

# Well Measurement Unit

Well survey tool to measure well depth, liquid level, liquid depth and liquid temperature in landfill applications

## Description

The LORENTZ Well Measurement Unit allows for surveying of landfill liquid wells. It is especially useful to ensure that the correct pump unit is specified before installation.

Equipped with an absolute pressure sensor, the unit provides a digital readout of depth of liquid above the sensor and the temperature of the liquid. The cable also provides markers to allow measurement of the “depth to liquid” and depth of well.

## Features

- High-precision liquid level measurement using an absolute pressure sensor, providing readings independent of atmospheric pressure.
- Displays liquid level above the sensor and liquid temperature.
- Protected cable for long-term durability.
- Real-time readings.
- Powered by 4 AA rechargeable batteries (not included outside of USA), with integrated charging port.
- Interchangeable sensor with an easy-to-install plug-in system.
- Cable marked every 5 ft (US version) or every 1 m (Metric version) for easy depth measurement.



Photo may differ from actual product

## Technical data

| Product name       | Well Measurement Unit                  |             |             |             |            |
|--------------------|----------------------------------------|-------------|-------------|-------------|------------|
| Item number        | 19-004802                              | 19-004804   | 19-004806   | 19-004810   | 19-004800  |
| Measurement units  | US units                               | US units    | US units    | US units    | SI units   |
| Max. level         | 66 ft                                  | 66 ft       | 66 ft       | 200 ft      | 20 m       |
| Temperature range  | 50 – 194 °F                            | 32 – 275 °F | 32 – 275 °F | 32 – 275 °F | 10 – 90 °C |
| Product net weight | 25.2 lb                                | 26.1 lb     | 33.5 lb     | 33.5 lb     | 11.4 kg    |
| Product dimensions | 13 x 13 x 17.7 in [330 x 330 x 450 mm] |             |             |             |            |

# Well Measurement Unit

|                     |                       |           |           |           |           |
|---------------------|-----------------------|-----------|-----------|-----------|-----------|
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## Sensor data

|                                    |                         |           |           |           |           |
|------------------------------------|-------------------------|-----------|-----------|-----------|-----------|
| <b>Pressure sensor type</b>        | Absolute (LLTS Modular) |           |           |           |           |
| <b>Item number</b>                 | On order                | 19-004496 | 19-004496 | 19-004497 | On order  |
| <b>Overpressure</b>                | 2 x FS (full scale)     |           |           |           |           |
| <b>Output signal</b>               | 4 - 20 mA               |           |           |           |           |
| <b>Voltage</b>                     | 12 - 28 V DC            |           |           |           |           |
| <b>Accuracy class</b>              | 0.5 % FS                |           |           |           |           |
| <b>Sensor enclosure class</b>      | IP 68                   |           |           |           |           |
| <b>Sensor housing material</b>     | AISI 304                |           |           |           | EN 1.4301 |
| <b>Isolated diaphragm material</b> | AISI 316L               |           |           |           | EN 1.4404 |

## Cable reel

|                        |                         |                                      |        |        |                            |
|------------------------|-------------------------|--------------------------------------|--------|--------|----------------------------|
| Cable length           | 200 ft                  | 200 ft                               | 300 ft | 300 ft | 60 m                       |
| Cable insulation       | Polyurethane (PU)       | FEP (Fluorinated Ethylene Propylene) |        |        | Polyurethane (PU)          |
| Cable (mesh) material  | AISI 304                |                                      |        |        | EN 1.4301                  |
| Cable Marking interval | Every 5 ft (US version) |                                      |        |        | Every 1 m (Metric version) |

## Display

|                                |                                                         |
|--------------------------------|---------------------------------------------------------|
| <b>Display</b>                 | Liquid depth above sensor, liquid temp., battery status |
| <b>Display enclosure class</b> | IP 65                                                   |

## Battery charger specification

|                |                                                                                   |
|----------------|-----------------------------------------------------------------------------------|
| <b>Details</b> | Universal battery charger for NiMH/NiCd battery pack of 2-10 cells (2.4 V - 12 V) |
| <b>Input</b>   | 100 - 240 V AC 50/60 Hz 0.2 A                                                     |
| <b>Output</b>  | 14 V (0.5 -7 A)                                                                   |

## Battery specification required (not supplied with the product)

|                                    |                   |  |  |  |
|------------------------------------|-------------------|--|--|--|
| <b>Quantity</b>                    | 4                 |  |  |  |
| <b>Battery Size - Feature</b>      | AA - Rechargeable |  |  |  |
| <b>Min. battery capacity (mAh)</b> | ≥ 2000 mAh        |  |  |  |
| <b>Battery power type</b>          | NiMH or NiCd      |  |  |  |
| <b>Battery life estimated</b>      | 4 - 5 hours       |  |  |  |



## Preparation

### Rechargeable battery insertion / replacement steps:



**WARNING** - Use only rechargeable batteries. Using alkaline batteries may cause damage if accidentally charged.

- Unscrew the 3 outer screws of the front panel using a PH2 screwdriver.
- Slide and rotate the display casing counterclockwise (untangling the cable).
- Remove the front panel from the drum to access the battery compartment located at the back side of the display housing.
- Open the battery casing using a small PH0 screwdriver and install 4 x AA rechargeable batteries (see technical data table for specifications). Rechargeable batteries are not included.
- Close the battery casing and tighten the screws securely to maintain water tightness.
- Rotate the casing clockwise, secure it back onto the cable drum, and retighten the 3 outer screws.
- Connect the battery charger to the port behind the drum when recharging is required.



# Well Measurement Unit

## Measuring the liquid depth (well level)



**CAUTION** - Do not pull the sensor with excessive force, as this may damage the unit and void the warranty. If the sensor becomes stuck in a well, remove the pump if necessary to prevent damage.

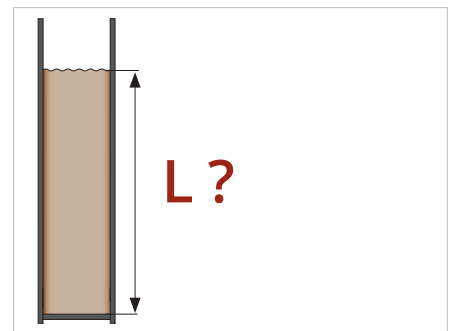


**WARNING** - Do not bend the FEP sensor cable tighter than the minimum bending radius of 3 in [80 mm]. Excessive bending can damage the cable and affect the unit.

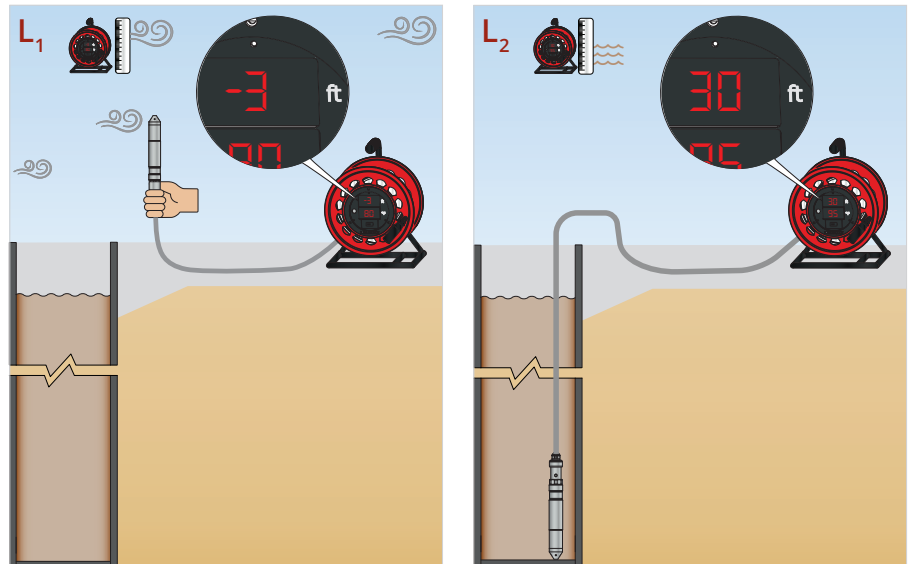
To help prevent excessive bending or sudden pulls on the sensor cable, LORENTZ has designed a WMU pulley system. This accessory ensures proper handling of the sensor cable during measurements and helps protect the unit from damage.



1. Switch on the Well Measurement Unit. The On/Off button is located on the left side of the front panel.
2. Take two measurements (L1 and L2, see the next page) to determine the accurate well level measurement (L):



- **L1 (sensor reading in air):**  
Hold the sensor in the air and note the reading on the display (feet or meters).
- **L2 (sensor reading in the liquid):**  
Submerge the sensor in the liquid to the bottom of the well, and note the reading on the display (feet or meters).



- The liquid depth (L) is obtained by subtracting the sensor reading in air ( $L_1$ ) from the sensor reading submerged in the liquid ( $L_2$ ).

**IMPORTANT** - The Well Measurement Unit may show a negative value when the sensor is in air. Always calculate the liquid level as the following formula. This ensures the correct liquid level, independent of atmospheric pressure or altitude.

$$L = L_2 - L_1$$

$$L = 30 \text{ ft} - (-3 \text{ ft}) = 33 \text{ ft}$$

$$L = 9 \text{ m} - (-1 \text{ m}) = 10 \text{ m}$$

# Well Measurement Unit

## Measuring the static head

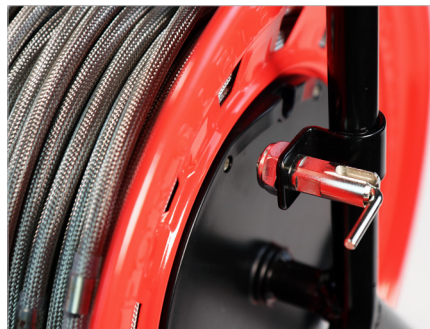
|                    |   |                                                                                                                                |   |                                       |
|--------------------|---|--------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------|
| <b>Static head</b> | = | Cable length<br>Use the cable markings shown in the figure on the right: every 5 ft (US version) or every 1 m (Metric version) | - | Liquid depth measurement (see page 4) |
|--------------------|---|--------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------|



Cable markings  
every 5 ft (US version) or every 1 m (Metric version)

## Measuring temperature

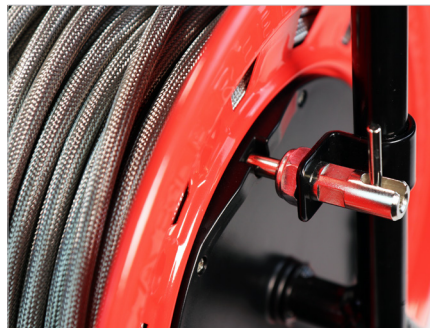
- Keep the sensor submerged until readings stabilize.
- Use the drum locking mechanism (on the back side) to hold the sensor in position during temperature stabilization.



**BATTERY SAVING TIP** - Turn off the Well Measurement Unit during temperature stabilization to conserve battery life.



**CAUTION** - Avoid inaccurate measurements by charging the batteries when the "battery indicator" shows 0% (after approx. 4 – 5 hours).



## Exchanging the sensor

The LLTS sensor features an easy-to-replace plug-in system for convenient exchange if needed.

- Unscrew the existing sensor as shown in the image.
- Take the new sensor and apply one to two drops of Loctite 222.
- Before screwing it in, ensure that the seals are correctly positioned and that the pins of the plug align properly.
- Screw the sensor in tightly, applying a torque of 7.4 – 11 lbf-ft [10 – 15 N·m].



## Order and packaging information

| Item number                         | Product description                                                                    | Packed gross weight |
|-------------------------------------|----------------------------------------------------------------------------------------|---------------------|
| 19-004802                           | Well Measurement Unit, 66ft, 194F, 200ft PU, Mesh                                      | 37.3 lb [16.9 kg]   |
| 19-004804                           | Well Measurement Unit, 66ft, 275F, 200ft FEP, Mesh                                     | 38.1 lb [17.3 kg]   |
| 19-004806                           | Well Measurement Unit, 66ft, 275F, 300ft FEP, Mesh                                     | 45.6 lb [20.7 kg]   |
| 19-004810                           | Well Measurement Unit, 200ft, 275F, 300ft FEP, Mesh                                    | 45.6 lb [20.7 kg]   |
| 19-004800                           | Well Measurement Unit, 20m, 90C, 60m PU, Mesh                                          | 37.3 lb [16.9 kg]   |
| <b>Box content</b>                  | 1 x Well Measurement Unit (mesh reel with LLTS sensor included)<br>1 x Battery charger |                     |
| <b>Packaging dimensions [LxWxH]</b> | 17 x 12 x 22 in [430 x 310 x 560 mm]                                                   |                     |
| <b>Packed volume</b>                | 2.6 ft <sup>3</sup> [0.075 m <sup>3</sup> ]                                            |                     |

