

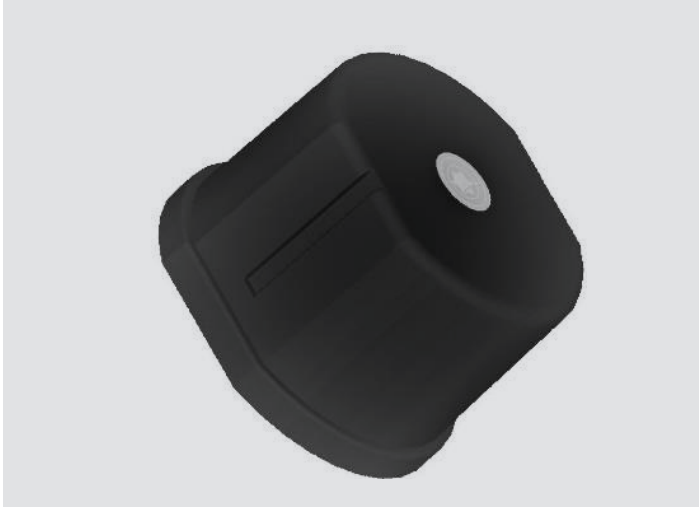
Installation Guide

EXaminer® CUI 310 E NB



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Introduction

Overview

This manual contains information related to installing, configuring, starting up, operating, maintaining, calibrating, and servicing the EXaminer® CUI 310 E NB sensor.

The sensor consists of a sensor housing containing the electronics and internal batteries. In the center of the housing is included a drill bit and an Umbrella Sensor Lock (also called a “parachute” device) for securing the sensor to the cladding on pipes. The sealing gasket to the pipe/cladding comes in 3 variants (dimensions).



IMPORTANT NOTE

The Sensor unit cannot be opened and has no physical wiring terminals. Communication takes place only through LTE and for service reasons also through Bluetooth communication protocol integrated in the electronics of the unit.

Features

The EXaminer® CUI 310 E NB sensor is intended for and specially designed for mounting on cladding on isolation on pipes. Other use cases may apply.

The EXaminer® CUI 310 E NB will sense the relative humidity and temperature and water presence.

Measurements are transmitted over NB-IoT or LTE-M to an IoT-Hub and a cloud solution like MS Azure or similar, as required by the end customer.

Physical Characteristics

As shown in Figure 1 the EXaminer® CUI 310 E NB sensor is one unit. All electrical and electronic parts are integrated in the unit. The sensor is manufactured in UV Stabilized POM.

Ingress protection:
IP67 according to IEC 60529.

Dimensions

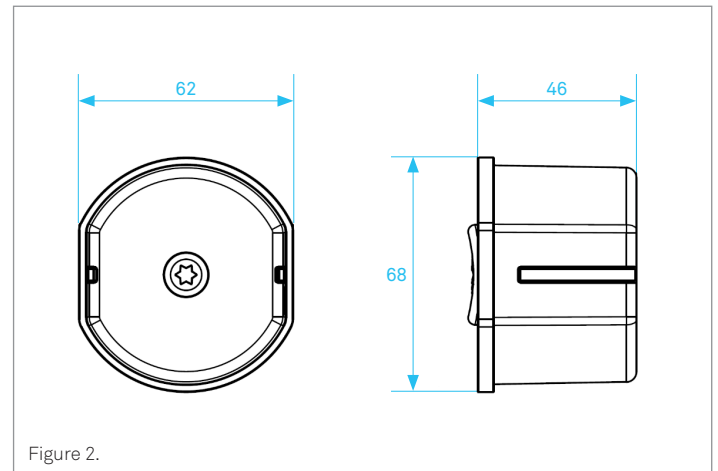


Figure 2.

Electric Characteristics

The sensor is powered from two 3V Lithium Manganese Dioxide batteries in series.

- Expected battery life: 9-11 years (0 - 40 °C, hourly measurements, daily transmissions). Lifetime is influenced positive and negative depending on environmental conditions as well as measurement and transmission intervals.

ATEX/IECEX certification

Reference Standard

EXaminer® CUI 310 E NB sensor is designed in accordance with the following standards.

Standards Document Number	Title
EN IEC 60079-0:2018 IEC 60079-0:2017	Explosive atmospheres, Part 0: Equipment General requirements
EN 60079-11:2012 IEC 60079-11:2011	Explosive atmospheres, Part 11: Equipment protection by intrinsic safety "i"

ATEX/IECEX Approval

IECEX DNV 21.0037X	Ex ia IIC T4 Ga -40 °C ≤ Ta ≤ +80 °C
DNV 21 ATEX 73941X	Ⓜ II 1G Ex ia T4 IIC Ga Tamb -40 °C to +80 °C

DNV GL Presafe AS

2460 Veritasveien 3
N-1363 Høvik
Norway

Label

<p>EXaminer CUI® 310 E NB 17-2131-****/**** EX II 1G Ex ia IIC T4 Ga -40 °C ≤ Ta ≤ +80 °C IECEX DNV 21.0037X ATEX DNV 21 ATEX 73941X</p>	<p>BARTEC 97980 Bad Mergentheim Germany</p>
<p>WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTION</p>	<p>Data Matrix Code</p>
<p>CE 0044 IP 67</p>	<p>Batch No. YYWW XX:XX:XX:XX:XX</p>

Installation and Startup

Installation of the EXaminer® CUI 310 E NB

The EXaminer® CUI 310 E NB sensor is designed for mounting on the cladding on pipes for measurement of temperature, relative humidity and if water is present. The included drill bit has a Torx T30 head.

Mounting the sensor on components with normal operating surface temperature of 80 °C or higher or below -40 °C must be avoided.

Operating in temperatures outside normal operating temperatures (5 °C to 40 °C) may have significant impact on battery lifetime.

Specific conditions for EXaminer® CUI 310 E NB

"X"- Equipment must be mounted on the metallic enclosure and/or contact with earth must be assured.

The sensor is marked:



WARNING

POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTION

Mounting principle



NOTE

Before mounting the sensor ensure that the place selected is not near a cladding joint or other obstructions/irregularities preventing the sensor to rest securely on the cladding. Preferably, the centre of the hole in the cladding should be no closer than 40 mm from such irregularity.

Installation by using a designated jig

The sensor is fitted with an integrated drill bit allowing installation by a special designed installation jig. Once installed correctly in the jig and positioned on the cladding, the jig will apply correct pressure and rotational speed to the sensor drill bit.

Manual installation

Alternatively 12 or 14mm holes can be pre-drilled in the cladding and then by positioning the sensor drill bit center/center in the hole, use a screwdriver or similar to press the drill bit assembly though the hole all the way in until the Umbrella Sensor Lock is engaged on the inside of the cladding.



NOTE

- Please ensure that the sensor is properly attached and seals off the hole.
- The Flat sides on the sensor housing must be positioned as shown on figure 3.

Robotic installation

The mountable sensor is also configured to allow installation by a robot as it only requires a single driving force to mount the sensor at a desired location. The robot is being developed separately.

Drill bit

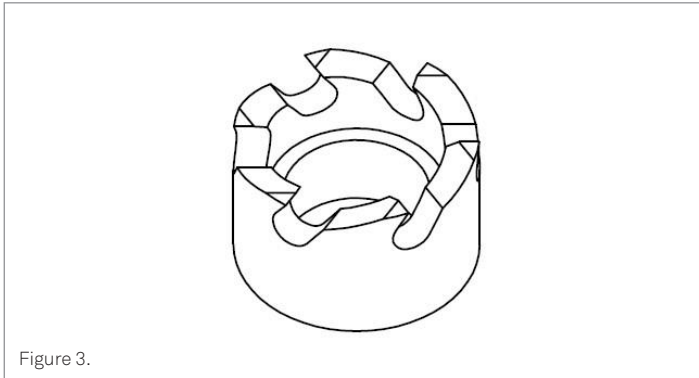


Figure 3.

Umbrella Sensor Lock

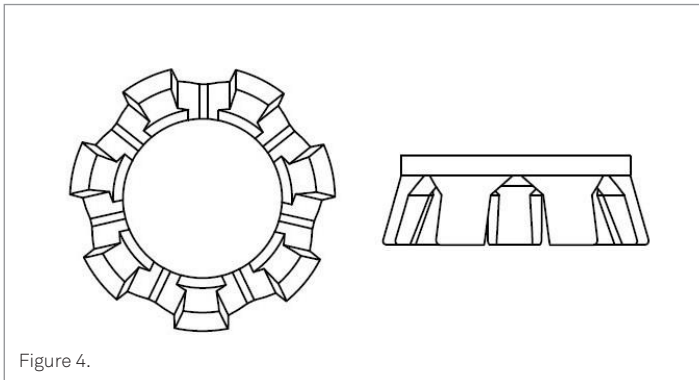


Figure 4.

Sealing

The sensor has 3 optional sealing gaskets for different diameter of the cladding.

This gasket has no safety function. The function is solely to secure that the measurement is performed in the intended atmosphere.

Depending on the curve of the cladding, the sensor can be mounted with Ø300 (black), Ø200 (red) or Ø100 (nature) sealing gaskets. The sealing gasket can only be mounted the correct way (poka-yoke).

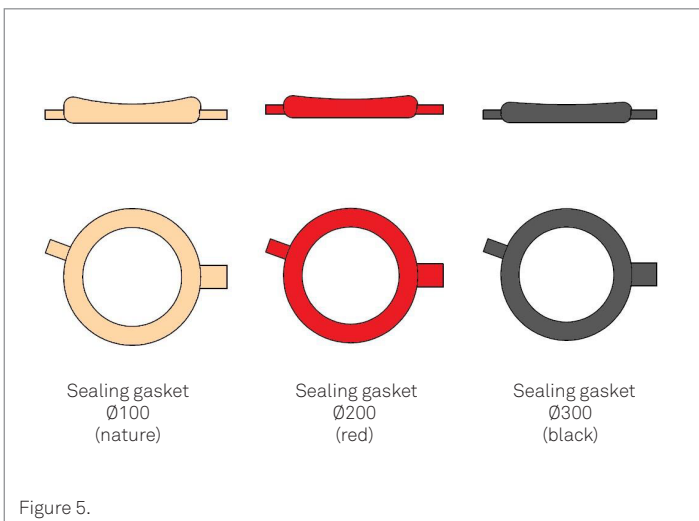


Figure 5.

Mounting of the EXaminer® CUI 310 E NB

Select the appropriate sealing gasket.

The EXaminer® CUI 310 E NB sensor can be mounted as a standalone unit. The sensor includes a drill bit and a Umbrella Sensor Lock mounting device.

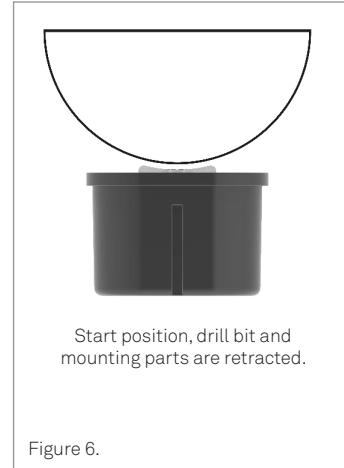


Figure 6.



Figure 7.

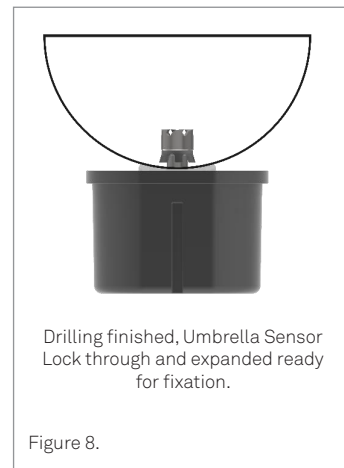


Figure 8.



Figure 9.

Alternative mounting of the EXaminer® CUI 310 E NB

The sensor can also be mounted in a pre-drilled Ø14 hole. This allows more space for the retaining umbrella and alternative parts include an alternative umbrella retainer in stainless steel. The Fusion 310 CUI sensor can also be mounted by replacing the umbrella with a M5 counter nut.

Operation

Overview

This section provides the information and work processes involved in operation of the EXaminer® CUI 310 E NB. The detector itself has no physical operator interface. The sensor can submit data by means of NB-IoT or LTE-M. These data will be transferred to a cloud computing system.

Startup

All electric parts of the Fusion sensor are factory tested, and no field work is necessary.

Maintenance

General

The EXaminer® CUI 310 E NB sensor does not require any specific maintenance at regularly scheduled intervals.

Inspection of the EXaminer® CUI 310 E NB sensor is limited to ensuring that encapsulation, seals, and mounting are tight and secure. There are no moving parts or adjustments and possible, nor can the housing be opened.



NOTE

Any attempts made to open the housing, may void the warranty.

Cleaning

Cleaning is not necessary for the functionality of the sensor. If cleaning is wanted for other reasons, use a damp cloth.

Battery

The internal battery is not replaceable. Battery status is reported by the sensor.

At end-of-life, the Fusion sensor has to be replaced by a new unit. Battery replacement is not possible as the battery and electronics are molded.

Replacing the EXaminer® CUI 310 E NB

In case of a fatal error of a sensor, it has to be replaced by a new unit. Repair or maintenance are not allowed by unauthorized personnel.

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