

INDUSTRY & PROCESS SOLUTIONS



INSPIRED. SOLUTIONS. FOR CUSTOMERS.



sera

Competence in dosing, conveying and compressing liquids and gases

The **sera Group** is an independent family-run company group with headquarters in Immenhausen in the heart of Germany.

Since the company founding in 1945, the **sera** name has stood for quality, competence, innovation, reliability and flexibility. As one of the world's leading companies in dosing and compressor technology, **sera** today offers efficient application solutions optimally tailored to customer requirements which ensure the precise dosing, conveying and compression of liquids and gases.

EXCELLENCE IN FLUID TECHNOLOGY

We create added value for people and the environment.

sera has a wide range of products, which provide the right solutions for many of your ranges of application all over the world: whether for water and wastewater treatment and disinfection, or for the precise dosing and conveying of chemicals and liquids.

Products for system monitoring and planning as well as customised solutions round off our portfolio. Our customers all over the world also benefit from our extensive range of services: From providing support in planning and commissioning systems, to quickly and easily replacing devices all over the world, through to developing innovative technologies.



Comprehensive product portfolio

Whatever you require, we create customised solutions for your applications.

This means that you can choose from a wide range of standard products and also configure customised systems completely according to your needs.





Speed, reliability and flexibility

Our reliable and competent contacts will provide you with the best possible customer service and support throughout the entire offer, order and project realisation process.

We always respond flexibly to your requirements and process and handle everything quickly and reliably. From engineering to production, through to after-sales service, we provide high-quality products and services.

Long-lasting products and high quality

For over 80 years, the name **sera** has stood for exceptional quality and know-how.

As part of this, we develop dosing pumps and systems for extreme operating conditions and long operating times. That's why the quality and reliability of our products always comes first. You can always rely on the expertise and experience of our team.

CUSTOMER SOLUTIONS

Our competence for your success

The requirements and dosing processes of our customers are extremely varied in the area of industrial and process solutions. Individual challenges must be identified and solved.

As a system provider of dosing technology, **sera** is able to understand these different processes and develop tailor-made solutions to meet any customer requirements. Particular attention is devoted to considering the interfaces: For which point in the customised process are our solutions intended and how can they be integrated smoothly? Only when these essential questions have been answered a smooth project management can be ensured for the customer.

sera is able to draw on a multitude of product solutions that it has developed itself to complete various dosing tasks, such as preparation and dosing stations with the associated dosing pumps and appropriate accessories. A decision is made in each case about which components are actually required to complete the dosing task and which are not. As a result, the dosing systems are adapted to the needs of the specific application.

In terms of design, the individual parameters and customer requirements are implemented by the company's own engineering department, so that the customer has a customised solution for their dosing task – all from one source!



FOR EVERY PROCESS STEP THE PERFECT SOLUTION

The process of the industry technology





OUR DOSING SYSTEMS AND UNITS -THE BEST SOLUTION FOR YOUR APPLICATION









CVD1- COMPACT DOSING SYSTEM, VERTICAL Flow rate: up to 1450 l/h Pressure: up to 10 bar Page 9

CVD2 - COMPACT DOSING SYSTEM, VERTICAL Flow rate: up to 2x 1450 l/h Pressure: up to 10 bar Page 10

CTD - COMPACT DOSING STATION Tank volume: 40-1000 litres Flow rate: 0.4 - 570 l/h Pressure: up to 10 bar Page 11

POLYLINE - PREPARATION AND DOSING UNITS Polymer preparation volume: 500 - 8000 l/h Page 12 - 17

CUSTOMIZED SOLUTIONS Individual design for your application Page 7





COMPACT DOSING UNITS, VERTICAL DESIGN CVD1



The most modern pump technology Standardized mounting plates Space-saving wall mounting Wide range of applications High safety standard Large range of capacity High dosing accuracy Easy to operate Low maintenance Complete range of accessories

TECHNICAL DATA

UNIT DATA		CVD1(s)-60.1	CVD1(s)-550.1	CVD1(s)-1500.1
Flow capacity	l/h	0 - 60	0 - 550	0 - 1500
Permissible counter pressure	bar (max)	10	8	5
Permissible suction head	mWC (max)	3	3	3
Number of pumps	Quantity	1	1	1

BASIC DESIGNS

CVD 1 s

Dosing pump

2-way shut-off valve on the pressure side (Shut off/Emptying) Diaphragm relief valve

Wall mounting plat made of PP (H=1.000mm, with drip pan) Piping on pressure side made of PVC-U or PP Seals made of EPDM or FPM

Connection suction side: External thread of pump's suction valve Connection pressure side: External thread of final shut-off valve

CVD 1

Dosing pump

2-way shut-off valve on the pressure side (Shut off/Emptying) Diaphragm relief valve

Wall mounting plat made of PP (H=1.500mm, with drip pan) Piping on pressure side made of PVC-U or PP Seals made of EPDM or FPM

Connection suction side: External thread of pump's suction valve Connection pressure side: External thread of final shut-off valve

COMPACT DOSING UNITS, VERTICAL DESIGN CVD2



The most modern pump technology Standardized mounting plates Space-saving wall mounting Wide range of applications High safety standard Large range of capacity High dosing accuracy Easy to operate Low maintenance Complete range of accessories

TECHNICAL DATA

UNIT DATA		CVD2-60.1	CVD2-550.1	CVD2-1500.1
Flow capacity	l/h	2x 0-60	2x 0-550	2x 0-1500
Permissible counter pressure	bar (max)	10	8	5
Permissible suction head	mWC (max)	3	3	3
Number of pumps	Quantity	2	2	2

BASIC DESIGNS

CVD 2
2. Desire auro
2-way shut-off valve on the pressure side (Shut off/Emptying)
Diaphragm relief valves
Wall mounting plat made of PP (H=1.500mm, with drip pan)
Piping on pressure side made of PVC-U or PP
Seals made of EPDM or FPM

Connection suction side: External thread of pump's suction valve Connection pressure side: External thread of final shut-off valve

COMPACT DOSING STATIONS



TECHNICAL DATA

UNIT DATA					CTD			
		40.1	75.1	100.1	200.1	300.1	500.1	1000.1
Tank volume	Litres	40	75	100	200	300	500	1.000
Flow capacity	l/h	0,435	0,4180	0,4180	0,4570	0,4570	0,4570	0,4570
Permissible counterpressure	bar (max)	10	10	10	10	10	10	10
Nominal width of suction lance	DN	5	5/10	5/10	5/10/15	5/10/15	5/10/15	5/10/15

BASIC DESIGNS

CTD

Dosing tank (PE-transparent) with litre scale and cover (DIN162) Suction lance with foot valve and sieve Ventilation- / exhaust bow with hose nozzle Brackets for floor mounting

PREPARATION UNIT FOR POLYMERS, POLYLINE FLOW



Fully automatic preparation of organic flocculent aid (pulverized and/or liquid)
Process logic control (PLC)
Selectable concentration of prepared solution
Feeding device
Dry material feeder with thermal protection zone
Pump for liquid polymer (option)
Dissolving water unit
Electric agitators
Performance graduation that meets the requirements

TECHNICAL DATA

DEFINITION of the types		
PolyLine S	S = solid	for preparation with polymer in powder form
PolyLine L	L = liquid	for preparation with liquid polymer
PolyLine SL	SL = solid/liquid	for preparation with polymer in powder form and/or liquid polymer

UNIT DATA			PolyLine Flow 500	PolyLine Flow 1000	PolyLine Flow 2000	PolyLine Flow 4000	PolyLine Flow 8000
Preparation capacity (at 45 min. maturing time)	l/h		500	1.000	2.000	4.000	8.000
Weight (empty)	kg	S	250	270	300	380	470
		L	230	240	280	360	450
		SL	270	290	340	410	520

ELECTRICAL DATA

PolyLine Flow ... S/L/SL

Supply voltage		~3/400 V /Hz + N + PE
Power consumption	approx. kW	2,0
Control voltage	V DC	24
Factorian	Control cabinet	IP 54
Enclosure	electr. consumer	IP 55

BASIC DESIGNS

PolyLine Flow S

3-Chamber tank made of PP Control (PLC) for fully automatic preparation Dry material feeder (DMF) with hopper, 25 liters Feeding device 2x electric agitator (low speed) Level monitoring Dissolving water unit Language on display de/en

PolyLine Flow L

3-Chamber tank made of PP Control (PLC) for fully automatic preparation Dosing pump for liquid polymer Feeding device 2x electric agitator (low speed) Level monitoring Dissolving water unit Language on display de/en

PolyLine Flow SL

3-Chamber tank made of PP Control (PLC) for fully automatic preparation Dry material feeder (DMF) with hopper, 25 liters Dosing pump for liquid polymer Feeding device 2x electric agitator (low speed) Level monitoring Dissolving water unit Language on display de/en

PREPARATION UNIT FOR POLYMERS, POLYLINE SWING



Fully automatic preparation of organic flocculent aid (pulverized and/or liquid)
Process logic control (PLC)
Selectable concentration of prepared solution
Feeding device
Dry material feeder with thermal protection zone
Pump for liquid polymer (option)
Dissolving water unit
Electric agitators
Performance graduation that meets the requirements

TECHNICAL DATA

DEFINITION of the types		
PolyLine S	S = solid	for preparation with polymer in powder form
PolyLine L	L = liquid	for preparation with liquid polymer
PolyLine SL	SL = solid/liquid	for preparation with polymer in powder form and/or liquid polymer

UNIT DATA			PolyLine Swing 500	PolyLine Swing 1000	PolyLine Swing 2000	PolyLine Swing 4000
Preparation capacity (at 30 min. maturing time)	l/h		500	1.000	2.000	4.000
Weight (empty)	kg	S	240	240	280	460
		L	230	230	260	440
		SL	260	260	295	480

ELECTRICAL DATA

PolyLine Swing ... S/L/SL

Supply voltage		~3/400 V /Hz + N + PE
Power consumption	approx. kW	2,0
Control voltage	V DC	24
Factoria	control cabinet	IP 54
Enclosure	electr. consumer	IP 55

BASIC DESIGNS

PolyLine Swing S

2-Chamber tank made of PP Control (PLC) for fully automatic preparation Dry material feeder (DMF) with hopper, 25 liters Feeding device 2x electric agitator (low speed) 2x Level monitoring Dissolving water unit Language on display de/en

PolyLine Swing L

2-Chamber tank made of PP Control (PLC) for fully automatic preparation Dosing pump for liquid polymer Feeding device 2x electric agitator (low speed) 2x Level monitoring Dissolving water unit Language on display de/en

PolyLine Swing SL

2-Chamber tank made of PP Control (PLC) for fully automatic preparation Dry material feeder (DMF) with hopper, 25 liters Dosing pump for liquid polymer Feeding device 2x electric agitator (low speed) 2x Level monitoring Dissolving water unit Language on display de/en

PREPARATION UNIT FOR POLYMERS, POLYLINE DOUBLE



TECHNICAL DATA

DEFINITION of the types		
PolyLine S	S = solid	for preparation with polymer in powder form
PolyLine L	L = liquid	for preparation with liquid polymer
PolyLine SL	SL = solid/liquid	for preparation with polymer in powder form and/or liquid polymer

UNIT DATA			PolyLine Double 500	PolyLine Double 1000	PolyLine Double 2000
Preparation capacity (at 45 min. maturing time)	l/h		500	1.000	2.000
Weight (empty)	kg	S	200	240	325
		L	160	200	285
		SL	210	250	335

ELECTRICAL DATA

PolyLine Double ... S/L/SL

Supply voltage		~3/400 V /Hz + N + PE
Power consumption	approx. kW	2,0
Control voltage	V DC	24
Enclosure	control cabinet	IP 54
	electr. consumer	IP 55

BASIC DESIGNS

PolyLine Double S

2-Chamber tank made of PP Control (PLC) for fully automatic preparation Dry material feeder (DMF) with hopper, 25 liters Feeding device Electric agitator (low speed) Level monitoring Dissolving water unit Language on display de/en

PolyLine Double L

2-Chamber tank made of PP Control (PLC) for fully automatic preparation Dosing pump for liquid polymer Feeding device Electric agitator (low speed) Level monitoring Dissolving water unit Language on display de/en

PolyLine Double SL

2-Chamber tank made of PP Control (PLC) for fully automatic preparation Dry material feeder (DMF) with hopper, 25 liters Dosing pump for liquid polymer Feeding device Electric agitator (low speed) Level monitoring Dissolving water unit Language on display de/en

EXAMPLES OF CUSTOMISED SOLUTIONS







SERA MIXING AND DOSING STATION FOR CAUSTIC SODA FOR THE POWER PLANT SECTOR

- sera multi-layer diaphragm pumps in a redundant design for maximum process safety
- Safety valves designed to protect the pump and pipes from excessive pressure
- A concentrated (50%) solution of NaOH is diluted to the desired concentration in a 3,000-litre storage tank of water
- A collecting basin features country-specific approval for safe operation

- An agitator produces a homogeneous solution
- Fluid level and temperature gauges for safe, uninterrupted plant operation

PORTABLE MIXING AND DOSING STATION FOR THE CHEMICALS IN-DUSTRY

- Mobile platform truck with 100-li-tre dosing tank featuring agitator, fluid level gauge and other fittings Centrifugal pump for the transfer of chemicals during the customer •
- process
- Collecting basin in case of leakage Control panel for on-site operation •
- •

PRESSURE BOOSTING UNIT FOR **ADBLUE IN THE AUTOMOTIVE** INDUSTRY

- Dosing unit for the automotive • sector (urea)
- Two three-headed pumps type • MK/MF/MK410.2-1450e





- Maximum flow rate of 4,350 l/h •
- per pump with low pulsation Safe operation and easy service thanks to two electric diaphragm • valves and a number of ball cocks



EXAMPLES OF CUSTOMISED SOLUTIONS







DOSING UNIT FOR WASTEWATER TREATMENT IN A CLOSED STAINLESS STEEL SAFETY CABINET

- Closed safety cabinet made of stainless steel for maximum protection against environmental factors
- External suction and pressure connections and cable terminal boxes make up the main electrical interface of the unit
- Two dosing lines with an additional stand-by pump to increase system availability
- Multi-layer diaphragm pump with built-on frequency converter to set variable flow rates
- Pulsation damper to regulate the flow rate and reduce fluctuations in the piping system
 Rinsing and ventilating connec-
- Rinsing and ventilating connections for easy commissioning and safe maintenance of the plant

DOSING CONTAINER FOR AMMONIA WATER

- Dosing container with special coating for saline ambient air
- Climate-control system to keep interior temperatures constant
- Dosing unit for aqueous ammonia with multi-layer diaphragm pumps

PREPARATION AND DOSING UNITS FOR POLYMER SOLUTIONS IN A **CLOSED CONTAINER**

Weather-protected and heat-• insulated container unit including heating system, lighting and ventilation

- Container contains a 3-chamber •
- polymer continuous flow systems (type: **sera** PolyLine Flow 2000 S) Dry material feeder with small-parts conveyor device and 200-li-tre storage tank for dry polymer •

- Two eccentric worm pumps with frequency converters to inject the polymer solution to the process •
- Entire unit features central control • cabinet (SPS technology) including customised programming



EXAMPLES OF CUSTOMISED SOLUTIONS







DOSING OF H2SO4 96%

- Dosing systems with innovative multiphase motor pumps and flow measurement for maximum precision
- System piping made of stainless steel with stand-by construction and design
- Maximum safety thanks to splash guard, intelligent diaphragm monitoring and operating condition notifications

DOSING OF AMMONIA SOLUTIONS AT POWER PLANTS

- All-in-one dosing station on a gridiron with collecting basin
- Two high-pressure pumps with multilayer diaphragm technology ensure optimal dosing precision
- Stainless steel preparation tank and control cabinet for automatic operation of the systems

CONTAINER FOR DOSING TRISODI-UM PHOSPHATE AT POWER PLANTS

- Two completely assembled dosing systems with collecting basins in one container with double doors
- Location can be determined by customer; easy to retrofit
- Dosing stations with two dosing/ metering pumps each and one preparation pump to ensure optimal availability of chemicals

DOSING PHYTASE

- Complete dosing units with down-• stream spraying units to supply
- phytase during pellet production Plastic dosing tank with level •
- monitoring and collecting basins High dosing accuracy thanks to diaphragm pump with electrical operation via a 4..20mA signal. Measures exact dosing quantities •
- with Coriolis flow meter





- Compact dosing pallet with drip tray and optional splash guard • for dosing oxygen binders for steam generators
- Easy plug-and-dose design •
- Dosing system with relief valve and pulsation damper for an even flow rate



DOSING SYSTEM FOR DEXTRIN

- Diaphragm pumps with stainless steel heads, 1450l/h capacity, in a stand-by design •
- Stainless steel frame construction for floor installation with drip tray and piping in stainless steel
- Pressure manometer and stainless steel pulsation damper for ideal operation





BONN - WASTE RECYCLING

Recycling of the waste from Bonn and the surrounding region is carried out by Müllverwertungsanlage Bonn GmbH (MVA), a subsidiary of Stadtwerke Bonn (Bonn Public Utilities). Over 1,000 tonnes of waste, which has to be disposed of in a safe and environmentally friendly way, is delivered to it every working day. In a complex thermal process, the waste is first incinerated and then processed. Flue gases are created when the refuse is burnt.

Their energy is recovered by means of a boiler or steam generator that is downstream from the incineration process. As the hot flue gases flow through the boiler, they are cooled down, while the boiler feed water heats up and evaporates. The steam created is then used to generate electricity and heat. In the downstream condenser, the steam is liquefied again and returned to the feed water. The feed and boiler water must meet certain requirements to be able to operate a boiler safely and without causing damage.

sera designed and supplied a special dosing system for the boiler plant at MVA Bonn. Two independent dosing systems for caustic soda and ammonia solution have been installed in this plant, which condition the boiler water in such a way that it corresponds to the specifications of the VGB guidelines for power station operation. Both systems have dosing pumps, fittings, 500 litre batching tanks, fill level sensors, collecting basins and space for delivery containers. As ammonia solution is a volatile chemical, this part of the system has a gas-tight design. A shared control cabinet monitors the two dosing systems and provides information to the control centre at MVA Bonn. Decentralised monitoring and control of the systems is therefore possible.

The application solutions are both made fully automatically and with level monitoring from a mixture of concentrate and water. Dosing of the prepared solutions is carried out with controllable **sera** diaphragm and/or piston pumps. The demand on and adjustment of the pumping capacities depend on the operation of the higher level system parts.

sera dosing pumps ensure that there is a consistent pH value in the boiler feed water by adding caustic soda and that the condensate has a pH value of approx. 9.5 to protect the feed water and condensate pipes.

In this way, the boiler and pipes in the thermal section of the MVA have the optimal permanent corrosion protection.





PHNOM PENH - HEINEKEN BREWERY

Approximately 50 million tons of caustic soda are produced annually and used in various ways in industry. **sera** has developed a cost-effective system solution specifically for use in the food industry, which has a variable but large demand for alkaline cleaning agents such as caustic soda. This enables safe and efficient preparation of caustic soda based on sodium hydroxide (NaOH) in solid form (pellets, flakes, pearls or powder) and water.

Breweries use caustic soda particularly because it is cost-effective: transport, delivery and storage of goods in sacks with undissolved solids is significantly less expensive than ready-made solutions. The extensive building work which is required to accommodate delivery of ready-made solutions in tankers containing hazardous substances is also unnecessary. Above all, however, the well-known suppliers in the drinks industry value the flexibility that they have with their own preparation unit: solutions are prepared as required and their concentration can be adjusted by increasing or lowering the amount of solid materials added.

These factors also played a part in the decision of Heineken, the operator of the Cambodia Brewery Ltd. in Phnom Penh, to go back to a caustic soda preparation unit in its renovation of the brewery in 2016.

The system supplied consists of a stainless steel batching tank, an agitator and a special conveyor that is separate from the batching tank. The conveyor consists of a feed hopper and a stainless steel screw-conveyor that carries the solid materials to the batching tank. With this design, the operating personnel are not in the immediate danger area of the batching tank in which the solid matter reacts exothermically with water.

The batching tank has a level indicator with a shut-off valve, a temperature display and a pipe safety cage to prevent accidental physical contact. The prepared solution is transferred into a larger storage tank either by a **sera** refilling system.

A **sera** CVD (Compact Vertical Dosing) system with a modular design is also provided to remove the solution from the storage tank and feed it precisely into the cleaning process.



INDIVIDUAL SOLUTIONS

sera ProDos offers servicing and repairs on site and in our workshop. Our experienced service staff carries out maintenance of your installed dosing stations in your factory, so downtimes are kept at a minimum.

Worldwide our customers can rely on five **sera** branches and on our global network of trained retail partners, so quick service is guaranteed.





WORKING FOR YOU ALL OVER THE WORLD

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