

BREWING TECHNOLOGY



INSPIRED. SOLUTIONS. FOR CUSTOMERS.



sera

A company of the future

sera is one of the world's leading companies in the field of dosing and compressor technology. For 80 years, the **sera Group** has been developing and producing application solutions that depend on the precise dosing, pumping and compression of liquids and gases.

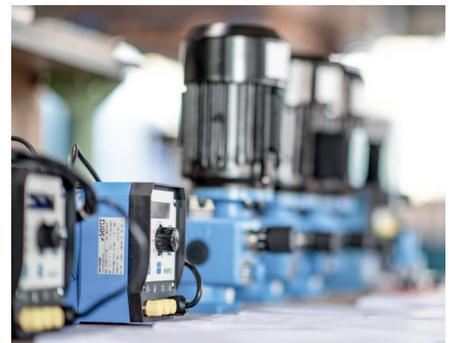
sera is an independent family-owned company headquartered in Immenhausen. In addition to subsidiaries in Great Britain, Austria, Switzerland, South Africa and Spain, **sera** also operates branches in Italy and the United Arab Emirates. More than 30 strong partners represent **sera** in over 80 countries, ensuring expert support, advice and services locally worldwide.

EXCELLENCE IN FLUID TECHNOLOGY

We create added value for people and the environment.

As an environmental technology company, **sera** offers a wide range of products that provide the right solutions for many of your applications worldwide. **sera** products are used wherever the precise dosing and pumping of chemicals and liquids is required, for example in water and waste water treatment and disinfection.

Customised solutions round off our portfolio. In addition, our customers worldwide benefit from our comprehensive services: from support in the planning and commissioning of systems, to the quick and easy replacement of devices worldwide, to the development of innovative technologies.



Comprehensive product portfolio

We create customised solutions for your application. Not only can you choose from a wide range of standard products and material designs, but you can also have customer-specific systems configured entirely according to your requirements.

The customer is our top priority

Assigned, expert contact persons throughout the entire offer, order and project realisation process ensure that you receive optimal customer care and advice. We respond flexibly to your needs and are quick and reliable in our processing and handling. From engineering to production and after-sales service, we offer you high-quality products and services.

Long-lasting products and high quality

For 80 years, the name **sera** has stood for exceptional quality and expertise. We develop dosing pumps and systems for extreme operating conditions and long runtimes. That is why the quality and reliability of our products are our top priority. Place your trust in the expertise and experience of our team.



PRECISE DOSING IS HALF THE BREWING PROCESS

Our expertise for your success

Plants and systems for the production of food and beverages must be regularly cleaned and disinfected – this also applies to brewing beer. In order to produce high-quality beer, strict hygiene standards and efficient processes for cleaning and disinfecting the production plants, as well as the treatment of all water resources required for the brewing process, are required in addition to sophisticated brewing processes. Reliable cleanliness of all components is crucial to ensure the quality and safety of the final product.

For decades, sera pumps and dosing systems have been an important and reliable part of many breweries worldwide. They play a central role in the pro-

duction plants and support consistently high beer quality through their precise and reliable performance.

The comprehensive sera product range includes dosing and transfer pumps, standardised dosing systems and units, as well as customised system and unit solutions that have been specially developed for the following applications:

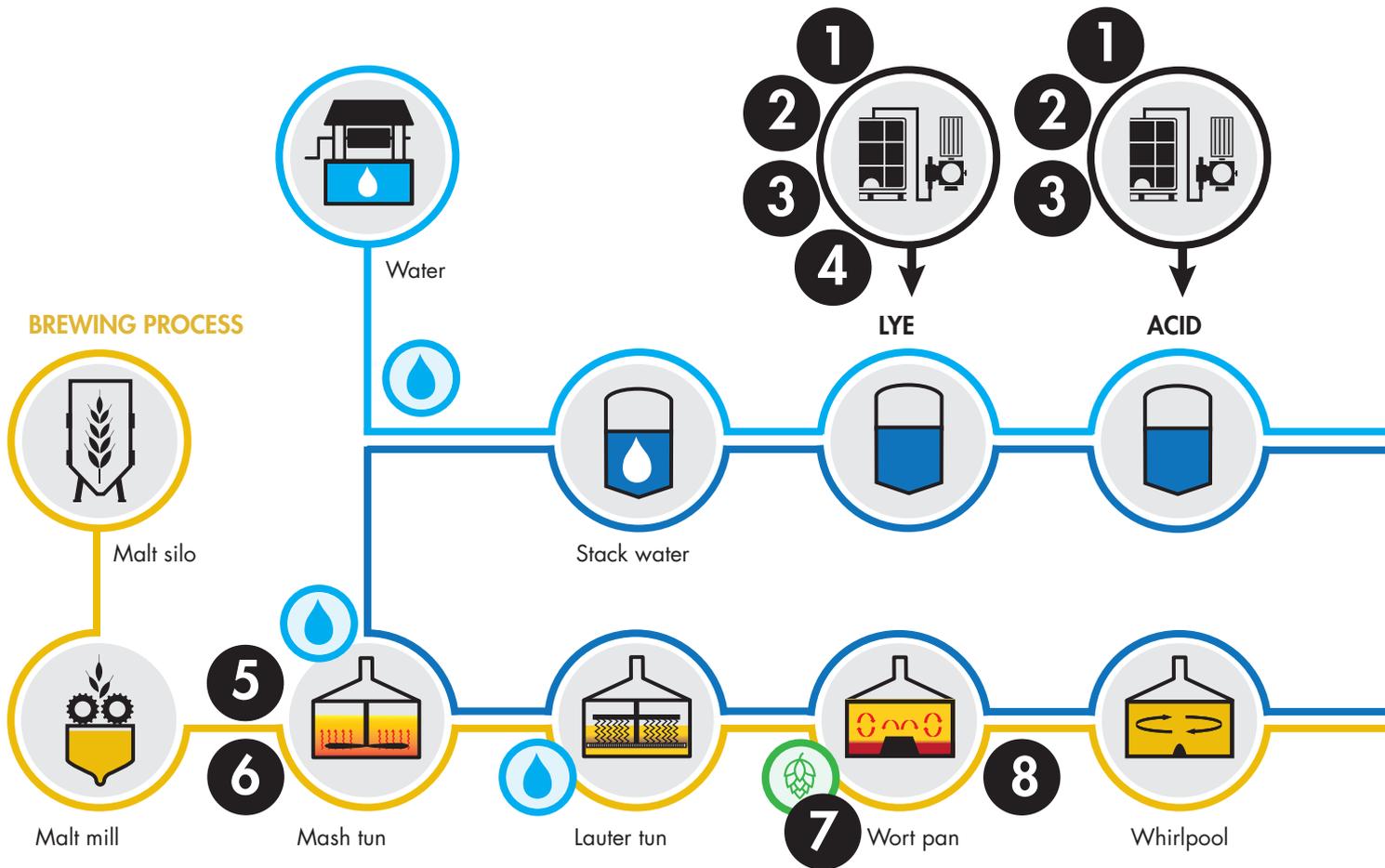
- Cleaning and disinfecting containers, pipes and systems (CIP)
- Brewing water treatment
- Beer filtration
- Waste water treatment



- Treatment of process water
- Dosing of enzymes, additives and auxiliary agents
- Yeast addition
- Dosing of conveyor belt lubricants
- Cooling water treatment
- Treatment of boiler feed water (steam generation)

With this wide range of products and solutions, sera offers breweries worldwide the opportunity to make their production processes efficient and sustainable.

APPLICATION IN THE BREWING PROCESS

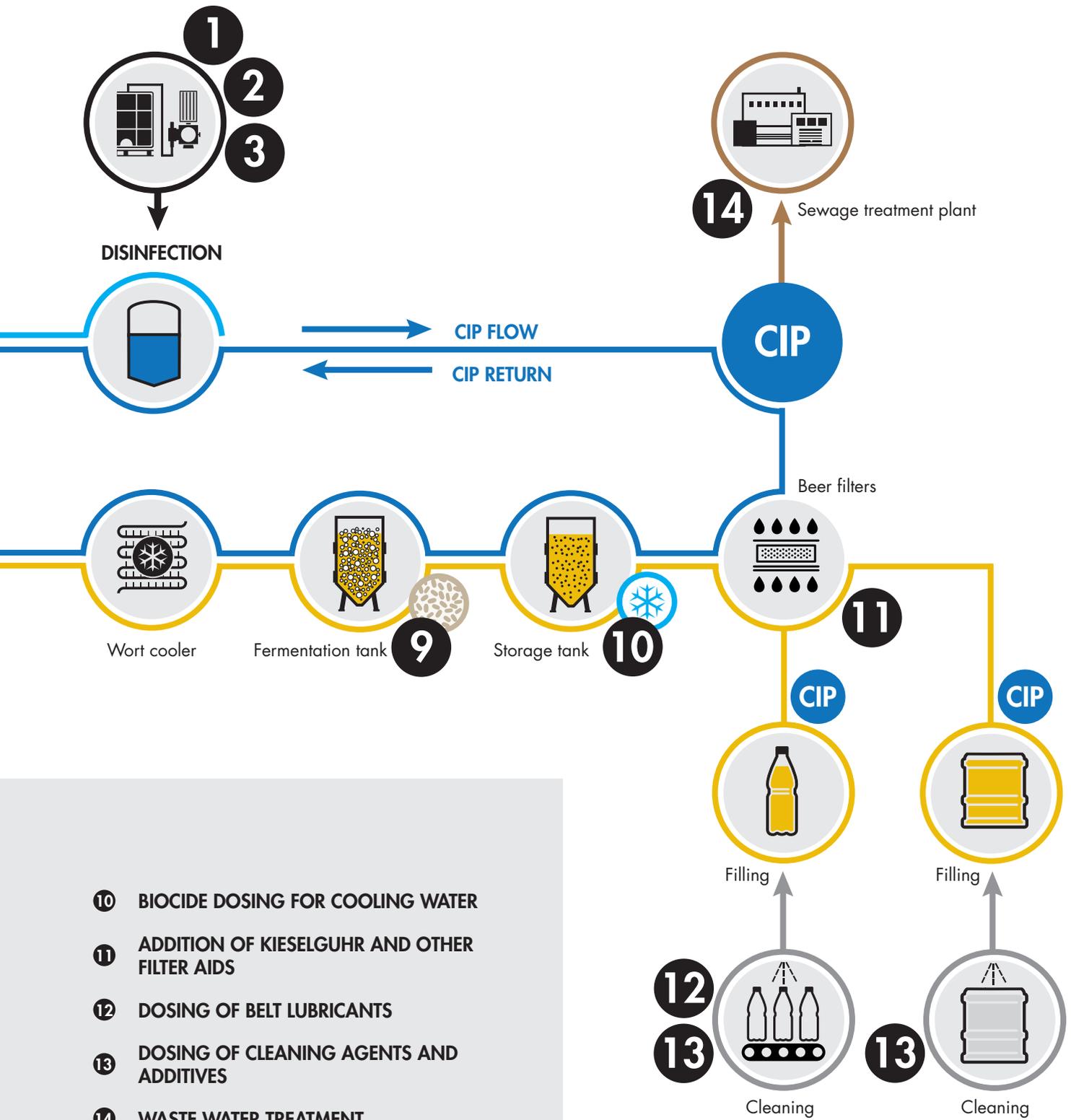


We offer a comprehensive range of products to ensure that the optimum solution is found for each step in the process. Based on a typical process in the brewing process, we present some examples of solutions from our comprehensive range:

- | | |
|---|--|
| <p>1 DOSING OF CHEMICALS AND ADDITIVES FOR CLEANING AND DISINFECTION</p> <p>2 IBC EMPTYING</p> <p>3 WITHDRAWAL OF CHEMICALS FROM STORAGE TANKS</p> <p>4 PREPARATION OF CAUSTIC SODA FROM SOLIDS</p> <p>5 DOSING OF ENZYMES */LACTIC ACID</p> | <p>6 PREPARATION AND DOSING OF CALCIUM CHLORIDE AND CALCIUM SULPHATE</p> <p>7 ADDITION OF HOP EXTRACT AND HOP OILS *</p> <p>8 ADDITION OF ROASTED MALT BEER</p> <p>9 ADDITION OF YEAST</p> |
|---|--|

* only permissible outside of the Purity Law

THE RIGHT SOLUTION FOR EVERY PROCESS STEP



- 10 BIOCIDES DOSING FOR COOLING WATER
- 11 ADDITION OF KIESELGUHR AND OTHER FILTER AIDS
- 12 DOSING OF BELT LUBRICANTS
- 13 DOSING OF CLEANING AGENTS AND ADDITIVES
- 14 WASTE WATER TREATMENT

1

The precise and reliable dosing of lyes, acids and disinfectants is essential for the ancillary processes of the actual brewing. The standardised CVD dosing systems impress with their versatility, short delivery times and unrivalled price/performance ratio. CVD (Compact Vertical Dosing) is a large modular system for dosing applications. sera is the only manufacturer to offer the appropriate drive technology in a configurable system for every application.

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DOSING OF CHEMICALS AND ADDITIVES



AREAS OF APPLICATION

- Dosing of cleaning agents and disinfectants in the CIP process
- Dosing of chemicals for cleaning bottles and barrels



PUMP FEATURES

- Modular design allows for a wide range of variants
- Controllable pumps on request with Profibus / Profinet
- Stepper motor pumps for precise and low-pulsation dosing



SETUP

The fully modular design makes it possible to adapt the system's functions to individual dosing requirements using standardised components, as if from a construction kit. The CVDs are suitable for use with IBCs, drums, small containers and storage tanks. Matching suction lances and connections complete the portfolio:

- Compact design, modular system
- Space-saving wall mounting
- High operational and process reliability
- Options with one pump (CVD1), two pumps (CVD2) or as a compact solution CVD1s
- Suction and pressure-side connection available



In the brewery, continuous removal of chemicals is very important – as is the efficiency of the process. **sera**'s IBC emptying station fulfils both requirements.

IBC EMPTYING



AREAS OF APPLICATION

Precise dispensing of chemicals such as caustic soda or disinfectants from IBCs.



FEATURES

- Simple structure consisting of a storage area and a storage tank
- Inclined storage area ensures complete emptying of the IBC
- When the IBC is completely empty, a defined residual volume remains in the storage tank
- IBCs can be replaced without interrupting the process
- Monitoring with level indicator and two float switches
- Improvement in occupational safety



SETUP

The IBC emptying station enables a continuous supply of chemicals in production processes. It consists of an inclined storage area for the IBC container, a receiving vessel and a collection tray. The liquid flows by gravity from the IBC into the receiving vessel, leaving a defined residual volume – this means that the IBC can be replaced without interrupting the process. The dosing station is placed directly on the collection tray. An additional drip tray is therefore not necessary.

3

In large breweries, the chemicals are usually stored in storage tanks, centrally in concentrate rooms. The **sera** dosing systems not only ensure that the chemicals are removed safely and easily, but also that they are precisely dosed over long pipe routes.



REMOVAL OF CHEMICALS FROM STORAGE TANKS



AREAS OF APPLICATION

Extraction of acids, lyes and disinfectants in large-scale food and beverage production plants.



FEATURES

- Siphon on the tank
- Suction aid
- Pulsation damper
- Flow meter



SETUP

Due to the design of the containers in the collecting tray, the product is only removed from the storage tanks, which are up to five metres high, from above. Therefore, a lifting device is always installed on the tanks at the highest point. In addition, the **sera** dosing systems are equipped with a suction aid. These devices enable trouble-free operation. **sera** offers the option of manufacturing storage tanks with a volume of up to 10 m³ in-house. This means that individual requirements can be flexibly implemented and high quality standards guaranteed.



4

When caustic soda is prepared from solids, an exothermic reaction occurs with temperatures of up to 95°C. The **sera** caustic soda preparation station is designed so that the user can easily add the caustic soda flakes to the process from a safe distance.

PREPARATION OF CAUSTIC SODA FROM SOLIDS



AREAS OF APPLICATION

Preparation of caustic soda from pellets and flakes.

Caustic soda is essential for thorough cleaning in the beverage industry and thus a prerequisite for safe, high-quality products.



FEATURES

- Media-contacting parts made of stainless steel
- Bag emptying with screw conveyor approx. 1,000 kg/h
- Filling level display with shut-off
- Electric agitator
- Temperature display
- Overflow with siphon
- Manual water addition
- Contact protection (all-round pipes)

- Bag emptying separate from hot area
- Version available for Big Bag feeding
- Improvement in occupational safety
- NaOH solutions from 20 to 50% possible



SETUP

The stainless steel container is filled with solids by a screw conveyor. The solids are fed into a conveyor hopper by the operator. The distance to the hot container ensures the operator's safety.

ACCESSORIES

- Suction device
- Transfer station
- Storage tank

6

The **sera** preparation stations are designed to meet the special requirements of preparing CaCl_2 and CaSO_4 . The containers are fitted with a conical bottom that allows complete emptying and rinsing after preparation. The materials are of high quality, so that even heat development during preparation with anhydrous CaCl_2 is not a problem. In order to ensure continuous availability of the additives, sera offers suitable storage containers.



PREPARATION AND DOSING CaCl_2 AND CaSO_4



AREAS OF APPLICATION

Addition and dosage of calcium chloride (CaCl_2) and calcium sulphate (CaSO_4) for brewing water treatment. Calcium chloride and calcium sulphate can be added to the brewing water to obtain a soft and rounded aroma later on.



FEATURES CaCl_2

- Very aggressive towards stainless steel
- When water-free CaCl_2 enormous heat development



FEATURES CaSO_4

- CaSO_4 is a suspension and has an abrasive effect
- Product must be kept in a suspended state by an agitator



SETUP

- Manual batching from bagged material
- Manual addition of water for rinsing
- PP container with conical bottom for complete discharge of residue
- Bag dump station
- Electric agitator
- Capacitive level indicator, adjustable
- All components are suitable for suspensions and heat-resistant



- 5 A hygienic dosing pump ensures precise and safe dosing of liquid additives such as enzymes or flavours in the brewery.
- 7 It is made of food-safe materials, is easy to clean and prevents contamination.
- 8 The pump meets strict hygiene standards and contributes to the quality and safety of the end product.

DOSING OF FOOD ADDITIVES



AREAS OF APPLICATION

- Dosing of lactic acid and enzymes (permissible outside of the Purity Law)
- Addition of hop extract, hop oils or roasted malt beer



FEATURES

- CIP-cleanable pump body
- Food compliant according to EC 1935/2004 and FDA
- SIP capability
- Dead space optimised design of pump body and valves



SETUP

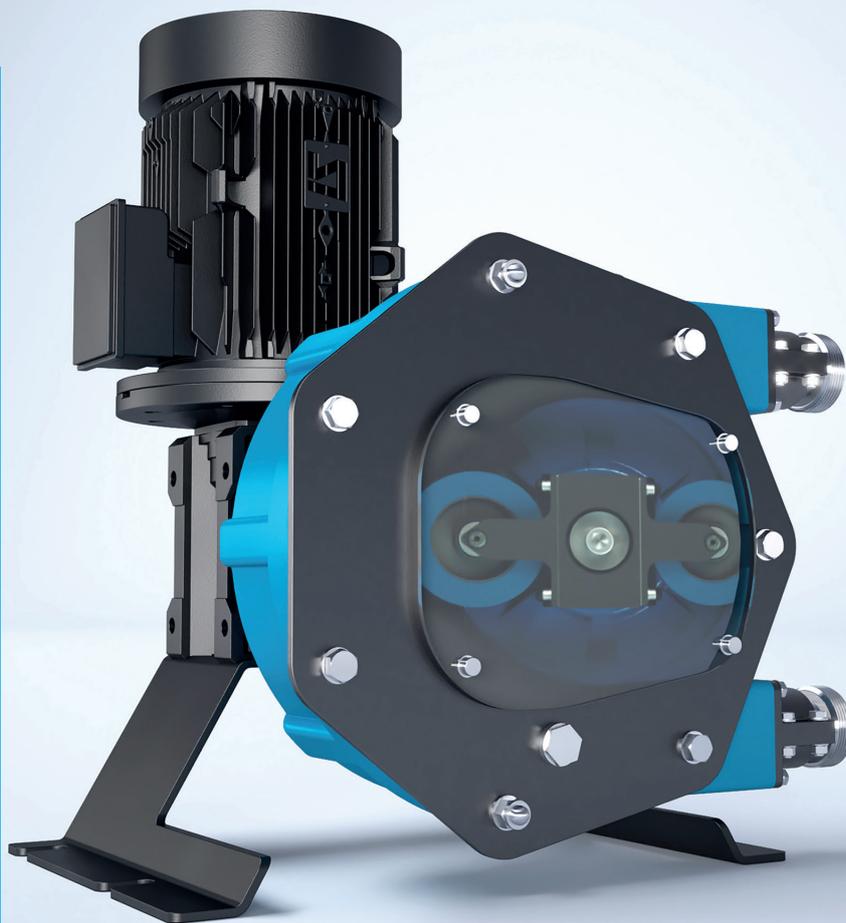
- All parts that come into contact with the media are made of stainless steel or other food-grade materials.
- Smooth, electropolished surfaces and a special design allow for thorough cleaning and prevent contamination.

9 ADDITION OF YEAST

Reliable yeast dosing is necessary for optimal fermentation. The minimal mechanical stress caused by the use of a peristaltic pump helps to avoid yeast stress. The design of the pump also allows for optimal cleaning, which minimises the risk of yeast contamination.

11 ADDITION OF KIESELGUHR

During filtration, yeast and other particles that cause cloudiness are removed from the beer. This results in a fine, shiny, clear beer. Diatomaceous earth and other filter aids are usually used in this process. The peristaltic pump is ideal for dosing these abrasive suspensions.



ADDITION OF YEAST AND KIESELGUHR



AREAS OF APPLICATION

Addition of yeast, kieselguhr and other filter aids

MEDIA

- Abrasive media
- Corrosive media
- Viscous media
- Shear-sensitive media



SETUP

- Maximum resistance to abrasion
- Unparalleled suction ability
- Unlimited dry running
- No valves or mechanical seals
- Gentle pumping
- Dosing possible in both directions
- Full dosing control
- Industrial, chemical-resistant and food-grade versions
- Dosing accuracy of $\pm 1\%$



10 BIOCIDES DOSING

In breweries, evaporative cooling systems provide cooling, but their environment can favour the growth of legionella, which can enter the environment via aerosols and cause health problems. Since 2017, operators have been obliged to monitor them in accordance with the 42nd BImSchV. Intermittently dosed biocides prevent the growth of legionella, for which our simple dosing system offers an efficient solution – without any connection to the process control system.

12 CONVEYOR BELT LUBRICATION

In breweries, precise dosing of conveyor lubricants ensures smooth operation and reduces wear and downtime. Exact dosing is particularly crucial in the food industry, where hygiene and operational safety are top priorities.

BIOCIDES DOSING AND BELT LUBRICATION



AREAS OF APPLICATION

- Dosing of biocides
- Dosing of lubricants for conveyor belts.



SETUP

- High-quality dosing pumps
- Suction lances for various container sizes
- Control units for quantity-proportional dosing
- Collecting tray if required
- Choice of materials according to the media used

ADVANTAGES BELT LUBRICATION



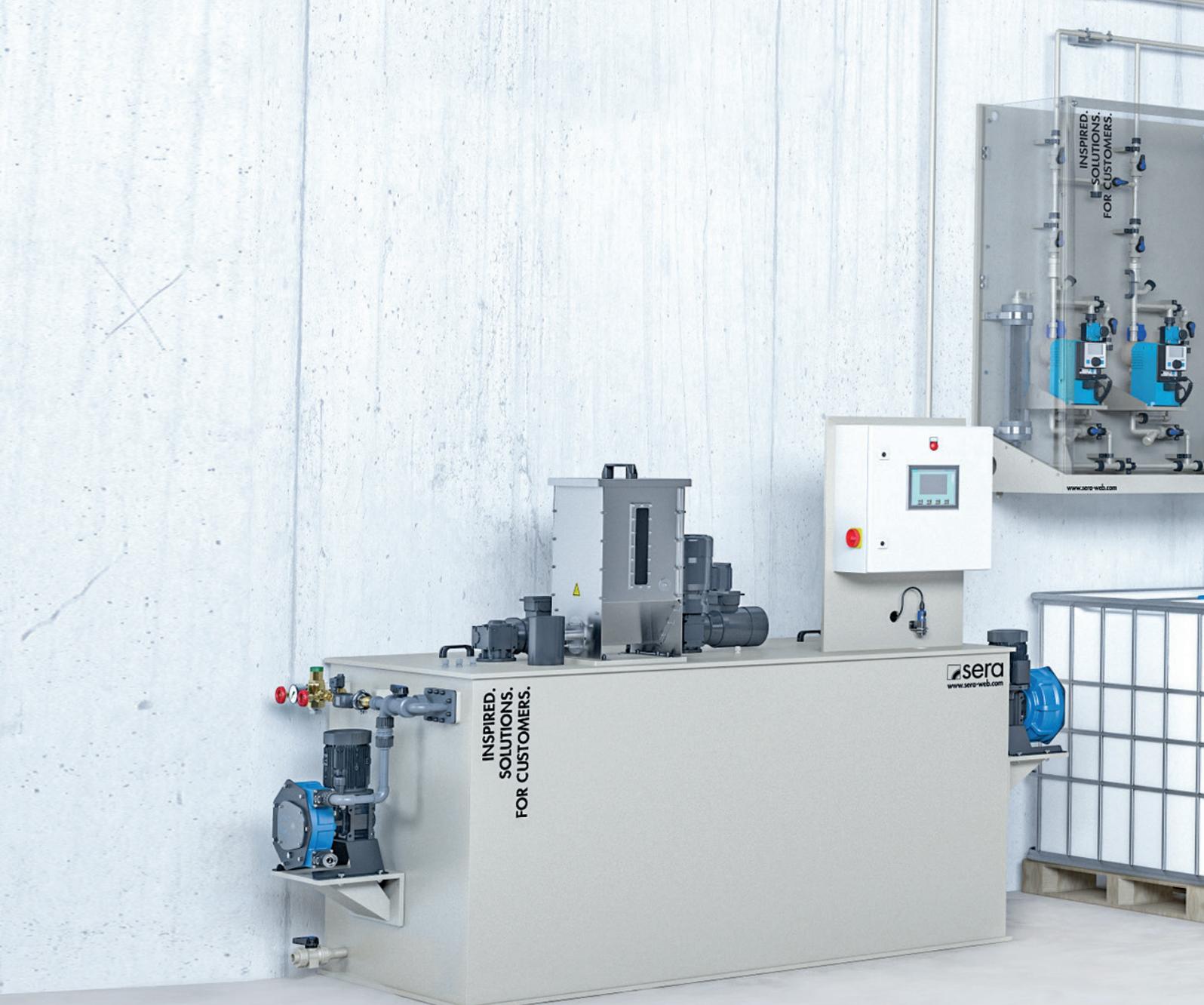
- Efficient lubrication: precise quantities reduce lubricant costs.
- Hygiene requirements: metering reduces residues and germ formation.

- Extended service life: gentle metering minimises material wear and maintenance costs.
- Environmentally friendly: less lubricant means lower water consumption and less environmental pollution.

ADVANTAGES BIOCIDES DOSING



- Effective germ control: precise dosing fights germs with minimal use of biocides.
- Product safety: controlled dosing prevents contamination and protects quality.
- Material protection: exact dosing reduces wear on seals and lines.
- Cost optimisation: precise dosing reduces costs and minimises chemical consumption.



14 WASTE WATER TREATMENT

sera offers proven solutions for waste water treatment in breweries

In breweries, the treatment of waste water is a central component of responsible and legally compliant operation. The waste water is often contaminated with organic substances such as product residues, yeast and cleaning agent residues, which must be removed before it is discharged into the public sewer system or into natural waters in order to protect the environment and resources. Careful treatment ensures that legal requirements for water quality are met while also reducing operating costs through the possible reuse of water. Professional waste water management not only emphasises the environmental responsibility of the brewery, but also strengthens its image as a sustainable company that relies on the careful use of resources and efficient processes.

The **sera** delivery programme for waste water treatment includes:

- Complete metering systems and metering systems
- Preparation and metering systems for polymer solutions
- System accessories
- Metering pumps



CLASSIC APPLICATIONS

- Carbon sources for a balanced nutrient ratio
- Phosphate precipitation
- Flocculation filtration
- Sewage sludge thickening
- Sludge dewatering
- Sludge conditioning
- pH adjustment
- Defoaming
- Desulphurisation of sewage gas
- H₂S elimination



sera INDUSTRIAL CLEANING TECHNOLOGY

Industrial high-pressure cleaning in the brewery

Industrial high pressure cleaning is of central importance for breweries, as it ensures thorough and efficient cleaning of the entire production and transport systems. This technology reliably removes deposits, residues and biofilms, so that the highest hygiene standards are maintained – a crucial factor in food production and a guarantee of product quality. Using **sera's** high-performance high-pressure systems enables resource-saving cleaning with reduced water and chemical consumption. This not only contributes to long-term operational reliability, but also to increasing the efficiency and sustainability of the brewing process.

CLASSIC APPLICATIONS

- Surface cleaning
- Internal tank cleaning
- External tank cleaning
- General external cleaning



FEATURES

- Determining the operating point at the customer's site
- Energy-efficient high-pressure system
- Multiple cleaning stations with a single device
- High productivity
- Time saving

handtmann
Ideen mit Zukunft.

Bitburger
Bitte ein Bit

Krombacher

bawaco ag
know how in food processing

AB InBev

PEPSICO

**RADEBERGER
GRUPPE**

Coca-Cola

Carlsberg



centec

coro
Prozeßsysteme



PALL



KIESELMANN
FLUID PROCESS GROUP

GEA



KRONES

BrauKon
Anlagen für die Brau- und Getränkeindustrie



OUR REFERENCES AT A GLANCE

sera dosing technology has been in use in a wide variety of industries worldwide for 80 years. Dosing pumps and systems ensure the precise dosing of relevant chemicals and other liquids in many industrial processes.

sera products create added value worldwide for people and the environment.



High-quality pumps, dosing units and systems

We offer you a comprehensive product portfolio of reliable, durable and precise dosing pumps for flow rates from 7 ml/h to 1,900 l/h at pressures up to 220 bar. Or you can choose from a variety of transfer pumps with flow rates up to 54 m³/h.



A wide variety of versions and materials

For over 80 years, we have stood for experience and knowhow. That way, we are able to quickly and flexibly modify your designs or realise the designs you require.



Individual customised solutions

Developing and implementing customised solutions perfectly tailored to meet the needs of each specific application.



Economical solutions

Short delivery times and high availability at great price without compromising on performance. Sophisticated product lines for a wide range of applications with extensive upgrading options and accessories.



Commissioning, maintenance and service

Professional commissioning is the basis for reliable operation of your system. Our maintenance and repair services ensure availability and avoid failures. Supplemented by spare parts service, installation, support and training – for smooth operation of your processes.



Fittings and Accessories

We provide an extensive range of fittings and accessories, thanks to our dosing systems and metering pumps. Feel free to contact us.

POWERFUL SERVICE DIRECTLY FROM THE MANUFACTURER

Technical equipment, systems and components are the heart of many production and work processes. They often work under extreme conditions, have to meet high standards and function reliably to ensure your operational processes. However, like any technical facility, they are subject to natural wear and tear, which can become a significant risk without regular maintenance.

The consequences of inadequate service range from a gradual loss of efficiency and higher energy and operating costs to sudden, unplanned outages. Such disruptions can cause production downtime, jeopardise delivery times and significantly increase your operating costs. In the worst case, there is a risk of damage that would require the complete renewal of components or systems.

Regular servicing is the key to avoiding such scenarios. It guarantees the long-term reliability and durability of your systems, minimises downtime and protects your investments. In addition, professional maintenance helps to increase the safety of your processes and to comply with legal requirements.

Your added value with sera service

- **Reliable maintenance**
Regular inspections and preventive maintenance by our experts ensure a high level of availability and extend the service life of your systems.
- **Fast assistance worldwide**
With eight of our own locations and over 30 trained trade partners, we offer you service in more than 80 countries – quickly, flexibly and with a focus on solutions.
- **Efficient device replacement**
Should a device fail, our worldwide replacement service ensures minimal disruption to your operations.
- **Customised support**
Whether complete systems or individual components – our service adapts to your specific requirements.
- **Expertise on the ground**
Our technicians are always up to date with the latest technology and work efficiently to minimise downtime.

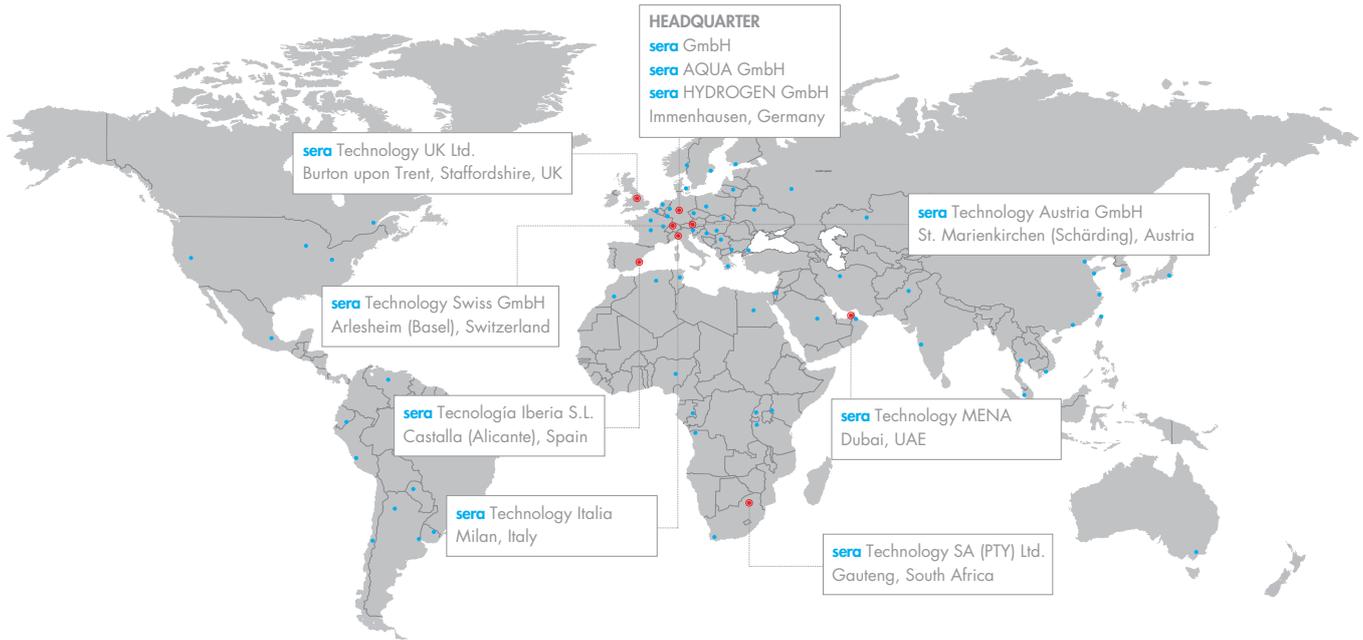
Our services support you in all areas – from installation and regular maintenance to repairs and the replacement of defective devices. With **sera** service, you have a partner at your side that not only offers quick solutions but also guarantees long-term reliability. This is how we ensure that your plants, systems and components always work optimally.



SERVICE



FOLLOW US



WORKING FOR YOU ALL OVER THE WORLD

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