



sera ProDos

A company of the **sera** group

Dosing
Technology

Fluid Technology is our Passion



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sera ProDos

Water is Life.
A clean environment is the basis of our existence.

Fluid Technology has been our passion for decades. We strive for expertise in the engineering and manufacturing of products and systems for precise dosing and feeding of fluids.

We daily create added value for people and nature to promote a clean and better environment.

Our customers' and partners' individual needs are at the centre of our interest at any time. We enthuse them with our products and service and convince them with our quality, expertise, speed and reliability.

Since 1945, **sera** has been one of the global leading system provider for dosing and feeding technology handling a wide range of fluids.

In order to meet and improve the growing demands of our customers for holistic and industrial-sector-specific solutions, **sera's** core competences in dosing technology were concentrated and outsourced in the international subsidiaries **sera ProDos** in 2010.

This concentration of expertise and technological know-how enables us to place optimum focus on the different industrial sectors and business areas of our customers.

Thanks to new structures and processes within our company and the expansion of our range of services as a system and full-service provider, we are now able to advise and support you even better and furthermore enthuse you with our high product quality, expertise, speed and reliability.

In many industrial sectors such as water and wastewater treatment, food and beverage, chemical and petrochemical, power plant technology and power generation, **sera ProDos** develops solutions which are economically, technologically and ecologically trendsetting.

The extensive product and service portfolio includes:

- Complex system solutions
- Pumps and fittings
- Measurement, analysis and control technology (MSR) and analytical measurement technology
- Global assembly and commissioning
- Extensive service before, during and after the sale
- Extensive technical support
- Spare parts and repair service
- Individual customer training

Performance features of all sera dosing pumps:

- High dosing accuracy
- Leakage-free
- Robust and durable
- Low maintenance
- Long service life of diaphragms
- Unlimited to run dry
- Low operating expenses
- High-quality materials
- Linear control characteristic
- Easy to operate
- Low weight
- Wide range of application by an extensive program of material combinations and accessories

Nearly all of our pump models have a design with intelligent control electronics, which can be characterized by the following features:

- Future-orientated pump concept by integral multi-functional control electronics with direct controllability via analog signal or pulse signal, charge dosing, level indicators and many more features
- High operational safety by permanent and automatic diaphragm monitoring
- Flexibility and high application security for viscous media due to slow-mode-technology
- Optional self ventilating
- Optional Profibus-DP-Interface

Solenoid pumps

The operating principle of the **sera** solenoid pumps is as follows: The drive unit consists of a strong stroke solenoid in a robust housing made of plastic and equipped with a thermal overload protection. The stroke solenoid drives a diaphragm in a pump head mechanically and oscillating and thereby feeds and doses the medium exactly.

Motor-driven pumps

The operating principle of the **sera** motor-driven pumps has shown its effectiveness over decades and is as follows:

A proven motor coupled to a stroke mechanism drives a diaphragm in a pump head mechanically and oscillating and thereby feeds and doses the medium exactly.

The robust cast iron housing of the motor-driven pumps can cope with even extreme operating conditions due to the thickness of the material and the surface treatment.

All **sera** motor-driven pumps are available as multi-headed or combination pumps with a single drive. Each pump head can be sized individually according to the requirements in respect of material, size and control for these reasonably priced twin head or multi-headed pumps.



Dosing pumps

Solenoid Diaphragm Pumps 2 series

Excellence in Fluid Technology



- Performance range between **0,4 l/h** and **35 l/h**, counter pressures up to max. **10 bar**
- Very simple commissioning thanks to **sera's** „plug & dose“ (standard configuration)

The solenoid diaphragm pumps of the 2 series are available with simple (R204.1) and extensive (C204.1) control electronics.

For special dosing problems and to meet nearly all of our customers' needs, we offer individual solutions, e.g.:

- RS-/CS-design for outgassing media
- Multi function valves
- Completely available with dosing kits ("plug & dose")
- Design with Profibus DP-Interface



R204.1 Flow rate: 0,4 - 35 l/h
Counterpressure up to 10 bar



C204.1 Flow rate: 0,4 - 35 l/h
Counterpressure up to 10 bar



C204.1 PROFIBUS Flow rate: 0,4 - 35 l/h
Counterpressure up to 10 bar



RS204.1 Flow rate: 0,4 - 35 l/h
Counterpressure up to 10 bar



CS204.1 PROFIBUS Flow rate: 0,4 - 35 l/h
Counterpressure up to 10 bar



CS204.1 Example: mounted on dosing tank
with level input

- Performance range between **0,4 l/h** and **1450 l/h**, counter pressures up to max. **10 bar**
- Applicable in explosion-hazardous areas by optional equipment components
- Very simple commissioning thanks to **sera's** „plug & dose“ (standard configuration)

For special dosing tasks and to meet nearly all of our customers' needs, we offer individual solutions, e.g.:

- Designs according to ATEX
- Pump heads with special nominal widths
- Heating devices
- Double valve assemblies
- Electric actuators
- Valves with elastic seats
- Stroke transmitting device
- Diaphragm monitoring
- and many more

All motor-driven diaphragm pumps of the 4 series are available with variable, intelligent control electronics (C-design).



C409.2 Flow rate: 0,8 - 350 l/h
Counterpressure up to 10 bar



C409.2 Example in CIP-design
with dairy pipe connections



C410.2 Flow rate: 260 - 1450 l/h
Counterpressure up to 8 bar



R409.2 Flow rate: 0,8 - 350 l/h
Counterpressure up to 10 bar



R410.2 Flow rate: 260 - 1450 l/h
Counterpressure up to 8 bar



RK409.2 Combination pump



RK410.2 Combination pump

- Performance range between **11 l/h** and **1200 l/h**, counter pressures up to max. **20 bar**
- High operational safety by multi-layer diaphragm technology and integrated diaphragm monitoring
- Up to ten times higher lifetime of the multi-layer diaphragm in comparison to single layer diaphragms
- Excellent priming characteristics without additional equipment
- Applicable in explosion-hazardous areas by optional equipment components
- Very simple commissioning thanks to **sera's** „plug & dose“ (standard configuration)

These pumps can handle dosing tasks with higher requirements regarding safety by using the multi-layer diaphragm and diaphragm monitoring.

The multi-layer diaphragm consists of three layers:

- working diaphragm
- signal diaphragm
- protective diaphragm

For special dosing tasks and to meet nearly all of our customers' needs, we offer individual solutions, e.g.:

- Designs according to ATEX
- Pump heads with special nominal widths
- Heating devices
- Double valve assemblies
- Electric actuators
- Valves with elastic seats
- Stroke transmitting device
- Diaphragm monitoring and many more

All multi-layer diaphragm pumps of the 4 series ML are available with variable, intelligent control electronics (C-design).



C409.2 ML Flow rate: 11 - 220 l/h
Counterpressure up to 20 bar



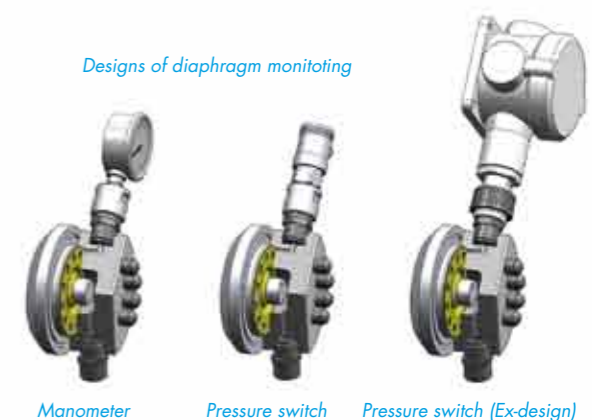
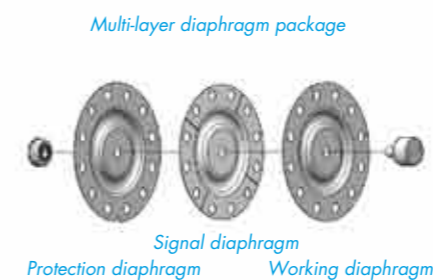
C410.2 ML Flow rate: 70 - 1200 l/h
Counterpressure up to 16 bar



R409.2 ML Flow rate: 11 - 220 l/h
Counterpressure up to 20 bar



R410.2 ML Flow rate: 70 - 1200 l/h
Counterpressure up to 16 bar



- Performance range between **7,5 l/h** and **850 l/h**, counter pressures up to max. **80 bar**
- High operational safety by multi-layer diaphragm technology and integrated diaphragm monitoring
- Up to ten times higher lifetime of the multi-layer diaphragm in comparison to single layer diaphragms
- Excellent priming characteristics without additional equipment
- Applicable in explosion-hazardous areas by optional equipment components

These pumps can handle dosing tasks with higher requirements regarding safety by using the multi-layer diaphragm and diaphragm monitoring.

Each drive unit of the piston diaphragm pumps consists of a proven motor which is coupled to a stroke mechanism in a robust cast iron housing and which drives a diaphragm in a pump head mechanically and oscillating and thereby feeds and doses the medium precisely.

For special dosing tasks and to meet nearly all of our customers' needs, we offer individual solutions, e.g.:

- Designs according to ATEX
- Pump heads with special nominal widths
- Heating devices
- Double valve assemblies
- Electric actuators
- Valves with elastic seats
- Stroke transmitting device
- Diaphragm monitoring and many more

All piston diaphragm pumps of the 4 series KM are available with variabel, intelligent control electronics (C-design).



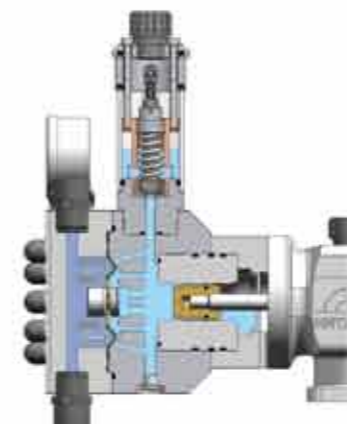
C409.2 KM Flow rate: 7,5 - 190 l/h
Counterpressure up to 80 bar



R409.2 KM Flow rate: 7,5 - 190 l/h
Counterpressure up to 80 bar



R410.2 KM Flow rate: 30 - 850 l/h
Counterpressure up to 80 bar



Designs of diaphragm monitoring



Manometer



Pressure switch



Pressure switch (Ex-design)

Dosing pumps

Air-driven Diaphragm Pumps APB/APE series, Motor-driven Feeding Pumps 4 series ZX

Excellence in Fluid Technology



Air-driven Pumps APB/APE series

- Performance range between **5 l/min** and **850 l/min (ca. 51 m³/h)**, counter pressures up to **7 bar**
- Cost-effective
- Leakage-free
- Easy to operate
- Low weight
- High operational safety
- Applicable in explosion-hazardous areas by optional equipment components

Accessories:

- Pulsation dampers
- Compressed air supply units
- Stroke transmitting devices and many more

The air control valve supplies the air chambers behind the diaphragm alternately with compressed air. One diaphragm is pressed to the front (= pressure stroke) while the other one is pulled backwards (= suction stroke).

The special design of the air control valve ensures that the pumps can always be approached safely, i.e. that there are no undesirable standstills.

Motor-driven feeding pumps 4 series ZX...

- Performance range between **2200 l/h** and **3100 l/h**, counter pressures up to **4 bar**

Feeding pumps of the series ZXM 422.3 and ZXR 411.3 are oscillating displacement pumps with two pump heads for the feeding and dosing of fluids in a wide range of industries.

The ZX series is not equipped with stroke length adjustment.

The ZXM-pumps run with constant stroke frequency. The flow rate of the ZXR-pumps can be controlled by an external frequency converter, if necessary.

Each drive unit consists of a proven motor coupled to a stroke mechanism in a robust grey cast iron housing which can cope with even extreme operating conditions due to the thickness of the material and the surface treatment.

For special dosing and feeding tasks and to meet nearly all of our customers' needs, we offer individual solutions, e.g.:

- Designs according to ATEX
- Pump heads with special nominal widths
- Double valve assemblies
- Valves with elastic seats
- Stroke transmitting device
- Diaphragm monitoring and many more



APB/APE 5 Flow rate: 5 l/min
Counterpressure up to 7 bar



APB/APE 15 Flow rate: 15 l/min
Counterpressure up to 7 bar



APB/APE 45 Flow rate: 45 l/min
Counterpressure up to 7 bar



APB/APE 200 Flow rate : 200 l/min
Counterpressure up to 7 bar



APB/APE ... Flow rate: up to 850 l/min
Counterpressure up to 7 bar



ZX.. 411.3 Flow rate: 2200 - 3100 l/h
Counterpressure up to 4 bar

- Performance range between **65 l/h** and **1650 l/h**, counter pressures up to max. **220 bar**
- High dosing accuracy and precise flow respectively dosing rates
- High operational safety by multi-layer diaphragm technology and integrated diaphragm monitoring
- Up to ten times higher lifetime of the multi-layer diaphragm in comparison to single layer diaphragms
- Safe against overpressure by an internal pressure relief valve
- Excellent priming characteristics without additional equipment
- Optional design in accordance with **API Standard 674/675**

Each drive unit of the 5 series piston diaphragm pump consists of a proven motor which is coupled to an adjustable eccentric stroke mechanism in a very robust cast iron housing which can cope with even extreme operating conditions due to the thickness of the material and the surface treatment.

The stroke of the mechanically linked piston is transferred to the multi-layer diaphragm. The integrated compensating valve ensures an excellent dosing accuracy and provides an optimum of protection against overstress: In case of an inadmissible higher counter pressure, the hydraulic fluid can escape via the compensating valve into the reservoir.

For special dosing tasks and to meet nearly all of our customers' needs, we offer individual solutions, e.g.:

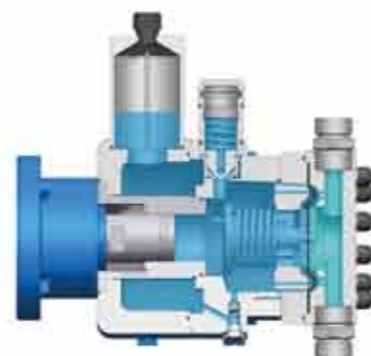
- Design in accordance with API Standard 674/675
- Designs according to ATEX
- Wide range of application by an extensive program of material combinations and accessories
- Electric actuators
- Stroke transmitting device and many more



R510.1 KM Flow rate: 65 - 1100 l/h
Counterpressure up to 180 bar



R511.1 KM Flow rate: 100 - 1650 l/h
Counterpressure up to 220 bar



Operating principle



MK511.1 KM/M511.1 KM Flow rate: 2x100 - 2x1650 l/h
Counterpressure up to 220 bar



XM511.1 KM Flow rate: 2x100 - 2x1650 l/h
Counterpressure up to 220 bar

sera ProDos offers an extensive program of dosing fittings and accessories in different materials and configurations for a wide range of processes and systems in order to maximize the operational safety and the reliability of the dosing systems for each respective application.

The **sera** pulsation dampers are certified according to the Pressure Equipment Directive.

The **sera** dosing fittings and accessories range includes:

- Dosing valves, check valves and foot valves
- Relief valves and pressure keeping valves
- Multi functional valves
- Suction lances
- Pulsation dampers
- Shut-off valves
- Priming aids/siphon vessels
- Calibration pots
- Injection fittings
- Line strainers
- Connection pieces
- Dosing hoses
- Dosing tanks
- Collecting basins
- Mixers and agitators
- Magnetic level switches
- Dry material feeders
- Absorbers



*Pulsation damper and
Diaphragm pulsation damper*



*Dosing tanks and
Collecting basins*



Dry material feeders



*Suction lances with/without level switches
as well as different foot valves*



*Diaphragm-pressure keeping-
and diaphragm-relief valves*



(controllable) electric agitators



Multi function valves



*Priming aids and
siphon vessels*



*Connection pieces, dosing hoses
as well as different accessories*

- Precise measurement of pH, chlorine and conductivity by temperature compensation as well as chlorine by pH-compensation
- Reduced consumption of chemicals due to AQUASENSO® analytical measurement technology
- Adjustable direction of control „Upward measurement“ or „Downward measurement“
- Frequency relay for the direct control of dosing pumps
- Performance relay configurable as alert, limit value, control output for pumps and solenoid valves
- 2 analogue outputs 0/4 ...20mA
- 5 digital inputs for the measuring water fault detection, external release, warning niveau of chemicals Min
- 1- or 2 channels available
- Capture of several measurements simultaneously

The precise interaction of sensors, controllers and dosing pumps plays an important role particularly in the area of chemical dosing.

The modules are used in the water analyzation in a wide field of applications such as drinking water, swimming pool water, sewage and wastewater treatment, process chemistry and beverage industry. Therefore the applications are tailored to the individual application.

The matching sensors AQUASENSO® feature a high level of availability for the detection of analysis parameters.

The following measurement parameters are available for the analysis of:

- pH
- Redox
- Conductivity
- Chlorine
- Temperature



Controller AQUASENSO®



Sensors for measuring of pH - Values



Redox Sensors



Chlorine Sensors



Sensor for measuring of Conductivity



Sensor for measuring of Temperature

Measurement, analysis and control technology MSR

Excellence in Fluid Technology



As a system provider, **sera** provides, besides standardized dosing systems and components, customized complete solutions for dosing systems ("turn key plants"), which are tailored optimally to the respective customer demands and application cases due to the extensive measurement, analysis and control technology. From the planning, engineering and documentation to the total assembly and commissioning worldwide - Everything from a single source!

Due to the application of modern flow measuring and level measuring systems as well as control and regulating technology, **sera** monitors, controls the dosing and ensures an effective use of chemicals. Furthermore, controllers are applied for mixing and preparing chemicals. All process parameters are monitored and if required evaluated directly in the dosing system or controlled via central control units.

The communication between the controller and the central control unit may take place in a conventional way, i.e. via analog signals or potential-free contacts or via local PLC and BUS when it comes to complex and demanding systems. All systems meet the currently applicable VDI-Directives and the European standards. If necessary, project-specific specifications are applied.

Depending on the dosing system and the local circumstances, **sera** develops the appropriate control system for the operating company. The service includes the entire engineering process, circuit diagram creation, programming, correct installation and testing as well as the commissioning of the complete dosing system.



- Highest accuracy and safety thanks to the use of the latest dosing and pump technology
- High quality materials, flexibly and variably integrable and applicable
- Little space requirement on site due to compact design
- Low parts diversity due to the use of standard components
- Shortest delivery times and availability
- Minimal effort in installation and commissioning thanks to **sera**'s standard configuration "Plug&Dose"

The standardized dosing systems are multiple useable. Their main features are the controlled and precise quantity dosing of liquids in processes or other media.

The completely modular design makes it possible to adapt the functions of the system to individual dosing requirements with standardized components - like from a construction kit -. Many optionally available accessories boost the range of applications and performance.

These systems combine quick availability and short delivery times, efficiency through cost-effective plant configuration from a construction kit and high quality and technically optimum system solutions, matching many customer application cases. Everything from a single source – made by **sera**!

The portfolio of standardized dosing systems includes:

- CVD1, CVD1s, CVD2
- PolyLine®
- CTD
- CDG
- PDS



PolyLine® Polymere Preparation- and Dosing unit
Preparation: 500-3000 l/h



CTD-... Compact Tank Dosing
Tank volume: 40-1000 Litres, Flow rate: 0,4 - 570 l/h, Pressure: up to 10 bar



CDG-... Chlorine dioxide plant
Performance: up to 1000 g ClO₂/h



PDS Proportional Dosing System
Flow rate: up to 10 l/h, Pressure: up to 10 bar



CVD2-... Compact Dosing System, vertical
Flow rate: up to 2x 1450 l/h, Pressure: up to 10 bar



CVD1-... Compact Dosing System, vertical
Flow rate: up to 1450 l/h, Pressure: up to 10 bar

sera's dosing pumps and systems are applied globally in many different industrial sectors. They create added value and finally promote high quality products for the consumers.

- Food and Beverage
- Dairies
- Brewing industry
- Agricultural industry
- Drinking-water treatment
- Wastewater treatment
- Chemical/Petrochemical
- Gas industry
- Laboratory technology
- Pharmacy
- Power plant technology
- Renewable energy
- Conventional energy
- Metal processing
- Pulp and paper
- Textile industry
- Color & printing industry
- Ship building
- Building engineering
- Mining



Food & Beverage



Water and Wastewater Treatment



Renewable Energy and Power Plant Technology



Utilising sera dosing systems in the CIP processes of a brewery

Wherever food products are being handled, the workplace must be cleaned and kept clean. Not only the visible soiling but also the "invisible" contamination is removed here because a food product can be altered through innumerable micro-organisms. This particularly applies to beer in breweries.

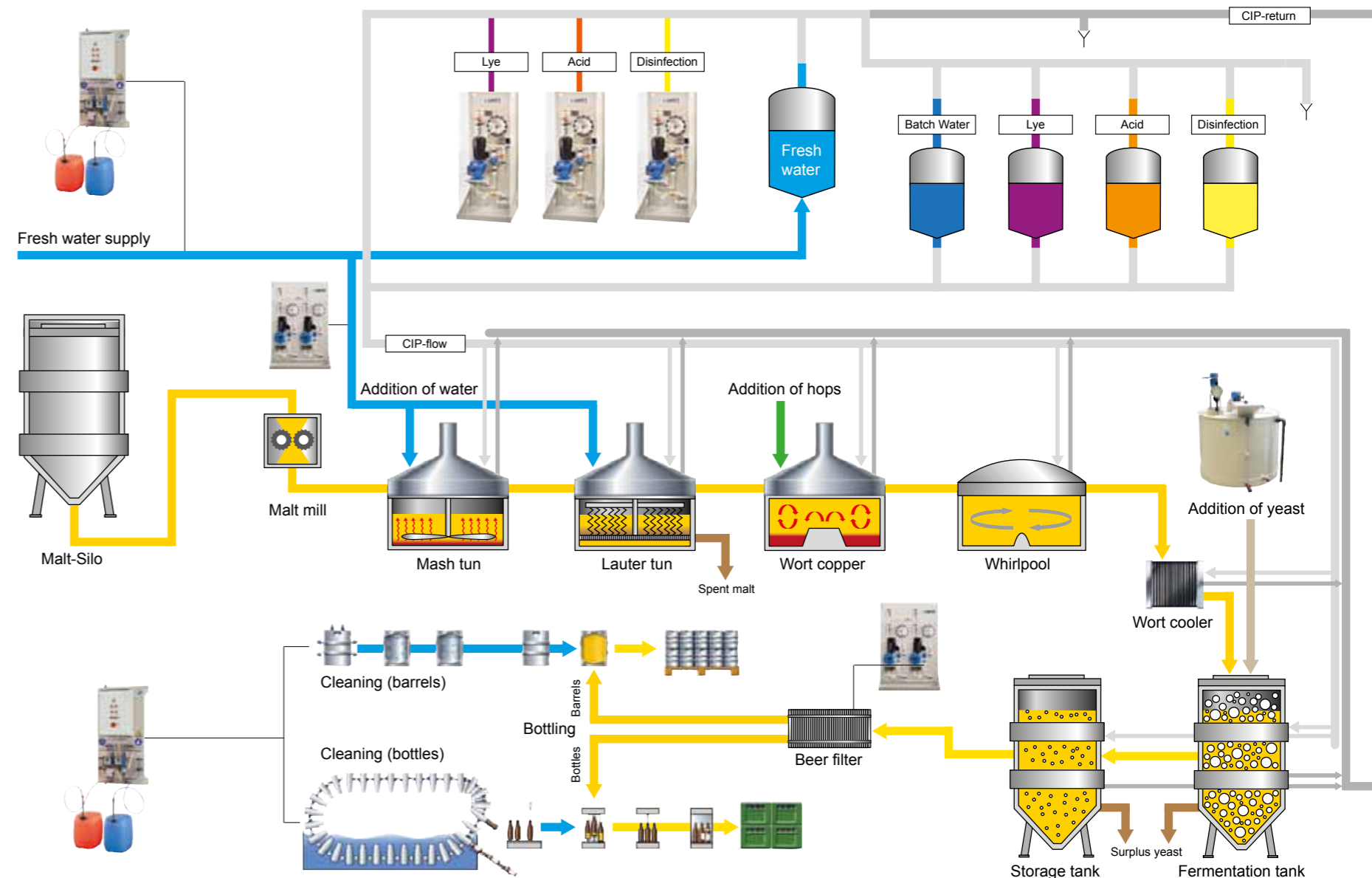
For precisely this purpose **sera** pumps and dosing units have been important and reliable components of production lines in numerous breweries worldwide for many decades.

The **sera** dosing systems will treat the brewing water with calcium chloride (CaCl_2) and calcium sulphate (CaSO_4). High water quality is essential for the brewing process and the good taste of the beer.

To avoid having to dismantle all individual parts for the cleaning process in the lines, there is the option of CIP (Cleaning In Place).

The dosing units of the type CVD are designed for the dosing of 50% nitric acid, sodium hypochlorite, 50% soda lye and anolyte solution.

The CVDs are mounted compact on a wall mounting board. A pressure relief valve is provided to safeguard against excess pressure. As long pipelines may present the risk of pulsations, the system may also be furnished with pulsation dampers. Suction lances, dosing hoses and matching connection fittings complete the installations.



Ideal quality and hygiene in the food industry

sera takes care of the hygiene and quality of the single process operation in the food industry with dosing pump, dosing units and sensors. Exemplarily shown in a cheese dairy.

Hygiene, of course, plays an extraordinary role in the processing or manufacturing of food products, if not the most important role.

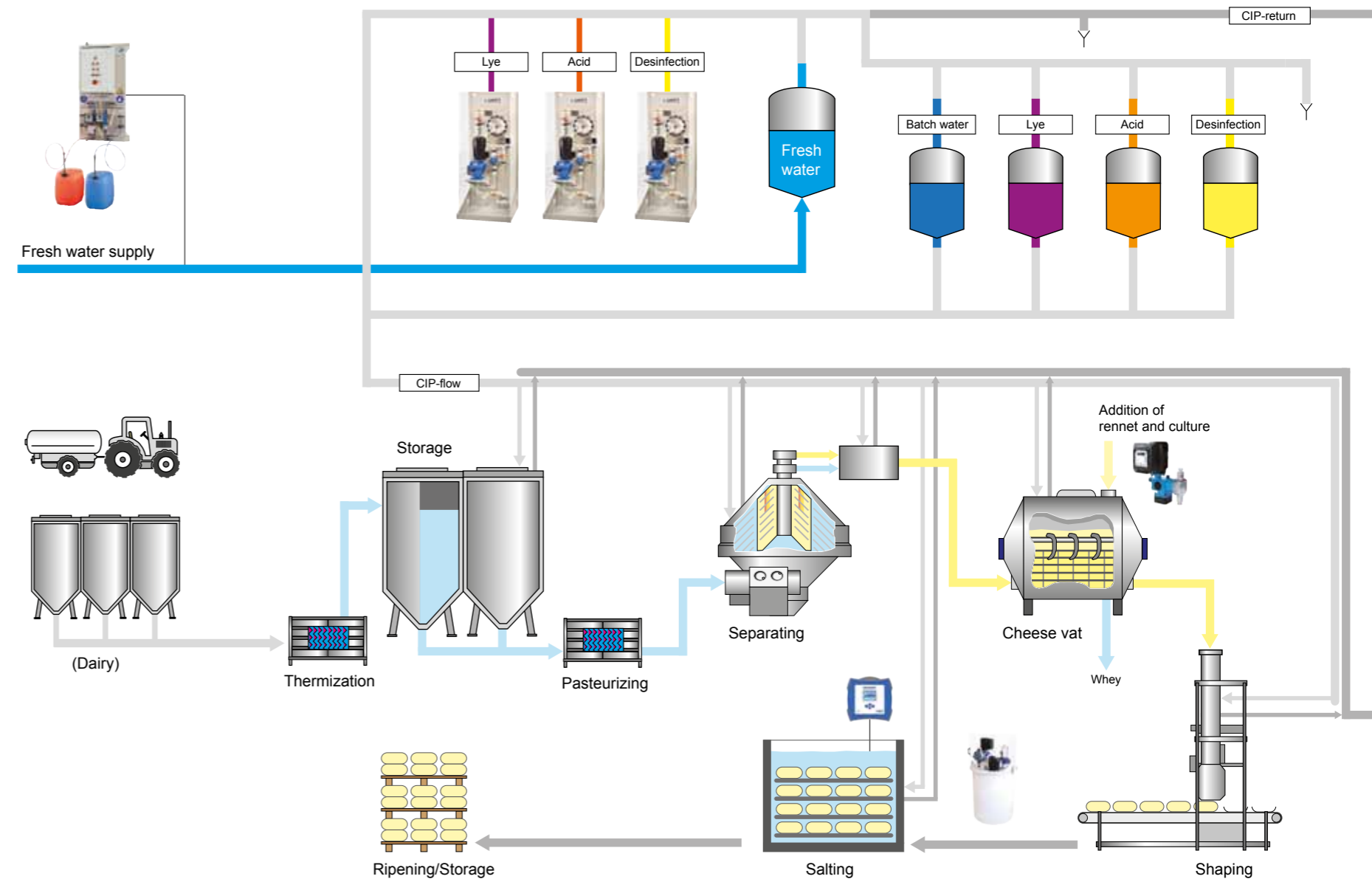
There is the option of CIP (Cleaning In Place). In addition dosing units for acid and alkaline were supplied which will be used for CIP (Cleaning in Place) processes.

The dosing systems are equipped with the latest selectable pump generation of model series C409.2 with integrated Profibus DP interface. This permits the optimal integration into the higher level control process. The dosing pumps are controlled according to volume.

The dosing systems are used in the following areas:

- Tank cleaning
- Pipe cleaning
- Heater cleaning
- Freezer cleaning

Also the **sera** products are installed in the food industry for the dosing of lactase, as more and more companys of the dairy industry produce lactose-free products.



The compliance of legal provisions applicable to the municipal or industrial wastewater treatment requires the use of high-quality and reliable system engineering and dosing technology.

The **sera** product range for sewage technology includes:

- Dosing devices for field tests with miscellaneous fluids
- Small dosing units and systems for water chemicals
- Dosing systems for precipitants with dosing pumps
- Preparation and dosing units for polymer solutions for sludge conditioning
- Dosing units for lime milk
- Components for units applying modern chemical thermal sludge treatment methods

for

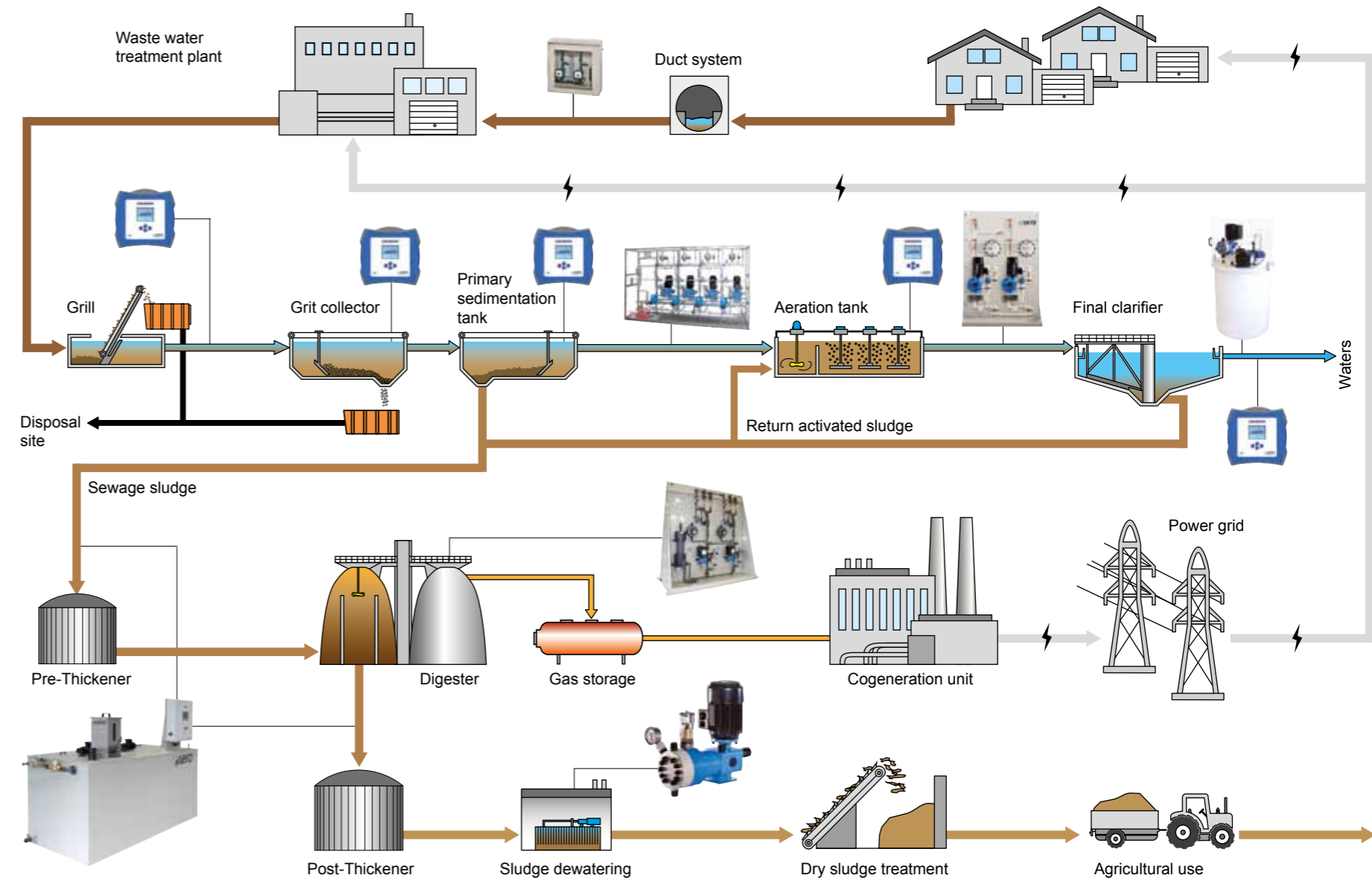
- Nutrient degradation / Phosphorus elimination (pre-precipitation)
- Flocculation filtration
- Sewage sludge thickening
- Sludge dewatering
- Charging of chamber filter presses
- pH-value adjustment
- Defoaming
- Desulphurization of sewage gas
- Neutralisation of hydrogen sulphide in sewer systems

To improve the waste water quality, precipitation methods are very often combined with flocculation processes. In case of the sewage pre-treatment by flotation, for example, **sera** pumps are used to dose sodium hydroxide in order to adjust the pH-value, a metallic salt solution as a primary precipitation agent and a polymer solution as a flocculation aid.

The wastewater treatment by means of decolourisation, neutralisation and heavy metal precipitation is linked with reliable **sera** technology as well as the water treatment.

Readily soluble solids such as aluminium sulphate or polymer can be efficiently prepared and added in a small dosing unit.

In order to prevent hydrogen sulphate from developing in sewers, **sera** has developed a number of dosing systems with which metallic salt solutions, such as iron (II) chloride (FeCl_2) and iron (III) chloride (FeCl_3) or combination products, can be fed into the sewer.



Water and Wastewater treatment

Industrial-sector-solutions for the Drinking water treatment

Excellence in Fluid Technology



Extensive sera expertise in the drinking water treatment

Drinking water treatment has to fulfill high standards worldwide. The natural water reserves and resources which can be used as drinking water without any treatment disappear increasingly. Therefore the provision of clean drinking water has become one global challenge.

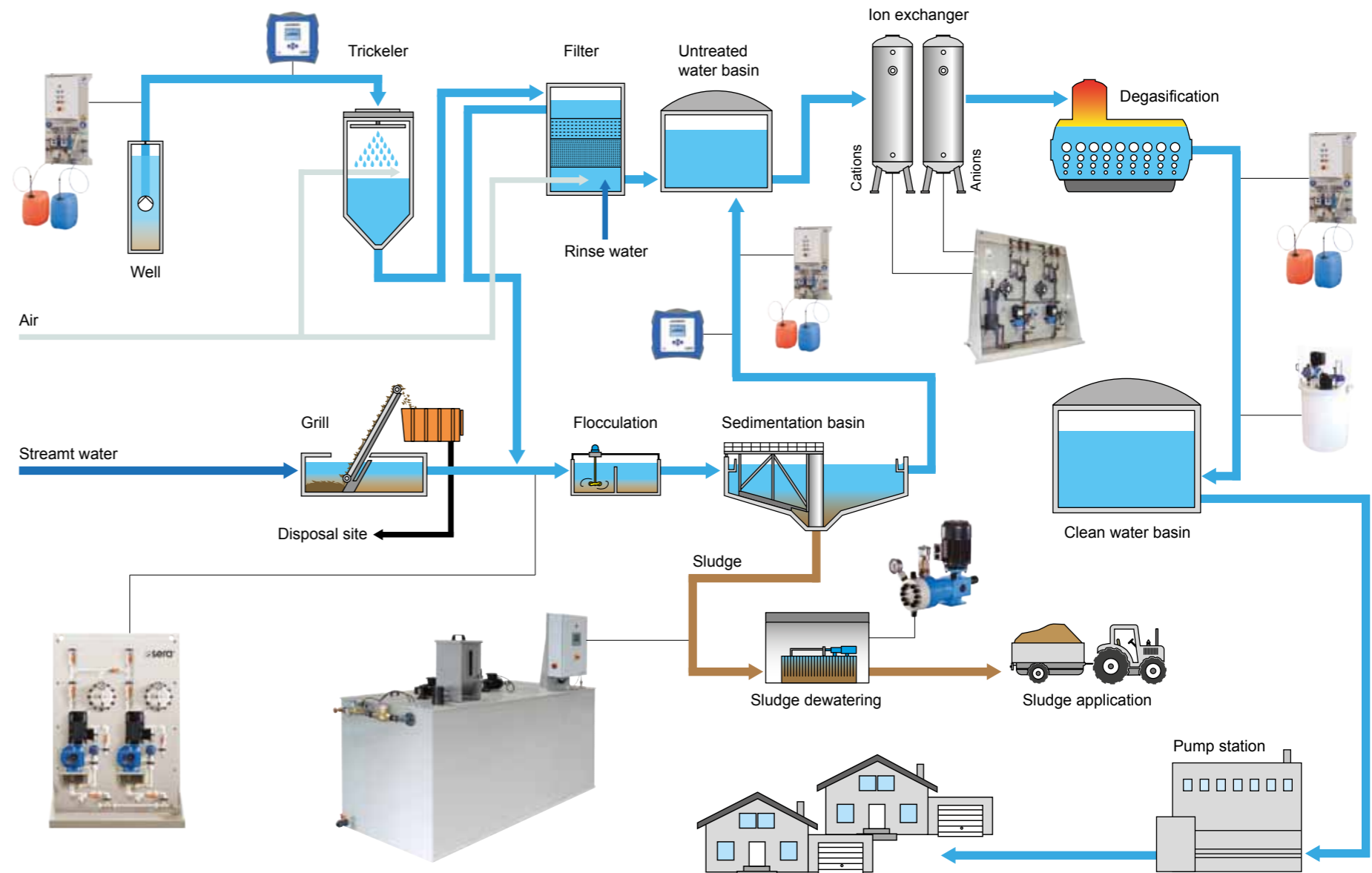
The extensive **sera** product range and the technological know-how enables us to procedurally treat water to suitable drinking water. In each step of the treatment process **sera** products are applied.

The **sera** chlorine dioxide preparation and dosing unit CDG is applied for the elimination of algae and microorganisms. The sensors of **sera**'s analysis technology product range analyse accurately the chlorine and pH-value of the water to be treated.

Compact vertical dosing systems (CVD) can be applied for the efficient and precise dosing of the chemical iron (III) chloride. After the flocculation, particles like heavy metals or microorganisms are absorbed and sediment. With the help of the **sera** polymere preparation units as of type PolyLine® and flocculation aids the sludge is thickened and after the sludge dewatering process which is supported by **sera** piston diaphragm pumps (as of type C409.2 KM) the sludge can be applied.

The water which has been cleaned in the flocculation process is collected in an untreated water basin and reaches the ion exchanger, where the **sera** vertical dosing system DAV doses hydrogen chloride (HCl).

Finally, **sera**'s compact dosing systems as of type CTD support the water treatment to clean drinking water by setting the residual hardness and remaining oxygen.



Renewable Energy + Power plant technology

Industrial-sector-solutions for the power plant technology

Excellence in Fluid Technology



sera pump technology for perfectly treated cooling water

To guarantee a trouble-free operation of power plant facilities, the quality of the cooling water is of elementary importance.

Many **sera** pumps which are applied in a cooling water circuit are equipped with selection via Profibus as well as a frequency converter for the speed control.

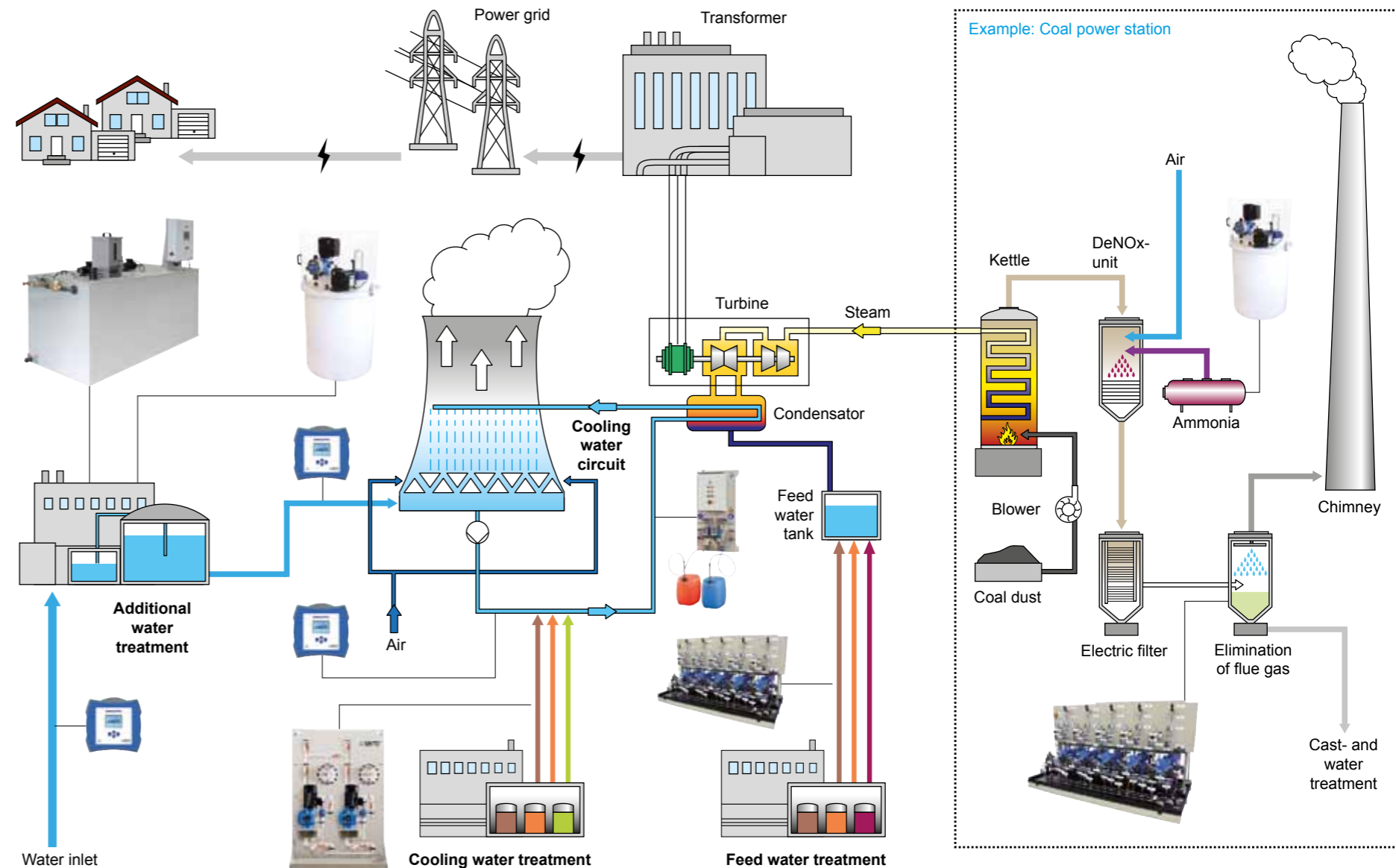
In addition, the proven diaphragm monitoring, installed at each pump, significantly contributes to the reliability of the systems.

sera measuring and dosing technology in the boiler feed water conditioning

Furthermore, **sera** dosing technology is applied for the cleaning and measuring of the boiler feed water. So that the highly sensitive sensors always provide accurate results, proper functioning of the sensors at all times are of the utmost importance. Due to constant contact with the boiler feed water, the sensors, which are built in protective tubes, tend to accumulate grime over time.

With the help of the specific dilution system developed by **sera**, hard incrustations can be cleaned regularly.

The prepared cleaning solution is injected through special nozzles onto the sensors and dissolve the grime.



Hydrogen sulphide elimination in modern biogas plants

Dosing with iron-II-chloride using a compact dosing system is much better. Dosing simply takes place by injecting the iron-II-chloride into the liquid phase of the substrate. The modern and precise dosing pumps permit the exact dosing of the preselected quantities and, in some plants, can also be run by the process control system (PCS) directly via the measured sulphur content.

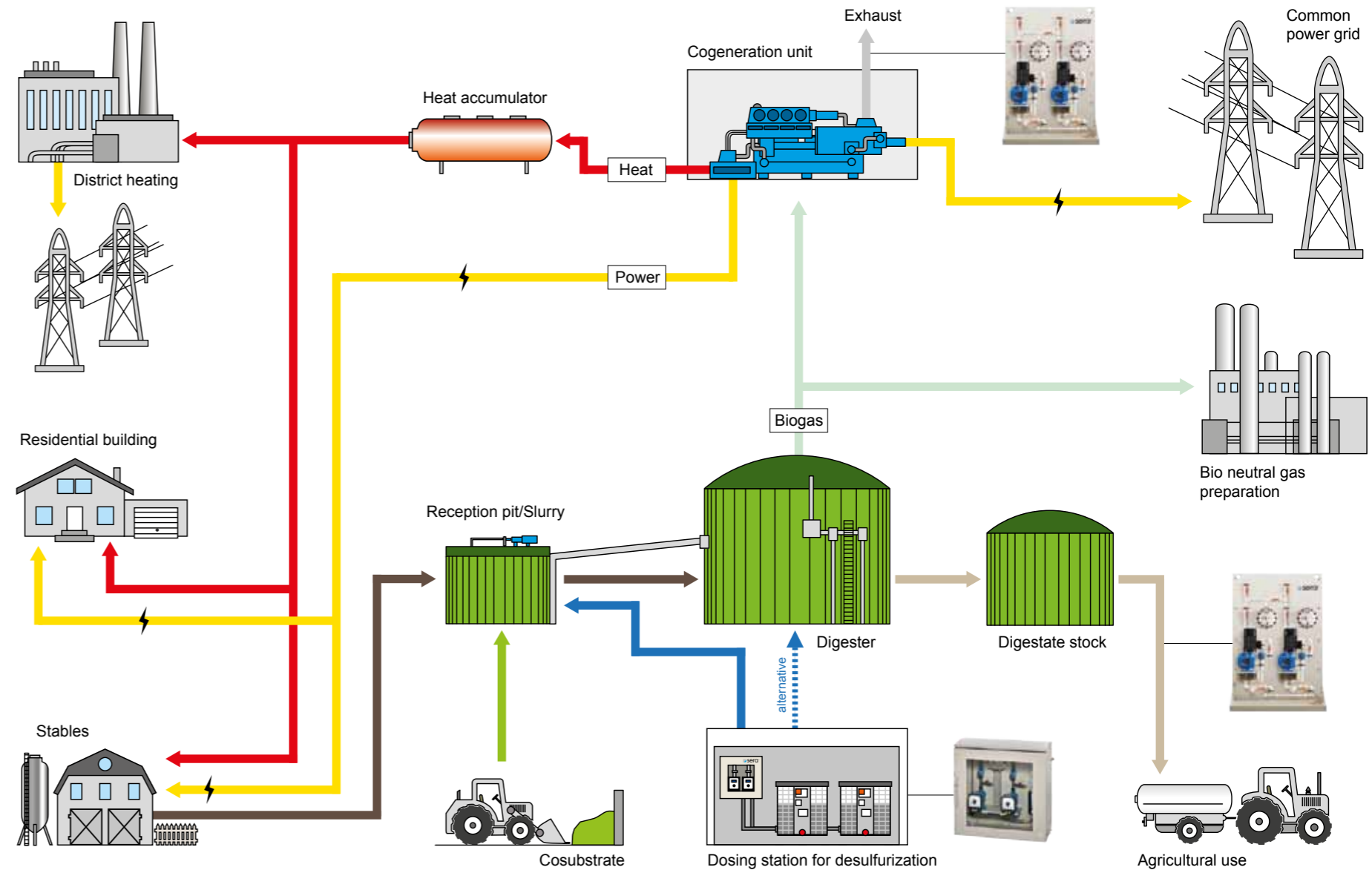
According to demand and hydrogen sulphide content, more or less dosing through optimal process control takes place. The dosing pumps are installed in a dosing cabinet and they signal diaphragm breakage and leaks in the pressure system directly to the PCS. The pump then stops dosing immediately. The dosing cabinet protects the user from the chemicals at all times.

The pipe assemblies on the suction and pressure sides may consist of hoses and the connection to the iron-II-chloride tank is usually made via suction lance.

This permits the simple exchange of the chemistry drums and prevents the suction line from running empty. Another advantage of the robust **sera** dosing pumps is the variable use with alternating chemicals. For example, the same pump can be used to meter defoaming agents, enzymes, additives and a variety of acids and lyes.

The optional manual stroke length and frequency adjustment permits further adaptations to the respective application.

Drip pan, pressure keeping valves and leakage sensors are always part of the standard system and ensure safe and optimal operation.



Customized dosing systems

System solutions for the paper, printing and textile industry

Excellence in Fluid Technology



Circulating varnish unit for the feeding of the paint bucket by sera

The circulating varnish unit by **sera** feeds the paint bucket with varnish. There is a dosing pump type ZR 409.1-190e installed for the suction of the varnish. The varnish is continuously circulated in order to exclude drying in the paint bucket.

The parts which are in contact with the varnish have to be cleaned with fresh water or the corresponding cleaning agents after the ending of the dispensing process. Therefore there are 3 way ball valves and solenoid valves installed which permit rinsing with water and emptying of the paint bucket through corresponding switching positions. The varnish-/rinsing solutions are provided into a rins tank.

The control of the circulating varnish unit takes place at the machine console of the printing press.

KKV dosing systems for the textile industry

sera delivers KKV dosing systems as twin-head diaphragm pumps. The ratio 4:1 is adjusted by an electric actuator. The flow rates of both components are measured volumetrically.

A PLC compares permanently both measured values and initiates immediately in the event of the slightest deviation a correction by approaching the actuator. The period of the actuating pulse can be calculated exactly from the size of the deviation.

This technology guarantees a constant dye quality, regardless of disturbances like different suction heights, viscosities, temperatures, dosing sizes etc.



Reference projects worldwide

Cooling water treatment in Egypt

Excellence in Fluid Technology



The plant stimulating growth effect of nitrogen was discovered around 1840. Bound in nitrates, this is obtained from ammonia and nitric acid. Ammonium nitrate is produced which quickly supplies plants with nitrogen, preventing its release into the atmosphere.

However, many farmed lands today are low in nitrogen. Therefore, fertilisers are important for agriculture and thus for the food supply across the entire world.

In 2013 the international plant constructor, Thyssen Krupp Uhde, built an ultra modern and efficient plant in Egypt for the manufacture of 200,000 tons per year of ammonium nitrate. This complex specialises in producing LDAN (Low Density Ammonium Nitrate). The cooling water quality is of elemental importance for trouble-free operation of the site.

Subsequently a **sera** dosing system was selected for the cooling water treatment. Design, engineering, manufacture, documentation and delivery were included in the scope of supply. Many different water treatment chemicals such as oxygen binding agents are dosed in the system. This provides corrosion protection. Furthermore, trisodium phosphate for pH value adjustment and sodium hypochlorite for disinfection are also dosed.

As the systems are installed outdoors, accordingly the design had to be adapted to the climatic conditions of Egypt. This was also not a problem for the **sera** application engineers.



For more than 20 years **sera** dosing pumps have been used in the treatment of drinking water by the Hessisches Ried water board in Biebesheim. The water board was founded in 1979 and is responsible for an area of 1,200 km². The main task of the water works in Biebesheim is to keep the ground water table at a normal level. Water is drawn in from the Rhine and treated in the extensive modern plant resulting in a product of drinking water quality.

Thanks to good maintenance, the **sera** dosing pumps are in pristine condition even today and still have the original paintwork from when they were manufactured and delivered.

In addition to maintaining the ground water table, the water board also provides agricultural sprinkling irrigation water for the Ried area. The capacity of the Biebesheim water works is 5,400 cubic metres per hour, which is 43 million cubic metres a year.

As the average natural precipitation of 600 mm a year in the region is not sufficient to provide the water needs of the crops, up to 5 million cubic metres are available for agricultural sprinkling. This means that vegetables can continually be irrigated in the fields of Hessisch Ried even during long periods of drought and supply the whole region with fresh crisp lettuce and asparagus.

The water from the Rhine is processed in eight consecutive steps and then made available as optimum quality for drinking water, ground water or for sprinkler irrigation.

In the fourth part of the water treatment procedure, the primary flocculation process, the **sera** dosing pumps add iron (III) chloride as well as flocculation aids to the water. Step by step, bigger and bigger flocs are formed in the four attached flocculation basins, trapping the particles of dirt including heavy metals and microorganisms and let them sink to the bottom where they can be removed.

Iron (III) chloride is also used in the secondary flocculation to trap the last muddy materials as flocs. These are again isolated and removed in the subsequent multi-layered filter. **sera**'s pumps are optimally sized and rated to facilitate efficient and precise dosage of chemicals as well as a safe and economical treatment.



From the saviour in time of need to a system partner

The english subsidiary of **sera**, **sera ProDos UK Ltd.**, was approached by Barhale & Trant Utilities (BTU) with somewhat of a logistical problem for 10 replacement Orthophosphoric dosing systems. The units were urgently required to replace told failing systems of the large regional water utility company Southern Water. BTU had only recently signed an Alliance agreement with them and did not want to let their customer down.

BTU therefore decided to take a high risk strategy to find a new supplier for the dosing systems in a minimum of time.

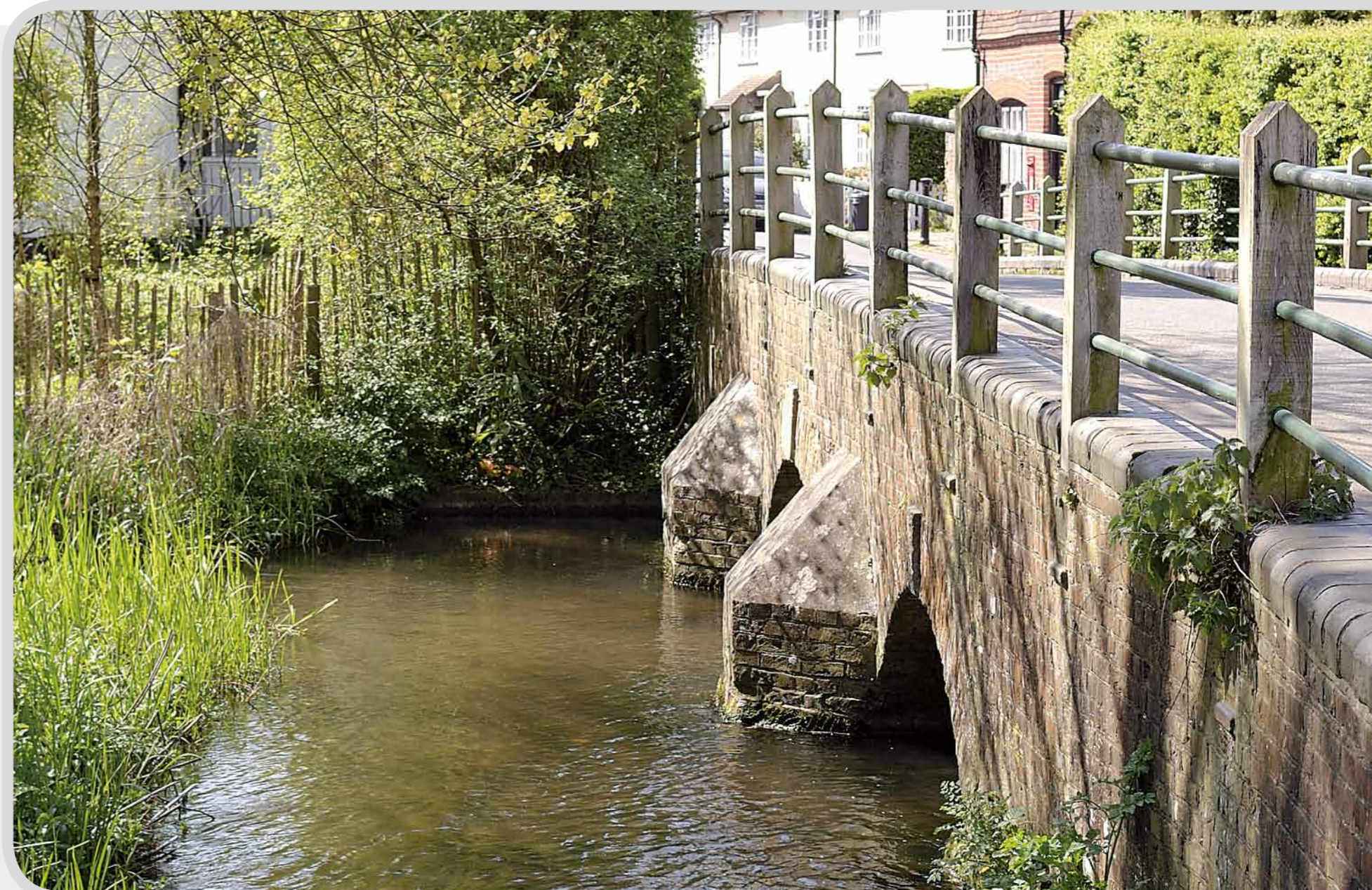
In their quest for a suitable partner, they found a link to **sera ProDos UK Ltd.** and approached them accordingly.

The initial contact was to establish more knowledge about **sera**. The fact that we had been in existence for decades, along with many testimonials that could be provided reinforcing **sera**'s reputation for long lasting reliable products helped. **sera** were also able to show that they had worked with many blue chip companies, particularly in brewing, food, pharmaceutical and power industries globally. This gave BTU the confidence to proceed with the real issue of getting their project back on line.

In order to be sure that **sera ProDos UK Ltd.** were also not taking on more that they could realistically provide, the General Manager of **sera ProDos UK Ltd.** visited a couple of the sites to scope the works.

An additional enhancement was that the pricing offered by **sera** was very close to that of the original contractor and therefore BTU were not going to be penalised for switching supplier.

One thing that stands out on this project was that BTU and Southern Water were ideally looking for a standardised system which would be as identical as possible across all project sites. Unfortunately it was soon discovered that the water flow and pressure demands on the various sites were different and additional scoping confirmed this. However because of **sera**'s expertise in designing and developing standardised dosing systems, they were able to utilize the original design concept put forward with only minor changes between the sites. **sera**'s German manufacturing facility made the necessary design changes and production was promptly begun!



Reference projects worldwide

Boiler demineralisation in South Africa

Excellence in Fluid Technology



De-mineralisation boiler feed water supply upgrade

sera ProDos SA (PTY) Ltd. was recently selected as the chemical dosing pump supplier for the Chevron Refinery in Cape Town's, demineralisation boiler feed water plant upgrade.

The demineralisation process requires raw water to flow over resin in a cation and anion column. The minerals are attracted to the resin stripping them out, insuring that the water entering the boiler tubes is mineral free.

This is important to prevent scaling and corrosion of the boiler tubes which will result in poor heat transfer and tube failure.

In the process the demineralisation, resin needs to be regenerated (the minerals need to be removed from the resin). This process is carried out by dosing 98% Sulphuric Acid [H_2SO_4] into a water stream. The diluted acid is then pumped through the resin, stripping the minerals and cleaning the resin.

Once the resin is clean, Caustic Soda (Sodium Hydroxide) NaOH is dosed into the water stream. The diluted caustic is then pumped through the resin to rinse and neutralise the acid water, before returning the demineralisation plant back into service.

The boiler feed water is critical to the refinery's production reliability. With reliability as the key focus, **sera** dosing pumps were chosen as the preferential dosing pump supplier. The R410.2-940 ML pump model was installed for both chemical applications and the multilayer diaphragm design is perfect for the extremely corrosive Sulphuric acid. With the multi layer diaphragm the pump gear box will be protected should the diaphragm fail.



What does characterize sera ProDos?

Our customers and partners individual needs are always at the centre of our interest. Beside our product portfolio we convince with our extensive services:

- Global assembly and commissioning
- Maintenance
- Spare parts service
- 24-hour delivery service
- Repair service
- Advisory service and engineering
- Extensive technical support
- Customer qualifications
- Individual customer trainings

Online Tools and Apps to support technical managers and planners

Extensive technical product description and information can be requested on the homepage www.sera-web.com and thus are at the planners' disposal at any time.

The sera app

Applying the **sera app**, you can check quickly and reliably at one glance the respective resistance of the materials used in the dosing and compressor technology against liquid and gaseous chemicals.

The choice of the media and materials aims specifically at the needs in the machine and plant engineering with a focus on dosing, feeding and compressor technology. The app is free of charge and available in German and English for IOS and Android depending on the language configuration of the smartphone.

sera PLATO

With the powerful and cost free „**sera PLATO app**“ sera provides technical managers and planners of industrial and municipal sewage and wastewater plants with a simple and platform-independent tool for the configuration and technical specification of dosing systems for precipitants such as iron and aluminium salts.

Benefits overview:

- Completely free, platform-independent use
- Intuitive user interface with comprehensive help
- With a few mouse clicks to the perfect solution for the process to be planned
- Saving of created tender specifications in the own project directory
- Export of the tender specification texts as TXT, PDF, Word and GAEB



Locally present for our global customers



With a headquarter in Germany and local offices in England and South Africa and a worldwide sales and service network with more than 30 foreign representatives in more than 80 countries across all continents, **sera** guarantees optimum support for customers locally.



Our representative offices

Algeria	Colombia	Greece	Latvia	Poland	Switzerland
Angola	Costa Rica	Grenada	Libya	Puerto Rico	Taiwan
Argentina	Croatia	Guatemala	Lithuania	Qatar	Thailand
Australia	Cuba	Guyana	Luxembourg	Romania	Trinidad and Tobago
Austria	Czech Republic	Haiti	Malaysia	Russia	Tunisia
Bahamas	Denmark	Honduras	Mexico	Rwanda	Turkey
Bahrain	Dominica	Hungary	Morocco	Saudi Arabia	UAE
Barbados	Dominican Republic	India	Netherlands	Serbia	Ukraine
Belgium	Dutch Antilles	Indonesia	Nicaragua	Singapore	Uruguay
Bolivia	Ecuador	Ireland	Nigeria	Slovakia	USA
Bosnia and Herzegovina	Egypt	Israel	Norway	Slovenia	Venezuela
Brazil	El Salvador	Italy	Oman	South Africa	Vietnam
Bulgaria	Estonia	Jamaica	Pakistan	South Korea	West Indies
Burundi	Falklands	Japan	Palestine	Spain	Yemen
Byelorussia	Finland	Jordan	Panama	St. Kitts	
Canada	France	Kenya	Paraguay	St. Vincent	
Chile	French Guiana	Kongo	Peru	Suriname	
China	Great Britain	Kuwait	Philippines	Sweden	

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