos-X series, the company is going down new paths in the direction of two-wire technology.

With two-wire wiring, the field device is supplied via the signal source and requires no further power supply. This means that the power supply available is extremely limited, which in turn means that a simpler electric installation as well as energy savings can be achieved. The product offers a passive analogue 4-20mA feedback signal as standard as well as digital input and output signals which can be used to query the current valve position or to register disturbances with the control centre.

Operation via mobile device

The special key feature of the new series is the newly adopted operating concept. A mobile device (smartphone or tablet) acts as an operating unit and replaces the local operating units previously fitted to the devices, which accordingly have small dimensions due to the limited space on offer. The controller is equipped with a radio module based on Bluetooth Low Energy and can therefore be operated via a GEMÜ app for iOS and Android operating systems developed in parallel. In addition to the option of operating compatible GEMÜ products, the app also offers a central location for other smart services. In the first step, a few selected functions are already integrated. These will be gradually expanded. In the application of device operation, compatible GEMÜ products can be found, selected and controlled at radio range.

The new GEMÜ 1441 cPos-X controller is equipped with the tried and tested speed AP function just like the GEMÜ 1434 µPos and GEMÜ 1436 cPos eco.



This permits fully independent commissioning and pre-configured basic operation. The self-commissioning of the controller can be started by means of magnets, via the function familiar from other products. Then automatic operation is directly activated and the controller controls the valve according to the applied control signal. The basic configuration can then be individually adapted via the app to fit the specific control task. In addition, error messages in plain text and all device statuses can be displayed, through which the diagnosis options are significantly simplified in the event of errors. Even without app connectivity, the controller displays the most important information on operating behaviour via an integrated status display. The status display also makes it possible to recognize whether a smart device is connected to the controller, and consequently also identify which device has been selected in the app.

The integrated actuator module for dosing the control air permits the precise positioning of the desired valve position; the control air consumption when idle simultaneously equals virtually zero. GEMÜ 1441 cPos-X consequently satisfies the ecological requirements just as it satisfies the control-specific requirements.

The electrical connection can optionally be made via a fitted M12 connector or via cable entries with an inside terminal strip. The integrated linear travel sensor with a length of 75 mm enables operation on the majority of GEMÜ equipment. In addition, external mounting, analogous to the existing series, is available. The controller is suitable both for single acting and double

acting pneumatic process valves with linear and quarter turn actuators.

Thorsten Ungerer
Product Manager for Positioners
and Process Controllers
thorsten.ungerer@gemue.de

ELECTRICAL POSITION INDICATORS AND COMBI SWITCHBOXES

In addition to optimizing existing product groups, GEMÜ is bringing new products in the area of electrical position indicators and combi switchboxes to market.

Over the last few months, the product groups of electrical position indicators and combi switchboxes have undergone optimizations. The optimization measures focused on the expansion of product features and product quality, cost reduction through the use of identical components, and the clear delimitation and differentiation between electrical position indicators and combi switchboxes.

Product launch of GEMÜ 1240, 1241 and 1242 size 2

The new GEMÜ 1240, 1241 and 1242 electrical position indicators are available with immediate effect. They can be combined with single acting and double acting linear or quarter turn actuators and can consequently be used for pneumatically operated diaphragm, globe and diaphragm globe valves, as well as butterfly valves and ball valves. Versions with proximity switches, microswitches and programmable solutions are available. The GEMÜ 1241 electrical position indicator is also approved for potentially explosive areas.



Product launch of GEMÜ 4240, 4241 and 4242

In addition to the electrical position indicators, the complete range of GEMÜ 4240, 4241 and 4242 combi switchboxes is also now available. The GEMÜ 4242 combi switchbox that is already established on the market has been supplemented by a version with a potentiometer length of 30 mm. This is particularly suitable for small and medium-sized valves.

Anesa Stanke
Product and Application Manager
Electronic Product and Application
anesa.stanke@gemue.de

A DAY IN THE LIFE OF A GEMÜ SERVICE TECHNICIAN

Today I am travelling to Hesse, to Melsungen to be precise, visiting GEMÜ customer B. Braun, one of the leading manufacturers of medical systems and pharmaceutical products and services. My job is to centralize the electro-pneumatic positioners GEMÜ 1435 and GEMÜ 1436.

At the B. Braun company plant, the positioners are mounted directly on the process valves. The valves in turn are installed in various locations in the plant. Sometimes they are in very inaccessible places like under containers or in intermediate ceilings which are common for the piping periphery, particularly in the pharmaceutical sector. This is the correct location for the actual control valve to carry out its task – but these locations are not so ideal for handling the positioner.

Operating the devices in these installation positions is a real challenge as the positioner is initialized using the operating keys and the different operating parameters and functions are set, displayed and read via the display.

Centralizing the positioners

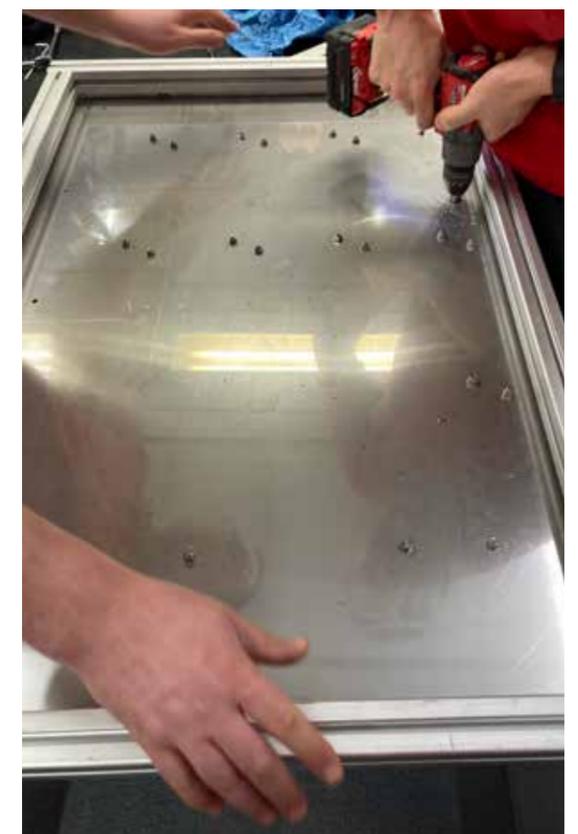
To optimize this situation, it is the job of our GEMÜ service teams to consolidate all the plant's positioners in one central, easily accessible location.

In order to arrange the total of 11 positioners of the types GEMÜ 1435 and GEMÜ 1436 on a central stainless steel mounting plate so that they are easy to operate, the area required for this panel was calculated first. We placed all positioners on the panel, suitably spaced. The additional bolt hole can be seen as a special feature. This is used to change the air throttles of positioner type 1436 - which serve to influence the actuating speed of the process valves - from the back of the panel, without having to disassemble the positioners. In addition, we fitted a stainless steel cable duct at the customer's request, cut out the bushings for electrical and pneumatic cables, and fitted edge protection around them to protect the cables. This successfully concluded the preliminary work.

Then it was installed locally at the customer site. In close collaboration with the maintenance personnel from B. Braun, I installed the panel in the plant and removed the directly mounted positioners from the process valves. Then the new travel sensors were installed on the valves and the signal lines were pulled up to the positioners on the central panel. Once all positioners were connected with new pneumatic lines up to the respective process valve, the positioners were initialized and parametrized. The plant could then be put back into operation with significant improvements made to the operation and handling of the control components.

This exciting challenge and the successful conclusion of this operation have shown me once again how much I enjoy realizing and implementing customer requirements.

 **Markus Hammel**
Head of Department
Service Department
markus.hammel@gemue.de



2022 training dates

The training courses will be held in German. Training courses in English will be held again in spring 2023.

 **Jessica Donner**
Assistant of the Service Department
Organisation of Technical Training
training@gemue.de