BERNT LORENTZ GmbH
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Monday, May 19, 2025

Muwayo

Solar pumping project

Parameter

Location:	Uganda, Jinja (0°; 33° East)	Water temperature:	23 °C		
Required daily output:	87 m³; Sizing for January	Dirt loss:	5.0 %	Motor cable:	50 m
Pipe type:	-	Total dynamic head:	131 m	Pipe length:	-

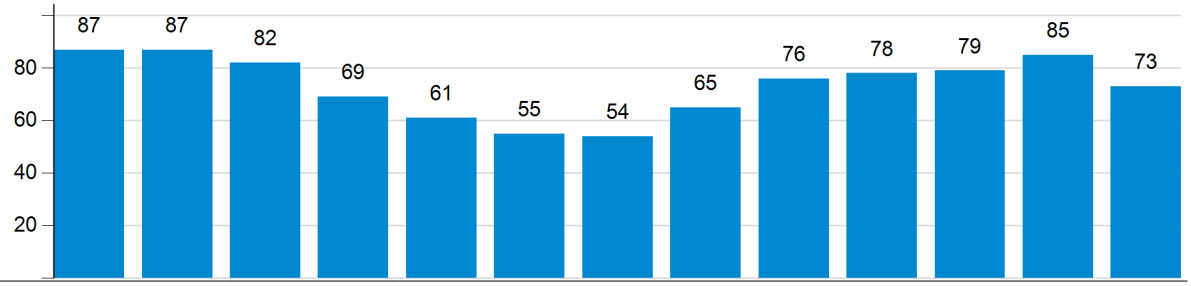
Products

	Quantity	Details
PSk3-15 C-SJ17-18	1 pc.	Submersible pump system including controller with DataModule, motor and pump end
LC325-P72	40 pc.	13,000 Wp; 20 x 2 modules; 15 ° tilted
Motor cable	50 m	4 mm² 3-phase cable for power and 1-phase cable for ground
Accessories	1 set	SmartStart, Surge Protector2, Water Level Measurement Solution, PV Disconnect 1000-50-5, PV Protect 1000-125

SunSwitch setting in PumpScanner — min. 400 W/m²

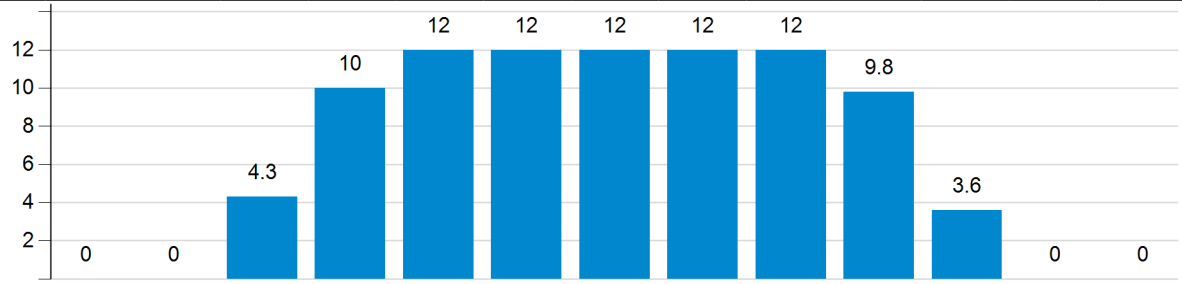
Daily output in January — 87 m³

Daily values



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Av.
Energy [kWh]	74	74	69	60	55	52	52	57	64	65	66	72	63
Irradiation [kWh/m²]	6.3	6.4	5.9	5.2	4.6	4.4	4.4	4.8	5.5	5.6	5.7	6.1	5.4
Rainfall [mm]	2.0	2.5	4.4	6.7	5.5	2.9	2.4	3.2	3.7	4.6	5.1	3.1	3.8
Ambient temp. [°C]	22	23	23	22	21	21	21	21	21	21	21	22	22

Hourly values



	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
Energy [kWh]	0	2.4	4.9	6.9	8.6	9.5	9.8	9.4	8.4	6.8	4.7	2.3	0
Irradiation [kWh/m²]	0	0.19	0.40	0.58	0.73	0.82	0.86	0.82	0.73	0.58	0.40	0.19	0
Ambient temp. [°C]	17	17	18	20	22	24	26	27	27	27	27	26	26

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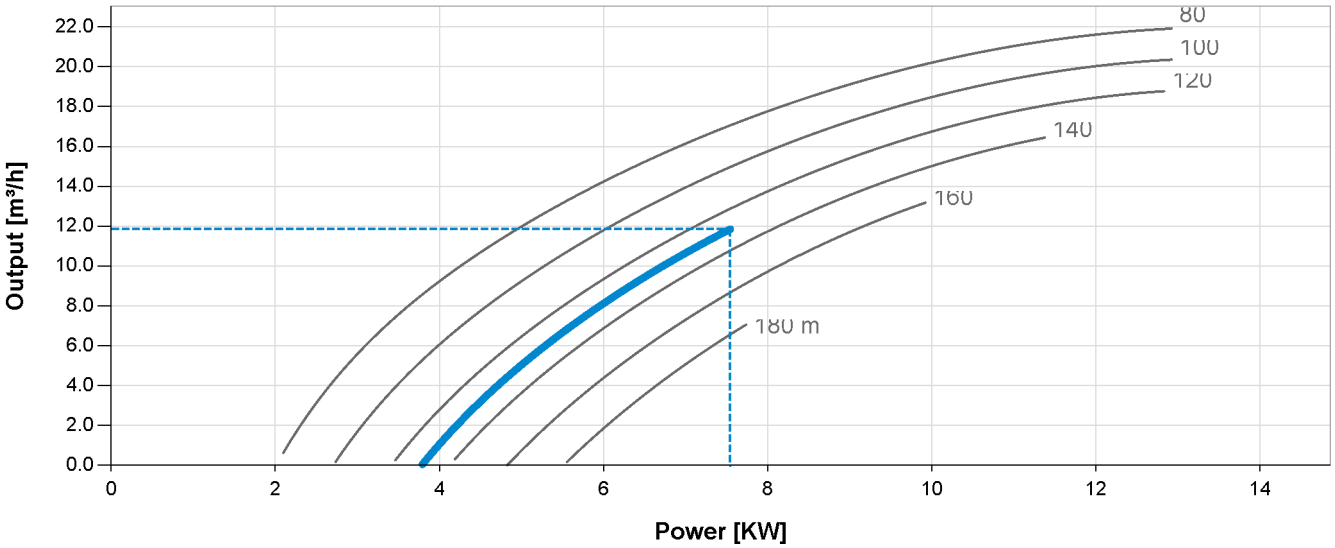
Solar pumping project

System characteristic



			Min.	800 W/m², 20 °C	Max./STC*
PV generator	Cell temperature	[°C]		46	25
	Temperature loss	[%]		6.1	-
	Dirt loss	[%]		5.0	-
	Pmax	[Wp]		9,280	13,000
	Vmp	[V]		704	750
	Imp	[A]		13	17
	Voc	[V]		826	918
	Isc	[A]		14	18
	Pout	[W]		7,780	-
	Vout	[V]		774	-
	Iout	[A]		9.9	-
Motor cable	Power loss	[%]	1.1	1.9	1.9
Pump systems	Motor power	[W]	3,790	7,540	7,540
	Motor voltage	[V AC]	315	343	343
	Motor current	[A]	8.0	15	15
	Motor speed	[rpm]	0	2,560	2,560
	Frequency	[Hz]	1.0	45	44
	Flow rate	[m³/h]	0.069	12	12
	Efficiency	[%]	0.64	55	55

*STC: Standard test conditions for photovoltaic modules, 1000 W/m² solar iradiance, 25 °C cell temperature

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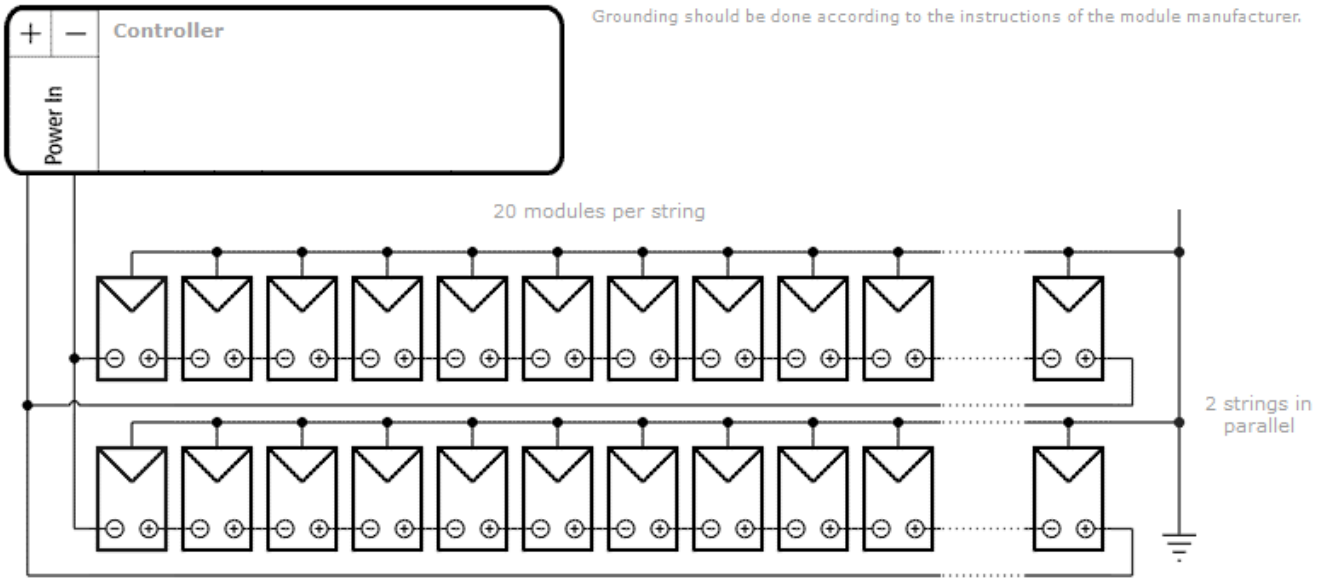
Wiring diagram



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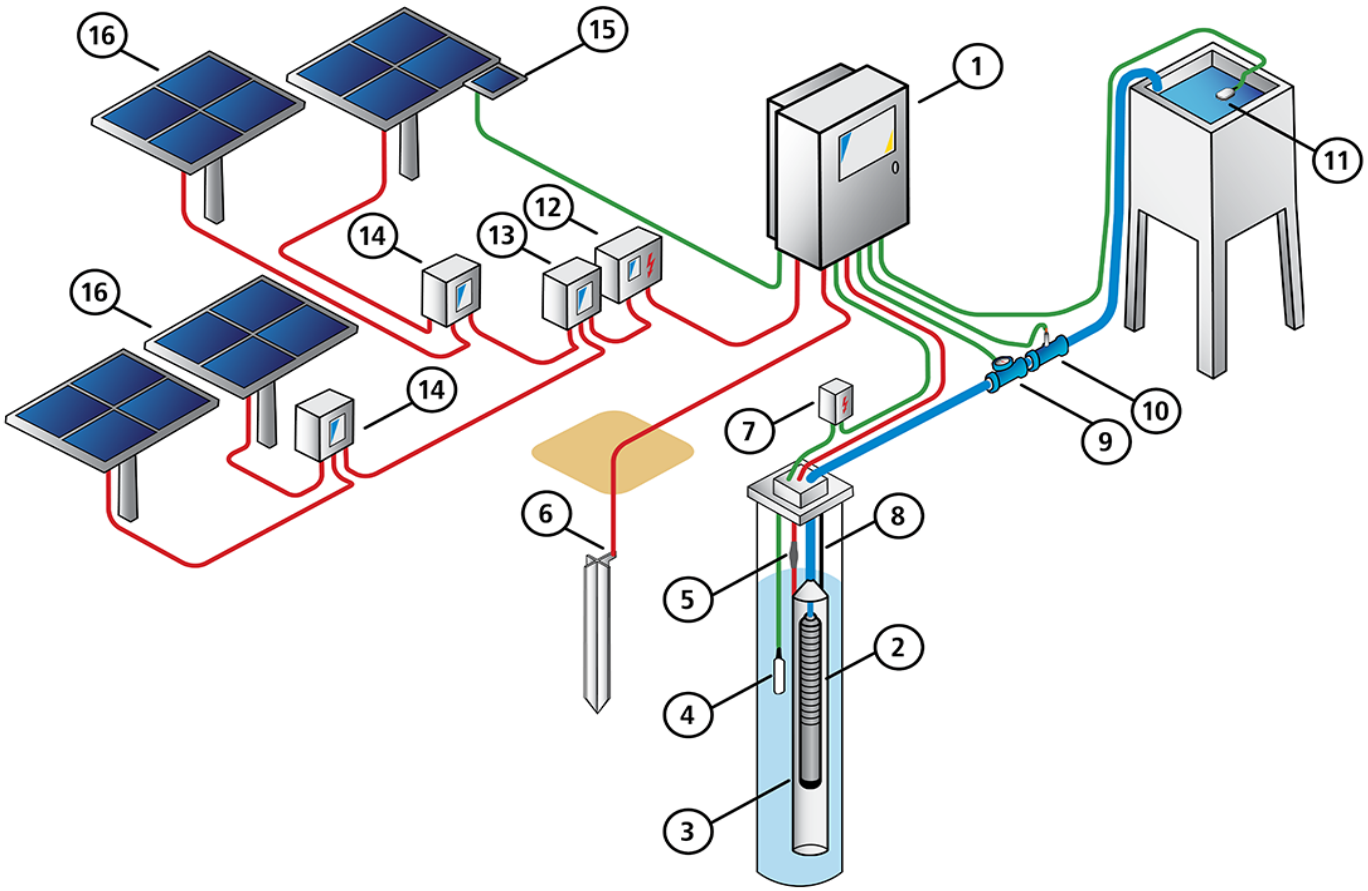
Solar pumping project

System Layout



1: PSk2 Controller	**11:** Float Switch
2: Submersible Pump	**12:** PV Protect
3: Stilling Tube	**13:** PV Combiner
4: Well Probe	**14:** PV Disconnect
5: Cable Splice Kit	**15:** PV Module for Sun Switch
6: Grounding Rod	**16:** PV Generator
7: Surge Protector*	*It is recommended to install a Surge Protector at each controller sensor input.
8: Safety Rope	
9: Water Meter	
10: Pressure Sensor	

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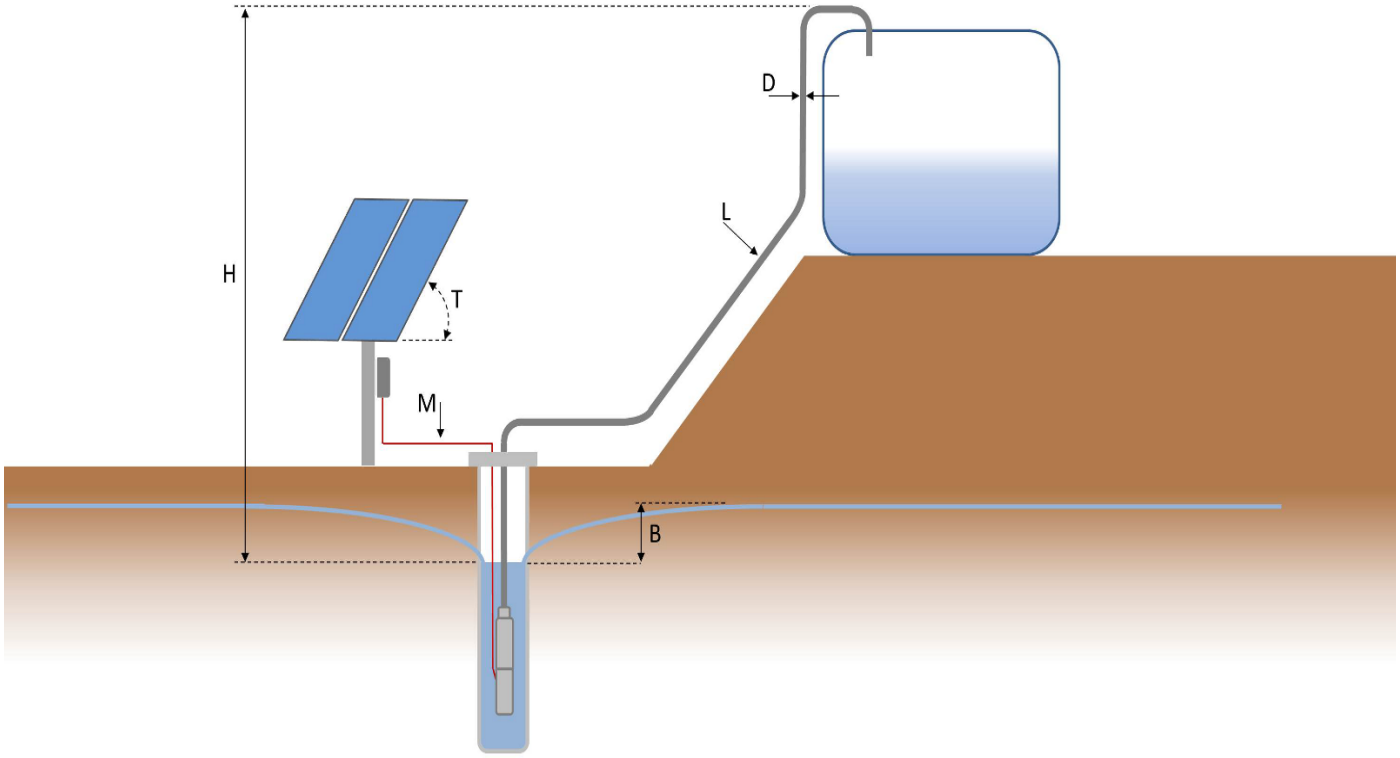
Sizing Layout



H (Static head):	Vertical height from the dynamic water level to the highest point of delivery.
B (Drawdown):	Lowering of water level depending on flow rate and recovery rate of the well.
D (Pipeline inner diameter)	
L (Pipe length):	Entire pipeline from the pump outlet to the point of delivery. Ellbows and armatures must be added as an equivalent length of pipeline.
M (Motor cable):	The cable between controller and pump unit.
T (Tilt angle):	Angle of the PV generator surface from the horizontal plane.

PSk3-15 C-SJ17-18

Solar Submersible Pump System for 6" wells

System Overview

Head	max. 180 m
Flow rate	max. 22 m³/h

Technical Data

Controller PSk3-15

- High efficiency solar pump controller
- Integrated hybrid power functions to mix solar with grid / generator power
- Integrated MPPT (Maximum Power Point Tracking)
- Multiple analogue and digital sensor
- Simple configuration with LORENTZ Assitant App
- Onboard data logging and system monitoring with real-time and historic data views
- Inbuilt water applications to manage your pumping system
- SunSensor included for unique pump and motor protection
- Active temperature management

Power	max. 16 kW
Input voltage	max. 850 V
Optimum Vmp**	> 575 V
Motor current	max. 25 A
Efficiency	max. 98 %
Ambient temp.	-25...60 °C
Enclosure class	IP66

Motor AC DRIVE SUB 6" 11kW

- Highly efficient 3-phase AC motor
- Frequency: 25...50 Hz
- Premium materials, stainless steel: AISI 304
- No electronics in the motor

Efficiency	max. 80 %
Motor speed	1,400...2,850 rpm
Power factor	0.87
Insulation class	F
Enclosure class	IP68
Submersion	max. 150 m

Pump End PE C-SJ17-18

- Non-return valve
- Premium materials, stainless steel: AISI 304
- Centrifugal pump

Efficiency	max. 74 %

Pump Unit PU15k C-SJ17-18 (Motor, Pump End)

Borehole diameter	min. 6,0 in
Water temperature	max. 30 °C****

Standards

CE 2006/42/EC, 2004/108/EC, 2006/95/EC

IEC/EN 61702:1995, IEC/EN 62253 Ed.1

The logos shown reflect the approvals that have been granted for this product family. Products are ordered and supplied with the approvals specific to the market requirements.

**Vmp: MPP-voltage under Standard Test Conditions (STC): 1000 W/m² solar irradiance, 25 °C cell temperature

****Special solutions available for >30 °C, please consult your distributor

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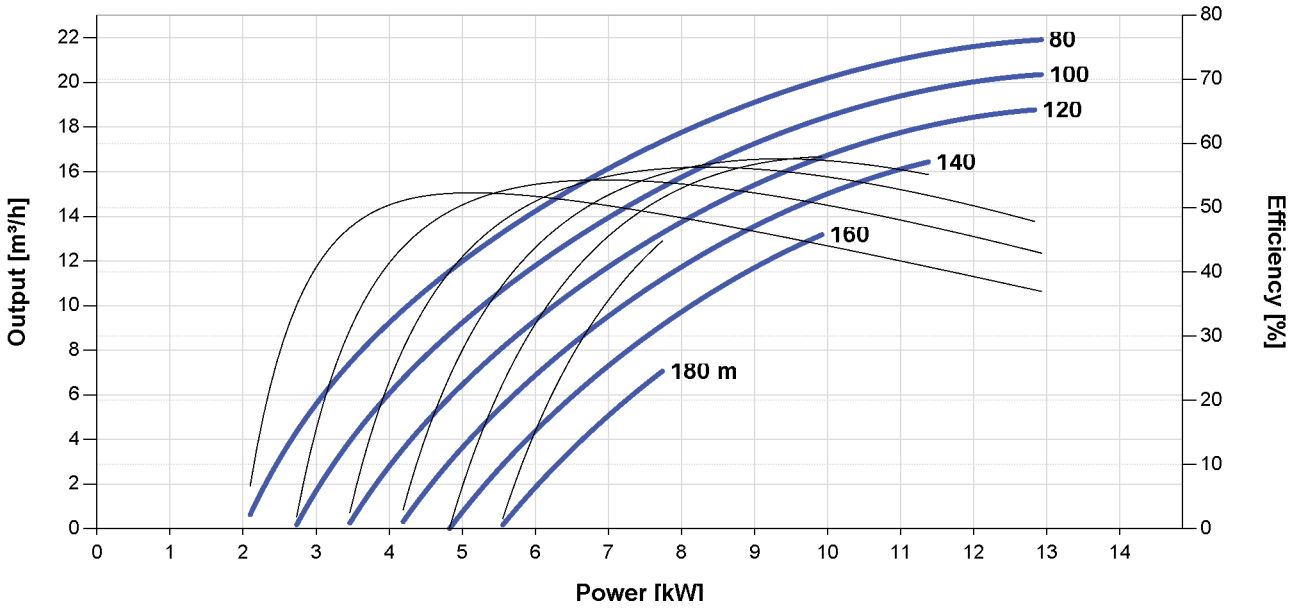
PSk3-15 C-SJ17-18

Solar Submersible Pump System for 6" wells

Pump Chart

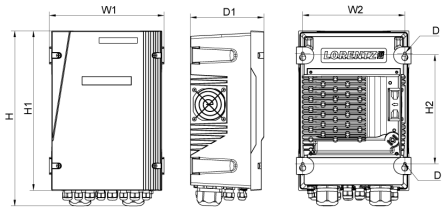
Vmp* > 575 V



Dimensions and Weights

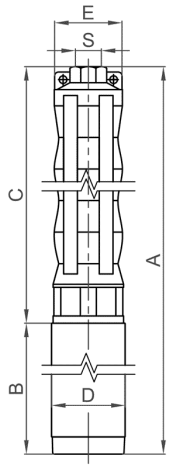
Controller

H = 428 mm
H1 = 390 mm
H2 = 270 mm
W1 = 280 mm
W2 = 250 mm
D = 6.0 mm
D1 = 180 mm



Pump Unit

A = 2,083 mm
B = 711 mm
C = 1,372 mm
D = 144 mm
E = 133 mm
S = 2.5 in



	Net weight
Controller	
Pump Unit	86 kg
Motor	57 kg
Pump End	29 kg

*Vmp: MPP-voltage under Standard Test Conditions (STC): 1000 W/m² solar irradiance, 25 °C cell temperature

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LC325-P72

High-efficiency PV Module

Features

- high energy yields ensured by high conversion efficiency
- sturdy, clear-anodized aluminum frame with pre-drilled holes for quick installation
- advanced EVA encapsulation with triple-layer backsheet, meets the most stringent safety requirements for high-voltage operation
- pre-wired junction box equipped with connectors "plug'n'play"
- reliable bypass diodes to prevent overheating (hot spot effect) and to minimise power loss by shading
- manufactured in ISO 9001:2000-certified factory

photo may differ from actual product

Warranty

- Warranty: 2 years
- Performance guarantee:
  up to 10 years (90% power output)
  up to 20 years (80% power output)

  Details according to warranty issued by LORENTZ

Standards

LC330-P72 is certified according to IEC 61215 and 61730 by TÜV Rheinland and meets the requirements for CE.

TÜVRheinland CERTIFIED

IEC 61215
IEC 61730
Regular Production Surveillance

www.tuv.com
ID 1419063782

Specifications

Electrical Data

Peak power	Pmax	[Wp]	325
Tolerance		[%]	+3/0
Max. power current	Imp	[A]	8.67
Max. power voltage	Vmp	[V]	37.5
Short circuit current	Isc	[A]	9.11
Open circuit voltage	Voc	[V]	45.9
Temperature co-efficient for Pmax		[%/°C]	-0.29
Temperature co-efficient for Voc		[%/°C]	-0.39
Temperature co-efficient for Isc		[%/°C]	0.04
Max. system voltage		[VDC]	1,000
Module efficiency		[%]	16.7

All technical data at standard test condition:
AM = 1.5, E = 1,000 W/m², cell temperature: 25 °C

Cells

Number of cells in series	72
Number of cells in parallel	1
Cell technology	polycrystalline
Cell shape	rectangular

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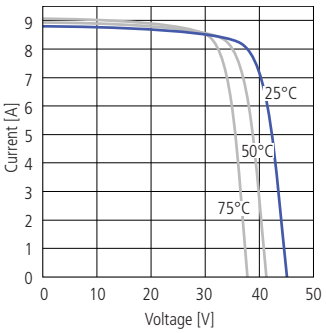
V210401

Electrical Performance

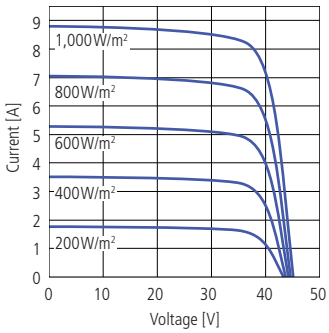
Electrical Performance

for different temperatures, at AM=1.5, E=1,000W/m²



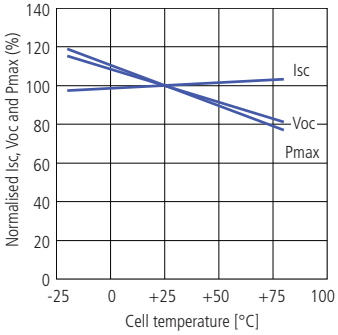
Electrical Performance

for different irradiation, at 25 °C



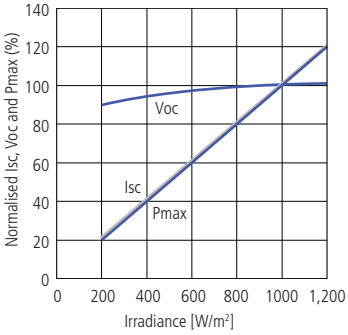
Temperature Dependence

of Isc, Voc and Pmax

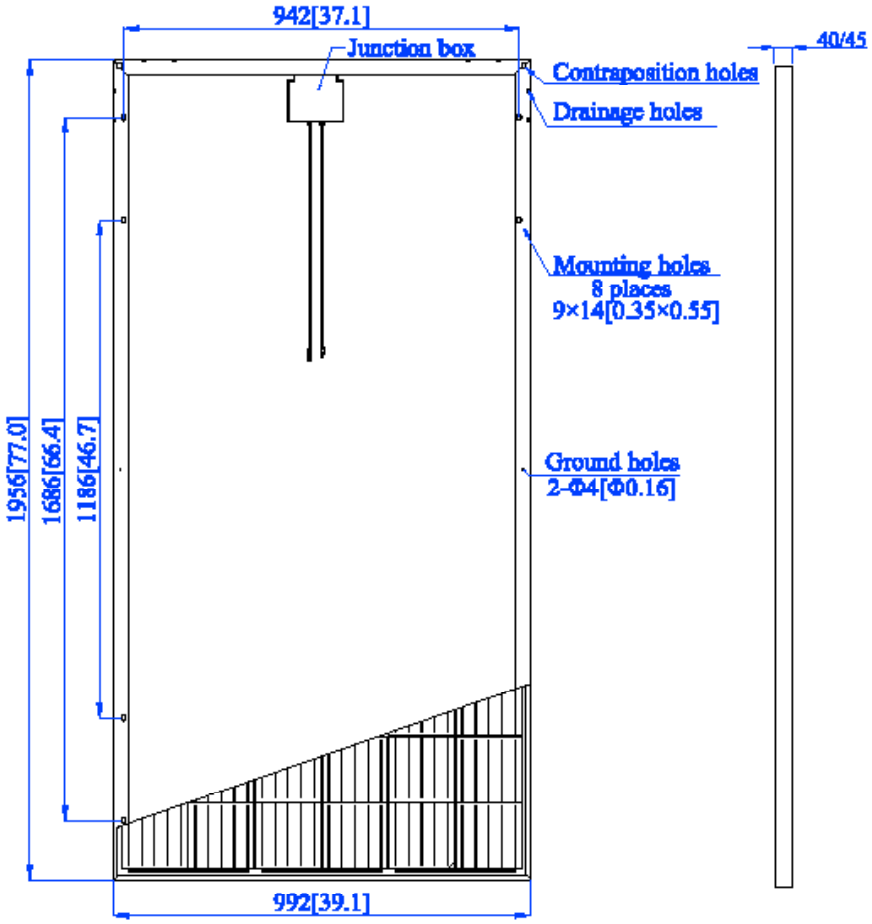


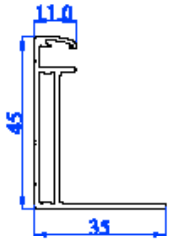
Irradiation Dependence

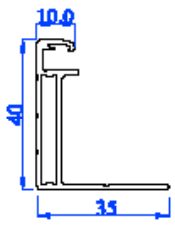
of Isc, Voc and Pmax at 25 °C



Physical Specifications mm [inch]







[kg]	20.8
[mm]	1,956 × 992 × 40
[N/m²]	2,400
	approx. 900 mm, 4 mm²
	MC4 compatible

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Well Probe V2

Mechanical float switch for dry run protection of LORENTZ solar pumps

The well probe provides a reliable method of run dry protection for LORENTZ pumps. The well probe detects that water is present within a well, tank or other water source. The well probe is typically attached to the riser pipe above the pump and connected to the controller. When the well probe becomes dry (water level is below the probe) the pump switches off to avoid dry running.

Order Information

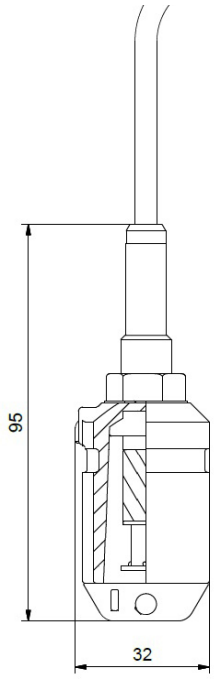
Item no.: 19-000005 **Product name:** Well probe sensor V2

Features

- Reliable dry run protection
- Simple to install using 3 cable ties
- Improved tolerance to dirt
- Splicing kit and cable ties for fixing are included

Technical Data

- Max. operating temperature 55°C
- Enclosure class: IP68
- Submersion depth: max 50 m (164 ft)
- Cable length: 1.5 m
- Wire size: 2 x 0.50 mm² or AWG 20, waterproofed
- Must be mounted in a vertical position
- Meets the requirements for CE



Dimensions / Weight

- Packaging dimensions: 255 x 170 x 40 mm
  10.0 x 6.7 x 1.6 in
- Total weight: 0.1 kg / 0.2 lbs

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V181107

Float Switch

Mechanically Activated Device for Water Level Detection in Applications with LORENTZ Solar Pump Systems

The switch can be used to detect the water level within a tank. When the water level in the tank reaches the maximum, the LORENTZ Controller will stop the pump and indicates Tank Full LED.

ORDER INFORMATION

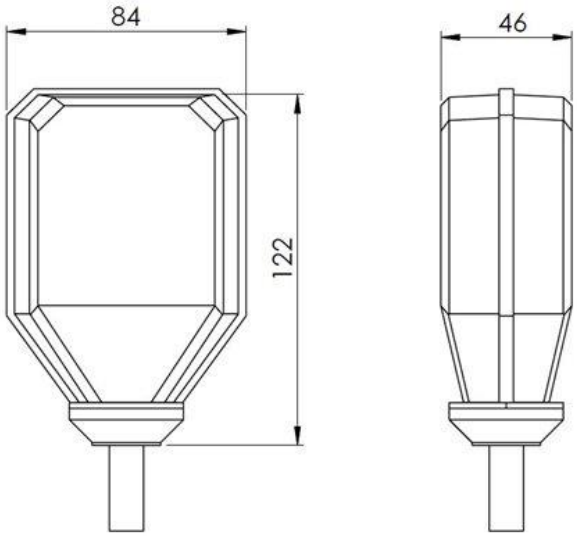
- **Item no.:** 19-000030 **product name:** Float Switch

FEATURES

- **N.O.** (normally open) and **N.C.** (normally closed) function
- Reliable water level detection
- Simple to install
- Trouble free operation
- Not sensitive to rotation
- Corrosion-free

TECHNICAL DATA

- Operating temperature: -10°C to 55°C
- Storage temperature: : -10°C to 55°C
- Enclosure class: IP68
- Cable length: 3m, waterproof
- Wire size: 3x 1.0mm² or AWG 18
- Meets the requirements for CE



DIMENSION/WEIGHT

- Packaging dimensions: 230 x 160 x 55 mm
  9.1 x 6.3 x 2.2 in
- Total weight: 0.8 kg / 1.8 lbs

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V180904

Pressure Switch

Device for Water Pressure Detection in Applications with LORENTZ Solar Pump Systems

The switch can be used to detect the water level within a tank. When the water level in the tank reaches the maximum, the pressure will increase and the LORENTZ Controller will stop the pump and indicates Tank Full LED.

ORDER INFORMATION

- **Item no.:** 19-000310 **product name:** Pressure Switch 1-5bar

FEATURES

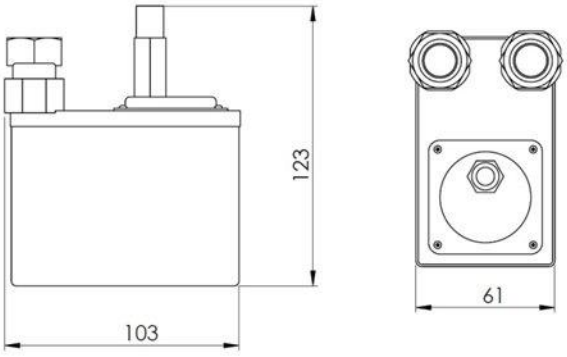
- Reliable water pressure detection
- Simple to install
- Trouble free operation
- Corrosion-free

TECHNICAL DATA

- Pressure range between 1 and 5 bar
- 2x cable gland Ø 5-9mm
- G ¼'' pipe thread
- Meets the requirements for CE

DIMENSION/WEIGHT

- Packaging dimensions: 130 x 105 x 65 mm
  5.1 x 4.2 x 2.6 in
- Total weight: 0.5 kg / 1 lbs



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V180904

Liquid Level Sensor

Sensor for measuring the level of liquid in a well or tank

USE / PURPOSE

The range of liquid level sensors use pressure to measure the liquid level in a well or tank. The sensors can be used for collection of long term liquid level monitoring and also for pump control in applications where a well probe cannot be used. The liquid level sensor must be used with a compatible LORENTZ Controller (see requirements).

FEATURES

- Gauge pressure sensor, pressure measurement relative to atmosphere
- For measuring levels of liquid in a well or tank
- Accurate, robust sensor
- For use with LORENTZ PumpScanner and pumpMANAGER

REQUIREMENTS

- LORENTZ PS2 controller, LORENTZ PSk2 controller or PS Controller equipped with a licensed PS DataModule
- The cable contains a capillary tube to balance the sensor against atmospheric changes. The sensor must be ordered with the required cable length for the application as it cannot be spliced. Further cable lengths are available on demand, please contact LORENTZ.

TECHNICAL DATA

- Sensor type: 2 wire gauge sensor
- Enclosure class: IP68
- Sensor housing: stainless steel
- Connects to LORENTZ PS DataModule
- Oil resistant cable with capillary tube
- Overpressure: 2x full scale
- Output signal :4-20mA output
- Voltage : 12-28VDC
- Application temp.: -10 to 80°C
  14 to 176°F
- Accuracy class :0.5% FS
- Meets the requirements for CE

DIMENSION/WEIGHT

- Packing dimensions:
  19-005040: 350 x 350 x 100 mm / 13.8 x 13.8 x 3.9 in
  19-005050: 350 x 350 x 100 mm / 13.8 x 13.8 x 3.9 in
  19-005080: 350 x 350 x 100 mm / 13.8 x 13.8 x 3.9 in
  19-004395: 350 x 350 x 180 mm / 13.8 x 13.8 x 7.1 in
- Weight:
  19-005040: 4 kg / 8.8 lbs
  19-005050: 5 kg / 11.0 lbs
  19-005080: 7 kg / 15.4 lbs
  19-004395: 11 kg / 24.3 lbs

ORDER INFORMATION

Item #	Product	Pressure range	Cable length
19-005040	Liquid Level Sensor, 0-10m/33ft, 30m/100ft Cable	0-100 kPa 0 to 10 m / 0 to 33 ft 0 to 1 bar / 0 to 14.5 psi	30 m / 100 ft *
19-005050	Liquid Level Sensor, 0-20m/66ft, 40m/130ft Cable	0-200 kPa 0 to 20 m / 0 to 66 ft 0 to 2 bar / 0 to 29 psi	40 m / 130 ft *
19-005080	Liquid Level Sensor, 0-50m/164ft, 60m/200ft Cable	0-500 kPa 0 to 50 m / 0 to 164 ft 0 to 5 bar / 0 to 72.5 psi	60 m / 200 ft *
19-004395	Liquid Level Sensor, 0-100m/328ft, 140m/460ft Cable	0-1000 kPa 0 to 100 m / 0 to 328 ft 0 to 10 bar / 0 to 145 psi	140 m / 460 ft *

***Further cable length is available on demand. Please contact LORENTZ.**

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V180822

Liquid Pressure Sensor

Sensor for measuring the pressure of liquid in a pipe or vessel

USE / PURPOSE

The sensors are commonly used to measure the pressure in the delivery pipeline or in a vessel. The pressure signal is used with a LORENTZ pump controller to measure pressure and for pressure switching or constant presure applications. The liquid pressure sensor must be used with a compatible LORENTZ Controller.

FEATURES

- Gauge pressure sensor, pressure measurement relative to atmosphere
- For measuring pressure in a pipe or vessel
- Accurate, robust sensor
- For use with LORENTZ PumpScanner and LORENTZ Global

REQUIREMENTS

- LORENTZ PS2 controller, LORENTZ PSk2 controller or LORENTZ PSk3 Controller
- Care must be taken to position the sensor without turbulent water to ensure accurate measurement
- G1/4” or G1/2” female threaded filling / air vent hole is required to mount the sensor

TECHNICAL DATA

- Sensor type: 2 wire gauge sensor
- Enclosure class: IP65
- Sensor housing : stainless steel
- Cable length: 10m/15m (33ft/50ft)
- Overpressure: 1.5x full scale
- Output signal : 4-20 mA
- Voltage : 11-28 VDC
- Application temp.: -30 to 80°C
  -22 to 176°F
- Accuracy class : 0.5% full scale
- Thread type: G1/2” male (G1/4” with adapter)
- Meets the requirements for CE

ORDER INFORMATION

Item #	Product	Pressure range
19-004450	Liquid Pressure Sensor, LPS-500	0-500 kPa 0 to 5 bar / 0 to 72.5 psi
19-004460	Liquid Pressure Sensor, LPS-1000	0-1000 kPa 0 to 10 bar / 0 to 145 psi
19-002760	Liquid Pressure Sensor, LPS-2000	0-2000 kPa 0 to 20 bar / 0 to 290 psi
19-002780	Liquid Pressure Sensor, LPS-5000	0-5000 kPa 0 to 50 bar / 0 to 725 psi

DIMENSION/WEIGHT

- Packing dimensions: 250 x 180 x 100 mm
  9.8 x 7.1 x 3.9 in
- Weight: 0.85 kg / 1.87 lbs

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V221117

Water Meters
Flow measuring instrument for water use

NWM Water Meter

The **NWM Water Meter** is a device for measuring flow in water applications.

The **NWM water meter** has a pulse output for connection to LORENTZ pump controllers.

The water meter is used in applications where measured flow and water volume values are required.

The **NWM Water Meter** is suitable for applications with a pipe size of DN25 and DN32.

The **NWM Water Meter** contains a special sealed liquid which is separate from the flow water to maximize readability, avoid fogging and avoid scaling.

Characteristics

- All materials in contact with water are corrosion resistant.
- Five (5) digit mechanical display showing total liquid in 1m3 increments.
- Reed switch output which can be connected to PS2 and PSk controllers.
- Easy to install.

Technical Data

- Water temperature max. 50°C
- Water pressure: max. 16 bar
- Reed switch positioned on the x0,001 dial pointer: 10 l/imp.
- Reed Switch cable length: 1,45m
- IP64
- CE Conformity

Flow rate characteristics

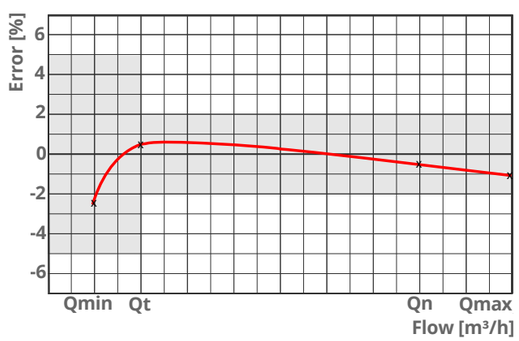
Flow	DN25	DN32
Max. flow rate: Q_{max} [m³/h]	7,87	12,5
Nominal flow rate: Q_n [m³/h]	6,3	10
Transition flow rate: Q_t [m³/h]	0,063	0,1
Minimum flow rate: Q_{min} [m³/h]	0,036	0,062

Reed switch impulse data output

Reed switch impulse	
Water meter size	**Liters per impulse**
DN25	10
DN32	10

Accuracy Curve

The Accuracy curve shows the deviation in percent error for different flow rates. In regular operation the deviation is between -2% and +2%.

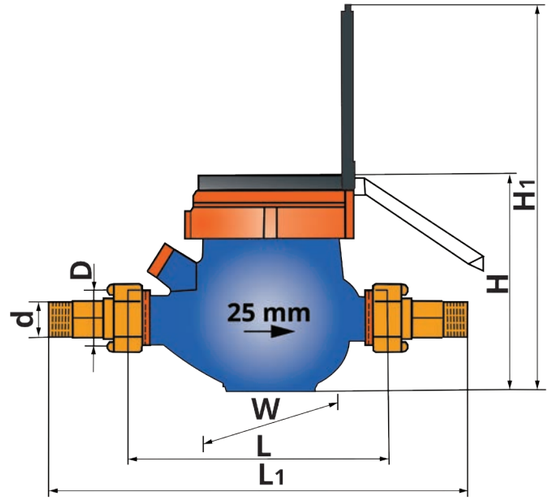


Water Meters
Flow measuring instrument for water use

NWM Water Meter

Dimensions and weights

Description	DN25	DN32
L [mm]	260	260
L1 [mm]	380	384
D [mm]	G1-1/4B	G1-1/2B
d [mm]	R1	R1-1/4
H [mm]	117,5	117,5
H1 [mm]	206,5	206,5
W [mm]	98	98
Net Weight [kg]	2,6	3,1



Order information

Item number	Description
19-002220	Water meter, NWM-DN25, 0.01 cbm/p
19-002225	Water meter, NWM-DN32, 0.01 cbm/p

Packaging information

Description	19-002220	19-002225
Dimension [LxWxH] [mm]	310x280x250	310x280x250
Gross Weight [Kg]	3,5	3,9
Volume [m³]	0,022	0,022

220601

Water Meters
Flow measuring instrument for water use

WP Water Meter

The **WP Water Meter** is a turbine type magnetic transmission instrument intended to measure high flow rates in water applications.
Water meters should be used in cases where accurate measurement of water volume is required.

WP Water Meters cover a wide flow range and are designed to handle high flow rates. They are suitable for applications with a pipe size from DN50 to DN200.

The helical blades of the turbine rotate around the axis of the flow. The magnetic transmission keeps the register separate from water, meaning only the impeller and transmission shaft contact water.

Characteristics

- Removable and interchangeable measuring element.
- Hermetically sealed dry type register.
- Reed switch output which can be connected to PS2 and PSk controllers using LORENTZ CONNECTED applications.
- Easy to install.

Technical Data

- Water temperature max. 40°C
- Water pressure: max. 16 bar
- Reed Switch cable length: 1,45m
- IP64
- CE Conformity

Flow rate characteristics

Flow	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Max. flow rate: Q_{max} [m³/h]	50	78,75	78,75	125	200	312,5	500
Nominal flow rate: Q_n [m³/h]	40	63	63	100	160	250	400
Transition flow rate: Q_t [m³/h]	0,8	1,26	1,26	2	3,2	5	8
Minimum flow rate: Q_{min} [m³/h]	0,5	0,7875	0,7875	1,25	2	3,12	5

Reed switch impulse data output

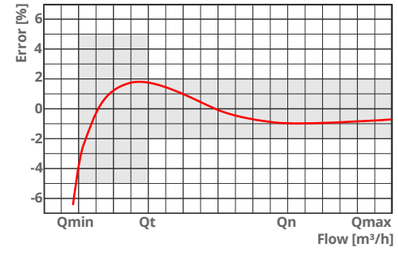
Reed switch impulse	
Water meter size	**Litres per impulse**
DN50	100
DN65	100
DN80	100
DN100	100
DN125	100
DN150	1000
DN200	1000

Water Meters
Flow measuring instrument for water use

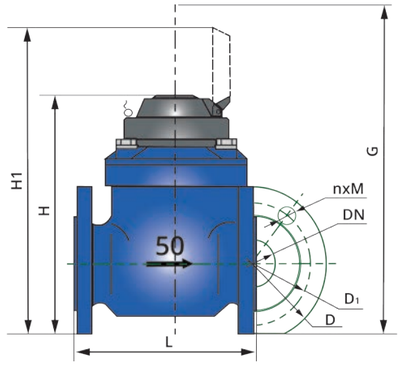
WP Water Meter

Accuracy Curve

The Accuracy curve shows the deviation in percent error for different flow rates. In regular operation the deviation is between -2% and +2%.



Dimensions and weights



Description	DN50	DN65	DN80	DN100	DN125	DN150	DN200
L [mm]	200	200	225	250	250	300	350
H [mm]	252	262	272	282	297	341	371
H1 [mm]	339	349	359	369	384	428	458
G [mm] [Maintaining height]	400	400	400	400	400	500	500
D [mm]	165	185	200	220	250	285	340
D1 [mm]	125	145	160	180	210	240	295
nxM [Connecting bolt qty]	4xM16	4xM16	8xM16	8xM16	8xM16	8xM20	12xM20
Weight [kg]	12	13	15	16	21	33	42

Order and Packaging information

Item number	Description	Gross Weight [Kg]	Dimension [LxWxH] [mm]	Volume [m³]
19-002165	Water meter, WP-DN50, 0.1 cbm/p	15	280x230x320	0,021
19-002170	Water meter, WP-DN65, 0.1 cbm/p	16	290x230x330	0,022
19-002180	Water meter, WP-DN80, 0.1 cbm/p	17	280x240x350	0,023
19-002190	Water meter, WP-DN100, 0.1 cbm/p	20	320x260x350	0,029
19-002200	Water meter, WP-DN125, 0.1 cbm/p	25	340x310x390	0,041
19-002210	Water meter, WP-DN150, 1 cbm/p	38	370x340x420	0,053
19-002202	Water meter, WP-DN200, 1 cbm/p	49	415x390x435	0,070

220601

PV Combiner 1000-125-4

Connection box or parallel PV wiring

Description

An outdoor rated, combining connection box that allows up to 4 strings of PV modules to be connected safely to a solar pump system.

This product is typically used to combine strings from multiple LORENTZ 1000-40-5 PV Disconnects.

photo may differ from actual product

Features

- Combining function, allows 4 strings to be connected to the solar pump system
- Robust weather proof housing designed to make installation simple
- Lockable for additional protection
- Tool required to open the housing
- Designed to be used with LORENTZ PSk range of systems

Ordering and shipping information

- Item no: 19-000122
- Product name: PV Combiner 1000-125-4
- Packed volume: 0.015 m^3 (0.54 ft^3)
- Packed weight: 2.75 kg (6.1 lbs)

Technical data / Specifications

Maximum voltage	1000 V DC	
Maximum current per string	125 A	
Maximum total current	125 A	
Number of strings.	4	
Input cables	10 - 35 mm^2	AWG 8 - 2
Output cables	10 - 35 mm^2	AWG 8 - 2
PG glands (input)	8 x PG16	
PG glands (output)	2 x PG16	
Environmental protection	IP68	NEMA6
Housing material	Polycarbonate	

Approvals and standards

CE

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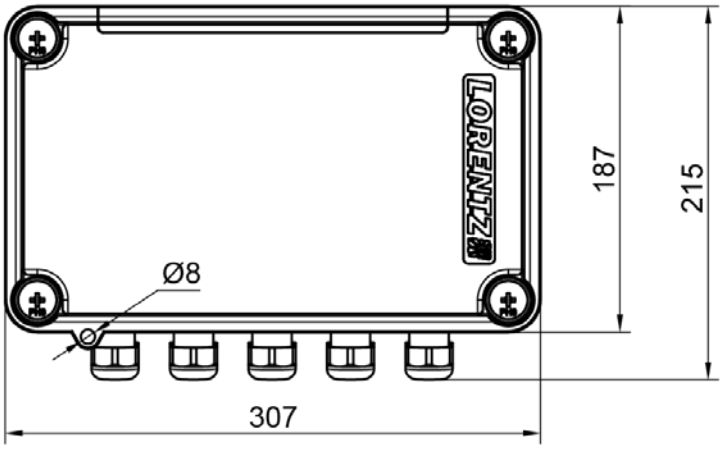
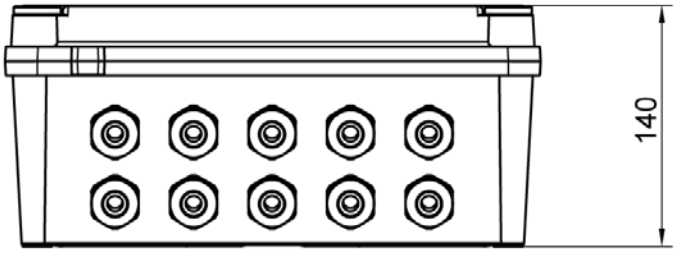
Mounting options

- Wall mount using 4 holes with weather protection
- Designed for optional pole mounting. Mounting points are pre-marked inside the housing.

Dimensions and weight

- See diagram for mm sizes
- Max height 215 mm (8.66“)
- Max width 307 mm (12.1“)
- depth 140 mm (5.5“)
- Weight 2.2 kg (4.8 lbs)





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SmartStart

Automatic Remote Diesel Generator Switching Device

Description

The SmartStart can automatically and remotely start and stop diesel generators for hybrid solar pumping. It has a secondary auxiliary output for switching other devices (only usable with PSk2). It connects to PSk2 or PSk3 Controllers and to the remote switch input of the diesel generator.

photo may differ from actual product

Features

- Automatically switches on/off diesel engines equipped with remote start input (NO or NC)
- SmartStart provides power to PSk2 / PSk3 systems for night time logic operation such as early morning pump starting
- Battery charging from PSk2 / PSk3 Controller
- Auxiliary output for switching other devices (only usable with PSk2)

Technical Data

- Max. switching capability: 250 V AC / 30 V DC, 2 A
- Enclosure class: IP54
- Nominal cross section for remote start cable 1.5 mm²
- Further information is available in the PSk2 and PSk3 manual on partnerNET

Product Content

The SmartStart comes with two cables, one cable to be used with the PSk2 product line and one cable to be used with the PSk3 product line. Each cable is ready to use and has a length of 2 m. The required battery must be ordered separately. The battery must meet the requirements on the right.

Battery Requirements

- NP7-12 or a similar sealed 12 V lead-acid battery
- Recommended minimum capacity: 7 Ah
- Max. dimensions without connector: 151 x 70 x 95 mm (5.94 x 2.56 x 3.74 in)
- Max height with connector: 100 mm (3.94 in)
- Connector: 4.8 mm (0.189 in) faston tabs

CE

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Mounting options

- Wall or panel mount using 4 mounting holes, hole diameter 6 mm
- You must allow a space above and below the SmartStart of 250 mm

Order information

Item number	Description
19-004285	SmartStart

Dimensions and weight

- Packaging dimensions: L x W x H 245 x 285 x 305 mm (9.6 x 11.2 x 12 in)
- Packed weight (without battery): 2.4 kg (5.2 lbs)

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Surge Protector2

Device to Protect LORENTZ Pump Accessories from Voltage Spikes

ORDER INFORMATION

- **Item no.:** 19-005210 **product name:** Surge Protector2

FEATURES/COMPATIBILITY

- Reliable surge protection device for any switched, pulse or analogue (4-20 mA) inputs sensors including:
  - Well Probe Sensor 19-000000
  - Water Sensor 19-000001
  - Float Switch 19-000030
  - Pressure Switch 19-000310
  - Liquid Level (all types, e.g. 19-005040)
  - Liquid Pressure Sensor (all types, e.g. 19-004460)
  - Water Meter (all types, e.g. 19-002160)
  - Sun Switch (19-000050)
- The device must be installed inside the PS2 or PSk2 controller.

TECHNICAL DATA

- Max. voltage: 30 V DC
- Max current 8/20µs: 500 A
- Enclosure class: IP20
- Ambient temperature: max. 80°C (176°F)
- Wire size: 2 x 1.5mm² (AWG 16)
- Meets the requirements for CE

DIMENSION/WEIGHT

- Packing dimensions: 56 x 26 x 120 mm
  2.2 x 1.02 x 0.47 in
- Total weight 0.1 kg / 0.2 lbs

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Water Level Measurement Solution

The LORENTZ Water Level Measurement Solution (WLMS) accurately measures water levels in boreholes and tanks. WLMS is a combination of pressure sensor and plug in barometer to provide water level measurement for PS2 and PSk3 systems. Used in conjunction with inbuilt software WLMS allows you to record and monitor water levels in your tank and control your system based on these levels.

The sealed sensor comes with a plug-in barometer placed in the controller and measures the pressure based on the difference between the submersed sensor and the barometer.

This solution allows control of the pump based on the water level in the source or tank. It delivers not only information about the current water level but also about trends related to water usage. Predicting and planning for low water levels is possible with this solution.

The WLMS can also provide dry run protection for the pump and is a very good alternative to a well probe in any water source that is prone to calcium scaling, snails, algae or other contaminants that can effect operation of mechanical float switches.

Features

- Measures water levels in tank, well or other water source
- Provides pump run dry run protection
- Absolute pressure sensor - complete with plug in barometer
- Control of pump based on sensor data
- Very simple configuration and high customer value
- Real time and historic level data is viewed locally via LORENTZ CONNECTED apps (PumpScanner or Assistant or remotely via LORENTZ Global

Technical Data

Sensor type	absolute pressure sensor
Enclosure class	IP68
Sensor housing	high tech polymer
Measuring range	25 m / 82 ft water level
Accuracy	+/- 0.35 m / 1.15 ft
Diaphragm material	stainless steel AISI316L
O-ring material	FKM
Overpressure	max 75m / 246 ft water column
Min shut off level	0.5 m / 1.6 ft
Output signal	4-20mA
Power supply	12-28V DC
Cable jacket	PVC
Cable length	35 m / 114.8 ft
Application temperature	-10 to 80° C / 14 to 176° F
Meets the requirements for CE	

Compatibility

- for use with LORENTZ PS2 controllers and LORENTZ PSk3 controllers

WLMS Ordering Information

Order information

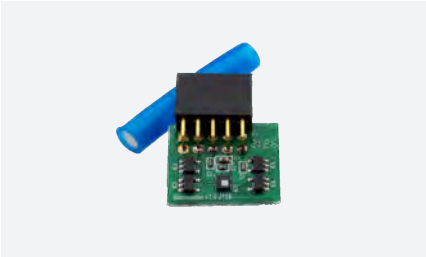
Item number	Description
19-005347	Water Level Measurement Solution, measurement range 25 m / 82 ft cable length 35 m / 115 ft

Dimensions

Packing Dimensions	Weight
225 x 205 x 70 mm / 8.9 x 8 x 2.8 in	1.5 kg / 3.3 lbs

Shipping Items

- Sensor with 35m (115 ft) cable on a cable drum
- Plug-in barometer
- Balancing valve
- Splice kit



CLS Water Sensor

Sensor for water presence detection

The CLS Water Sensor is a capacitive limit switch sensor. It is used for efficient and reliable detection of the presence of liquid in pipes or open tanks. The sensor operates on the principle of capacitance variation which is more reliable than resistive or inductive measurement between open probes.

The CLS Water Sensor is suitable as dry run protection for surface pump applications and can be also used to detect the presence of water in tanks.

Characteristics

- Water detection based on the capacitive change principle.
- Quick reaction time.
- Reliable fluid detection.
- Robust and corrosion resistant: Sensor made of AISI316, measuring tip made of PEEK (polyetheretherketone).
- Over current and reverse polarity protection.
- LED indicator on the sensor.
- NPN output for use with water sensor input on PS2 and PSk family controllers.
- Meets the requirements for CE.

Photo may differ from actual product

Technical Specification

Connection	Thread M14x1
Material	Sensor housing: Stainless steel 316 Sensor tip: PEEK
Operating pressure	0 - 10 bar [0 - 145,03 psi]
Temperature range	-25 °C ... 90 °C [-13 °F ... 194 °F]
Protection Class	IP 67
Electrical connection	M12-plug
Supply	12 ... 24 V DC
Output	NPN (max. 100 mA, short circuit protection) PNP output also possible [1]
Reaction time	Approx. 1 ½ s
Display	LED
Cable length	2 m [6.5 ft]

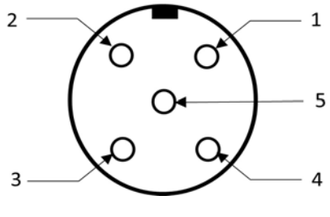
[1] **Refer to the electrical connection**

Connection – Water Sensor connection terminals

Controller	Jumper	Brown	Black	Blue
PS2	-	13	14	15
PSk2 (21 to 40)	6 to 16	15	5	6
PSk2 (60 to 100)	-	13	14	15
PSk3	-	14	15	16

Electrical connection

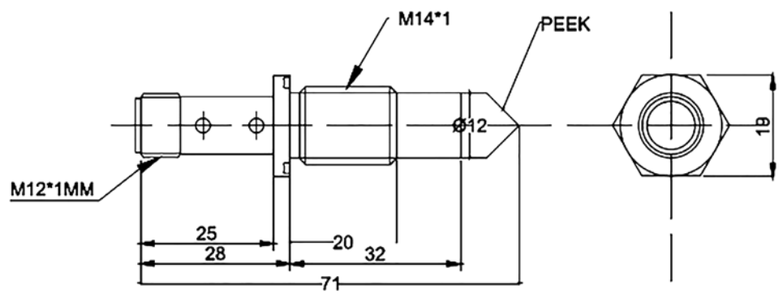
M12-Plug	Wire	Description
1	Brown	+12 ... 24 V DC
2	White	PNP
3	Blue	0 V
4	Black	NPN
5	Grey	NC



CLS Water Sensor

Sensor for water presence detection

CLS Water Sensor Drawing and Dimensions



Order information

LORENTZ provides CLS Water Sensor for both millimeter and inch pipe installations, please consider the correct item number when ordering:

Item number	Description	Item Picture
19-000004	CLS Water Sensor with cable **(Metric units)**. Includes: - CLS Water Sensor - PVC Adaptor, D 50 mm M14x1 - Ring w. seal for PVC Adaptor, 3 mm - Jumper cable wire [2]	
19-000009	CLS Water Sensor with cable **(U.S. units)**. Includes: - CLS Water Sensor - PVC Adaptor, 2", M14x1 - Ring w. seal for PVC Adaptor, 3 mm - Jumper cable wire [2]	
19-000006 [3]	Adaptor kit, for CLS Water Sensor, Welding, M14x1, Steel + Stainless Steel. Includes: - Adaptor for welding, M14x1, steel - Adaptor for welding, M14x1, stainless steel	
19-000008 [3]	Adaptor, CLS Water Sensor, G1" x M14x1, stainless steel	

[2] **Applicable only for connection to PSk2-21 to PSk2-40 controllers.**
[3] **These items can be ordered separately according to the pipework.**

Weight and Volume information

Item number	19-000004	19-00009	19-000006	19-000008
Dimension (LxWxH)	190 x 105 x 75 mm [7.4 x 4.1 x 2.9 in]	190 x 105 x 75 mm [7.4 x 4.1 x 2.9 in]	190 x 105 x 75 mm [7.4 x 4.1 x 2.9 in]	190 x 105 x 75 mm [7.4 x 4.1 x 2.9 in]
Volume	0.0015 m³ [0.053 ft³]	0.0015 m³ [0.053 ft³]	0.0015 m³ [0.053 ft³]	0.0015 m³ [0.053 ft³]
Net Weight	0.19 kg [0.42 lb.]	0.21 kg [0.46 lb.]	0.16 kg [0.35 lb.]	0.14 kg [0.31 lb.]
Gross Weight	0.33 kg [0.73 lb.]	0.35 kg [0.77 lb.]	0.26 kg [0.57 lb.]	0.23 kg [0.50 lb.]

230628

PV Combiner 1000-15-3-F

Connection Box for parallel wiring with integrated string fuses

Description

The **LORENTZ PV Combiner 1000-15-3-F** is a PV connection box with **fuses** to be used with our PS2 and PSk pump systems.

Its main function is to combine up to **three** (3) PV arrays in parallel with the purpose of reducing the multiple cable inputs to only two cable outputs (+ -) to make more flexible installations.

The **fuses** provide protection and isolation for the control unit in the event of an overcurrent situation from the PV array.

Use this PV combiner with a properly sized DC disconnect switch in your system (LORENTZ PV Disconnect).

Photo may differ from actual product

Features

- Combined function, allows up to **three** (3) PV arrays to be connected in parallel to the solar pumping system
- Built-in **Fuses** protection
- Equipped with fuse holders specially designed for solar power applications
- Robust, weatherproof housing, designed to make installation simple
- Lockable for additional protection.
- Internal touch protection with screws
- Required for a professional installation of solar pumping systems

Technical Data

Product name	PV Combiner 1000-15-3-F
Built-in protection	Fuses
Ambient temperature	-30 °C to 50 °C [-22 °F to 120 °F]
Max. Voltage	1000 V DC
Max. current per string	15 A
Max. total current	45 A
Max. no. of strings	3
Input cable size	2.5 - 10 mm² / AWG 14 - 8
Output cable size	2.5 - 16 mm² / AWG 14 - 6
Quantity of fuses	6
Fuse current rating	15 A
Fuse voltage rating	1000 V DC
Fuse Size	10 x 38 mm
PG glands (input)	6 x M16
PG glands (output)	2 x PG-11
Enclosure class	IP 68
Housing material	Polycarbonate
Approvals and standards	EN 60204 / EN 6094-3

PV Combiner 1000-15-3-F

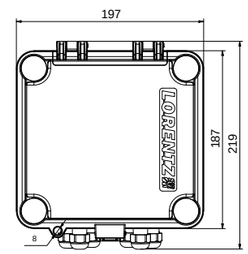
Connection Box for parallel wiring with integrated string fuses

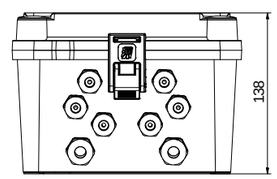
Compatibility

- For use with LORENTZ PS2 and PSk controllers.

Product dimensions and weight

Dimensions [LxWxH]	219 x 138 x 197 mm [8.6 x 5.4 x 7.8 in]
Net Weight	1.7 kg [3.7 lbs]





Mounting options

- Wall mount using 4 holes with weather protection.
- Designed for optional pole mounting. Mounting points are pre-marked inside the housing.

Mounting hole distances [WxH, Hole diameter]	160 x 150, Ø6 mm [6.3 x 5.9, Ø0.236 in]

PV Fuse, 15A

Order and Packaging information

Item number	19-001940
Product name	PV Combiner 1000-15-3-F
Packed gross weight	2.4 kg [5.2 lbs]
Packed volume	0.0125 m³ [0.44 ft³]
Packaging dimensions [LxWxH]	250 x 250 x 200 mm [9.8 x 9.8 x 7.8 in]

CE

V220803

PV Combiner 1000-15-6-F

Connection Box for parallel wiring with integrated string fuses

Description

The **LORENTZ PV Combiner 1000-15-6-F** is a PV connection box with **fuses** to be used with our PS2 and PSk pump systems.

Its main function is to combine up to **six** (6) PV arrays in parallel with the purpose of reducing the multiple cable inputs to only two cable outputs (+ -) to make more flexible installations.

The **fuses** provide protection and isolation for the control unit in the event of an overcurrent situation from the PV array.

Use this PV combiner with a properly sized DC disconnect switch in your system (LORENTZ PV Disconnect).

Photo may differ from actual product

Features

- Combined function, allows up to **six** (6) PV arrays to be connected in parallel to the solar pumping system
- Built-in **Fuses** protection
- Equipped with fuse holders specially designed for solar power applications
- Robust, weatherproof housing, designed to make installation simple
- Lockable for additional protection
- Internal touch protection with screws
- Required for a professional installation of solar pumping systems

Technical Data

Product name	PV Combiner 1000-15-6-F
Built-in protection	Fusibles
Ambient temperature	-30 °C to 50 °C [-22 °F to 120 °F]
Max. Voltage	1000 V DC
Max. current per string	15 A
Max. total current	90 A
Max. no. of strings	6
Input cable size	2.5 - 10 mm² / AWG 14 - 8
Output cable size	2.5 - 16 mm² / AWG 14 - 6
Quantity of fuses	12
Fuse current rating	15 A
Fuse voltage rating	1000 V DC
Fuse Size	10 x 38 mm
PG glands (input)	12 x M16
PG glands (output)	2 x PG-11
Enclosure class	IP 68
Housing material	Polycarbonate
Approvals and standards	EN 60204 / EN 6094-3

PV Combiner 1000-15-6-F

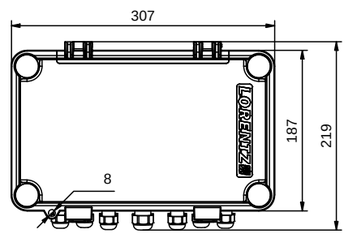
Connection Box for parallel wiring with integrated string fuses

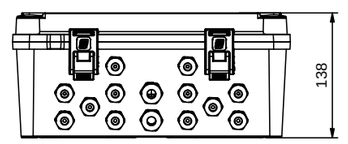
Compatibility

- For use with LORENTZ PS2 and PSk controllers.

Product dimensions and weight

Dimensions [LxWxH]	307 x 138 x 219 mm [12.1 x 5.4 x 8.6 in]
Net Weight	2.8 kg [6.1 lbs]





Mounting options

- Wall mount using 4 holes with weather protection.
- Designed for optional pole mounting. Mounting points are pre-marked inside the housing.

Mounting hole distances [WxH, Hole diameter]	270 x 150, Ø6 mm [10.6 x 5.9, Ø0.236 in]

PV Fuse, 15A

Order and Packaging information

Item number	19-001945
Product name	PV Combiner 1000-15-6-F
Packed gross weight	3.4 kg [7.5 lbs]
Packed volume	0.018 m³ [0.63 ft³]
Packaging dimensions [LxWxH]	360 x 250 x 200 mm [14.1 x 9.8 x 7.8 in]

CE

V220801

PV Disconnect 1000-50-5

Connection Box with DC Disconnect Switch

Description

The **LORENTZ PV Disconnect 1000-50-5** is a PV connection box with an integrated DC disconnect switch and a combining function designed to be used with LORENTZ PSk pump systems.

The product can combine up to five (5) PV Module strings in parallel and connect them through the enclosed DC disconnect switch to the pump controller.

Designed to be installed between the solar generator and the pump controller meeting the electrical requirements of the connected devices.

Photo may differ from actual product

Features

- DC rated disconnect to provide safe isolation of the system
- Combining function, allows up to 5 PV strings to be connected in parallel to the solar pump system
- Robust weatherproof housing designed to make installation simple
- Lockable to secure the system during maintenance (power locked off)
- Internal touch protection with screws
- Required for a professional installation of solar pumping systems

Technical Data

Product name	PV Disconnect 1000-50-5
Ambient temperature	-30 °C to 50 °C [-22 °F to 120 °F]
Max. Voltage	1000 V DC
Max. current per string	50 A
Max. total current	50 A
Max. no. of strings	5
Input cable size	2.5 - 10mm² / AWG 14 - 8
Output cable size	4 -16 mm² / AWG 12 - 6
PG glands (input)	10 x M16
PG glands (output)	2 x PG-11
Enclosure class	IP 68
Housing material	Polycarbonate
Approvals and standards	Switch IEC 60947-3

PV Disconnect 1000-50-5

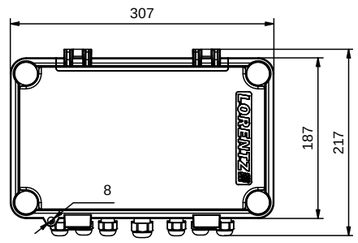
Connection Box with DC Disconnect Switch

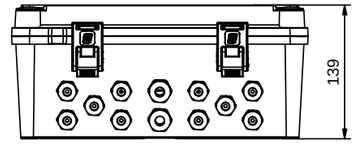
Compatibility

- For use with LORENTZ PSk controllers.

Product dimensions and weight

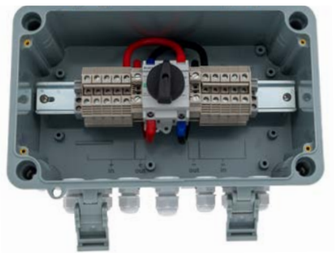
Dimensions [LxWxH]	307 x 139 x 217 mm [12.1 x 5.4 x 8.5 in]
Net Weight	2.1 kg [4.7 lbs]





Mounting options

- Wall mount using 4 holes with weather protection.
- Designed for optional pole mounting. Mounting points are pre-marked inside the housing.



Mounting hole distances [WxH, Hole diameter]	270 x 150, Ø6 mm [10.6 x 5.9, Ø0.236 in]

Order and Packaging information

Item number	19-001965
Product name	PV Disconnect 1000-50-5
Packed gross weight	2.8 kg [6.2 lbs]
Packed volume	0.018 m³ [0.63ft³]
Packaging dimensions [LxWxH]	360 x 250 x 200 mm [14.1 x 9.8 x 7.8 in]

CE

V220803

PV Protect 1000-125

Surge protection device for PV systems

Description

The **LORENTZ PV Protect 1000-125** is an outdoor surge protection device for PSk solar pump systems, it will provide a higher level of protection against electrical surges from the PV generator, usually caused by indirect lightning strikes.

This product should be installed between the PV generator and the pump controller.

For operation it requires a reliable ground connection.

Photo may differ from actual product

Features

- Provides enhanced protection to the pump controller from incoming voltage surges
- Robust weatherproof housing designed to make installation simple
- Tool required to open the housing
- Lockable for additional protection
- Correct grounding is required to make this device effective
- Required for a professional installation of solar pumping systems

Technical Data

Product name	PV Protect 1000-125
Ambient temperature	-30°C to 50°C (-22°F to 120°F)
Max. Voltage	1000 V DC
Max. current per string	125 A
Max. total current	125 A
Input cable size	10 - 35 mm² / AWG 8 - 2
Output cable size	10 - 35 mm² / AWG 8 - 2
Ground cable size	≥ 16 mm² / AWG 6
PG glands (input)	2 x PG16
PG glands (output)	2 x PG16
PG gland GND	1 x PG16
Enclosure class	IP 68
Housing material	Polycarbonate
Approvals and standards	EN 60204 - EN 61000 - EN 61643

PV Protect 1000-125

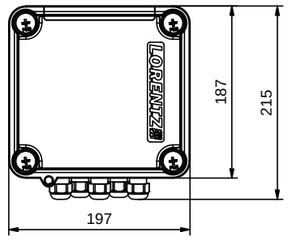
Surge protection device for PV systems

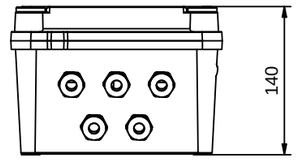
Compatibility

- For use with LORENTZ PSk controllers.

Product dimensions and weight

Dimensions [LxWxH]	215 x 140 x 197 mm [8.6 x 5.5 x 7.8 in]
Net Weight	1.8 kg [3.9 lbs]





Mounting options

- Wall mount using 4 holes with weather protection.
- Designed for optional pole mounting. Mounting points are pre-marked inside the housing.

Mounting hole distances [WxH, Hole diameter]
160 x 150, Ø6 mm [6.3 x 5.9, Ø0.236 in]

Order and Packaging information

Item number	19-001970
Product name	PV Protect 1000-125
Packed gross weight	2.4 kg [5.3 lbs]
Packed volume	0.0125 m3 [0.44 ft3]
Packaging dimensions [LxWxH]	250 x 250 x 200 mm [9.8 x 9.8 x 7.8 in]