

RECHNER
Food and
Pharma





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Edition January 2020

All specifications are subject to change without notice. (14.01.2020)

DEAR BUSINESS PARTNER!

THANK YOU FOR YOUR INTEREST.

RECHNER SENSORS HAS BEEN DEALING WITH SENSOR TECHNOLOGY FOR MORE THAN 50 YEARS - OUR CORE COMPETENCY..

CAPACITIVE SENSORS DETECT LEVELS OR THEY ARE USED FOR POSITION CONTROL AND ARE AN IMPORTANT PULSE DEVICE FOR THE EXECUTION OF AUTOMATIC PROCESSES.

THEY HELP TO MAKE THE WORK EASIER AND SAFER FOR PEOPLE AND MAKE A MAJOR CONTRIBUTION TO THE QUALITY CONTROL.

THEY HELP OPTIMISE YOUR PRODUCTION AND AUTOMATION PROCESSES AND CAN HELP TO ENSURE YOUR COMPETITIVE EDGE.

JUST IN THE FOOD AND PHARMACEUTICAL INDUSTRY QUALITY CONTROL IS ESSENTIAL. RECHNER SENSORS HAVE A GREAT NUMBER OF LEVEL SENSORS IN THEIR PORTFOLIO WHICH ARE DESIGNED ACCORDING TO THE EHEDG DIRECTIVES. WITH THIS BROCHURE WE OFFER YOU A SMALL OVER-VIEW OF OUR PRODUCT RANGE.

A SMALL OUTLOOK ON THE WORLD OF SENSORS.

PLEASE GET IN CONTACT WITH US IF YOU WISH FOR MORE DETAILED INFORMATION. WE WOULD BE HAPPY TO TALK TO YOU.

YOUR RECHNER Team



**„COMING TOGETHER IS THE BEGINNING,
KEEPING TOGETHER IS PROGRESS,
WORKING TOGETHER IS SUCCESS“**

HENRY FORD



Capacitive Sensors for the Food and Pharmaceutical Industry

Capacitive Sensors (KAS) react to all kind of material that exceed a specific capacitance on approaching the active surface. This change of capacitance is electronically evaluated.

The fact, that it is possible to detect practically all materials with capacitive high performance sensors, no matter if the product is liquid, pasty or if there is a powder or granulate, is the reason why this measuring principle is of such interest for the user. Furthermore there are no mechanical moving parts which can lead to malfunction and therefore the capacitive level measurement is maintenance free. The function is totally independent from the mounting position, soiling or product adhesion. And for instance a minimum bulk density is also not required.

The dielectric constant of the material to be detected is an important parameter for the capacitive measurement. The higher the dielectric constant of a material, the easier it can be detected. Capacitive sensors from RECHNER can detect products with a dielectric constant from just 1,1.

- ✓ Capacitive
- ✓ Level control
- ✓ All products
- ✓ Liquid
- ✓ Paste
- ✓ Granule
- ✓ Powder
- ✓ Maintenance free
- ✓ Any mounting position

Insensitive to soiling or adhesion of the material to be detected.

Dielectric constant (DC) of some materials

Material	DC
Ascorbic acid (Vitamin C)	2,1
Beer brew	25,0
Ethanol	16,2
Glycerol	13,2
Honey	24,0
Cacao beans	1,8
Coffee beans	1,5
Ketchup	25
Corn	3,6
Corn grist	2,1
Flour	2,5
Wine	25,0
Water	80

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Quality Assurance is the Basic Principle

of the Corporate Philosophy of RECHNER Sensors

We practice a comprehensive **quality management according to ISO DIN 9001**. Each individual device we manufacture is finally tested for its perfect function. Every device has an own ID number engraved by laser and under that all production data and test values are recorded in our ERP-system. This guarantees a complete traceability.

Type tests are made at regular intervals. Especially with new developments this guarantees a high reliability of our sensors, even under hard operating conditions.

These tests comprise electrical, mechanical tests, climate and ESD tests, control of the degree of protection and much more.

Our testing laboratory is equipped with state-of-the-art systems, such as computer-controlled test station according to ISO 17025.

We know our client's requirements and take care that there will be no reason for complaint - uncompromising!

Same is valid for the applied component parts. We only use outstanding quality. For instance we use circuit boards with Gold plated circuit tracks and Gold contacts.

Quality Made in Germany

- ✓ 100 % tested
- ✓ Climate tests
- ✓ ESD tests
- ✓ IP degree check
- ✓ Gold-plated tracks
- ✓ Gold-plated contacts
- ✓ Traceability

Our employees are trained at regular intervals and they know what matters.



Capacitive Level Measurement with High Performance Sensors is the New Cool

- ✓ Media optimized
- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ SIP
- ✓ Maintenance free
- ✓ Any mounting direction

Capacitive sensors have no moving parts and are therefore not subject to wear or tear. They are ideal for applications where traditionally Rotary Switches, Vibrating Forks or Mechanical Switches are being used.

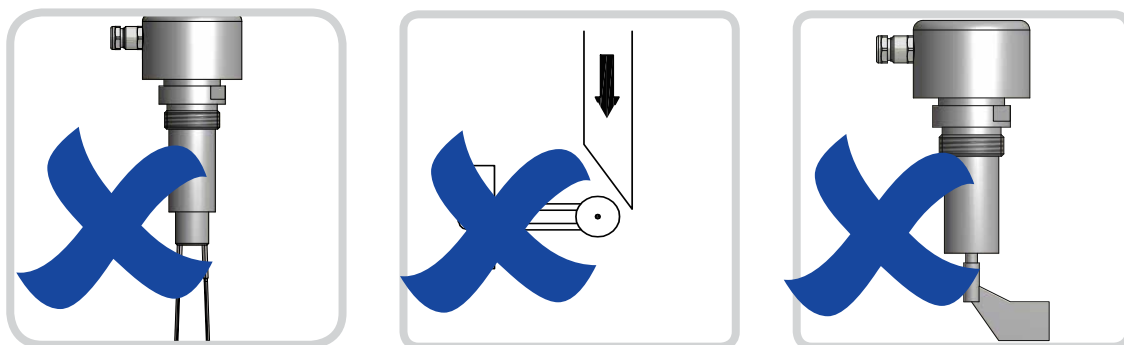
The special cool with capacitive High Performance Sensors is: they are media optimised!

This means capacitive electrodes and circuits are designed in such way, that the detection of a large range of media or materials to be detected can be made with one adjustment and this with the lowest possible sensitivity. Time consuming readjustments can be omitted, the switching safety is increased.

The advantages are obvious: easy installation, reliable level control and at the same time solving the well-known issues of mechanical systems being used today. No more down time due to false detections caused by material build-up, getting stuck between vibrating forks or around rotary switches.

As already mentioned before, with the capacitive measurement the dielectric constant of the material to be detected is an important parameter for achieving the sensor's maximum sensitivity.

The norm indicates as a key figure the definition sensing distance (S_n). With regard to the state-of-the-art technology of level sensors this definition is not ideal anymore. Especially with the level measurement, where the sensor is in touch with the material to be detected this definition appears to be unreasonable. For that reason it is recommended to speak about the sensitivity of the sensor instead. The higher the dielectric constant of a material, the easier it can be detected. A further decisive parameter is the electronic circuit and the assembling of the sensor electrodes.



Capacitive Sensors

Media Optimized Adjustment

The capacitive sensors are equipped with an adjustment option, with which the sensor sensitivity can be adjusted on the product to be detected. Type dependent we offer different adjustment possibilities, with:

- Metal potentiometer - robust and precise (20-turns)
- EasyTeach by Button (with teach button ET))
- EasyTeach by Wire (with teach wire ETW)
- EasyTeach by Magnet (with teach magnet ETM)
- Mount and Go (media optimized pre-adjustment MaG)
- Customized Mount and Go (customized pre-adjustment CMaG)

- ✓ EasyTeach
- ✓ ETM
- ✓ ETW
- ✓ MaG
- ✓ CMaG
- ✓ Maintenance free
- ✓ Bluetooth possible

EASYTEACH - Function from RECHNER Sensors:

Perfect adjustment of the sensor sensitivity. Facilitates the adjustment and prevents errors. Time and cost savings during initial operation.



Capacitive Sensors Non-Flush Mountable = in Contact with the Material

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ SIP



For the level control of liquids or bulk material in most cases the sensors are used in such a way, that the active surface of the sensor comes in direct contact with the material to be detected.

Dependent on the material to be detected specific requirements to the housing designs have to be considered. Especially for that part which is in direct contact with the product.

- Housing material with FDA certificate
- Traceability of the materials according to EG 1935/2004
- Surface quality, that means roughness $Ra \leq 0,8 \mu m$
- Cleanability, CIP, SIP
- Chemical resistance
- Operating temperature up to 100°C, 180°C and 250°C

Materials used by RECHNER Sensors for the housings						
Abbreviation	Material	FDA - No.	Food Contact	Traceability according to EU 1935/2004	Hyg. Design possible	
LCP	Liquid crystal polymer	FDA 21 CFR 176.170(c)	Yes	No	No	
PA	Polyamid 6.6, Glass-fibre reinforced	No	No	No	No	
PC	Polycarbonate	FDA 21 CFR 177.1580	Yes	No	No	
PEEK	Polyether ether ketone	FDA 21 CFR 177.2415	Yes	Yes	Yes	
POM	Polyoxymethylene	No	No	No	No	
PP	Polypropylene	FDA 21 CFR 177.1520	Yes	No	No	
PPO	Polyphenylene oxide	No	No	No	No	
PTFE	Polytetrafluorethylene	FDA 21 CFR 177.1550	Yes	Yes	No	
PVC	Polyvinyl chloride	No	No	No	No	
PVDF	Polyvinylidene fluoride	FDA 21 CFR 177.2510	Yes	No	No	
MS	Brass / chrome-plated or nickel-plated	No	No	No	No	
VAa	Stainless steel material no. 1.4301 (AISI 304)	No	No	No	No	
VAb	Stainless steel material no. 1.4305 (AISI 303)	No	No	No	No	
VAc	Stainless steel material no. 1.4404 (AISI 316L)	FDA-compliant	Yes	No	Yes	

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Capacitive Proximity Sensor Flush Mountable

= Detection at Distance or Through Container Wall

Besides product-touching level control there is the option of level control through a non-metal container wall. The thickness of the container wall should not exceed 4 mm at the place where the measurement is made. Furthermore the flush mountable sensors are often used for the position control of objects. With these kind of applications the sensor is not normally in direct contact with the material to be detected and therefore the demands on the housing designs are lower. Nevertheless demanding housing designs are possible as well, when required:

- Housing material with FDA certificate
- Traceability of the materials according to EG 1935/2004
- Surface quality, that means roughness $Ra \leq 0,8 \mu m$
- Cleanability, CIP, SIP
- Chemical resistance
- Operating temperature up to 100°C

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ SIP



Capacitive Sensors with Semispherical Active Surface - S26

The Highlight in the Food and Pharmaceutical Sector

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ SIP
- ✓ IP67, IP68, IP69K
- ✓ Patented
- ✓ Bluetooth possible



The capacitive S26 sensors have a semispherical active surface as outer sign indicating that this is an extraordinary device for level control. This natural shape facilitates draining of materials and thus enhances the antistatic and anti-stick characteristics of the housing made of PTFE. At the same time the cleanability is improved. In connection with the patented electrode structure which is specially designed for the S26 sensor there is a sensor at your disposal that is very insensitive to soiling or material adhesion. This guarantees a safe and reliable level detection. On demand this sensor is available with built-in Bluetooth function for a wireless data transfer.

For applications with higher demand on the mechanical resistance, e.g. for applications with higher pressure or for the detection of abrasive media, like sugar or salt, we recommend the use of the S26 sensor with a robust PEEK body.



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Capacitive Sensors - ATEX - IECEx For Areas with Risk of Explosion Dust Zone 20 and Gas Zone 0

Rechner sensors have a large range of ATEX certified Sensors.

The Portfolio comprise of NAMUR-Sensors that are operated with additional Ex-Barriers.

Very popular are our so-called „All-in-One“ types, for which no additional ex-barriers are required. These sensors allow the 1:1 exchange of classic non-ATEX sensors. They can be connected directly to electronic control systems.



- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ ATEX Zone 20
- ✓ ATEX Zone 0
- ✓ IECEx Zone 20
- ✓ IECEx Zone 0
- ✓ All in One
- ✓ No Ex-Barrier



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Capacitive Sensor with Semispherical Active Surface - S26 - EHEDG Certified

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ SIP
- ✓ $Ra \leq 0,4 \mu m$

This capacitive sensor is designed for the level control of bulk material and liquids.

The housing material is PEEK with a surface quality of $Ra 0,4 \mu m$. PEEK is mechanically very robust and has very good chemical resistance and can be in contact with food.

The process connection is G 1/2".

Rechner provides as accessories welding sockets for G 1/2" and adapter in common shapes, for instance Triclamp and Varivent N DN 50.



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Capacitive Sensor with Semispherical Active Surface - S26 - for the Level Control of Conductive and/or Adhesive Products.

LevelMaster

These capacitive sensors are designed for the level control of liquids with a dielectric constant ϵ_r (DK) of $\geq 1,25$.

Also this sensor variant focuses on the dielectric constant of the material to be detected and therefore for the measurement it is important that the active surface of the sensor (PEEK tip) is totally covered with the material to be detected.

This sensor is equipped with Rechner's EasyTeach function. Both variants are available:

ET = EasyTeach by button
ETW = EasyTeach by wire)

Thus the sensitivity adjustment on the product to be detected is very easy and user friendly.

The sensors are designed according to the EHEDG directives.

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ SIP
- ✓ Ketchup
- ✓ Fruit concentrate
- ✓ Mayonnaise
- ✓ Vinegar
- ✓ Pastes



Capacitive Sensors Classic Shape



- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP
- ✓ SIP
- ✓ ATEX Zone 20
- ✓ ATEX Zone 0
- ✓ IECEx Zone 20
- ✓ IECEx Zone 0
- ✓ All in One

RECHNER Sensors also has a large range of sensors with classic shape and norm sizes. Flush and non-flush mountable variants which can be used for applications in the food or pharmaceutical Industry.

The portfolio comprises also NAMUR Sensors which are operated with additional ex-barriers.

Very popular are our so-called „All-in-One“ types, for which no additional ex-barriers are required. These sensors allow the 1:1 exchange of classic non-ATEX sensors. They can be connected directly to electronic control systems.



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Capacitive Sensors - Made for You - Customised Design

The variety of possible applications for capacitive sensors results in the customers wishes to make adjustments in shape and function for perfect integration into their plant.

A strength of RECHNER:
Ingenious art - made in Germany .

We are happy when we can fulfil the wishes of our clients.
Our competent team loves it to realize customised types.

RECHNER Sensors is market leader
in capacitive sensor technology

- ✓ Flexible
- ✓ Innovative
- ✓ Creative
- ✓ Competent
- ✓ Customer-oriented



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Capacitive Leak Sensors

- ✓ Reliable Leakage control
- ✓ Compliance with the Water Resource Act (WHG)
- ✓ Models available with both WHG and ATEX certificate

If leaks occur on your plant, the leak sensor detects the liquid that comes into the active area of the sensor and immediately it triggers an alarm.

The leak detection sensors, which are placed in the drip trays serve as a water protection device in accordance with the water protection Act (WHG).

Leakage Control!



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Capacitive Leak Sensors

For non-ATEX applications. Leak detector with PNP output function.

No adjustment required. The adjustment is made from the unit automatically.

Chemically resistant PTFE body.

- Mounting bracket.

- ✓ Reliable Leakage control
- ✓ Protection of the environment
- ✓ Mount-and-Go
- ✓ Mounting bracket

*Leakage-
Control!*



Autoadjustment Function

- Mount and Go

Capacitive Level Probe i-Level

CAPACITIVE LEVEL PROBE FOR THE LEVEL MEASUREMENT OF 4...20 mA OR 0...10 V WITH 2 ADDITIONAL SWITCHING POINTS

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP/SIP
- ✓ Analogue

The switching points can be placed inside or outside of the analogue measuring range.

This rod probe with integrated evaluation electronics is based on our patented 3-electrode measuring principle. The measurement is made between the measuring electrode in the probe and the metal container wall (or additional electrode) The measuring area is defined by means of inactive areas that are placed on its top and at the tip.

Special feature. Empty adjustment.

A defined empty adjustment can be made in which it is not necessary to fill the container up to the probe or even to know the material that should be detected.

It is not necessary to make a manual preselection of the capacity range or of a basic capacity. This is automatically done from the intelligent probe during the initial operation.

Application areas: **Level control of liquids or bulk materials.**

The probes are suitable for the level control of liquids or bulk materials with a dielectric constant (DC) ϵ_r between 2 and 80.

Probe length up to 2000 mm
Linear measurement 4...20 mA or 0...10 V



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Capacitive Level Measuring System i-Level - Excellent in Small Containers

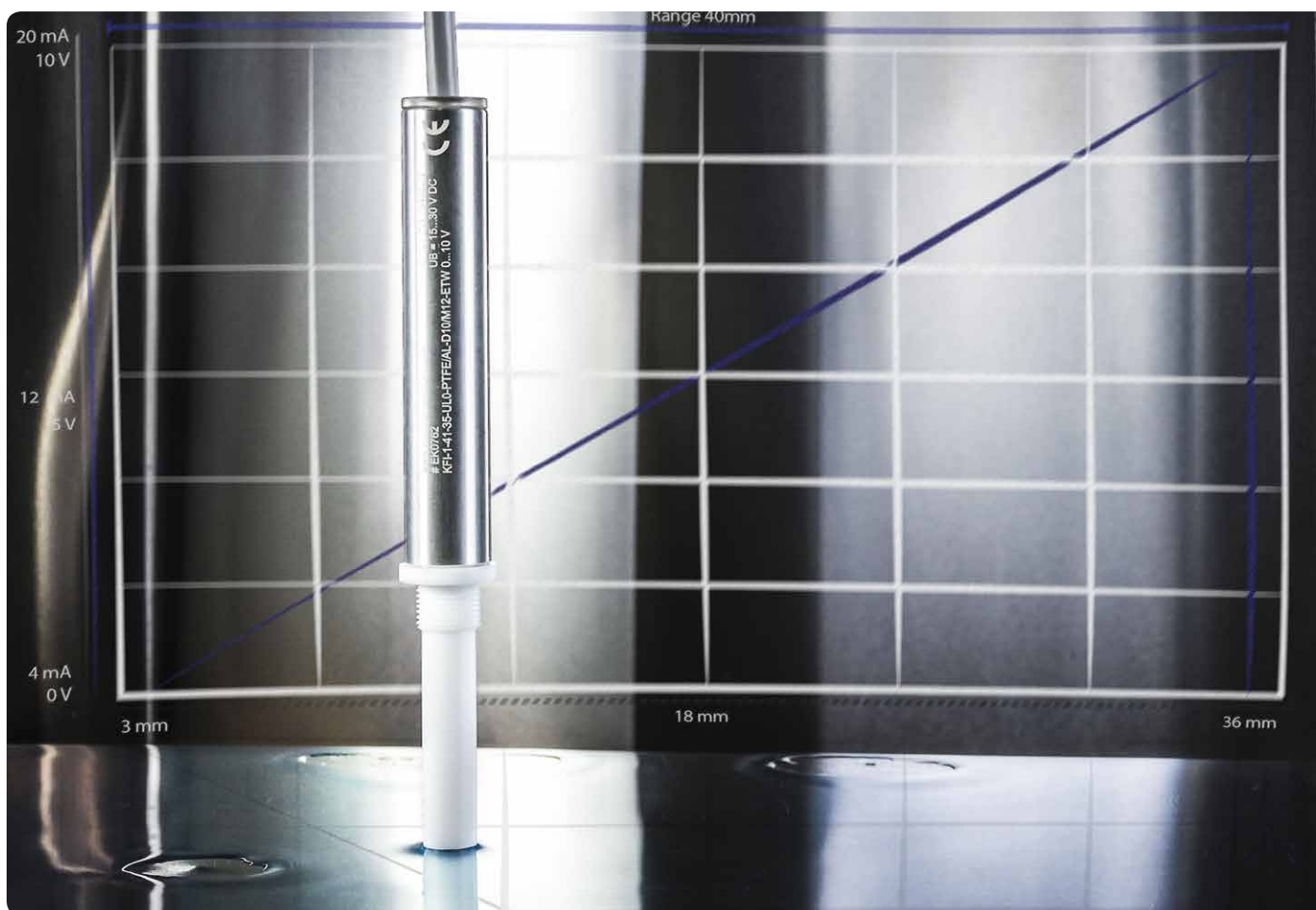
ANALOGUE LEVEL MEASUREMENT 4...20 mA or 0...10 V

Here we introduce a variant of the i-Level probe, that differs from the previous mentioned i-Level probe in the way, that it is designed for level control in very small containers and the adjustment of the measuring area is made by means of the proven EasyTeach by Wire function.

The active area (4...20 mA, 0...10 V) or the available measuring range can be free defined with the EasyTeach by Wire (ETW) function and can be changed at any time.

To give an example: with a probe diameter of 8 or 10 mm an analogue measurement can be made for a range of 3...36 mm.

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP/SiP
- ✓ Analogue
- ✓ Programmable



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Capacitive Level Probe i-Level - Excellent in Small Container

LIMIT VALUE MEASUREMENT FOR 1 OR 2 POINTS

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP/SIP
- ✓ Limit value
- ✓ Programmable

Here we introduce a variant of the i-Level probe, which differs from the previous mentioned i-Level probe in the way, that it is designed for limit value measurement in very small containers and the adjustment of the measuring position is made by means of the proven EasyTeach by Wire function.

Two options are at your disposal, for:

- **1 LIMIT VALUE SWITCHING POINT KFI-51-...**
- **2 LIMIT VALUE SWITCHING POINTS KFI-52-...**

The position of the switching points can be defined anywhere on the available measuring area with the EasyTeach by Wire (ETW) function and can be changed at any time.



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CAPACITIVE LEVEL MEASURING PROBE

WITH EASYTEACH FUNCTION COMPENSATION OF THE DIELECTRIC CONSTANT (DC).

ANALOGUE LEVEL MEASUREMENT 4...20 mA or 0...10 V

With this level measuring probe the evaluation unit is integrated in the connection head. The probe has a reference area for the compensation of the dielectric constant (DC). Thanks to this function the probe will be adjusted with empty container and it detects reliably the level of liquids or bulk material with a dielectric constant (DC) from $\epsilon_r > 1,2$. A

After the single setting on the empty container, the probe automatically adjusts itself to the material to be measured.

- ✓ Cleanability
- ✓ Inert
- ✓ Robust
- ✓ CIP/SIP
- ✓ Limit value
- ✓ Programmable



TRUE LEVEL®

This saves the user a lot of time during the initial operation and is also particularly advantageous for applications with changing products.

- EasyTeach by Membrane Foil (ETF)
- EasyTeach by Wire (ETW)
- Sensitivity adjustment with empty container.
- Easy and quick commissioning
- Compensation of the dielectric constant (DC)
- Max. probe length 2000 mm
- Material of the probe body PTFE, PEEK or GFK
- Process connection stainless steel G1"

Customer proximity guaranteed!

Rechner Sensors has daughter and sister companies in China, Great Britain, Italy, Canada, South Korea and in the U.S..

Furthermore we have representative offices in over 50 countries. For the addresses of our sales partners please visit our website. You will find the addresses under the category contact.

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