GRUNDFOS **WATER TREATMENT**

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 one of the most extensive product ranges in the market and is a natural partner of choice for products and solutions within the municipal, industrial and building services industries. The product range for dosing and disinfection covers everything from disinfection of drinking water to water treatment in highly sensitive industrial processes. Our products are perfectly matched to both, the applications and the market.

The Grundfos product portfolio can also provide you with innovative solutions in the following business areas: water supply and waste water disposal, chemical and process engineering, food and beverage industry as well as heating and cooling technology.

You can always rely on Grundfos as a competent partner for all your applications.

Dosing pumps Grundfos offers a wide range of dosing pumps. Our innovative drive concepts with stepper motor technology (Digital Dosing™) cover a large-scale performance range with only a few models. In addition, there are many advantages such as low pulsation, smooth continuous dosing, simple to use and universal connections to existing process control systems.

To achieve accurate dosing and high process reliability, Grundfos offers integrated solutions. Digital Dosing combined with optimal dosing head design and 100% stroke length enables you to smoothly dose degassing liquids, such as sodium hypochlorite and hydrogen peroxide. With an optionally integrated FlowControl or FlowMonitor system, malfunctions in your dosing process will be detected and displayed. Furthermore, AutoFlowAdapt or AutoCal ensure automatic compensation and recalibration during the dosing process, even in case of environmental changes.

Dosing stations › Dosing is precision work and one of the main tasks in chemical and process engineering as well as in water treatment. Digital Dosing™ pumps deliver unrivalled and optimum performance in these industries.
As they are easy to install, dosing tank stations are the first choice in terms of economic efficiency and process optimization when adding liquids as coagulants, disinfectants or neutralising agents to a process in a precise and controlled way.

Disinfection › Grundfos offers a variety of disinfection systems to ensure appropriate disinfection for your applications. For sustainable disinfection, our Selcoperm system generates hypochlorite (8 g/l) on-site from salt, water and electricity only and our Oxiperm system offers a wide range of possibilities for production and dosing of chlorine dioxide. For chlorine gas dosing we can offer our Vaccuperm systems.

Measurement & Control › Control of dosing pumps often requires process control equipment to automatically adjust dosing pump flows to set points. Grundfos also offers measurement & control equipment for chlorine, chlorine dioxide, pH, ORP either as loose equipment or as preassembled compact backboard mounted systems. And to complete the measurement & control product range, the Grundfos portfolio also includes hand photometers for calibrating the measurement & control devices.

Digital Dosing™: Diaphragm dosing pumps – Innovation in its purest form

With its diaphragm dosing pumps, Grundfos has redefined dosing. By using stepper motors, the discharge stroke speed can be adjusted continuously over a wide range.

Which advantages do digital dosing pumps offer for your application?

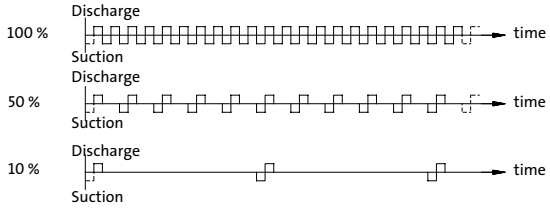
Low pulsation and smooth dosing ›

Traditional dosing pumps regulate the dosed quantity by adjusting stroke length and / or stroke frequency. But reducing the stroke length does create disadvantages regarding dosing accuracy. In cases where the dosing pump cannot operate at 100% stroke length, both the suction and discharge valves will suffer from reduced performance leading to inefficient dosing. Variations in stroke frequency also lead to non continuous dosing.

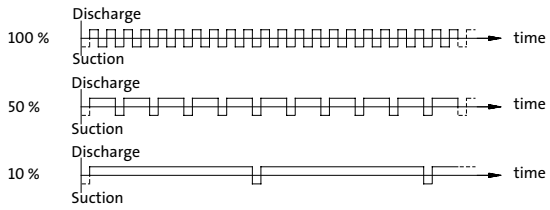
By using a stepper motor, the volume dosed is altered by the discharge stroke speed while continuously utilising 100% of the stroke length - which leads to optimum dosing accuracy and better handling of degassing liquids.

Digital Dosing™ offers obvious advantages against solenoid pumps, particularly when dosing minute volumes such as antiscalant in reverse osmosis.

Traditional dosing pump



Digital Dosing pump



Continuous dosing even down to ml/h

High turn-down ratio – less models needed ›

By using a stepper motor, the digital dosing pumps can reach a turn-down ratio of 1:3000 which is approximately 30 times higher than the turn-down ratio of a conventional dosing pump. Therefore, one model only can cover a range of 2.5 ml/h up to 7.5 l/h, for example. This means, you need less storage facilities and less spare parts and you have more flexibility regarding possible fields of application.

Modularity › Unique flexibility with only a few variants

The included click-stop mounting plate makes SMART Digital more flexible. Three different positions are possible without using any additional accessories such as wall brackets. Service and pump exchange can now be done easily and fast just by clicking the pump in and out of the mounting plate. The control cube on the DDA and DDC pump can be lifted and turned easily into three different positions: front, left or right.
DME and DDI pumps are available with front or side mounted control interfaces.

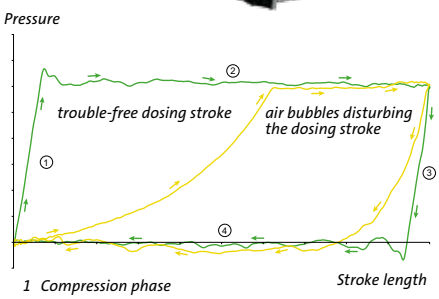
Simplicity › Easy handling and perfect overview and control

The operator can easily install the pump and set it to discharge exactly the quantity of dosing liquid required for the application. In the display, the setting of the pump is read out directly, the flow is shown in ml/h, l/h, or gph.
The click wheel (turn-and-push knob) and the graphical LC display with plain-text menu in more than 25 languages make commissioning and operation of the SMART Digital pumps intuitive. The large LC display indicates the pump status in different colours (traffic-light concept).

Flow Intelligence › Advanced process reliability

Flow Control › The pump monitors the dosing process of liquids when the FlowControl function is activated. Although the pump is still operating, some influences such as air bubbles may cause reduced flow rates or even stop the dosing process. The unique FlowControl is based on an intelligent and maintenance-free sensor integrated in the dosing head. Comparable to an ECG of monitoring your heart activities, an internal diagram is generated combining the actual pressure with the diaphragm position. For optimal process safety and reliability, the FlowControl function immediately detects and displays the following malfunctions in plain text:

- Overpressure / Discharge line burst
- Air bubbles in the dosing head
- Cavitation at the suction side
- Suction or discharge valve leakage



1 Compression phase
2 Discharge phase
3 Expansion phase
4 Suction phase

Flow Measurement › Additional monitoring and control equipment is made redundant by the Flow Measurement function. The pump can precisely measure and display the actual dosing flow. Via the analog 0/4-20 mA output or fieldbus, you can easily integrate the actual flow signal in any process control system, without needing any additional measurement equipment.

AutoFlowAdapt › When activating the AutoFlowAdapt function, even environmental changes will be compensated. The required target flow rate is always achieved due to AutoFlowAdapt, which makes additional monitoring and control devices redundant. Detected air bubbles, for example, will be pushed out by a special motor drive strategy. This is particularly important when dosing degassing liquids. AutoFlowAdapt (AutoCal) also compensates fluctuating system pressure by automatically and continuously adapting the motor speed to keep the flow rate constant

Versatile control possibilities › For optimum integration into your process

Digital Dosing pumps offer versatile control options, signal inputs and outputs; flow proportional dosing via pulse input or 0/4-20mA analog control, batch dosing via timer (week/repetition) or pulse. Via the 0/4-20mA analog output and additional relay outputs, the status of the pump can also be perfectly integrated in your process control system. Digital Dosing pumps can also be easily integrated in fieldbus networks (Profibus DP or Genibus).

Digital diaphragm dosing pumps up to 30 l/h

SMART Digital: Designed to save costs

The SMART Digital generation (DDA, DDC and DDE) features a powerful variable-speed stepper motor and brings state-of-the-art technology to perfection. Combined expert knowledge and new patented solutions set future standards. A wide field of customers' requirements, ranging from enhanced process reliability to economic solutions, can now be satisfied by only one family.

All our SMART models feature the following: Turn-down ratio of 1:3000 for DDA 7.5-16 and 1:1000 for all other models; smooth continuous dosing; always full stroke length and improved dosing head/ valve design for excellent dosing of degassing liquids; click-stop mounting plate for flexible installation; full-PTFE diaphragm ensuring high reliability; wide range power supply 100-240V, 50/60Hz

DDA: High end solution for complex and demanding applications

- Advanced capacity and pressure rates up to 30 l/h and 16 bars
- FlowControl system with selective fault diagnosis, and pressure monitoring
- Integrated flow measurement and AutoFlowAdapt (intelligent flow regulation)
- Control options: Manual, pulse, analog 0/4-20mA (incl. scaling), batch, timer cycle, timer week
- Analog 0/4-20 mA output, external stop, dual-level tank control, 2 relay outputs
- Auto deaeration during pump standby
- Accessory: E-Box with Profibus or Power-Relays

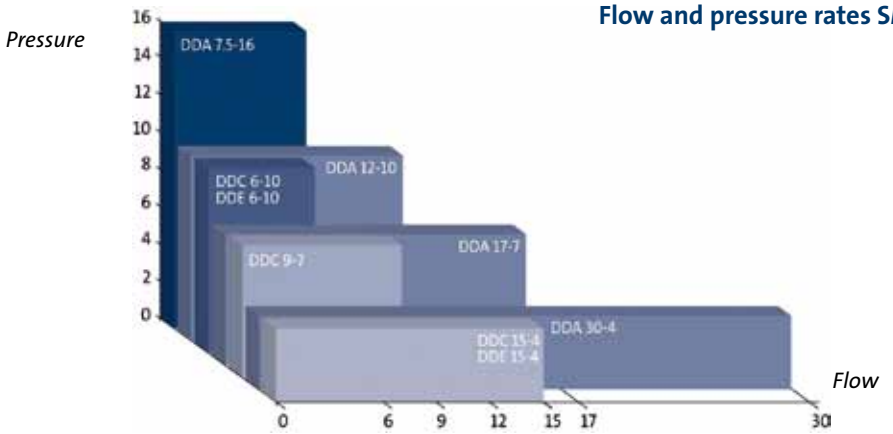
DDC: Offers an optimum price-performance ratio

- Control options: Manual in l/h or gph, pulse in ml/pulse, analog 0/4-20mA
- 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

- Only 2 models from 0.006 to 15 l/h
- Control options: Manual control 0.1-100 %, pulse in % of stroke volume
- External stop, empty tank control

Flow and pressure rates SMART Digital



Areas of Application

Chemical treatment and conditioning of water

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

Digital diaphragm dosing pumps up to 940 l/h

DME

DDI

DME 60-10, DME 150-4, DME 375-10 and DME 940-4:

- Universal high performance pump (up to 940 l/h) with brushless direct current motor for industrial processes, waste water treatment (flocculation tools)
- Turn-down ratio up to 1:800
- Integrated overpressure valve
- Continuous dosing throughout the whole range
- User-friendly, 14 user-languages
- Profibus optional

DDI 60-10 and DDI 150-4:

- Universal high performance pump with brushless direct current motor for industrial processes, waste water treatment (flocculation tools)
- Turn-down ratio up to 1:800
- 0/4-20 mA analog output proportional to dosing quantity
- Full-PTFE diaphragm for universal chemical resistance
- Comprehensive monitoring system (Flow Monitor, AutoCal)

Areas of Application

Chemical treatment and conditioning of water

- Disinfection
- Coagulation, flocculation, precipitation
- Food and beverage, Clean-In-Place
- Pulp and Paper
- Cooling tower
- Chemical industry

Mechanical diaphragm dosing pumps up to 2 x 4,000 l/h

DMX

DMX

The DMX series of high-quality motor-driven diaphragm pumps is suitable for various applications. The pumps are very economic and robust - for medium up to high performance

- Optionally available as duplex pump: the two dosing heads offer a cost-efficient way of dosing two different chemicals or of gaining higher flow rates for a single chemical
- DMX pumps can be configured with servomotors or Atex-class motors to meet specific requirements

Hydraulically actuated piston diaphragm dosing pumps

DMH 25x

DMH 28x

DMH 25x, DMH 28x

Both series are extremely robust, high-performance dosing pumps for process engineering applications. Long lifetime due to piston diaphragm technology. The DMH 28x has been designed especially for high pressure applications.

- High dosing accuracy and exact reproducibility. The dosing flow constancy and linearity deviation are below 2% (DMH 28x: 1%)
- High functional safety due to a serially integrated diaphragm protection system, integrated pressure relief valve and degassing valve of the hydraulic system (DMH 28x).
- Universal fields of application for this pump series due to a full PTFE dosing diaphragm.
- Available in various options for manifold application requirements, such as ATEX, API, VIK, etc.

Areas of Application

Chemical treatment and conditioning of water

- Disinfection
- Coagulation, flocculation, precipitation
- Mining
- Power plants
- Oil and gas
- Filling and batch dosing
- High liquid temperatures

Dosing stations

DTS

1. Multifunction valve
2. Agitator
3. Dosing pump
4. Tank inlet valve
5. Tank
6. Bund
7. Drain valve
8. Suction line
9. Level switch

Mobile DOS

Dosing is precision work and one of the main tasks in chemical and process engineering as well as in water treatment. Digital Dosing™ pumps are delivering an optimal performance in these industries.

The selection of a dosing pump plus accessories requires a systematic approach to cater for a process specific application. As they are easy to install, dosing tank stations are the first choice in the matter of economic efficiency when adding liquids as coagulants, disinfectants or neutralising agents to a process in a precise and controlled way.

DTS > Configurable dosing tank station

DTS dosing stations are intended for storing and dosing liquid chemicals. They can be configured by means of a type key and can be flexibly applied to fulfil various dosing tasks. Due to the use of high-quality materials, DTS dosing stations can be employed universally for diverse dosing liquids. The selection of materials can be adapted via the configuration.

Mobile dosing station

This dosing station is ideally suited for a short-term, temporary operation such as an emergency disinfection with chlorine bleaching, for example. It is pre-assembled and ready for connection to 30 litre containers. The portable dosing station is equipped with a rigid suction line which features an empty signal and pre-alert (to warn in case of lack of dosing liquid), a dosing pump (to be selected), integrated pressure retention and pressure relief valves and a 10-meter pressure line with fitted injection unit. The Mobile DOS with its Plus³ dosing head system is ideally suited for degassing media such as chlorine bleaching.

Areas of Application DTS

- 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)

Areas of Application Mobile DOS

- Dosing of chlorine bleaching for drinking water disinfection, dosing alkalis and acids for pH control, dosing of coagulants for waste water treatment, dosing of cleaning and disinfection agents (CIP, cleaning machines), dosing of biocides and inhibitors in cooling water

Measuring amplifiers

Conex® – extremely easy to operate

Conex® DIA-1/-2/-2Q
Cl_2 / ClO_2 / O_3
pH / redox (ORP)
H_2O_2 / PAA

Conex® DIS-C
conductivity

Sensors

AquaCell & more – for every occasion

AquaCell
Cl_2 / ClO_2 / O_3
pH / redox (ORP)

membrane-covered measuring cells
H_2O_2 / PAA

single-rod probes & electrodes
pH / redox (ORP)

Grundfos Water Treatment measurement and control - you won't find an easier, more comprehensive system!

Straightforward, efficient operation even for complicated processes is our hallmark. That's why all our measuring and control units have convenient, multilingual, plain-text operator prompting throughout.

If you are looking for even greater convenience, Grundfos Water Treatment also provides complete systems consisting of a measuring amplifier and all necessary sensors premounted on a base plate and wired ready for use. These Plug'n'Play systems offer impressive, all-round reliability, ease of use and high precision.

Our measuring amplifiers make life easy

Get optimum control over key water chemistry and process engineering parameters. Our versatile measuring amplifiers offer ultra-precise measurement and control of pH values, redox (ORP), chlorine, chlorine dioxide, ozone, hydrogen peroxide and peracetic acid.

Ultra-easy operation – fast and reliable

- **Plain-text operator prompting**
  Makes even the most complicated settings extremely easy; fewer keyboard inputs and a reliable end result.
- **Straightforward calibration**
  Integrated plausibility check and automatic buffer detection prevent operator error.

Optimal sensors for customized applications

Our sensors are fully adapted to complex water chemistry requirements.

- **Chlorine, chlorine dioxide and ozone**
  Potentiostatic pressure-proof **AquaCell** measuring cells with motorised or hydromechanical electrode cleaning.
- **pH value, redox potential (ORP) and temperature**
  Maintenance-free electrodes and single-rod probes.
- **Conductivity** – conductive or inductive sensors
- **Peracetic acid and hydrogen peroxide**
  Membrane-covered measuring electrodes

Grundfos Water Treatment measuring amplifiers & controllers – as expert and sophisticated as your applications

› The product	› The special feature	› How you benefit
Conex® DIA-1 / -1-A	1 parameter: pH, redox (ORP), Cl_2, ClO_2, O_3, PAA, H_2O_2	The all-round device for flexible use
Conex® DIA-2 / -2-A	2 parameters: (1) Cl_2, ClO_2, O_3 or H_2O_2 , (2) pH	Measures disinfection parameters and pH in parallel
Conex® DIA-2Q DIA-2Q-A	2 parameters and compound-loop control: (1) Cl_2, ClO_2, O_3, PAA or H_2O_2, (2) pH or redox (ORP)	Measures disinfection value and pH or redox (ORP) in parallel, compensates flow fluctuations
Conex® DIS-PR / -PR-A DIS-D / -D-A	1 parameter each: DIS-PR /-PR-A: pH/redox (ORP) DIS-D / D-A: Cl_2, ClO_2, O_3	High-performance, low-cost Economic-Line: freeing up resources for your process
DIP / DIP-A	3 parameters: (1) Cl_2, ClO_2, O_3, H_2O_2, (2) pH, (3) redox (ORP)	Measures disinfection value and pH and redox (ORP)

Compact systems

Plug'n'Play – there is no easier way

Conex® DIS-PR-A
pH / redox (ORP)

DIP-A D2
Cl_2 / ClO_2 / O_3
pH / redox (ORP)

Equipment

Water analysis, safety

DIT – hand-photometer

Conex® DIA-G Gas warning unit

Complete systems
Plug'n'Play saves you valuable time and money

For hassle-free turnkey measurement and monitoring of all key parameters for water treatment

- with **Conex® DIA-1, DIA-2, DIA-2Q, DIS-PR/-D** or **DIP**
- and optimal sensors such as:
  - pH single-rod probe in a flow-type electrode holder
  - or pressure-proof **AquaCell** with cleaning motor, chlorine electrode, temperature sensor and, depending on the measuring amplifier, also with pH or Redox (ORP) single-rod probes

Process reliability and water analysis in top form

Total reliability and precision are always needed to control ambient air and water quality for chemical water treatment.

- The **Conex® DIA-G gas warning unit** monitors ambient air for admissible gas concentration – chlorine, chlorine dioxide, ozone, ammonia and hydrochloric acid.
- **DIT** mobile, optoelectronic measuring device with very high measuring accuracy and reproducibility for up to 14 parameters: aluminium, bromine, chlorine (free, combined, total), chlorine dioxide, chloride, chlorite, cyanuric acid, iron, fluoride, manganese, ozone, phosphate, pH, acid demand to pH 4.3, hydrogen peroxid.

Areas of Application

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

* for effluent disinfection

Grundfos Water Treatment sensors

The product	The special feature	How you benefit
AquaCell Cl_2, ClO_2 or O_3, installation points for pH / redox (ORP) / water sensor	> Pressure-proof or pressureless measuring cells > Motorised / hydromechanical cleaning > Integrated temperature sensor	> Pressure-proof cells to recycle sample water > Self-cleaning every time the water is contaminated > Automatic temperature compensation of disinfection value and/or pH value
pH/redox (ORP) single-rod probe	> Ceramic, PTFE or hole diaphragm	> The optimum sensor for every type of water
H_2O_2 / PAA measuring cells	> Membrane-covered measur. electrode	> Protected electrode boosts service life
Photometer (DIT-M, DIT-L)	> Parameters: Al, Br, Cl_2 (free, total, comb.), ClO_2, Cl^-, ClO_2^-, $C_3H_3N_3O_3$, Fe, F^-, Mn, O_3, PO_4, pH, acid capacity KS(4.3), H_2O_2	> Easy photometrical calibration

Measurement and control

Measuring units

Measuring cells and sensors

AquaCell for Cl_2 / ClO_2 /O_3	single rod probe pH redox (ORP)	mem-brane covered H_2O_2 PAA	conducti-vity conductive inductive	gas sensor amperom. potentio-static
AQC-D1: cleaning motor, pressure-proof	pH-value	hydrogen peroxide H_2O_2	conductive	amperometric
AQC-D2: hydromechanical cleaning, pressure-proof, with water sensor	redox-potential (ORP)	peracetic acid PAA	inductive	potentiostatic
AQC-D3: hydromechanical cleaning, pressureless				

Parameters

1 1 1 1 1. parameter
2 2 2. parameter
3 3. parameter
A amperometric
P potentiostatic
AP amperom. or potentiostatic

chlorine Cl_2 · chlorine dioxide ClO_2 · ozone O_3 · hydrogen peroxide H_2O_2 · peracetic acid PAA · conductivity · pH value · redox potential (ORP) · temperature · ammonia · hydrochloric acid

Conex® DIA / DIS and DIP measuring amplifiers and controllers

		chlorine Cl_2	chlorine dioxide ClO_2	ozone O_3	hydrogen peroxide H_2O_2	peracetic acid PAA	conductivity	pH value	redox potential (ORP)	temperature	ammonia	hydrochloric acid
DIA-1	(1 parameter)	1	1	1	1	1		1	1	●)		
DIA-2	(2 parameters)	1	1	1	1			2		●)		
DIA-2Q *)	(2 parameters)	1	1	1	1	1		2	2	●)		
DIS-D	(1 parameter)	1	1	1								
DIS-PR	(1 parameter)							1	1	●)		
DIS-C	(1 parameter)						1			●)		
DIP	(3 parameters)	1	1	1				2	3	●)		

*) *Conex® DIA-2Q with additional 4-20 mA input to compensate variable flow rates* ●) only for compensation in case of temperature fluctuations

Conex® DIA-x-A / DIS-x-A and DIP-A preassembled compact systems

	chlorine Cl_2	chlorine dioxide ClO_2	ozone O_3	hydrogen peroxide H_2O_2	peracetic acid PAA	conductivity	pH value	redox potential (ORP)	temperature	ammonia	hydrochloric acid
DIA-1-A-*D1/-D2/-D3*	1	1	1				●		●)		
DIA-2-A -*D1/-D2/-D3*	1	1	1				2		●)		
DIA-2Q-A -*D1/-D2/-D3* *)	1	1	1				2	2	●)		
DIA-1-A-PR							1	1	●)		
DIA-2-A-PR							1		●)		
DIA-1-A-HP				1							
DIA-1-A-PA					1						
DIS-D-A -*D1 /-D2/-D3*	1	1	1								
DIS-PR-A							1	1			
DIP-A -*D1 /-D2/-D3*	1	1	1				2	3	●)		

*) *Conex® DIA-2Q-A with additional 4-20 mA input to compensate variable flow rates* ●) only for compensation in case of temperature fluctuations

Conex® DIA-G / DIS-G gas warning units control 2 gases simultaneously

DIA-G											●	●	AP	AP	AP				P	P
DIS-G											●		A	A	A					

DIT mobile photometer measures all important parameters in water chemistry

DIT-M
DIT-L

DIT-M: aluminium, bromine, chlorine (free, combined, total), chlorine dioxide, chloride, chlorite, cyanuric acid, iron, fluoride, manganese, ozone, phosphate, pH, acid demand to pH 4.3, hydrogen peroxide

DIT-L: chlorine (free, combined, total), chlorine dioxide, chlorite, ozone, pH

With our user-friendly measurement and control devices ...

... you'll always get your process under perfect control!

Always the optimum functional measurement and control solution for customized applications

› Task	› What Grundfos does	› How you benefit
Straightforward operation and setting	Ultra-easy menu-driven operator prompting, Conex® DIS: easy programming using numerical codes	You master even complex settings without any difficulty and save valuable time
Fast calibration	Separate menu-driven calibration with integrated plausibility check, automatic buffer recognition and AutoRead for calibrating the pH value	You avoid operating errors and achieve maximum process quality
Multiple languages	Multilingual operation using plain-text display in up to nine languages	If your local process operator has a different native language, simply switch
pH and temperature fluctuations	Automatic compensation with a fluctuating pH value and/or changing temperature	You save time and money for additional measuring devices and calculations
Recording (log book function)	Conex® devices (except DIS type) record sensor data and calibration values chronologically with date and time	You have a complete view of the process and cut your service costs
Access protection	Individual operating codes and key locking protect against accidental adjustment or unauthorised access	You secure optimal process availability and quality
System stability	Optimum self-monitoring – wire break monitoring of current loops, automatic regulator optimisation using adaptive regulators and error message for non-functioning sensors	You ensure maximum process reliability without costly downtimes
Optimum regulation	Numerous adjustable control functions – P/PI/PID 2-position controller, limit switch, setpoint controller, continuous controller DIA-1 also with 3-position step controller DIA-2Q with proportional controller + compound-loop control	You ensure maximum flexibility and mould your process to match your exact requirements

Chlorine gas

Vaccuperm
Chlorine gas systems

Chlorine – the no. 1 disinfectant worldwide

Chlorine has been used to treat drinking water for more than 75 years. Thanks to its high safety standards, it is the most widely used disinfectant worldwide:

- When dissolved in water, the actual disinfectant – hypochlorous acid (HClO) – is produced
- HClO is most effective at a pH value around 5.

The most frequently used procedures are the following:

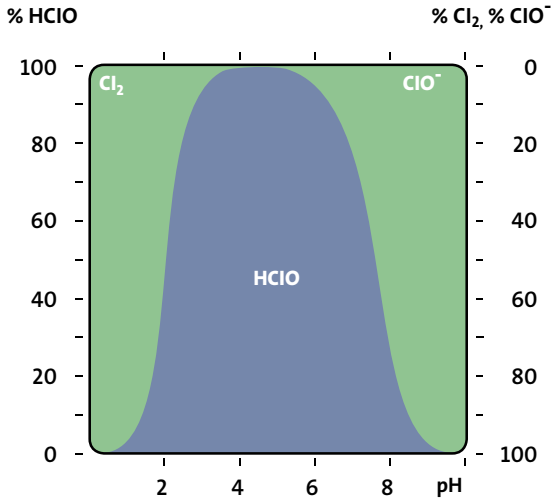
- Dosing of chlorine gas
- Dosing of liquid sodium/calcium chlorite solution
- Electrolytic production and dosing of sodium hypochlorite solution.

Dosing of chlorine gas

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.

Our product range is extensive:

- Compact units of up to 4 kg/h for installation on cylinders
- Fully automatic high-performance system of up to 200 kg/h.



Dissociation of hypochlorous acid, dependant on pH value of water

Vision for water technology

In line with our mission statement, we at Grundfos Water Treatment rely on our many years' experience and comprehensive range of products and systems to provide continually innovative solutions. This enables us to be up to all important tasks in water treatment:

- Treated **waste water** must be pumped back into the natural circuit without any danger of contamination.
- Sufficient quantities of **industrial water** that is suitable for processing should be available at all times.
- The quanity of the disinfectant in **swimming pool water** has to be regulated precisely – depending on the type of pool or the number of users.
- The chief objective of water treatment is to provide safe **drinking water** for everybody in the world.

Chlorine

Selcoperm
Onsite generation

Electrolytic production and dosing of sodium hypochlorite solution

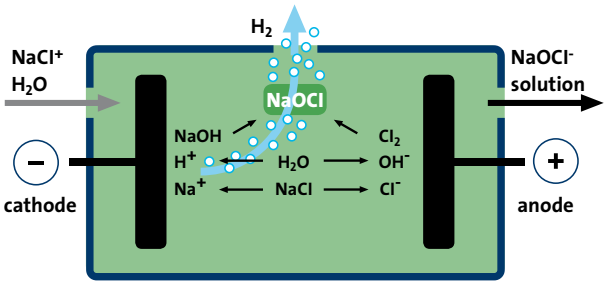
Grundfos Water Treatment **Selcoperm** electrolysers produce sodium hypochlorite electrolytically, directly from a solution of common salt using electricity.

In the electrolytic cell, caustic soda solution, chlorine and hydrogen are generated. The chlorine produced reacts immediately with the caustic soda solution, resulting in a sodium hypochlorite solution, which is the disinfectant. The solution generated has a pH value between 8 and 8.5, and a chlorine concentration of less than 8 g/l.

- Offers health and safety benefits for operators.
- With no expenditure required on safe transport of the disinfectant, and its storage and handling being easy, operating costs remain low.
- Peaks in demand can be handled effortlessly, because the disinfectant generated is very easily stored in buffer tanks for long periods of time.

The disinfectant is dosed from the buffer tank directly into the piping system with a dosing pump.

Selcoperm standard systems are available for capacities of 125, 250, 500 1000 and 2000 g Cl_2/h. Higher capacities are possible on demand.



Generation of sodium hypochlorite solution in an electolytic cell

› Disinfectant	› Features	› How you benefit
Chlorine	› Low-cost chemicals › Proven procedure worldwide › High safety standards	› Chemical cost savings › Process and operation cost savings › Reliable and safe disinfection process
Chlorine dioxide	› Sustained release action › No formation of biofilms in pipes › Highly effective against all germs › No AOX/THM formation	› Low level of chemical consumption, long-lasting disinfecting effect › No additional disinfecting procedure required › Highly effective disinfectant that avoids reinfection with germs › No effect on odour or taste

Chlorine dioxide

Oxiperm®
Chlorine dioxide systems

Chlorine dioxide – effective even against biofilms

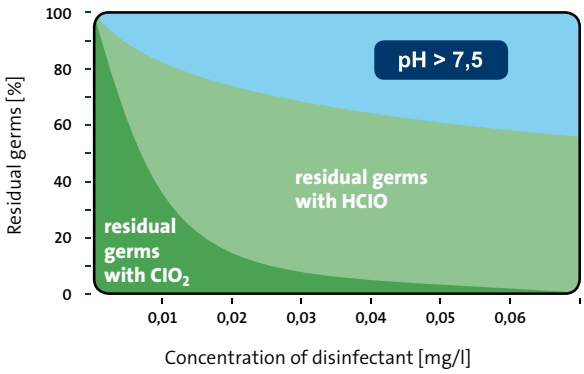
In the past few years, the demand for Grundfos Water Treatment Oxiperm® chlorine dioxide generators has increased dramatically. On the one hand, this is because chlorine dioxide is an extremely long-lasting and effective disinfectant:

- Even relatively small quantities of chlorine dioxide display high disinfecting properties against all critical and chlorine-resistant germs, almost regardless of the pH value.
- Chlorine dioxide can be used to successfully reduce the formation of biofilms in water pipes. This removes the life source for harmful germs such as legionella, which has a significant impact on the durability of the disinfection.

On the other hand, our **Oxiperm®** chlorine dioxide generators are outstandingly easy to use. Other important factors include:

- The effective interplay of precise dosing technology, an ideal mixture of components, quick chemical reactions with maximum conversion rates.
- Outstandingly reliable and effective disinfection, which saves time and operating costs.

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



› System	› Features	› How you benefit
Vaccuperm	› Reliable full-vacuum method with chlorine gas › Very straightforward handling an operation	› Reliable disinfection process › You save time and therefore running costs
Selcoperm	› Generates chlorine on site according to your requirements › Requires only salt, water and electricity	› You save on transportation and storage costs › Low-cost generation of your disinfectant
Oxiperm	› Innovative dosing and calibration technology › Complete chemical reaction in a minimum of time	› Always the optimum solution for your specific application › Reduced taste & lower THM formation of Cl_2

Complete range of disinfectants from a single source

The disinfectant	Our product	The process	The preferred application
Chlorine gas	**Vaccuperm VGA-111/-113/-117 VGB 103** up to 10 kg/h 	Vacuum chlorine gas dosing	› **Drinking water:** Independent water supply › **Waste water**: Industrial waste water › Public **swimming pools**
	Vaccuperm VGS 140 up to 200 kg/h 	Fully automatic vacuum chlorine gas dosing	› **Drinking water:** Municipal waterworks › **Waste water:** Municipal sewage purification plants
Onsite generation of sodium hypochlorite	**Selcoperm SES** up to 2 kg/h higher capacities on request 	Electrolytic chlorine production	› **Drinking water:** Independent water supply › **Waste water:** Industrial waste water › Public **swimming pools** › **Marine** - application specific
Chlorine dioxide	**Oxiperm OCD-164 OCC-164 OCG-166** up to 10 kg/h 	Chlorite / hydrochloric acid (diluted or concentrated) or chlorite/chlorine	› **Drinking water**: Municipal waterworks › **Food and drinks industry:** Brewing water, bottle washing, CIP systems, etc. › **Cooling circuit water**
	Oxiperm OCD-162 up to 60 g/h 	Chlorite / hydrochloric acid (diluted)	› **Drinking water**: Hotels, hospitals, retirement homes, protection against legionella › **Shower facilities** in swimming pools › **Cooling circuit water** › **Commercial buildings**