

## LORENTZ PSk3 Hybrid solar pumping solution

PSk3-7 and PSk3-15

- Hybrid solar pumping controller for 3 phase pumps
- Automatic choice of power source with blending of solar power and grid or generator
- Extensive inputs, outputs and features to manage water delivery
- Industry leading **CONNECTED** features with onboard data logging, simple app configuration and remote management



**LORENTZ PSk3 is a hybrid solar pumping controller for 3 phase electric pumps**

**Hybrid solar allows your pump to operate with solar only, to combine solar with grid or generator power by blending power sources or to operate only with grid / generator.**

**Having this automated choice of power based on water demand means that almost any pumping requirement can be supported by solar in a primary or secondary way.**

**Almost anything is possible with PSk3**

**Why hybrid?**

Solar power is almost always the cheapest power source, usually cheaper than grid and always cheaper than diesel generated electricity. On a global average solar is <50% of grid and 300% to 400% less than diesel per kWh. Using solar when you can and an alternative power sources when you have to, gives you the best of both worlds.

PSk3 makes mixing power simple and affordable allowing customers to focus on their daily business while PSk3 manages water delivery and cost optimization.

PSk3 maximizes the use of solar for low cost, clean power and a 2nd power source is efficiently blended in when the water demand requires it.

The best of both worlds, to meet almost any pumping requirement.

**Why PSk3 ?**

PSk3 is built using LORENTZ experience of designing and manufacturing off-grid solar water pumping solutions.

PSk3 is designed with a focus on delivering the water you need, when you need it, even in the most challenging conditions.

LORENTZ products differentiate themselves from the competition with the attention to engineering, choice of materials for hostile conditions, features that are focused on delivering water, excellent manufacturing standards and exceptional levels of testing of every manufactured product.

With PSk3 the result is more water, more useful functionality, less breakdowns and assurance that you have made a wise choice to get the best from your solar investment.



## PSk3 features

### System sizing and planning

- Sizing and planning with LORENTZ COMPASS, the industry leading planning and simulation tool
- Fit the right system first time
- Make sure your customers get the water they need

### Installation and wiring

- Easy wall or pole mounting
- Ample cable entries and space to work inside for wiring
- Clear terminal labeling and use of spring connectors for reliability
- Full range of power connection accessories such as PV Disconnect / combiner / protection device to manage large PV arrays efficiently

### PSk3 controller features and protection

- High efficiency pump system controller
- Maximum power point tracking
- Simple LED status and on off switch
- Speed control, timers, constant pressure, constant flow, level and pressure controls
- Under voltage
- Over voltage
- Phase imbalance
- Over current
- Under current
- Short circuit
- Active Temperature Management
- Phase Loss

### Hybrid features

- Measurement of solar and 2nd source power mix
- All in one design
- Optional SmartStart for automatic generator control
- Control by pressure, time, level, flow, frequency, daily amount or even combinations of these.

### Simple setup and management via LORENTZ Assistant app

- No complex programming
- The system is running with 3 selections
- Water focused built in applications
- Technicians and customers use the Assistant app for different features (rights managed)

### Data-logging and connectivity

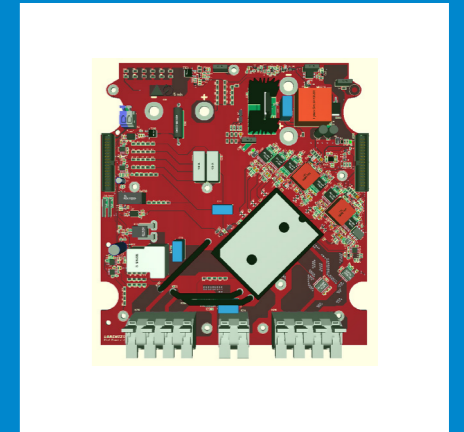
- Built in Bluetooth LE for wireless local connectivity
- All system data, operational data and sensor values are recorded
- Historic or real-time data via LORENTZ Assistant app
- High customer value in tracking system performance
- High technician value for troubleshooting
- Upload from LORENTZ Assistant to LORENTZ Global platform
- Remote management and monitoring via the LORENTZ Global IoT service, a low cost, professional, cloud based management system unique in the market

### I/O, sensors and inbuilt applications

- Inputs for water meter, analogue (pressure, level, temperature) sensors, digital switches and sensors
- Built in applications including constant pressure, constant flow and daily amount plus control by pressure, level and flow
- Included SunSensor to increase the life of your motor and pump
- Active temperature management, reduces power when needed to avoid system damage while still delivering water

### Serviceability

- Should the worst happen through accidents, vandalism, external influences or a breakdown, PSk3 is designed to be serviced in the field
- Modular design
- Colored boards for easy identification
- Common spare parts across models
- Fast board changes and low cost spares

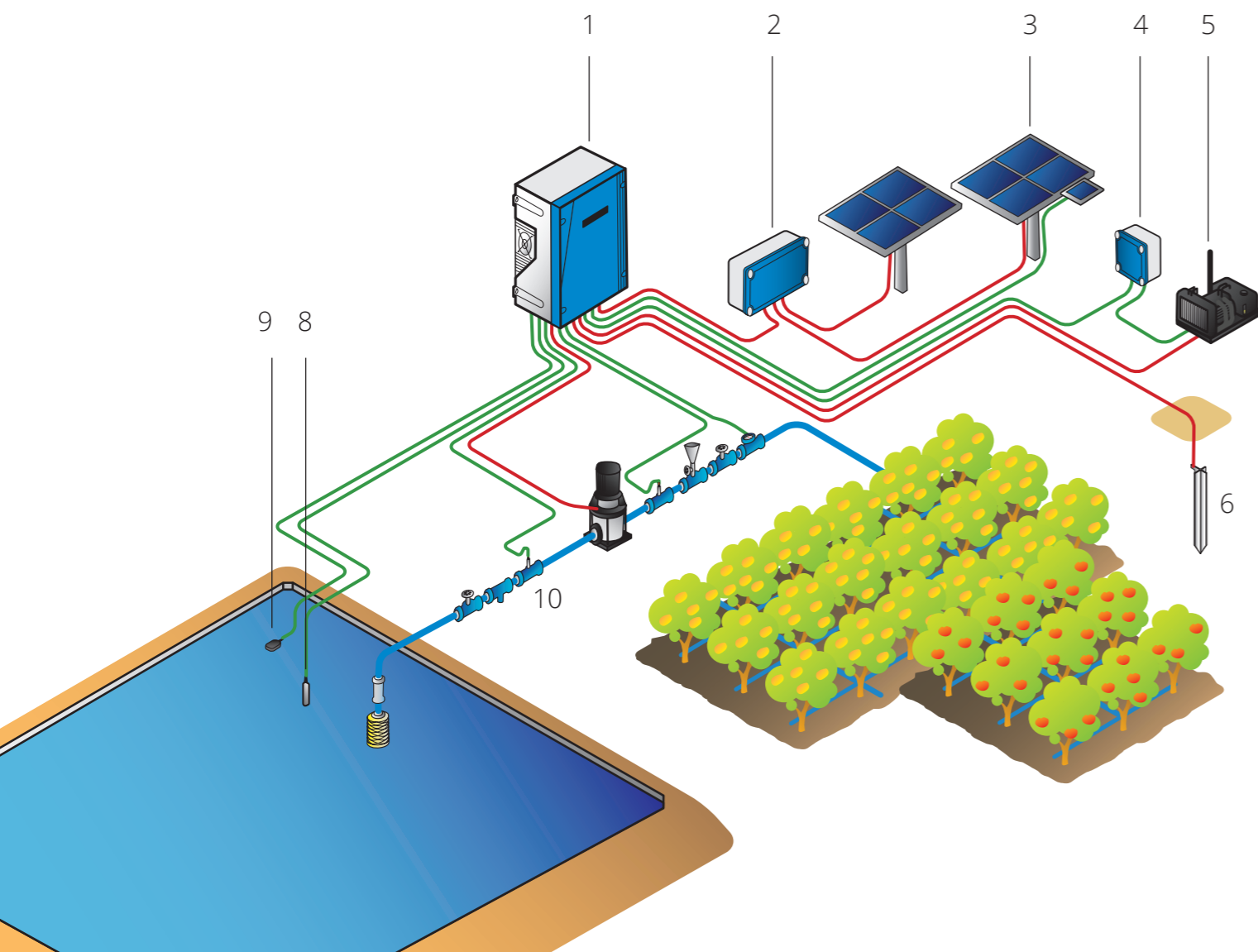


# Simple, flexible installation

## Simple to install but with massive flexibility

PSk3 is fast to install and easily configured in 2 minutes. To run a solar direct system only DC input, motor wires and a run dry sensor connection is needed. The system below shows what can be done with PSk3. PSk3 has all of the sensor inputs you will ever need and all of the software is included in the controller for automation. With PSk3 you can fully manage your water system.

1. PSk3 Controller
2. PV Disconnect
3. PV Module with SunSensor
4. SmartStart
5. AC source (diesel generator)
6. Grounding
7. Pump
8. Liquid level sensor
9. Float Switch
10. Pressure sensor



# Hybrid power

## Addressing the challenge of expanding pumping time in solar applications

Solar power is the cheapest and cleanest energy source available source available for water pumping.

In applications where there is a higher seasonal or peak water consumption demand, or where pumping is required outside of daylight hours, then solar power alone might not meet the requirements.

PSk3 allows a second power source to be connected which complements the solar power. Based on the defined water need PSk3 will prioritize solar and blend in the second power source. This hybrid function significantly reduces energy costs not only in off-grid but also on-grid applications.

## Visualizing hybrid Operation

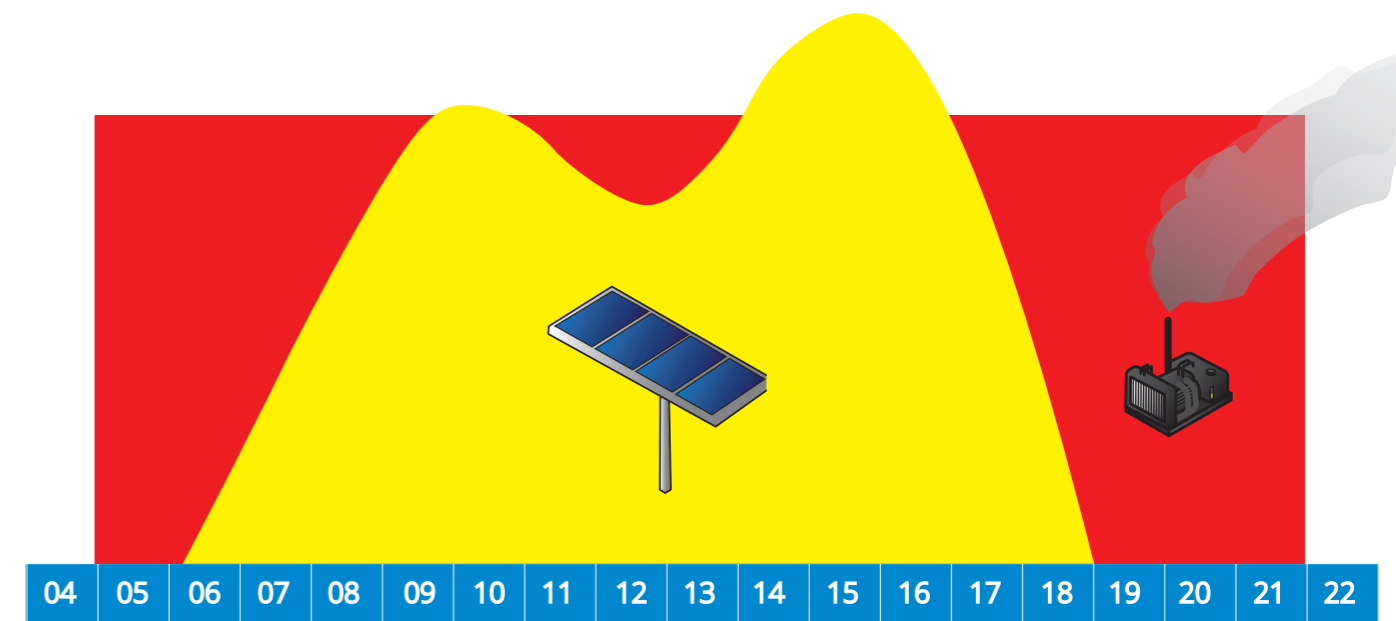
The PSk3 does not switch between sources but blends power seamlessly when a second source is needed.

In this diagram you can see the power from grid / generator (red) and the power from solar (yellow). In this example PSk3 has been set to run from 05:00 (5am) to 22:00 (10pm) at a constant speed. Power choice and blending of power is automatic.

PSk3 uses all of the solar power available and uses the second power source to support solar. This is done automatically. Even starting the generator in the middle of the night if this is what is required to meet the defined water demand.

Time, amount of water, pressure, flow, or tank levels can all be used to decide when the pump should run. This automation removes the risk to people and machinery of having to switch multiple power sources using complex switching sequences.

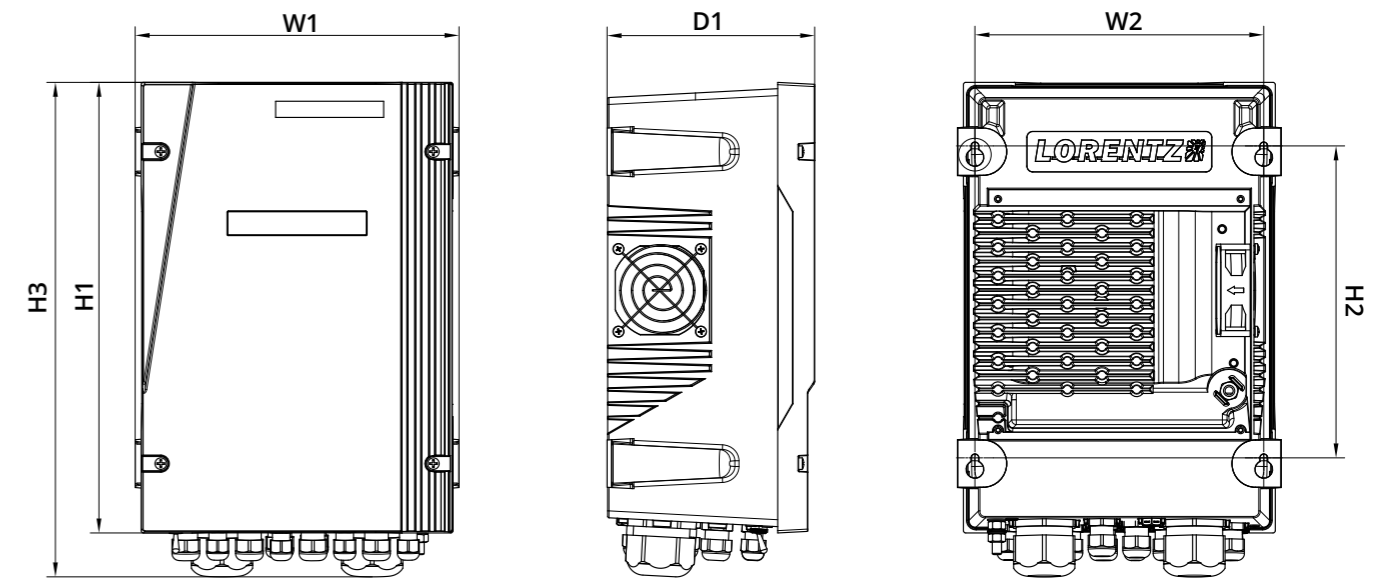
Other systems that are marketed as hybrid are only switching between power sources, we would call these dual power rather than hybrid. PSk is blending powers which can make savings of 60-70% against the operation of dual power systems.



## Technical data

	PSk3-7	PSk3-15
<b>Input (DC)</b>		
Max. PV voltage	850 V	850 V
Voltage range	400 ... 850 V	400 ... 850 V
Optimum MPPT voltage	575 V	575 V
Max. current	14 A	27 A
Max. ISC PV array	30 A	40 A
Max. inverter backfeed current into array	0 A	0 A
<b>Input (AC)</b>		
Rated voltage	380 ... 480 V +/- 10 %	380 ... 480 V +/- 10 %
Frequency range	45 - 60 Hz	45 - 60 Hz
Max. current	17.5 A	30 A
Max. current (inrush)	42 A	42 A
Max. fuse ratings	20 A	35 A
Grid type	TN / TT	TN / TT
<b>Output (AC)</b>		
Voltage range	380 V / 400 V / 415 V / 440 V / 460 V / 480 V	380 V / 400 V / 415 V / 440 V / 460 V / 480 V
Frequency range	0 ... 60 Hz	0 ... 60 Hz
Rated voltage	380 V	380 V
Rated frequency	50 Hz	50 Hz
Rated current	13 A	24.5 A
Rated output power	8.3 kVA	16 kVA
Min. rated power factor	0.85	0.85
Rated power of motor	5.5 kW	11 kW
<b>General</b>		
Protection	I	I
Ingress protection	IP 66	IP 66
Overtoltage category	II (PV), III (AC)	II (PV), III (AC)
Ambient temperature range	-25 ...60°C	-25 ...60°C
Cooling concept	forced cooling	forced cooling
Max. altitude rating	2000 m	2000 m

## Dimensions, weight



### Dimensions PSk3-7 and PSk3-15

	H1	H2	H3	W1	W2	D1
mm	390	270	428	280	250	180
inch	15.4	10.6	16.9	11	9.8	7.1

### Weight

	PSk3-7	PSk3-15
kg	7.9	8.4
lbs	17.4	18.5

## Supplementary information

### Mounting options

- Wall or panel mount using 4 holes
- Pole mounting with optional pole mount kit

### Approvals and standards

- IEC 62109-2:2011
- 61800-5-1:2011 + A1:2016
- EN 60529:1991/A2:2013/AC:2019-02

### Product Content

- PSk3 Controller
- SunSensor
- Manual for installation and operation

### Packaging

- Sustainable, environmentally friendly pulp packaging

### PSk systems

Please see COMPASS and the PSk family brochure for information about pump systems that incorporate the PSk3 controller. Using LORENTZ motors and pumps with PSk3 controllers ensures best performance and automatic configuration.

### Order information

item number	description
09-000250	PSK3-15 Controller-11kVA
09-000260	PSK3-7 Controller-5.5kVA
19-005310	Pole mount kit

### Transport and shipping

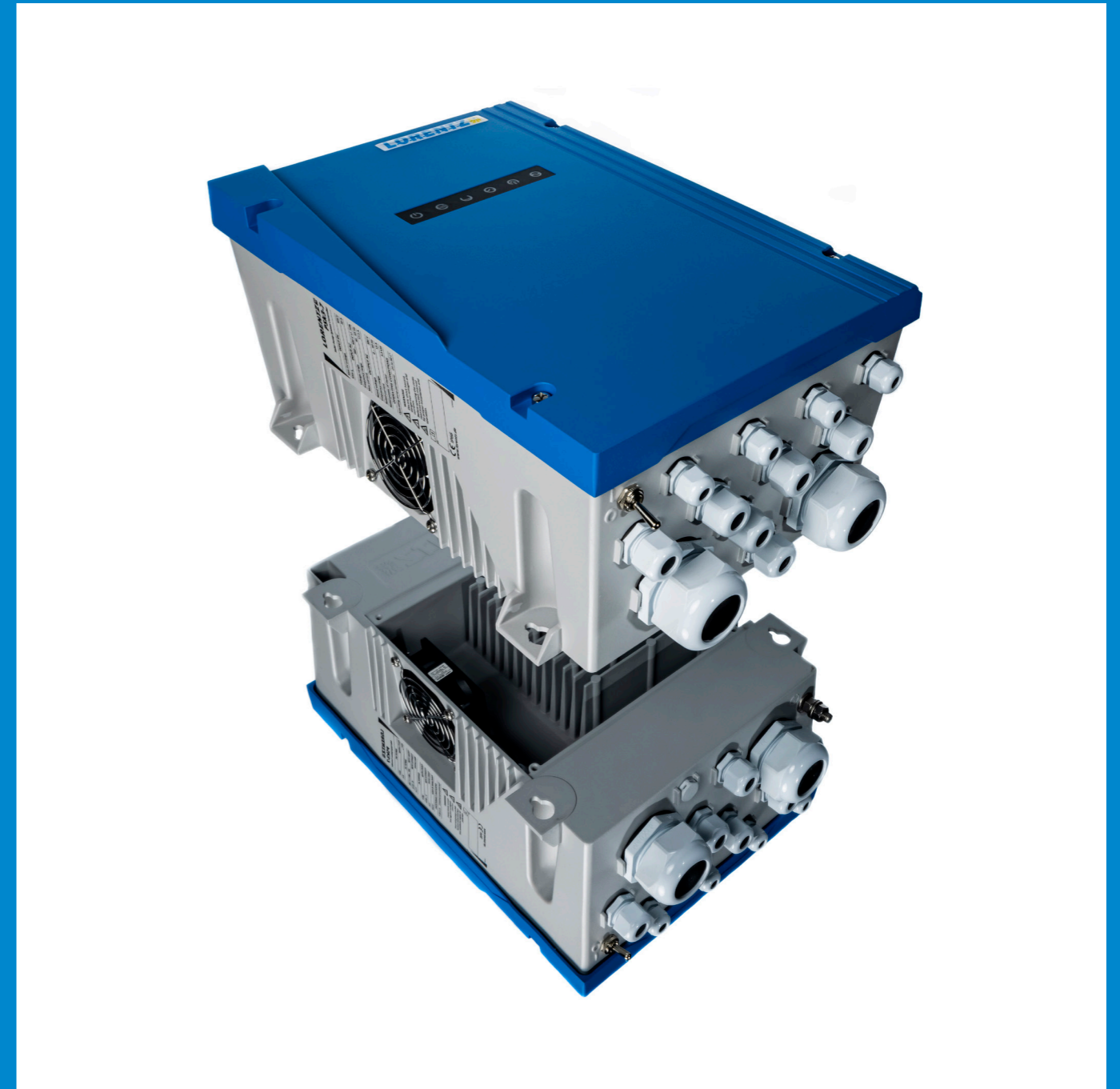
- Packed volume in mm [inch]:  
335 [13.2] x 500 [19.7] x 275 [10.8]

### Packed weight

	PSk3-7	PSk3-15
kg	11.3	11.7
lbs	24.9	25.8

### Palleting

units per pallet	loading height
16	1,360 mm (airfreight)
12	960 mm (seafreight to allow 2 stacked pallets)



# 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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