

# DOSING PUMPS, MEASUREMENT & CONTROL AND DISINFECTION SYSTEMS

Universal products for industrial, municipal  
and building services applications

be  
think  
innovate

**GRUNDFOS** 

# The full range from one single source

Grundfos offers a comprehensive range of dosing pumps and systems, disinfection solutions, accessories, measurement and controls.

The Grundfos dosing and disinfection product range covers everything from disinfection of drinking water to water treatment in highly sensitive industrial processes. With one of the most extensive product ranges in the market, we are a natural partner for products and solutions within the municipal, industrial and building services industries.

Grundfos also offers innovative solutions in water supply and waste water disposal, chemical and process engineering, food and beverage industry and heating and cooling technology. You can always rely on Grundfos as a competent partner for all applications.

## Dosing pumps

Grundfos offers a wide range of dosing pumps. Our innovative drive concepts cover a large performance range with only a few models, and our dosing pumps offer many advantages such as smooth continuous dosing and universal connections to existing process control systems. Digital Dosing™, an optimised dosing head design and 100% stroke length enable you to smoothly dose degassing liquids. With optional integrated flow intelligence features, malfunctions in your dosing process will be detected and displayed, and our AutoFlowAdapt or AutoCal features ensure automatic compensation and recalibration during the dosing process.

## Digital Dosing™ – accuracy through superior technology

Traditional dosing pumps regulate the dosed quantity by adjusting stroke length and/or frequency. However, reducing the stroke length adversely affects dosing accuracy. In cases where the dosing pump cannot operate at 100% stroke length, valves will suffer from reduced performance leading to inefficient dosing. Digital Dosing™ offers obvious advantages against solenoid pumps: using a stepper motor, the volume dosed is altered by the discharge stroke speed while continuously utilising 100% of the stroke length, leading to optimum dosing accuracy and better handling of degassing liquids.



### **Dosing stations and pump accessories**

Dosing is precision work and one of the main tasks in chemical and process engineering as well as in water treatment. Dosing stations are easy to install and deliver cost-efficiency and process optimisation, accurately dosing liquids such as coagulants or neutralising agents. Grundfos also offers a wide range of accessories to suit your application.

### **Disinfection**

Grundfos offers a variety of chemical disinfection systems to ensure appropriate disinfection for your applications. For sustainable disinfection, our Selcoperm system generates hypochlorite onsite using only salt, water and electricity. Our Oxiperm system offers a wide range of possibilities for the production and dosing of chlorine dioxide, while our Vaccuperm system offers disinfection using chlorine gas.

### **Measurement and control**

Grundfos offers measurement and control equipment for chlorine, peracetic acid, hydrogen peroxide and other process parameters as preassembled compact backboard mounted systems. And to complete our measurement and control product range, the Grundfos portfolio includes hand photometers for calibrating and water sampling.



# Digital dosing pumps

## SMART Digital diaphragm dosing pumps up to 30 l/h

The SMART Digital generation DDA, DDC and DDE with powerful variable-speed stepper motor brings state-of-the-art technology to perfection. Combined expert knowledge and the new patented solutions set future standards. Traditional technologies such as stroke length/stroke frequency adjustment with synchronous motor or solenoid drive become a thing of the past. The click-stop mounting plate provides unique mounting flexibility, and the entire dosing range up to 30 l/h is covered with only a few pump variants.

### DDA: high-end solution for complex and demanding applications

- Flow and pressure up to 30 l/h and up to 16 bar
- Auto-deaeration during pump standby
- Flexible Fieldbus control
- Turn-down ratio 1:3000 with constant 100% stroke length

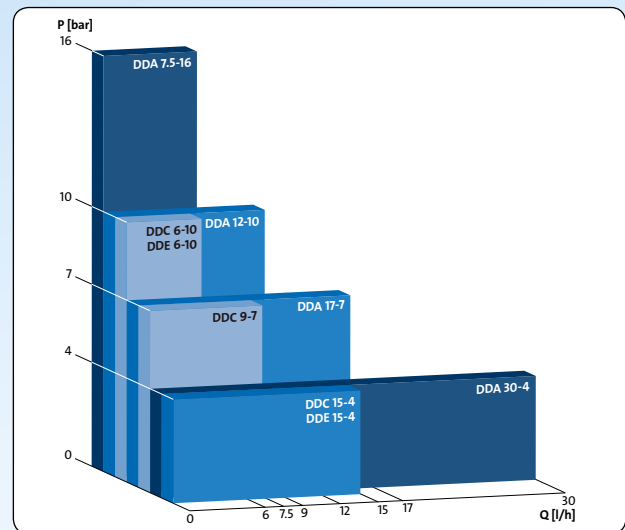
### DDC: optimal price-performance ratio

- Flow and pressure up to 15 l/h and up to 10 bar
- Two SlowMode steps (25% and 50%), calibration mode, service display
- External stop, dual-level tank control, 2 relay outputs

### DDE: Digital Dosing™ even for the low budget segment

- Flow and pressure from 0.006 to 15 l/h and up to 10 bar; two models cover entire range
- Control options: manual control 0.1-100 %, pulse in % of stroke volume
- External stop, empty tank control

## Flow rates and pressure, SMART Digital



## Application areas

### Chemical treatment and conditioning of water

- Disinfection and pH adjustment
- Drinking water, process water and wastewater
- Food and beverage, Clean-In-Place
- Ultrafiltration and reverse osmosis
- Pulp and paper, boiler feed water
- Swimming pool water, cooling towers
- Coagulation, flocculation, precipitation
- Chemical industry, car wash, irrigation





DME3/DME4

# General-purpose high-performance dosing pumps

## DME, DDI: digital diaphragm dosing pumps up to 940 l/h

Dosing is precision work, and Digital Dosing™ represents state-of-the-art technology. Grundfos DME and DDI Digital Dosing™ pumps combine perfect precision with user-friendliness, covering large dosing quantities up to 940 l/h with few variants.

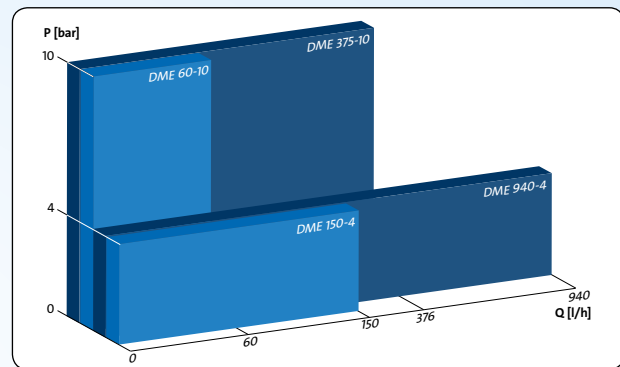
### DME: precise and easy setting

- Capacity from 75 ml/h up to 940 l/h and up to 10 bar
- Turn-down ratio 1:800 with constant 100% stroke length
- Adjustable slow mode for dosing high viscosity liquids (up to 3000 mPas)

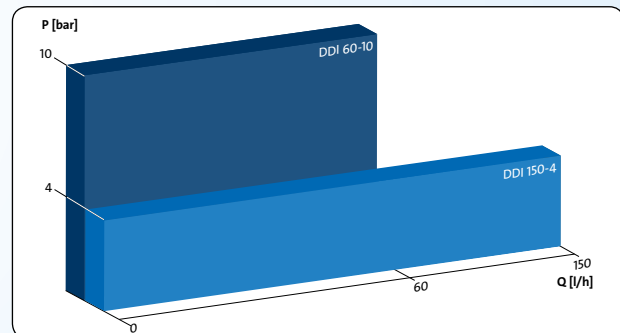
### DDI: double diaphragm for optimum process reliability

- Capacity from 75 ml/h up to 150 l/h and up to 10 bar
- 2 models cover the entire range
- Double diaphragm for universal chemical resistance
- Optional built-in flow control sensor

### Flow rates and pressure, DME



### Flow rates and pressure, DDI



## SMART Digital DDA-FCM

### Accurate dosing

± 1% of set point at 50 ml/h and up; deviation below 2% when dosing chlorine bleach

### Built-in flow meter

FCM flow control measuring sensor (positive-displacement flow meter with integrated pressure sensor, measuring volume with every stroke)

### AutoFlowAdapt

Automatically adapting measured flow to attain target flow

### Degassing features

Improved dosing head and valve design, air bubble detection, AutoDegassing drive strategy and auto-deaeration during pump standby

### Stepper motor technology

Pump runs at 100% stroke constantly

### Wide dosing range

Full range covered with only four dosing head sizes



# Mechanical diaphragm dosing pumps

## DMX: mechanical diaphragm dosing pumps up to 2 x 4000 l/h

The Grundfos DMX range has proven its worth in dosing applications worldwide. With their robust diaphragm-based design and high-quality motors, DMX pumps require minimum maintenance and are the best choice for many dosing applications. The DMX range is highly versatile: it covers a wide flow range and offers a variety of dosing head sizes, materials and accessories.

### DMX: robust design for minimum maintenance

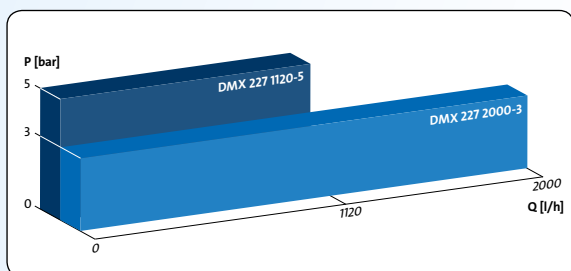
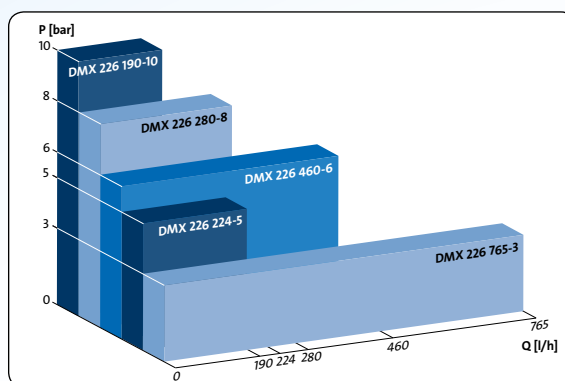
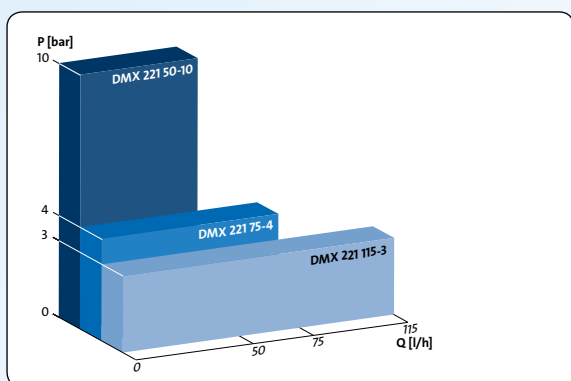
- Capacity from 0.4 to 2 x 4000 l/h and up to 10 bar
- Double-head versions increase flexibility or dosing flow rate
- Available with ATEX design – certified for EX classified zones

### Application areas

Disinfection, coagulation, flocculation, pH correction, etc. in:

- Drinking water treatment
- Waste water treatment
- Pulp and paper industry
- Textile industry
- Cleaning water treatment
- Food & Beverage industry, dairies
- Cooling tower water treatment
- Low-pressure boiler feed water treatment

### Flow rates and pressure, DMX (50 Hz)



DMX 221



DMX 226



DMX 227

# Hydraulic piston diaphragm dosing pumps

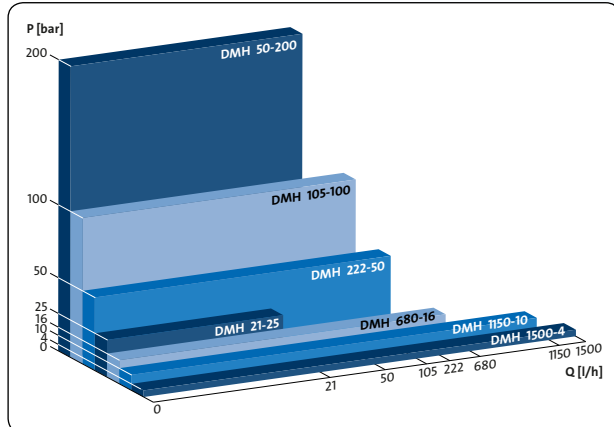
## DMH: hydraulic piston diaphragm dosing pumps up to 2 x 1500 l/h and up to 200 bar

The Grundfos DMH range is a series of extremely strong, robust pumps for applications requiring reliable dosing and high-pressure capability, such as process engineering. The range is highly versatile: it covers a wide flow range and offers a variety of dosing head sizes, materials and accessories.

### DMH: long lifetime in high-pressure applications

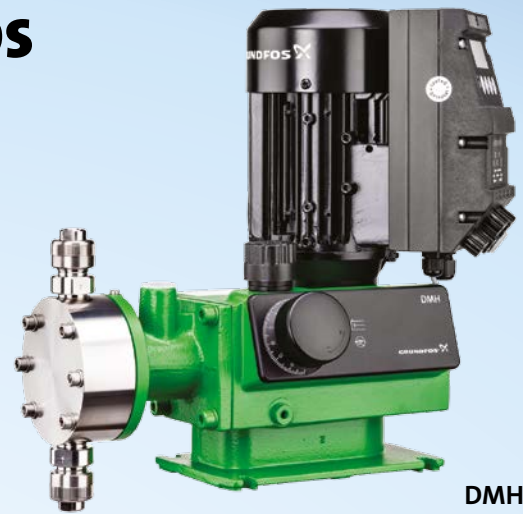
- Capacity from 0.15 to 2 x 1500 l/h and up to 200 bar; available in simplex and duplex versions
- Integrated pressure relief valve and active diaphragm protection system
- Available with ATEX design – certified for EX classified zones and API 675 certificate
- Double diaphragm design and breakage monitoring for max. safety

### Flow rates and pressure, DMH (50 Hz)



### Application areas

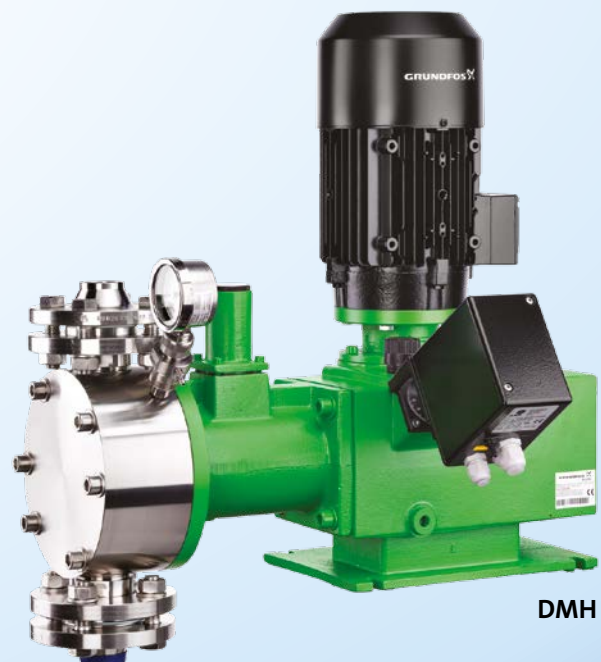
- Power plants
- High pressure boiler feed water treatment
- Petrochemical industry, refinery
- Treatment of process water
- Drinking water treatment
- EX zones / dosing of flammable liquids



DMH 251



DMH 255



DMH 257

# Dosing pump accessories

Grundfos offers a comprehensive range of accessories covering every requirement when dosing with Grundfos pumps. The range includes:

- Dosing tanks
- Foot valves & suction lances
- Multifunction valves
- Pressure loading valves
- Pressure relief valves
- Injection units
- Hoses
- Connectors
- Cables & plugs
- Hand mixers & electric mixers
- Pulsation dampeners
- Adaptors



Multifunction valve



Suction lance



Mixer



Tank



Pulsation dampeners





**Dosing cabinet skid**

# Dosing tank and skid systems

## DTS: cost-effective dosing stations

The cost-effective dosing tank stations for storing and dosing liquid chemicals can be configured by means of a type key and can be flexibly applied to perform various dosing tasks. Made from high-quality materials, DTS units can be employed universally and are easy to install.

### Application areas

- Dosing of biocides and inhibitors in cooling water
- Dosing of alkalis and acids for pH control
- Dosing of coagulants (such as ferric (II/III) chloride) for waste water treatment
- Dosing of hypochlorite, dosing of cleaning agents and disinfectants (CIP, cleaning machines)

## Complete dosing skids tailored to your application

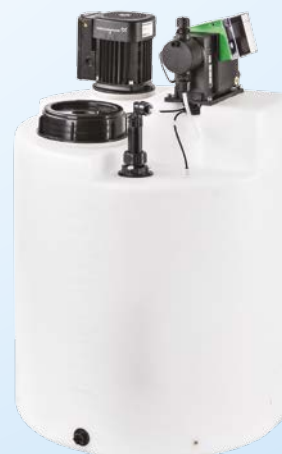
The complete chemical feed systems are designed to make dosing technology available as a complete package with all necessary pipework, valves and dosing pumps. With more than 30 years of experience designing and fabricating chemical dosing skids, we can deliver standardised packaged systems or build custom systems to your specifications.

### Flexibility by design

- Various dimensions, connection locations and installation options
- Choice of materials and accessories in the system envelope
- Filters, electrical controls, containment systems and optional measurement and control instruments



**Dosing skid**



**DTS**

# Vaccuperm chlorine gas systems

## Chlorine – the no. 1 disinfectant worldwide

Chlorine has been used to treat drinking water for more than 75 years and it is the most widely used disinfectant worldwide. When dissolved in water, the actual disinfectant – hypochlorous acid (HClO) – is produced.

Our Vaccuperm gas dosing systems work in accordance with the tried-and-tested full-vacuum principle, which regulates the addition of gaseous chlorine reliably and precisely. The systems are available as compact units of up to 4 kg/h for installation on cylinders and as fully automatic high-performance systems of up to 200 kg/h.

The optional Conex® DIA-G gas warning unit monitors ambient air for admissible gas concentration, measuring levels of chlorine, chlorine dioxide, ozone, ammonia and hydrochloric acid.

## Vaccuperm: chlorine gas dosing systems

- Systems for direct installation on chlorine gas cylinders or drums or for installation in header lines
- Fully automated systems (wall or floor mounted)
- Precise regulation and dosing of gaseous chlorine
- Simple handling and user-friendly design
- Complete range of accessories available on request: injectors, automatic changeover units, evaporators, liquid traps, gas warning systems

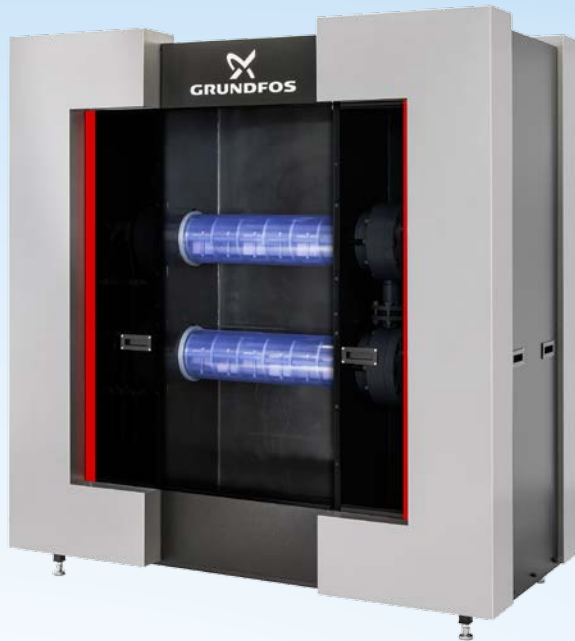
### Application areas

- Municipal waterworks
- Independent water suppliers
- Industrial waste water plants
- Cooling towers
- Swimming pools



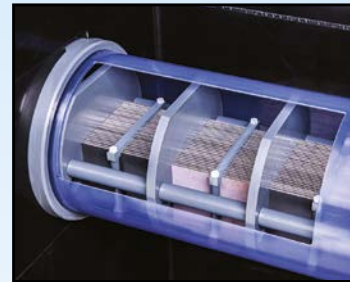
## Grundfos disinfection solutions at a glance

System	Page	Features	How you benefit
Vaccuperm	10	<ul style="list-style-type: none"> <li>– Reliable full-vacuum method with chlorine gas</li> <li>– Very straightforward handling and operation</li> </ul>	<ul style="list-style-type: none"> <li>– Reliable disinfection process</li> <li>– You save time and therefore running costs</li> </ul>
Selcoperm	11	<ul style="list-style-type: none"> <li>– Generates chlorine onsite</li> <li>– Requires only salt, water and electricity</li> </ul>	<ul style="list-style-type: none"> <li>– You save on transportation and storage costs</li> <li>– Low-cost generation of your disinfectant</li> </ul>
Oxiperme	12	<ul style="list-style-type: none"> <li>– Innovative dosing and calibration technology</li> <li>– Complete chemical reaction in a minimum of time</li> </ul>	<ul style="list-style-type: none"> <li>– Always the optimum solution for your specific application</li> <li>– Reduced taste &amp; lower THM formation of Cl<sub>2</sub></li> </ul>



### Selcoperm SES 5000-45000

- Capacities from 5 to 45 kg/h
- Max. salt consumption 3.5 kg per kg of Cl<sub>2</sub>
- Max. power consumption 5.4 kWh (AC) per kg of Cl<sub>2</sub>
- Sodium hypochlorite concentration 0.8%



# Selcoperm electrolysis system

## Electrolytic production and dosing of sodium hypochlorite solution

The Selcoperm electrolyzers use electricity to produce sodium hypochlorite through electrolysis directly from a solution of common salt. Onsite production of the disinfectant solution gives you maximum safety at minimum cost: no transportation is required, and storage and handling are easy.

Peaks in demand can be handled effortlessly because the disinfectant generated can easily be stored in buffer tanks for long periods of time. The disinfectant is dosed from the buffer tank directly into the piping system using a dosing pump.

## Selcoperm: safe onsite generation solution

- Only water, common salt and electricity are needed
- Fresh disinfectant solution (hypochlorite) is always available
- Simple handling and user-friendly design
- Low maintenance and long service life due to robust components

### Application areas

- Municipal waterworks
- Independent water suppliers
- Industrial waste water plants and process water
- Cooling towers
- Swimming pools



### Selcoperm SES 125-2000

- Comprises electrolysis cell, degassing column, brine dosing pump and softener
- Salt consumption 4-4.5 kg per kg of Cl<sub>2</sub>
- Power consumption 5.5-6.5 kWh (AC) per kg of Cl<sub>2</sub>



Oxiperm Pro



Oxiperm 164

# Oxiperm® chlorine dioxide systems

## Chlorine dioxide – effective against legionella and biofilm

Chlorine dioxide is an extremely long-lasting and effective disinfectant. Even relatively small quantities of chlorine dioxide display high disinfecting properties against all critical and chlorine-resistant germs, almost regardless of pH value. Chlorine dioxide can be used to successfully reduce the formation of biofilm in water pipes, which removes the life source for harmful germs such as legionella.

The compact Oxiperm® Pro OCD-162 system has been developed for applications in building services. This disinfection system is specifically designed for fighting legionella in drinking water installations.

## Oxiperm®: compact, effective and cost-effective disinfection

- Compact system to be installed on confined spaces
- On-site preparation of chlorine dioxide
- Complete chemical reaction within a minimum of time
- Low operating costs and low consumption of chemicals

## Application areas

- Fighting legionella in hotels, hospitals, old people's homes, fountains, swimming pools and sports facilities
- Municipal waterworks
- Independent water suppliers
- Industrial process water like brewing water, bottle washing and CIP systems
- Cooling towers



Oxiperm ISIA

# Measuring and control solutions

## Conex measuring amplifiers: extremely user-friendly

Monitoring of typical water quality parameters as well as precise control of disinfectant addition or pH adjustment is essential for many water treatment processes. Grundfos offers two ranges: the Conex for well-proven stand-alone technology and the DID for full integration with digital communication and data logging.

## Conex – preassembled compact measuring systems

Conex DIA and Conex DIS are preassembled measurement stations. The Conex DIA is available with  $\text{Cl}_2$ ,  $\text{ClO}_2$ ,  $\text{O}_3$ , pH, redox,  $\text{H}_2\text{O}_2$  and PAA measurements. The controller is multilingual and offers precise measurement. The pre-assembled package is easy to install. The plain text interface makes set-up fast and easy with as little user input as possible for a reliable end result.

## DID – fully digital pre-assembled compact measuring station

The new Grundfos by s::can DID systems are the perfect combination of s::can's state-of-the-art digital sensor technology and Grundfos experience in PID controlling of dosing and disinfection processes. DID systems are designed to perfectly match Grundfos dosing pumps, gas dosing systems and systems for the generation and dosing of chlorine dioxide and hypochlorite.

DID systems are available as compact systems with bypass flow cell or as kits for applications with tank-immersed sensors. The DID is extremely easy to set up due to the pre-assembled and pre-calibrated configurations. Installation is easy due to the Fieldbus-based communication with both controller and sensors.

## DID systems feature the following:

- Automatic setting of water flow and detection of missing water flow in systems with flow cell
- Probe carrier included in systems for tank installation
- 7.5 m cable included in systems for tank installation
- Probe guard included in systems for tank installation
- Temperature compensation included for all sensors
- Designed for extra-long maintenance intervals (0.5 to 1 year)
- Pre-calibrated sensors (pH, ORP, conductivity)
- One sensor variant per parameter for all applications and measuring ranges (pH, ORP, conductivity sensors)
- Diaphragm-covered amperometric sensor principle (free and total chlorine,  $\text{ClO}_2$ ,  $\text{H}_2\text{O}_2$  and PAA)
- Lowered pH dependency for free-chlorine sensors

## DIT hand photometer: professional analysis tool

Total reliability and precision are always needed to control ambient air and water quality for chemical water treatment. Our portable, optoelectronic DIT measuring device offers very high measuring accuracy and reproducibility for up to 14 parameters including chlorine (free, combined, total), chlorine dioxide and pH.

### Application areas

- Drinking water treatment: pH control for dosing acids and alkalis, monitoring & control of residual chlorine
- Industrial process water and waste water treatment (effluent disinfection): pH control for dosing acids and alkalis and control of chlorine, chlorine dioxide or ozone
- Food and beverages: disinfection in filling tanks and CIP applications.
- Swimming pool water treatment: pH control for dosing acids and alkalis, monitoring & control of residual chlorine



DID



DIT



DIA

# Polydos fully automatic preparation systems

## Compact and customisable solution preparation system

Polydos is a fully automatic system for preparing solutions from dry or concentrated liquid polymers. It comes in several variants to suit your application:

- Polydos 412 is a fully automatic three-chamber preparation system for liquid and dry polymers for preparation and dosing of liquid flocculants and coagulants
- Polydos 420 is a fully automatic two-chamber preparation system for liquid polymer only
- KD 440 is a fully automatic one-chamber preparation system
- TD423 is a dry material feeding system for feeding powders or granules, such as lime hydrate, aluminium sulphate, diatomite, phosphates, activated carbon or polymers.

## Polydos: flexibility to suit your application

- Compact, yet flexible installation of fully integrated system including material handling, preparation and maturing and solution dosing
- Configured according to the required polymer quantity in kg/h
- Contactless ultra-sonic level sensor to enable flow proportional preparation
- Customisation of systems to match the application

### Application areas

- Drinking water treatment
- Wastewater treatment



Polydos 420



Polydos 412



KD440



# Sustainable water treatment projects

## Your powerful partner

From planning to reliable delivery, installation and start-up, our team combines technical engineering expertise with intercultural competencies and many years of experience.

We are your one-stop partner for water treatment solutions that require complex engineering and in-depth process know-how. Our portfolio includes the entire spectrum of disinfection technologies and chemical treatment of water. Our reliable, proven methods in research, development and production ensure outstanding solutions.

We can assist you with both smaller custom solutions and the planning of complex water treatment systems, converting our state of the art dosing & disinfection products into uniquely tailored systems that match your requirements.

## Disinfection technologies

- Electrochlorination
- Chlorine gas
- Chlorine dioxide

## Chemical treatment

- Flocculation
- Coagulation
- pH correction

## Applications

- Drinking water
- Wastewater
- Process water
- Cooling water
- Boiler feed water



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