

# PUMPS FOR PHARMACEUTICAL AND BIOTECH APPLICATIONS

PLAY IT SAFE WITH GRUNDFOS





## RELIABLE OPERATION AND DOCUMENTED SAFETY

For every conceivable pump application in pharmaceuticals, biotech and personal care, the full-line Grundfos range gives you better peace of mind and high energy efficiency.

There are many possible ways to customise a Grundfos pump to suit specific requirements. Tell us what you need to pump, and we will deliver a fully-documented, hygienic solution to do just the job.

### **Pharmaceuticals**

For a reliable supply of water for injection, we have a range of aseptic pumps dedicated to pharmaceutical processes. We supply all relevant certification for your validation process.

### **Biotechnology**

In upstream and downstream processes our range of pumps offers the highest aseptic standards and gentle product-handling.

### **Personal care**

Lotions and creams benefit from the excellent viscosity-handling capabilities of the Grundfos range. Extremely viscous mixtures, crystallines and corrosive or abrasive media, there's nothing we can't move gently and reliably.

### **150 years of service**

Grundfos is the world's largest pump manufacturer with pump ranges covering every end of the industrial spectrum. The pharmaceutical and biotech industries are no exception.

In the production of healthcare and personal care products, our expertise and heritage go back 150 years through our Hilge and Alldos subsidiaries.

### **Quality products need quality pumps**

Our pumps and systems are installed in pharmaceutical manufacturing, biotech facilities and cosmetics production around the world. Grundfos pumps are ideal for this kind of work because they are designed specifically to maintain product integrity and consistency, as well as to be CIP and SIP-compatible. And then there's peace of mind: Grundfos pumps are synonymous with reliability and ensure that your product lives up to your standards – batch after batch.

### **Global service, just around the corner**

Grundfos has a close-knit service network of more than 580 service partners in more than 52 countries. Whether you need products, parts or just some good advice, there is always a local Grundfos expert available who is ready to help.

Go in and try our online pump selection and sizing tool. You can find the right pump for your installations and download pump documentation, including 3D technical drawings, installation manuals and literature. Basically, everything you need to know about our pumps is online at [www.grundfos.com/industry](http://www.grundfos.com/industry) any time of the day or night.

### **The sign of top industrial quality**

The characteristic stainless steel Grundfos Industrial Solutions sign symbolises our commitment to industrial professionals. Our pump ranges cover it all: cleaning, dosing, water treatment, water supply, wastewater, cooling, boiler feeding, heating, fire protection and general or sanitary processing.


Grundfos Industrial Solutions is determined to become your preferred pump and pump solution supplier. Read on and let us convince you.



# WE HAVE YOUR PRODUCTION FLOOR COVERED

Grundfos is a full-line supplier of pumps for plant service systems and processes. We produce pumps for every facility in the industrial water circuit: Delivering water to the plant, moving the water inside the plant to where it's needed, e.g.



for boiler feeding or cooling systems. Finally, we have the pumps for leading the wastewater out of the plant to a treatment facility.



## Heating and cooling

### Heating and cooling

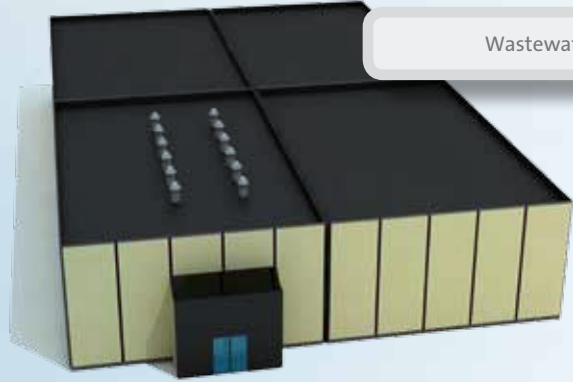

Our complete range of reliable, energy-optimised circulators ensures stable heating and cooling.



## Wastewater inactivation

### Wastewater inactivation

Our complete range of dosing systems and corrosion-resistant wastewater pumps also comes with advanced monitoring and control features.



## Water supply

### Water supply

Ensure a stable water supply with our complete range of disinfection systems and energy-optimised pumps with advanced monitoring/measuring and control features.

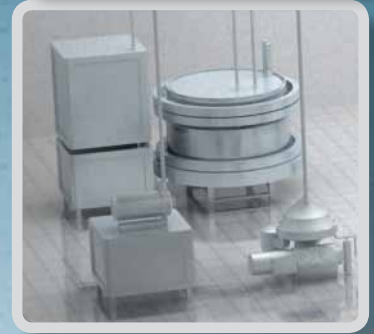
### Upstream processes



#### Upstream processes

Stainless steel sanitary pumps ensure controlled mixing and fermentation processes.

### Downstream processes



#### Downstream processes

The refined product is pumped gently and precisely through filtration and chromatography processes.



### CIP-system



#### CIP-system

Robust, self-priming pumps ensure fast cleaning and minimal water and detergent use.

### Water for injection system



#### Water for injection system

Our sanitary pumps play a critical and dependable role in the production and distribution of WFI.

# BEAT THE CHALLENGES

Difficult liquid characteristics and high regulatory standards pose some special challenges for pharma and biotech. With a combination of our expertise, quality pumps and a wide range of customised components, we can help you meet

each of the challenges you face. In our customised solutions, your assurance is that every component is a standard component – proven, tested and used in different configurations.

CHALLENGE	SOLUTION	DESIGN
The system must be completely drainable.	<b>Fully drainable</b> Vertical pump installations or casing drains are alternative ways to ensure that your system is fully drainable.	
Dangerous and toxic liquids must not leak.	<b>Sealless solution</b> The hermetically sealed CRN MAGdrive ensures that your CR pump will never leak. Newly patented features make the CRN MAGdrive unbeatably reliable while maintaining a high efficiency.	
Crystallising and abrasive liquids are hard on the shaft seal.	<b>Customised seal solutions</b> <ul style="list-style-type: none"> <li>• A flushed seal (double shaft seal with rinsing chamber) is unbeatable at handling liquids where the risk of crystallisation is high.</li> <li>• A double shaft seal is designed to counter the wear of abrasive liquids.</li> </ul>	
Energy consumption must be kept down.	<b>Pump Audit</b> A pump audit checks your pump installations for overall energy efficiency. You get a report that recommends changes, incl. savings and payback time.	
There must be no risk of contamination within the system.	<b>Extremely fine surface finish</b> All Grundfos sanitary pumps are made of cold-rolled stainless steel that provides a robust, homogenous and pore-free surface. The surface is electro-polished – a completely smooth surface down to the molecular level.	<b>Surface finish</b> 

## Keep your process running

For fast service and maintenance we have designed our pumps for easy access using standard tools.

The components most susceptible to wear are designed to be removed and replaced for a fast turnaround.

# ONE TRUSTED NAME DESERVES ANOTHER

Healthcare professionals need to trust pharmaceuticals enough to recommend them to their patients. Consumers have to feel safe using lotions and creams. They trust your brands. Grundfos has a range of renowned pumps that help safeguard product quality and brand reputation. And this is how:

## HiGenix™ – Unique hygienic design

HiGenix™ is the design philosophy behind Grundfos sanitary pumps. It encapsulates the unique manufacturing techniques and dedication to quality that make Grundfos pumps the most hygienic and competitive options available.

The interiors of Grundfos sanitary pumps are hygienic because they don't give bacteria or residue anywhere to cling or hide. The pumps are free of edges, seams, screw-heads and dead-ends where bacteria particles can accumulate. And an optimised vortex design keeps the fluid in constant circulation.

## Processing with care

As well as fulfilling the strictest hygienic criteria, Grundfos sanitary pumps treat your product gently: maintaining purity and product characteristics without damaging even the most delicate ingredients.

## Easier cleaning

All Grundfos sanitary pumps are designed for easier, 100%-thorough CIP (Cleaning In Place) and SIP (Sterilisation In Place).

## Peace of mind

The offshoot of all of the above is better peace of mind. Not only can you be sure your product quality standards are being maintained, you will reap the benefits of less downtime and longer product life.

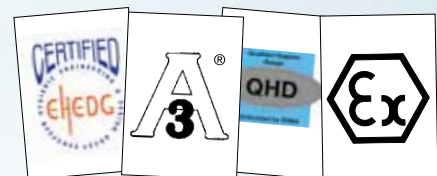
### CERTIFICATIONS

We can supply all the documentation you need:

- type approvals
- surface roughness tests
- material certificates

EHEDG approvals for CIP and SIP

3A  
Qualified Hygienic Design  
ATEX



# KEEP THE FLOW GOING WITH GRUNDFOS

Grundfos is a full-line supplier of premium pump solutions. Our range has a variety of models suited to different stages of industrial processes. We can outfit your entire application with general process pumps, dosing solutions and sanitary pumps that fulfil the strictest hygienic criteria.

## SANITARY PUMPS

### Low viscous transfer

Safeguard the integrity of your product and process with pumps that do the job cleanly and reliably.



*Euro-HYGIA®*

### Solvents and aggressive liquids

You can be sure that hazardous liquids stay where you want them with a sealless pump that is hermetically sealed.



*CRN MAGDrive*

### High viscous transfer

For highly to extremely viscous media we can customise our pumps to be robust enough to take the load and still be gentle on the product.



*NOVAlobe*

### Water for Injection

Fully drainable, fully documented pumps from Grundfos will not compromise product purity in any way.



*Contra vertical*

### Clean in Place

Self-priming robust pumps with very high suction capability ensure efficient and thorough plant cleaning.



*SIPLA*



## UTILITY SYSTEMS

### Water treatment

Grundfos has developed a flexible range of stainless steel pumps and systems that don't contaminate pure water. Naturally, all pressure requirements can be met.



NB/NK

### Water supply

Our range covers both pressure tank systems and frequency-controlled systems. It includes submersible SP pumps for borehole applications as well as inline and end-suction pumps for backwash applications and DMS/DME dosing pumps for water chlorination.



Hydro Booster system

### Wastewater

Solids and other particles in wastewater cause wear requiring robust pumps. Our range varies from small stainless steel drainage pumps to large wastewater pumps with up to 600 kW motor power.



SE

### Cooling

Speed-regulated pumps offer a major advantage in terms of dimensioning and energy savings. Our cooling shaft seal has a reduced seal face to avoid crystallisation damage. We offer pumps for waterborne cooling systems and single-stage pumps.



TP

### Boiler feeding

Grundfos has customised a CR pump version with low NPSH, specially designed for systems with poor inlet conditions. This ensures cavitation-free operation even outside the pump's normal duty range. We recommend speed-regulated pumps (E-pumps) for boiler feeding. CRN/BM pumps are ideal for water replenishment.



CR

## DOSING & DISINFECTION

### Dosing

With the unique Digital Dosing™ pumps, you can dose exactly what you set with no pulsation and no overdosing. With a turndown ratio of up to 1:1000, Digital Dosing™ pumps are accurate down to the smallest dose between 0.0025 – 940 l/h.



DME

### Disinfection

Easily installable Grundfos Oxiperm Pro systems produce chlorine dioxide using diluted solutions of sodium chlorite (NaClO<sub>2</sub> 7.5%) and hydrochloric acid (HCl 9%). The disinfection systems can be used for the CIP and SIP-processes. Measurement and control system provide the necessary safety.



Oxiperm Pro



## KEEPING CLEAN HANDS STERILE

With disinfection creams for the healthcare sector, eye wash and skin care products, PLUM SKIN SAFETY in Denmark has hygiene as their top priority. All their products live up to international standards for hygiene in the healthcare sector.

PLUM produces skin creams, soaps and disinfectants for the healthcare sector, the food sector and industry. With a history of getting very dirty hands clean for mechanics and plumbers, the PLUM range is today increasingly focused on keeping skin sterile with disinfectants.

Healthcare workers must maintain the proper, high standards of hygiene to prevent viral and bacterial infection. Skin disinfectants are an effective means to do this. At the same time protect their skin. PLUM's hand hygiene system addresses the important issue of skin protection that arises with frequent hand washing.

### **NOVALobe gives confidence**

PLUM needs pumps that can pump hot or cold, thick or thin liquids, and in some cases creams containing abrasive particles.

Although aware of Grundfos by reputation, PLUM had been unaware that Grundfos also had a range of products that meet the high standards of hygiene.

"Our relationship with Grundfos started because their man was at the right place at the right time," says production manager Per Pasfall. Since that time PLUM has grown confident with Grundfos as supplier of hygienic pumps.

Currently, PLUM has seven NOVALobe pumps for transporting the high-viscous liquids from process to process and for feeding the filling machines.



## AN OVERHAUL WITH HIGH EXPECTATIONS

### Protecting an investment

When one of Bavaria's largest pharmaceutical companies decided to overhaul its entire production line it wanted only premium solutions. Around €280 million was being spent, and the company wasn't going to compromise its investment with anything less than the best sanitary pumps on the market.

As a pharmaceutical company the customer's requirements included a reliable flow of ultra-pure and deionised water, and a solution that made as little noise as possible. The CIP (Cleaning in Place) applications presented a particular installation challenge and required sterile double axial face seals.

### An ensemble of ultra-sanitary solutions

Grundfos was commissioned to install 52 of its pumps. Before installation began, Grundfos specialists were closely

involved in the planning phase to ensure optimal installation and operation. The sanitary pumps installed included standard centrifugal pumps (Euro-HYGIA® I, Euro-HYGIA® II, Contra I, Contra II) and SIPLA self-priming centrifugal pumps.

### A "success story"

A spokesperson for the company says they are very happy with the outcome. He says Grundfos pumps are "one hundred per cent guaranteed" when it comes to reliability.

The project engineer, who was largely responsible for the commissioning and installation of the Grundfos pumps, adds that the collaborative efforts between his company and Grundfos had been a "success story from start to finish".

## GRUNDFOS INDUSTRIAL SOLUTIONS

The full-line Grundfos range caters to the specific needs of food processing plants, confectionery and chocolate factories as well as dairies. Grundfos sanitary pumps give you better peace of mind and optimal pump application compatibility for every stage in your production process. Our range has models specifically designed to handle viscous, delicate or temperature sensitive ingredients

– all with maximum care and hygiene. At Grundfos we know reliability and easy maintenance are critical factors in keeping the production flow going. That is why our sanitary pumps are SIP/CIP-compatible and can be customised for optimal performance. And all Grundfos pumps come with the expertise and global support network of the Grundfos Group.

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