

Measuring and Managing Levels

Liquid Level Sensor and Water Level Measurement Solution

Measuring the level of liquids in tanks, wells and other water sources provides the information needed for precise pump control.

Knowing exactly how much water is available now and understanding long term trends assist with daily operations and future planning.

Level measurement and management allows you to;

- Measure levels in groundwater and tanks
- Recording of levels over time for trend analysis
- Control your pump based on water levels, on, off and speed
- Industry leading **CONNECTED** features - see live and historic data and manage your pump controls remotely with **LORENTZ Global**



To effectively manage water supply you need to be able to measure it. Measuring levels in wells, elevated tanks or remote locations is time consuming and has risks. Risks can include physical access to high tanks, and contamination of water with measurement instruments.

By using the sensor inputs and embedded software in LORENTZ pump controllers, combined with one of our measurement solutions, continuous and precise monitoring of water levels is achieved.

Information from the sensors is used to control the pump, for example, switch the pump on, off or maintain a specific level.

All level data is recorded inside the pump controller for trend and usage analysis by LORENTZ CONNECTED apps.

Why is water measurement important?

Knowing not only that water is present but exactly how much water is available has three benefits:

- Immediate control of the pump, switching it off if there is no water or a tank is full, switching on when a defined level is reached or using real time measurement to maintain a level.
- Understanding the behavior of a water source such as a well. With real-time measurement the impact that pumping has can be seen, Draw-down levels and recovery times indicate the performance of the water source
- Long term monitoring of source and storage levels provide trends on usage and allows for future planning and risk assessment.

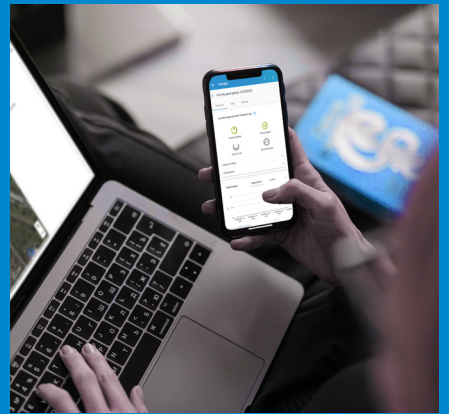
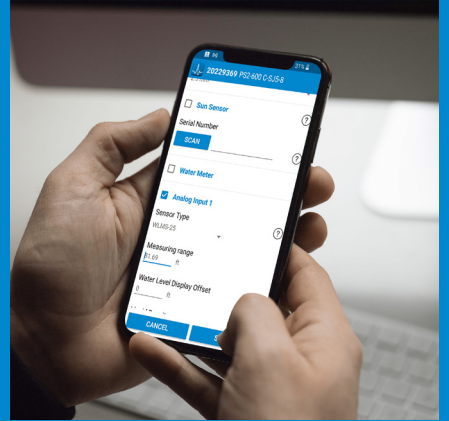
LORENTZ measurement solutions

LORENTZ have developed two solutions for measuring levels that are used in different applications.

The solutions are a combination of a submerged pressure sensor with hardware and software included in the LORENTZ PS* and PSk* pump controllers. The pump controller not only stores the level data but provides sophisticated functions to manage the water system using level data.

Data from the sensors is translated into easy to read levels that are displayed locally using LORENTZ smartphone apps or remotely on LORENTZ Global remote monitoring and management platform.





Measuring Levels and Pump Control

LORENTZ level sensors can be used in boreholes, rivers, ponds and tanks.

The level sensors measure the pressure at the sensor. This pressure measurement is then used to calculate the height of liquid above the sensor. The sensors compensate for atmospheric pressure and altitude to provide accurate level readings. This compensation ensures that measurements are accurate wherever the sensors are installed and whatever the weather is doing.

The sensors will always measure the level of liquid above it.

In the example on the page opposite, one sensor is located in a well, above the pump (C) and another is located in an elevated tank (E).

In both cases the level of water above the sensor is measured.

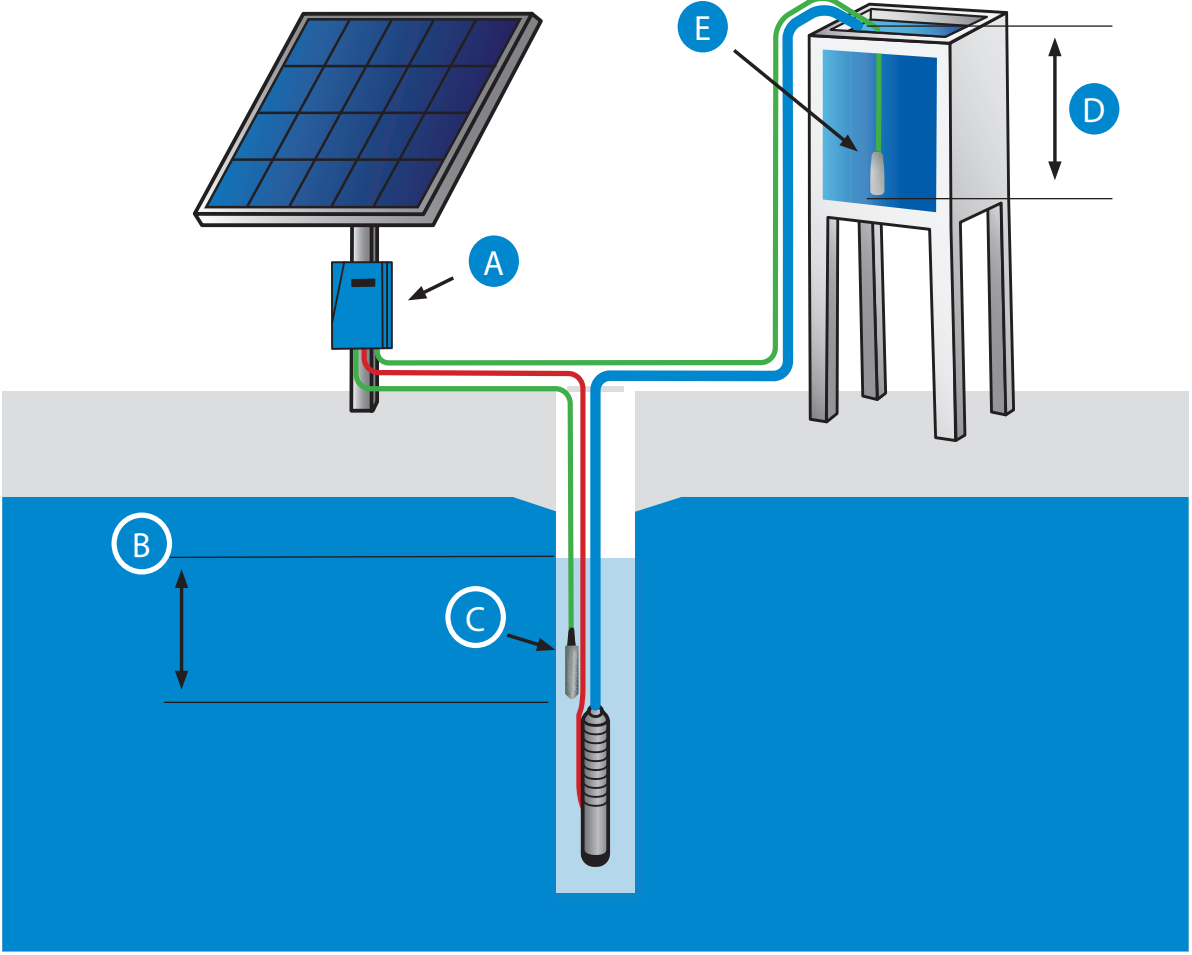
For the example in the well (C) the level from the bottom of the sensor to the top of the water is measured (B).

For the example in the tank (E) the level from the bottom of the sensor to the top of the water in the tank is measured (D).

Using this example the LORENTZ pump controller could be configured to switch off the pump if the value of B reached the predefined shut-off level to ensure the pump did not run dry. The pump could then be switched on when the water level B reached a safe level.

The tank level could also be used to control the pump, switching off the pump when the tank was full and switching the pump back on when the water level drops.

The configuration of the sensors also allows for offsets to be included where sensors are not installed at the level of a pump or in the bottom of a tank. Configuration is also possible for liquids with different density.



- A: LORENTZ Controller
- B: Water level in borehole
- C: Water level sensor
- D: Water level in tank
- E: Water level sensor

Which level measurement solution ?

Is the required level measuring range above 25 m (82 ft) ?

No

Is the submersion range of the sensor above 75 m (246 ft) ?

No

Are the liquids you are measuring chemically aggressive such as oil or leachate ?

No

Do you need to measure levels using a LORENTZ PSk2 pump controller?

No

Choose Water Level Measurement Solution

Yes

Yes

Yes

Yes

Choose Liquid Level Sensor

CONNECTED

All LORENTZ Solar Water Pumping Systems are CONNECTED, this means they are easy to configure, provide rich information to technicians and customers plus they can be managed remotely.

Our CONNECTED features make configuration simple, reduce site visit costs and ensure you are informed of exactly what your life critical solar water pumping system is doing.

With our LORENTZ CONNECTED apps, PumpScanner and LORENTZ Assistant, easily downloadable in the Google Play Store, you can configure the system with just a couple of clicks and swipes on a smart device.

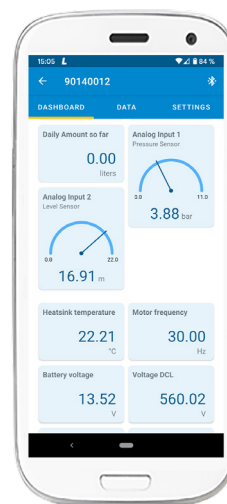
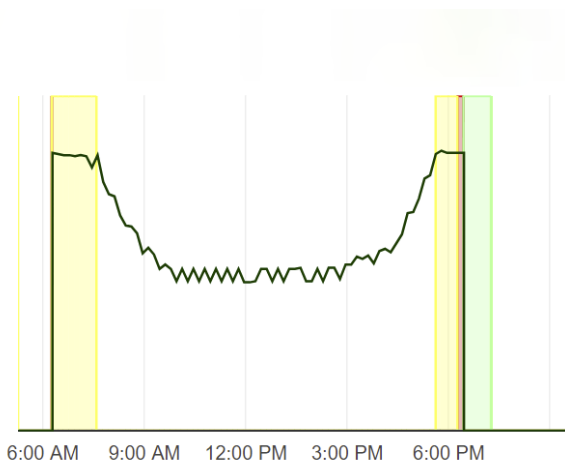
PumpScanner & Assistant

- allow easy configuration of pump system and accessories
- real-time and stored data access to keep track of pumps, and monitor water levels

LORENTZ Global

- remote monitoring service that stores data in the cloud
- upload data directly to Global with LORENTZ Assistant
- manage your pumps and check your water levels from anywhere

Water level development within a 12 hour period



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

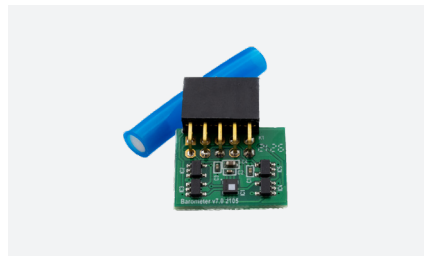
Item number	Description
19-005347	Water Level Measurement Solution, measurement range 25 m / 82 ft cable length 35 m / 115 ft

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



Liquid Level Sensor

The Liquid Level Sensor (LLS) is a highly reliable and accurate submersible pressure sensor optimized for level measurement. This fully sealed, small sized and robust sensor is ideal for level measurements in difficult conditions. This gauge pressure sensor measures the pressure relative to the atmosphere by use of a capillary air pipe incorporated into the cable. This has the advantage that the measurement results are very accurate and not effected by weather or location.

When combined with a LORENTZ pump controller the sensor provides a solution for measuring levels in real time and for logging levels over time. Data is displayed via local connection to the pump controller from LORENTZ PumpScanner or LORENTZ Assistant apps. Remote data views are available on LORENTZ Global.

With LORENTZ pump controllers the sensor data can also be used for full pump control including run dry protection.



Features

- Gauge pressure sensor, pressure measurement relative to atmosphere
- For measuring levels of liquid in a well, tank or other source
- Accurate, robust sensor
- Provides pump dry run protection
- 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)

Requirements

- LORENTZ PS2 controller, LORENTZ PSk2 controller or PS Controller equipped with a data module.
- 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	gauge pressure sensor
Enclosure class	IP68
Sensor housing	stainless steel AISI304
Measuring range (FS)	several variants available: 10 m / 32.8 ft, 20 m / 65.6 ft, 50 m / 164 ft, 100 m / 328 ft
Accuracy	0.5 % FS
Diaphragm material	stainless steel AISI316L
O-ring material	FKM
Overpressure	1.5x FS
Output signal	4-20mA
Power supply	12-28V DC
Cable jacket	PU with capillary tube inside
Cable length	depending on variant 30m, 40m, 60m, 140m customised cable lengths on request
Application temperature	-10 to 80°C / 14 to 176° F
	Meets the requirements for CE

LLS Ordering Information

Dimensions

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

Order information

Item number	Description	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



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.**



LORENTZ Germany
Siebenstücken 24
24558 Henstedt-Ulzburg
Germany

☎ +49 (4193) 8806 700

LORENTZ China
No 34 Jiuan Road
Doudian Town
Fangshan District
102433 Beijing
China

☎ + 86 (10) 6345 5327

LORENTZ US Corp
710 S HWY 84
Slaton, TX 79364
USA

☎ +1 (844) LORENTZ

LORENTZ India Pvt. Ltd.
Netaji Subhash Place
Pitampura110034
New Delhi
India

☎ + 91 (11) 4707 1009

www.lorentz.de