

CLS Water Sensor

Sensor for water presence detection

Manual for Installation and Operation

EN

Photo may differ from actual product



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1 Introduction

Thank you for purchasing a LORENTZ product.

Before you begin - Check the product label to verify that this is the item that you ordered. Also check the product specifications to be sure the product is appropriate for your application.

Read the manuals of pump end, controller and other components used in your system.

2 Storage and Handling

- This LORENTZ product is supplied from the factory in proper packing in which it should remain until it is to be installed.
- Handle the product with care and avoid unnecessary impacts and shocks.
- Prolonged intermediate storage in an environment of high humidity and fluctuating temperatures must be avoided. Moisture condensation may damage metal parts and electronics inside the sensor. Non-compliance will void any warranty. It is recommended storing the parts in a closed and dry room.

3 Operating Conditions

The operating temperature range for use are: -25 °C ... 90 °C / -13 °F ... 194 °F.

4 Declaration of Conformity

We, BERNT LORENTZ GMBH, declare under our sole responsibility that the product:

CLS Water Sensor

to which the declaration relates, is in conformity with the Council Directives on the approximation of the laws of the EC Member States relating to:

- Electromagnetic compatibility (2014/30/EU)
- References of harmonized standards and/or other technical specifications applied:
- EN 55032; 2015+AC:2016+A11:2020
 - EN 55035; 2017+A11:2020
 - EN IEC 61000-3-2; 2019
 - EN 61000-3-3; 2013+A1:2019



Person authorized to compile the technical file and empowered to sign the EC/EU declaration of conformity.

Henstedt-Uitzburg, Germany, 10th November 2021.

STANDARDS

Meets the requirements for CE



5 Safety Instructions

Safe operation of this product depends on its correct transportation, installation, operation and maintenance. Failure to follow these instructions can be dangerous and/or void the warranty.


READ AND FOLLOW ALL INSTRUCTIONS!


Explanation of Warning Symbols


 **WARNING** – Disregard might lead to injury or damage to the installation.

 **CAUTION** – Recommended to avoid dysfunction or premature ageing of the equipment etc.

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

 **WARNING** – To reduce the risk of injury, do not permit children to use this product.

 **WARNING** – To reduce the risk of electric shock, replace damaged cords and cabling immediately.

 **WARNING** – It must be assured that all grounding connections are properly made and that the resistances meet local codes or requirements.

- The manual contains basic instructions which must be observed during installation, operation and maintenance. The manual should be carefully read before installation and start-up by the person in charge of the installation. The manual should also be read by all other technical personnel/ operators and should be available at the installation site at all times.

- **Personnel qualification and training** – All personnel for the operation, maintenance, inspection and installation must be fully qualified to perform that type of job. Responsibility, competence and the supervision of such personnel must be strictly regulated by the user. Should the available personnel be lacking the necessary qualification, they must be trained and instructed accordingly. If necessary, the operator may require the manufacturer/supplier to provide such training. Furthermore the operator/user must make sure that the personnel fully understand the contents of the manual.

- **Dangers of ignoring the safety symbols** – Ignoring the safety directions and symbols may pose a danger to humans as well as to the environment and the equipment itself. Non-observance may void any warranties. Non-observance of safety directions and symbols may for example entail the following: Failure of important functions of the equipment/plant; failure of prescribed methods for maintenance and repair; endangerment of persons through electrical, mechanical and chemical effects; danger to the environment because of leakage of hazardous material; danger of damage to equipment and buildings.

- **Safety-oriented operation** – The safety directions contained in the manual, existing national regulations for the prevention of accidents as well as internal guidelines and safety-regulations for the operator and user must be observed at all times.

- **General safety directions for the operator/user** – If hot or cold equipment parts pose a danger then they must be protected by the operator/user against contact with people. Protective covers for energized parts (e.g. terminal clamps) must not be removed when the equipment is running. All government and local regulations must be observed at all times. Any danger to persons from electrical energy must be excluded by using good installation practices and working to local regulations. (For example VDE in Germany).

- **Safety directions for maintenance, inspection and assembly work** – It is the user's responsibility to make sure that all maintenance, inspection and assembly work is performed exclusively by authorized and qualified experts sufficiently informed through careful perusal of the Operating Instructions. The accident prevention regulations must be observed. All work on the equipment should be done when it is not operational and ideally electrically isolated. Immediately upon completion of the work, all safety and protective equipment must be restored and activated.

- **Unauthorized changes and manufacturing of spare parts** – Any conversion or changes of the equipment may only be undertaken after consulting the manufacturer. Original spare parts and accessories authorized by the manufacturer guarantee operational safety. Using non-authorized parts may void any liability on the part of the manufacturer.

- **Unauthorized operation** – The operational safety of the equipment delivered is only guaranteed if the equipment is used in accordance with the directions contained in this manual. Limits stated in the data sheets may not be exceeded under any circumstances.

- Cited standards and other documentations – DIN 4844 Part 1 Safety marking; Safety symbols W 8, Supplement 13; DIN 4844 Part 1 Safety marking; Safety symbols W 9, Supplement 14.

RETAIN THESE INSTRUCTIONS FOR FUTURE USE!

6 Scope of delivery

Scope of delivery CLS Water Sensor for both metric (millimeters) and U.S. (inches) systems:

Table 1: List of delivery:

Item	Description	Quantity
1	CLS Water Sensor	1 unit
2	PVC Adaptor	1 unit
3	Ring with seal	1 unit
4	Jumper cable wire	1 unit
5	Manual	1 unit

Depending on the material/sizing of the installation pipe to be used, LORENTZ provides accessories that can be ordered separately, for more information please see **section No. 8.2 and 8.3** of this manual.

7 Product Description

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.

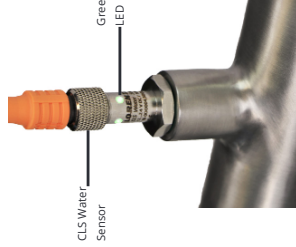
The sensor operates on the principle of capacitance variation which is more reliable than resistive or inductive measurement between open probes.

The LED on the **CLS Water Sensor** lights green when the sensor tip is immersed in water and red when there is no water. (See Figure No. 1)

This manual covers the use of the **CLS water sensor** with PS2 and PSK family controllers.

For more information and technical specification refer to the product datasheet.

Figure 1: Example of **CLS Water Sensor**. The green LED shows the sensor tip is immersed in water:

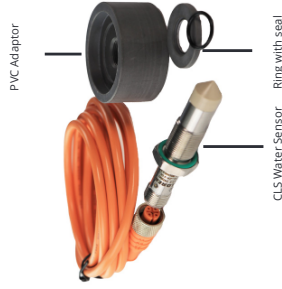


8 Installation of Adaptors

The **CLS Water Sensor** has a M14 x 1 thread. The sensor is connected to pipework via a suitable adaptor. The adaptor should be at the top of the pipe on the suction side of the pump. Depending on the product number, the **CLS Water Sensor** will be supplied with a PVC adaptor in millimeters or inches (please consider the respective product number when ordering). The measuring tip of the **CLS water sensor** must be immersed at least 11 mm (or 7/16") into the pipe. We recommend immersion in the 11mm to 15mm (or 7/16" to 19/32") range as this provides good run dry protection while avoiding unnecessary pump stop / starts.

The sensor is delivered with a PVC adaptor set to allow for correct installation depth on different pipe types.

Figure 2: Order product number: **19-000004** - CLS Water Sensor (Metric units), and **19-000009** - CLS Water Sensor (U.S. units); both include a PVC adaptor and a ring with seal:

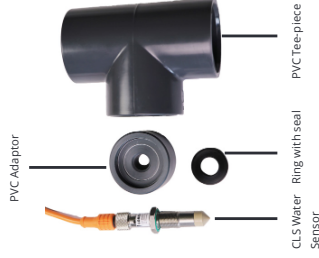


8.1 Installation for PVC pipe less than 140 mm (or 6")

Use a PVC Tee-piece and the **PVC Adaptor** – for more information see section "11. Applications with PVC pipe".

The PVC adaptor and ring with seal are included with **CLS Water Sensor**. The Tee-piece is not included.

Figure 3: Components for installation in PVC pipes less than 140 mm (or 6"):



8.2 Installation for welding on Steel / Stainless steel pipes

The steel or stainless steel adaptor must be welded to the pipe.

Figure 5: Order product number: **19-000006**, Adaptor kit, includes Welding, M14x1, Steel + Stainless Steel. (Order separately when your installation uses steel / stainless steel piping):

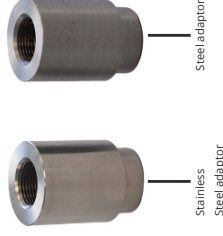


Figure 6: Example of installation of the **CLS Water Sensor** with a stainless steel adaptor welded to the pipe:



Figure 4: Example of installation of the **CLS Water Sensor** with an adaptor on a PVC pipe less than 140 mm (or 6"):



Depending on the pipe size, the adaptor (See Figure No. 11) must be installed in orientation A or B. Orientation A has the wider opening at the top. Orientation B has the narrow opening at the top (See Figure No. 12). The small 3 mm spacer ring (See Figure No. 13) is required for some pipe sizes.

Figure 12: PVC Adaptor, D50 mm (or 2"), M14X1:

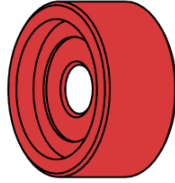


Figure 14: Ring - 3mm, for PVC Adaptor:



Figure 15: CLS Water Sensor, PVC Tee-piece D 75 mm (or 3"), PVC Adaptor with ring in Orientation A:

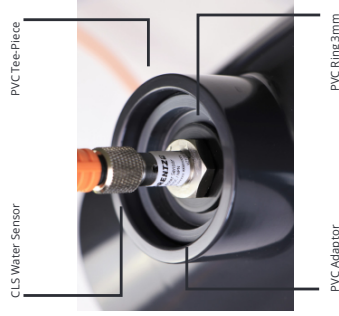
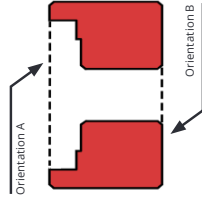


Figure 13: Cross section - PVC Adaptor, D50 mm (or 2"), M14X1:



11.2 Selection and Installation Guide for CLS Water Sensor Components

In this section are the instructions for proper selection and mounting of the CLS water sensor installation components.

In Table No. 4 and 5 are specified the dimensions that the Tee-piece must have, the orientation (A or B) of the adaptor and the cases that must integrate the 3mm ring in function of the diameter of the PVC pipe.

Please consider the information in Tables No. 4 or 5 according to the pipe size, whether in millimeters or inches.

Table 4: Guide for selection and installation of millimeter piping components:

PVC Pipe size (mm)	Tee-piece (mm)	PVC Adapter Orientation	With 3 mm Ring?
50	50 x 50 x 50	B	No
63	63 x 50 x 63	B	Yes
75	75 x 50 x 75	A	Yes
90	90 x 50 x 90	A	Yes
110	110 x 50 x 110	A	No
125	125 x 50 x 125	A	No
140	140 x 50 x 140	A	No

Table 5: Guide for selection and installation of inch piping components:

SCH 40- PVC Tee-piece (inch)	SCH 40- PVC Tee-piece (inch)	PVC Adapter Orientation	With 3 mm Ring?
2"	2" x 2" x 2"	B	No
3"	3" x 3" x 2"	A	Yes
4"	4" x 4" x 2"	A	Yes
5"	5" x 5" x 2"	A	No
6"	6" x 6" x 2"	A	No



CAUTION - Check the PVC parts are correctly orientation and the immersion depth is > 10 mm (or 3/8") before gluing the parts into place.

11.3 Examples

Figure 16: PVC Tee-piece, PVC Adaptor installed in Orientation B, without ring:

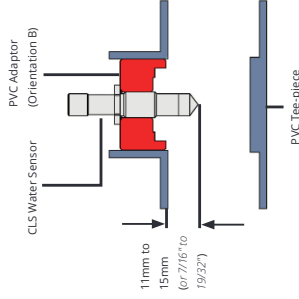


Figure 17: PVC Tee-piece, PVC Adaptor installed in Orientation B, with ring:

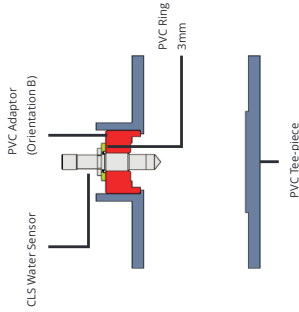
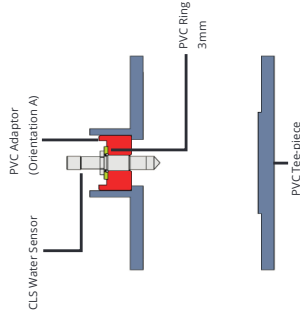


Figure 18: PVC Tee-piece, PVC Adaptor installed in Orientation A, with ring:



CAUTION – Make sure the PVC adaptor is pushed all the way into the Tee-piece when gluing.

12 Troubleshooting

If the pump stops with a "Source Low" led on the controller then use Pumpscammer / LORENTZ Assistant to identify the pump off reason. If the "CLS Water sensor" is the shown then:

- Immerse the sensor tip into water, the CLS Water Sensor LED should indicate green.
- Make sure the pump end is sufficiently primed.
- Make sure there is no air leakage on the suction side of the pump.
- Make sure there are no air locks in the pipe, pay attention to the sensor measuring tip area.
- Make sure the non-return valve at the suction inlet is not clogged or damaged.
- Check the sensor wiring (loose contacts, broken cable, correct wiring).
- If necessary, remove the CLS Water Sensor and perform a simple functionality test using a glass water.
- Turn off the pump to avoid dry running during testing.
- Avoid water accumulation around the sensor. If necessary, drill a hole into the upper Tee-piece area (installation with PVC pipes) to avoid water accumulation.

If the issue is not solved, please contact LORENTZ support.

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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