

CONDURIX

The potentiometric level sensor



Edition: 2016-08
Version: 9
Art. no.: 207134



Table of contents

1	Range of application	1
2	Safety instructions	2
3	Design and function	3
4	Installation	5
4.1	CONDURIX Mono (single rod).....	6
4.2	CONDURIX DU (two rods).....	6
4.3	CONDURIX MA (jacketed pipe)	6
5	Electrical connection	7
6	Parametrisation	9
6.1	Measuring span at the level sensor	9
6.2	Current consumption in failure mode	10
7	Maintenance	11
7.1	Overhaul	11
7.2	Return shipment.....	11
8	Technical Data	12
9	List of figures	13
10	Annex	14
10.1	EC Declaration of Conformity	14
10.2	EC-Type Examination Certificate	15
10.3	Safety instructions	18

© Copyright:

Reproduction and translation are permitted only with the written consent of the FAFNIR GmbH. FAFNIR GmbH reserves the right to make changes to products without prior notice.

1 Range of application

The purpose of the CONDURIX level sensor is to provide continuous level gauging of electrically conductive liquids ($> 1 \mu\text{S}/\text{cm}$). During the measurement no insulating layer must be formed on the probe tube.

The level sensor is available in lengths of 200 to 6,000 mm.

With the "single-rod probe" model (CONDURIX Mono), the inside of the container must have a conductive surface (metal containers / downpipes). The "two-rod probe" model (CONDURIX DU) or "jacketed probe" model (CONDURIX MA) are both compatible with non-conductive containers.

The standard sensors work by outputting the measured fill level as an analogue value in the range 4 to 20 mA.

With the HART option, the configuration and retrieval of measured values by the digital HART protocol are supported, see

- Technical Documentation CONDURIX with HART protocol, art. no. 350044

In conjunction with the standard level sensors, wetted parts are in stainless steel 1.4571 (316Ti), insulators are in PEEK (alternatively in PTFE). On request, the probe tubes are also available in Hastelloy, tantalum, titanium or stainless steel 1.4404 (316L).

2 Safety instructions

The purpose of the CONDURIX level sensor is to provide continuous level gauging of liquids. The level sensor must be used exclusively for this purpose. The manufacturer accepts no liability for any form of damage resulting from improper use.

The level sensor has been developed, manufactured and tested in accordance with the latest good engineering practices and generally accepted safety standards. Nevertheless, hazards may arise from its use. For this reason, the following safety instructions must be observed:

Do not change or modify the level sensor or add any equipment without the prior consent of the manufacturer. The installation, operation and maintenance of the level sensor must be carried out only by expert personnel. Operators, installers and service technicians must observe all applicable safety regulations. This also applies to any local safety and accident prevention regulations which are not stated in this manual.

The safety instructions in this manual are marked as follows:



If these safety instructions are not observed, it may result in the risk of accident or damages to the CONDURIX level sensor.



Useful information designed to ensure continued and correct operation of the CONDURIX level sensor or helpful advice to make your work easier.

3 Design and function

The design of the CONDURIX level sensor is illustrated in Figure 1 with the screw-in unit version as an example. Inside the sensor head (1) of the level sensor and concealed by a cap (2) are the protected terminals and configuration buttons. The electrical connection is established by means of an M16x1.5 screwed cable gland (3) and screw terminals or by an M12 plug-in connection. The potential equalization terminal (4) is required only in conjunction with the CONDURIX Mono version (see section 5 Electrical connection). On the probe neck, there is either a screw-in unit (5) or a flange (not shown) for installing the probe in the container.

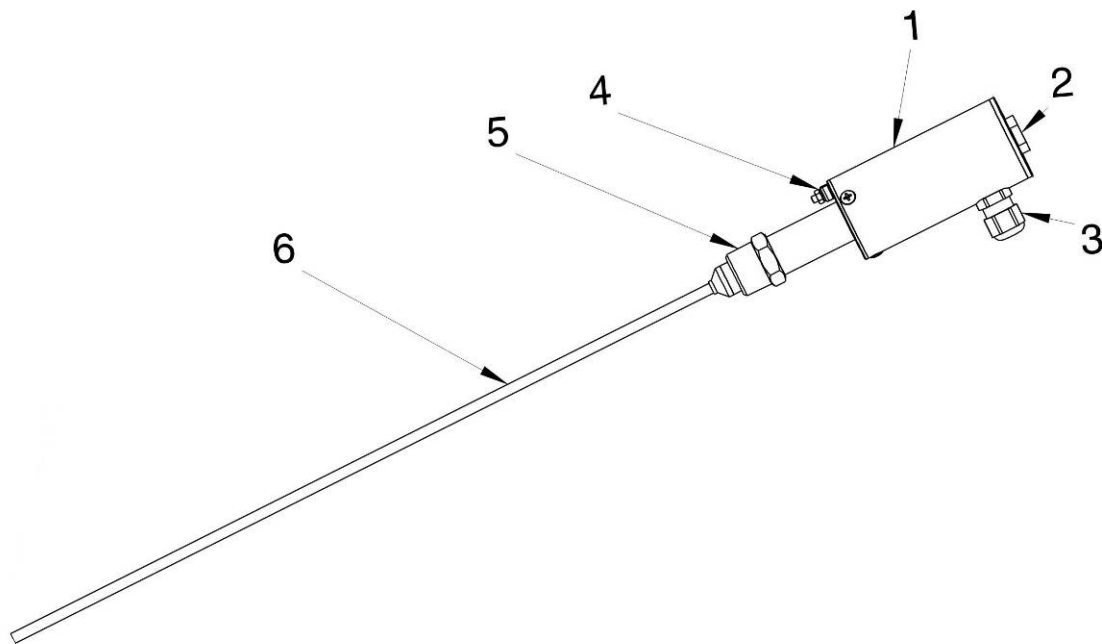


Figure 1: The CONDURIX level sensor

A current pulse generates a linear voltage drop (< 100 mV) on the probe tube (6) electrically insulated from tank potential. The voltages at the bottom end and top end of the tube are measured.

As long as the probe tube is not immersed, it has no path to tank potential. This state is detected by the signal processor, which outputs an "empty" signal. As soon as the probe tube is immersed, the voltage measured at the immersed tube end corresponds to tank potential and the voltage measured at the top end is added to the voltage drop along the non-immersed part of the probe tube.

With the probe tube fully immersed, the voltages measured at the top and bottom ends of the tube are equal in respect of the potential reference point. The region in between is mostly linear, depending on the tank geometry and the distance between the tube end and tank bottom, which makes it possible to calculate the fill level from the ratio of the measured voltages.

The fill level is calculated from the ratio of the measured voltages by a microcontroller. The ratio of the two voltages also enables the orientation of the CONDURIX sensor to be detected, i.e. whether the sensor has been installed from top down or bottom up.

The level sensor is fed from a 2-wire 4 ... 20 mA interface and requires a voltage of between 8 and 30 V. The position of 4 mA and 20 mA points on the probe tube is freely adjustable (see chapter 6, Parametrisation). To prevent galvanic processes from occurring in the liquid, both the discharging and charging currents flow through a galvanically isolating transformer. The alternating voltage produced across the very low-resistance probe tube is in the 100 mV range.

The table below shows the signal characteristics of the sensor as a function of sensor orientation and the measured value output setting (normal/inverted).

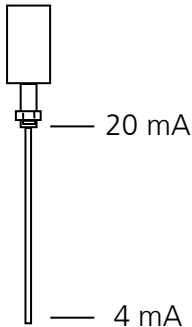
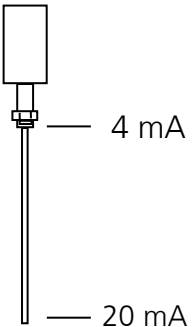
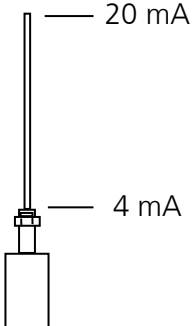
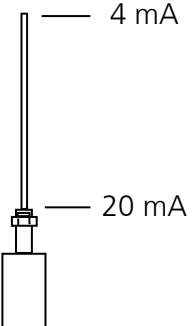
	Measured value output normal		Measured value output inverted	
	Filling level	"Empty" signal	Filling level	"Empty" signal
Installation top down		3.8 mA		20.5 mA
Installation bottom up		3.8 mA		20.5 mA

Figure 2: Measured value output

Installation top down: The zero point is at the probe base
Installation bottom up: The zero point is at the sensor head
Normal measured value output: The 20 mA point is higher than the 4 mA point
Inverted measured value output: The 20 mA point is lower than the 4 mA point

4 Installation



All local safety and accident prevention regulations not expressly referred to herein must be observed.

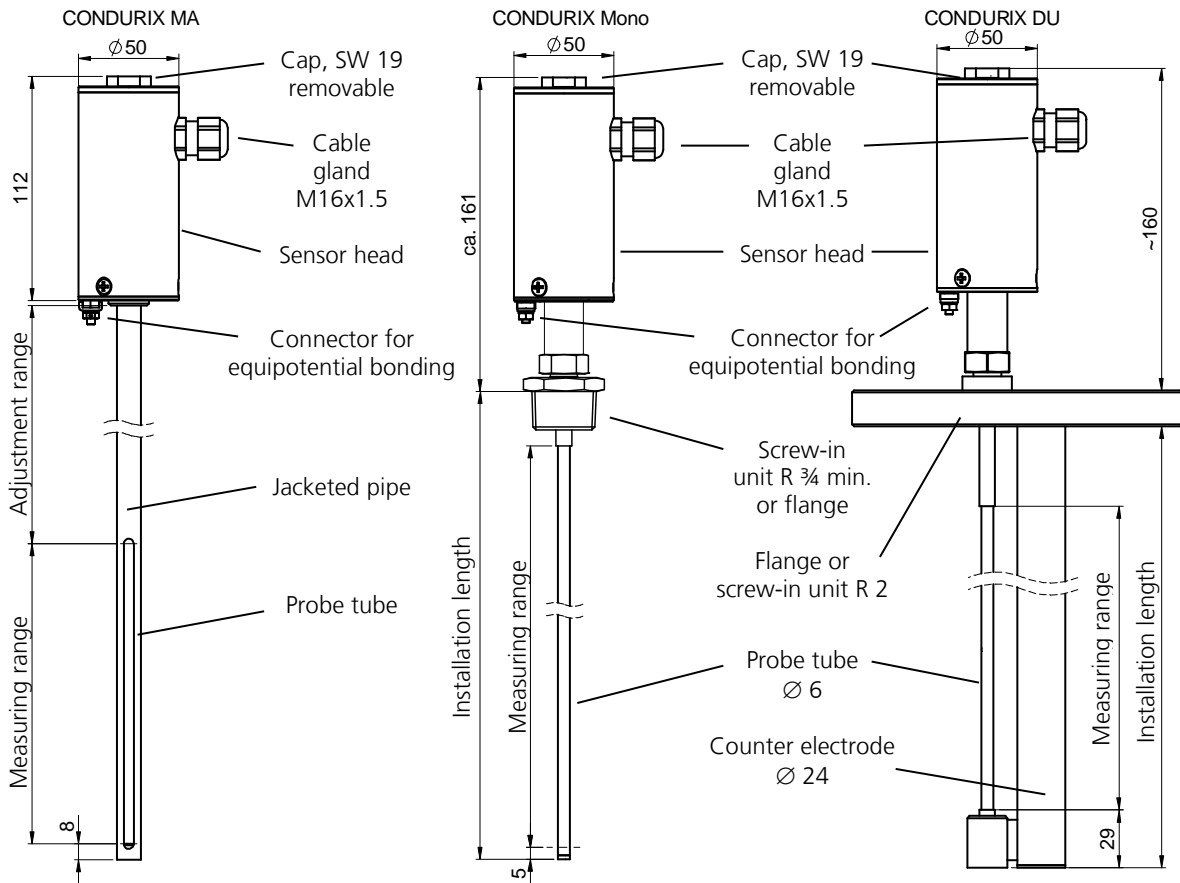


Figure 3: CONDURIX variants



Level gauging with CONDURIX is possible only in electrically conductive liquids.



The level sensor can also be fitted into the tank from underneath. The sensor must be configured accordingly.



CONDURIX Mono: If the probe tube is immersed in the liquid only a short way, the linearity of the measurement is affected by the short distance between the probe tube and reference potential.

4.1 CONDURIX Mono (single rod)

With the single-rod probe, the tank acts as the counter electrode. For this reason, the material on the inside of the tank must be conductive and there must be good electrical contact between the tank and the sensor head. For this purpose, the potential equalization terminal must be connected to the tank.

4.2 CONDURIX DU (two rods)

With the two-rod probe, the second rod acts as the counter electrode. As the distance from reference potential is constant, the measurement result is unaffected by the geometry of the tank. While the second rod also adds to the stability of the mechanical design, this does require a larger process connection for installation.

4.3 CONDURIX MA (jacketed pipe)

With the jacketed probe version, a pipe (coaxial in construction) surrounding the probe tube acts as the counter electrode. As the distance from reference potential is constant, the measurement result is unaffected by the geometry of the tank.

The jacketed pipe also provides a shield against electrical interference and facilitates measurements in otherwise unfavourable measuring conditions.

5 Electrical connection

For the wiring of the level sensor, you need a two-core unshielded cable, which is terminated inside the sensor head of the level sensor.

It is essential that the correct cross section be selected: the supply voltage at the level sensor must not fall below 8 V in the event of maximum current consumption (21.5 mA).

To connect the level sensor (see Figure 4):

- (1) Unscrew cap (1) using an open-ended spanner (SW 19)
- (2) Loosen union nut (2) of screwed cable gland (3)

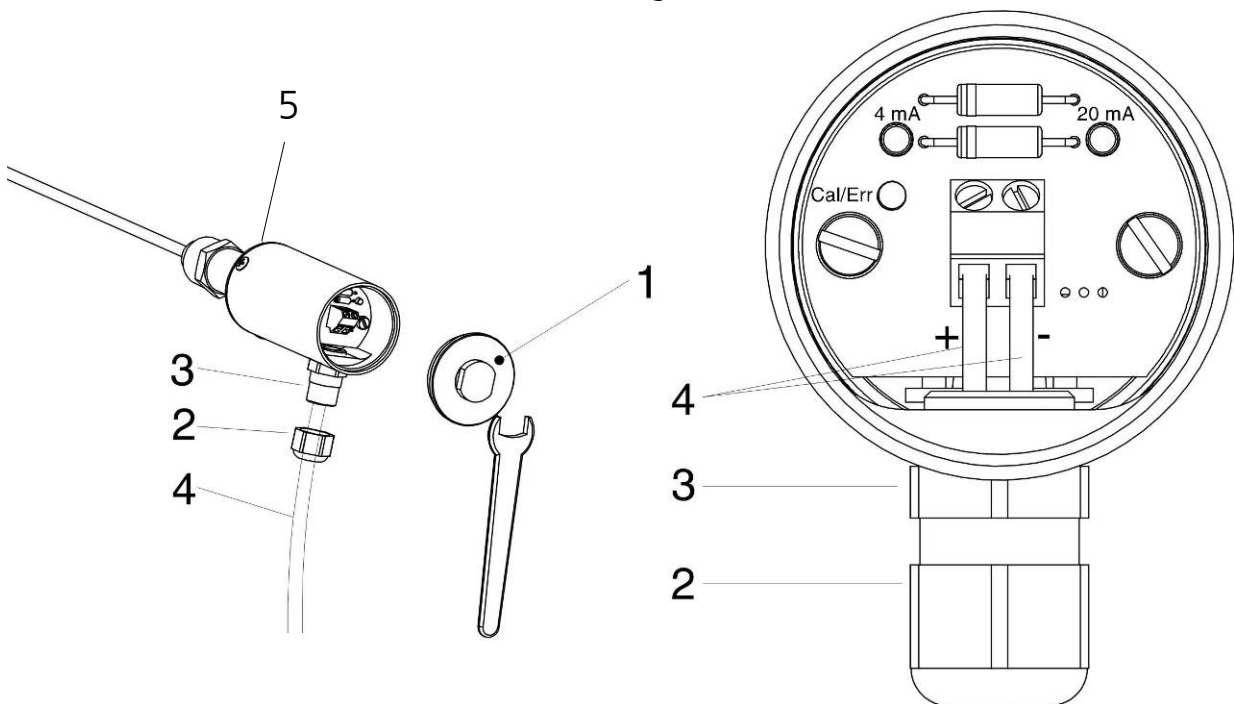


Figure 4: Connecting the CONDURIX level sensor

- (3) Feed two-core cable (4) through union nut (2) and fit screwed cable gland (3) and then retighten the union nut.
- (4) Connect the two-core cable (4) to the screw terminals on the sensor head marked (+) and (-).

Pinout of the M12 plug-in connection:
Pin 1 = brown (+) Pin 3 = blue (-)

- (5) Screw on cap (1)

The connector on the underside of the sensor head (5) can be used for earthing or equipotential bonding.



With the CONDURIX Mono, the potential equalization terminal (5) must be connected to the electrically conductive tank.



Protect the sensor head against the ingress of water. An external cable diameter of 5 to 10 mm ensures reliable sealing of the cable gland. Make sure that the cable gland is screwed tight, and close the cap firmly.



During all installation operations, it must be ensured that the negative terminal of CONDURIX is internally connected to the housing. Therefore, use only a galvanic isolated input of your control system (i.e. PLC) or use an external galvanic separator.

6 Parametrisation

6.1 Measuring span at the level sensor

To enable configuration of the 4 mA and 20 mA points at the CONDURIX level sensor, two buttons and an LED (light emitting diode) are provided near the terminals inside the probe head.

By default, the level sensor is set to maximum span with 4 mA at the probe base and 20 mA at the sensor head. The measuring span is configurable for adaptation to the tank concerned. However, a minimum distance of 10 mm between both points must be observed. If this minimum distance is not observed, the display direction of the level sensor will be reversed automatically. The measured value would then be inverted.

Adjustment of the measuring span (see Figure 5):

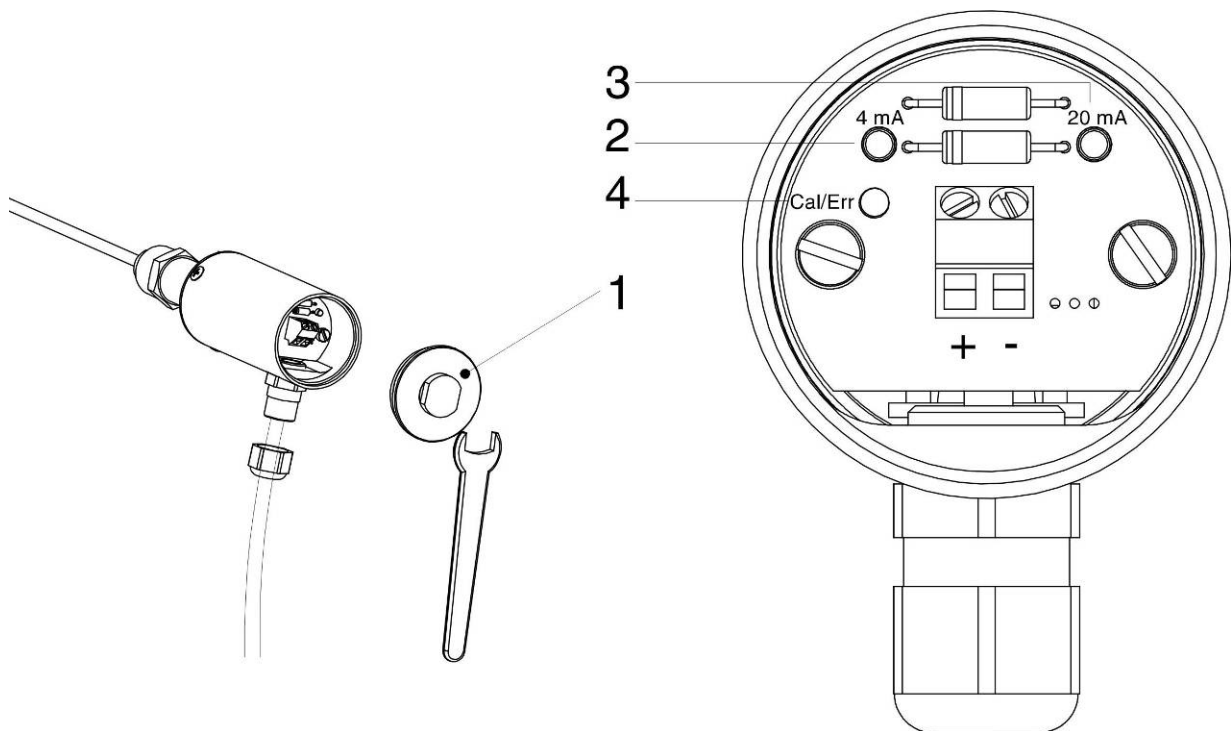


Figure 5: Parametrisation measuring span

- (1) Unscrew cap (1) using an open-ended spanner (SW 19).
- (2a) **Mounting from the top:** Press and hold the 4 mA button (2) for at least 3 seconds.
- (2b) **Mounting from the bottom:** Press and hold the 20 mA button (3) for at least 3 seconds.

The level sensor is now in configuration mode. Green LED (4) "Cal/Err" flashes. The current consumption of the level sensor is 12 mA. If no button is pressed again, the level sensor remains in configuration mode for 20 seconds before reverting to measuring mode and discarding any changes.

In configuration mode, the 4 mA or 20 mA point, or both reference points, can be modified in any order.

To define a reference point while the sensor is in configuration mode

- briefly (1-2 seconds) press "4 mA" button (2) to define a current consumption of 4 mA for the present immersed position of the sensor.
- briefly (1-2 seconds) press "20 mA" button (3) to define a current consumption of 20 mA for the present immersed position of the sensor.

When the "4 mA" button is pressed, the LED goes out for 5 seconds. When the "20 mA" button is pressed, the LED lights up permanently for 5 seconds. The sensor then remains in configuration mode for a further 15 seconds before storing the change and reverting to measuring mode.



The new configuration will not be adopted by the level sensor until it has switched from configuration mode to measuring mode automatically (LED goes out). The level sensor must, therefore, not be disconnected from the power supply until this time.

6.2 Current consumption in failure mode


If a malfunction is preventing the level sensor from detecting levels correctly, the sensor will enter failure mode after a short time. Failure mode signalling conforms to the NAMUR NE43 recommendation. The failure current is set by default to 21.5 mA but this value can also be set to 3.6 mA.

To configure current consumption in failure mode (see Figure 5):


- (1) Unscrew cap (1) using an open-ended spanner.
- (2) Press and hold both the "4 mA" button (2) and "20 mA" button (3) simultaneously for at least 3 seconds.

Green LED (4) "Cal/Err" flashes rapidly. The current consumption of the level sensor is 16 mA. After 5 seconds, the LED stops flashing and indicates the selected failure current consumption for 2.5 seconds. If the LED is on permanently, failure current consumption is 21.5 mA; if the LED turns off, failure current consumption is 3.6 mA. If no button is pressed again, the level sensor remains in failure mode for a further 2.5 seconds before reverting to measuring mode and discarding the change.

- For adjusting the current consumption of 3.6 mA during the dwell time (10 sec) in the fault mode, briefly (1-2 seconds) press the "4 mA" button (2).
- For adjusting the current consumption of 21.5 mA during the dwell time (10 sec) in the fault mode, briefly (1-2 seconds) press the "20 mA" button (3).

 *The new configuration will not be adopted by the level sensor until it has switched from configuration mode to measuring mode automatically (LED goes out). The level sensor must, therefore, not be disconnected from the power supply until this time.*

(3) Screw on the cap (1).

 *If, during operation, the level sensor detects that the level cannot be output correctly due to an insufficient supply voltage, it enters failure mode and sets current consumption to 3.6 mA (regardless of any failure current settings).*


7 Maintenance

7.1 Overhaul

The level sensor is maintenance-free.

7.2 Return shipment

Before returning any FAFNIR equipment the Return Material Authorization (RMA) by the FAFNIR customer care is required. Please contact your account manager or customer service for instructions on how to return goods.

 *The return of FAFNIR equipment is possible only with authorization by the FAFNIR customer care.*

8 Technical Data

Electrical connection	2-wire terminal
Power supply	8 ... 30 V DC
Output signal	4 ... 20 mA
"Empty" signal	3.8 mA or 20.5 mA
Error message	21.5 mA or 3.6 mA
Process Connection	Screw-in unit (standard R 3/4) Flange on request For material, see probe tube
Sensor head	Height above screw-in unit/flange 160 mm Diameter 50 mm Index of protection IP 68 Material: stainless steel Cable diameter 5 ... 10 mm Temperature -40 ... +85 °C
Probe tube	Length 200 ... 6,000 mm Diameter of single rod 6 mm (Standard) Standard material: 1.4571 (316Ti) Optional material: tantalum, titanium, Hastelloy, or 1.4404 (316L) Measuring range freely adjustable (> 10 mm)
Sealing	PEEK (alternatively PTFE)
Measuring accuracy	Linearity better than ± 1 mm or ± 1 %
Digital component	Resolution better than 0.1 %
Analogue component	Temperature drift better than ± 0.01 %/K Resolution better than 0.5 μ A
Process temperature	-40 ... +125 °C
Process pressure	100 bar at 20 °C, 25 bar at 125 °C
Process conductivity	> 1 μ S/cm

9 List of figures

Figure 1: The CONDURIX level sensor	3
Figure 2: Measured value output.....	4
Figure 3: CONDURIX variants	5
Figure 4: Connecting the CONDURIX level sensor.....	7
Figure 5: Parametrisation measuring span	9



**EU-Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de Conformité**

**FAFNIR GmbH
Bahrenfelder Straße 19
22765 Hamburg / Germany**

erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt
declares as manufacturer under sole responsibility that the product
déclare sous sa seule responsabilité en qualité de fabricant que le produit

**Füllstandsensor
Filling Level Sensor
Capteur de Niveau**

CONDURIX ...

den Vorschriften der europäischen Richtlinien
complies with the regulations of the European directives
est conforme aux réglementations des directives européennes suivantes

2011/65/EU	Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten	RoHS
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment	RoHS
2011/65/UE	Limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques	RoHS
2014/30/EU	Elektromagnetische Verträglichkeit	EMV
2014/30/EU	Electromagnetic compatibility	EMC
2014/30/UE	Compatibilité électromagnétique	CEM
2014/34/EU	Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen	ATEX
2014/34/EU	Equipment and protective systems intended for use in potentially explosive atmospheres	ATEX
2014/34/UE	Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles	ATEX

durch die Anwendung folgender harmonisierter Normen entspricht
by applying the harmonised standards
par l'application des normes

RoHS / RoHS / RoHS	EN 50581:2012
EMV / EMC / CEM	EN 61326-1:2013
ATEX / ATEX / ATEX	EN 60079-0:2009
	EN 60079-11:2007
	EN 60079-26:2007

Das Produkt ist bestimmt als Elektro- und Elektronikgerät der RoHS-
The product is determined as electrical and electronic equipment of RoHS
Le produit est déterminés comme des équipements électriques et électroniques de RoHS

Kategorie / Category / Catégorie	Überwachungs- und Kontrollinstrumenten in der Industrie / Industrial Monitoring and Control Instruments / Instruments de contrôle et de surveillance industriels
---	---

Das Produkt entspricht den EMV-Anforderungen
The product complies with the EMC requirements
Le produit est conforme aux exigences CEM

Störaussendung / Emission / Émission	Klasse B / Class B / Classe B
Störfestigkeit / Immunity / D'immunité	Industrielle elektromagnetische Umgebung / Industrial electromagnetic environment / Environnement électromagnétique industriel

Die notifizierte Stelle TÜV NORD CERT GmbH, 0044 hat eine EG-Baumusterprüfung durchgeführt und folgende Bescheinigung ausgestellt
The notified body TÜV NORD CERT GmbH, 0044 performed a EC-type examination and issued the certificate
L'organisme notifié TÜV NORD CERT GmbH, 0044 a effectué examen CE de type et a établi l'attestation

CONDURIX Ex ...	TÜV 11 ATEX 078858
------------------------	---------------------------

Hamburg, 20.04.2016
Ort, Datum / Place, Date / Lieu, Date

Geschäftsführer / Managing Director / Gérant: René Albrecht

Translation



(1) **EC-Type Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 94/9/EC**

(3) **Certificate Number** TÜV 11 ATEX 078858

(4) for the equipment: Level Gauge CONDURIX Ex ...

(5) of the manufacturer: FAFNIR GmbH

(6) Address: Bahrenfelder Straße 19
22765 Hamburg
Germany

Order number: 8000392998

Date of issue: 2011-04-07

(7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, notified body No. 0044 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 11 203 078858.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60 079-0:2009

EN 60079-11:2007

EN 60079-26:2007

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

 **II 1 G Ex ia IIC/IIB T6 Ga resp. II 1/2 G Ex ia IIC/IIB T6 Ga/Gb or
II 1 G Ex ia IIB T6 Ga resp. II 1/2 G Ex ia IIB T6 Ga/Gb**

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, accredited by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body

Schwedt

Hanover office, Am TÜV 1, 30519 Hannover, Fon +49 (0)511 986 1455, Fax +49 (0)511 986 1590

This certificate may only be reproduced without any change, schedule included.
Excerpts or changes shall be allowed by the TÜV NORD CERT GmbH

(13) **SCHEDULE**

(14) **EC-Type Examination Certificate No. TÜV 11 ATEX 078858**

(15) Description of equipment

The Level Gauge CONDURIX Ex ...is used for continuous measuring of liquid detection in explosive hazardous areas.

The permissible ambient temperature ranges as well as the medium temperature in dependence of the temperature class have to be taken from the following tables:

Use as Category 1 apparatus

Temperature class	Ambient temperature range/Medium temperature
T6	-20 °C to +45 °C
T5 to T1	-20 °C to +60 °C

The process pressure of the media has to be from 0.8 bar to 1.1 bar when potentially explosive mist air mixtures exit. If no potential explosive mixtures exist, the device may also be operated outside of this stated range according to the specification of the manufacturer.

Use as Category 1/2 apparatus

Temperature class	Ambient temperature range	Medium temperature
T6	-40 °C to +45 °C	-20 °C to +60 °C
T5	-40 °C to +60 °C	-20 °C to +60 °C
T4 to T1	-40 °C to +85 °C	-20 °C to +60 °C

The process pressure of the media has to be from 0.8 bar to 1.1 bar when potentially explosive mist air mixtures exit. If no potential explosive mixtures exist, the device may also be operated outside of this stated range according to the specification of the manufacturer.

Use as Category 2 apparatus

Temperature class	Ambient temperature range	Medium temperature
T6	-40 °C to +45 °C	-40 °C to +85 °C
T5	-40 °C to +60 °C	-40 °C to +100 °C
T4	-40 °C to +85 °C	-40 °C to +135 °C
T3	-40 °C to +85 °C	-40 °C to +200 °C
T2	-40 °C to +85 °C	-40 °C to +300 °C
T1	-40 °C to +85 °C	-40 °C to +450 °C

Schedule EC-Type Examination Certificate No. TÜV 11 ATEX 078858

Electrical data

Signal- and power circuit
(terminals + and – resp.
M12 plug Pin 1 (+) and Pin 3 (-))

in type of protection “Intrinsic Safety” Ex ia IIC/IIB
only for the connection to a certified intrinsically safe circuit

Maximum values: $U_i = 30 \text{ V}$
 $I_i = 200 \text{ mA}$
 $P_i = 1 \text{ W}$
 $L_i = 30 \text{ } \mu\text{H}$
 $C_i = 5 \text{ nF}$

(16) Test documents are listed in the test report No. 11 203 078858.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

10.3 Safety instructions

Level Gauge CONDURIX Ex ...

Edition: 04.2011

I Range of application

The intrinsically safe equipment CONDURIX Ex ... is used for the continuous measurement of liquid levels. The level sensor operates only in electrically conductive liquids (conductivity $\geq 1 \mu\text{S}/\text{cm}$). If the level sensor is inserted into a tank with non-conducting wall, the sensor must be equipped with a counter electrode, e. g. the CONDURIX Ex MA ...

II Standards

See EC-Type Examination Certificate.

III Instructions for safe ...

III.a ... use

The approval applies to the following types or device versions:

- CONDURIX Ex ... Mono
- CONDURIX Ex ... DU
- CONDURIX Ex ... MA
- CONDURIX Ex E HY
- CONDURIX Ex E ... V
- CONDURIX Ex ... extern
- CONDURIX Ex ... extern Steck
- CONDURIX Ex ... M12

All level sensors CONDURIX Ex ... can be produced with plastic insulation (e. g., PEEK, PTFE or ceramic with O ring seal).

In order to vary the height the version CONDURIX Ex E ... V is provided. The process connection is done via a cutting ring fitting.

With limited mounting space the electronics may be installed in an external enclosure (CONDURIX Ex ... external). The connection to the sensor can be done via a fixed cable or via a connector (e. g., LEMO).

The level sensor CONDURIX Ex ... HART has in addition to the current signal a digital communication capability supported by the HART protocol. This allows a highly flexible programming and operation of the level sensor.

III.b ... mounting

Screw-in unit:

Seal the thread of the screw-in unit with a suitable sealing material, screw it into the existing socket and tighten it.

In the case of installation with a cutting ring fitting, the position of the sensor can no longer be altered after the union nut has been tightened.

Flange:

The probe tube is permanently fixed to the flange, which means that the installation length cannot be altered. Seal the flange with a suitable sealing and fix it with the flange bolts or nuts.

If the filling level sensor is supplied without process connection, the installer is responsible for compliance with the EX requirements.

III.c ... installation

The level sensor has a two-pole electrical connector. Via this two pole connector, the sensor is powered and the level signal is forwarded simultaneously to the parent transducer.

Wiring work may only be performed with the power disconnected. The special EN regulations including EN 60079-14 and local installation regulations must be observed. The wiring from the sensor to the transducer shall be carried out using a two-wire cable (preferably blue). The terminals + and - of the sensor must be connected to the same terminals of the transducer.

The PA terminal is located at the bottom of the probe head and must securely be attached to the tank.




III.d ... putting into service

Before putting into service, all devices must be checked to ensure it is properly connected and installed. The power supply, as well of the upstream devices, must be checked.

III.e ... maintenance, overhaul and repair

The device is maintenance-free. In case of a defect, please send back the level sensor to the manufacturer FAFNIR.

IV Equipment marking

- | | | |
|---|---------------------|---|
| 1 | Manufacturer: | FAFNIR GmbH, Hamburg |
| 2 | Type designation: | CONDURIX Ex ... |
| 3 | Serial number: | Ser. N°: ... |
| 4 | Certificate number: | TÜV 11 ATEX 078858 |
| 5 | Ex marking: | 
II 1 G Ex ia IIC/IIB T6 Ga
II 1/2 G Ex ia IIC/IIB T6 Ga/Gb
Different marking for the level sensor CONDURIX Ex E HY

II 1 G Ex ia IIB T6 Ga
II 1/2 G Ex ia IIB T6 Ga/Gb |
| 6 | Temperature: | Zone 0: -20 °C ... +45 °C (T6), +60 °C (T5, T4)
Zone 0/1: -40 °C ... +45 °C (T6), +60 °C (T5), +85 °C (T4) |
| 7 | CE marking: |  |
| 8 | Electrical Data: | $U_i \leq 30 \text{ V}$
$I_i \leq 200 \text{ mA}$
$P_i \leq 1 \text{ W}$
$C_i \leq 5 \text{ nF}$
$L_i \leq 30 \text{ }\mu\text{H}$ |

V Technical data

The level sensor is connected to a 4 ... 20 mA interface, which provides the auxiliary energy simultaneously. The connection is via the + and - terminals. The sealing of the cable is given by a cable gland or by a conduit system. Also an M12 plug-in connection can be used for the interface, pin 1 (+) and pin 3 (-).

Power supply: $U = 8 \text{ V} \dots 30 \text{ V d.c.}$

The following safety-related values are defined with:

Input voltage: $U_i \leq 30 \text{ V}$
 Input current: $I_i \leq 200 \text{ mA}$
 Input power: $P_i \leq 1 \text{ W}$

The externally effective capacitance and inductance are:

Internal capacitance: $C_i \leq 5 \text{ nF}$
 Internal inductance: $L_i \leq 30 \text{ }\mu\text{H}$

When used in potentially explosive atmospheres, the maximum temperatures depending on the temperature classes and categories can be found in the table.

Temperature class	T_{medium} or $T_{\text{probe tube}}$	T_{medium} or $T_{\text{probe head}}$
Category 1 (level sensor entirely erected in Zone 0)		
T6	-20 °C ... +45 °C	
T5, T4, T3, T2, T1	-20 °C ... +60 °C	
Category 1/2 (probe tube erected in Zone 0, sensor head erected in Zone 1)		
T6	-20 °C ... +60 °C	-40 °C ... +45 °C
T5		-40 °C ... +60 °C
T4, T3, T2, T1		-40 °C ... +85 °C
Category 2 (level sensor entirely erected in Zone 1)		
T6	-40 °C ... +85 °C	-40 °C ... +45 °C
T5	-40 °C ... +100 °C	-40 °C ... +60 °C
T4	-40 °C ... +135 °C	-40 °C ... +85 °C
T3	-40 °C ... +200 °C	
T2	-40 °C ... +300 °C	
T1	-40 °C ... +450 °C	

If the probe tube is operated at higher liquid temperatures as listed in the table, it must be ensured through appropriate measures that at no point of the probe, the temperature (T_{ambient}) will be exceeded according to the relevant temperature class.

General Note: Zone 0 is given only under atmospheric conditions (see EN 60079-0):

Temperature range: -20 °C ... +60 °C
 Pressure range: 0.8 bar to 1.1 bar
 Oxidants: Air (oxygen content approx. 21 %)



FAFNIR GmbH
Schnackenburgallee 149 c
22525 Hamburg, Germany
Tel.: +49 / 40 / 39 82 07-0
Fax: +49 / 40 / 390 63 39
E-mail: info@fafnir.com
Web: www.fafnir.com
