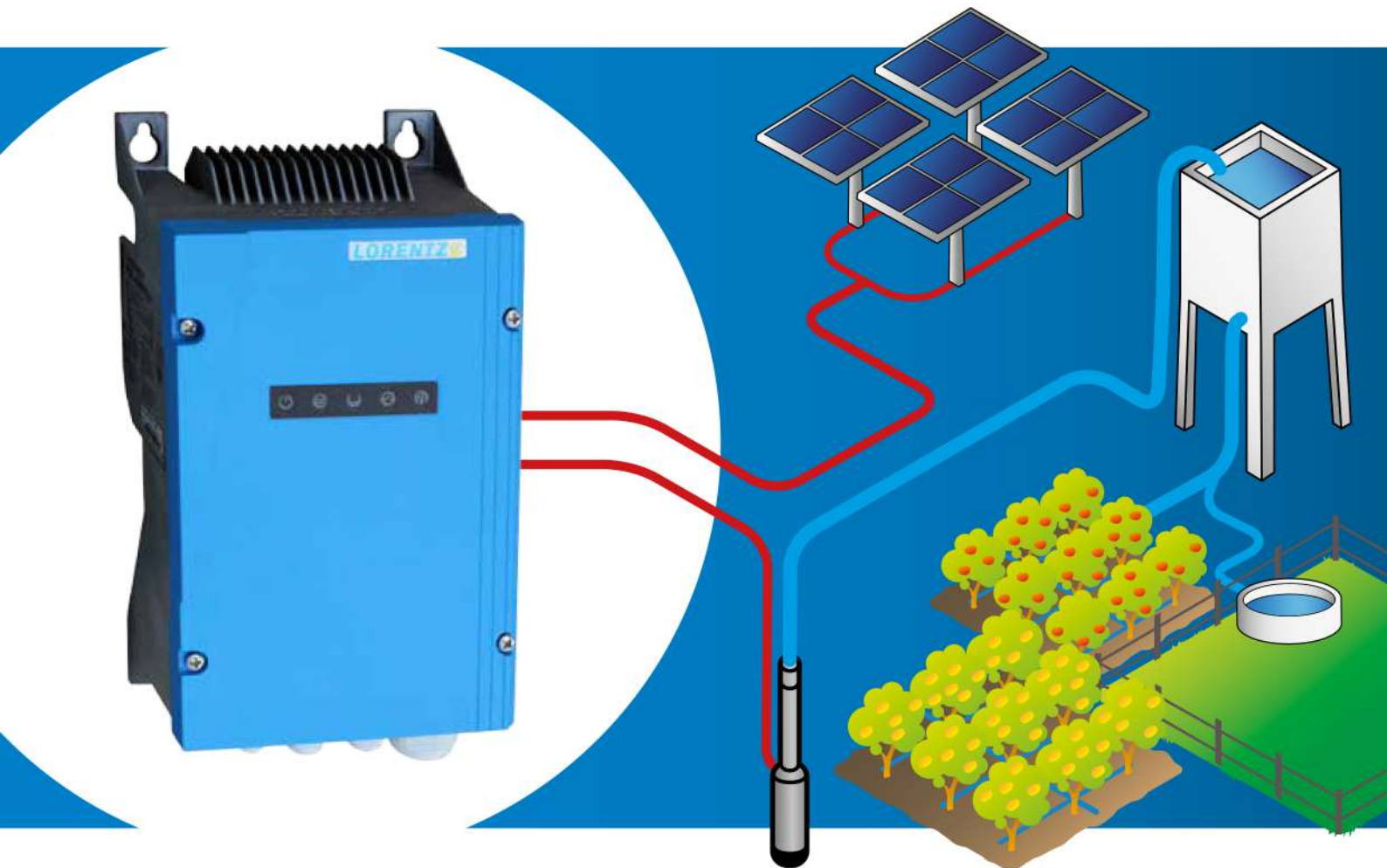


# PS2

The complete, efficient, solar water pumping solution  
Delivering you more water!



**PS2 is an integrated solar water pumping system for small to medium sized applications.**

PS2 provides a very efficient total solution to meet your solar water pumping needs.

Whether your need is to reduce operational costs, improve water security, or be more sustainable, PS2 provides the right solution.

**LORENTZ**   
*The Solar Water Pumping Company*



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# The complete solution

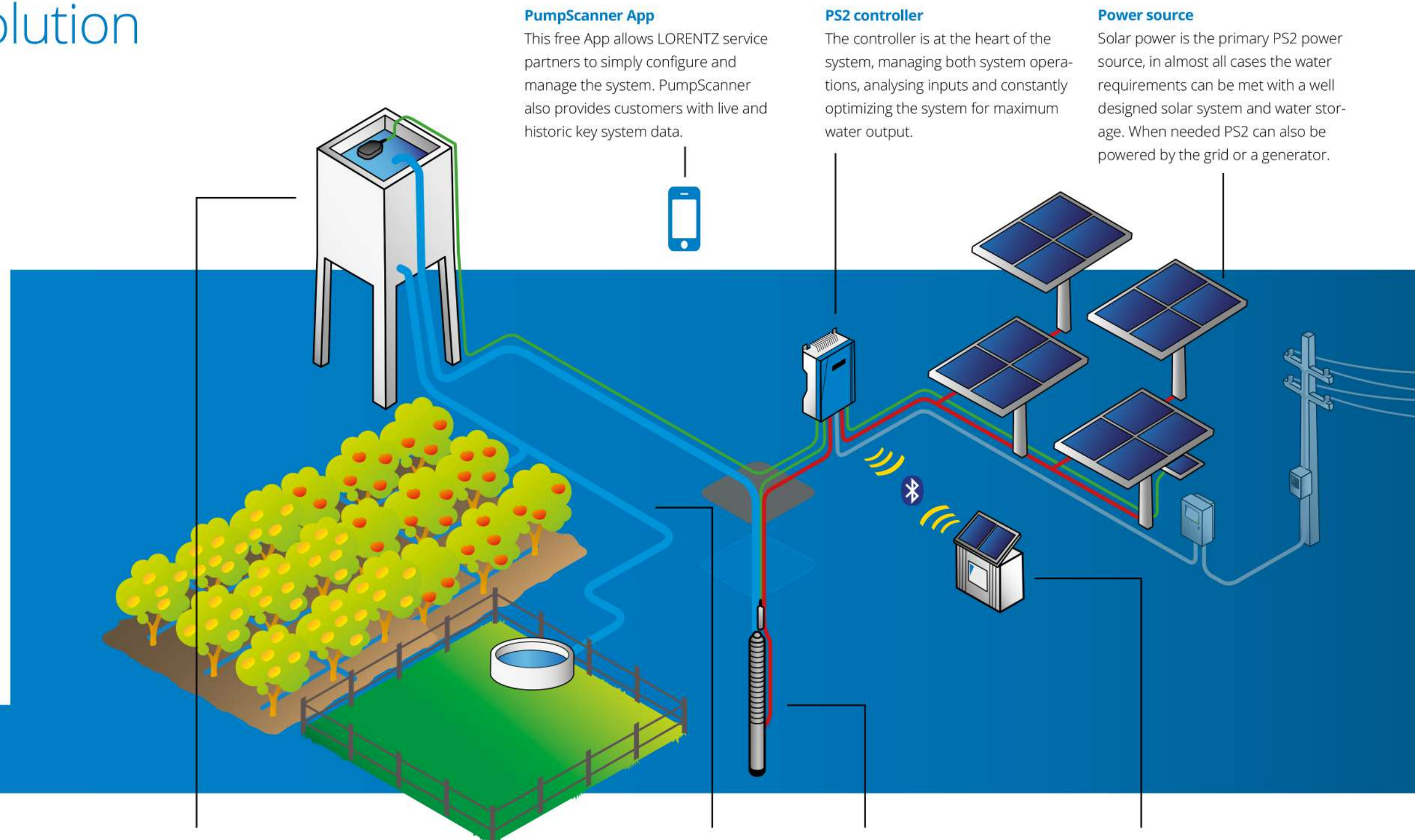
Pumping water uses a significant amount of power. The sun provides us with an almost infinite energy source that, with the right planning and equipment, means we can pump water anywhere without the needs for power infrastructure.

PS2 is an advanced solar water pumping system. The system is designed specifically to use the power of the sun to move water, so replacing the need for grid power or diesel.

As solar power is not consistent through the day then PS2 constantly changes the pump parameters to optimize the amount of water available.

Being designed as an off-grid solar water pumping system, PS2 has all of the inputs and outputs needed in an integrated self-managing system.

PS2 systems are the most efficient available, delivering 30 % to over 1,000 % more water than the competitors' products depending on weather conditions.



## PumpScanner App

This free App allows LORENTZ service partners to simply configure and manage the system. PumpScanner also provides customers with live and historic key system data.

## PS2 controller

The controller is at the heart of the system, managing both system operations, analysing inputs and constantly optimizing the system for maximum water output.

## Power source

Solar power is the primary PS2 power source, in almost all cases the water requirements can be met with a well designed solar system and water storage. When needed PS2 can also be powered by the grid or a generator.

## Water storage

Introducing water storage to a solar water pumping system allows for increased seasonal demands to be met, or simply for overnight water availability without a generator or grid power.

## Distribution network

LORENTZ solar water pumping systems are used for drinking water, irrigation and swimming pools. Whatever the PS2 pump is connected to the system will optimize water delivery depending on the power available and inputs from the various sensors.

## Wide range of pumps

PS2 has a wide range of submersible and surface pump systems available to meet your water needs. Submersible pumps are available that can pump from 450 m (1500 ft) depths and surface pumps available for flows of up to 60 m<sup>3</sup>/h (265 US Gal./min).

## Monitoring and management

All PS2 systems have inbuilt data logging and a simple management interface. All systems can also be remotely monitored and managed remotely along with any other LORENTZ systems you have via our pumpMANAGER service.

**The Solar Water Pumping Company**





# Benefits you can realize



## No infrastructure to install

Using solar power means that you can install a pumping system almost anywhere, irrespective of power infrastructure availability and the associated costs. PS2 is designed for the harshest off-grid environments.

## Low operational costs

Operational cost savings are achieved as the system requires no fossil fuels, can be fully remotely managed and is designed to have a long working life. The result is very low, or no operating costs.

## Low cost of water

PS2 uses brushless and sensorless DC motors for maximum efficiency, this results in significantly more water being pumped with the available power. This efficiency results in a lower unit cost of water pumped.

## Lowest project risk

As PS2 is designed to be a complete system, it has all of the needed software and hardware for your water project. The result is that your projects are delivered on time, on budget and without technical risk.

## *The Solar Water Pumping Company*





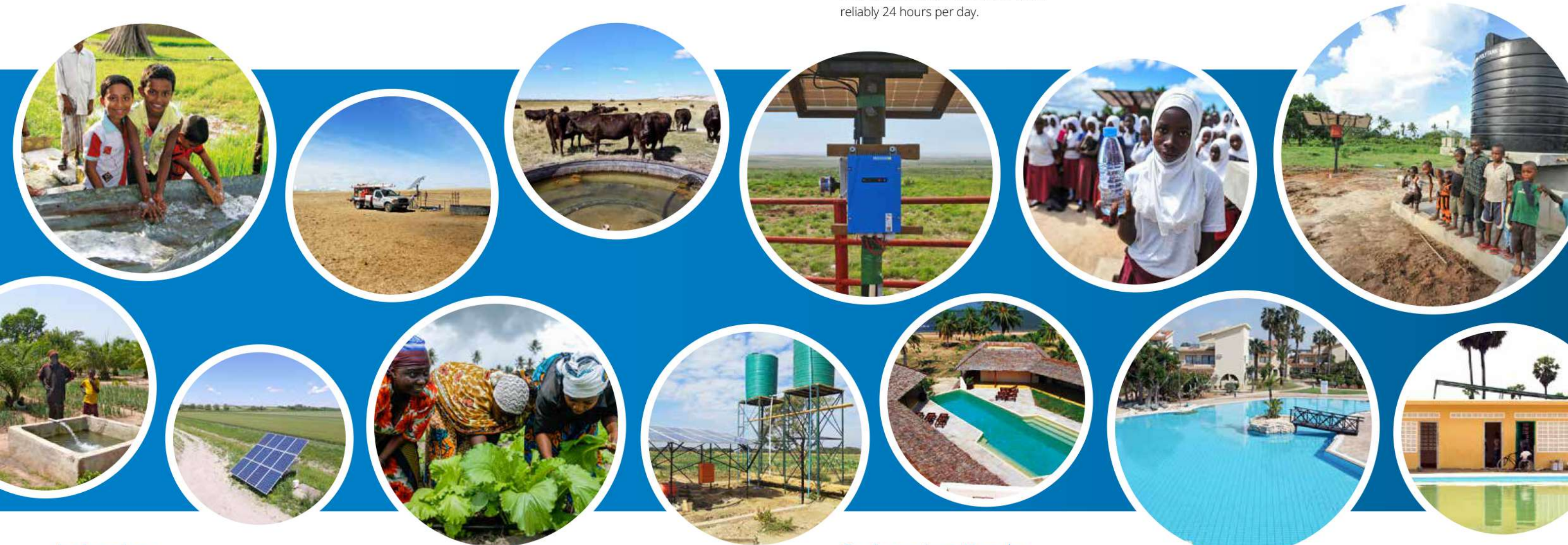
# How customers are using PS2

## Drinking Water

**For people** – PS2 has been deployed as the primary water delivery mechanism for communities in all parts of the world. By utilizing water storage, solar direct PS2 systems deliver water reliably 24 hours per day.

**For livestock** – PS2 is providing very economical solutions for both water abstraction and pressure boosting applications for livestock.

Farmers rely on PS2 to deliver water in remote locations reliably and cost effectively.



## Irrigation

**Solar pumps are a perfect match for irrigation – more sun equals more water.**

PS2 is being used to transform unused land into productive farms. Bringing water to locations that do not have any existing infrastructure is improving food security and generating significant income for communities.

PS2 systems provide water into irrigation systems all around the world. Drip, sprinkler or flood irrigation method are all fully supported using this system. High flows and high pressures can be achieved allowing almost any existing irrigation system to be converted to solar power without replacement.

## Swimming Pools

**Pool pumps are the second biggest energy consumer in many homes after air conditioning.**

**PS2 solar pool pumps keep swimming pools crystal clear without any electricity costs.**

LORENTZ PS2 Pool Pumps are high quality products designed for use in residential and commercial swimming pools and spas.

In most pool applications all of the filtration needs can be met directly from solar power meaning no electricity costs and significant benefits to the environment.

The LORENTZ pump uses a DC brushless motor for high efficiency and reliability.

**The Solar Water Pumping Company**





# What makes PS2 better for you ?



## Designed for Solar Water Pumping

PS2 has been designed from the first white board sketches to be a solar pumping system.

The system has been designed and built by an engineering team who only focus on solar water pumping. This experience means they design, test and build systems where operation in the harshest, most remote environments is normal.

PS2 is designed to be field serviceable, the pump unit components and electronics are modular to allow for cost effective and fast replacement.

Having a great feature set is only part of being a good solar water pumping system, what really matters is how efficient the system is. Efficiency defines how much water it will pump. PS2 has class leading efficiency and optimized maximum power point tracking for best performance when conditions are not perfect. The system also has active power management to ensure that high ambient temperatures have minimal impact on water output.

**PS2 makes the best use of the available power to deliver the most water possible.**

## Ultimate Efficiency

All PS2 systems use a unique DC brushless and sensorless motor named ECDRIVE.

This motor is a perfect match for solar applications as it has a very high efficiency across its whole operating range. This is very different to a small AC motor where maximum efficiency is only achieved in a narrow operating band.

Solar power is always changing through the day and depending on weather conditions. The LORENTZ ECDRIVE and PS2 have an average daily efficiency of above 90 %, most of our competitors achieve 65 % with clear blue skies and much less when there is cloud cover.

What this high efficiency means is that you get more water from the system from less installed PV modules. Less modules means less cost, less racking, less installation time and labor. A high efficiency system means less total investment.

**Efficiency simply means pumping more water, pumping for a longer period of time and pumping after the competitors have stopped.**

## The Complete Solution

PS2 is designed to be a complete solar water pumping system comprising of a specialized pump controller and carefully matched pumps.

PS2 has eight sensor inputs that allow analogue and digital sensors to be connected. This combination of sensors with the powerful inbuilt software applications allows for full pump control and water specific applications.

The system also has an inbuilt Sun Sensor which measures the available irradiation and then makes decisions of what to do based on the available power. The SunSensor also avoids unnecessary stop start cycles which increase pump wear.

PS2 is a complete solution "out of the box" without the need for building additional switching cabinets or PLC units.

**Everything to deliver your projects successfully, on time and with minimal risk.**

## CONNECTED

The PS2 is part of the LORENTZ CONNECTED software ecosystem.

The system is configured on site using PumpScanner, an Android™ based App that the installer uses. Common configuration is done with three clicks and there is full access to configure system behavior based on additional sensor inputs.

The PS2 constantly records operational data and provides access to rich information for both customers and technicians.

The PS2 can also be connected to our pumpMANAGER managed service. This is a simple, cloud delivered, pay monthly service that takes away the complexity of remote monitoring and management. One low fee means that you can see exactly what the system is doing, make changes to settings and receive alerts irrespective of location.

**Advanced, but simple monitoring and management of your system locally or remotely.**


**The Solar Water Pumping Company**





# Ultimate Efficiency

Sometimes you have to look at the data

	Leading Competitors AC solution		LORENTZ PS2 DC Brushless Solution		
	<b>28 m<sup>3</sup></b> <b>7,500 US Gal.</b>			<b>39 m<sup>3</sup></b> <b>10,300 US Gal.</b>	<b>+36 %</b> more water
	<b>16 m<sup>3</sup></b> <b>4,200 US Gal.</b>			<b>25 m<sup>3</sup></b> <b>6,700 US Gal.</b>	<b>+60 %</b> more water
	<b>0.38 m<sup>3</sup></b> <b>101 US Gal.</b>			<b>6.0 m<sup>3</sup></b> <b>1,600 US Gal.</b>	<b>+1,460 %</b> more water

Look at the numbers

Sometimes the only way to make the difference clear is to look at the data. The charts above compare a leading global pump solution to the LORENTZ PS2 under the same conditions with the same solar input. These are real world tests.

The competitors pump and controller is about 15 % cheaper than the LORENTZ PS2. If you want to deliver the same amount of water in real world conditions it becomes almost 40 % more expensive!

The efficiency of PS2 means that the system starts earlier in the day, pumps more during the day and stops later. This can make a significant difference to the people, crops or animals that use the water.

Compare like with like

When you compare systems look at the water that is pumped for your investment. Comparing motor sizes, solar panel sizes or theoretical maximums are not good indicators of how much water you will be able to pump.

When making your comparisons look at the whole system costs. Adding extra solar modules, racking cabling and labor to get competitors' products to meet LORENTZ performance gets expensive.

COMPASS – the LORENTZ system planning software – will accurately simulate real world situations and design a system that will give you the water you need, when you need it.

The Solar Water Pumping Company





# A complete system



**An effective solar water pumping system is made up of more than one component. When you choose a LORENTZ system you will get an integrated solution design specifically for solar water pumping from a company with absolute focus on this technology.**

## PS2 Controller

PS2 controllers are available from 150 W to 4 kW. The controller includes the electronic to drive the ECDRIIVE brushless DC motor, software for our water applications, all the inputs you will ever need, data logging, plus intelligent control over the whole system to give you the most water possible.

## PS2 Submersible Pumps

PS2 4" helical rotor pumps and 4" to 6" submersible multistage mean that your hydraulic needs can be closely matched for maximum efficiency. See the "choosing and designing your system" section. All LORENTZ pumps are pre configured in our PumpScanner App with a simple 3-click setup.

## PS2 Surface Pumps

PS2 single or multistage surface pumps perform equally well in irrigation projects and for drinking water applications where they reliably meet the most demanding requirements. All LORENTZ pumps are pre configured in our PumpScanner App for simple 3-click setup of any system.

## PS2 Pool Pumps

Two sizes of pool pump system are offered on PS2. These two systems meet the requirements of most residential and small commercial pools. Due to the efficiency of the PS2 system a smaller motor size is required to keep the pool clean.

## Accessories

To complete your PS2 system LORENTZ provide a wide range of compatible probes, sensors, solar power connection equipment, racking and PV modules. This enables a single source of tested, ready to integrate components to give you a complete solution.

**The Solar Water Pumping Company**





# PS2 Features



## Electrical Features

### MPP Tracking

Highly efficient maximum power point tracking with pump system specific algorithms.

### Active power management for temperature

Automatic power management to ensure the system continues to run in even the most extreme temperature conditions. At ambient temperatures up to 50°C (122°F) the system operates on full power and then actively manages power above that temperature.

### Variable speed

Electronically controlled variable speed to allow maximum water to be pumped based on available power.

### Motor control

Brushless and Sensorless ECDRIVE motor control with gentle start, very high efficiency and no stop/start restrictions.

### Protection

Protection against input reverse polarity, overload, motor short circuit and over temperature.



## I/O Features

### Digital inputs

For connection of well probe, tank full, pressure switches, remote switches and ancillary switching.

### Analogue inputs

For 2x 4-20mA sensors. Applications included for pressure and level monitoring and pump control.

### Sun Sensor function

Sun Sensor module is supplied to measure irradiation and control the pump based on available solar energy.

### Water meter input

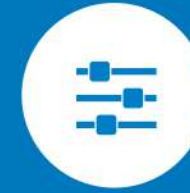
Pulse water meter input for accurate collection of flow data.

### Water sensor input

For use with "wet electrodes" when sensing water is present in pipelines.

### Signal output

For controlling externally connected devices.



## Software Applications

### Constant pressure and flow

In-built applications to limit or to provide minimum pressure and flow.

### Pump control on pressure or flow

Control of pump system using pressure sensors for remote control applications and pressure depended processes.

### System timers

In-built timers for providing time of day or interval timing control.

### Liquid level monitoring

Application software included to use pressure sensors for liquid level monitoring and pump control by level.

### Speed Control

Set the maximum speed of the pump for use in low yielding water sources.



## Display and Connectivity

### Simple configuration

Simple system configuration and operational control from PumpScanner Smartphone App, for installers and customers.

### Data logging

Automatic logging of all running pump data. Recording frequency is configurable with capacity for up to 10 years.

### Customer display

Simple LED display to indicate system status.

### App enabled (included)

Detailed information and configuration via PumpScanner Smartphone App.

### CONNECTED

Local and remote monitoring and management with the LORENTZ CONNECTED infrastructure.

**The Solar Water Pumping Company**





# Technical Data

## Controller Technical Data

Model	PS2-150	PS2-200	PS2-600	PS2-1800	PS2-4000
Power (max)	300 W	300 W	700 W	1,800 W	4,000 W
Input voltage (max) DC Voc	50 V	100 V	150 V	200 V	375 V
Input current (max)	22 A	11 A	13 A	14 A	14 A
Output voltage PWM 3 phase	4 – 36 V	10 – 60 V	10 – 60 V	30 – 130 V	60 – 240 V
Efficiency	Max 98%				
Ambient temperature	-38 ... 50 °C (-36...122F)				
Enclosure	IP 68 (NEMA 6P) outdoor housing Pressure cast aluminum and powder coated cover Pressure cast aluminum case with integrated heat sink				

## ECDRIVE (motor) Technical Data

Model	ECDRIVE 150	ECDRIVE 200	ECDRIVE 600	ECDRIVE 1800	ECDRIVE 4000
Power (max)	300 W	300 W	700 W	1,800 W	4,000 W
Input voltage	18 V	45 V	45 V	95 V	240 V
Physical	Insulation class F, Max submersion 150 m, Enclosure class IP68, EN 1.4301/ AISI 304 stainless steel				

**The Solar Water Pumping Company**

## Pump Technical Data

### Submersible pumps

Motor technology	4" high efficiency EC DRIVE brushless DC motor
Speed	600 to 3,300 rpm – depending on pump end
Pump ends Helical Rotor	EN 1.4301/ AISI 304 cast Stainless steel stator housing Solid stainless steel rotor
Pump ends Centrifugal	Multi-stage centrifugal – premium materials, EN 1.4301/ AISI 304 stainless steel

### Surface pumps

Motor technology	4" high efficiency air cooled EC DRIVE brushless DC motor	
Speed	600 to 3,300 rpm – depending on pump end	
Pump ends	Vertical multi-stage centrifugal premium materials, EN 1.4301/ AISI 304 stainless steel	Single stage centrifugal premium materials, cast iron body

### Pool pumps

Motor technology	4" high efficiency air cooled EC DRIVE brushless DC motor
Speed	900 to 3,300 rpm – depending on pump end
Pump ends	Single stage centrifugal premium materials





# Choosing and designing your system

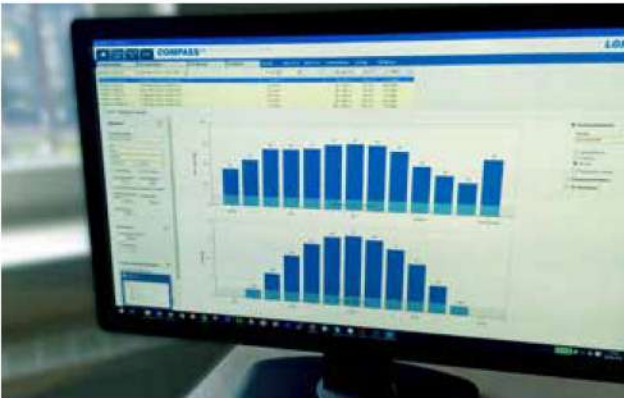
## Partner Network

PS2 is available from approved LORENTZ partners across 130 countries. Our sales and service partners have the local knowledge, access to the right tools and information to plan a system accurately. This high degree of certainty and real world experience removes risk from your project.



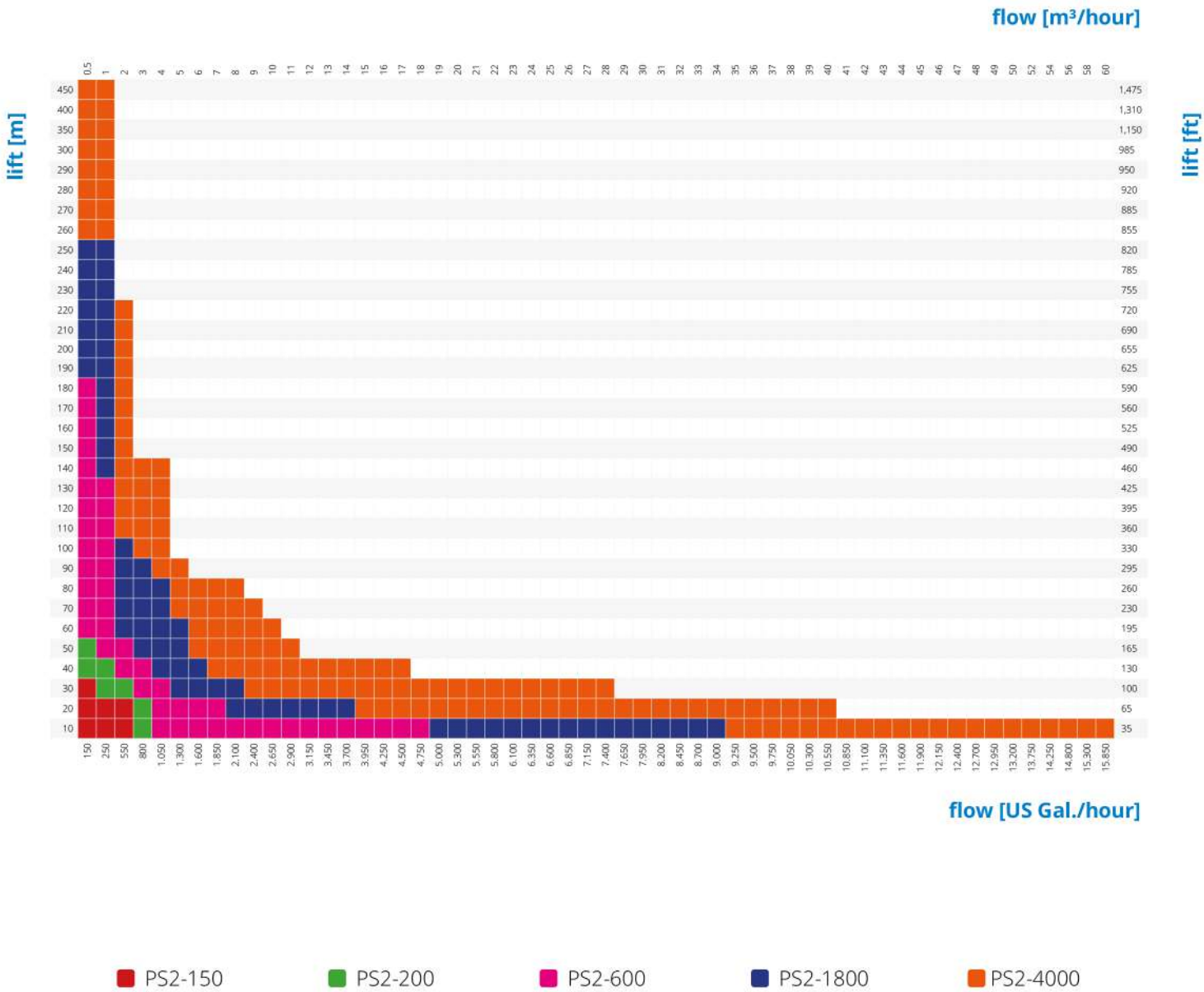
## COMPASS

Our industry leading COMPASS system planning software gives a detailed simulation of the water delivery through the year for your exact site location. This detailed modeling application provides a high degree of confidence that your system will perform as you require it to.



## Performance

The table below provides an indicative view of the system type that would be required to meet a specific hourly flow, and a given pumping head. Higher flow water applications are also possible, please speak to a LORENTZ partner about your specific project needs.



To find a partner near you, visit [www.lorentz.de/partners](http://www.lorentz.de/partners)

The Solar Water Pumping Company





## About LORENTZ

LORENTZ is the global market leader in solar powered water pumping solutions. Founded in Germany during 1993 LORENTZ has pioneered, innovated and excelled in the engineering and manufacturing of solar powered water pumping. Today LORENTZ is active in over 130 countries through a dedicated network of professional partners. LORENTZ technology uses the power of the sun to pump water, sustaining and enhancing the life of millions of people, their livestock and crops.

Simply – **Sun. Water. Life.**



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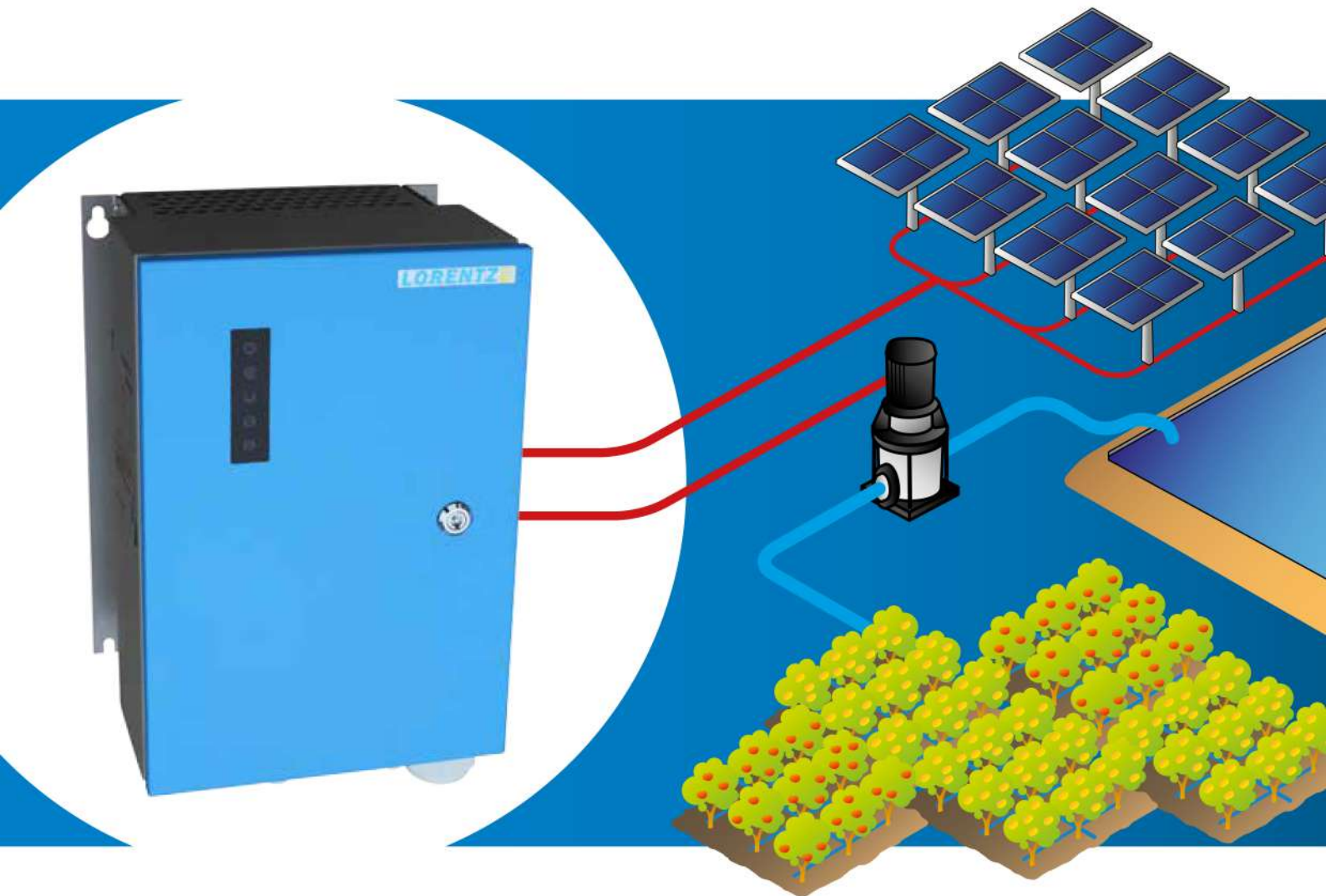
**[www.lorentz.de](http://www.lorentz.de)**





# PSk2

The complete solar water pumping solution  
with SmartSolution hybrid power support



**PSk2 is an integrated solar water pumping system for larger applications.**

With our new SmartSolution, PSk2 provides a true hybrid pumping system which automatically can blend grid power and generator power with the core solar power supply.

Whether your need is to reduce operational costs, improve water security, or be more sustainable, PSk2 provides the right solution.

**LORENTZ**   
*The Solar Water Pumping Company*





# The complete solution

Pumping water uses a significant amount of power. The sun provides us with an almost infinite energy source that, with the right planning and equipment, means we can pump water anywhere without the needs for power infrastructure.

PSk2 is an advanced solar water pumping system. The system is designed specifically to use the power of the sun to move water, so replacing the need for grid power or diesel.

As solar power is not consistent through the day then Psk2 constantly changes the pump parameters to optimize the amount of water available.

Being designed as an off-grid solar water pumping system, Psk2 has all of the inputs and outputs needed in an integrated self-managing system.

Where water demands cannot be met by solar power alone the hybrid Psk2 SmartSolution seamlessly blends in external power sources on demand.

## Hybrid operation

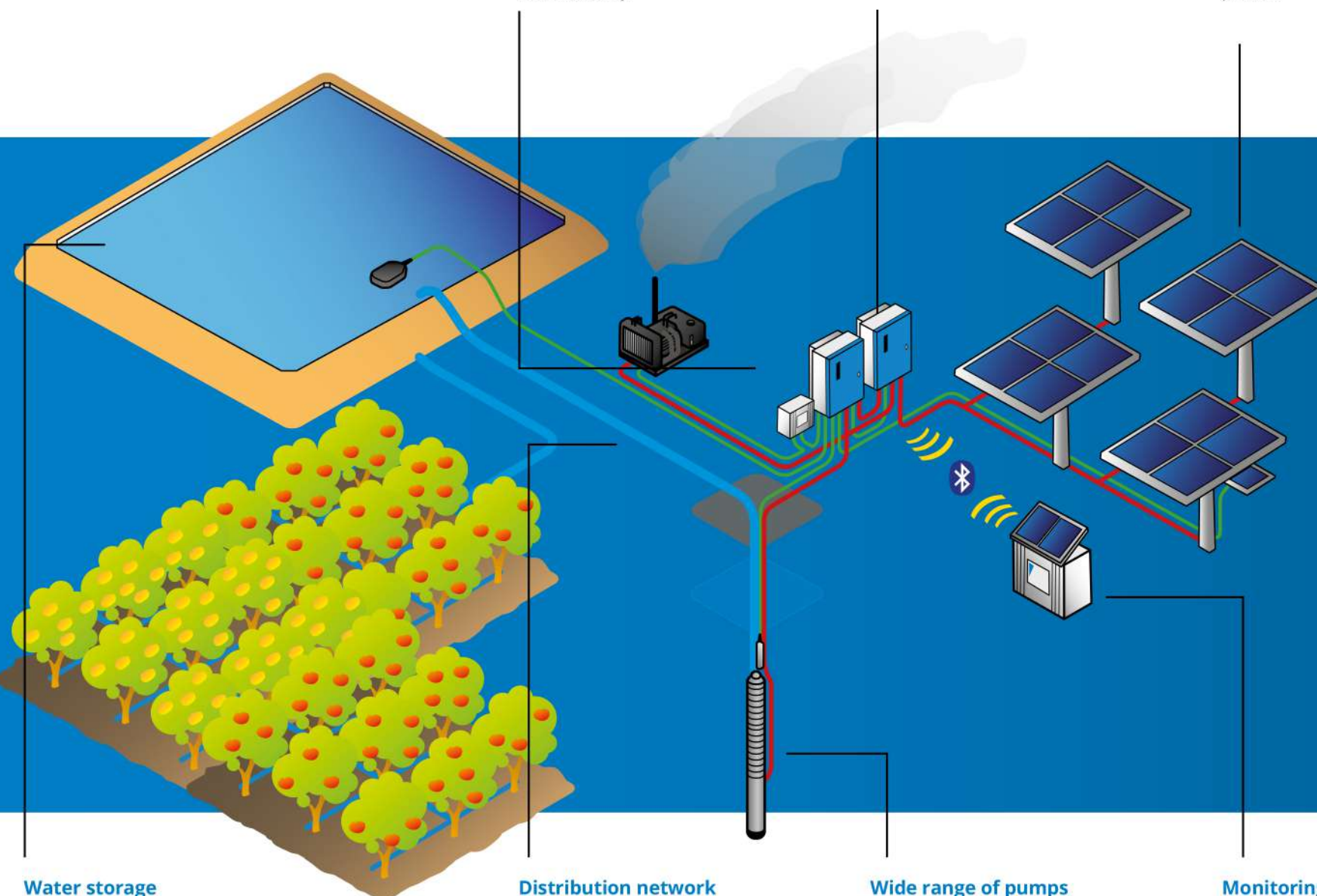
PSk2 can use solar combined with either grid or generator power to provide 24 hour operation. The system seamlessly blends the available solar power with external power sources automatically.

## PSk2 controller

The controller is at the heart of the system, managing both system operations, power sources and constantly optimizing the system for maximum water output.

## Power source

Solar power is always the primary Psk2 power source, where the application demands it Psk2 becomes an automated hybrid system, seamlessly blending solar and grid or generator power.



## Water storage

Introducing water storage to a solar water pumping system allows for increased seasonal demands to be met, or simply for overnight water availability without a generator or grid power.

## Distribution network

LORENTZ solar water pumping systems are used for drinking water, irrigation and industrial applications. Whatever the Psk2 system is connected to the system will optimize water delivery depending on the power available and inputs from the various sensors.

## Wide range of pumps

PSk2 has a wide range of submersible and surface pump systems available to meet your water needs. Submersible pumps are available that can pump from 200 m (920ft) depths and surface pumps available for flows of up to 457 m<sup>3</sup>/h (2200 US Gal./min).

## Monitoring and management

All Psk2 systems have inbuilt data logging and a simple management interface. All systems can also be remotely monitored and managed remotely along with any other LORENTZ systems you have via our pumpMANAGER service.

**The Solar Water Pumping Company**





# Benefits you can realize



## No infrastructure to install

Using solar power means that you can install a pumping system almost anywhere, irrespective of power infrastructure availability and associated costs. PSk2 is designed for the harshest off-grid environments.

## Low operational costs

Operational cost savings are achieved as the system requires no fossil fuels, can be fully remotely managed and is designed to have a long working life. The result is low or even no operating costs.

## "Right sizing"

With infinite smart motor control PSk2 is very gentle on pump motors, this both extends the system life and allows for any generators that are integrated into the system to be much smaller than for conventional pump systems.

## Lowest project risk

As PSk2 is designed to be a complete system, it has all of the needed software and hardware for your water project. The result is that your projects are delivered on time, on budget and without technical risk.

***The Solar Water Pumping Company***





# How customers are using PSk2

## Drinking Water

**For communities** – PSk2 has been deployed as the primary water delivery mechanism for communities of up to 400,000 people. By utilizing water storage, solar direct PSk2 systems deliver water reliably 24 hours per day.

**For utilities** – PSk2 is providing very economical solutions for both water abstraction, pressure boosting and in water purification applications.

Water utilities are able to lower their operating costs by converting their pump systems from diesel power to solar or solar / diesel hybrid.



## Irrigation

**Solar pumps are a perfect match for irrigation – more sun equals more water.**

PSk2 is being used to transform unused land into productive farms. Bringing water to locations that do not have any existing infrastructure is improving food security and generating significant income for communities.

PK2k systems provide water into irrigation systems all around the world. Drip, sprinkler, pivot or flood irrigation methods are all fully supported using this system. Very high flows and high pressures can be achieved allowing almost any existing irrigation system can be converted to solar power without replacement.

## Industry

**Where an industrial process uses high volumes of water then PSk2 can significantly reduce energy costs and provide a reliable solution to water demands.**

Industry in both developed and fast developing countries can suffer from unreliable grid power, or very high peak rate power which has an adverse effect on productivity and competitiveness.

With a PSk2 system, pumps will operate purely using solar power during the daytime with the ability to call for a “top up” of power from the grid or a generator when needed to meet production deadlines or process requirements.

**The Solar Water Pumping Company**





# What makes PSk2 better for you ?



## Designed for Solar Water Pumping

PSk2 has been designed from the first white board sketches to be a solar pumping system.

The system has been designed and built by an engineering team who only focus on solar water pumping. This experience means they design, test and build systems where operation in the harshest, most remote environments is normal.

Having a great feature set is only part of being a good solar water pumping system, what really matters is how efficient the system is. Efficiency defines how much water it will pump. PSk2 has class leading efficiency and optimized maximum power point tracking for best performance when conditions are not perfect. The system also has active power management to ensure that high ambient temperatures have minimal impact on water output.

**PSk2 makes the best use of the available power to deliver the most water possible.**

## Hybrid Power

With our SmartSolution PSk2 becomes a hybrid powered system. Hybrid means seamlessly blending solar power with grid or generator power sources.

The PSk2 becomes the brain of your water system, looking at what power is available, using solar power wherever possible and only starting a generator or putting a load on the power grid when there is not enough sun. This function is not a simple switching system, there is active blending of power sources meaning that your solar investment is fully utilized and that the use of expensive, non-renewable power is minimized.

The PSk2 SmartSolution manages all of this for you, including generator auto start and stop, timed starts and also volume based decision making. This flexibility means that the most efficient and effective solutions can be built to meet any water need.

**Automatic blending of power sources based on your water requirements.**

## The Complete Solution

PSk2 is designed to be a complete solar water pumping system comprising of a specialized pump controller and carefully matched pumps.

PSk2 has eight sensor inputs that allow analogue and digital sensors to be connected. This combination of sensors with the powerful inbuilt software applications allows for full pump control and water specific applications.

The system also has an inbuilt Sun Sensor which measures the available irradiation and then makes decisions of what to do based on the available power. The Sun Sensor also avoids unnecessary stop start cycles which increase pump wear.

PSk2 is a complete solution "out of the box" without the need for building additional switching cabinets or PLC units.

**Everything to deliver your projects successfully, on time and with minimal risk.**

## CONNECTED

The PSk2 is part of the LORENTZ CONNECTED software ecosystem.

The system is configured on site using PumpScanner, an Android™ based App that the installer uses. Common configuration is done with three clicks and there is full access to configure system behavior based on additional sensor inputs.

The PSk2 constantly records operational data and provides access to rich information for both customers and technicians.

The PSk2 can also be connected to our pumpMANAGER managed service. This is a simple, cloud delivered, pay monthly service that takes away the complexity of remote monitoring and management. One low fee means that you can see exactly what the system is doing, make changes to settings and receive alerts irrespective of location.

**Advanced, but simple monitoring and management of your system locally or remotely.**

***The Solar Water Pumping Company***





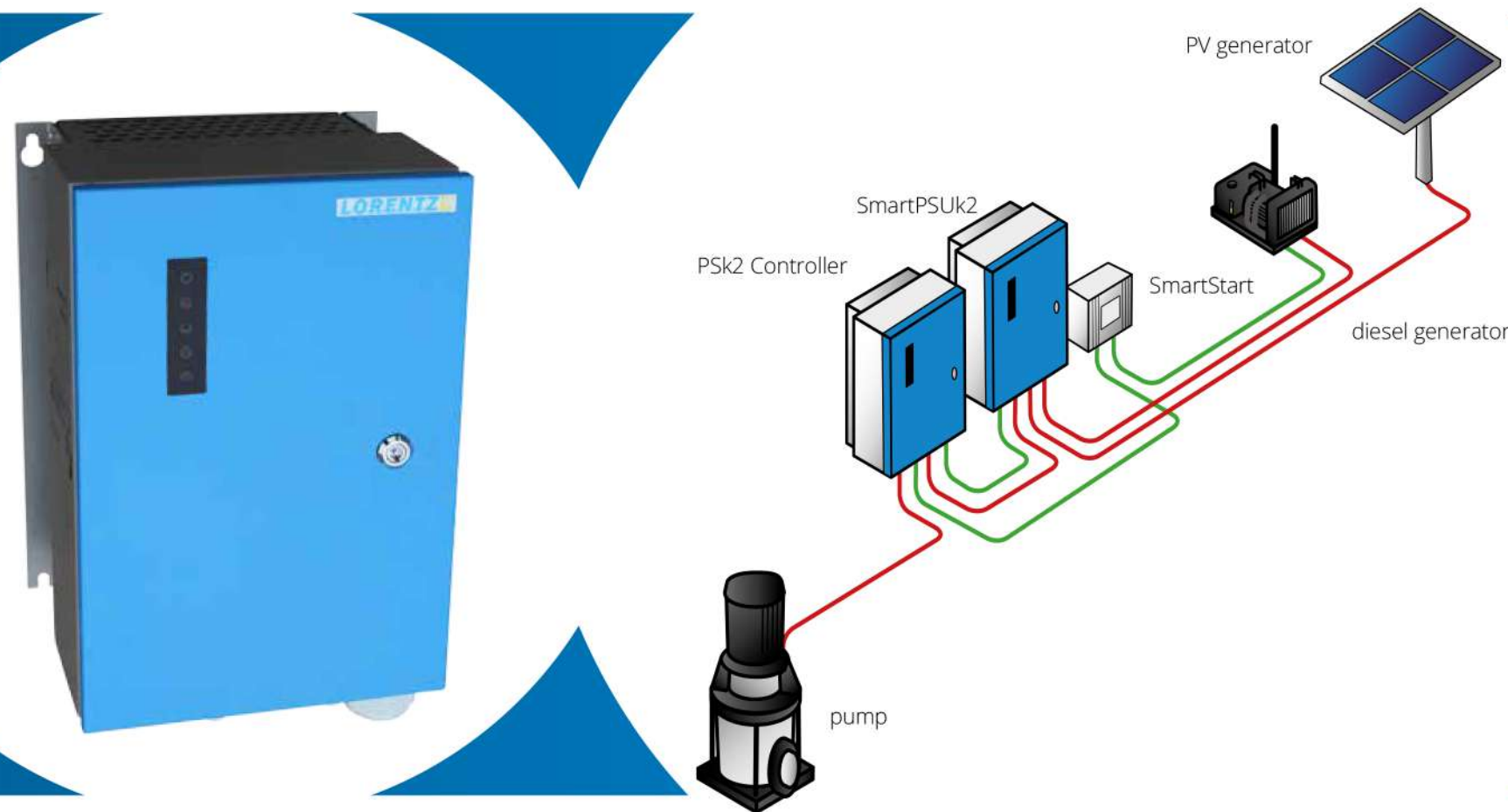
# SmartSolution – Hybrid Power

## SmartPSUK2

SmartPSUK2 runs PSK2 into a hybrid pumping system.

## SmartStart

The SmartStart integrates with the PSK2 and SmartPSUK2 to provide generator control and autonomous power.



There are applications and times when solar power alone is not the most practical or economical solution. SmartPSUK2 provides a way to fully utilize your solar investment while using an alternative power source when solar alone is not enough.

By blending solar with an alternative power source the SmartPSUK2 acts as a top up when the sun cannot meet the water need. PSK2 manages the start and end of day transition from solar to grid or from solar to generator power seamlessly and without the need for any operator intervention.

PSK2 with the SmartPSUK2 will allow you to deliver your 24 hour water needs and manage seasonal demands simply and cost effectively.

Adding SmartStart to your system means the PSK2 can make decisions when there is no solar power available. This means that the system is available to start pumping 24 hours per day.

SmartStart is also the interface for connecting an auto start generator. The system will call for the generator when it is required to meet your programmed water needs of flow, volume, pressure, water levels or time.

***The Solar Water Pumping Company***





# A complete system



**An effective solar water pumping system is made up of more than one component. When you choose a LORENTZ system you will get an integrated solution design specifically for solar water pumping from a company with absolute focus on this technology.**

## PSk2 Controller

PSk2 controllers are available from 7 to 40 kw. The controller includes the functions of a highly efficient digital inverter, a variable speed drive, all the inputs you will ever need, data logging plus intelligent control over the whole system to give you the most water possible.

## PSk2 Submersible Pumps

PSk2 6" to 10" submersible multi-stage pumps perform equally well in irrigation projects and for wide area drinking water applications where they reliably meet the most demanding requirements. All LORENTZ pumps are pre configured in our PumpScanner App with a simple 3 click setup.

## PSk2 Surface Pumps

PSk2 single or multistage surface pumps perform equally well in irrigation projects and for wide area drinking water applications where they reliably meet the most demanding requirements. All LORENTZ pumps are pre configured in our PumpScanner App for simple 3 click setup of any system.

## SmartSolution Components

The PSk2 SmartSolution enables seamless blending of an AC power source, either from the power grid or a generator, with solar power. Learn more about the SmartPSUK2 and SmartStart for hybrid pumping applications in the SmartSolution – Hybrid Power section.

## Accessories

To complete your PSk2 system LORENTZ provide a wide range of compatible probes, sensors, solar power connection equipment, racking and PV modules. This enables a single source of tested, ready to integrate components to give you a complete solution.

**The Solar Water Pumping Company**





# PSk2 Features



## Electrical Features

### MPP Tracking

Highly efficient maximum power point tracking with pump system specific algorithms.

### Active power management for temperature

Automatic power management to ensure the system continues to run in even the most extreme temperature conditions. At ambient temperatures up to 50°C (122°F) the system operates on full power and then actively manages power above that temperature.

### Variable frequency output

Variable frequency output to allow maximum water to be pumped based on available power.

### Soft start

Soft start and infinite control of motor speeds for long life and low generator loads.



## I/O Features

### Digital inputs

For connection of well probe, tank full, pressure switches, remote switches and ancillary switching.

### Analogue inputs

For 2x 4-20mA sensors. Applications included for pressure and level monitoring and pump control.

### Sun Sensor function

Sun Sensor module is supplied to measure irradiation and control the pump based on available solar energy.

### Water meter input

Pulse water meter input for accurate collection of flow data.

### Water sensor input

For use with "wet electrodes" when sensing water is present in pipelines.

### Signal output

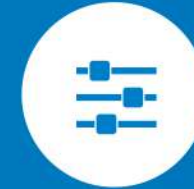
For controlling externally connected devices.

### SmartPSUk2 connection

To automatically control operation of the SmartPSUk2 when in hybrid pumping mode.

### Low voltage input for configuration

Low voltage DC input to allow bench / field configuration when 3 phase power is not available.



## Software Applications

### Constant pressure and flow

In-built applications to limit or to provide minimum pressure and flow.

### Pump control on pressure or flow

Control of pump system using pressure sensors for remote control applications and pressure depended processes.

### System timers

In-built timers for providing time of day or interval timing control.

### Liquid level monitoring

Application software included to use pressure sensors for liquid level monitoring and pump control by level.

### Power choice control

Ability to prioritize water delivery or power type (cost) in hybrid applications.



## Display and Connectivity

### Simple configuration

Simple system configuration and operational control from PumpScanner Smartphone App, for installers and customers.

### Data logging

Automatic logging of all running pump data. Recording frequency is configurable with capacity for up to 10 years.

### Customer display

Simple LED display to indicate system status.

### App enabled (included)

Detailed information and configuration via PumpScanner Smartphone App.

### CONNECTED

Local and remote monitoring and management with the LORENTZ CONNECTED infrastructure.

**The Solar Water Pumping Company**





# Technical Data

## Controller Technical Data

Model	PSk2-7	PSk2-9	PSk2-15	PSk2-21	PSk2-25	PSk2-40
Power (max)	8 kW	10 kW	15 kW	21 kW	25 kW	37 kW
Input voltage	max. 850 V					
Input current	14 A	20 A	27 A	39 A	48 A	70 A
Optimum Vmp**	> 575 V					
Motor voltage	3 x 380/400/415 V 0 – 60 Hz					
Motor current	max. 3 x 13 A	max. 3 x 17 A	max. 3 x 24 A	max. 3 x 33 A	max. 3 x 40 A	max. 3 x 65 A
Efficiency	max. 98 %					
Ambient temperature	-30 ... 50 °C (-22 ... 122F)					
Enclosure class	IP 54 – stainless steel and powder coated outdoor housing					

## Pump Technical Data

Submersible pumps	
Motor technology	6" high efficiency 3-phase 380 V AC motor – 25 to 55 Hz operation
Speed	1,400 to 3,080 rpm – depending on pump end
Pump ends	Multi-stage centrifugal – premium materials, AISI 304 stainless steel
Surface pumps	
Motor technology	High efficiency air cooled 3-phase 380 V AC motor – 25 to 55 Hz operation
Speed	700 to 2,905 rpm – depending on pump end
Pump ends	Vertical multi-stage centrifugal premium materials, AISI 304 stainless steel      Single stage centrifugal premium materials, cast iron body

**The Solar Water Pumping Company**





# Choosing and designing your system

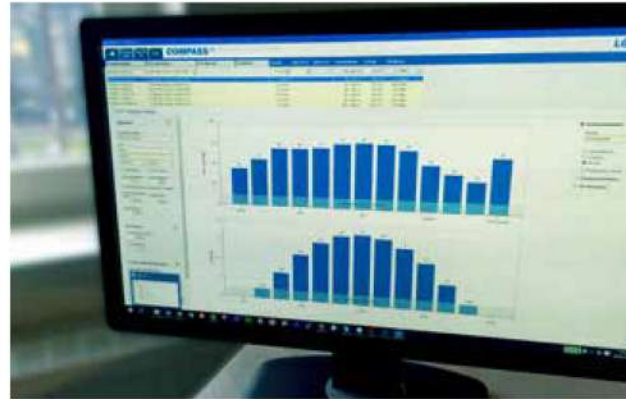
## Partner Network

PSk2 is available from approved LORENTZ partners across 130 countries. Our sales and service partners have the local knowledge, access to the right tools and information to plan a system accurately. This high degree of certainty and real world experience removes risk from your project.



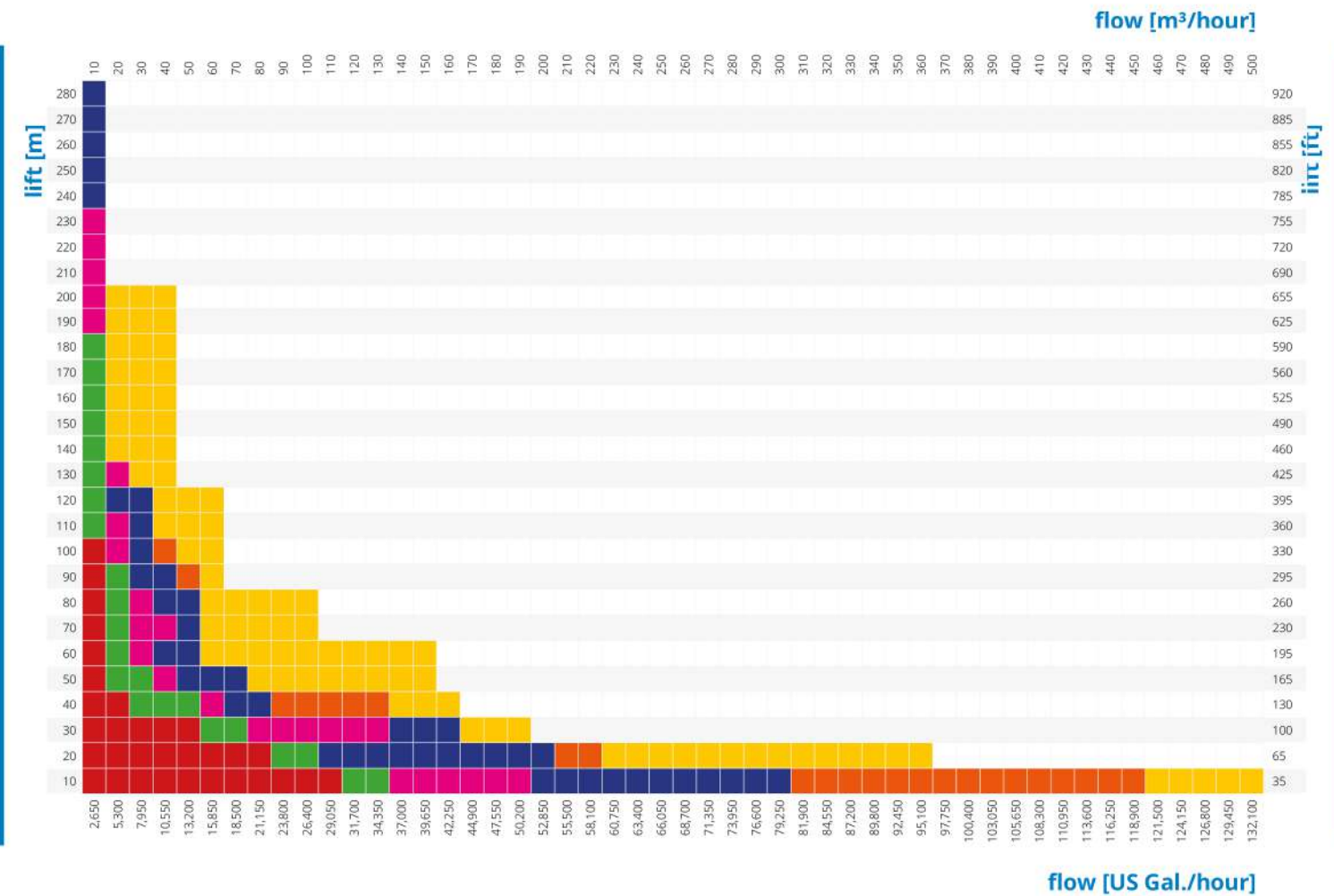
## COMPASS

Our industry leading COMPASS system planning software gives a detailed simulation of the water delivery through the year for your exact site location. This detailed modeling application provides a high degree of confidence that your system will perform as you require it to.



## Performance

The table below provides an indicative view of the system type that would be required to meet a specific flow at a given pumping head. Higher flow water applications are also possible, please speak to a LORENTZ partner about your specific project needs.



To find a partner near you, visit [www.lorentz.de/partners](http://www.lorentz.de/partners)

**The Solar Water Pumping Company**





## About LORENTZ

LORENTZ is the global market leader in solar powered water pumping solutions. Founded in Germany during 1993 LORENTZ has pioneered, innovated and excelled in the engineering and manufacturing of solar powered water pumping. Today LORENTZ is active in over 130 countries through a dedicated network of professional partners. LORENTZ technology uses the power of the sun to pump water, sustaining and enhancing the life of millions of people, their livestock and crops.

Simply – **Sun. Water. Life.**



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# PS2 Solar Pump Systems for Pools



**LORENTZ PS2 Swimming Pool Pumps are high quality products designed for use in residential and commercial swimming pools and spas. In most pool applications all of the filtration needs can be met directly from solar panels meaning no electricity costs and significant benefits to the environment.**

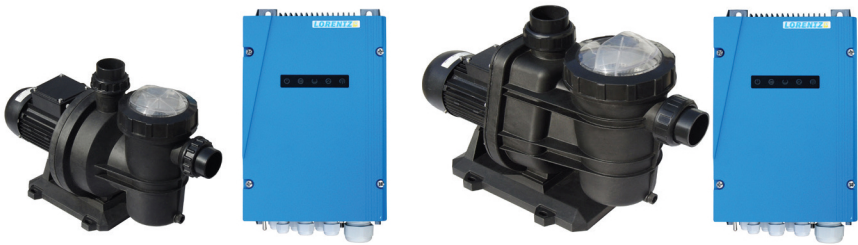
**The LORENTZ pump uses a DC brushless motor for high efficiency and reliability, it is connected to a solar generator via a controller. The controller monitors the system, controls the pump speed and optimizes the amount of water pumped based on the power available. The PS2 controller has extensive connectivity options for sensors and switches, in built software applications and data logging to meet all of your pumping needs.**

### Benefits

- Zero energy costs provide a very fast return on investment
- Longer life expectancy than standard AC motors
- Quiet and efficient
- Proven in service record
- Speed controllable to match the pool size exactly
- Smart modular design for simple and cost effective servicing and repair
- Fast and simple installation, direct replacement for an existing pool pump
- Simple configuration, diagnostics and performance data via free LORENTZ PumpScanner Android™ App

### Features

- Engineered in Germany
- EC DRIVEDC brushless motors, designed for solar with over 90% efficiency
- High quality non corrodible materials used throughout
- Solar direct connect with AC connection options
- MPPT technology to maximise power use from PV modules
- Inbuilt data logger with wireless access
- Multi LED display for simple operation
- Multiple analog and digital inputs and outputs for ultimate connectivity



pump system	PS2-600 CS-17-1		PS2-1800 CS-37-1	
max. total dynamic head (TDH)	[ft]	40		45
max. flow rate	[USG/h]	5,000		9,500
solar operation:				
max. power voltage (Vmp)*	[VDC]	> 68		> 102
open circuit voltage (Voc)	[VDC]	max. 150		max. 200
nominal voltage	[VDC]	48 – 72		84 – 96
battery operation:				
nominal voltage	[VDC]	48		96
pump type		centrifugal pump		centrifugal pump
integrated strainer		■		■
suitable for sea water		on request		on request

\*) PV modules at standard test condition: AM = 1.5, E = 1,000W/m², cell temperature: 25 °C

To find out more visit [www.lorentz.de](http://www.lorentz.de)

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All specifications and information are given with good intent, errors are possible and products may be subject to change without notice. Pictures may differ from actual products depending on local market requirements and regulations. A pump system consists of a controller, motor and pump end. Multiple pumps/ pump ends are shown to represent the wide range of pumps (over 70) that LORENTZ has.

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# PS2 Surface Solar Pump Systems



**LORENTZ PS2 Surface Pumps are high quality products designed for water transfer, pond management and irrigation applications where a surface pump is required.**  
**The LORENTZ PS2 range of DC powered surface pumps are connected to a solar generator via a controller. The PS2 controller has extensive connectivity options for sensors and switches, in built software applications and data logging to meet all of your pumping needs.**

### Benefits

- Long life expectancy and proven in service record
- Designed for use in remote and harsh conditions
- Smart modular design for simple and cost effective servicing and repair
- Fast and simple installation
- Cost effective spare parts philosophy
- Very strong ROI against diesel powered pumping reducing production costs and reducing carbon footprint
- Simple configuration, diagnostics and performance data via free LORENTZ PumpScanner Android™ App

### Features

- Engineered in Germany
- High quality non corrodible materials used throughout
- Solar direct connect with AC connection options
- MPPT technology to maximise power use from PV modules
- EC DRIVE DC brushless motors, designed for solar with over 90 % efficiency
- Inbuilt data logger with wireless access
- Multi LED display for simple operation
- Multiple analog and digital inputs and outputs for ultimate connectivity



pump system		PS2-150 Boost	PS2-600 CS-F	PS2-1800 CS-F	PS2-4000 CS-F
max. total dynamic head (TDH)	[ft]	500	130	160	230
max. flow rate	[USG/h]	345	2,200	2,250	15,600
solar operation:					
max. power voltage (Vmp)*	[VDC]	> 17	> 68	> 102	> 238
open circuit voltage (Voc)	[VDC]	max. 50	max. 150	max. 200	max. 375
nominal voltage	[VDC]	12 – 24	24 – 48	72 – 96	168 – 192
battery operation:					
nominal voltage	[VDC]	12 – 24	48	96	n.a.
pump type		positive displacement	centrifugal pump	centrifugal pump	centrifugal pump

\*) PV modules at standard test condition: AM = 1.5, E = 1,000W/m², cell temperature: 25 °C

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# PS2 Centrifugal Solar Pump Systems

## Submersible Pump Systems for 4” and 6” Wells



LORENTZ PS2 centrifugal pumps are high quality products designed for higher flow drinking water supply, livestock watering, pond management and irrigation applications. PS2 centrifugal pumps provide large volumes of water economically, without pollution, anywhere.

The LORENTZ PS2 range of DC powered centrifugal pumps have been designed specifically to pump larger volumes of water efficiently using solar power. These highly efficient pumps can achieve flow rates of 20,900 USG/hour.

Each system consists of a pump, pump motor and a controller. This modular concept keeps all electronics above ground providing simple servicing, ease of access and a low cost of ownership. PS2 has extensive connectivity options for sensors and switches, in built software applications and data logging to meet all of your pumping needs.

### Benefits

- Long life expectancy and proven in service record
- Designed for use in remote and harsh conditions
- Smart modular design for simple and cost effective servicing and repair
- Highest efficiency, pumps more water than the competition, starts earlier in the day and finishes later
- Fast and simple installation
- Cost effective spare parts philosophy
- Large range of pumps to closely match each application and optimise efficiency
- Simple configuration, diagnostics and performance data via free LORENTZ PumpScanner Android™ App

### Features

- Engineered in Germany
- High quality non corrodible materials used throughout
- Solar direct connect with AC connection options
- MPPT technology to maximise power use from PV modules
- ECDDIVE DC brushless motors, designed for solar, with over 90% efficiency
- Inbuilt data logger with wireless access
- Multi LED display for simple operation
- Multiple analog and digital inputs and outputs for ultimate connectivity

pump system		PS2-150 C	PS2-600 C	PS2-1800 C	PS2-4000 C
max. total dynamic head (TDH)	[ft]	65	100	330	525
max. flow rate	[USG/h]	1,050	3,170	14,000	20,900
solar operation:					
max. power voltage (Vmp)*	[VDC]	> 17	> 68	> 102	> 238
open circuit voltage (Voc)	[VDC]	max. 50	max. 150	max. 200	max. 375
nominal voltage	[VDC]	12 – 24	48 – 72	72 – 96	168 – 192
battery operation:					
nominal voltage	[VDC]	12 & 24	48	96	n.a.

\* ) PV modules at standard test condition: AM = 1.5, E = 1,000W/m², cell temperature: 25 °C



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# PS2 Helical Rotor Solar Pump Systems

## Submersible Pump Systems for 4" and 6" Wells



LORENTZ PS2 helical rotor pumps are high quality products designed for drinking water supply, live-stock watering and smaller irrigation applications. PS2 helical rotor pump systems deliver water economically, cleanly and reliably, anywhere.

The LORENTZ PS2 range of DC powered helical rotor pumps have been designed specifically to pump water efficiently using solar power. The helical rotor pump is simple, efficient and reliable, pumping water with very low levels of solar power from up to 1,150ft below the ground.

Each system consists of a pump, pump motor and a controller. This modular concept keeps all electronics above ground providing simple servicing, ease of access and a low cost of ownership. PS2 has extensive connectivity options for sensors and switches, in built software applications and data logging to meet all of your pumping needs.

### Benefits

- Long life expectancy and proven in service record
- Designed for use in remote and harsh conditions
- Smart modular design for simple and cost effective servicing and repair
- Highest efficiency, pumps more water than the competition, starts earlier in the day and finishes later
- Fast and simple installation
- Cost effective spare parts philosophy
- Large range of pumps to closely match each application and optimise efficiency
- Simple configuration, diagnostics and performance data via free LORENTZ PumpScanner Android™ App

### Features

- Engineered in Germany
- Water temperature specific variants to provide the most efficient outputs
- High quality non corrodible materials used throughout
- Solar direct connect with AC connection options
- MPPT technology to maximise power use from PV modules
- ECDRIVE DC brushless motors, designed for solar, with over 90 % efficiency
- Inbuilt data logger with wireless access
- Multi LED display for simple operation
- Multiple analog and digital inputs and outputs for ultimate connectivity

pump system		PS2-200 HR	PS2-600 HR	PS2-1800 HR	PS2-4000 HR
max. total dynamic head (TDH)	[ft]	165	590	820	1,500
max. flow rate	[USG/h]	690	690	1,030	660
solar operation:					
max. power voltage (Vmp)*	[VDC]	> 34	> 68	> 102	> 238
open circuit voltage (Voc)	[VDC]	max. 100	max. 150	max. 200	max. 375
nominal voltage	[VDC]	24–48	48–72	72–96	168–192
battery operation:					
nominal voltage	[VDC]	24 and 48	48	96	n.a.

\*) PV modules at standard test condition: AM = 1.5, E = 1,000W/m², cell temperature: 25 °C

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