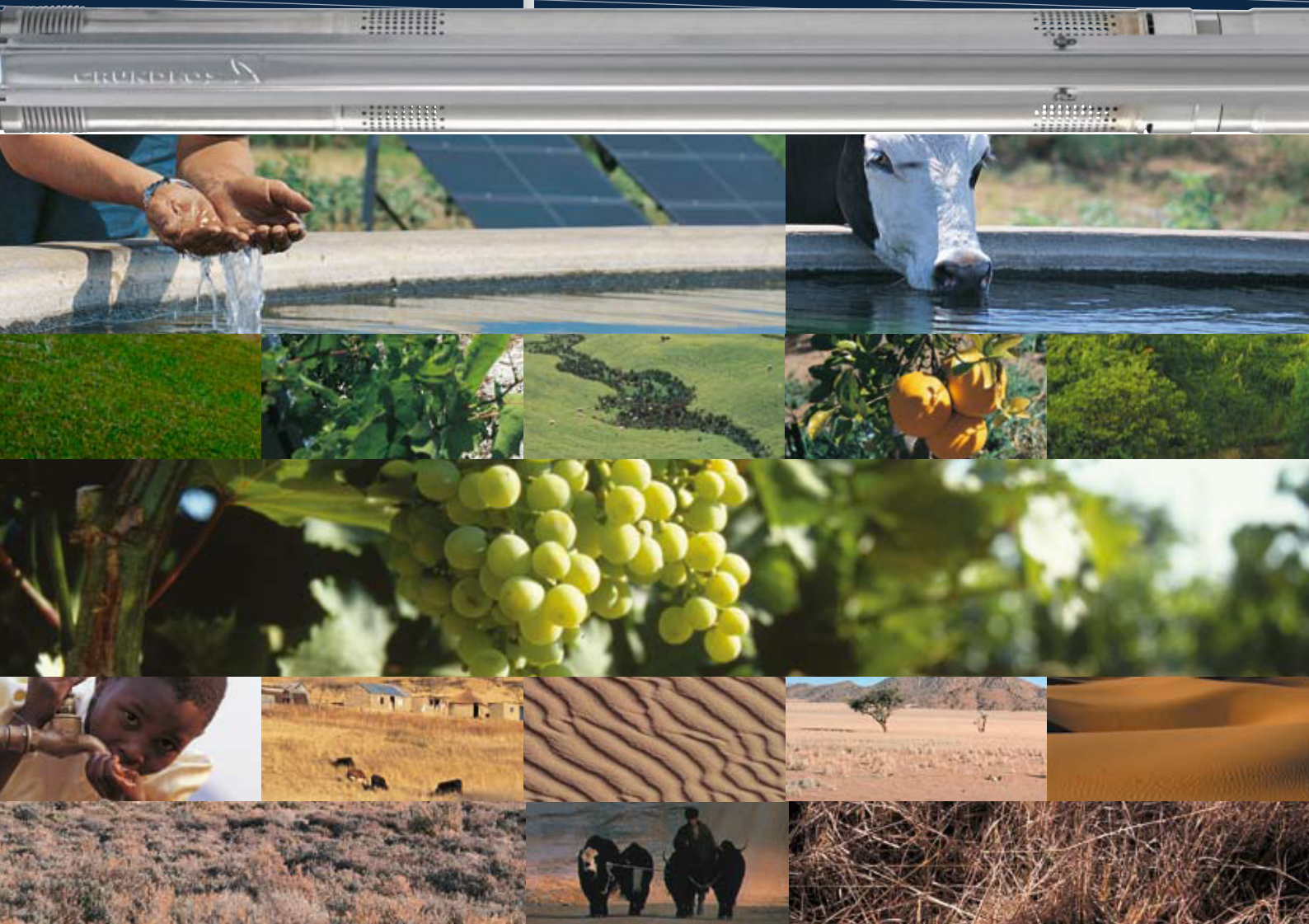


Water, wherever, whatever



CASE STUDIES >



CATTLE FARM, AUSTRALIA

SQFlex Solar has replaced the conventional windmill at Hamilton Downs, a 2,000 square kilometres cattle and sheep property in the Australian Outback. The outcome is a much more reliable and efficient water supply for the 5,000 cattle, and considerably less maintenance work for the farm owner.



VINEYARD, SPAIN

SQFlex Wind provides the power to draw water from a depth of 95 metres below the ground to a well, irrigating the 3,000 individual grapevines through a drip irrigation system. The regular supply of fresh water contributes to better vintage quality and thus increased business prosperity for the winery.



GAME PARK, NAMIBIA

The NamibiRand Nature Reserve extends over 2,000 square kilometres and into the Namibian desert. SQFlex Solar helps preserve the wildlife by delivering water to the many animal species who roam unhindered in the fence-free game reserve.



REMOTE VILLAGE, SOUTH AFRICA

Instead of walking long distances for water, and sometimes in vain, the 1,800 residents of the Abantunga Community now enjoy the luxury of clean water provided by SQFlex Solar. Water for drinking, ablution and cooking is provided by several public standpipes in the village and at the local school.



Sometimes Mother Nature needs a hand

Innovative technology and nature hand in hand

Human existence and business prosperity in remote locations depend largely on the availability of clean water to people, livestock and crops. But in many parts of the world reliable power can be in just as short supply as the water. Grundfos SQFlex lends nature a helping hand by providing both water and the power needed to fuel the pump system. Areas that would previously have been considered uninhabitable or not supportive of life suddenly become viable and attractive.

Based on renewable energy sources such as solar and wind power, SQFlex combines state-of-the-art pump technology with sustainable, energy efficient solutions to provide a reliable water supply to remote locations with little or no access to water and electricity. The better the quality of the water, and the more reliable the water supply, the better the quality of life for everyone.

100% nature – just add water

Whether you are blessed with an abundance of sunshine or wind, or a bit of both, SQFlex solar panels or wind turbines adapt to the characteristic weather profile of any given area. A generator or battery backup system can take over when the natural energy sources are scarce, and accumulate energy when they are plentiful. With an SQFlex system, there is water whenever and wherever you need it. It is as simple as that!

Complete system ready to go

Tell us where you are located, your water table depth and estimated water needs. By analysing location specific variables such as average sunshine and wind speed, we can tailor the system so it matches your application and local conditions perfectly. SQFlex is a customised product delivered as a plug-and-go solution complete with SQF submersible pump, controller, energy source and support structure. The system is remarkably easy to install and use under even the most difficult conditions.

Application areas

Designed for continuous as well as intermittent operation, the SQFlex system is especially suitable for water supply in remote locations such as:

- villages, schools, hospitals, single-family houses, etc.
- farms and ranches
 - watering of livestock
 - irrigation of crops and greenhouses
- game parks and game farms
 - watering applications
- conservation areas
 - surface water pumping
- ponds and lakes
 - floating pump installations





Stay flexible with SQFlex



SQFlex pumps

The complete SQFlex pump range consists of 10 different pump sizes: 4 helical rotor pumps for medium to high heads and low to medium flows, and 6 centrifugal pumps for shallow heads and high flows. It is available in two different stainless steel material variants: type AISI 304 as standard and type AISI 316 for slightly aggressive water. The pump is fitted with a high-efficiency motor for DC or AC voltage. This makes pump sizing and selection extremely easy.



Solar systems

The GF solar panels are designed especially for the SQFlex pump motor unit. A higher output voltage compared to standard 12V panels ensures optimum efficiency of the complete SQFlex pump system – with up to 20% flow increase per day in small systems. The solar panels incorporate eight bypass diodes, which minimise power loss in case the panels are covered by patches of shadow, dirt, leaves or bird lettings. Wiring of the GF solar panels is easily done using the MC cable connectors, and the panels are mounted to the support structures without the use of any special tools.



Wind systems

Where wind speed prevails over sunshine hours, the SQFlex Wind is just as cost-effective and sustainable. SQFlex Wind is particularly suitable for open fields, valleys and landscapes where the wind blows constantly. The small but high-quality wind turbine consists of only a few simple components, making it exceptionally easy to install and maintain compared to conventional windmills.



Combi systems

The SQFlex Combi takes maximum advantage of natural energy resources by providing a combination of solar and wind energy: solar panels for when the sun is shining; a wind turbine for when the wind is blowing. The added benefits of the SQFlex Combi are even greater reliability and water whenever it is needed.



Backup systems

Natural energy rarely runs low, but if it ever does, both the SQFlex Solar and SQFlex Wind systems can temporarily fall back on a petrol or diesel-driven generator or batteries. Intelligent control units make changing between power supplies very easy.



Control units

The SQFlex system is available with a user-friendly CU200 control unit that maintains two-way communication with the pump and monitors the operating conditions. Built-in diagnostics indicate faults and dry-running, display operating status power consumption and level switch input.

Other alternatives are IO100 switch box and IO101 generator box for SQFlex Solar, and IO102 breaker box for SQFlex Wind, which are controlled by a manual on/off switch.



Level switch

Save energy as you save water. With a level switch inside the storage tank connected to the CU200 control unit, the pump knows when the tank is full and shuts itself off.

Battery backup system

Battery backup systems with a charge controller are typically used in applications where the pump is not running during most of the peak sun hours of the day, or where it is impossible or impractical to store large volumes of water. Examples include remote homes or cabins, automatic livestock waterers, and very low-yielding wells. The SQFlex battery backup system enables SQFlex Solar to operate just like any traditional closed water supply system powered by the mains supply, providing water pressure day and night.



SQFlex Solar WaterPack

A SQFlex Solar WaterPack is a complete system solution ready for installation

- just add one or more solar panels. The standard package contains:

- SQF submersible pump
- IO100 SQFlex switch box
- Support structure
- Cable kit

You get it all

- reliable water supply
- cost-efficient pumping
- complete plug-and-go system
- easy installation
- virtually no maintenance
- numerous expansion possibilities

Quality inside out

SQFlex pumps have built-in protection features that protect the pump itself and in many cases the well. Among these features are:

- Protection against dry-running, overloading and overheating
- Automatic restart when water returns to the well or when the motor temperature returns to the safety range
- Continuous load condition and voltage monitoring



Pump casing

Stainless steel for long pump life.

Helical rotor pump (3")

Based on original pumping principles, the helical rotor pump uses a few, simple components for effective pumping – medium to high head and medium to low flow.



Sand slinger

To ensure maximum protection of the motor and thus extended motor life, the SQFlex pumps are equipped with a composite sand slinger on the motor shaft as standard. The sand slinger rotates with the shaft, thereby pushing sand away from the centre and out through three grooves in the pump sleeve. Another distinctive benefit is that pump and motor can be replaced independently of one another, in case one of them wears out.



Bearings

Powerful carbon/ceramic bearing system ensures high reliability.

Motors

Two motor sizes are available for the SQFlex system with built-in unique features: 3000 rpm for helical pumps and 3600 rpm for centrifugal pumps segmented stator and permanent magnet rotor for high efficiency and starting torque.

Power transmission

The unique Grundfos micro frequency converter ensures power transmission to the motor.

Any voltage

A wide voltage range enables the motor to operate at any voltage between 30V and 300V DC or 90-240V AC, which makes installation and sizing especially easy.



Communication

Two-way communication between control unit and pump eliminates the need for additional wires.

System efficiency

Maximum Power Point Tracking (MPPT) means even and high system efficiency regardless of power source.



Dry-running protection

This unique feature shuts down the pump if it detects water shortage. It protects the well from being over-pumped and the motor from burning out. The pump restarts automatically when water returns to the well.

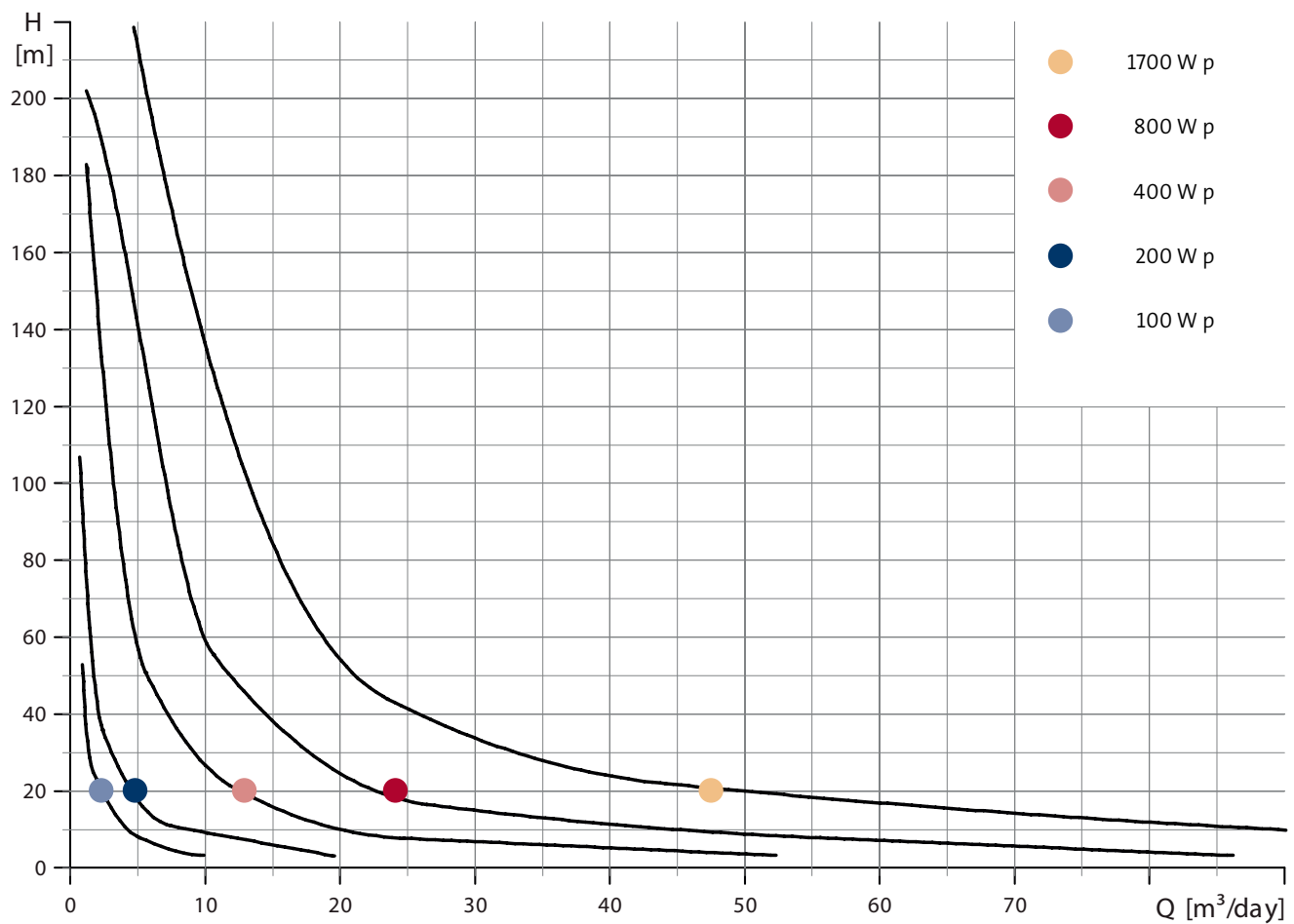


Centrifugal pump (4")

Technology based on 30 years' experience enables high flow in shallow water conditions. Stainless steel components give high wear resistance.

Total performance, total range

SQFLEX Solar



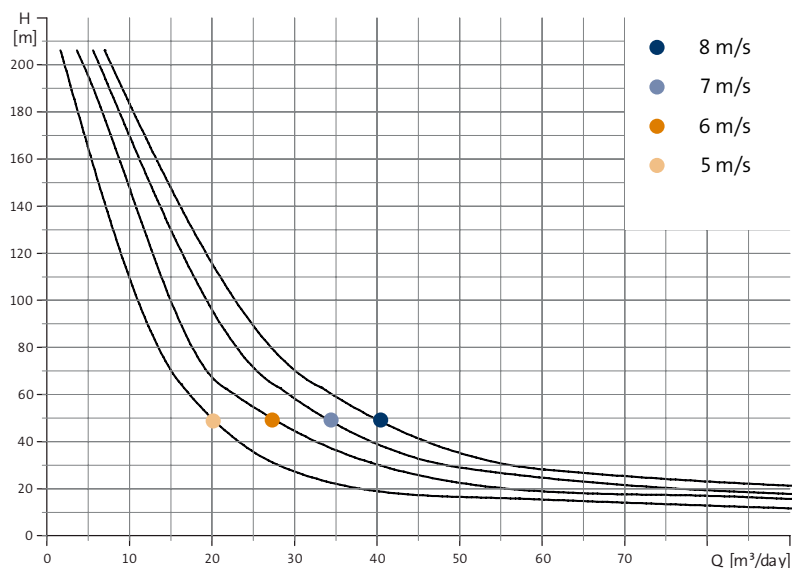
The SQFlex Solar performance curves

are based on:

- Irradiation on a tilted surface
- $H_t = 6 \text{ kWh/m}^2$ per day
- 20° tilt angle
- Ambient temperature at 30°C
- 20° northern latitude
- 120V DC



SQFLEX Wind



The SQFlex Wind performance curves are based on:

- Average wind speed
- Calculations according to Weibull's factor $k = 2$
- Continuous operation over 24 hours

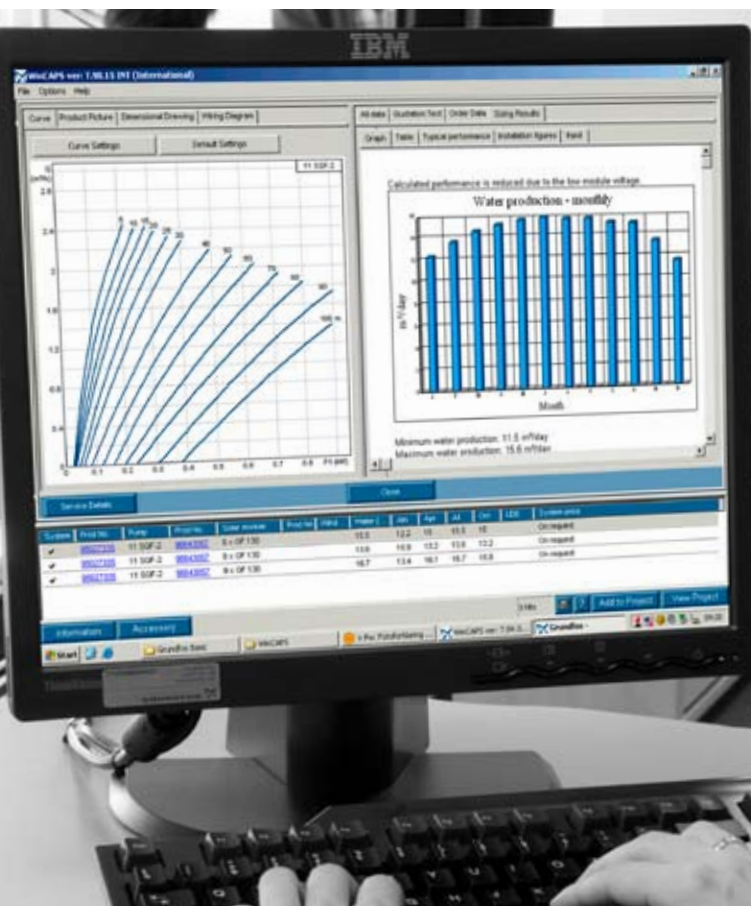
Water for life

The table provides a quick overview of average water consumption per day for humans and selected livestock and crops. This indicative information can be used to make a rough estimate of your required water needs per day when sizing and selecting the SQFlex system. Please note that the figures in the table are intended for guidance purposes only.

Type	Average water consumption
Human	30 ltr/day
Cattle	40 ltr/day
Sheep	10 ltr/day
Game/Deer	10 ltr/day
Olive tree	40 ltr/day
Grapevine	12 ltr/day



Sizing and selection made simple and easy



Getting it right from the start

Sizing and selection of the optimum SQFlex system has never been easier. Based on a few location-specific variables such as average sunshine and wind speed and your estimated water needs, Grundfos' sizing tool WinCAPS does the calculation and system sizing for you.

All you need to determine is the following three parameters:

- geographical location
- required maximum head
- required water quantity per day

Contact your local Grundfos dealer/installer for a sizing proposal.

Comprehensive online documentation

You can draw on a wide range of expert knowledge, documentation, installation and service information via Grundfos' online software tool WebCAPS; available at www.grundfos.com. It contains product information about more than 180,000 Grundfos products in more than 22 languages.

Especially the installation and service videos are the ultimate, convenient way to be informed about how to install and maintain a pump. Simply select product type and click on the camera symbol, then press play and watch all the installation and service tips play before your eyes.





Choose the win-win alternative

Individual solutions to remote water supply

SQFlex's many possibilities and areas of application means that it constitutes the perfect sustainable, reliable and cost-efficient alternative to irregular, cost-intensive water supply solutions in remote locations. It provides individual solutions to water problems where conventional water supply systems fail or simply cannot reach – and at hardly any cost. By opting for green technology, you can contribute to increased sustainability – for the benefit of your business and nature in general.

Turn harsh conditions into your advantage

Instead of working against nature, you can work with it. Use the sun or the wind, or a combination of both, to create power for your water supply system. For instance, in warm places there is traditionally more sun than wind, and with SQFlex Solar you can take maximum advantage of the local weather conditions by relying on solar energy all the year round.

Work smart, not hard

With an SQFlex system, the time-consuming and often dangerous work of climbing a traditional windmill structure to perform regular maintenance on body, wings and gearbox will be history. So are the expensive insurance policies covering hazardous work. SQFlex solar panels and wind turbines are virtually maintenance-free and much safer to handle.

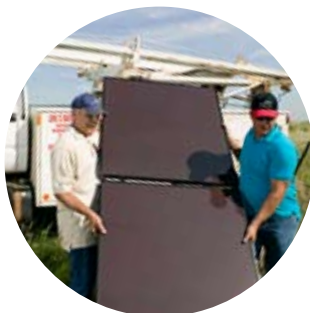
Focus on lifecycle costs

You cannot afford not to. The initial upfront investment in a SQFlex solution is comparable to conventional water supply systems. But this is where the comparison stops. The total cost of owning a pump system over its entire life is about much more than just the purchase price – it is the total sum of not only the costs but also the benefits of having a business relationship with Grundfos.

The lifecycle costs of an SQFlex system will be considerably lower than with other water supply systems, because you can save substantial sums on reduced energy and maintenance costs. Other more intangible cost-reducing factors include correct system sizing, high pump efficiency and performance, technical advice, service and reliable logistics.

Water, wherever, whatever

You can count on quick and efficient service from your local Grundfos dealer/installer in case your SQFlex system needs a general service check-up or a new spare part. Grundfos offers a close-knit service network with own service organisation in more than 40 countries combined with hundreds of Grundfos Service Partners, installers and dealers worldwide. Efficient logistics ensure rapid delivery of spare parts, which are handled from one of our strategically placed distribution hubs.



BE

Being responsible is our foundation. We know that we have a responsibility towards the people who are Grundfos, towards the innovative soul of Grundfos, as well as towards the surrounding world. Whatever we do, we make sure that we have a firm and sustainable basis for doing it.

THINK

Thinking ahead makes innovation possible. We encourage a certain Grundfos way of thinking that is founded on the belief that everyone must contribute by using his or her judgment and foresight. We are looking for commitment and ideas in everything we do in order to make the best solutions. We think – and then we act.

INNOVATE

Innovation is the essence. It is the innovations that make Grundfos unique. We stand out because of our ability to constantly create new solutions to the ever-changing demands of the pump business. We meet every challenge, and we are never afraid of taking the initiative – remaining true to our ideals is the basis for our ongoing renewal. Innovation is the soul of Grundfos.