

# OPTIMISED WATER SOLUTIONS

Pumps and systems for water supply and wastewater challenges.



be  
think  
innovate

**GRUNDFOS** 

# INDIA'S WATER CHALLENGES

Water is a unique, irreplaceable, natural and economic resource, which is unevenly distributed in India and an important basic necessity for human survival. The quantity of fresh water on earth is limited and its availability per person is reducing day by day due to increase in population and ecological degradation.

Though water available in nature is free, sizeable investment and planning is needed in order to make water available to people in the desired quality and quantity on a consistent basis.

Access to safe drinking water was declared as a human right by the United Nations but this remains a challenge for India. Depleting ground water, lack of proper rainwater harvesting mechanism and rising contamination in the ground water, lakes/rivers due to sewage and industrial effluent discharge are posing challenges for the Indian cities.

## SUSTAINABILITY IN GRUNDFOS

ITS ABOUT OUR PRODUCTS, SOLUTIONS AND EXPERTISE

We improve water and energy efficiency for the greater good and we believe in our duty to make a difference locally and globally by solving the issues close to us all

6 CLEAN WATER  
AND SANITATION



### PASSIONATE ABOUT WATER

Here we focus on SDG#6 on Clean Water and Sanitation. We want to contribute to the global water challenge through technology and by utilizing new business models to introduce sustainable water solutions to existing and future customers



## GREEN AT HEART

Digitalization, application knowledge, strong research and development capabilities, coupled with our deep customer and enduser insights, allow us to contribute to global challenges by offering solutions that use as little energy as possible

As per the international norms, countries with per capita water availability less than 1,700 m<sup>3</sup> per year are categorized as water-stressed. Studies show that the projected per capita water availability of India will become 1,401 m<sup>3</sup> and 1,191 m<sup>3</sup> by 2025 and 2050 respectively. Going by the booming economy, population growth, rapid urbanization, changes in food consumption, life-style and land use pattern.

**India is likely to become a water-stressed country soon**

## GRUNDFOS IN WATER UTILITY

Grundfos brings innovative technology to the water utility market. Grundfos's innovation resources are fully focused on its commitment to sustainability, as Grundfos continually strived to set new standards for water and energy use. Water supply and wastewater require practical and effective solutions at a level closest to the consumers of water and energy, in cooperation with all stakeholders.

Grundfos engages with local, regional and global level adding value to the process by contributing with its knowledge and vision for sustainability.

Global Grundfos Water Utility competency network ensures that complex projects get the expertise they require for an optimised project execution, ensuring deliverables at all stages of the project are timely, correct and within budget.



# OPTIMISING LIFECYCLE COSTS AND BUILDING RESOURCE EFFICIENCY

At Grundfos, resource efficiency starts with the pump. We lower product lifecycle costs, ensure sustainable water management and build optimized equipment into the application. The measures we take for resource efficiency are from the outset designed for pumps and pumping systems only, ensuring high reliability, continuous operation and superior performance.

From new installations to refurbishment and replacement of vital components, optimizing resource efficiency has a positive impact on the reliability, overall performance and lifecycle costs of water supply and wastewater operations.

## REFURBISHMENT OPTIMISES PERFORMANCE

Pumping station refurbishment is a source of cost reductions and energy savings. Failure to refurbish in time could result in excessive costs from using too much energy, the increasing risk of breakage in the system, health and environmental hazards to the community, the environment, to workers and end users. Grundfos minimises the impact on the safe and reliable operation throughout the refurbishment period.

Grundfos Pump Audit team has helped a cross section of customers from water supply companies to industries and public buildings facilitating to cut their energy consumption on an average by 40% to 60% just by studying their pumping systems.

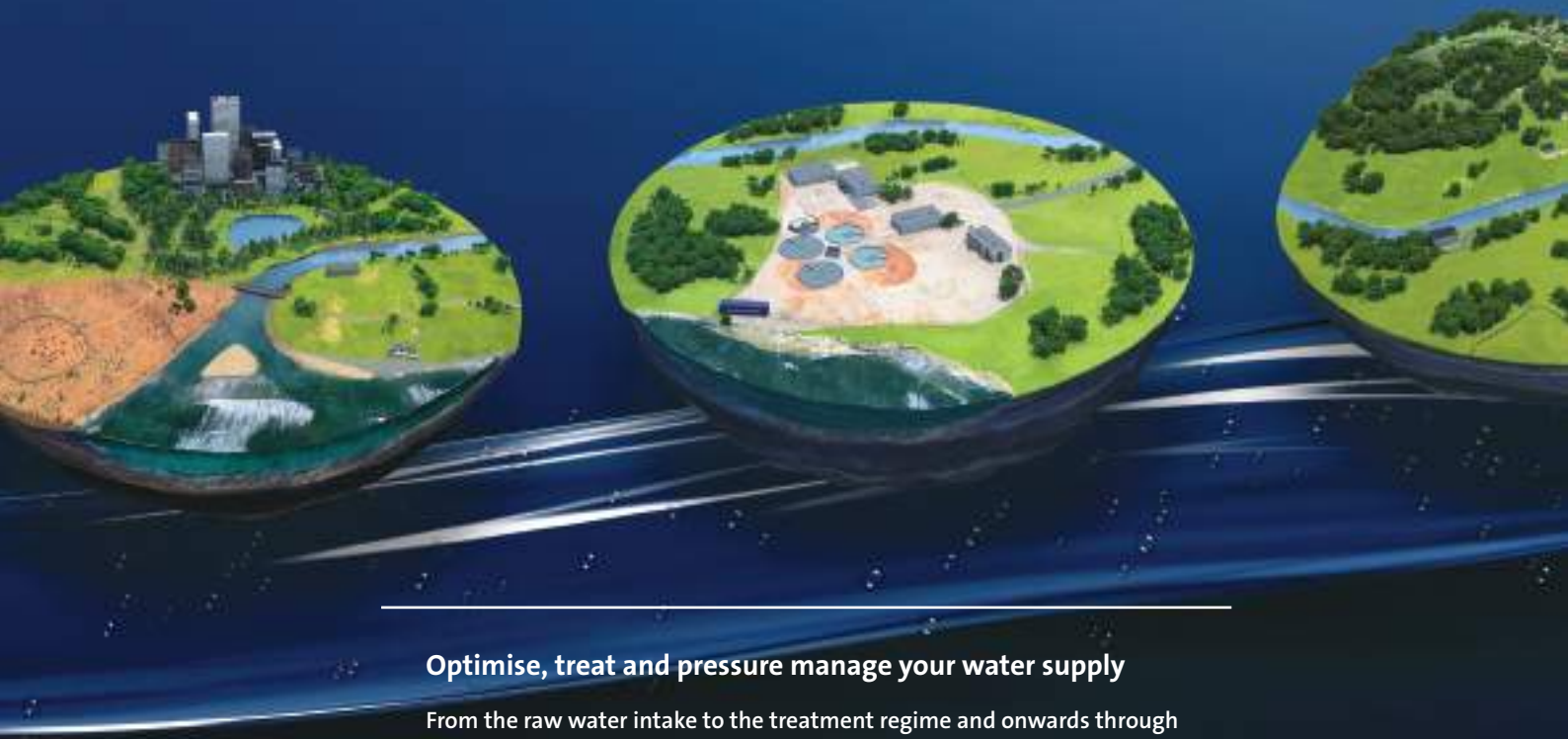


# OPTIMISED SOLUTIONS FOR THE ENTIRE WATER CYCLE

OUR OPTIMISED SOLUTIONS AND SERVICES COMPLEMENT AN UNWAVERING FOCUS ON RESOURCE EFFICIENCY, DESIGN VERIFICATION AND PROJECT CONSULTANCY AND EXECUTION. THAT IS WHAT YOU GET FROM GRUNDFOS, A FULL-LINE SUPPLIER OF PRODUCTS AND SOLUTIONS FOR ALL WATER UTILITY APPLICATIONS.

**RAW WATER INTAKE**

**DRINKING WATER TREATMENT**



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## Optimise, treat and pressure manage your water supply

From the raw water intake to the treatment regime and onwards through the distribution network to the end user, a water supply system must be fully integrated. Resource efficiency requires that the pumps, controls, dosing and disinfection solutions and pressure management regime are made for each other. Grundfos does precisely that.

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**WATER  
DISTRIBUTION**



**WASTEWATER  
TRANSPORT &  
FLOOD CONTROL**



**WASTEWATER  
TREATMENT**



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### **Reliability and modularity for optimised wastewater handling**

Collecting, transporting and treating wastewater is about keeping reliability high. Grundfos products and solutions for wastewater transport, flood control and the wastewater treatment plant build on reliability, modularity and energy efficiency from optimised pump systems and modular solutions.

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# RAW WATER INTAKE

## ENSURING STABLE WATER SUPPLY CONDITIONS

- GROUNDWATER
- RIVERS
- SEAWATER
- LAKES



### GETTING RAW WATER MOVING

Sourcing raw water is the first step in any water supply system. Our cost effective, reliable and energy optimised raw water pumping solutions go further than most to bring water to life in a manner that is financially and environmentally sustainable.

At Grundfos, we have decades of experience manufacturing pumps and motors and developing controller and monitoring systems for pumping solutions. This ensures a perfect match between hydraulics, motors, electrics and all other mechanical components that make up a comprehensive pumping solution, ensuring the highest possible energy efficiency.

Grundfos pioneered the implementation of variable speed drives in pumping operations. Furthermore, we have refined numerous functionalities that cater specifically to pumping conditions.

Experience from a huge installed base of stainless steel submersible pumps and motors is designed into our surface water solutions. Grundfos can supply submersible, end suction, split case and propeller shaft pumps that effectively handle surface water, recycled water and seawater.

In addition to pumps and pump systems optimised for performance and reliability, we supply the tools you need to guarantee the highest possible energy efficiency. We carry out energy audits at the water source giving you the facts and figures you require to optimise your system for top efficiency and reliable operation.

As a full line supplier with unsurpassed experience with groundwater, we have a proven track record of applying our extensive knowledge to all water sources and the entire water supply network.

### FEW REFERENCES

DWASA water supply project - Dhaka, Bangladesh  
Kankroliya Ghati pumping system- Rajasthan, India



# DRINKING WATER TREATMENT

## KEEPING DRINKING WATER QUALITY HIGH

- DESALINATION
- CHEMICAL TREATMENT
- FLOCCULATION AND AERATION
- SEDIMENTATION
- FILTRATION AND BACKWASH
- DISINFECTION
- WATER RESERVOIRS
- INTERSTAGE PUMPING
- MIXING



### YOUR POWERFUL PARTNER

Drinking water treatment is technology driven and heavily regulated. For this reason, you need a partner who, in addition to supplying pumping, dosing and disinfection solutions for each stage of the water treatment cycle, is able to offer packaged solutions for the entire water treatment process. Grundfos offers complete solution including controls to make it work together.

Grundfos supplies a wide range of disinfection methods suitable for different disinfection tasks and requirements. These include effective chlorine and sodium hypochlorite treatment with required residual effect and chlorine dioxide treatment for effective legionella and biofilm control.

Prior to dosing and disinfection, we ensure a uniform bulk flow and oxygenation in the reservoir. We use computer simulations in the design to assess the need for mixing. All necessary mixing and aeration equipment is supplied in accordance with the design requirements.

From planning to reliable delivery, installation and start up, our team combines technical engineering expertise with intercultural competencies and many years of experience. We are your one stop partner for water treatment solutions that require complex engineering and in depth process knowhow and our reliable, proven methods in research, development and production ensure outstanding solutions.

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

### FEW REFERENCES

- Minjur desalination plant - Chennai, India
- Bhandup water treatment plant - Mumbai, India

# WATER DISTRIBUTION

## MANAGING PRESSURE FROM SOURCE TO TAP

- PUMPING STATIONS
- PRESSURE MANAGEMENT
- LEAKAGE REDUCTION
- ENERGY OPTIMIZATION



### SYSTEM DESIGN USING PROPORTIONAL FLOW

To reduce water loss (non-revenue water - NRW) and cut distribution costs, Grundfos offers Demand Driven Distribution (DDD) solution that increases system efficiency, ensures correct water pressure at the consumer and delivers high reliability and intelligent surveillance of the water distribution systems.

Pressure management is now well recognised as being essential to effective leakage management. We package pumps, intelligent components and system surveillance to build unique pressure management solutions that minimise water losses (NRW), reduce energy consumption and minimise operational costs for leaks and pipe maintenance.

The highly variable flow rates that characterise water distribution networks are an important factor affecting cost efficiency and water loss. A tendency in system design has been to size pumps based on maximum demand, however far more time is spent pumping at low flows and the efficiency of such a single pump solution will fall quickly as flow decreases.

The optimal solution is to employ more smaller pumps in parallel controlled by our Multi Pump Controller (MPC). Grundfos systems can be expected to deliver a hydraulic efficiency of up to 80% and the Multi Pump Controller automatically maintains the best efficiency point by cascade operation and speed control.

To design systems based on this principle, Grundfos uses load profiles based on 24 hour consumption patterns. The load profile gives an overview of how much a pumping system operates at a specific flow rate on a daily basis and the system can be designed accordingly.

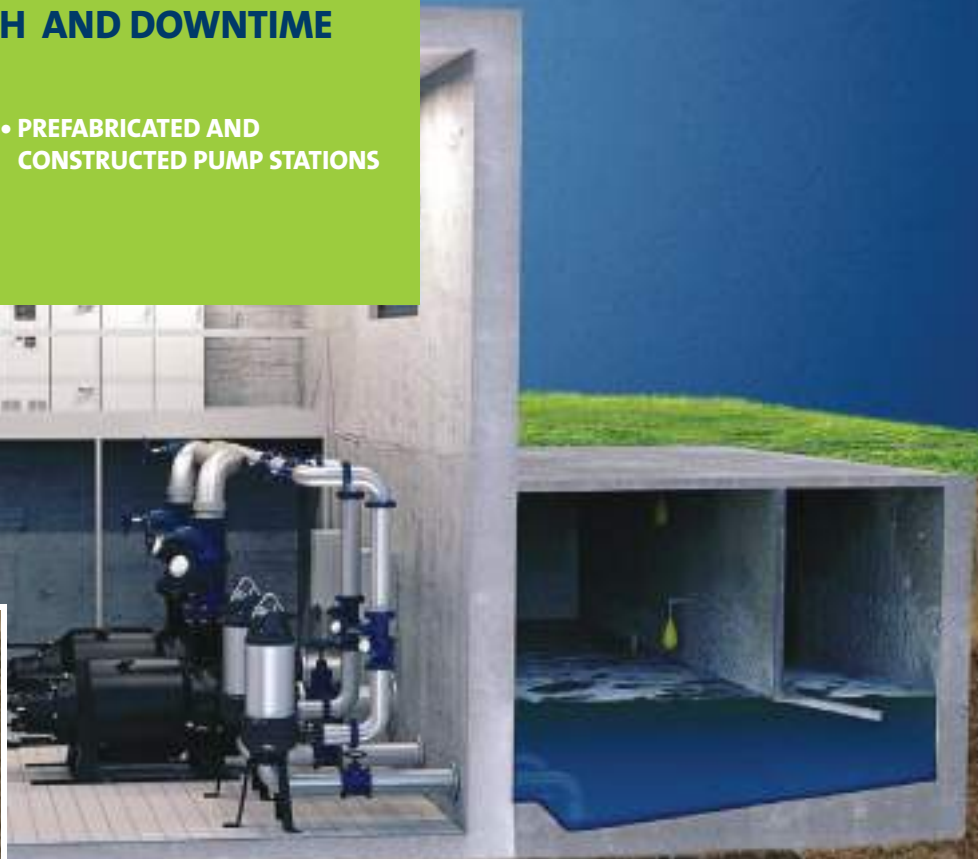
### FEW REFERENCES

11 towns in Ganganagar and Jhunjhunu - Rajasthan, India  
Greater Vizag Municipal Corporation ( GVMC ) - Vizag, India

# WASTEWATER TRANSFER

## KEEPING RELIABILITY HIGH AND DOWNTIME LOW

- SEPARATED AND COMBINED SEWAGE NETWORKS
- STORAGE/RETENTION TANKS
- PRESSURISED COLLECTION SYSTEMS AND LIFTING STATIONS
- PREFABRICATED AND CONSTRUCTED PUMP STATIONS



### EFFICIENT TRANSFER SYSTEM

Dependable, energy efficient solutions for your pumping stations and networks are essential for wastewater collection and transport. In an environment with continuous wastewater inflow, downtime is to be avoided at all costs. Your pumps need to work and risk minimisation needs to be embedded into the system.

A pumping station is complex and getting things right at the design stage is important to avoid issues such as blockages, odours, power outages and flooding. Grundfos takes the greatest risk factors out of the equation when designing or refurbishing a wastewater transport network, ensuring cost effective and reliable operation.

We apply our technology and expertise to benefit the operation and reliability of your installation. Our technology leading wastewater pumps offer the industry's highest total, wire-to-water efficiency. Further variable speed drives, wastewater control and remote monitoring from Grundfos keep you always in complete control of your system.

Our prefabricated pumping stations offer a unique, customised solution where space is critical. We carry out advanced computer modeling of pressurised sewer systems, and for large pumping stations we use Computational Fluid Dynamics (CFD) flow simulation and model testing to optimise the design.

### FEW REFERENCES

Prefabricated sewage pumping station - Aurangabad, India  
Purasaiwakkam sewage pumping station - Chennai, India  
Palmer Bazar, Dhapaloc Ballygunge drainage pumping stations- Kolkata, India

# WASTEWATER TREATMENT

## OPTIMISED SOLUTIONS

- PRE-TREATMENT
- PRIMARY TREATMENT
- CHEMICAL TREATMENT
- BIOLOGICAL TREATMENT
- TERTIARY TREATMENT
- SLUDGE TREATMENT
- WATER REUSE



### MODULAR SOLUTIONS OPTIMISED FROM THE DESIGN PHASE

The efficient treatment of wastewater requires strong technical competencies. At the same time, wastewater treatment plants are required to meet increasingly stringent demands to reduce their impact on the environment and local communities. Wastewater goes through an increasing number of processes before being discharged into receiving waters and each new process increases total energy costs.

From solution design and proposal to project execution and handover and run-in, Grundfos offers one point of contact for all phases of the project. We are a trusted partner for design, verification, installation, operation and maintenance. We save you time, energy and costs.

At the design stage, Grundfos works with you to ensure low life cycle costs and hydraulic stability for mechanical, biological and chemical treatment.

Our contribution starts with the initial identification of needs. Through our design expertise we provide guidance in optimal selection and positioning of equipment. For complex installations, this can include CFD flow simulations in the design and specification phase. Our pumping, mixing, dosing and aeration systems are optimised for each other and we offer pre-engineered and optimised modules for treatment processes.

Biological treatment is the largest and most expensive element at a wastewater treatment plant. In response to flow variations in the tank, variable speed pumps equalize flow and load to the plant so the capacity of the biological process is not exceeded. With our aeration systems, we can further optimise treatment performance, tank layout and minimise operating costs.

### FEW REFERENCES

- Common effluent treatment plant - Tirupur, India
- Sewage treatment plant - Rashtrapati Bhavan - Delhi, India
- Sewage treatment plant - Dholera smart city - Gujarat, India

# FLOOD CONTROL

## RESPONDING TO FLOOD AND STORMWATER RISK

- FLOOD PUMPING STATION DESIGN
- PUMP GATE
- POWERFUL HIGH FLOW PUMPS
- MONITORING AND CONTROL



### WE START WHEN NATURE STOPS

Flood control pumping is characterised by a requirement for high flow and low head. As many flood scenarios are seasonal, flood control pumps may only run occasionally, placing heavy demands on the reliability of the pumping solution.

As part of our dependable, energy efficient flood control solutions, we supply a complete range of products optimised for high total efficiency and low maintenance costs. Applying our design and flow simulation competencies means we can minimise the pumping station footprint, ensure safe pump operation and reduce the total cost of the pumping station.

Storm water tanks are an effective way of reducing peak flow and equalising flow rates from storm water run-offs in the sewer system. Computational Fluid Dynamics (CFD) flow simulation and model testing are used to optimise tank design and our pump and control solutions ensure reliable and automatic operation, regardless of the size. And once the hydraulic load is reduced and capacity is available, you can get storm water moving again with perfect efficiency and reliability.

### FEW REFERENCES

- 5 municipal pumping stations - Kolkata, India
- Gazdharbandh flood control systems - Mumbai, India
- Mobile pumping station - Chennai Airport, India

# IRRIGATION

## CONTROLLABLE DISTRIBUTION

### ADAPTATION TO TERRAIN

- SURFACE IRRIGATION
- LOCALIZED IRRIGATION
- FIXED SPRINKLERS
- TRAVELING IRRIGATORS
- SUB-IRRIGATION
- IN-GROUND IRRIGATION



#### MORE CROP PER DROP WITH VARIABLE SPEED PUMPS

Grundfos offers a large variety of pump solutions that come with intelligent control systems to optimise irrigation efficiency. The right solution for given water sources and certain crop demands is the key to a reliable irrigation system. Remote monitoring and control features provide the possibility for continuous surveillance, analysis and regulation of the entire irrigation process.

When the times call for new thinking, agriculture has always taken on new techniques to boost productivity. And now change is upon us again. The market for agricultural products is both more competitive and volatile than we have seen in decades. At the same time, local water resources are showing undeniable signs of stress.

Now it is time to look for new solutions that can reduce energy costs, safeguard the water resource and keep agricultural productivity at its best. We need to use water more responsibly and get more crop per drop.

Grundfos offers the industry's broadest line of irrigation pumping systems. Our passion for perfection drives us toward designing the most intelligent solutions for today's growing challenges. Our pumping systems are efficient, tested for reliability and designed to work seamlessly with modern farming operations.

With many changes in the market, today's farmers cannot rely on the technology and practices of the past. In the face of depleted water reserves, we must also acknowledge that water is a resource to be managed just as we do with the soil itself.

To get more crop per drop, everyone in the industry needs to pool knowledge and experience to make agriculture more competitive and sustainable. From a pumping perspective, Grundfos can contribute with expertise and technology that can ensure uniform coverage despite changeable conditions.

#### FEW REFERENCES

Indira Gandhi International (IGI) Airport - T3 terminal - Delhi, India  
Kempegowda International Airport - Bengaluru, India  
Rajiv Gandhi International Airport - Hyderabad, India

# CONTROLS & AUTOMATION

## SINGLE SOURCE SUPPLIER

- FLOOD CONTROL
- DEWATERING
- WASTE WATER TRANSFER
- IRRIGATION
- WATER INTAKE
- DOSING AND DISINFECTION



### INTEGRATED SOLUTIONS

Water utility projects require a unique skill set of understanding pump hydraulics and integrating that with electro-mechanical, controls and automation systems. Grundfos India with its decades of experience in this domain provides a complete one-stop solution to projects with it's in house competency.

Grundfos engineering team has been the backbone of water utility projects in designing, executing and maintaining various storm & sewage water pumping stations across Asia Pacific & Africa region. From the year 2004 to date, Grundfos India has executed around 30 projects in this sphere.

CFD analysis, civil structure design, electro-mechanical design, automation and controls, implementation of SCADA systems are the core deliverables of Grundfos India team in these water utility projects.

### FEW REFERENCES

- Controls, Automation and SCADA of Flood control pumping stations - Mumbai, India
- Controls, Automation and SCADA of multiple drainage pumping stations - Kolkata, India
- SCADA based Controls, Remote monitoring systems for intake water systems - Dhaka, India







## WATER DISTRIBUTION

	Distribution	Local Stations	Boosting	Water Towers
SINGLE-STAGE STANDARD PUMPS	●	●	●	●
MULTI-STAGE CENTRIFUGAL PUMPS & SYSTEMS	●	●	●	●
CONTROLS & MONITORING	●	●	●	●
DOSING & DISINFECTION	●	●	●	●



## WASTEWATER TRANSPORT & FLOOD CONTROL

	Pumping from inside building	Main Pumping Station	Pressurised Pumping Station	Network Pumping Station	Flood Control
WASTEWATER PUMPS	●	●	●	●	●
FLOOD CONTROL PUMPS		●			●
MIXERS & FLOWMAKERS		●		●	●
PREFABRICATED PUMPING STATIONS	●	●	●	●	●
CONTROLS & MONITORING	●	●	●	●	●
DOSING & DISINFECTION		●	●	●	



## WASTEWATER TREATMENT

	Inlet	Primary Treatment	Chemical Treatment	Biological Treatment	Tertiary Treatment	Sludge Treatment
SINGLE-STAGE STANDARD PUMPS					●	
MULTI-STAGE CENTRIFUGAL PUMPS & SYSTEMS					●	
WASTEWATER PUMPS	●	●	●	●	●	●
FLOOD CONTROL PUMPS	●			●	●	
MIXERS & FLOWMAKERS	●		●	●	●	●
PREFABRICATED PUMPING STATIONS	●					
CONTROLS & MONITORING	●		●	●	●	
DOSING & DISINFECTION		●	●	●	●	●

A glass of water is tilted, pouring water onto a light blue surface. The water forms a large, irregular splash that spreads across the right side of the page. The background is a solid, light blue color.

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**FLOOD CONTROL  
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**MIXERS &  
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**PREFABRICATED  
PUMPING STATIONS**

**CONTROLS &  
MONITORING**

**DOSING &  
DISINFECTION**



# SUBMERSIBLE PUMPS

Grundfos is a global market leader for submersible groundwater pumps, having perfected the match between the pump, motor and protection, with monitoring and controls available for system optimisation. Grundfos is one of the world's largest manufacturers of high-quality submersible motors, and our motors match the optimum duty points for our SP and SQFlex pumps.





## SUBMERSIBLE PUMPS – SP

Complete range of submersible pumps for groundwater applications are built to deliver optimum efficiency during periods of high demand, with long product life and easy maintenance.

### BENEFITS

- State-of-the-art hydraulics provide high efficiency and low operating costs
- Made entirely of stainless steel to ensure high reliability and long life, even in corrosive environments
- One supplier of the pump, motor and controls for an optimal pumping system

### TECHNICAL DATA

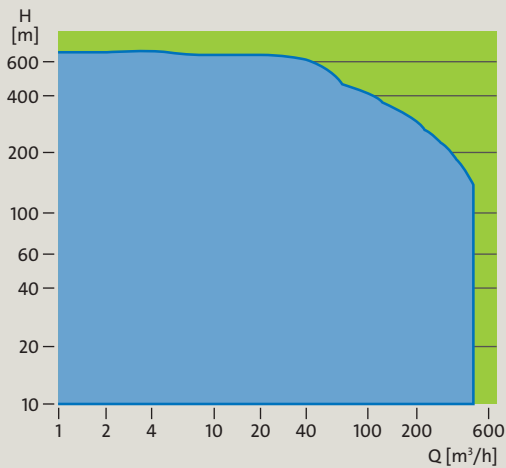
- Motor size: 0.37 kW to 250 kW
- Flow rate (Q): Maximum 470 m<sup>3</sup>/h
- Head (H): Maximum 670 m
- Liquid temperature: 0 °C to +60 °C
- Discharge diameter: 1" to 6"
- Diameter: 4", 6", 8", 10", 12"

### APPLICATIONS

- Raw water intake
- Drinking water treatment

### VARIANTS

- SS 304
- SS 316
- SS 904L



## SUBMERSIBLE PUMPS – SQFlex

Intelligent Solar submersible pump with high efficiency permanent magnet motor is available in both helical and multistage centrifugal hydraulic. A system offering low (or nearly no) operating costs.

### BENEFITS

- High efficiency permanent magnet motor with built-in MPPT software and motor protection
- Flexibility to various power sources from AC or DC
- Tank filling system by connecting to CU200 and remote monitoring through GSM by connecting to CIU Flex

### TECHNICAL DATA

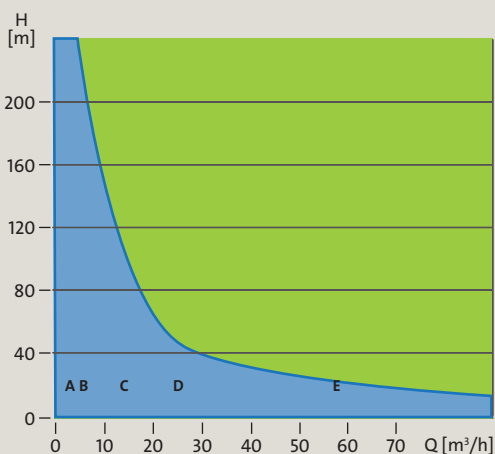
- Motor size: 1.4 kW
- Flow rate (Q): 18 m<sup>3</sup>/h
- Head (H): 250 m
- Liquid temperature: 0 °C to +40 °C
- Enclosure class: IP68
- Maximum system pressure: 15 bar

### APPLICATIONS

- Raw water intake
- Drinking water treatment

### VARIANTS

- Two grades of stainless steel
- SS 304
- SS 316





# **SINGLE-STAGE** **STANDARD PUMPS**

Grundfos single-stage pumps are available for a wide variety of applications, where reliability and cost-efficiency is required. In water utility, single-stage pumps are generally used in raw water or water supply applications where the requirement is for the low head relative to the flow and the designs are available both vertically and horizontally



## END-SUCTION STANDARD PUMPS – NB / NK (NBG / NKG)

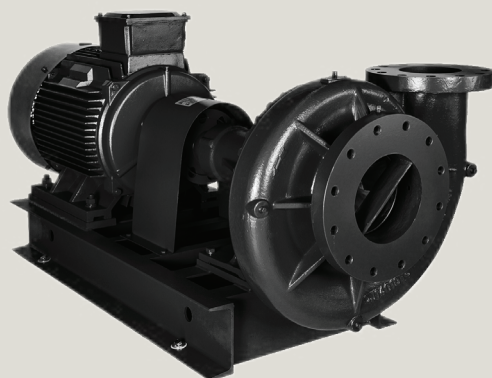
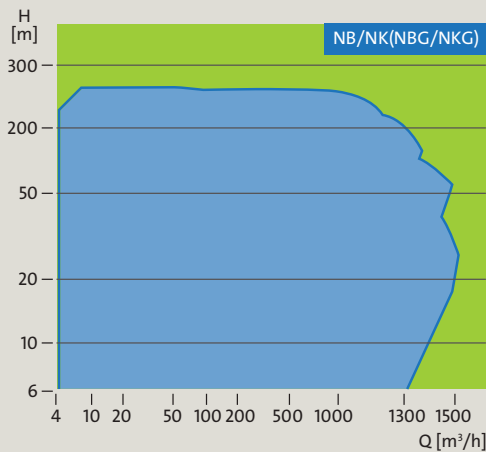
- Large flow/low head multi-purpose pumps available with back pull-out design in either close- or long-coupled versions.
- Non-self-priming, single-stage, centrifugal volute with axial suction port, a radial discharge port and horizontal shaft.
- Back pull-out design enables removal of the motor, coupling, bearing bracket and impeller without disturbing the pump housing or pipework.

### FEATURES & BENEFITS

- Dimensions according to EN 733 and ISO 2858 standards
- Back pull-out design
- EN 12756 shaft seal
- Enclosed, balanced impeller
- CED coated cast iron parts
- Motors are with IE3 efficiency as standard (IE4 is offered as an option)

### TECHNICAL DATA

- Flow, Q : max. 1300 m<sup>3</sup>/h
- Head, H: max. 160 (250) m
- Liquid temperature: -35°C to +140°C (220°C)
- Operating pressures : 16 (25) bar
- Discharge diameter : DN32 – DN300



## END-SUCTION STANDARD PUMPS – LF, LFE

- Non-self-priming, single-stage, a tangential/centre-line discharge, Large flow/low head multi-purpose pumps available with back pull-out design.

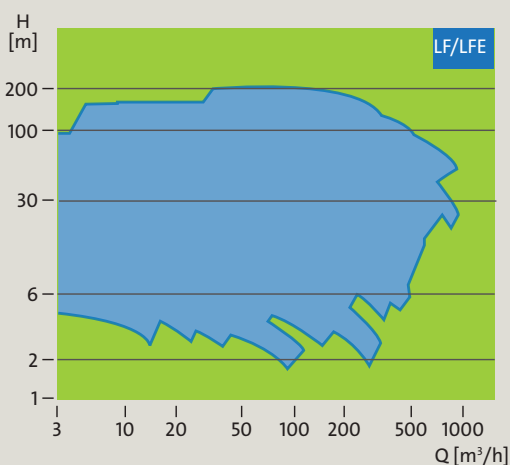
### FEATURES & BENEFITS

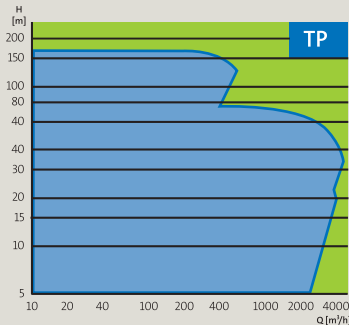
- Wide hydraulic range
- Back pull out
- Double volute casing
- Footless volute
- Frame mounted design
- Standard IE3 efficiency class motors



### TECHNICAL DATA

- Flow, Q : 3 to 1800m<sup>3</sup>/h (3 to 2200)
- Head, H: 2 to 87m (3 to 125)
- Liquid temperature: Upto 120°C
- Working pressure : max 16 bar
- Discharge Diameter: 25-300mm





## SINGLE STAGE VERTICAL INLINE PUMPS

### - TP

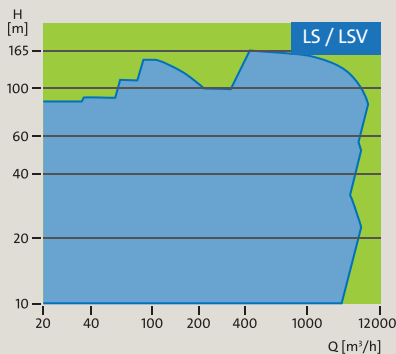
Single-stage, in-line centrifugal volute pumps with standard motors and mechanical shaft seals. Compared to end suction pumps, in-line pumps allow a straight pipe work and thus often reduce installation cost and space.

#### FEATURES & BENEFITS

- Compact design with small footprint
- Optimised hydraulics for high efficiency
- Service-friendly, top pull-out design
- Reduced power consumption
- Standard IE3 motor

#### TECHNICAL DATA

- Flow rate (Q) : 4500 m<sup>3</sup>/h
- Head (H) : 140 m
- Liquid temperature : -25 °C to +150 °C
- Discharge diameter : DN 25 to DN 500
- Operating pressure : Up to 25 Bar
- Maximum hydraulic efficiency: Upto 87%



## AXIAL SPLIT CASE PUMPS (HORIZONTAL & VERTICAL MOUNTING)

### - LS / LSV

- This axial split case is a single-stage, between bearing centrifugal volute pump.
- The axially split design allows easy removal of the top casing and access to the pump components without disturbing the motor or pipework.

#### FEATURES & BENEFITS

- Wide hydraulic range
- In-line design eliminates piping complicity
- Double volute design
- Double suction impeller
- Low NPSHr
- High energy efficiency and reliable design result in low life-cycle cost

#### TECHNICAL DATA

- Flow, Q : max. 12,000 m<sup>3</sup>/h
- Head, H : max. 165 m
- Liquid temperature : -15°C to +120°C
- Working pressure : max, 25 Bar
- Discharge sizes : 2" to 30"
- Motor rating : 1.5 - 600 kW

#### VARIANTS :

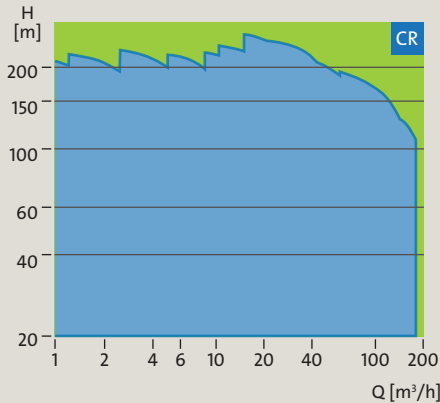
- Available in a number of shaft seal and material variants
- Available with 20,000-100,000 h bearing bracket design (NKG)
- Loose flange
- High inlet pressure (NK/NKG)
- Available with single or double cartridge shaft seal





## **MULTI-STAGE** CENTRIFUGAL PUMPS AND SYSTEMS

In water utility applications, where a high head relative to the flow is required, Grundfos supplies multistage pumps that can deliver this. Our CR pumps are one of our most recognised and successful products and are at the heart of our pressure boosting systems.



## VERTICAL MULTI-STAGE PUMPS

### - CR

Modularity for a complete range of pump solutions; from four material variants, thirteen flow sizes (up to almost 50 bar of pressure), a variety of shaft seals, rubber materials, and supply voltages. Pump parts can be optimised and designed for specific requirements.

#### BENEFITS

- Available with Grundfos Blueflux IE3 motor efficiency, reducing energy costs
- Multi-flange fits a variety of standard connections for a more flexible solution
- Uniquely designed cartridge shaft seal increases reliability, reducing downtime

#### VARIANTS:

- Pump material of construction (cast iron / SS316 / SS304 / Titanium)
- Available in different shaft seal combination
- Factory product variants
  - High inlet pressure
  - Low-NPSH
  - Horizontal mounting
  - Belt drive

#### TECHNICAL DATA

- Flow (Q): Maximum 200 m<sup>3</sup>/h
- Head (H) : Maximum 500 m
- Liquid temp. : -40 °C to +180 °C
- Operating pressure: Maximum 50 bar
- Discharge diameter : Up to DIN 150

## VERTICAL MULTI-STAGE PUMPS

### - CRFlex

- Highly efficient surface mounted solar pump
- Proven hydraulics
- Extremely low or nil operating cost

#### FEATURES & BENEFITS

- Built-in frequency converter with MPPT software and motor protection
- Compatible to both AC and DC, with 3 x analog input and 2 x digital input
- Uniquely designed cartridge shaft seal offers excellent reliability

#### TECHNICAL DATA

- Flow (Q) : Maximum 20 m<sup>3</sup>/h
- Head (H) : Maximum 150 m
- Liquid temp : 0 °C to 40 °C
- Voltage range : 30 to 300 VDC or 1 x 90 to 240 VAC

#### VARIANTS:

- Pump material of construction (cast iron / SS316 / SS304 / Titanium)
- Available in different shaft seal combinations





## BOOSTER PUMPS

### - BM / BM hp

- BM is suitable for water supply applications requiring increased system pressure.
- High-pressure booster modules for boosting, liquid transfer and circulation in systems under high static pressure and used in reverse osmosis and ultra-filtration applications in water supply and water treatment.
- Grundfos BMhp booster module is suitable for water supply applications where the inlet pressure is high, i.e. 60 to 80 bar.
- BMhp booster modules are used for increasing the system pressure up to 80 Bar.

#### FEATURES & BENEFITS:

- All stainless-steel construction, available in three MOCs: SS 304, SS 316, SS 904 L
- Easy to install and low noise
- Compact and modular design that is leakage free

#### TECHNICAL DATA

- Flow rate (Q): Up to 265 m<sup>3</sup>/h
- Head (H) : Up to 800 m (series connection)
- Liquid temperature : 40 °C
- Discharge diameter : Victaulic connection
- Maximum system pressure: Up to 60 Bar.



## BOOSTER PUMPS

### -BMS (hs PM/ hs AC/ hp MG/ hp MGE)

#### BMS HS (PM & AC)

- The BMS hs range is a completely new range of booster modules for reverse osmosis and filtration applications which improve efficiency compared to earlier ranges. The BMS hs booster system consists of a standard SP pump centred in a stainless-steel sleeve and a permanent-magnet high speed motor (PM) or a asynchronous high speed motor (AC)..

#### BMS HP (MG & MGE)

- Grundfos BMS hp booster system is suitable for industrial and water supply applications where the system pressure up to 82.7 bar (1200 psi). Perfect fit for applications requiring a minimum maintenance.

#### FEATURES & BENEFITS:

- Motor controlled by variable-frequency drive.
- Built-in check valve. (except BMS hp)
- Speed range of 4500-5500 rpm.
- High-pressure booster up to 82.7 bar

#### TECHNICAL DATA

BMS	hs PM	hs AC	hp MG	hp MGE
Flow rate (Q)	up to 144.8 m <sup>3</sup> /h	up to 120 m <sup>3</sup> /h	up to 343.3 m <sup>3</sup> /h	up to 254 m <sup>3</sup> /h
Head max (H)	844.8 m	911.3 m	125.6 m	125.6 m
Liquid temperature	40 deg C	40 deg C	40 deg C	40 deg C
Pressure max (P)	82.7 bar	82.7 bar	80 bar	80 bar



# HYDRO PNEUMATIC SYSTEM FOR PRESSURE BOOSTER APPLICATION

## RELY ON US FOR CONSTANT PRESSURE

Whatever the demand, our booster systems provide constant pressure at all levels. Whether you require pressure boosting in the right solution for you. Our booster systems are famous for always maintaining the pre-set pressure level, thereby providing optimal stability and the lowest possible energy consumption.

## THE GRUNDFOS STANDARD

### MANIFOLD

The manifolds are made in an extruding process that eliminates “dead corners” and reduces noise, friction loss and bacteria growth in the pipes. As a standard Hydro MPC is delivered with Manifolds in hot dip galvanized iron.

### HIGH EFFICIENT MOTOR

Hydro MPC Systems are equipped with Grundfos IE3/IE5 motors.

### NRV & ISOLATION VALVES

Low resistance, easy to service non return valves.

### CONTROLLER

The controller features a large color display that, in combination with the intelligent button lights makes it easy to operate.

### PUMP

The standard Hydro MPC is equipped with the CR pumps. CRI/CRN stainless steel pump, all wetted parts are SS 304/SS 316.

# MULTI PUMP CONTROLLER — MPC

Grundfos Hydro MPC is a control cabinet with a CU352 controller that permits monitoring and control of up to six identical pumps connected in parallel. The Hydro MPC is easy to install and configure and offers standby pump allocation, forced pump changeover and dry-running protection that helps in increasing the system reliability, reduce downtime and costly maintenance. Soft pressure build-up minimises risk of water hammer, reducing the risk of leakage and cost of pipe maintenance.

## Proportional Pressure

Reduces energy consumption upto 11% over conventional systems

## Perfect cascade control

With inbuilt pump curve data MPC Controller chooses number of pumps to optimize system efficiency



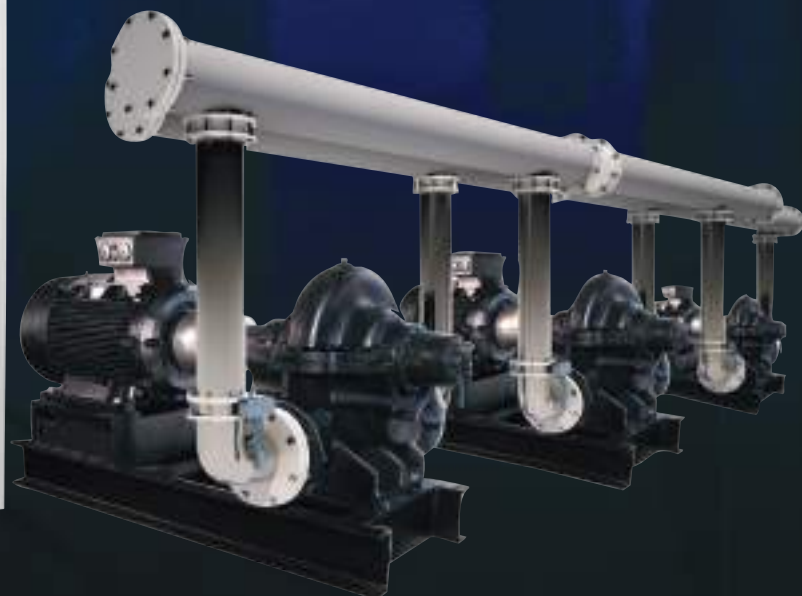
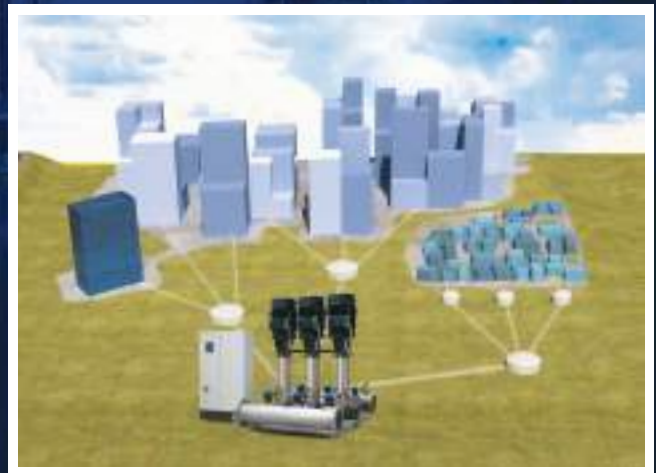
## Soft pressure build up

Reduces stress on the piping network there by lowering maintenance cost

## Flow estimation

Reduces the investment expensive flow meter

**With a goal to improve energy efficiency and to reduce water consumption by optimized pressure management, Grundfos has embedded several hydro MPC's functionalities making it a first choice**



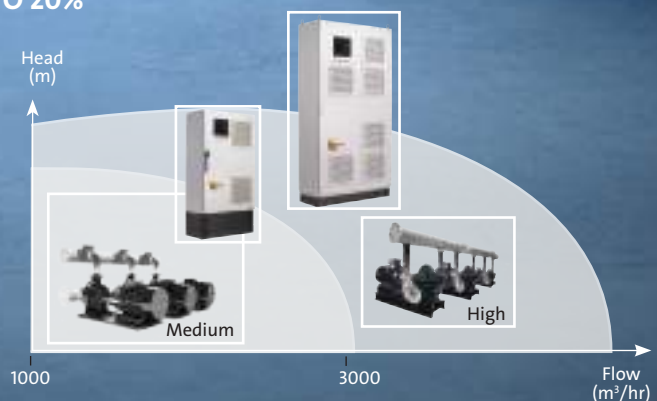
# DEMAND DRIVEN DISTRIBUTION CUT WATER LEAKAGE LOSS UP TO 20%



**GRUNDFOS DEMAND DRIVEN DISTRIBUTION USES PRESSURE CONTROL TO ENSURE CONSTANT TAP PRESSURE AT THE CONSUMER AS OPPOSED TO A CONSTANT PUMP DISCHARGE PRESSURE. AUTOMATIC SETPOINT REDUCTION REDUCES LEAKAGE LOSS UP TO 20%**

In high flow periods, friction loss in the mains is relatively high. The loss is correspondingly low when flow drops in off-peak periods of the day. If the pump discharge pressure remains constant regardless of the flow, the difference in friction loss will result in excess pressure in the system. This increases leakage loss during the off-peak periods.

Grundfos Demand Driven Distribution (DDD) system compensates for excessive system pressure by automatically adapting the setpoint to the actual flow. This is unique to Grundfos' DDD controller



**FIG. 1** – With application-optimised software, the DDD controller offers complete monitoring and control of up to six split case or end-suction pumps from Grundfos.

**45 MILLION CUBIC METERS (OF DRINKING WATER) ARE LOST DAILY THROUGH WATER LEAKAGE IN THE DISTRIBUTION NETWORKS – ENOUGH TO SERVE NEARLY 200 MILLION PEOPLE.**

- WORLD BANK 2006

# PRESSURE MANAGEMENT - PAYS YOU BACK

## GRUNDFOS DDD CONTROLLER CU354

GRUNDFOS DEMAND DRIVEN DISTRIBUTION USES PRESSURE CONTROL TO ENSURE CONSTANT TAP PRESSURE FOR THE CONSUMER AS OPPOSED TO A CONSTANT PUMP DISCHARGE PRESSURE. AUTOMATIC SETPOINT REDUCTION REDUCES LEAKAGE LOSS UPTO 20%



GRUNDFOS DDD CONTROLLER PROVIDES PRESSURE CONTROL, GRADUAL RAMP-UP AND RAMP-DOWN, THE CASCADE OPERATION OF UPTO SIX PUMPS, MONITORING AND CONTROLLING WITH MOBILE COMMUNICATION. THE GRUNDFOS DDD CONTROLLER WORKS WITH ALL PUMP TYPES, OFFERING SUBSTANTIAL ECONOMICAL BENEFITS.

### Reduce surplus pressure

The surplus system pressure that arises in low flow situations is a major cause for the water loss through existing leaks. The pressure functionality built into the Grundfos DDD controller is a unique tool for reducing this surplus.

The DDD controller monitors system conditions, detects the increase in system pressure and reduces the setpoint accordingly. For the consumer there is no change in tap pressure. But for the operator, leakage is reduced significantly, and a considerable cost saving is achieved.

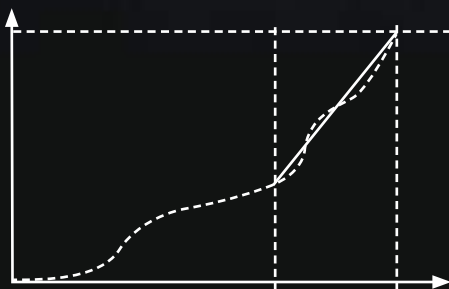
### Beat water hammer

An important contributing factor behind the new leaks is the water hammer Caused by sudden momentum changes in a pipe system, this

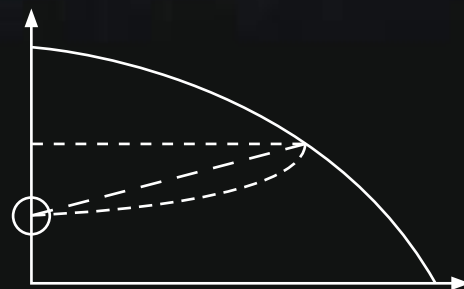
phenomenon can be reduced or eliminated by lowering fluid velocities, reducing pump size or by gradual ramp-up/rampdown.

***A big pump has a big water hammer effect; this is a factor of the pump's inertia. Smaller pumps reduce the risk of water hammer. The purchase price and operating costs are also lowered.***

To fight water hammer, Grundfos can assess the options for each distribution network by analysing system conditions and consumption patterns. Our recommendations are held up against the economic level of leakage and the resources available to maintain a viable pressure management strategy.



Sudden momentum changes that cause water hammer can be avoided by a gradual ramp-up, likewise with ramping down. This is a standard pre-programmed function in the Grundfos DDD controller.



Pressure control automatically regulates the setpoint to minimise water leakage loss and energy consumption. This is unique to the Grundfos' DDD controller.

### WHAT'S IN IT FOR THE STAKEHOLDERS

THE GRUNDFOS DDD CONTROLLER ENSURES RELIABLE AND CONSTANT WATER PRESSURE AT ALL TIMES, AND THIS RESULTS IN THE ABILITY TO CONTROL MANY PUMPS OPERATING IN PARALLEL WITH GREAT ACCURACY, MAKING THE SUBSTANTIAL COST SAVINGS POSSIBLE.

# WASTEWATER PUMPS

GETTING RID OF WASTE WATER IN A SAFE,  
EFFICIENT AND HYGENIC WAY IS JUST AS  
IMPORTANT AS ACCESS TO CLEAN DRINKING  
WATER

Grundfos offers a complete range of wastewater pumps,  
designed to handle wastewater, process water, and unscreened  
raw sewage in heavy-duty municipal, utility, and industrial  
applications.





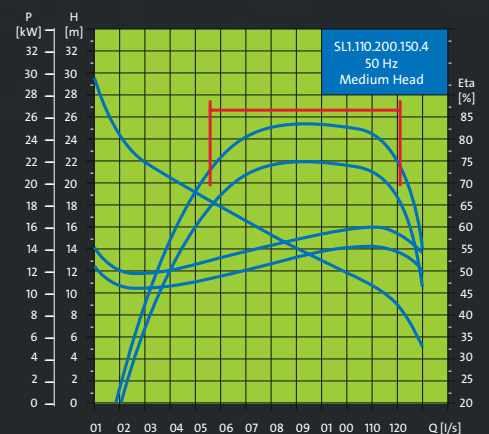
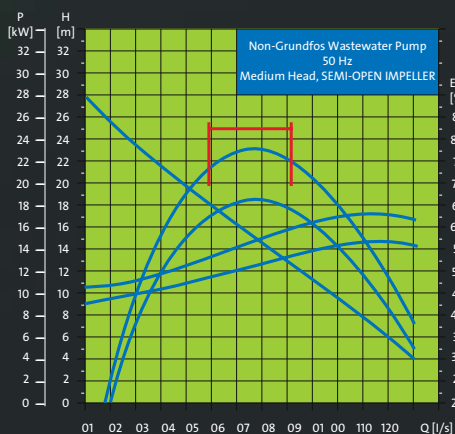
# GRUNDFOS S-TUBE IMPELLER

Highest hydraulic efficiency and best non-clogging capabilities

The S-tube offers greater hydraulic efficiency than any other type of wastewater impeller, without compromising free passage. This results in the lowest life cycle cost, trouble free operation and best-in-class non-clogging capabilities.



S tube





## SUBMERSIBLE WASTEWATER PUMPS – SE/SL

Designed to handle wastewater, process water and unscreened raw sewage. The pumps can be installed, submerged and/or dry.

### BENEFITS

- SE/SL pumps offer you the best level of reliability due to optimised hydraulics designed with large free passage
- Highest wire-to-water efficiency is available, reducing your total costs
- Highest level of service friendliness, making service of the pump trouble-free and time saving

### TECHNICAL DATA

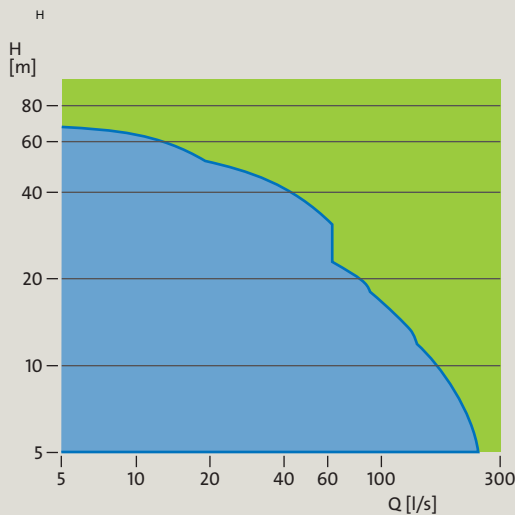
- Motor size: 0.9 to 30 kW
- Flow rate (Q): Maximum 320 l/s (1008 m<sup>3</sup>/h)
- Head (H): Maximum 71.3 m
- Liquid temperature: 0 °C to +40 °C
- Discharge diameter: DN 65 to DN 300
- Free passage: Up to 125 mm
- Insulation class: H
- Maximum efficiency: 83.7 %
- Maximum system pressure: PN10

### APPLICATIONS

- Dewatering
- Run off Management
- Mild effluent
- Grey Water Transfer
- Black water/Raw Sewage Transfer

### AVAILABLE MATERIALS

- Stainless steel impeller (SE, SL)Run off Management
- Stainless steel variants for standards SS316, Duplex SS, SS904L



## SEWAGE PUMPS – S RANGE

Highly dependable, powerful sewage pumps, designed for handling unscreened raw sewage, acknowledged for their strength, their durability, and for innovative features such as SmartTrim impeller clearance adjustment system and SmartSeal for leakage prevention.

### BENEFITS

- High efficiency and excellent non-clogging capabilities with large free passage of 80 to 145 mm
- Patented SmartTrim system for extremely easy impeller adjustment without dismantling the pump, to maintain peak performance and keep lifecycle costs low.
- The SmartSeal auto-coupling gasket provides a completely leak-proof connection between the pump and the base unit of the auto-coupling system.

### TECHNICAL DATA

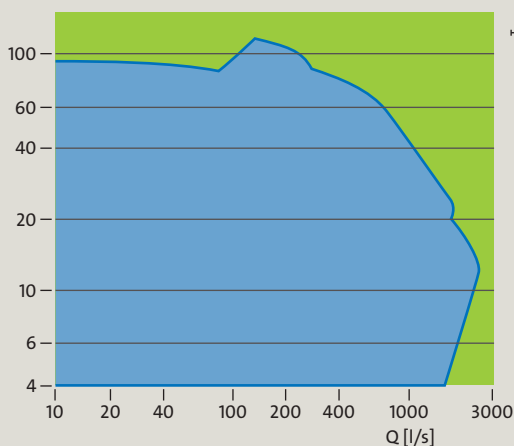
- Motor size: Up to 520 kW
- Flow rate (Q): 2000 l/s
- Head (H): 116 m
- Liquid temperature: 0 °C to +40 °C
- Discharge diameter: 80 to 600 mm
- Free passage: Up to 145 mm
- Insulation class: F (H on request)
- Maximum system pressure: PN 10
- Maximum hydraulic efficiency: 85 %

### VARIANTS

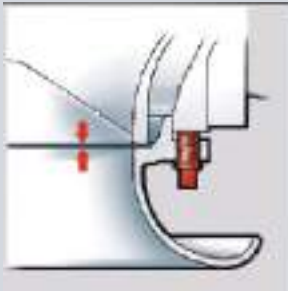
- Stainless steel variants to SS316
- Sensors available for monitoring the pump: bearing and winding temperature, vibrations and water in oil
- A wide range of possibilities for customising to customers requirements

### APPLICATIONS

- Wastewater transport
- Run Off Management
- Wastewater treatment



## KEY FEATURES :



### SmartTrim Impeller Adjustment

The Grundfos-patented smartTrim impeller adjustment system lets you maintain the factory set impeller clearance at all times simply by tightening the adjustment screws on the exterior of the pump housing. This can be done on-site without dismantling the pump.



### Leak-proof flange Connection

The Grundfos smartseal auto coupling gasket mounted on the pump discharge flange gives you a completely leak-proof connection between the pump and the base unit of the auto coupling system.



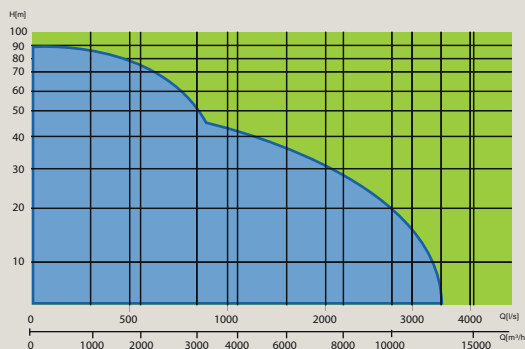
### Channel impeller

S Pumps with channel impellers are ideal for large flow of raw, unscreened sewage. Depending on the model, these channel-impeller pumps are capable of handling solids up to 155mm. The result is less clogging and increased pumping efficiency.



### SuperVortex impeller

For liquids containing large quantities of solids or fibres, or gassy sludge, S pumps fitted with a SuperVortex impeller are ideal. Available in motor sizes up to 29kW, the Grundfos SuperVortex impeller pumps allow for free passage of solids of up to 100mm.



## SEWAGE PUMPS – KSN

The KSN pumps ranges DN500,600,800, are free-flow channel impeller pumps specifically designed for pumping sewage and wastewater in a wide range of municipal and industrial applications. The pumps are made of resistant materials, such as cast iron and stainless steel..

### BENEFITS

- High efficiency and excellent non-clogging capabilities with large free passage
- Patented SmartTrim system for extremely easy impeller adjustment without dismantling the pump, to maintain peak performance and keep lifecycle costs low.
- The SmartSeal auto-coupling gasket provides a completely leak-proof connection between the pump and the base unit of the auto-coupling system.

### TECHNICAL DATA

- Motor size: 75 to 650 kW
- Flow rate (Q): 3200 l/s
- Head (H): 85m
- Liquid temperature: 0 °C to +40 °C
- Discharge diameter: 80 to 600 mm
- Free passage: 100 to 230 mm
- Insulation class: F (H on request)

### VARIANTS

- Stainless steel variants to SS316
- Sensors available for monitoring the pump: bearing and winding temperature, vibrations and water in oil
- A wide range of possibilities for customising customers requirements

### APPLICATIONS

- Rawwater intake
- Wastewater transport
- Run Off Management
- Wastewater treatment



## GRINDER PUMPS – SEG/SEG AUTOADAPT

Submersible sewage grinder pumps for pressurised wastewater pumping is designed to optimise performance in your system. The adaptive intelligence built into the AUTOADAPT versions minimises the risk factors and reduces the installation cost, commissioning and maintenance.

### BENEFITS

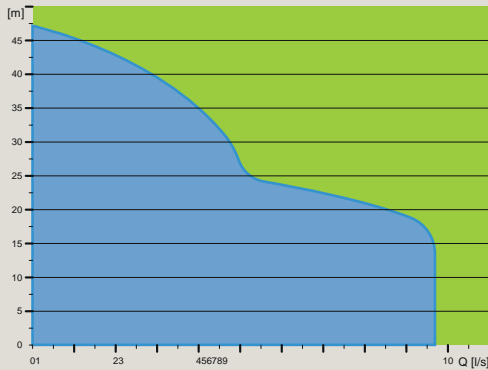
- High discharge pressure enables transfer of wastewater over longer distances
- Plug and pump – all necessary control and protection built into the pump, eliminating complexity (AUTOADAPT version)
- Wear resistant grinder system which grinds solids into small pieces, so they can be pumped away through discharge pipes of a small diameter

### TECHNICAL DATA

- Motor size: 0.9 to 4 kW
- Flow rate (Q): 9.5 l/s (34m<sup>3</sup>/h)
- Head (H): 45.7 m
- Liquid temperature: 0 °C to +40 °C
- Discharge diameter: DN 40/50
- Insulation class: F
- Free passage: Grinder
- Insulation Class: IP68

### APPLICATIONS

- Wastewater Transport



## HEAVY-DUTY DEWATERING PUMPS – DWK

Contractor pumps for construction dewatering in building and infrastructure sites, designed with semi-open or enclosed impeller. Made of corrosion-resistant materials such as cast iron and high-chrome stainless steel, for harsh environments.

### BENEFITS

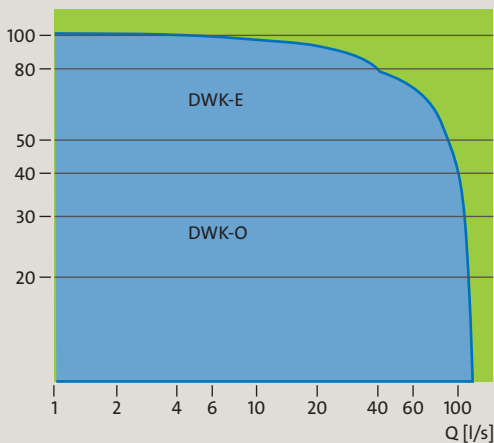
- High reliability and flexibility pumps with protection features for harsh operating environments
- Top-discharge with different connection types available for multiple use of the pump, depending on conditions and specific needs
- Pumps up to 15 kW have a double mechanical seal and pumps from 22 kW to 90 kW have a triple-seal system, for longer operation and less downtime

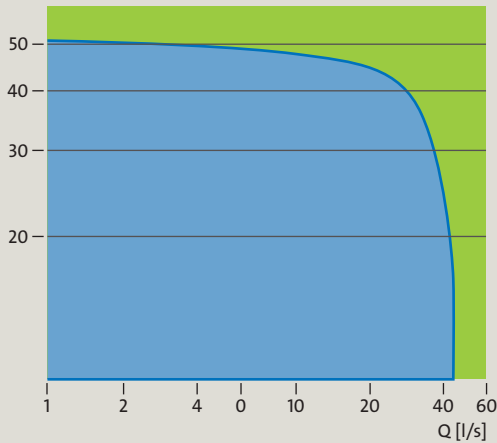
### TECHNICAL DATA

- Motor size: 0.75 - 90 KW
- Flow rate (Q): 110 l/s (430 m<sup>3</sup>/h)
- Head (H): 160m
- Liquid temperature: 0°C to +40°C
- Discharge diameter: 2" - 6"
- Free passage: Strainer
- Insulation class: F
- Maximun hydraulic efficiency: Upto 75%

### APPLICATIONS

- Raw Water Intake
- Drinking Water Treatment
- Water Distribution
- Wastewater Transport and Flood Control
- Wastewater Treatment





## SUBMERSIBLE DRAINAGE PUMPS – DPK

Drainage pumps designed with semi-open or enclosed impeller for pumping water in a wide range of applications. The pumps are made of robust cast iron, ensuring durable operation.

### BENEFITS

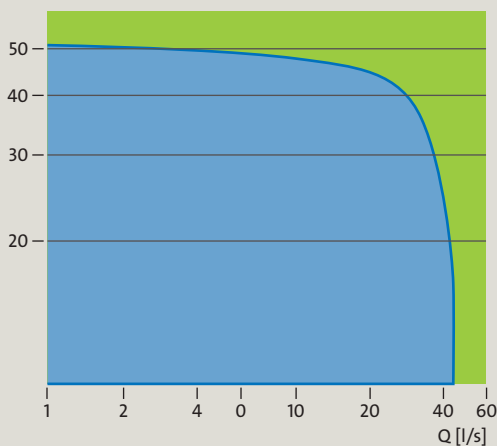
- Semi-open ductile cast iron impeller maintains its performance, ensuring an increased lifetime
- Submerged free-standing installation, or submerged installation on an auto-coupling system
- The double mechanical seal is positioned in the oil chamber and ensures trouble-free operation

### TECHNICAL DATA

- Motor size: 0.75 - 22 KW
- Flow rate (Q): 45 l/s (165 m<sup>3</sup>/h)
- Head (H): 56 m
- Liquid temperature: 0°C to +40°C
- Discharge diameter: DN 50-DN 150
- Free passage: 10 to 20 mm
- Insulation class: F
- Maximum hydraulic efficiency:  
Upto 74%

### APPLICATIONS

- Flood Control
- Underground drainage pits
- Courts drainage solutions



## VORTEX SEWAGE PUMPS – DPK.V

The DPK.V range of submersible sewage pumps from Grundfos combines durable performance with ease of installation, providing an immediate return on your building service investment.

The DPK.V is intended for submersible use in underground sewage collection tanks in or around buildings when cost-effective and reliable sewage transport is required.

The compact & service-friendly design and the flexible installation options combine to make the DPK.V the perfect choice.

### TECHNICAL DATA

- Motor size: 1.5 - 7.5 KW
- Flow rate (Q): 24 l/s (90 m<sup>3</sup>/h)
- Head (H): 3 - 31 m
- Liquid temperature: 0°C to +40°C
- Discharge diameter: DN 50-DN 150
- Free passage: 65 & 80 mm
- Insulation class: F
- Maximum hydraulic efficiency:  
Upto 71%

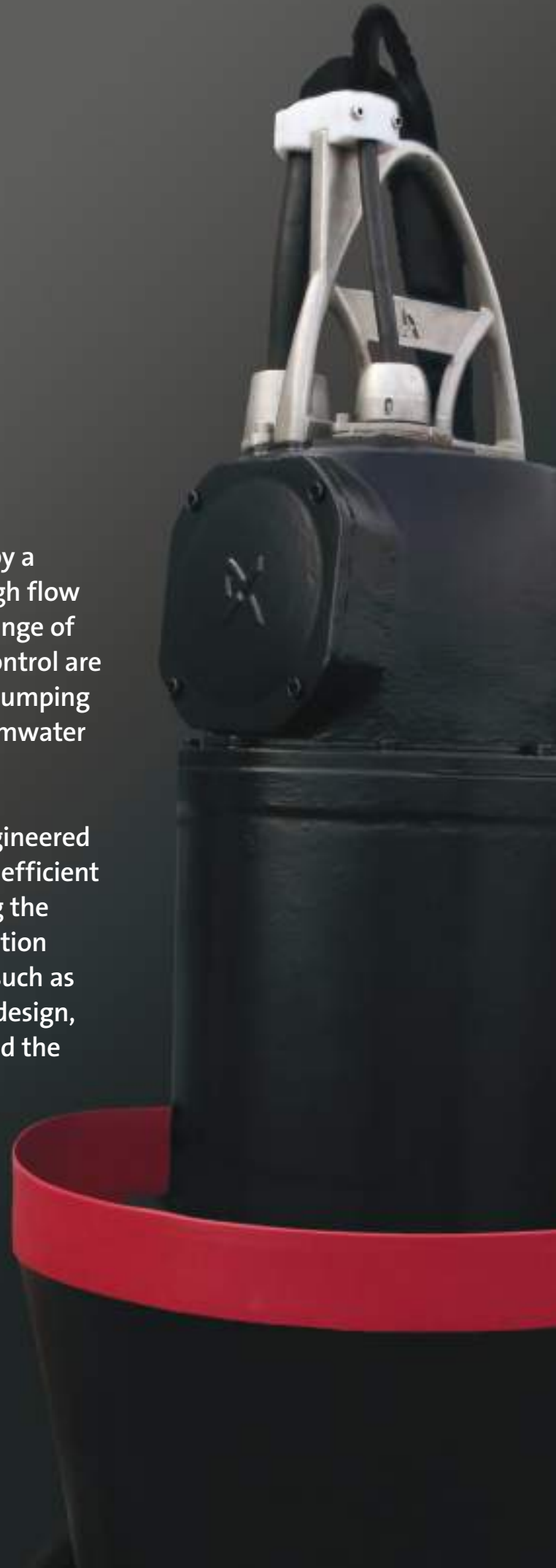
### APPLICATIONS

- Dewatering and Raw sewage transfer
- Waste water treatment

# FLOOD CONTROL

Flood control pumping is characterised by a requirement for pump solutions with high flow and low head. The powerful Grundfos range of axial and mixed-flow pumps for flood control are specifically designed for durable use in pumping stations, harbour management and stormwater tank solutions.

Flood control pumps are individually engineered to suit your requirements, ensuring cost-efficient performance. Including Grundfos, during the planning stages of the flood control solution ensures that all aspects are considered, such as pumping station design, retention tank design, pump selection, future requirements, and the total life cycle costs.





## AXIAL FLOW PROPELLER PUMP – KPL

Axial flow propeller pump is designed for the high flow at low head requirements of flood control and other similar duty applications. The Turbulence Optimiser™ reduces turbulence in the gap between the pump volute and the column pipe, increasing efficiency upto two percentage points.

### BENEFITS

- With the Turbulence Optimiser™, for best-in-class hydraulic efficiency of up to 86 %
- High-voltage motors for low installation costs
- High-precision one piece propeller with back-swept design reduces clogging

### TECHNICAL DATA

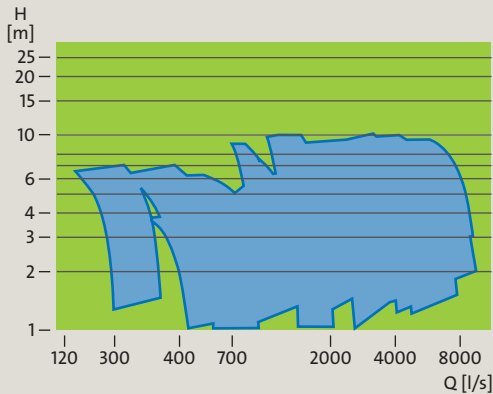
- Motor size: 11 to 700 kW (Up to 850 kW on request)
- Flow rate (Q): 9,200 l/s (33,120 m³/h)
- Head (H): 10 m
- Liquid temperature: 0 °C to +40 °C
- Discharge diameter: Up to 2200 mm
- Insulation class: F
- Maximum installation depth: 20 m
- Maximum hydraulic efficiency: 86 %

### VARIANTS

- Propeller in stainless steel is standard; other materials available on request
- Sensors for monitoring the pump: bearing and winding temperature, vibrations and water in oil

### APPLICATIONS

- Raw water intake
- Wastewater transport
- Flood control
- Wastewater treatment



## MIXED FLOW PUMP – KWM

Mixed flow pump designed for the high flow at low head requirements of, wastewater treatment recirculation control and other heavy-duty pumping applications.

### BENEFITS

- With Turbulence optimizer (TM), for best-in-class hydraulic efficiency up to 86 %
- High-voltage motors for low installation costs
- Robust, reliable and efficient, offering maximum value for money

### TECHNICAL DATA

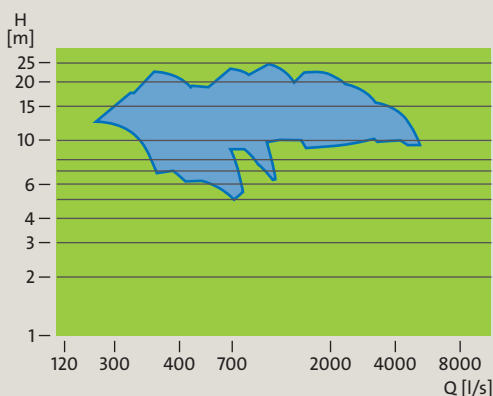
- Motor size: 11 to 700 kW (Up to 850 kW on request)
- Flow rate (Q): 5,590 l/s (20,000 m³/h)
- Head (H): 24.5 m
- Liquid temperature: 0 °C to +40 °C
- Discharge diameter: column (FPV up to DN 2,200)
- Insulation class: F
- Maximum installation depth: 20 m
- Maximum hydraulic efficiency: 85 %

### VARIANTS

- Impeller in cast iron is standard; stainless steel available on request
- Sensors for monitoring the pump: bearing and winding temperature, vibrations and water in oil

### APPLICATIONS

- Raw water intake
- Wastewater transport
- Flood control
- Wastewater treatment



# FLOOD MITIGATION CONTROLLER

IS A CONTROL SOLUTION TO OPERATE AND CONTROL THE PUMPING STATION AUTOMATICALLY BASED ON PLC AND WIRE/WIRELESS LINES.

## BENEFITS

Traditionally a flood control station in many countries is manually operated, with many switches and controls that requires workforce 24/7 to be available in the station. With our new solution, only one control unit is needed, and we can provide an intuitive interface with remote vaccess on different platforms.

- Less cost compared to the existing control system
- Saving energy consumption
- Flexibility and expandability
- Wireless control
- Easy maintenance
- Data storage
- Unique solution by pump station specialist
- User friendly interface (Touch screen)
- Grundfos One stop solution provider



**Conventional Pumping Station**

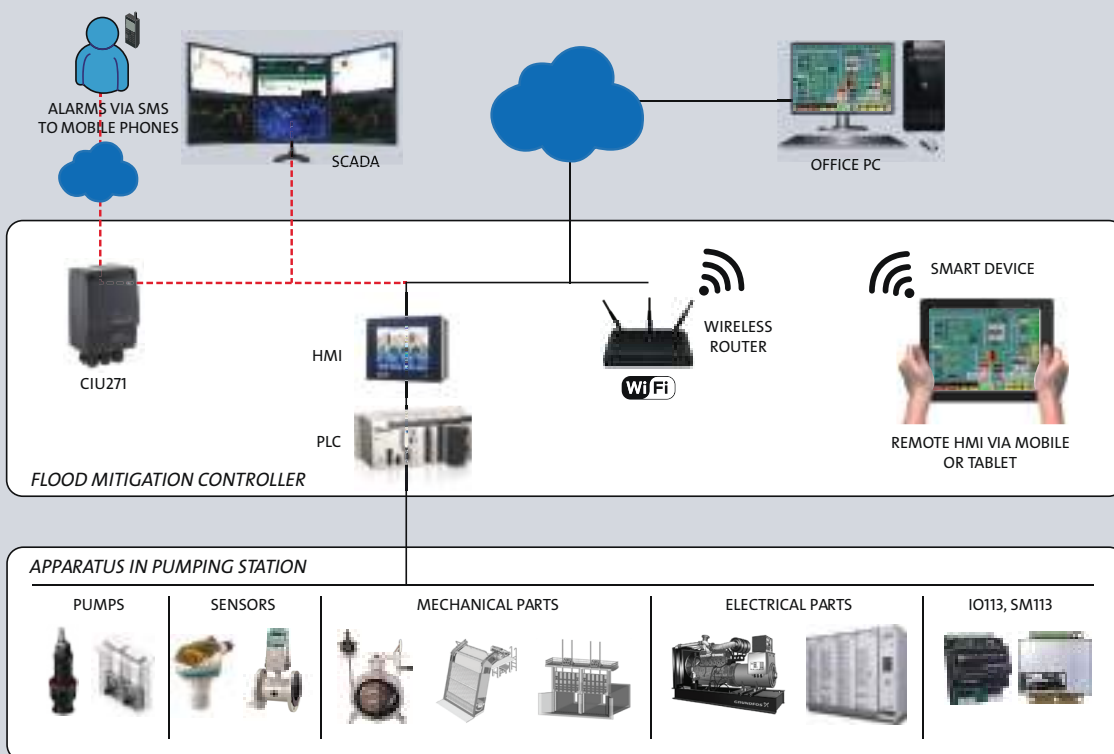


**Gate Pumping Station**

Description	Conventional Pump Station	Gate Pump (Submersible Axial flow pump)	
Pump Type	Vertical	Vertical	Horizontal
Pump station footprint	100	65	60
Pump Room	Required	Not Required	
Reservoir	Required	Channel used reservoir	
Flood Gate	Required	Gate pump used for flood gate	
ME.EL Cost	100	65	60
Civil cost	100	60	55
Maintenance Cost	100	80	80
Management	100	95	95



## SYSTEM OVERVIEW



## POWERFUL PUMPING EFFICIENT OPERATION

Gate pump is a reliable solution if a pumping station and reservoir are not an option due to lack of space. If the outside water level is low, the gate pumps and screen will open and discharge the inside water with gravity flow. Once the outside water level gets higher, blocking the back flow, the gate pumps close and block the rising water level. If the inside water reaches a certain level, the pump and screen will start operating to forcibly discharge the water inside.

The market-leading high efficiency and compact design make it possible to reduce the size of the pumping station and cost for civil construction work. Built from cast iron or stainless steel, a wide range of variants using different materials, sensors, surface coatings and shaft seal materials are available, ensuring excellent reliability in demanding applications.

### The range of Gate pumps offers:

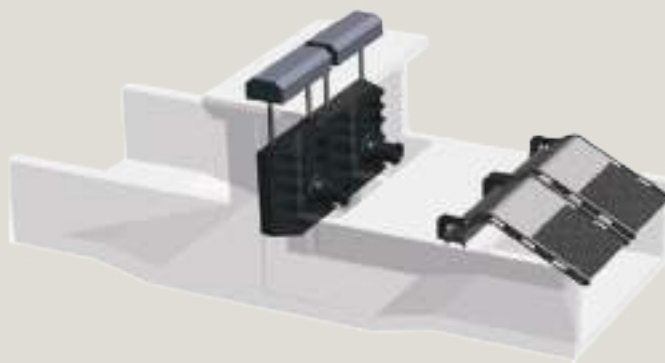
- Best-in-class hydraulic efficiency
- Market-leading compact and light weight design
- Backswept self-cleaning hydraulic design that provides great non-clogging performance

These axial flow pumps are designed for high flow up to 300m<sup>3</sup>/min and head up to 5.5m. Higher flow and head is available on request. Built to handle large amount of water, the pumps are ideal for a wide range of applications such as:

- Flood and storm water control
- Large volume drainage and irrigation
- Water level control in coastal and low-lying areas
- Filling and emptying water from dry docks and harbour

## BENEFITS

- Serves as a flood gate and pump simultaneously
- Equipped with submersible pumps, the gates can be installed on an existing waterway
- Required small space, ideal for both urban and rural areas





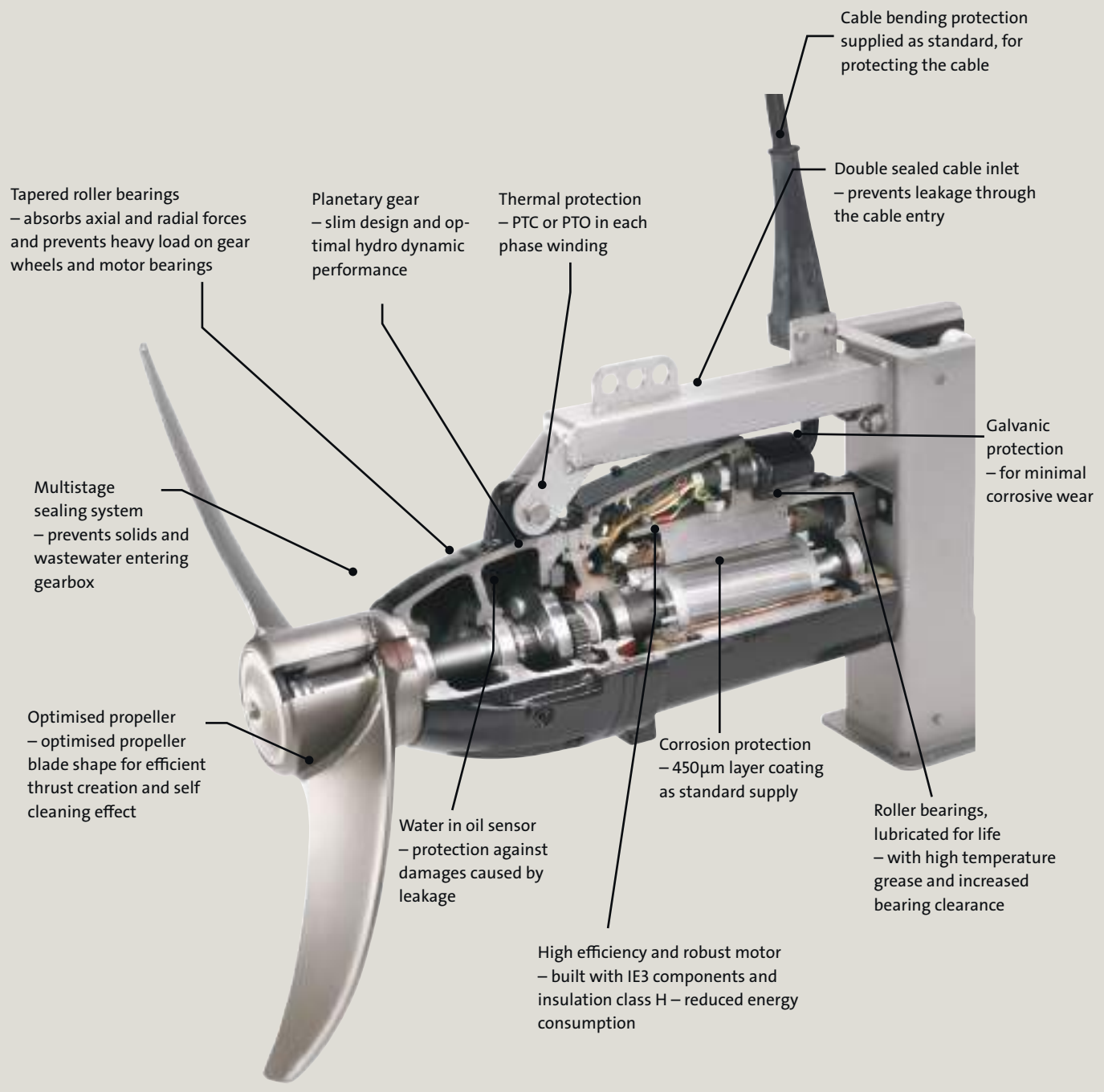
# MIXERS & FLOW MAKERS

Mixing is extremely important in wastewater treatment and is one of the key operations for the achievement of treatment targets.

Grundfos has a range of SMD/SMG mixers, SFG flowmakers and SRG recirculation pumps that meets your treatment targets with a lower energy consumption for a wide range of applications, where adjustable and efficient operation is required with limited space requirements.



Grundfos SMD and SMG submersible mixers, SFG submersible flowmakers and SRG submersible recirculation pumps are designed to operate in municipal wastewater treatment plants, industrial processes and agriculture.



	SMD	SMG	SFG	SRG
50Hz[kw]	0.9 - 3.5	0.9 - 18.0	0.7 - 8.0	0.8 - 24.0

# GRUNDFOS PREFABRICATED PUMPING STATION

## FLEXIBLE AND POWERFUL

### Sturdy one-piece moulded pit

Polyethylene pump pits that by far exceed the lifetime of a concrete pumping pit. Highly resistant to aggressive liquids.

### Individually positioned inlets

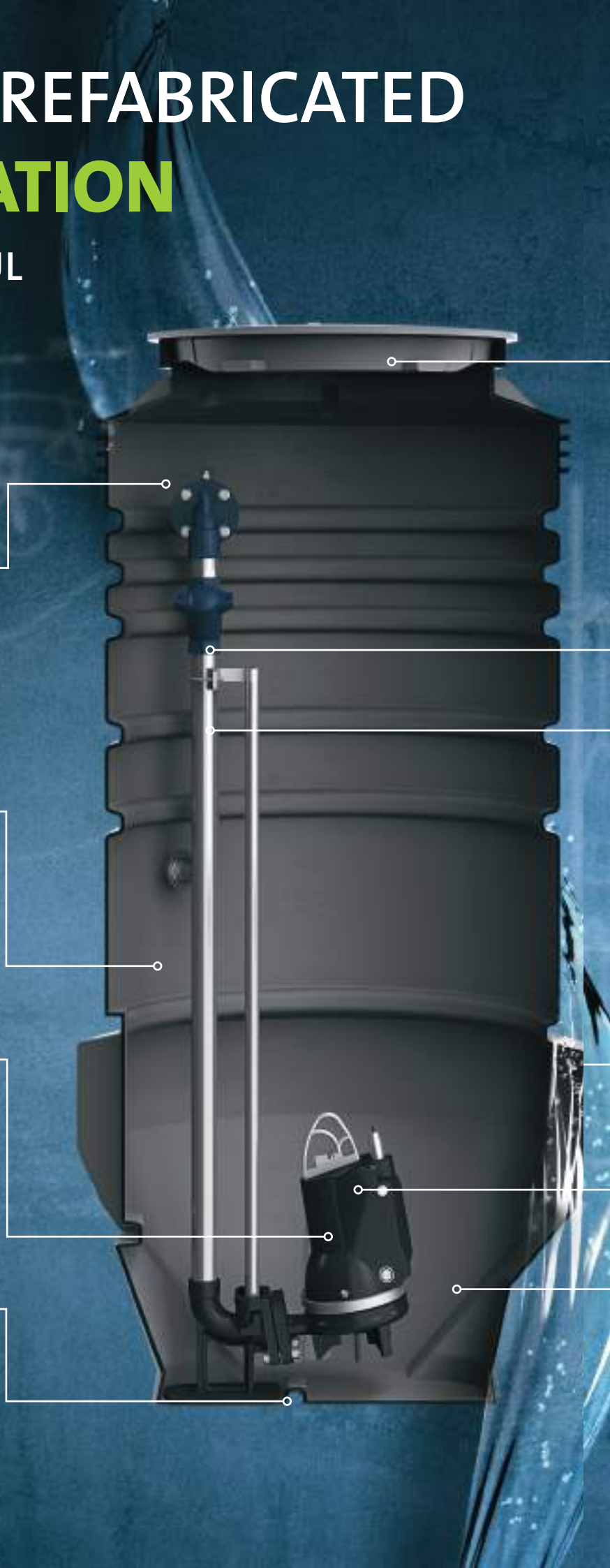
Drill on-site with a cup wheel cutter for perfect positioning every time.

### High performance pumps

Choose from a wide range of highly efficient Grundfos pumps with unmatched reliability.

### Service friendly

The auto coupling is not attached to the bottom, but kept in place by the bottom design. This means that all components can be serviced from the surface without entering small diameter pumping stations.



## PE top cover with unique closing mechanism

Unauthorised access prevented with special bolt. Traffic covers are also available up to class D – 40Ton.

## Valves/valve chamber

High quality non-return valves and closing valves are an integrated part of the package.

## Corrosion-free pipework and valves

To achieve high reliability and easy service pipings are designed in high quality stainless steel or PE.

## Shoulders that give an increased sump volume – patented by Grundfos

The unique shoulder design ensures that the pumping station remains in place without using a concrete foundation - even with high groundwater levels.

## Intelligent control solutions

A full range of options for monitoring, control, communication, and optimisation either in separate control cabinet or build into the pump.

## Unique pit design for reduced sludge and odour problems

All Grundfos pumping stations feature a benching bottom design with self-cleaning properties, which minimises the risk of hydrogen sulphide creation, odour problems, clogging, and, in turn, maintenance costs.

System simulation

## OPTIMISED SYSTEM DESIGN

Grundfos offers pressurised sewer network modelling using software that simulates your entire system. This allows you to make informed decisions based on advanced calculations. The modelling is tailored to take unique flow patterns in the pipes into account and gives you a precise picture of what to expect from your system – including if there is a risk of high hydrogen sulphide levels due to long retention times.

### The outcome

A thorough report enabling correct prioritisation when designing your wastewater solution, in accordance with your planning, investment, and payback requirements.

### Your benefits

- Optimal system performance
- Save time and money

Consult your local Grundfos sales engineer to find out if your project will benefit from network modelling.



Try our new Pumping Station Creator

## DESIGN YOUR OWN PUMPING STATION IN MINUTES



### 1 Input your requirements

It is quick and easy to design the perfect Grundfos pumping station. Simply log on and type in your project requirements. In 5 simple steps the tool will guide you through the process of specifying the perfect size, features, and functionalities for your project.

### 2 Select a solution

Based on your input the Pumping Station Creator offers a range of solutions that match your demands. Click a solution to see all the details.

### 3 Configure & customise

Customise your pumping station by adding your choice of manifolds, pressure pipes and so on. See a detailed technical drawing of your exact pumping station.

### 4 Pick your accessories

To complete the design process, choose the right accessories e.g. centre drills and hole saws.

### 5 View the solution

Now, you are ready to download a full report containing everything you need to place an order. One click of a mouse, and you will receive a full specification of your project with a unique specified quotation text and CAD drawings.

try the pumping station creator at <https://product-selection.grundfos.com>

# GRUNDFOS LARGE PREFABRICATED PUMPING STATION

## READY FOR ANYTHING

### Extremely durable tank

Glass-reinforced polyester tank with unmatched robustness that by far exceeds the lifetime of a concrete pumping pit.

### Valves/valve chamber

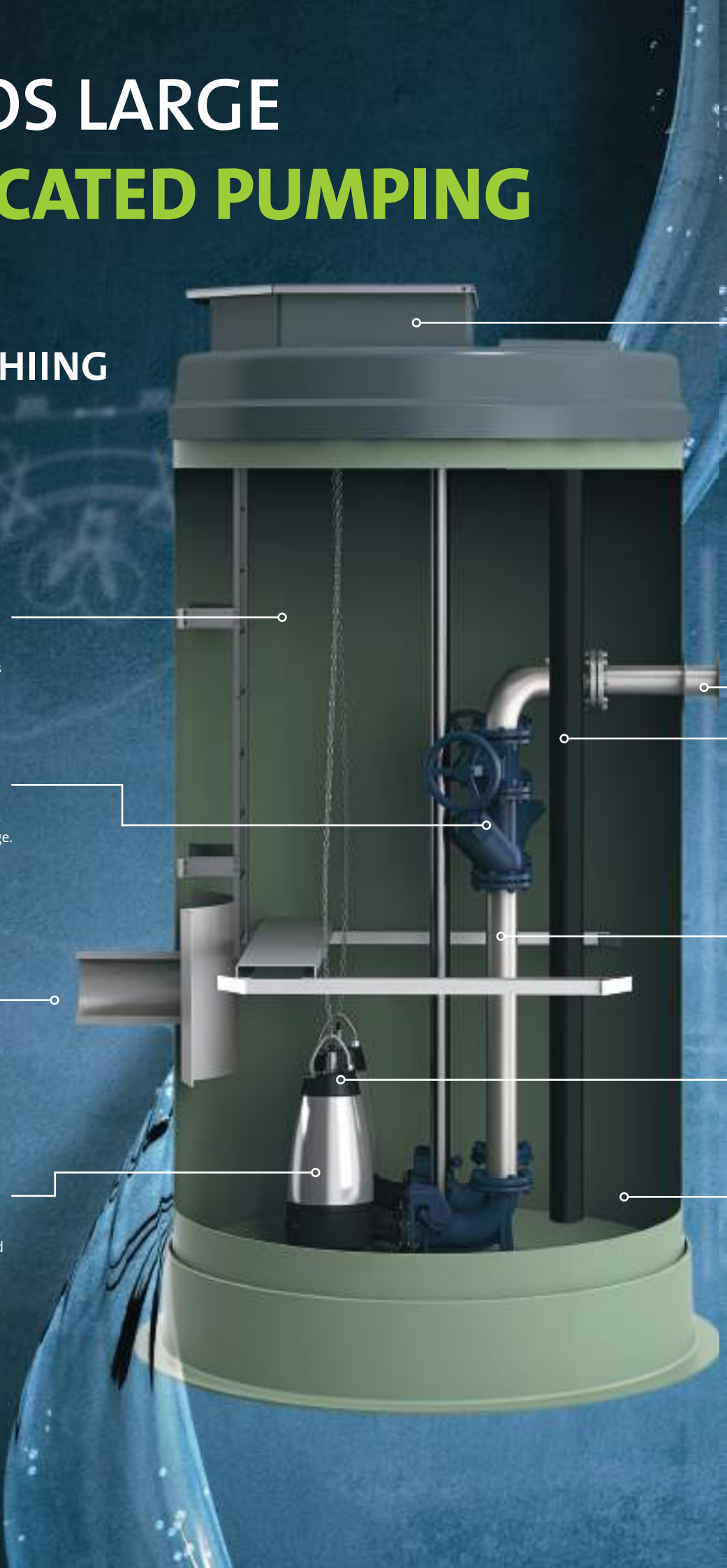
High quality non-return valves and closing valves are an integrated part of the package.

### Flanged inlet or inlet sleeve

Water tight connections as standard up to DN600. Screen baskets or baffle plates are optional.

### High performance pumps

Choose from a wide range of highly efficient Grundfos pumps with unmatched reliability.



### Lockable hatch with built-in safety features

Anti-slip roughing on the cover. Elevated hatch frame to prevent accidental falls and built-in safety grid as default. Traffic covers are also available up to class D - 40 Ton.

### Pressure tested, high quality pipework

Everything is quality controlled prior to assembly.

### Prepared for various types of level controls

The unique hanging system makes servicing and repositioning easy.

### Corrosion free pipework

Stainless steel for pipes up to DN250 and PE pipes up to D160. Focus on use of flowbends to reduce energy cost where possible.

### Intelligent control solutions

A full range of options for monitoring, control, communication, and optimisation.

### Unique pit design for reduced sludge and odour problems

All Grundfos pumping stations feature a benching bottom design with self-cleaning properties, which minimises the risk of hydrogen sulphide creation, odour problems, clogging, and, in turn, maintenance costs. The spheric design ensures robustness and guides sedimentation to the pump inlets.

## COMPETENCES AT YOUR DISPOSAL

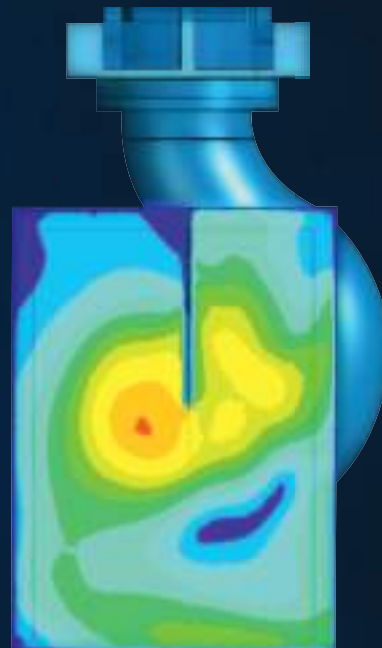
Any wastewater transport project starts with thorough planning taking current and future demands into account. Considerations include how to avoid water hammer, siphoning, venting needs, utilisation of retention basins, parallel rising mains, hydrogen sulphide problems, and much more. Designing a future-proof pumping station layout based on these insights takes experience and a well-equipped toolbox.

### Experience-based expertise

Our knowledge is available through local representatives and dedicated customer service units with support from the Global Water Utility Competence Centre. Experienced engineers, supply chain experts, and project managers are ready to contribute to your solution with research-based know-how and in-depth solution knowledge.

### Advanced tools

Our toolbox consists of, among many other things, water hammer calculation software, CFD analysis, water age simulations, and velocity calculations – all building on the experience and insights we have gained from hundreds of projects. Combined, the tools help us minimise your total system life-cycle costs without compromising uptime and efficiency.



*CFD enables our analysts to simulate fluid flows without expensive on-site measurements, allowing us to discover and correct flow problems before construction begins.*



# CONTROLS & **MONITORING**

Grundfos has decades of experience developing controller and monitoring systems for pumping solutions and manufactures its own pump motors for all fluid types and flow requirements.

This ensures a perfect match with hydraulics, motors, electrics, and all other mechanical components that make up a comprehensive pumping solution, ensuring the best possible efficiency point.





## DIGITAL PUMP CONTROLLER:

### – GI DPC / GIDPC Plus

Digital controller for water and wastewater application in residential or commercial buildings. GI DPC can also be used for tank filling or water transfer.

#### BENEFITS

- LCD screen display
- Phase loss protection
- Individual pump overload protection
- Transient surge protection
- Auto/manual switch

#### Applications

- Dewatering
- Tank Filling
- Pressure boosting



## INPUT/OUTPUT MODULE:

### – IO113 / SM113

IO 113 & SM 113 forms an interface between a Grundfos pump with Analogue and digital sensors and the pump controller. Together with the sensors, the IO 113 forms a galvanic separation between the motor voltage in the pump and the controller connected. SM113 sensor module works together with IO113 and is used for collection and transfer of sensor data

#### COMMUNICATION

- RS485 communication (Modbus or GENibus) by PC Tool for Water Utility
- Wired / wireless by a SCADA or PLC system
- CIU data communication interface

#### BENEFITS

- SolutionProtect the pump against over-temperature
- Monitor sensors for analog measurement of :
  - Motor winding temperature
  - Water content [%] in oil
  - Stator insulation resistance
  - Bearing temperature
  - Vibration (SM113)



## DEDICATED CONTROLS

### – CU 362

dedicated controls is a pump control system that combines a large number of advanced function with a large, intuitive and easy-to-use graphic display.

#### BENEFITS

- Easy to read colour screen
- Calculation and display of specific energy consumption
- Overflow measurement
- Daily flushing function, overflow registration, or set any starting level
- Control of up to six pumps

#### Applications

- Wastewater transport
- Flood control
- Wastewater treatment

# DOSING AND DISINFECTION

Grundfos offers one of the most extensive product ranges in the market for dosing and disinfection, covering everything from disinfection of drinking water to water treatment in highly sensitive industrial processes.

Grundfos can supply complete dosing pump systems for large or small volumes and based on different technologies for flocculation, disinfection, and pH adjustment. Moreover, the Grundfos range of electronic and electrochemical accessories offers complete control of your dosing and disinfection processes and can be seamlessly integrated into your system. We can also advise and supply disinfection solutions using chlorine compounds such as chlorine gas ( $\text{Cl}_2$ ), sodium hypochlorite ( $\text{NaOCl}$ ), and chlorine dioxide ( $\text{ClO}_2$ ).



## DIGITAL DOSING PUMP

Covering flow rates up to 200 litres an hour, and output pressure ratings up to 16 bar, the SMART Digital range delivers reliable, safe, and cost-effective dosing in any application across a wide selection of businesses including water treatment, with industry-leading user friendliness and flexibility. And the advanced monitoring and self-analysis features offered by several control variants provide intelligent process control that looks beyond the pump and keeps an eye on the entire system for you.

The SMART Digital range includes the original SMART Digital DDA, DDC, and DDE pumps which cover flows up to 30 l/h, and the SMART Digital XL DDA and DDE pumps which cover flows up to 200 l/h. All pumps can be supplied with a wide selection of accessories such as installation kits, signal cables, and dosing tanks that make it even easier to customise the pumps to any application.



### SMART DIGITAL – DDA

High-end solution for complex and demanding applications

- AutoFlowAdapt: automatically adapts measured flow to attain target flow
- Auto-deaeration during pump standby
- Flexible Fieldbus control
- Turn-down ratio 1:3000 with constant 100% stroke length



### SMART DIGITAL – DDC

Optimal price-performance ratio

- Two SlowMode steps (25% and 50%) calibration mode, service display
- External stop, dual-level tank control, 2 relay outputs



### SMART DIGITAL – DDE

A cost-effective Digital Dosing™ solution

- Control options: manual control 0.1-100 %, pulse in % of stroke volume, and analogue control (DDE XL)
- External stop, empty tank control



## SMART DIGITAL – DME

### Precise and easy setting

- Two pump variants: 375 l/h at 10 bar, or 940 l/h at 4 bar
- Turn-down ratio 1:800 with constant 100% stroke length
- Adjustable slow mode for dosing high viscosity liquids (up to 3000 mPas)

### Applications

- Disinfection and pH adjustment
- Drinking water, process water and wastewater
- Ultrafiltration and reverse osmosis
- Coagulation, flocculation, precipitation



DMX 221

DMX 226

## MECHANICAL DIAPHRAGM DOSING PUMPS – DMX

### Robust design for minimum maintenance

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



DMH 170

DMH 171

## HYDRAULIC PISTON DIAPHRAGM DOSING PUMPS – DMH

### Long lifetime in high-pressure applications

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



## DOSING TANK AND SKID SYSTEMS

### – DTS

#### Cost-effective dosing tank stations

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

#### Applications

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



## OXIPERM CHLORINE DI OXIDE SYSTEMS

### – OXIPERM

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

Ideal application areas for Oxiperm include combating germs and pathogens, such as legionella in building installations, disinfecting cooling water systems, and disinfecting drinking water in water plants or industrial processes.

#### Applications

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

# MEASURING AND CONTROL SOLUTIONS

Monitoring of typical water quality parameters as well as precise control of disinfectant addition or pH adjustment is essential for many water treatment processes. Grundfos offers two ranges: The DIT hand-held photometer, and the online measuring and control system DID for full integration with digital communication and data logging.

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

DID systems are available as compact systems with bypass flow cell or as kits for applications with tank-immersed sensors. The DID is easy to set up due to the pre-assembled and pre-calibrated configurations. Installation is easy due to the Fieldbus-based communication with both system control and sensors. The control unit CU382 included in DID offers a wide variety of set up options for the freely assignable digital and analog in- and outputs as well as for the controller functions.

## **DID systems feature the following:**

- Automatic setting of water flow and detection of missing water flow in systems with flow cell
- Probe carrier included in systems for tank installation
- 7.5 m cable included in systems for tank installation
- Probe guard included in systems for tank installation
- Temperature compensation included for all sensors
- Designed for extra-long maintenance intervals (0.5 to 1 year)
- Pre-calibrated sensors (pH, ORP, conductivity)
- One sensor variant per parameter for all applications and measuring ranges (pH, ORP, conductivity sensors)
- Diaphragm-covered amperometric sensor principle (free and total chlorine, ClO<sub>2</sub>, H<sub>2</sub>O<sub>2</sub> and PAA)
- Lowered pH dependency for free-chlorine sensors



# POLYDOS FULLY AUTOMATIC PREPARATION SYSTEMS

## Compact and modular preparation system

Grundfos preparation systems are designed for granulates and liquid concentrates. It comes in several variants to suit your application:

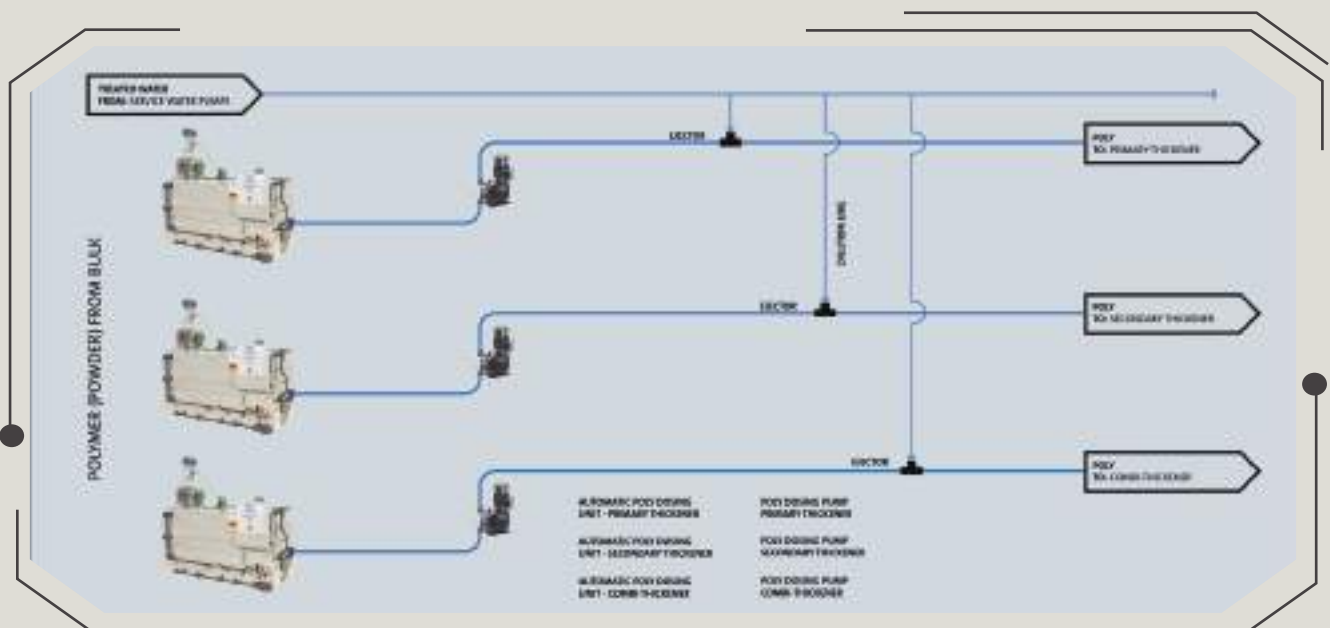
- Polydos 412E is a fully automatic three-chamber polyelectrolyte preparation system for concentrated liquid and dry polymers
- Polydos 420E is a fully automatic two-chamber preparation system for liquid concentrated polymer only
- KD 440 is a fully automatic one-chamber preparation system for different products such as aluminium sulphate, polyelectrolyte, lime milk and activated carbon
- Polydos 460E is a fully automatic two-chamber preparation system for liquid concentrated polymer

## Polydos: flexibility to suit your application

- Compact, yet flexible installation of fully integrated system including material handling, preparation and
- Maturing and solution dosing
- Configured according to the required polymer consumption and the desired concentration
- Our VFI vortex water sensor ensures an exact concentration thanks to a proportional dosing of the polyelectrolyte
- Customisation of systems to match the application
- Additionally to our Polydos unit we can propose powder handling of big-bags solution, granulates/powders/liquids conveying solution. Dosing of prepared solution can be done with Grundfos Polydos 520 dosing station, and with additional Polydos P510 post dilution

## Applications

- Drinking water treatment
- Wastewater treatment industrial/municipal



# A PUMP AUDIT CAN REALLY MAKE A DIFFERENCE

A pump audit is the ideal way to find out whether your company's pump system is operating efficiently. A pump audit is an optimal way to reduce CO2 emissions and save money by a thorough analysis of your installations.

## DID YOU KNOW

That approximately 85% of a pumps Life Cycle Costs are incurred by power consumption?

### THIS IS HOW IT WORKS:

A pump auditor will visit your site and conduct a survey in order to collect necessary data. After analysing the data a recommendation will be prepared for you. In this, the Life Cycle Costs of your company's current pump system will be compared with the system you could have if the pumps were changed to more efficient models.

Among other investigations, the auditor will check the overall efficiency of your company's pumps, look at the initial purchase price of a different pump solution and compare costs for both maintenance and power consumption.

**Step 1**

APPOINTMENT WITH  
THE CUSTOMER

**Step 2**

ON-SITE  
STUDY

**Step 3**

ANALYSE THE  
DATA



# CUT ENERGY CONSUMPTION UP TO 60%

Grundfos' Pump Audit team has helped everyone from water supply companies to industries and public buildings to cut their energy consumption on average by 40% to 60% just by looking at their pumping systems.



A water supply project in Rajasthan could save close to Rs.6 lakhs per month by upgrading their existing low efficient water supply pumps to energy efficient Grundfos pumps. Thanks to exhaustive work by Grundfos energy audit team - customer could save close to 1,110 tons of CO2 emission per annum

**Step 4**

RECOMMENDATIONS  
WITH ROI

**Result**

OPTIMISED  
PROCESSES



# KNOW MORE ON WATER AND WASTE WATER SYSTEMS

Grundfos Academy is a free digital training tool and information platform that keeps you abreast of the latest developments within Grundfos and the pump industry. Once you sign up, you have free access to the entire Grundfos Academy online training platform, tailored specifically to your needs.

This easy to use online tool offers you training videos, downloadable presentations and in-depth articles you can work through at your own pace on your smart-phone, tablet or computer.

Scan and enter the Grundfos academy or visit <https://in.grundfos.com/ecademy.html>





# WORLD OF GRUNDFOS IN YOUR HAND



THE GRUNDFOS PRODUCT CENTER ONLINE TOOL LETS YOU SIZE PUMPS, BROWSE THE GRUNDFOS PRODUCT CATALOGUE, FIND APPROPRIATE REPLACEMENT PUMPS AND FIND PUMPS FOR HANDLING SPECIFIC LIQUIDS

Search in the way that meets your needs by application, pump design or pump family.

Experience faster sizing thanks to a new intelligent "Quick Size" function.

Documentation includes pump curves, technical specs, CAD drawings, available spare parts, installation videos, and much more.

Optimised for your PC, tablet or smartphone.

As a registered user you will have access to saved preferences, products and projects and recent browsing history.

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