



Portugal  
English  
50Hz

# GRUNDFOS SOLUTIONS For Industry

## WATER TREATMENT



Water Intake /  
Supply / Transfer



Water Treatment



Wastewater  
Treatment & Reuse

## TEMPERATURE CONTROL



Industrial Heating



Industrial Cooling

## INDUSTRIAL PROCESSES



Machining



Cleaning Processes



Process Fluid  
Transfer

**GRUNDFOS**

Possibility in every drop



Grundfos delivers a range of products, solutions and services to help maintain industrial processes. Grundfos pumps are built to withstand aggressive media and the demands of industry. This portfolio overview presents these as well as dosing and disinfection, monitors, controls and sensors, service offerings and digital solutions available for all applications before, after and related to industrial processes.

The products shown are suitable for the majority of applications. There could be exceptions where other products of our broad portfolio fit better. Please ask your local sales representative. The product specifications show the maximum ranges and can vary in your local country. Please have a look in Grundfos Product Center for detailed data.



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# Service & Solutions

By taking a greater responsibility for the operation and efficiency of your pumps, we allow you to focus your attention on what is important to you rather than worrying about your pumps.

We bring peace of mind to you by minimising downtime, optimising performance and helping you contribute to a more sustainable world.

We add value through:

- Enhanced asset management
- Energy and water savings
- Digital services



Service Agreements		Repair Services		Operation Services		Optimisation Services	
	Customized Service Agreement		Spare Parts		Installation		Energy Check Advanced
	Standard Service Agreement		Repair		Extended Warranty		Grundfos Machine Health
					Laser Alignment		Energy Audit
					Inspection		Energy Check Basic
					Commissioning		Training





## Optimisation Services



### Energy Check Advanced

#### **Energy Check Advanced identifies opportunities for energy optimisation within your processes based on measured data.**

The energy check advanced report provides fully costed recommendations for process optimisation and energy savings.

#### **The Energy Check Advanced includes:**

- Site visit to gather data from your pumping system
- Load profiles from measurement of power consumption
- Energy Check Advanced report
- Presentation of the final report and potential savings

The Energy Check Advanced report provides recommendations for replacement pumps correctly sized to the application with reduced energy consumption



### Grundfos Machine Health

#### **Get immediate, predictive insights and pinpoint problems before they become costly failures.**

With Grundfos Machine Health, you'll get an overview of the condition of all your pumps and other critical assets, allowing you to take preventive action before surprises such as unexpected breakdowns occur.

#### **What's in it for you?**

- Manage and monitor your installed base
- Stay ahead of downtime and maintenance management
- Reduce energy consumption
- Ultimately, prevent costly damage



### Energy Audit

#### **Energy Audit is our most advanced service offering based on system performance measurements on-site.**

A service technician will visit your site and install measuring instruments. This can also include thermal analysis of energy consumption (Pump Thermography). Based on analysis of the data collected, we provide advice and a proposal on how to improve the energy efficiency of your system

An energy audit will often result in significant energy savings by replacing a pump with a smaller one or completely redesigning your system by, for example, changing the number of installed pumps.



### Energy Check Basic

#### **Energy Check identifies opportunities for improvement of energy efficiency in your system based on pump nameplate specifications.**

The energy check report provides recommendations for replacement pumps with the same specifications but lower energy consumption.

#### **The energy check process includes:**

- Site visit to gather data from your pumping system
- Load profiles by measurement of power consumption (Energy Check Advanced)
- Energy check report
- Presentation of final report

The energy check report provides recommendations for replacement pumps with the same specifications but lower energy consumption.



### Training



## Repair Services



### Spare Parts

With Grundfos original spare parts, you get more than just spare parts. You get the right spare part solutions and service kits with these benefits:

- Increased efficiency
- Greater reliability / minimised downtime
- Documented performance
- Fast delivery



### Repair

**Downtime is inconvenient and expensive so to minimise this, we offer two types of repair service: on-site and workshop repair.**

**Workshop repair:** Workshop repairs are the ideal choice for smaller pumps that can be shipped easily.

**On-site repair:** Having our service technician come to you to do on-site repair is the best option for large installed pumping systems.



## Service Agreements



Customized Service Agreement

**A Customised Service Agreement is tailor-made to suit your needs.** Pick and mix from our extensive service offering and pay only for what you need.  
The customisable service agreement gives you direct access to Grundfos professionals and our trusted partners for the selected service offerings.

**Choose elements across:**

- Repair services
- Operation services
- Optimisation services



Standard Service Agreement

**A Standard Service Agreement consists of one or two yearly inspections by a qualified service technician.**  
The service technician checks your equipment, assesses the need for repair and/or preventive maintenance.

**The check includes:**

- Equipment check
- Inspection report covering pumps, motors, wear parts and integrated controls
- Recommendations for performance optimisation, if required



## Operation Services



Installation

**We offer installation by a skilled service technician to ensure correct installation according to I&O manual.**  
This will ensure that your Grundfos pump achieves optimal performance.

**Installation includes:**

- Delivery to your facility
- Installation and mounting on the correct type of base
- Mechanical work, incl. alignment of pipes and flanges
- Electrical installation
- System start-up



Extended Warranty

**How you benefit from our Extended Warranty**

- Peace of mind: up to 5 years of warranty
- Easy overview: clearly defined warranty terms and conditions throughout warranty period
- Fast response: well-defined contacts and short response time in case of warranty claims

**See how the Grundfos Extended Warranty works for you!**

- 12, 24 or 36 months of additional warranty coverage
- Insurance against defects in materials or workmanship
- Same terms and conditions as standard warranty
- Well-defined contacts and short response time in case of warranty claims
- Can be purchased with pump or along with Service Contract



Laser Alignment

Alignment between pump and motor can cause unnecessary wear and damage other parts of the system.  
To significantly reduce these risks, we offer Laser Alignment to ensure 100% accuracy.

**Benefits:**

- Prolonged lifetime, less wear and tear
- Lower noise level
- Lower lifecycle costs



Inspection

Your whole system is analysed according to a specific checklist by expert personnel.  
This gives you an overview of any adjustments or spare part replacements necessary to improve your system and provide financial benefits.

**Benefits:**

- Reduce energy consumption
- Reduce operating costs
- Prolong lifetime
- Pumps run at peak performance



Commissioning

Expert service technicians verify that the installation is consistent with I&O manual, and that everything is set up correctly.  
This will ensure that your pumping system is running as efficiently as possible.

**Benefits:**

- Grundfos-approved installation
- Reduced operation costs
- Eliminated wear on pumps
- Prolonged lifetime



# Service offerings

Service agreements and offerings covering operation, repair and optimisation as well as digital offerings are shown for the equipment categories relevant for the specific application.

	Multistage Pumps	Single-stage Pumps	Circulator Pumps	Submersible Groundwater Pumps	Submersible Wastewater Pumps	Hydro Boosters	Dosing Pumps	Disinfection Systems
<b>Optimisation Services</b>								
Energy Check Advanced	●	●	●					
Grundfos Machine Health	●	●	●			●		
Energy Audit	●	●	●		○	●		
Energy Check Basic	●	●	●					
Training	○	○	○	○	○	○	○	○
<b>Repair Services</b>								
Spare Parts	●	●	●	●	●	●	●	●
Repair	●	●	●	●	●	●	●	●
<b>Service Agreements</b>								
Customized Service Agreement	●	●	●	●	●	●	●	●
Standard Service Agreement	○	○	○	○	○	○	○	
<b>Operation Services</b>								
Installation	●	●	●	●	●	●	●	●
Extended Warranty	○	○	○	○	○	○	○	○
Laser Alignment		○						
Inspection	●	●	●	●	●	●	●	●
Commissioning	●	●	●	●	●	●	●	●

● Available ○ Special conditions and limitations

# Water Intake / Supply / Transfer

A production plant needs water to operate. Grundfos offers a complete portfolio of pumps to reliably supply water to the plant; the right amount, at the right pressure and at the right time. Whether the source is a well, mains or a river or lake, and no matter the quality of the water, Grundfos has efficient and high-quality equipment that supplies and transfers the water as needed, with no surprises.

*"Not only have we seen an immediately improved water supply with stable and constant pressure; we have been able to monitor and trend the flows, enabling continuous improvements on our processes."*



**Calvin Winch, Engineer,  
Operations Development  
GB & I, Britvic Soft Drinks  
Ltd**



## GROUND WATER INTAKE

### Pumps

#### Submersible groundwater pumps - **SP**



Grundfos SP are submersible borehole pumps, designed for pumping groundwater. Grundfos SP are all stainless-steel pumps, and they are available in 3 material grades. The pumps are suitable for boreholes in sizes ranging from 4" over 6" and 8" to 10".

Flow max.: 290 m<sup>3</sup>/h      Head max.: 676 m  
Liquid temperature: -15..90 °C      p max.: 60 bar

#### Submersible groundwater pumps - **SQ/SQE**



SQ/SQE pumps are compact submersible pumps, designed for domestic groundwater supply for private housing, small waterworks, and small irrigation systems.

Flow max.: 9 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: 0..35 °C      p max.: 15 bar

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Pump control - **CU 200, 300, 301**



The control units are designed for communication, monitoring and control of submersible pumps. The CU 200 is suitable for the SQFlex system, it also enables the connection of a level switch. The CU 300 is suitable for SQE submersible pumps in various applications, the CU 301 for SQE in constant pressure applications.

#### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

#### Level Control - **LC 232 / LC 242**



LC 232 / LC 242 level controllers offer a comprehensive range of features for groundwater installation, monitoring and control of one or two pumps.

#### Level Transmitters - **MS1, M2, FS1**



Float switches for level control/monitoring in tanks, pumping stations or similar applications.

#### Level Transmitters - **Level Transmitter S, E, W**



Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



## GROUND WATER INTAKE

### Flow Sensors - **VFI/VFS**

Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Flow Sensors - **MAG 3100, 5100, 8000**

Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.



### Pressure Sensors - **DPI, DPS, RPI, RPS**

Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Pressure Sensors - **ISP40, ISP44**

Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.



### Temperature Sensors - **ITS**

ITS is an integrated temperature sensor from Grundfos Direct Sensors. It is fully compatible with wet, aqueous media and based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.



### Temperature Sensors - **Danfoss MBT 3270**

The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.



### M&C for Dosing & Disinfection - **DID**

The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.



p max.: 3 bar

### M&C for Dosing & Disinfection - **DIT-L, DIT-M**

Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.



## Drives

### External Frequency Converters - **CUE**

CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.





## SURFACE WATER INTAKE

- The Hydro MPC optimises the energy consumption by determining the most efficient speed and required number of pumps.

### Pumps

#### Vertical multistage pumps - **CR/CRE**



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - **NK/NKE**



Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 l/s      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Horizontal splitcase pumps - **LS**



Grundfos LS is a horizontal, single-stage or double-stages, between bearings, split case pump. The axially split design allows easy removal of the top casing and access to the pump components without disturbing the motor or pipe work.

Flow max.: 9503 m<sup>3</sup>/h      Head max.: 238 m  
Liquid temperature: 0..100 °C      p max.: 25 bar

### Service offerings



Customized Service Agreement



Laser Alignment



Commissioning



Grundfos Machine Health

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

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Pump controller system designed for water utility market. Complete protection of one pump.

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The control units are designed for communication, monitoring and control of submersible pumps. The CU 200 is suitable for the SQFlex system, it also enables the connection of a level switch. The CU 300 is suitable for SQE submersible pumps in various applications, the CU 301 for SQE in constant pressure applications.





## SURFACE WATER INTAKE

### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

### Level Control - **LC 232 / LC 242**



LC 232 / LC 242 level controllers offer a comprehensive range of features for groundwater installation, monitoring and control of one or two pumps.

### Level Transmitters - **MS1, M2, FS1**

Float switches for level control/monitoring in tanks, pumping stations or similar applications.



### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



### Flow Sensors - **VFI/VFS**

Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Flow Sensors - **MAG 3100, 5100, 8000**

Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.



### Pressure Sensors - **DPI, DPS, RPI, RPS**

Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Pressure Sensors - **ISP40, ISP44**

Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.



### Temperature Sensors - **ITS**

ITS is an integrated temperature sensor from Grundfos Direct Sensors. It is fully compatible with wet, aqueous media and based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.



### Temperature Sensors - **Danfoss MBT 3270**

The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.







## SURFACE WATER INTAKE

### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

### M&C for Dosing & Disinfection - **DIT-L, DIT-M**



Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.

## Drives

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## Service offerings



Customized Service Agreement



Laser Alignment



Commissioning



Grundfos Machine Health



## SEAWATER INTAKE

### Pumps

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - **NK/NKE**



Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 l/s      Head max.: 177 m  
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Grundfos SP are submersible borehole pumps, designed for pumping groundwater. Grundfos SP are all stainless-steel pumps, and they are available in 3 material grades. The pumps are suitable for boreholes in sizes ranging from 4" over 6" and 8" to 10".

Flow max.: 290 m<sup>3</sup>/h      Head max.: 676 m  
Liquid temperature: -15..90 °C      p max.: 60 bar

#### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.



## SEAWATER INTAKE

### Monitors, Controls and Sensors

#### Level Control - **LC 232 / LC 242**

LC 232 / LC 242 level controllers offer a comprehensive range of features for groundwater installation, monitoring and control of one or two pumps.



#### Level Transmitters - **MS1, M2, FS1**

Float switches for level control/monitoring in tanks, pumping stations or similar applications.



#### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



#### Pressure Sensors - **DPI, DPS, RPI, RPS**

Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.



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p max.: 3 bar



## SUPPLY & TRANSFER

- Hydro MPC E and Multi E help meet energy targets and are ready for future growth as it can deliver min and max flows keeping a high efficiency in mind. Additionally, the system can be delivered with a standby pump that can be easily used as a duty pump and by that extend the flow significantly.

### Pumps

#### Vertical multistage pumps - **CR/CRE**



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

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Flow max.: 9503 m<sup>3</sup>/h      Head max.: 238 m  
Liquid temperature: 0..100 °C      p max.: 25 bar

### Monitors, Controls and Sensors

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## SUPPLY & TRANSFER

### Systems

#### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h

Head max.: 161 m

Liquid temperature: 0..60 °C

p max.: 16 bar



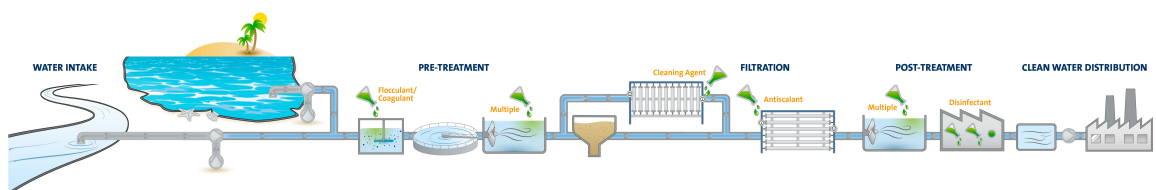
# Water Treatment

Grundfos has an extensive range of water treatment pumps and solutions for the entire water treatment cycle from intake and distribution to handling of wastewater. Water treatment is technology-driven and heavily regulated, and pump, dosing and disinfection solutions have been designed to meet every demand and comply with regulations. Grundfos has years of water treatment application experience and guarantees the perfect match between component and sub-system, whether you are looking for packaged solutions or individual pumping products for each stage of the treatment process.

*"Our small reverse osmosis 1000 lit./h system with activated carbon and softener for pretreatment. Thanks to Grundfos 'smart' pump we are controlling RO only with pump, there is no additional controller or PLC needed."*



Vladimir Kruljac, CEO FELLER  
d.o.o.





## CHEMICAL TREATMENT

- Bubble formation due to **outgassing chemicals** like sodium hypochlorite could lead to inefficient and unreliable processes. With **FLOW CONTROL** in DDA dosing pumps this can be eliminated.
- **Measurement of pulsating flows** can be challenging for conventional flow meters. With **FCM** this functionality is **integrated in DDA dosing pumps** simplifying the installation with **less components**.
- **All relevant approvals**, certifications and documentation is **included** in our prefabricated **dosing skid systems** ready to install.

### Pumps

#### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C p max.: 16 bar

#### Mechanical Dosing Pumps - **DMX**



With their robust diaphragm-based design and their 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.

Flow max.: 4000 l/h  
Liquid temperature: -10..70 °C p max.: 10 bar

#### Mechanical Dosing Pumps - **DMH**



The DMH range is a series of extremely strong, robust hydraulically actuated piston diaphragm dosing 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.

Flow max.: 3000 l/h  
Liquid temperature: -10..90 °C p max.: 200 bar

#### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.

### Service offerings



Customized Service Agreement



Commissioning

### Monitors, Controls and Sensors

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.





## CHEMICAL TREATMENT

### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



### Pressure Sensors - **ISP40, ISP44**



Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.

### Temperature Sensors - **Danfoss MBT 3270**

The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.



### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

### Communication Interfaces - **E-Box**

The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.



### M&C for Dosing & Disinfection - **DIT-L, DIT-M**



Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.

## Systems

### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

### Dosing Tank Stations - **DTS**



Dosing tank stations are intended for storing and dosing liquids. Many different configurations can be selected flexibly to fulfil various dosing tasks. They are available in 6 tank sizes: 60 l, 100 l, 200 l, 300 l, 500 l and 1000 l.



## CHEMICAL TREATMENT

### Disinfection Systems

#### Chlorine Dioxide Systems - **Oxiper Pro**



Compact pre-mounted chlorine dioxide preparation and dosing system. Oxiper Pro generates a ClO<sub>2</sub> solution from diluted NaClO<sub>2</sub>, HCl and water and supports flow proportional or setpoint controlled dosing. Accessories for installation and measurement of ClO<sub>2</sub> content are part of the product range. Max. ClO<sub>2</sub> prep. quantity: 60 g/h

#### Electro-chlorination Systems - **Selcoperm**



SES electrolysis systems produce sodium hypochlorite solution from common salt and water using electricity. The accessories range provides the complete installation from brine preparation to the injection point. A max. production capacity of up to 1,8 kg/h (SES 125-2000) and 45 kg/h (SES 5000-45000) chlorine equivalent is covered.

Liquid temperature: 0..20 °C

#### Chlorine Gas Systems - **Vaccuperm**



The Vaccuperm range is our vacuum chlorine gas dosing equipment covering all equipment between the chlorine gas container and the water line to be treated as well as chlorine container handling and safety equipment. The different lines cover a max. chlorine flow of up to 4 kg/h (VGB 103, VGA 113), 20 kg/h (VGA 117) and 200 kg/h (VGS).

### Service offerings



Customized Service Agreement



Commissioning

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## PHYSICAL TREATMENT

- High **pressure demands** can be fulfilled **with a compact pump design** (less stages) by operating at **over-synchronous speed**. Factory configured CRE's with **reinforced chambers** and impellers can be an option. The motor size must be adjusted accordingly.
- Our variable frequency drives (VFD) can **automate backwash** through the use of sensors, so that **no PLC is needed** in simple filtration systems.
- The **DDA FCM** can **accurately dose the right amount of chemicals** so that the membranes are clean and protected, while the **DID** probes and controller can **adjust the dosing pump based on changing water quality parameters**.

### Pumps

#### Vertical multistage pumps - CR/CRE



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Endsuction close coupled multistage pumps - CM/CME



CM, CME are reliable, quiet and compact horizontal end-suction pumps. The modular pump design makes it easy to make customised solutions.

Flow max.: 36 m<sup>3</sup>/h      Head max.: 132 m  
Liquid temperature: -20..120 °C      p max.: 16 bar

#### Endsuction close coupled single-stage pumps - NB/NBE



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - NK/NKE



Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 l/s      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - NKG/NKGE



Standard pumps according to ISO 2858 with axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 231 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Horizontal multistage pumps - BM



High pressure booster modules are used for boosting, liquid transfer and circulation in systems under a high static pressure. Modules of different sizes can be combined and connected either in series or in parallel to meet exact Q/H requirements.

Flow max.: 280 m<sup>3</sup>/h      Head max.: 430 m  
Liquid temperature: 0..45 °C

#### Horizontal multistage pumps - BMS



The Grundfos BMS range consists of hp (high pressure) and hs (high speed) versions. BMS hp are suitable for industrial and water supply applications where the inlet pressure is high. BMS hs enables the creation of high pressure.

Flow max.: 343 m<sup>3</sup>/h      Head max.: 1053 m  
Liquid temperature: 0..40 °C

#### Horizontal multistage pumps - BMSX



A BMSX booster system consists of a BMS hs high-speed pump, a BM hp high-inlet-pressure pump and an isobaric pressure exchanger. It has a unique design dedicated to seawater and brackish water desalination.



## PHYSICAL TREATMENT

### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C p max.: 16 bar

### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.

### Optimisation services - **Energy Optimisation Offering**



A Grundfos Energy Check or Energy Audit will help you find hidden savings in your pump installation. It can also help to reduce your operating expenses and reach your sustainability targets.

### Service offerings



Grundfos Machine Health

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Level Transmitters - **MS1, M2, FS1**



Float switches for level control/monitoring in tanks, pumping stations or similar applications.



## PHYSICAL TREATMENT

### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



### Flow Sensors - **VFI/VFS**

Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Flow Sensors - **MAG 3100, 5100, 8000**

Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.



### Pressure Sensors - **DPI, DPS, RPI, RPS**

Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Pressure Sensors - **ISP40, ISP44**

Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.



### Temperature Sensors - **ITS**

ITS is an integrated temperature sensor from Grundfos Direct Sensors. It is fully compatible with wet, aqueous media and based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.



### Temperature Sensors - **Danfoss MBT 3270**

The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.



### M&C for Dosing & Disinfection - **DID**

The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.



p max.: 3 bar

### Communication Interfaces - **E-Box**

The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.



### M&C for Dosing & Disinfection - **DIT-L, DIT-M**

Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.





## PHYSICAL TREATMENT

### Drives

#### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

#### Drive Accessories - **Sine-wave filter**



Sine wave filters have a high degree of filtering, resulting in a high reduction of the stress on the motor insulation system. At the same time, they reduce the acoustic noise from the motor. Motor losses are reduced due to the fact that a sine-wave filter converts the output pulses of the frequency converter into a sine-wave-shaped.

### Systems

#### Application-specific bundles - **iQ range**



The iSOLUTIONS Q-pump range consists of CRNE high-pressure pumps, specifically designed for maximum utilization of the MGE motor for high pressure applications. The hydraulic part has a flipped stack and reinforced chambers. It is optimised for greater Q/H performance with higher maximum speeds.

#### Application-specific bundles - **iSOLUTIONS for Reverse Osmosis (iRO)**



Standardised plugandplay kits for low pressure reverse osmosis systems. Standardised solutions are available in six prepackaged kits consisting of Grundfos components selected to cover the requirements of different flow and pressure systems.

#### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

#### Dosing Tank Stations - **DTS**



Dosing tank stations are intended for storing and dosing liquids. Many different configurations can be selected flexibly to fulfil various dosing tasks. They are available in 6 tank sizes: 60 l, 100 l, 200 l, 300 l, 500 l and 1000 l.

### Disinfection Systems

#### Chlorine Dioxide Systems - **Oxiperm Pro**



Compact pre-mounted chlorine dioxide preparation and dosing system. Oxiperm Pro generates a ClO<sub>2</sub> solution from diluted NaClO<sub>2</sub>, HCl and water and supports flow proportional or setpoint controlled dosing. Accessories for installation and measurement of ClO<sub>2</sub> content are part of the product range. Max. ClO<sub>2</sub> prep. quantity: 60 g/h

#### Gas Warning Systems - **DIA-G**



DIA-G gas warning systems monitor the concentration of dangerous gasses with up to two gas sensors. The range also includes accessories like battery backup, horn and flashlight to complete the installation. Available monitoring parameters: chlorine, chlorine dioxide, hydrochloric acid, ammonia and ozone.

### Service offerings



Grundfos Machine Health



## PHYSICAL TREATMENT

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## DISINFECTION

- Oxiperm Pro offers onsite production of chlorine dioxide, that **avoids chemicals transport** and unnecessary handling.
- **Chlorine dioxide** has a **high efficiency** at a **broad pH range**, while it does not react with organics to form THMs or ammonia nitrogen.

### Pumps

#### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

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Flow max.: 200 l/h  
Liquid temperature: -10..50 °C    p max.: 16 bar

#### Mechanical Dosing Pumps - **DMH**



The DMH range is a series of extremely strong, robust hydraulically actuated piston diaphragm dosing 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.

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Flow max.: 3000 l/h  
Liquid temperature: -10..90 °C    p max.: 200 bar

### Monitors, Controls and Sensors

#### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



#### Flow Sensors - **VFI/VFS**

Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.




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Liquid temperature: -30..120 °C





## DISINFECTION

### Flow Sensors - **MAG 3100, 5100, 8000**



Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.

### Pressure Sensors - **ISP40, ISP44**



Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.

### Temperature Sensors - **Danfoss MBT 3270**



The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.

### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

### Communication Interfaces - **E-Box**



The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.

### M&C for Dosing & Disinfection - **DIT-L, DIT-M**



Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.

## Systems

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There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

### Dosing Tank Stations - **DTS**



Dosing tank stations are intended for storing and dosing liquids. Many different configurations can be selected flexibly to fulfil various dosing tasks. They are available in 6 tank sizes: 60 l, 100 l, 200 l, 300 l, 500 l and 1000 l.



## DISINFECTION

### Disinfection Systems

#### Chlorine Dioxide Systems - **OxiperM Pro**



Compact pre-mounted chlorine dioxide preparation and dosing system. OxiperM Pro generates a ClO<sub>2</sub> solution from diluted NaClO<sub>2</sub>, HCl and water and supports flow proportional or setpoint controlled dosing. Accessories for installation and measurement of ClO<sub>2</sub> content are part of the product range. Max. ClO<sub>2</sub> prep. quantity: 60 g/h

#### Electro-chlorination Systems - **Selcoperm**



SES electrolysis systems produce sodium hypochlorite solution from common salt and water using electricity. The accessories range provides the complete installation from brine preparation to the injection point. A max. production capacity of up to 1,8 kg/h (SES 125-2000) and 45 kg/h (SES 5000-45000) chlorine equivalent is covered.

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Liquid temperature: 0..20 °C

#### Chlorine Gas Systems - **VaccuperM**



The VaccuperM range is our vacuum chlorine gas dosing equipment covering all equipment between the chlorine gas container and the water line to be treated as well as chlorine container handling and safety equipment. The different lines cover a max. chlorine flow of up to 4 kg/h (VGB 103, VGA 113), 20 kg/h (VGA 117) and 200 kg/h (VGS).

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## SEA WATER DESALINATION

- By bundling the BMS hs, BMS hp and pressure exchanger, **energy consumption can be reduced** to as low as 2 kWh/m<sup>3</sup> of produced water – with capacities up to 1,500 m<sup>3</sup>/day.
- A product range designed for its environment with **resistant components** made of super duplex stainless steel, polymer and ceramic.
- **Protect your membranes** with **accurate dosage** of chemicals with the DDA FCM, while being able to react to water quality changes with the DID probes and controller.

### Pumps

#### Vertical multistage pumps - CR/CRE



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Endsuction close coupled single-stage pumps - NBG/NBGE



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Endsuction close coupled single-stage pumps - NB/NBE



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - NK/NKE



Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 l/s      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - NKG/NKGE



Standard pumps according to ISO 2858 with axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 231 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Horizontal multistage pumps - BM



High pressure booster modules are used for boosting, liquid transfer and circulation in systems under a high static pressure. Modules of different sizes can be combined and connected either in series or in parallel to meet exact Q/H requirements.

Flow max.: 280 m<sup>3</sup>/h      Head max.: 430 m  
Liquid temperature: 0..45 °C

#### Horizontal multistage pumps - BMS



The Grundfos BMS range consists of hp (high pressure) and hs (high speed) versions. BMS hp are suitable for industrial and water supply applications where the inlet pressure is high. BMS hs enables the creation of high pressure.

Flow max.: 343 m<sup>3</sup>/h      Head max.: 1053 m  
Liquid temperature: 0..40 °C

#### Horizontal multistage pumps - BMSX



A BMSX booster system consists of a BMS hs high-speed pump, a BM hp high-inlet-pressure pump and an isobaric pressure exchanger. It has a unique design dedicated to seawater and brackish water desalination.



## SEA WATER DESALINATION

### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C p max.: 16 bar

### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.

### Optimisation services - **Energy Optimisation Offering**



A Grundfos Energy Check or Energy Audit will help you find hidden savings in your pump installation. It can also help to reduce your operating expenses and reach your sustainability targets.

### Service offerings



Laser Alignment

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Communication Interface - **MI 301**



Grundfos remote controls used for installation, data monitoring, fault information and configuration of Grundfos pumps and systems, by radio or IR connections.

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.



## SEA WATER DESALINATION

### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

### Level Transmitters - **MS1, M2, FS1**

Float switches for level control/monitoring in tanks, pumping stations or similar applications.



### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



### Flow Sensors - **VFI/VFS**

Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.



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Liquid temperature: -30..120 °C

### Flow Sensors - **MAG 3100, 5100, 8000**

Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.



### Pressure Sensors - **DPI, DPS, RPI, RPS**

Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.



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Liquid temperature: -30..120 °C

### Temperature Sensors - **ITS**

ITS is an integrated temperature sensor from Grundfos Direct Sensors. It is fully compatible with wet, aqueous media and based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.



### M&C for Dosing & Disinfection - **DID**

The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.



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p max.: 3 bar

### Communication Interfaces - **E-Box**

The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.



### M&C for Dosing & Disinfection - **DIT-L, DIT-M**

Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.





## SEA WATER DESALINATION

### Drives

#### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

#### Drive Accessories - **Sine-wave filter**



Sine wave filters have a high degree of filtering, resulting in a high reduction of the stress on the motor insulation system. At the same time, they reduce the acoustic noise from the motor. Motor losses are reduced due to the fact that a sine-wave filter converts the output pulses of the frequency converter into a sine-wave-shaped.

### Systems

#### Application-specific bundles - **iSOLUTIONS for Reverse Osmosis (iRO)**



Standardised plug-and-play kits for low pressure reverse osmosis systems. Standardised solutions are available in six prepackaged kits consisting of Grundfos components selected to cover the requirements of different flow and pressure systems.

#### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h      Head max.: 161 m  
Liquid temperature: 0..60 °C      p max.: 16 bar

#### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

#### Dosing Tank Stations - **DTS**



Dosing tank stations are intended for storing and dosing liquids. Many different configurations can be selected flexibly to fulfil various dosing tasks. They are available in 6 tank sizes: 60 l, 100 l, 200 l, 300 l, 500 l and 1000 l.

### Disinfection Systems

#### Chlorine Dioxide Systems - **Oxiperm Pro**



Compact pre-mounted chlorine dioxide preparation and dosing system. Oxiperm Pro generates a ClO<sub>2</sub> solution from diluted NaClO<sub>2</sub>, HCl and water and supports flow proportional or setpoint controlled dosing. Accessories for installation and measurement of ClO<sub>2</sub> content are part of the product range. Max. ClO<sub>2</sub> prep. quantity: 60 g/h

#### Electro-chlorination Systems - **Selcoperm**



SES electrolysis systems produce sodium hypochlorite solution from common salt and water using electricity. The accessories range provides the complete installation from brine preparation to the injection point. A max. production capacity of up to 1,8 kg/h (SES 125-2000) and 45 kg/h (SES 5000-45000) chlorine equivalent is covered.

Liquid temperature: 0..20 °C

#### Chlorine Gas Systems - **Vaccuperm**



The Vaccuperm range is our vacuum chlorine gas dosing equipment covering all equipment between the chlorine gas container and the water line to be treated as well as chlorine container handling and safety equipment. The different lines cover a max. chlorine flow of up to 4 kg/h (VGB 103, VGA 113), 20 kg/h (VGA 117) and 200 kg/h (VGS).



## SEA WATER DESALINATION

### Service offerings



Laser Alignment

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



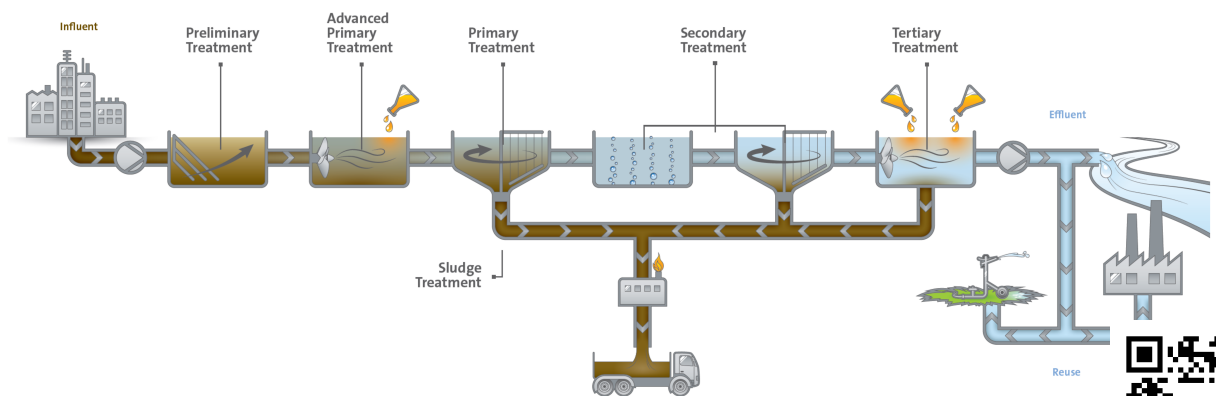
# Wastewater Treatment & Reuse

Handling wastewater is a crucial part of any industrial water solution, and pumps play a key role in every application. Often, wastewater in industrial applications can be unpredictable, and an industrial wastewater solution must be tough enough to deal with everything from grit and grease to large particles. Wastewater pumps need to be efficient, reliable and intelligent to handle these changing wastewater qualities. You also need to be certain that the water leaving the system is of the right quality before it enters the sewer or the environment.

*“As you know, chemicals are always a big risk. So for us it was very time-saving and stress-saving to get a complete dosing solution from Grundfos. We got the full cabinets with the dosing pumps, all the piping, the valves, everything was included, so we were very happy with that. In addition, the Grundfos pumps have a software with flow control. And that guarantees that you're dosing what you need to be dosing.”*



**Bryan de Bel, Project Manager with turnkey WWTP contractor Pantarein (about Carlsberg Fredericia project)**







## WASTEWATER TRANSFER

- Grundfos prefabricated pumping stations are cost effective and flexible, with already built-in components such as pumping and cables.
- Grundfos SEG, SL and SE wastewater pumps have built in **AUTOADAPT** to adjust to operating conditions.
- Grundfos **dedicated controllers** control up to 6 wastewater pumps to provide continuous energy optimization according to duty point.
- The **anticlogging function** on the **DC controller** stops the pumps from blocking by acting during abnormal events.
- Grundfos packaged pumping stations with **LC controller and CIM** communication can provide: **Real time pump control and alerts** (high level, pump failures, warning logs, dry run etc).
- **Vortex pump** and **S tube reduce clogging** issue for high solid with larger length.

### Pumps

#### Submersible wastewater pumps - S



The S pumps are a range of free-flow channel impeller pumps specifically designed for pumping sewage and wastewater in a wide range of municipal and industrial applications.

Flow max.: 6793 m<sup>3</sup>/h      Head max.: 116 m  
Liquid temperature: 0..50 °C

#### Submersible wastewater pumps - SE, SE1, SEV



Submersible Grundfos SE sewage pumps are fitted with either S-tube (SE1) or SuperVortex impeller (SEV). The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 83 l/s      Head max.: 44 m  
Liquid temperature: 0..40 °C

#### Submersible wastewater pumps - SEG



Submersible Grundfos SEG sewage grinder pumps are designed for pumping wastewater, sludge-containing water, and sewage. Fitted with a patented grinder system designed to grind the media.

Flow max.: 10 l/s      Head max.: 48 m  
Liquid temperature: 0..40 °C      p max.: 6 bar

#### Submersible wastewater pumps - SL



Submersible Grundfos SL sewage pumps are fitted with an S-tube® impeller. The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 83 l/s      Head max.: 31 m  
Liquid temperature: 0..40 °C      p max.: 6 bar

#### Submersible wastewater pumps - SLV



Submersible Grundfos SLV sewage pumps are fitted with a SuperVortex impeller. The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 40 l/s      Head max.: 46 m  
Liquid temperature: 0..40 °C      p max.: 6 bar

#### Submersible wastewater pumps - AP/APG



AP pumps are designed for pumping wastewater, sludge-containing water, groundwater and sewage. APG are equipped with cutter system for grinding solids into small pieces.

Flow max.: 46 l/s      Head max.: 68 m  
Liquid temperature: 0..40 °C

#### Submersible wastewater pumps - EF



Grundfos EF pumps have a single-vane, semi-open impeller for 30 mm free passage, designed for pumping effluent and other liquids such as drainage and surface water with fibres and small impurities.

Flow max.: 12 l/s      Head max.: 23 m  
Liquid temperature: 0..40 °C



# WASTEWATER TRANSFER

## Service offerings



Customized Service Agreement



Commissioning

## Monitors, Controls and Sensors

### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

### Pump control - **Control DC**



Grundfos Control DC is a control system designed for installation in municipal wastewater transportation installations, commercial buildings or network pumping stations with up to six wastewater pumps. Advanced control and data communication are also possible.

### Level Control - **LC 231 / LC 241**



LC 231 pump controllers are designed for level control, monitoring and protection of pumping systems, one or two pumps starting DOL up to 12 Amp. LC 241 level controllers are designed for waste water pumping systems, monitoring and control of one or two pumps, up to 72 Amp.

### Level Transmitters - **MS1, M2, FS1**

Float switches for level control/monitoring in tanks, pumping stations or similar applications.



### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



### Flow Sensors - **MAG 3100, 5100, 8000**

Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.



### Pump control accessories - **IO (for wastewater pumps)**

Various input and output modules for control solutions.





## WASTEWATER TRANSFER

### Drives

#### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

#### Service offerings



Customized Service Agreement



Commissioning



## CHEMICAL TREATMENT

- CU 382 control unit handles number of analogue/digital input/output for control and monitoring of water quality and accordingly have dosing control (example: pH control, ClO<sub>2</sub> dosing, Cl dosing etc.).
- Polydos for **coagulation/flocculation**: Compact and flexible installation of a **fully integrated system** including material handling, preparation and maturing, and solution dosing.

### Agitators

Mixers - **AMD, AMG, SMD, SMG**



Grundfos mixers are designed for mixing, i.e. homogenisation and suspension of low/medium viscosity liquids in small tanks and pumping stations.

Liquid temperature: 0..60 °C

### Pumps

Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

Submersible wastewater pumps - **S**



The S pumps are a range of free-flow channel impeller pumps specifically designed for pumping sewage and wastewater in a wide range of municipal and industrial applications.

Flow max.: 6793 m<sup>3</sup>/h      Head max.: 116 m  
Liquid temperature: 0..50 °C

Submersible wastewater pumps - **SE, SE1, SEV**



Submersible Grundfos SE sewage pumps are fitted with either S-tube (SE1) or SuperVortex impeller (SEV). The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 83 l/s      Head max.: 44 m  
Liquid temperature: 0..40 °C

Submersible wastewater pumps - **SEG**



Submersible Grundfos SEG sewage grinder pumps are designed for pumping wastewater, sludge-containing water, and sewage. Fitted with a patented grinder system designed to grind the media.

Flow max.: 10 l/s      Head max.: 48 m  
Liquid temperature: 0..40 °C      p max.: 6 bar

Submersible wastewater pumps - **SL**



Submersible Grundfos SL sewage pumps are fitted with an S-tube<sup>®</sup> impeller. The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 83 l/s      Head max.: 31 m  
Liquid temperature: 0..40 °C      p max.: 6 bar

Submersible wastewater pumps - **SLV**



Submersible Grundfos SLV sewage pumps are fitted with a SuperVortex impeller. The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 40 l/s      Head max.: 46 m  
Liquid temperature: 0..40 °C      p max.: 6 bar



## CHEMICAL TREATMENT

### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

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Flow max.: 200 l/h  
Liquid temperature: -10..50 °C    p max.: 16 bar

### Digital Dosing Pumps - **DME**



Digital diaphragm dosing pump with variable-speed motor drive. For enhanced accuracy, the pump can be calibrated to the actual installation by means of a simple calibration function. The turndown ratio is 1 to 800 with the same accuracy and uniform dosage with reduced pulsation throughout the capacity range.

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Flow max.: 940 l/h  
p max.: 10 bar

### Mechanical Dosing Pumps - **DMX**



With their robust diaphragm-based design and their 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.

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Flow max.: 4000 l/h  
Liquid temperature: -10..70 °C    p max.: 10 bar

### Mechanical Dosing Pumps - **DMH**



The DMH range is a series of extremely strong, robust hydraulically actuated piston diaphragm dosing 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.

---

Flow max.: 3000 l/h  
Liquid temperature: -10..90 °C    p max.: 200 bar

### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.



## CHEMICAL TREATMENT

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Level Transmitters - **Level Transmitter S, E, W**



Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.

#### Communication Interfaces - **E-Box**



The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.

#### Pump control accessories - **IO (for wastewater pumps)**



Various input and output modules for control solutions.

### Systems

#### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## BIOLOGICAL TREATMENT

- SE/SL come in three hydraulic concepts for **different wastewater contamination levels** (semi-open, closed and free flow impellers). The product range is designed for its environments, with extreme durability that covers aggressive environments.
- Grundfos **mixers and flowmakers** keep particles evenly distributed in the wastewater and sludge and can be controlled with Grundfos variable speed drive for optimised energy efficiency.
- The Aerojet can help to **avoid odour problems** during wastewater storage and keep the treatment process running. Since it is submersed, no harmful aerosols are dispersed into the surroundings.

### Agitators

#### Flowmakers - **AFG**



The Grundfos range of horizontal, planetary gear drive AFG flowmakers are designed for flowmaking, i.e. keeping liquids moving in low/medium viscosity liquids. Fitted with motors of 1.5-7.5 kW.

Liquid temperature: 0..40 °C

#### Mixers - **AMD, AMG, SMD, SMG**



Grundfos mixers are designed for mixing, i.e. homogenisation and suspension of low/medium viscosity liquids in small tanks and pumping stations.

Liquid temperature: 0..60 °C

#### Recirculation pumps - **SRG**



Grundfos SRG recirculation pumps are designed for the pumping of sludge from one tank to another in sewage treatment plants and for other pump applications involving a high flow rate and low head.

Flow max.: 1450 l/s      Head max.: 2 m  
Liquid temperature: 0..40 °C

### Pumps

#### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Submersible wastewater pumps - **S**



The S pumps are a range of free-flow channel impeller pumps specifically designed for pumping sewage and wastewater in a wide range of municipal and industrial applications.

Flow max.: 6793 m<sup>3</sup>/h      Head max.: 116 m  
Liquid temperature: 0..50 °C

#### Submersible wastewater pumps - **SE, SE1, SEV**



Submersible Grundfos SE sewage pumps are fitted with either S-tube (SE1) or SuperVortex impeller (SEV). The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 83 l/s      Head max.: 44 m  
Liquid temperature: 0..40 °C

#### Submersible wastewater pumps - **SEG**



Submersible Grundfos SEG sewage grinder pumps are designed for pumping wastewater, sludge-containing water, and sewage. Fitted with a patented grinder system designed to grind the media.

Flow max.: 10 l/s      Head max.: 48 m  
Liquid temperature: 0..40 °C      p max.: 6 bar



## BIOLOGICAL TREATMENT

### Submersible wastewater pumps - **SL**



Submersible Grundfos SL sewage pumps are fitted with an S-tube® impeller. The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 83 l/s      Head max.: 31 m  
Liquid temperature: 0..40 °C      p max.: 6 bar

### Submersible wastewater pumps - **SLV**



Submersible Grundfos SLV sewage pumps are fitted with a SuperVortex impeller. The free passage through the pump varies from 50-100 mm depending on size.

Flow max.: 40 l/s      Head max.: 46 m  
Liquid temperature: 0..40 °C      p max.: 6 bar

### Submersible wastewater pumps - **AP/APG**



AP pumps are designed for pumping wastewater, sludge-containing water, groundwater and sewage. APG are equipped with cutter system for grinding solids into small pieces.

Flow max.: 46 l/s      Head max.: 68 m  
Liquid temperature: 0..40 °C

### Submersible wastewater pumps - **EF**



Grundfos EF pumps have a single-vane, semi-open impeller for 30 mm free passage, designed for pumping effluent and other liquids such as drainage and surface water with fibres and small impurities.

Flow max.: 12 l/s      Head max.: 23 m  
Liquid temperature: 0..40 °C

### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C      p max.: 16 bar

### Digital Dosing Pumps - **DME**



Digital diaphragm dosing pump with variable-speed motor drive. For enhanced accuracy, the pump can be calibrated to the actual installation by means of a simple calibration function. The turndown ratio is 1 to 800 with the same accuracy and uniform dosage with reduced pulsation throughout the capacity range.

Flow max.: 940 l/h  
p max.: 10 bar

### Mechanical Dosing Pumps - **DMX**



With their robust diaphragm-based design and their 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.

Flow max.: 4000 l/h  
Liquid temperature: -10..70 °C      p max.: 10 bar

### Mechanical Dosing Pumps - **DMH**



The DMH range is a series of extremely strong, robust hydraulically actuated piston diaphragm dosing 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.

Flow max.: 3000 l/h  
Liquid temperature: -10..90 °C      p max.: 200 bar

## Monitors, Controls and Sensors

### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

### Communication Interface - **MI 301**



Grundfos remote controls used for installation, data monitoring, fault information and configuration of Grundfos pumps and systems, by radio or IR connections.





## BIOLOGICAL TREATMENT

### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

### Level Transmitters - **Level Transmitter S, E, W**



Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.

### Communication Interfaces - **E-Box**



The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.

### Pump control accessories - **IO (for wastewater pumps)**

Various input and output modules for control solutions.



## Systems

### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

## Accessories

### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## PHYSICAL TREATMENT

- **High pressure** demands can be fulfilled with a **compact pump design** (less stages) by operating at **over-synchronous speed**. Factory configured CRE's with reinforced chambers and impellers can be an option. The motor size must be adjusted accordingly.

### Pumps

#### Vertical multistage pumps - **CR/CRE**



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - **NK/NKE**



Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 l/s      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - **NKG/NKGE**



Standard pumps according to ISO 2858 with axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 231 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Horizontal multistage pumps - **BM**



High pressure booster modules are used for boosting, liquid transfer and circulation in systems under a high static pressure. Modules of different sizes can be combined and connected either in series or in parallel to meet exact Q/H requirements.

Flow max.: 280 m<sup>3</sup>/h      Head max.: 430 m  
Liquid temperature: 0..45 °C



## PHYSICAL TREATMENT

### Horizontal multistage pumps - **BMS**

The Grundfos BMS range consists of hp (high pressure) and hs (high speed) versions. BMS hp are suitable for industrial and water supply applications where the inlet pressure is high. BMS hs enables the creation of high pressure.



Flow max.: 343 m<sup>3</sup>/h      Head max.: 1053 m  
Liquid temperature: 0..40 °C

### Horizontal multistage pumps - **BMSX**

A BMSX booster system consists of a BMS hs high-speed pump, a BM hp high-inlet-pressure pump and an isobaric pressure exchanger. It has a unique design dedicated to seawater and brackish water desalination.



### Digital Dosing Pumps - **SMART Digital S/XL**

SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.



Flow max.: 200 l/h  
Liquid temperature: -10..50 °C      p max.: 16 bar

### Digital Dosing Pumps - **DME**

Digital diaphragm dosing pump with variable-speed motor drive. For enhanced accuracy, the pump can be calibrated to the actual installation by means of a simple calibration function. The turndown ratio is 1 to 800 with the same accuracy and uniform dosage with reduced pulsation throughout the capacity range.



Flow max.: 940 l/h  
p max.: 10 bar

### Mechanical Dosing Pumps - **DMX**

With their robust diaphragm-based design and their 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.



Flow max.: 4000 l/h  
Liquid temperature: -10..70 °C      p max.: 10 bar

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Flow max.: 3000 l/h  
Liquid temperature: -10..90 °C      p max.: 200 bar

### Service offerings



Laser Alignment

### Monitors, Controls and Sensors

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Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.

### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

### Communication Interfaces - **E-Box**



The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.

## Systems

### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h

Liquid temperature: 0..60 °C

Head max.: 161 m

p max.: 16 bar

### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

## Service offerings



Laser Alignment



## PHYSICAL TREATMENT

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## DISINFECTION

### Pumps

#### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C    p max.: 16 bar

#### Digital Dosing Pumps - **DME**



Digital diaphragm dosing pump with variable-speed motor drive. For enhanced accuracy, the pump can be calibrated to the actual installation by means of a simple calibration function. The turndown ratio is 1 to 800 with the same accuracy and uniform dosage with reduced pulsation throughout the capacity range.

Flow max.: 940 l/h  
p max.: 10 bar

### Monitors, Controls and Sensors

#### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



#### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

#### Communication Interfaces - **E-Box**

The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.



#### M&C for Dosing & Disinfection - **DIT-L, DIT-M**



Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.

### Systems

#### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.



## DISINFECTION

### Disinfection Systems

#### Chlorine Dioxide Systems - **Oxiperm Pro**



Compact pre-mounted chlorine dioxide preparation and dosing system. Oxiperm Pro generates a ClO<sub>2</sub> solution from diluted NaClO<sub>2</sub>, HCl and water and supports flow proportional or setpoint controlled dosing. Accessories for installation and measurement of ClO<sub>2</sub> content are part of the product range. Max. ClO<sub>2</sub> prep. quantity: 60 g/h

#### Gas Warning Systems - **DIA-G**



DIA-G gas warning systems monitor the concentration of dangerous gasses with up to two gas sensors. The range also includes accessories like battery backup, horn and flashlight to complete the installation. Available monitoring parameters: chlorine, chlorine dioxide, hydrochloric acid, ammonia and ozone.

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



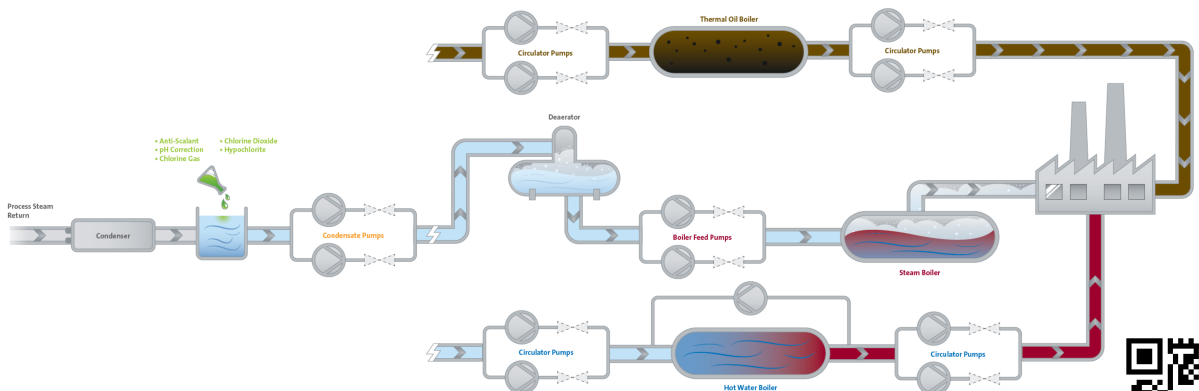
# Industrial Heating

Grundfos supplies thoroughly tested, variable frequency drive-controlled pumps that optimise the boiler feed process. Designed with low NPSH, these solutions cater to systems with poor inlet conditions. This ensures cavitation-free operation even outside the pump's normal duty range. The Grundfos air-cooled top shaft seal solution eliminates the need for external cooling in high-temperature applications.

*"We're seeing a greater energy efficiency of the boiler, gas usage, steam quality is better, control of level is better. No failure rates. No problems whatsoever."*



**Scott Curran, Maintenance Team Leader, William Grant & Sons' Girvan Distillery**





## BOILER SYSTEM

- **Low NPSH** versions (oversized impeller in 1<sup>st</sup> stage) for boiler feed pumps can better handle poor inlet pressure and hot water.
- Some installations result in same temperatures in the feed pumps as in the boiler. With **air-cooled top** the shaft seals are protected.
- **Direct boiler feed** with speed-controlled pumps replaces the modulating valves and leads to lower energy consumption, less stress on components and better steam quality.
- Stable operation with **pump curve compensation** for low flows with Grundfos frequency converters.
- Using a **level sensor** in the boiler for optimum level leads to better steam quality, efficiency and reliability.
- **MAGdrive** or **double shaft seal** to prevent from air entering the pump in duty/stand-by configurations.

### Pumps

#### Vertical multistage pumps - **CR/CRE**



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Endsuction close coupled multistage pumps - **CM/CME**



CM, CME are reliable, quiet and compact horizontal end-suction pumps. The modular pump design makes it easy to make customised solutions.

Flow max.: 36 m<sup>3</sup>/h      Head max.: 132 m  
Liquid temperature: -20..120 °C      p max.: 16 bar

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Inline single-stage pumps - **TP/TPE, TPD/TPED**



Grundfos TP/TPE pumps are single-stage, close-coupled in-line centrifugal pumps with mechanical shaft seal and primarily for applications such as heating/cooling/district energy. TPD/TPDE pumps are the twin-head version.

Flow max.: 4374 m<sup>3</sup>/h      Head max.: 139 m  
Liquid temperature: -40..150 °C      p max.: 25 bar

#### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C      p max.: 16 bar

#### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.

#### Optimisation services - **Energy Optimisation Offering**



A Grundfos Energy Check or Energy Audit will help you find hidden savings in your pump installation. It can also help to reduce your operating expenses and reach your sustainability targets.



## BOILER SYSTEM

### Service offerings



Customized Service Agreement



Commissioning



Grundfos Machine Health

### Monitors, Controls and Sensors

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

#### Level Transmitters - **Level Transmitter S, E, W**



Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



## BOILER SYSTEM

### Flow Sensors - **VFI/VFS**

Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Pressure Sensors - **DPI, DPS, RPI, RPS**

Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.



Liquid temperature: -30..120 °C

### Pressure Sensors - **ISP40, ISP44**

Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.



### Temperature Sensors - **Danfoss MBT 3270**

The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.



### M&C for Dosing & Disinfection - **DID**

The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.



p max.: 3 bar

### M&C for Dosing & Disinfection - **DIT-L, DIT-M**

Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.



## Drives

### External Frequency Converters - **CUE**

CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.



## Systems

### Application-specific bundles - **iSOLUTIONS for Boiler Feed**

With customised software, the variable speed Grundfos CRE pumps can operate outside their set pump curves for unrivalled performance in boiler feed systems.



### Application-specific bundles - **iQ range**

The iSOLUTIONS Q-pump range consists of CRNE high-pressure pumps, specifically designed for maximum utilization of the MGE motor for high pressure applications. The hydraulic part has a flipped stack and reinforced chambers. It is optimised for greater Q/H performance with higher maximum speeds.





## BOILER SYSTEM

### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h      Head max.: 161 m  
Liquid temperature: 0..60 °C      p max.: 16 bar

### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

### Dosing Tank Stations - **DTS**



Dosing tank stations are intended for storing and dosing liquids. Many different configurations can be selected flexibly to fulfil various dosing tasks. They are available in 6 tank sizes: 60 l, 100 l, 200 l, 300 l, 500 l and 1000 l.

## Disinfection Systems

### Chlorine Dioxide Systems - **Oxiperm Pro**



Compact pre-mounted chlorine dioxide preparation and dosing system. Oxiperm Pro generates a ClO<sub>2</sub> solution from diluted NaClO<sub>2</sub>, HCl and water and supports flow proportional or setpoint controlled dosing. Accessories for installation and measurement of ClO<sub>2</sub> content are part of the product range. Max. ClO<sub>2</sub> prep. quantity: 60 g/h

## Service offerings



Customized Service Agreement



Commissioning



Grundfos Machine Health

## Accessories

### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## HEAT DISTRIBUTION

- For high temperatures the shaft seals can be protected with **air-cooled top**.
- The MAGNA3 features a **built-in heat energy meter** that can monitor system heat energy distribution and consumption to **reduce high energy demand** caused by system imbalances.

### Pumps

#### Inline single-stage pumps - **TP/TPE, TPD/TPED**



Grundfos TP/TPE pumps are single-stage, close-coupled in-line centrifugal pumps with mechanical shaft seal and primarily for applications such as heating/cooling/district energy. TPD/TPDE pumps are the twin-head version.

Flow max.: 4374 m<sup>3</sup>/h      Head max.: 139 m  
Liquid temperature: -40..150 °C      p max.: 25 bar

#### Circulator pumps - **MAGNA**



The Grundfos MAGNA circulator pumps are designed for heating and cooling applications in commercial buildings. The pumps are available in both cast-iron and stainless-steel and as twin-head variants. The pumps are maintenance-free due to the canned-rotor type design.

Flow max.: 81 m<sup>3</sup>/h      Head max.: 19 m  
Liquid temperature: -10..110 °C      p max.: 16 bar

#### Circulator pumps - **ALPHA**



The Grundfos ALPHA pumps are high-efficiency variable speed circulators designed for heating, air-conditioning and also suitable for some industrial applications.

Flow max.: 4 m<sup>3</sup>/h      Head max.: 8 m  
Liquid temperature: 0..110 °C      p max.: 10 bar

#### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.

#### Optimisation services - **Energy Optimisation Offering**



A Grundfos Energy Check or Energy Audit will help you find hidden savings in your pump installation. It can also help to reduce your operating expenses and reach your sustainability targets.





## HEAT DISTRIBUTION

### Monitors, Controls and Sensors

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Flow Sensors - **VFI/VFS**



Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.

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Liquid temperature: -30..120 °C

#### Temperature Sensors - **Danfoss MBT 3270**



The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.

### Systems

#### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

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Flow max.: 1464 m <sup>3</sup> /h	Head max.: 161 m
Liquid temperature: 0..60 °C	p max.: 16 bar



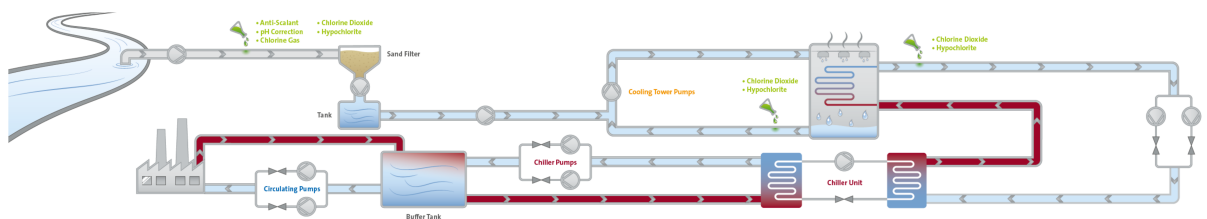
# Industrial Cooling

As the demand for industrial production grows globally, so too does the demand for cooling. In almost every industrial facility, ensuring the right temperature for machines and processes is essential to production efficiency, reliability and quality. Grundfos offers pumps and solutions equipped with variable frequency drive motors and sensors to create a complete solution that can improve operational efficiency and achieve greater OPEX savings.

*"With 40 to 60% energy savings on every project that we're going for, then all the projects are being approved as quick as they're suggested."*



**Daniel Gray, Energy and Sustainability Manager, Sundry Beverage & Food GB & I**





## COOLING TOWER

- Cooling tower **fans** can be intelligently **controlled by MPC** controllers.
- The **cooling tower** with all its devices can be **run with the pump controller** without the need of another controller.
- **Differential temperature control** (according to return temperature) based on RPI+T sensors can significantly reduce OPEX.
- **Onsite chlorine dioxide production** will eliminate biofilm / legionella risk, improving the safety and efficiency of the cooling tower.
- Grundfos iSOLUTIONS (DID + DDA) can automate the **blowdown process**, which leads to lower OPEX through less water and energy consumption.
- When **biocides** reach a defined lower threshold, the **DDA** automatically and accurately adjusts the dosing rate with up to 75 % chemical savings.
- For **scaling and fouling control** the SMART Digital DDA with DDA can maintain a fixed flow and send alarms in case of e.g. low amount of chemicals. Chemical cost can be reduced.

### Pumps

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - **NK/NKE**



Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 l/s      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Inline single-stage pumps - **TP/TPE, TPD/TPED**



Grundfos TP/TPE pumps are single-stage, close-coupled in-line centrifugal pumps with mechanical shaft seal and primarily for applications such as heating/cooling/district energy. TPD/TPDE pumps are the twin-head version.

Flow max.: 4374 m<sup>3</sup>/h      Head max.: 139 m  
Liquid temperature: -40..150 °C      p max.: 25 bar

#### Horizontal splitcase pumps - **LS**



Grundfos LS is a horizontal, single-stage or double-stages, between bearings, split case pump. The axially split design allows easy removal of the top casing and access to the pump components without disturbing the motor or pipe work.

Flow max.: 9503 m<sup>3</sup>/h      Head max.: 238 m  
Liquid temperature: 0..100 °C      p max.: 25 bar

#### Immersible Pumps - **MTR/MTRE**



Vertical multistage centrifugal pump designed for tank top mounting and for pumping of cooling lubricants and cutting oils for machine tools, cooling applications, industrial liquid transfer and similar applications.

Flow max.: 87 m<sup>3</sup>/h      Head max.: 371 m  
Liquid temperature: -10..90 °C      p max.: 38 bar

#### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C      p max.: 16 bar

#### Optimisation services - **Energy Optimisation Offering**



A Grundfos Energy Check or Energy Audit will help you find hidden savings in your pump installation. It can also help to reduce your operating expenses and reach your sustainability targets.



## COOLING TOWER

### Monitors, Controls and Sensors

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

#### Flow Sensors - **VFI/VFS**



Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.

Liquid temperature: -30..120 °C

#### Pressure Sensors - **DPI, DPS, RPI, RPS**



Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.

Liquid temperature: -30..120 °C

#### Pressure Sensors - **ISP40, ISP44**



Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.

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The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.

#### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

#### M&C for Dosing & Disinfection - **DIT-L, DIT-M**



Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.



## COOLING TOWER

### Drives

#### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

#### Drive Accessories - **Sine-wave filter**



Sine wave filters have a high degree of filtering, resulting in a high reduction of the stress on the motor insulation system. At the same time, they reduce the acoustic noise from the motor. Motor losses are reduced due to the fact that a sine-wave filter converts the output pulses of the frequency converter into a sine-wave-shaped.

### Systems

#### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h      Head max.: 161 m  
Liquid temperature: 0..60 °C      p max.: 16 bar

#### Dosing Skid Systems - **DSS and Systems**



There are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.

#### Dosing Tank Stations - **DTS**



Dosing tank stations are intended for storing and dosing liquids. Many different configurations can be selected flexibly to fulfil various dosing tasks. They are available in 6 tank sizes: 60 l, 100 l, 200 l, 300 l, 500 l and 1000 l.

### Disinfection Systems

#### Chlorine Dioxide Systems - **Oxiperm Pro**



Compact pre-mounted chlorine dioxide preparation and dosing system. Oxiperm Pro generates a ClO<sub>2</sub> solution from diluted NaClO<sub>2</sub>, HCl and water and supports flow proportional or setpoint controlled dosing. Accessories for installation and measurement of ClO<sub>2</sub> content are part of the product range. Max. ClO<sub>2</sub> prep. quantity: 60 g/h

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## CHILLER/EVAPORATOR/CONDENSER/COOLING WATER DISTRIBUTION

- In chiller units, setting to **constant temperature** (with E-motor) instead of constant pressure (with regulating valve) **saves energy** and smaller pumps can be used (running faster).
- The **viscosity of glycol and brines** changes with the liquid temperature. Grundfos pumps can be supplied with **oversized motors** that efficiently cope with higher load.
- **Critical cooling processes** require that the **temperature does not deviate**. Grundfos speed-controlled pumps make sure that the temperature is held constant.
- Low temperatures in installations can cause **water condensation** in the motor **at standstill**. With Grundfos **integrated motor heaters** condensation is completely avoided.
- To **prevent deformation** because of **thermal expansion** CRN versions are recommended for **low-temperature applications**.
- On the **secondary side** usually ice water, glycol, brine or alcohol-water are used as cooling liquid. This can be best handled with **stainless steel pumps**.

### Pumps

#### Endsuction close coupled multistage pumps - **CM/CME**

CM, CME are reliable, quiet and compact horizontal end-suction pumps. The modular pump design makes it easy to make customised solutions.



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Flow max.: 36 m <sup>3</sup> /h	Head max.: 132 m
Liquid temperature: -20..120 °C	p max.: 16 bar

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**

Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.



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Flow max.: 4184 m <sup>3</sup> /h	Head max.: 230 m
Liquid temperature: -25..140 °C	p max.: 25 bar

#### Endsuction close coupled single-stage pumps - **NB/NBE**

End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.



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Flow max.: 1401 m <sup>3</sup> /h	Head max.: 177 m
Liquid temperature: -25..120 °C	p max.: 16 bar

#### Endsuction long coupled single-stage pumps - **NK/NKE**

Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.



---

Flow max.: 1401 l/s	Head max.: 177 m
Liquid temperature: -25..120 °C	p max.: 16 bar



## CHILLER/EVAPORATOR/CONDENSER/COOLING WATER DISTRIBUTION

### Inline single-stage pumps - **TP/TPE, TPD/TPED**



Grundfos TP/TPE pumps are single-stage, close-coupled in-line centrifugal pumps with mechanical shaft seal and primarily for applications such as heating/cooling/district energy. TPD/TPDE pumps are the twin-head version.

Flow max.: 4374 m<sup>3</sup>/h      Head max.: 139 m  
Liquid temperature: -40..150 °C      p max.: 25 bar

### Circulator pumps - **MAGNA**



The Grundfos MAGNA circulator pumps are designed for heating and cooling applications in commercial buildings. The pumps are available in both cast-iron and stainless-steel and as twin-head variants. The pumps are maintenance-free due to the canned-rotor type design.

Flow max.: 81 m<sup>3</sup>/h      Head max.: 19 m  
Liquid temperature: -10..110 °C      p max.: 16 bar

### Horizontal splitcase pumps - **LS**



Grundfos LS is a horizontal, single-stage or double-stages, between bearings, split case pump. The axially split design allows easy removal of the top casing and access to the pump components without disturbing the motor or pipe work.

Flow max.: 9503 m<sup>3</sup>/h      Head max.: 238 m  
Liquid temperature: 0..100 °C      p max.: 25 bar

### Immersible Pumps - **MTR/MTRE**



Vertical multistage centrifugal pump designed for tank top mounting and for pumping of cooling lubricants and cutting oils for machine tools, cooling applications, industrial liquid transfer and similar applications.

Flow max.: 87 m<sup>3</sup>/h      Head max.: 371 m  
Liquid temperature: -10..90 °C      p max.: 38 bar

### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.

## Monitors, Controls and Sensors

### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

### Flow Sensors - **VFI/VFS**



Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.

Liquid temperature: -30..120 °C





## CHILLER/EVAPORATOR/CONDENSER/COOLING WATER DISTRIBUTION

### Pressure Sensors - **ISP40, ISP44**



Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.

### Temperature Sensors - **Danfoss MBT 3270**



The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.

### M&C for Dosing & Disinfection - **DIT-L, DIT-M**



Photometers for several parameters (e.g. chlorine, ClO<sub>2</sub>, O<sub>3</sub>, pH), with two different wavelengths, with high-quality interference filters and long-term stable LEDs as light source, without moving parts, automatic selection of the wavelength, easy operation.

## Drives

### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

### Drive Accessories - **Sine-wave filter**



Sine wave filters have a high degree of filtering, resulting in a high reduction of the stress on the motor insulation system. At the same time, they reduce the acoustic noise from the motor. Motor losses are reduced due to the fact that a sine-wave filter converts the output pulses of the frequency converter into a sine-wave-shaped.

## Systems

### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h

Head max.: 161 m

Liquid temperature: 0..60 °C

p max.: 16 bar



# Machining

Machining processes such as grinding, turning, milling, boring, sawing, wire cutting and spark erosion lie at the heart of industrial manufacturing, where accuracy, economy and reliability count for everything. The Grundfos range of immersible machine tool coolant pumps and high-pressure pumps for machining processes offer unsurpassed accuracy and stability to make sure that nothing interferes with these delicate processes. Integrated variable frequency drives can be optionally supplied for increased system efficiency and flexibility. Our immersible pumps suitable for machine tool applications offer a tank-mounted design, and our dry-installed multi-stage pumps are also well-suited for machine tool applications.

*"Grundfos has handled the changeover to the horizontally mounted end-suction pump with open impeller very professionally. You could already tell that the people are at home in the machine tool industry."*



Ralf Dörr, Process Planning  
Gearboxes, ZF Saarbrücken



## CLEAN SIDE

- For installations with **limited space** (i.e., installation in cabinets or machine centers) **high rpm versions** with over-synchronous operation can be suitable and provide the required flow and head, with a more compact pump design.
- **Leaking pumps** may lead to contamination and costly downtime. MTR pumps eliminate this risk with **drainage back to tank** (DBT).
- When **multiple duty points** are needed, E-pumps and sensors can speed up and slow down pumps to fulfil larger Q/H areas, and thereby replace 2 - 3 pumps or control valves with one E-pump.
- For global OEMs **stock costs** can be **reduced** with our IE5 E-motors providing multiple **approvals** and 50/60 Hz in one pump.
- The immersible pumps can be adjusted in length to accommodate different tank designs.
- The pumps are available in complete **stainless-steel** execution for **special applications**.
- The MTH/MTHE pumps are designed with **compactness** in mind increasing the ease of installation.

### Pumps

#### Immersible Pumps - MTR/MTRE



Vertical multistage centrifugal pump designed for tank top mounting and for pumping of cooling lubricants and cutting oils for machine tools, cooling applications, industrial liquid transfer and similar applications.

Flow max.: 87 m <sup>3</sup> /h	Head max.: 371 m
Liquid temperature: -10..90 °C	p max.: 38 bar

#### Immersible Pumps - SPK/SPKE



Vertical multistage centrifugal pump designed for tank top mounting and for pumping of cooling lubricants and cutting oils for machine tools, condensate transfer and similar applications.

Flow max.: 5 m <sup>3</sup> /h	Head max.: 98 m
Liquid temperature: -10..90 °C	p max.: 0 bar

#### Immersible Pumps - MTH/MTHE



Vertical multistage centrifugal pump designed for tank top mounting and for pumping of cooling lubricants and cutting oils for machine tools, cooling applications, industrial liquid transfer and similar applications.

Flow max.: 22 m <sup>3</sup> /h	Head max.: 102 m
Liquid temperature: -10..90 °C	p max.: 10 bar

#### Immersible Pumps - MTS/MTSE



Screw spindle pump designed for pumping cooling lubricants and cutting oils for machine tool applications.

Flow max.: 17 m <sup>3</sup> /h	Head max.: 1037 m
Liquid temperature: 0..80 °C	p max.: 100 bar



## CLEAN SIDE

### Vertical multistage pumps - **CR/CRE**



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

### Endsuction close coupled multistage pumps - **CM/CME**



CM, CME are reliable, quiet and compact horizontal end-suction pumps. The modular pump design makes it easy to make customised solutions.

Flow max.: 36 m<sup>3</sup>/h      Head max.: 132 m  
Liquid temperature: -20..120 °C      p max.: 16 bar

### Endsuction close coupled single-stage pumps - **NBG/NBGE**



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

### Endsuction long coupled single-stage pumps - **NKG/NKGE**



Standard pumps according to ISO 2858 with axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 231 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

### Endsuction long coupled single-stage pumps - **NK/NKE**



Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

Flow max.: 1401 l/s      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

## Service offerings



Customized Service Agreement



Commissioning

## Monitors, Controls and Sensors

### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.



## CLEAN SIDE

### Motor Protection - **Control MP 204**

Pump controller system designed for water utility market. Complete protection of one pump.



### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



### Temperature Sensors - **Danfoss MBT 3270**

The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.



### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

## Drives

### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

## Service offerings



Customized Service Agreement



Commissioning



## DIRTY SIDE

- The MTA pumps are available in **different immersible lengths** to accommodate different tank designs.
- The MTA pumps are designed **without shaft seal** to increase service life.
- The NBG/NKG pumps are built according to ISO 5199/2858. The impeller is designed according to the **super vortex principle**; thus, chips and fibers up to 25 mm will not clog up the pump.
- The NBG/NKG pumps are available in different materials with a broad range of shaft seal combinations to accommodate almost any customer requirement.

### Pumps

#### Immersible Pumps - **MTA**



Single stage pump for tank top mounting for pumping cooling lubricants and cutting oils for machine tool applications.

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Flow max.: 21 m<sup>3</sup>/h      Head max.: 20 m  
Liquid temperature: 0..60 °C

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

---

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

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Standard pumps according to ISO 2858 with axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.

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Flow max.: 1401 m<sup>3</sup>/h      Head max.: 231 m  
Liquid temperature: -25..140 °C      p max.: 25 bar





## DIRTY SIDE

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

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The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

### Drives

#### External Frequency Converters - **CUE**



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# Cleaning Processes

Part washing applications are notoriously demanding, as they often use aggressive liquids, high temperatures and high pressures. Using conventional pumps, this would result in bulky installations where the motor's power is not fully utilised. Wash and clean applications in the food processing industry, such as slaughterhouses and breweries, place restrictions on the physical size of the pump, as the equipment either is installed in a cabinet or fitted on a trolley moved by hand.

*"By adjusting the pump capacity to the actual pressure required, a saving of 90 percent in energy consumption and energy costs was achieved. In the case of the parts cleaning system under consideration, these measures save 51,410 kWh of electricity per year and thus costs of around 6,200 €. With a total investment of only 3,800 €, this results in a return on investment of over 100 percent. The efficiency measures developed can in principle be extended to numerous comparable plants, enabling the company to tap further savings potential."*



Özkan Karakurt, WPS/WSE,  
Mercedes-Benz plant  
Untertürkheim



## FOOD

- **High pressure** demands can be fulfilled with a **compact pump design** (less stages) by operating at **over-synchronous speed**. Factory configured CRE's with reinforced chambers and impellers can be an option. The motor size must be adjusted accordingly.
- **Flow** demand can **change fast** with large variations. **Ramp and control trim** can **take stress from the pumps**.
- **Standstill motor heaters** are recommended **for very cold ambient temperatures** to **reduce condensation**. Drain holes might also need to be opened.

### Pumps

#### Vertical multistage pumps - **CR/CRE**



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Endsuction close coupled multistage pumps - **CM/CME**



CM, CME are reliable, quiet and compact horizontal end-suction pumps. The modular pump design makes it easy to make customised solutions.

Flow max.: 36 m<sup>3</sup>/h      Head max.: 132 m  
Liquid temperature: -20..120 °C      p max.: 16 bar

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**



Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
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#### Endsuction close coupled single-stage pumps - **NB/NBE**



End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Horizontal multistage pumps - **BMS**



The Grundfos BMS range consists of hp (high pressure) and hs (high speed) versions. BMS hp are suitable for industrial and water supply applications where the inlet pressure is high. BMS hs enables the creation of high pressure.

Flow max.: 343 m<sup>3</sup>/h      Head max.: 1053 m  
Liquid temperature: 0..40 °C

#### Immersible Pumps - **MTR/MTRE**



Vertical multistage centrifugal pump designed for tank top mounting and for pumping of cooling lubricants and cutting oils for machine tools, cooling applications, industrial liquid transfer and similar applications.

Flow max.: 87 m<sup>3</sup>/h      Head max.: 371 m  
Liquid temperature: -10..90 °C      p max.: 38 bar

#### Digital Dosing Pumps - **SMART Digital S/XL**



SMART Digital diaphragm dosing pump with powerful variable-speed stepper motor (S) or powerful PMS (Permanent Magnet Synchronous) motor (XL) and FlowControl system to automatically detect malfunctions. High-end solution for complex and demanding applications with turn-down ratio up to 1:3000.

Flow max.: 200 l/h  
Liquid temperature: -10..50 °C      p max.: 16 bar





## FOOD

### Service offerings



Customized Service Agreement



Commissioning



Grundfos Machine Health

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Communication Interface - **MI 301**



Grundfos remote controls used for installation, data monitoring, fault information and configuration of Grundfos pumps and systems, by radio or IR connections.

#### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

#### Communication Interfaces - **E-Box**



The E-Box device enables our digital dosing pumps SMART Digital S to communicate with a wired transmission to a various range of fieldbus standards.

### Drives

#### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

#### Drive Accessories - **Sine-wave filter**



Sine wave filters have a high degree of filtering, resulting in a high reduction of the stress on the motor insulation system. At the same time, they reduce the acoustic noise from the motor. Motor losses are reduced due to the fact that a sine-wave filter converts the output pulses of the frequency converter into a sine-wave-shaped.



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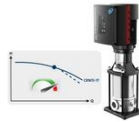
## Systems

### Application-specific bundles - **iQ range**



The iSOLUTIONS Q-pump range consists of CRNE high-pressure pumps, specifically designed for maximum utilization of the MGE motor for high pressure applications. The hydraulic part has a flipped stack and reinforced chambers. It is optimised for greater Q/H performance with higher maximum speeds.

### Application-specific bundles - **iSOLUTIONS Compact Performance**



The most compact and cost effective full featured CRNE range possible sized to utilize full power in the primary operating area, often saving a motor size compared to traditional motor sizing. iCP is the perfect choice when available space is tight and efficiency is paramount.

### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h      Head max.: 161 m  
Liquid temperature: 0..60 °C      p max.: 16 bar

## Service offerings



Customized Service Agreement



Commissioning



Grundfos Machine Health

## Accessories

### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



## NON FOOD

- **High pressure** demands can be fulfilled with a **compact pump design** (less stages) by operating at **over-synchronous speed**. Factory configured CRE's with reinforced chambers and impellers can be an option. The motor size must be adjusted accordingly.
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### Pumps

#### Vertical multistage pumps - **CR/CRE**



Vertical, multistage centrifugal pump with suction and discharge ports on the same level.

Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Endsuction close coupled multistage pumps - **CM/CME**



CM, CME are reliable, quiet and compact horizontal end-suction pumps. The modular pump design makes it easy to make customised solutions.

Flow max.: 36 m<sup>3</sup>/h      Head max.: 132 m  
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Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
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End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.

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Flow max.: 200 l/h  
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#### Customised Solutions - **Custom-Built Pumps**



Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.



## NON FOOD

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Pump controller system designed for water utility market. Complete protection of one pump.

#### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

#### Level Transmitters - **MS1, M2, FS1**



Float switches for level control/monitoring in tanks, pumping stations or similar applications.



## NON FOOD

### Level Transmitters - **Level Transmitter S, E, W**

Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.



### Pressure Sensors - **ISP40, ISP44**



Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.

### Temperature Sensors - **ITS**

ITS is an integrated temperature sensor from Grundfos Direct Sensors. It is fully compatible with wet, aqueous media and based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.



### Temperature Sensors - **Danfoss MBT 3270**

The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.



### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

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## NON FOOD

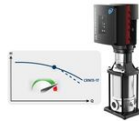
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The iSOLUTIONS Q-pump range consists of CRNE high-pressure pumps, specifically designed for maximum utilization of the MGE motor for high pressure applications. The hydraulic part has a flipped stack and reinforced chambers. It is optimised for greater Q/H performance with higher maximum speeds.

#### Application-specific bundles - **iSOLUTIONS Compact Performance**



The most compact and cost effective full featured CRNE range possible sized to utilize full power in the primary operating area, often saving a motor size compared to traditional motor sizing. iCP is the perfect choice when available space is tight and efficiency is paramount.

#### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h      Head max.: 161 m  
Liquid temperature: 0..60 °C      p max.: 16 bar

### Accessories

#### Dosing Pump Accessories - **General and Tank Accessories**



Comprehensive range of accessories for safe operation covering every requirement when dosing with Grundfos pumps. The range includes: installation kits, tanks, mixers, suction lances, tubing, adaptors, connectors, various valve types, pulsation dampeners, injection units, etc.



# Process Fluid Transfer

Process liquids are liquids that are used in industrial processes for various purposes, such as cooling, heating, cleaning, chemical reactions or as ingredients. Examples of process liquids include water, oil, acids (e.g. hydrochloric acid and sulfuric acid), bases (e.g. sodium hydroxide and potassium hydroxide), and solvents (e.g. ethanol and methanol). These liquids are used in a wide range of industries, including food and beverage, chemical, pharmaceutical, and manufacturing. Certain requirements to the pumps are important to consider when pumping process liquids such as temperature, viscosity, corrosion/chemical resistance and safety. Grundfos offers the right standard and customised solutions for a wide range of applications.





## PROCESS FLUID TRANSFER

- For high-viscous liquids precautions must be taken to ensure that the motor of the pump is not overloaded. The viscosity of a pumped liquid depends strongly on the liquid temperature. We offer CR pumps with oversize motors for stable operation.

### Pumps

#### Endsuction close coupled multistage pumps - **CM/CME**

CM, CME are reliable, quiet and compact horizontal end-suction pumps. The modular pump design makes it easy to make customised solutions.



Flow max.: 36 m<sup>3</sup>/h      Head max.: 132 m  
Liquid temperature: -20..120 °C      p max.: 16 bar

#### Vertical multistage pumps - **CR/CRE**

Vertical, multistage centrifugal pump with suction and discharge ports on the same level.



Flow max.: 336 m<sup>3</sup>/h      Head max.: 487 m  
Liquid temperature: -40..150 °C      p max.: 40 bar

#### Customised Solutions - **Custom-Built Pumps**

Customised pumps to meet specific application challenges (temperatures, pressures, difficult liquids) or installation requirements (ambient conditions) not covered by the standard pump range. It is a modular platform built on stocked components. For more information please contact Grundfos sales.



#### Immersible Pumps - **MTR/MTRE**

Vertical multistage centrifugal pump designed for tank top mounting and for pumping of cooling lubricants and cutting oils for machine tools, cooling applications, industrial liquid transfer and similar applications.



Flow max.: 87 m<sup>3</sup>/h      Head max.: 371 m  
Liquid temperature: -10..90 °C      p max.: 38 bar

#### Endsuction close coupled single-stage pumps - **NB/NBE**

End-suction close-coupled pumps according to EN 733. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.



Flow max.: 1401 m<sup>3</sup>/h      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction close coupled single-stage pumps - **NBG/NBGE**

Close-coupled pumps according to ISO 2858. Flanges are PN 16 with dimensions according to AS2129 table E. The pump has an axial suction port, radial discharge port, horizontal shaft and a back pull-out design enabling removal of the motor, motor stool, cover and impeller without disturbing the pump housing or pipework.



Flow max.: 4184 m<sup>3</sup>/h      Head max.: 230 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

#### Endsuction long coupled single-stage pumps - **NK/NKE**

Standard pumps according to EN 733. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.



Flow max.: 1401 l/s      Head max.: 177 m  
Liquid temperature: -25..120 °C      p max.: 16 bar

#### Endsuction long coupled single-stage pumps - **NKG/NKGE**

Standard pumps according to ISO 2858 with axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the coupling, bearing bracket and impeller without disturbing the motor, pump housing or pipework.



Flow max.: 1401 m<sup>3</sup>/h      Head max.: 231 m  
Liquid temperature: -25..140 °C      p max.: 25 bar

### Service offerings



Customized Service Agreement



Laser Alignment



Commissioning



Grundfos Machine Health





## PROCESS FLUID TRANSFER

### Monitors, Controls and Sensors

#### Communication Interfaces - **CIM/CIU**



Communication Interface Module/Communication Interface Unit is the range of communication options from Grundfos. They enable you to connect your product to the wide range of field bus standards.

#### Motor Protection - **Control MP 204**



Pump controller system designed for water utility market. Complete protection of one pump.

#### Pump control - **Control MPC**



Control MPC controls up to six identical pumps connected in parallel. It uses advanced algorithms to optimise performance and minimise energy consumption

#### Temperature Sensors - **Danfoss MBT 3270**



The MBT 3270 is an easy and cost-effective way to equip our MGE and CUE control products with a robust temperature measurement possibility. The sensors are resistance based with a Pt 100 output.

#### M&C for Dosing & Disinfection - **DID**



The DID system with bypass flow cell is intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The system is preassembled on a common backplate and includes a control unit CU382 as well as the water parameter sensor(s). Several accessories are available.

p max.: 3 bar

#### Pressure Sensors - **DPI, DPS, RPI, RPS**



Our pressure sensor ranges are designed to be robust, accurate and reliable. Depending on the product family they measure relative or differential pressure and temperature. They use our Silicoat coating to be in direct contact with the media and provide stable signals.

Liquid temperature: -30..120 °C

#### Pressure Sensors - **ISP40, ISP44**



Grundfos ISP40 and ISP44 are robust industrial pressure transmitters which can be used in a wide temperature range and portfolio of wet medias including corrosive properties. They can also handle some degree of water hammering.

#### Temperature Sensors - **ITS**



ITS is an integrated temperature sensor from Grundfos Direct Sensors. It is fully compatible with wet, aqueous media and based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.

#### Level Transmitters - **Level Transmitter S, E, W**



Hydrostatic level transmitters with different versions. S: applicable for most wastewater, drinking water and other media usages, W: wastewater, E: endurance and robustness strengthened product.

#### Flow Sensors - **MAG 3100, 5100, 8000**



Several variants of the Mag Flow system are available, depending on needed requirements and specifications. In general, the system consists of a flow meter and a transmitter of choice. MAG 3100 covers all the applications which the other industry specific sensors do not cover.



## PROCESS FLUID TRANSFER

### Communication Interface - **MI 301**



Grundfos remote controls used for installation, data monitoring, fault information and configuration of Grundfos pumps and systems, by radio or IR connections.

### Motor Protection - **MP 204**



MP 204 protects the motor against overload, dry running and incipient motor defects based on many parameters like: supply voltage, phase sequence or harmonic distortion. It disconnects the contactor if, for example, the current exceeds the preset value. It can be used stand-alone or for example incorporated in a Control DC.

### Level Transmitters - **MS1, M2, FS1**



Float switches for level control/monitoring in tanks, pumping stations or similar applications.

### Flow Sensors - **VFI/VFS**



Flow and temperature sensors designed to be robust and accurate. They use our Silicoat® coating to be in direct contact with the media and provide stable signals.

Liquid temperature: -30..120 °C

## Drives

### External Frequency Converters - **CUE**



CUE is a complete range of external frequency converters designed for speed control of a wide range of Grundfos pumps. CUE has a built-in PI controller and offers the same functionality and user-interface as Grundfos E-pumps. Power range up to 250 kW.

### Drive Accessories - **Sine-wave filter**



Sine wave filters have a high degree of filtering, resulting in a high reduction of the stress on the motor insulation system. At the same time, they reduce the acoustic noise from the motor. Motor losses are reduced due to the fact that a sine-wave filter converts the output pulses of the frequency converter into a sine-wave-shaped.

## Systems

### Booster Systems - **Hydro MPC, Hydro Multi-E**



Advanced and energy efficient pressure boosting system for boosting of clean water. Available with 2 - 6 (2 - 4 for Multi-E) parallel connected pumps, integrated advanced controller and all necessary fittings.

Flow max.: 1464 m<sup>3</sup>/h      Head max.: 161 m  
Liquid temperature: 0..60 °C      p max.: 16 bar

## Service offerings



Customized Service Agreement



Laser Alignment



Commissioning



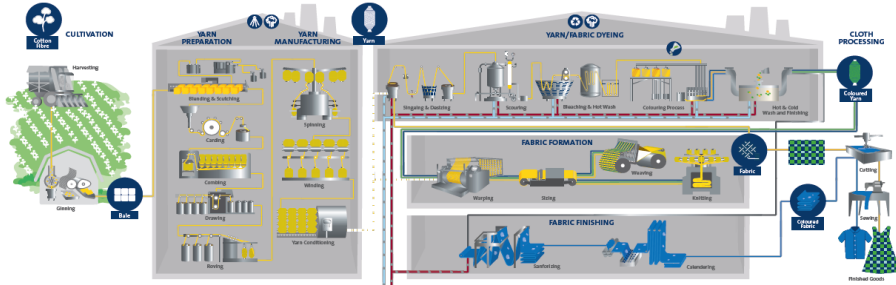
Grundfos Machine Health



# Process Charts

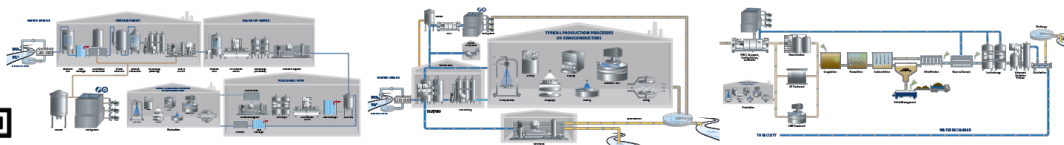
## Grundfos Products in Textile

### GRUNDFOS PRODUCTS IN TEXTILE



## Semiconductor Production Process

### SEMICONDUCTOR PRODUCTION PROCESS



## Pharmaceuticals and Personal Care Products

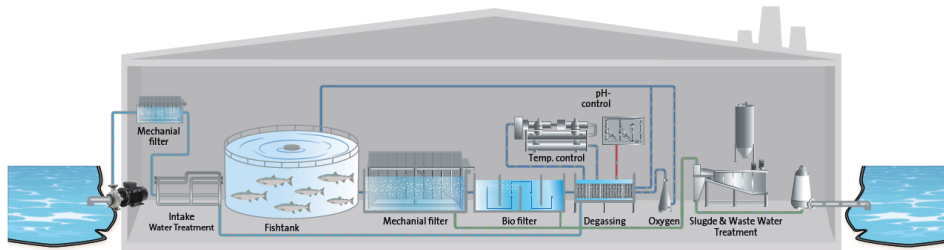
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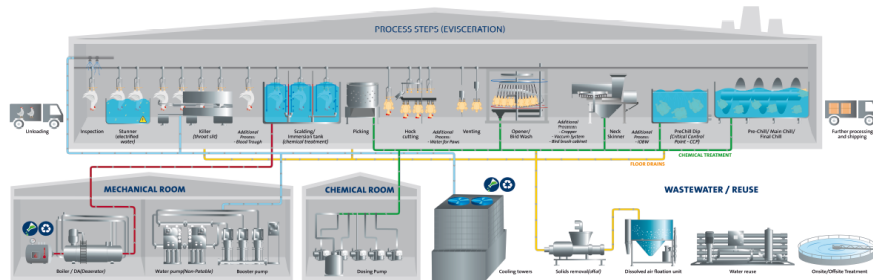


## Food & Beverages

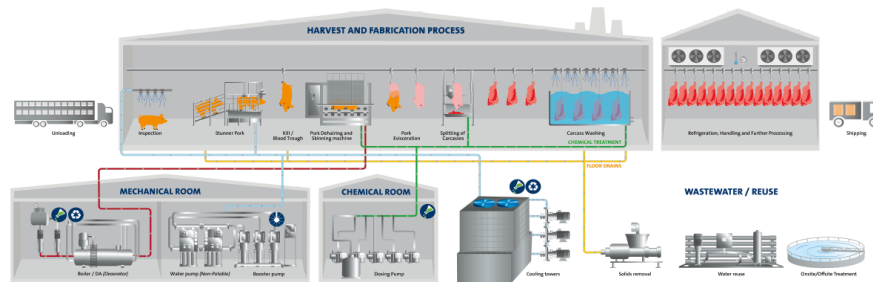
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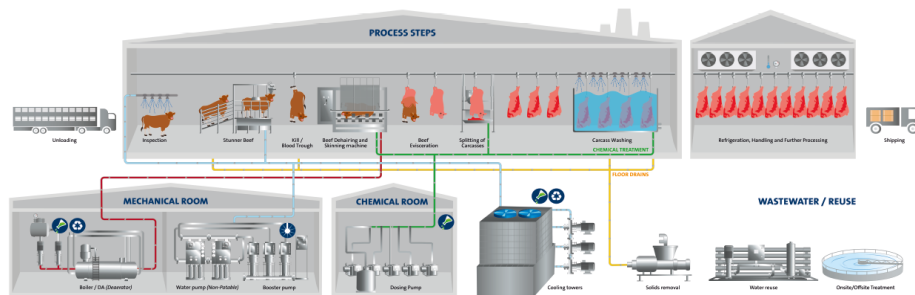
### GRUNDFOS PRODUCTS IN POULTRY



### GRUNDFOS PRODUCTS IN PORK

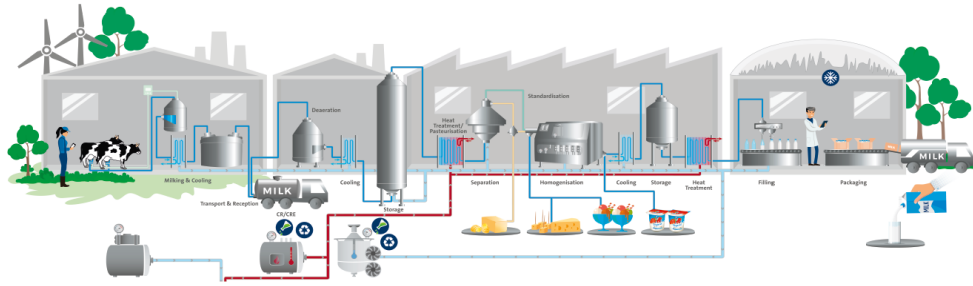


### GRUNDFOS PRODUCTS IN BEEF

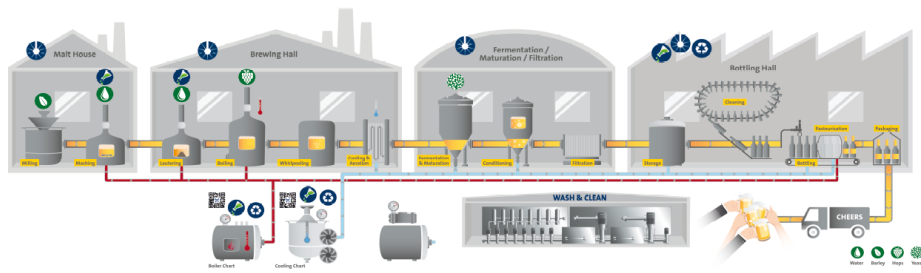




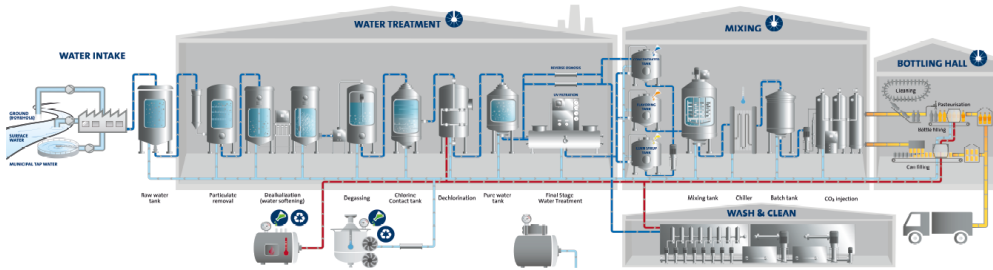
### GRUNDFOS PRODUCTS IN DAIRIES



### GRUNDFOS PRODUCTS IN BREWERIES

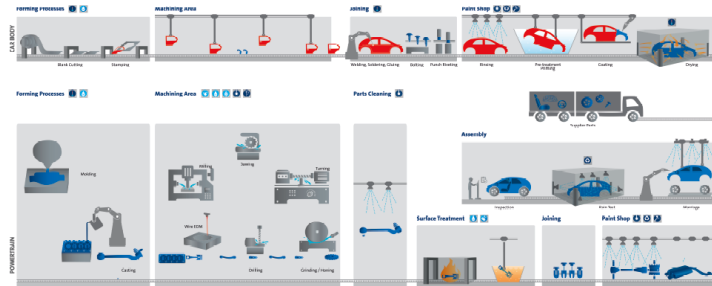


### GRUNDFOS PRODUCTS IN SOFT DRINKS

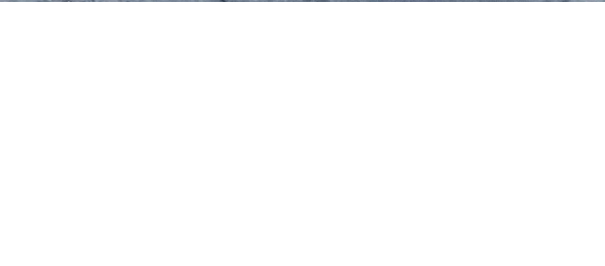


## Mobility

### GRUNDFOS PRODUCTS IN AUTOMOTIVE







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