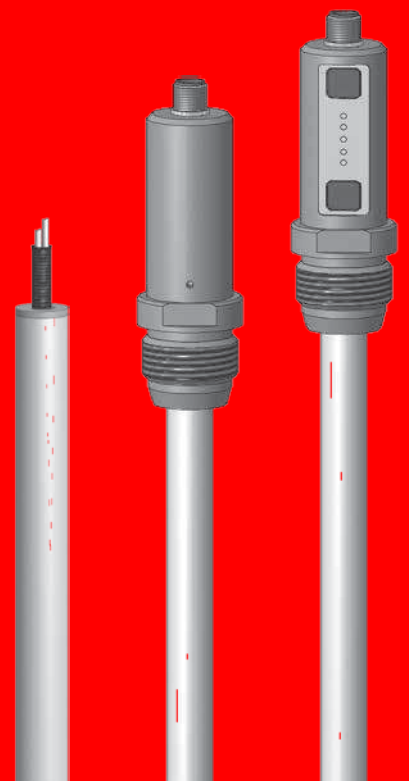


i-LEVEL



**CAPACITIVE
LEVEL MEASURING SYSTEMS**

**RECHNER
SENSORS**



For all transactions the newest version of „General Conditions of Sale and Delivery for Products and Services of the Electrical Industry ZVEI“ shall apply, with the supplementary condition „extended reservation of proprietary rights“, together with the supplements listed on our confirmations and/or invoices. All specifications are subject to change without notice. Reprint, even in parts, only with our consent. © RECHNER Germany 02/2017 GB - Printed in EU, all rights reserved.

Edition February 2017

With publication of this catalogue all former printed catalogues about RECHNER capacitive filling level systems of i-Level series are invalid.

All specifications are subject to change without notice. (02/2017)



**CAPACITIVE FILLING LEVEL
MEASURING SYSTEM**



	Pages
Technology	4
Norms	5
Technical information	6 - 7
Type code	8 - 10
iLevel - Analogue level measurement with 2 programmable switching points	11 - 20
iLevel - Analogue level measurement	21 - 30
iLevel - Binary level measurement with 1 or 2 switching points	31 - 43
iLevel +	44 - 81

All specifications are subject to change without notice. (02/2017)

GENERAL DESCRIPTION

Capacitive Level Probe for level control of liquids and bulk material. .

This rod probe with integrated evaluation electronics is based on our patented 3-electrode measuring principle.

The iLevel Product family consists of the following series:

i-LEVEL

A metal container or a additional electrode serve as counter electrode for the measurement. The measurement is made between the measuring electrode in the probe and the metal container wall (or additional electrode).

= **Very large measuring volume**

| **Metal container or additional electrode required.**

The following variants are available

- | Analogue Level Probe with 2 additional switching points and EasyTeach function (ET) **KFI-1-2...**
- | Analogue Level Probe with EasyTeach by Wire (ETW) **KFI-1-...**
 - with connection head, process connection G1"
 - . without process connection
- | Limit value level probe with 1 switching point and EasyTeach by Wire (ETW) **KFI-51...**
 - with connection head, process connection G1"
 - . without process connection
- | Limit value level probe with 2 switching points and EasyTeach by Wire (ETW) **KFI-52...**
 - with connection head, process connection G1"
 - . without process connection

i-LEVEL⁺

With the Level+ Probe the 3rd electrode is integrated in the probe and therefore it allows the use in a plastic container as well. The measurement is made in the near surrounding of the probe.

= **Large measuring volume.**

| **Also for plastic container.**

The following variants are available

- | Analogue Level Probe with 2 additional switching points and EasyTeach function (ET) **KFW-1-2...**
- | Analogue Level Probe with EasyTeach by Wire (ETW) **KFW-1-...**
 - with connection head, process connection G1"
 - . without process connection
- | Limit value level probe with 1 switching point and EasyTeach by Wire (ETW) **KFW-51...**
 - with connection head, process connection G1"
 - . without process connection
- | Limit value level probe with 2 switching points and EasyTeach by Wire (ETW) **KFW-52...**
 - with connection head, process connection G1"
 - . without process connection

For further technical details please see the different chapters of the product series.

NORMS

The products of Rechner Industrie-Elektronik GmbH are designed and checked in accordance with the latest standards and specifications, DIN - VDE - IEC, for electric and electronic instruments. For new and revised products the newest standards are always used.

CE - Marking

The CE marking represents the manufacturer's confirmation that the identified product conforms to applicable standards and directives throughout Europe. The following regulations apply to the RECHNER products.

2014/30/EU

EMC Directive (EN 60 947-5-2)

2014/35/EU

Low-voltage Directive (compare with VDE 0160, product standard EN 60947-5-2)

RECHNER Industrie-Elektronik GmbH certifies the conformity of its products with each of the applicable directives in a Manufacturer's Declaration.

TECHNICAL INFORMATION

Housing materials

The application of the housing materials used is based on the technical specifications of the material and of the manufacturer. Even though RECHNER Sensors have far-reaching application experience concerning the use of different housing materials, the customer is responsible for checking in each case that the housing material is suitable for the application.

The following housing materials are used:

The following housing materials are used:				
Abbreviation	Material	FDA - No.	Contact with food permitted	Traceability according to EU 1935/2004
ABS	Acrylnitril-Butadien-Styrole	No	No	No
GFK	Glass fibre reinforced plastic	No	No	No
PEEK	Polyetheretherketonee	FDA 21 CFR 177.2415	Yes	Yes
PP	Polypropylene	FDA 21 CFR 177.1520	Yes	No
PTFE	Polytetrafluoroethylenee	FDA 21 CFR 177.1550	Yes	Yes
PVC	Polyvinylchloridee	No	No	No
PVDF	Polyvinylidene fluoridee	FDA 21 CFR 177.2510	Yes	No
AL	Aluminum	No	No	No
MS	Brass / chrome or nickel plated	No	No	No
VAa	Stainless steel VA, material No. 1.4301 (AISI 304)	No	No	No
VAb	Stainless steel VA, material No. 1.4305 (AISI 303)	No	No	No
VAc	Stainless steel VA, material No. 1.4404 (AISI 316L)	FDA konform	Yes	No

Cable

For the standard models COAX-, TRIAX-, PVC- or PUR-cable are used. One has to take into consideration that the cable should not be moved with ambient temperatures below -5°C . PVC is not suitable for use in applications with oil-based liquids or with UV-radiation. PUR is not suitable for continuous contact with water. For special application areas silicone or PTFE cables are available. COAX- and TRIAX-Cable are not designed for continuous movement/flexible use. When routing please consider the bending radius of minimum $10 \times \varnothing$.

All specifications are subject to change without notice. (02/2017)

TECHNICAL INFORMATION

Degree of protection according to IEC 60529

	1. Digit: Protection against solids		2. Digit: Protection against water	
IP	0	No protection	0	No protection against water
IP	1	Protection against solid foreign bodies $\varnothing > 50$ mm	1	Protection against vertical water drops
IP	2	Protection against solid foreign bodies $\varnothing > 12$ mm	2	Protection against diagonal water drops (up to a 15° angle)
IP	3	Protection against solid foreign bodies $\varnothing > 2,5$ mm	3	Protection against spray water
IP	4	Protection against solid foreign bodies $\varnothing > 1$ mm	4	Protection against splashing water
IP	5	Protection against harmful dust deposits, dust protected	5	Protection against water jet
IP	6	Protection against contact with voltage-carrying parts. Protection against penetration of dust	6	Protection against strong water jet
			7	Protection against ingress of water when the equipment is immersed in water, up to 1 m depths and for a period of 30 minutes
			8	Protection against ingress of water when the equipment is immersed in water, under conditions determined from the manufacturer.
			9	Protection against ingress of water during high pressure or steam cleaning under defined conditions

Temperature sensors

Optional additional temperature measuring sensors can be integrated in the probe (PT 100, variants of thermo elements on request).

All specifications are subject to change without notice. (02/2017)

TYPE CODE PROBE

Example: Capacitive level probe for analogue measurement

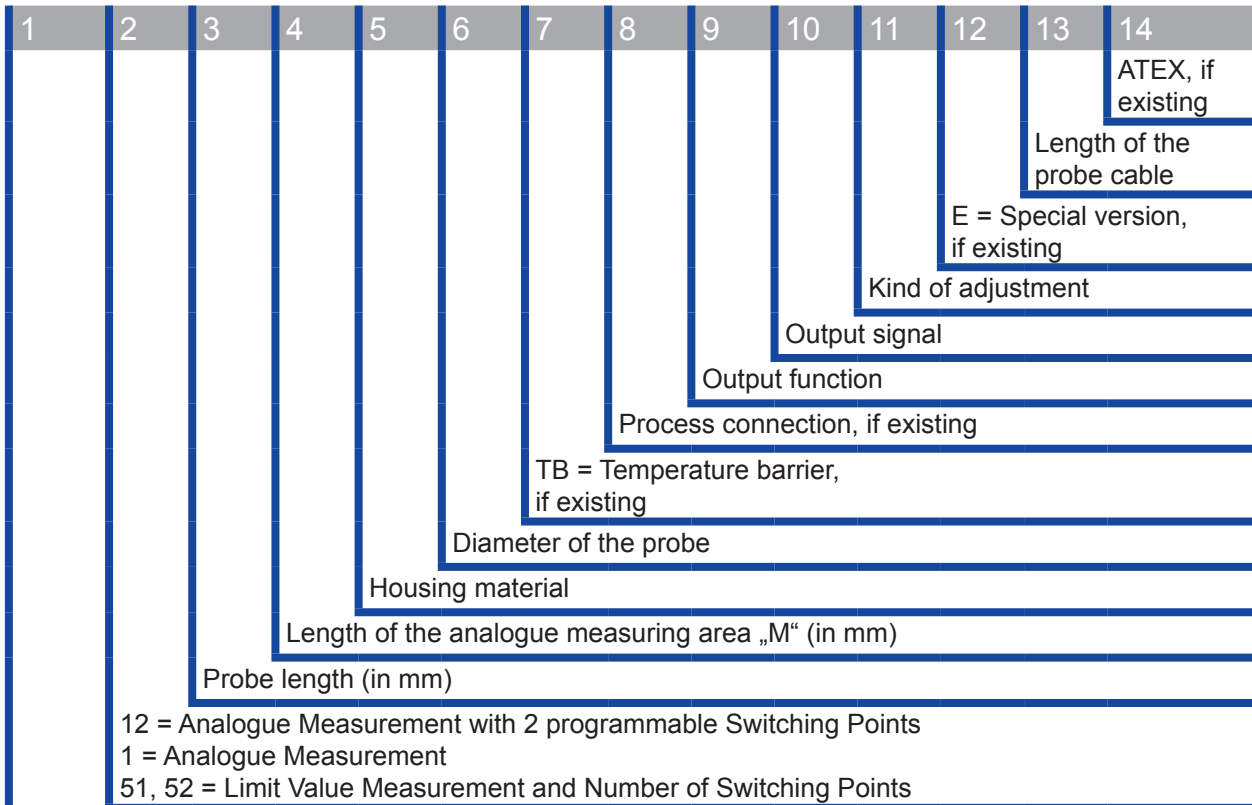
KFI/KFW- 12 - 585 - 500 -GFK/VAa- D16 - TB80 - G1 - IL - 4 - ETF - E - Z02 - 3G3D

Example: Capacitive level probe for analogue measurement

KFI/KFW- 1 - 500 - 370 -GFK/VAa- D16 - TB80 - G1 - UL - 0 - ETW - E - Z02

Example: Capacitive level probe for limit value measurement

KFI/KFW- 52 - 500 - 370 -GFK/VAa- D16 - TB80 - G1 - S - ETW - E - Z02



KFI = Capacitive Filling Level Probe
 KFW = Capacitive Filling Level Probe

Position 1

Value	Measuring principle
KFI	Measurement with external 3. electrode / counter electrode
KFW	Measurement with internal 3. electrode / counter electrode

Position 2

Value	Measuring principle
12	Analogue with 2 programmable switching points
1	Analogue
51	1 Switching Point
52	2 Switching Points

TYPE CODE PROBE

Position 3

Value	Probe length
Material	Max. length
GFK	2000 mm
PTFE	2000 mm
PEEK	400 mm
PVDF	2000 mm
PVC	2000 mm

Position 4

Length of the analogue measuring area „M“ (in mm)

Position 5 housing material

Material	Probe	Housing / Process connection
GFK	Fiberglass reinforced plastic	Fiberglass reinforced plastic
GFK/VAa	Fiberglass reinforced plastic	Stainless steel No. 1.4301 (AISI 304)
GFK/VAb	Fiberglass reinforced plastic	Stainless steel No. 1.4305 (AISI 303)
GFK/VAc	Fiberglass reinforced plastic	Stainless steel No. 1.4404 (AISI 316L)
GFK/AL	Fiberglass reinforced plastic	Aluminum
PEEK	Polyetheretherketone FDA 21 CFR 177.2415	Polyetheretherketone
PEEK/VAa	Polyetheretherketone FDA 21 CFR 177.2415	Stainless steel No. 1.4301 (AISI 304)
PEEK/VAb	Polyetheretherketone FDA 21 CFR 177.2415	Stainless steel No. 1.4305 (AISI 303)
PEEK/VAc	Polyetheretherketone FDA 21 CFR 177.2415	Stainless steel No. 1.4404 (AISI 316L)
PTFE	Polytetrafluoroethylene FDA 21 CFR 177.1550	Polytetrafluoroethylene
PTFE/MS	Polytetrafluoroethylene FDA 21 CFR 177.1550	Brass chrome or nickel
PTFE/VAa	Polytetrafluoroethylen FDA 21 CFR 177.1550	Edelstahl Werkstoff Nr. 1.4301 (AISI 304)
PTFE/VAb	Polytetrafluoroethylen FDA 21 CFR 177.1550	Edelstahl Werkstoff Nr. 1.4305 (AISI 303)
PTFE/VAc	Polytetrafluoroethylen FDA 21 CFR 177.1550	Edelstahl Werkstoff Nr. 1.4404 (AISI 316L)
PTFE/AL	Polytetrafluoroethylene FDA 21 CFR 177.1550	Aluminum
PVC	Polyvinylchloride	Polyvinylchloride
PVDF	Polyvinylidene fluoride	Polyvinylidene fluoride

Position 6

Value	Diameter of the probe
D10	10 mm
D16	16 mm

Position 7

Value	Temperature barrier
No indication	Without temperature barrier
TB50	50 mm
TB80	80 mm
TB100	100 mm

Position 8

Value	Process connection
No indication	No process connection
G1	G1"
G11/2	G1 1/2"
G1/4	G1/4"
G3/4	G3/4"
M12	M12 x 1
M14	M14 x 1
M18	M18 x 1
M20	M20 x 1,5
M30	M30 x 1,5
NPT1	NPT 1"
W	Angle

All specifications are subject to change without notice. (02/2017)

TYPE CODE PROBE

Position 9

Value	Output function
UL	Analogue voltage output
IL	Analogue current output
No indication	PNP / NPN

Position 10

Value	Output signal
0	0...10 V
10	10...0 V
4	4...20 mA
20	20...4 mA
S	Normally open (NO)
Ö	Normally closed (NC)

Position 11

Value	Kind of adjustment
ETW	Easy Teach by Wire
ETF	Keypad

Position 12

Value	Special version
No indication	Standard version
E	Special version

Position 13

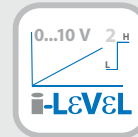
Value	Length of the cable
Z0E	Special version
Z01	1 m
Z02	2 m
Z03	3 m
Z05	5 m
Z10	10 m
Y10	Plug connection

Position 14

Wert	ATEX
3G3D	With manufacturer declaration for ATEX zone 2 (gas) and 22 (Dust)

**CAPACITIVE FILLING
LEVEL MEASURING
SYSTEM**

i-LEVEL



Pages

General description	12 - 13
Adjustment	14
Mounting	15
Applications	16
Capacitive Filling Level Probe KFI-12-...	17 - 20

All specifications are subject to change without notice. (02/2017)

CAPACITIVE LEVEL PROBE FOR ANALOGUE LEVEL MEASUREMENT WITH 2 ADDITIONAL SWITCHING POINTS.

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

Maximum probe length 2000 mm.

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 end. 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.

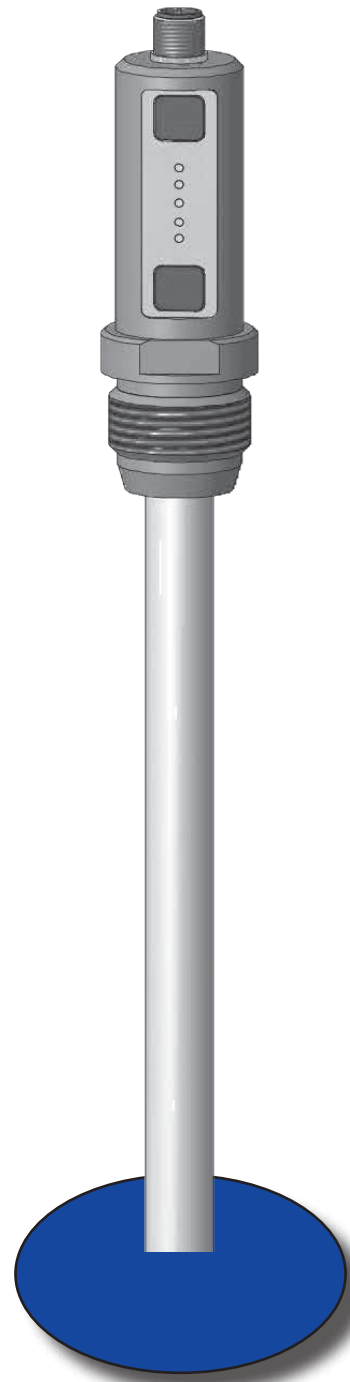
It is not necessary to make a manual pre-selection of the capacity range or of a basic capacity. This is automatically done from the intelligent probe during the initial operation.

**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.

Measurement possible with product temperature of up to 100°C

Even of the compact design of the probe it is possible to realise measurements in high temperature ranges. For this case we offer variants of the level probes with temperature barriers in order to protect the integrated evaluation electronics. The product temperature at the probe rod can be up to 100 provided, that at the same time it is guaranteed that the temperature at the sensor head, where the evaluation electronic is placed do not exceed a value of +70°C.



All specifications are subject to change without notice. (02/2017)

Linear measurement 4...20 m A or 0...10 V

The analogue measurement in a vertically conducting area in a metal container is linear. The use of a jacket tube is not necessary, as is the case for other sensors on the market.

Within the cone of the container the deviation is basically defined by the container geometry that means by the distance between sensor and container wall. Because of the highly increasing or decreasing distance a direct linear measurement is not possible in this area. However the good repeatability of the measurement makes it possible to apply a corrective curve in the control system in order to achieve a linear measuring signal. Alternatively it is also possible to use a jacket tube or another suitable counter electrode.



- Analogue measuring range user selectable within the analogue measuring area
- 2 additional switching points which can be set at any place within or outside of the analogue area
- With intelligent PNP /NPN recognition, normally open or normally closed function programmable
- Analogue outputs available are 0...10 V, 4...20 mA or 0...20 mA
- Supply voltage 18...30 V DC
- EasyTeach Function
On request variants with EasyTeach by wire (ETW) or CANBus interface are available
- On request Unit also available with fixed programming of analogue range and switching points: „Mount and Go“
- Electronic lock - prevents undesired changes of the programmed adjustment

All specifications are subject to change without notice. (02/2017)

EasyTeach Adjustment

The adjustment of the switching points and of the analogue measuring range is made over the keypad on the stainless steel head. This is supported by a variant of the well-poven EasyTeach technology.

The operation of both the buttons, set and mode, is intuitive and very easy. The built-in LED's reflect each adjustment action and display during normal operation, the switching states of the outputs, ore are warning the user in case of a failure. For applications with difficult access to the sensor there are models available which can be adjusted by RECHNER'a EasyTeach by wire (ETW) or direct via CAN-Bus.

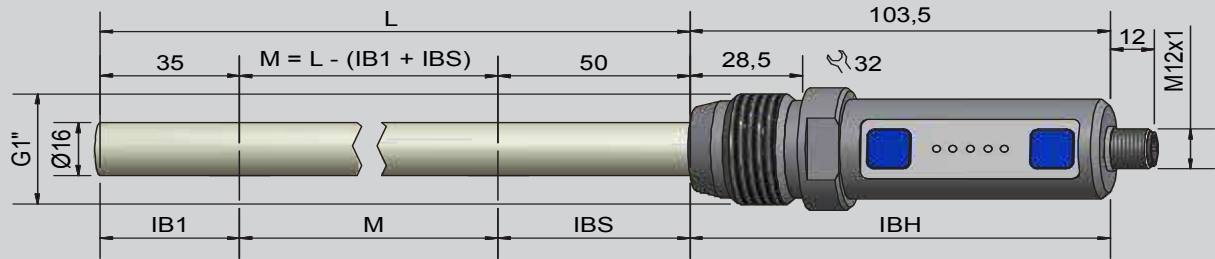
The general interaction of sensor and control system can be checked with the test mode. With the reset function the sensor can be re-adjusted to the factory setting at any time.

- **simple and easy adjustment with EasyTeach function**
- **no additional tool needed**
- **adjustable by hand**
- **LED's provide visual feedback of the outputs.**



MOUNTING

i-LEVEL



The **non-active range (IB1)** is as standard 35 mm.

The **non-active range (IB1)** does not require a constant cross section of the container. Thus it can project into the cone of the container.

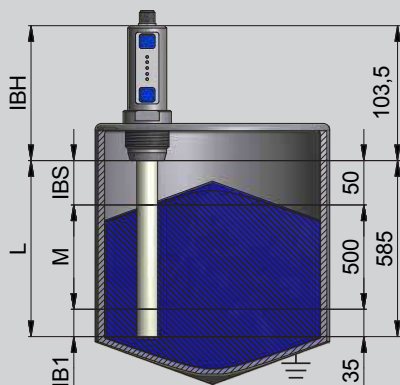
The length of the **analogue Measuring range (M)** is dependent from the ordered total probe length ($L = \text{max. } 2 \text{ m}$).

The **measuring range (M)** of the probe must be mounted in a range of the container without change in diameter of the cross section in order to guarantee the linearity of the analogue output signal. Changes in cross section lead to non-linearity,

The **non-active range TB** (if existing) serves as temperature barrier and must be placed outside of the hot area.

The **non-active range (IB2)** from the measuring range to the top of the container (if metal) should be 1/3 of the container diameter or not less than 50 mm in order to prevent non-linearity.

All specifications are subject to change without notice. (02/2017)



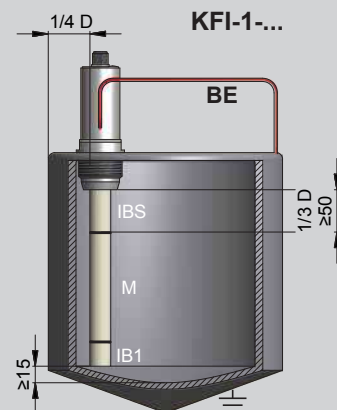
Example calculation for an analogue probe with PTFE body and G1" process connection (VA), Total probe length $L = 585 \text{ mm}$. The IBS is calculated with the min. distance of 50 mm. That results in an available measuring range $M = 500 \text{ mm}$. The calculation is as follows:

$$M = L - (IB1 + IBS)$$

$$M = 585 - (35 + 50)$$

$$M = 500$$

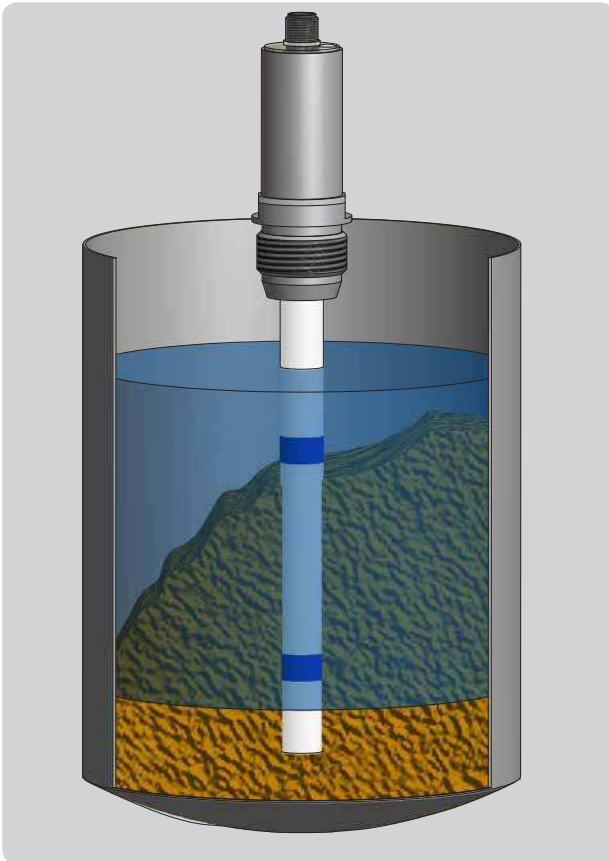
→ KFI-1-2-585-500-IL4-PTFE/VA-G1"-Y10



The probe can be mounted centrally or eccentricly. For a measurement independent of the filling cone, we recommend that the probe be mounted at a 1/4 of the diameter. The minimum distance between the end of the measuring range and the conductive lid of the container is 50 mm.

Connect the BE over the process connection or by means of the rear screw connection.

We use for these analogue level systems our patented three electrode measuring principle. With this measuring principle the container is part of the measurement. The container must be metal or a metal foil has to be fixed on the container (foil length > probe length)). The resulting large measuring volume is the reason why material depositions on the probe surface are irrelevant for the measurement.



On the left you see a schematic drawing of the possible analogue measuring range of a i-Level probe of the KFi-12-... series. You see the maximum possible measuring range between the inactive areas at the probe tip and the top and the measuring field that reaches in this case up to the container wall.

ADJUSTMENT BY MEANS OF THE MEMBRANE KEYPAD AND EASYTEACH

The user adjusts the desired analogue measuring range „Analogue Min. and Analogue Max.“. By means of the membrane keypad additionally 2 further switching points can be adjusted. These 2 switching points can be placed at any position over the possible measuring area, inside or outside of the adjusted analogue measuring range. This means for example, one can make an analogue measurement and with the same probe one can realize an overflow protection and a dry running protection.

These level probes are designed for level control of liquids, pastes and bulk materials with a dielectric constant ϵ_r between 2 and 80.

- Level control of bulk material, pastes, or liquids in storage or dosing systems. These analogue probes are applied in various industries, thanks to the different housing materials that are available, so for instance:

FOOD OR PHARMACEUTICAL INDUSTRY, CHEMICAL INDUSTRY, RECYCLING TECHNOLOGY, AUTOMOTIVE TECHNOLOGY, PACKAGING INDUSTRY, PRINTING TECHNOLOGY.

With the same probe:
Analogue measurement and
overflow protection and
dry running protection.

All specifications are subject to change without notice. (02/2017)



i-LEVEL Capacitive Filling Level Probe - KFI
Analogue current output 4...20 mA
2 programmable limit value switching points

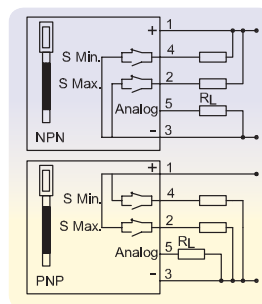
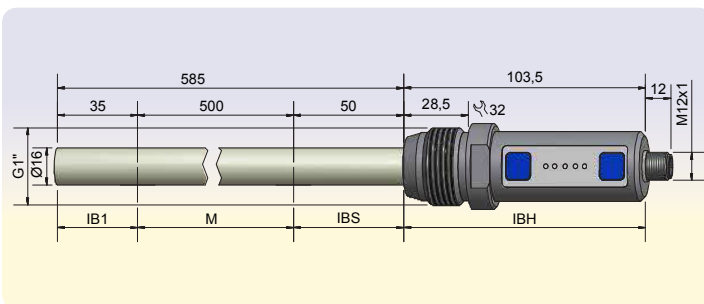
- Integrated evaluation electronics
- Housing material: GFK, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Multifunction probe: Automatic identification of NPN- / PNP function
- Normally open / normally closed function switchable
- Electronic lock



Technical data	
Active zone [mm]	500 mm
Electrical version	5 - pin DC
Output function	Analogue, 2 limit value switching points, Normally open / normally closed switchable
Type	KFI-12-585-500-GFK/VA-16-G1-IL4-ETF-Y10
Art.-No.	KI 0002
Operating voltage (U _B)	18...30 V DC
Permitted residual max.	5 %
Load resistance (R _L)	≤ 400 Ohm
Output current	100 mA
Power consumption (outputs no-load)	0,8 W
Analogue output	4...20 mA
Switching frequency max.	1 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	10 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1
Housing material	VA No. 1.4305 / AISI 303 / polyester
Active zone	GFK
For matching connectors please see our selection of accessories.	

All specifications are subject to change without notice. (02/2017)

*Where applicable



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany



i-LEVEL Capacitive Filling Level Probe - KFI

Analogue current output 4...20 mA

2 programmable limit value switching points

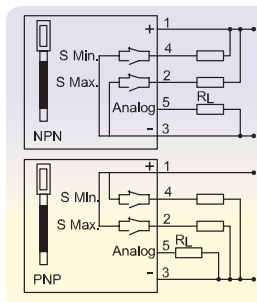
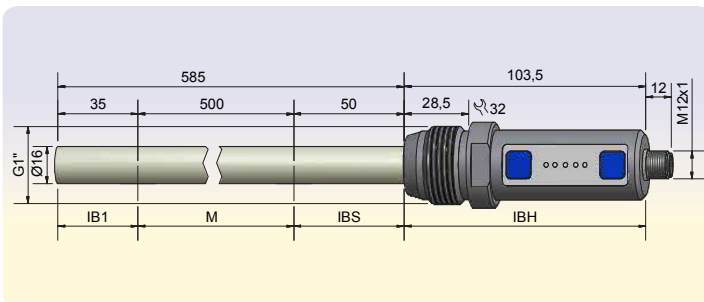
- Integrated evaluation electronics
- Housing material: PTFE, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Multifunction probe: Automatic identification of NPN- / PNP function
- Normally open / normally closed function switchable
- Electronic lock



Technical data

Active zone [mm]	500 mm
Electrical version	5 - pin DC
Output function	Analogue, 2 limit value switching points, Normally open / normally closed switchable
Type	KFI-12-585-500-PTFE/VAb-D16-G1-IL4-ETF-Y10
Art.-No.	KI 0011
Operating voltage (U _B)	18...30 V DC
Permitted residual max.	5 %
Load resistance (R _L)	≤ 400 Ohm
Output current	100 mA
Power consumption (outputs no-load)	0,8 W
Analogue output	4...20 mA
Switching frequency max.	1 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	10 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1
Housing material	VA No. 1.4305 / AISI 303 / polyester
Active zone	PTFE (FDA 21 CFR 177.1550)

For matching connectors please see our selection of accessories.



Other housing materials for the active zone (probe), like PE, GFK, PVDF or PEEK on request.

All specifications are subject to change without notice. (02/2017)



i-LEVEL Capacitive Filling Level Probe - KFI
Analogue voltage output 0...10 V
2 programmable limit value switching points

- Integrated evaluation electronics
- Housing material: GFK, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Multifunction probe: Automatic identification of NPN- / PNP function
- Normally open / normally closed function switchable
- Electronic lock

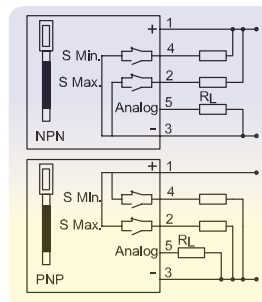
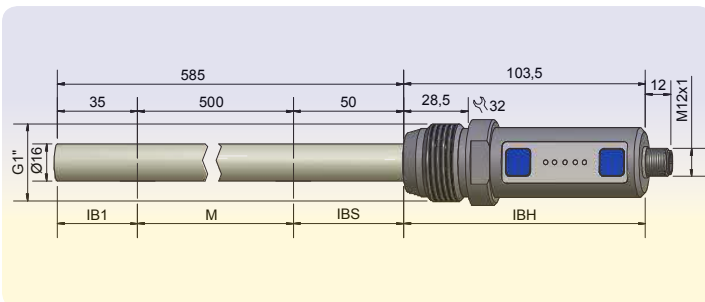


Technical data

Active zone [mm]	500 mm
Electrical version	5 - pin DC
Output function	Analogue, 2 limit value switching points, Normally open / normally closed switchable
Type	KFI-12-585-500-GFK/VaB-D16-G1-UL0-ETF-Y10
Art.-No.	KI 0004
Operating voltage (U _B)	18...30 V DC
Permitted residual max.	5 %
Load resistance (R _L)	≥ 2 K Ohm
Output current	100 mA
Power consumption (outputs no-load)	0,8 W
Analogue output	0...10 V
Switching frequency max.	1 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	10 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1
Housing material	VA No. 1.4305 / AISI 303 / polyester
Active zone	GFK
For matching connectors please see our selection of accessories.	

All specifications are subject to change without notice. (02/2017)

*Where applicable



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

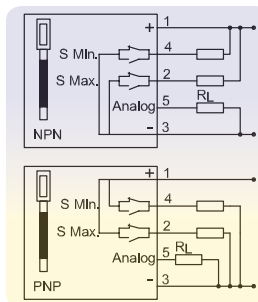
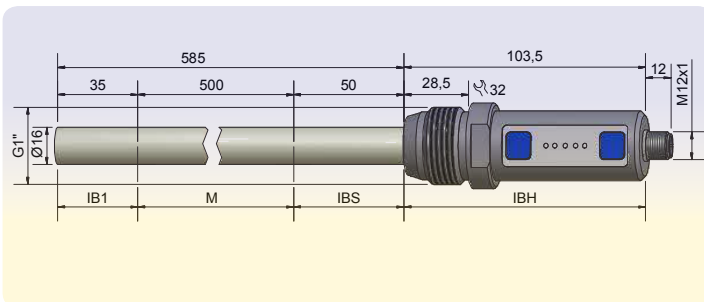


L&VEL Capacitive Filling Level Probe - KFI
Analogue voltage output 0...10 V
2 programmable limit value switching points

- Integrated evaluation electronics
- Housing material: PTFE, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Multifunction probe: Automatic identification of NPN- / PNP function
- Normally open / normally closed function switchable
- Electronic lock



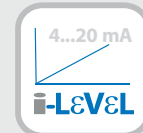
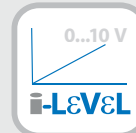
Technical data	
Active zone [mm]	500 mm
Electrical version	5 - pin DC
Output function	Analogue, 2 limit value switching points, Normally open / normally closed switchable
Typ	KFI-12-585-500-PTFE/VA b-D16-G1-UL0-ETF-Y10
Art.-Nr.	KI 0015
Operating voltage (U _B)	18...30 V DC
Permitted residual max.	5 %
Load resistance (R _L)	≥ 2 K Ohm
Output current	100 mA
Power consumption (outputs no-load)	0,8 W
Analogue output	0...10 V
Switching frequency max.	1 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	1 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1
Housing material	VA No. 1.4305 / AISI 303 / polyester
Active zone	PTFE (FDA 21 CFR 177.1550)
Passende Steckverbinder finden Sie in unserem Zubehörprogramm.	



All specifications are subject to change without notice. (02/2017)

**CAPACITIVE FILLING
LEVEL MEASURING
SYSTEM**

i-LEVEL



Pages

General description	22 - 23
Adjustment	23
Mounting	24
Applications	25
Capacitive Filling Level Probe KFI-1-...	26 - 30

All specifications are subject to change without notice. (02/2017)

CAPACITIVE LEVEL PROBE FOR ANALOGUE MEASUREMENT

In this section we describe variants of the i-Level probe which are designed for the analogue level measurement. The adjustment of the measuring area is made by RECHNER's EasyTeach by Wire (ETW).

**Analogue Measurement: 4...20 mA, 20...4 mA,
0...10 V oder 10...0 V**

Maximum probe length 2000 mm.

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 end. 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.

**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.

Measurement possible with product temperature of up to 100°C

Even of the compact design of the probe it is possible to realise measurements in high temperature ranges. For this case we offer variants of the level probes with temperature barriers in order to protect the integrated evaluation electronics. The product temperature at the probe rod can be up to 100 provided, that at the same time it is guaranteed that the temperature at the sensor head, where the evaluation electronic is placed do not exceed a value of +70°C.

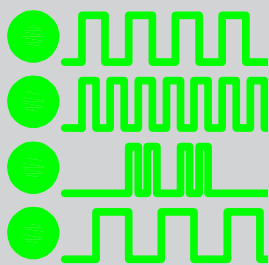


All specifications are subject to change without notice. (02/2017)



- Analogue measuring range user selectable within the analogue measuring area
- With intelligent PNP /NPN recognition
- Analogue outputs available are 0...10 V, 4...20 mA or 0...20 mA
- Supply voltage 18...30 V DC
- EasyTeach Function

Adjustment



EasyTeach Adjustment:

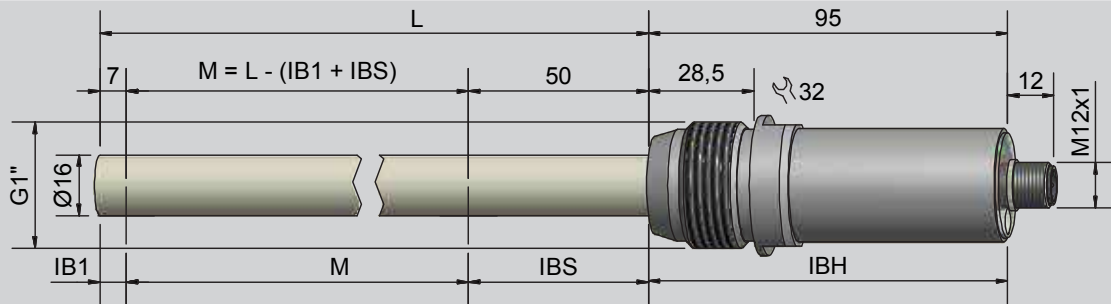
The adjustment of the analogue measuring area is made by means of the teach wire. This is supported by a variant of the well-known EasyTeach technology.

The Adjustment is made by disconnection of the ETW-wire from the supply voltage (+) at the desired menu point.

The LED display is an adjustment help with its flashing sequences for each menu point.

The general interaction of sensor and control system can be checked with the test mode. With the reset function the sensor can be re-adjusted to the factory setting at any time.

MOUNTING



The **inactive area (IB1)** is 7 mm as standard.

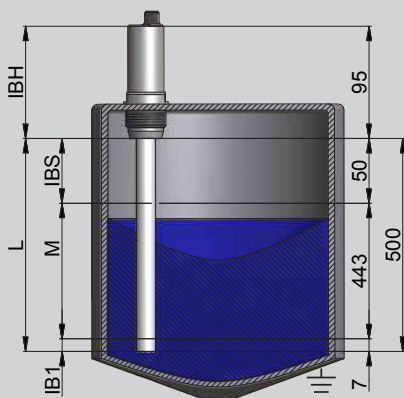
The length of the **analogue Measuring range (M)** is dependent from the ordered total probe length ($L = \text{max. } 2 \text{ m}$).

The **measuring range (M)** of the probe must be mounted in a range of the container without change in diameter of the cross section in order to guarantee the linearity of the analogue output signal. Changes in cross section lead to non-linearity,

The **non-active range TB** (if existing) serves as temperature barrier and must be placed outside of the hot area.

The **non-active range (IB2)** from the measuring range to the top of the container (if metal) should be 1/3 of the container diameter or not less than 50 mm in order to prevent non-linearity

The non-active range **IBH** serves for mounting of the probe.



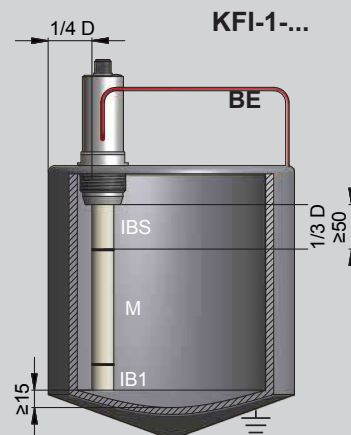
Example calculation for an analogue probe with PTFE body and G1" process connection (VA), Total probe length $L = 500 \text{ mm}$. The IBS is calculated with the min. distance of 50 mm. That results in an available measuring range $M = 443 \text{ mm}$. The calculation is as follows:

$$M = L - (IB1 + IBS)$$

$$M = 500 - (7 + 50)$$

$$M = 443$$

→ KFI-1-500-443-IL4-PTFE/VA-G1"-Y10-ETW



The probe can be mounted centrally or eccentricly. For a measurement independent of the filling cone, we recommend that the probe be mounted at a $1/4$ of the diameter. The minimum distance between the end of the measuring range and the conductive lid of the container is 50 mm.

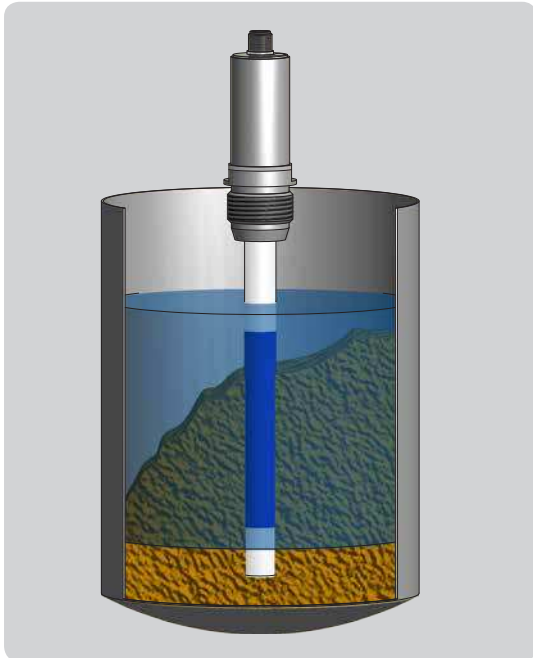
Connect the BE over the process connection or by means of the rear screw connection.

All specifications are subject to change without notice. (02/2017)

Applications

i-LEVEL

We use for these analogue level systems our patented three electrode measuring principle. With this measuring principle the container is part of the measurement. The container must be metal or a metal foil has to be fixed on the container (foil length > probe length)). The resulting large measuring volume is the reason why material depositions on the probe surface are irrelevant for the measurement.



On the left you see a schematic drawing of the possible analogue measuring range of a i-Level probe of the KFi-1-... series. You see the maximum possible measuring range between the inactive areas at the probe tip and the top and the measuring field that reaches in this case up to the container wall.

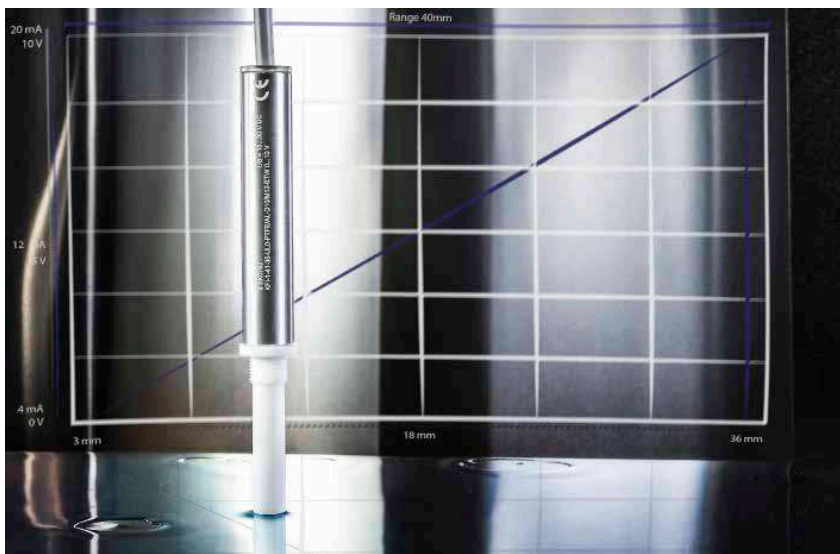
ADJUSTMENT BY MEANS OF EASYTEACH BY WIRE

The user adjusts the desired analogue measuring area „Analogue Min. and Analogue Max.“. By means of the teach wire. At this variant of the i-Level probe it is also possible to make the adjustment with empty container.

This level probes are designed for level control of liquids, pastes and bulk materials with a dielectric constant ϵ_r between 2 and 80.

Level control of bulk material, pastes, or liquids in storage or dosing systems. These analogue probes are applied in various industries, thanks to the different housing materials that are available, so for instance:

**FOOD OR PHARMACEUTICAL INDUSTRY, CHEMICAL INDUSTRY,
RECYCLING TECHNOLOGY, AUTOMOTIVE TECHNOLOGY,
PACKAGING INDUSTRY, PRINTING TECHNOLOGY.**



I-Level Probes

Small sensor body designs - great for applications in small dosing systems

Analogue Measurement over a few mm possible.

All specifications are subject to change without notice. (02/2017)



L&V&L Capacitive Filling Level Probe - KFI

Analogue current output 4...20 mA

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: GFK, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Automatic identification of NPN / PNP function
- Probe length max. 2000 mm
- With flange connector M 12 x 1



Technical data

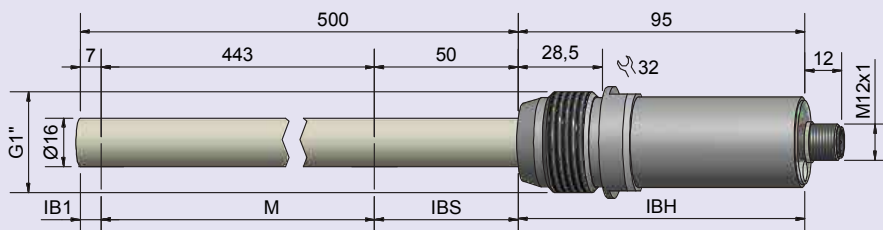
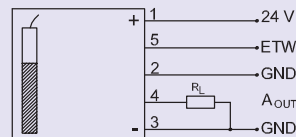
Active zones [M]	Type dependent
Electrical version	5 - pin DC
Output function	Analogue
Type	KFI-1-500-443-GFK/VAb-D16-G1-IL4-ETW-Y10
Art.-No.	KI 0058
Operating voltage (U _B)	15...30 V DC
Permitted residual ripple max.	5 %
Load resistance (R _L)	≤ 400 Ω
Power consumption (outputs no-load)	0,9 W
Analogue output	4...20 mA
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1
Housing material	VA No. 1.4305 / AISI 303
Active zone	GFK
Lid	PC (FDA 21 CFR 177.1580)

For matching connectors please see our selection of accessories.

*Where applicable

EasyTeach chart:

- LED green / Adjustment function
- Adjustment Min.
- Adjustment Max.
- Werteseite
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)



i-L&VEL Capacitive Filling Level Probe - KFI

Analogue current output 4...20 mA

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: PTFE, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- With flange connector M 12 x 1 (5-pin Teach function included)



Technical data

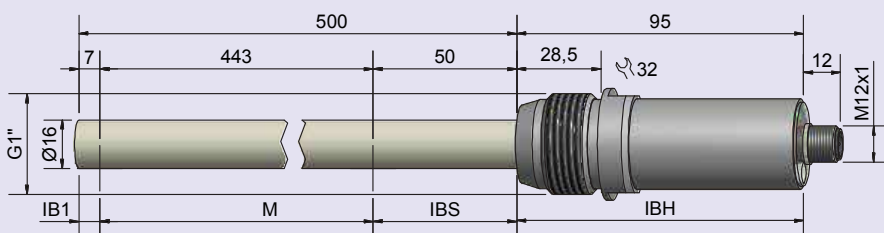
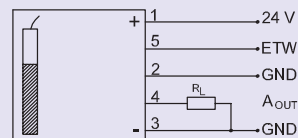
Active zones [M]	443 mm
Electrical version	4 - pin DC
Output function	Analogue
Type	KFI-1-500-443-PTFE/VAb-D16-G1-IL4-ETW-Y10
Art.-No.	KI 0075
Operating voltage (U _b)	15...30 V DC
Permitted residual ripple max.	5 %
Load resistance (R _L)	≤ 400 Ω
Power consumption (outputs no-load)	0,9 W
Analogue output	4...20 mA
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1 (5-pin)
Housing material	VA No. 1.4305 / AISI 303
Active zone	PTFE (FDA 21 CFR 177.1550)
Lid	PC (FDA 21 CFR 177.1580)

For matching connectors please see our selection of accessories.

*Where applicable

EasyTeach chart:

- LED green / Adjustment function
- Adjustment Min.
 - Adjustment Max.
 - Factory set
 - Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)



L&V&L Capacitive Filling Level Probe - KFI

Analogue current output 4...20 mA

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: GFK, Ø 16 mm



Technical data

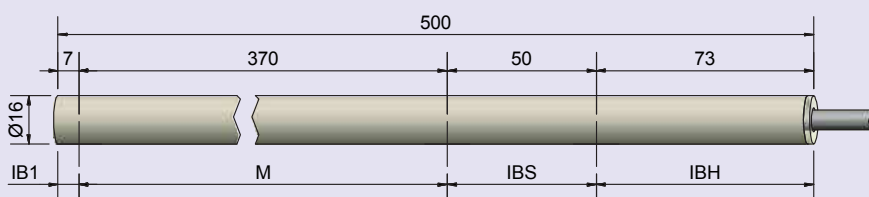
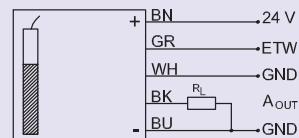
Active zones [M]	370 mm
Electrical version	4 - wire DC
Output function	Analogue
Type	KFI-1-500-370-GFK-D16-IL4-ETW-Z02
Art.-No.	KI 0023
Operating voltage (U _B)	15...30 V DC
Permitted residual ripple max.	5 %
Load resistance (R _L)	≤ 400 Ω
Power consumption (outputs no-load)	0,9 W
Analogue output	4...20 mA
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection cable	2 m, PVC, 5 x 0.34 mm ²
Housing material	GFK
Active zone	GFK
Lid	PC (FDA 21 CFR 177.1580)

Accessories for mounting (is not delivered with the probe) please see our selection of accessories.

*Where applicable

EasyTeach chart:

- LED green / Adjustment function
- Adjustment Min.
 - Adjustment Max.
 - Factory set
 - Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)



i-L&V&L Capacitive Filling Level Probe - KFI

Analogue current output 4...20 mA

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: PTFE, Ø 16 mm



Technical data

Active zones [M]	370 mm
Electrical version	4 - wire DC
Output function	Analogue
Type	KFI-1-500-370-PTFE-D16-IL4-ETW-Z02
Art.-No.	KI 0074
Operating voltage (U _b)	15...30 V DC
Permitted residual ripple max.	5 %
Load resistance (R _L)	≤ 400 Ω
Power consumption (outputs no-load)	0,9 W
Analogue output	4...20 mA
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection cable	2 m, PVC, 5 x 0.34 mm ²
Housing material	PTFE (FDA 21 CFR 177.1550)
Active zone	PTFE (FDA 21 CFR 177.1550)
Lid	PC (FDA 21 CFR 177.1580)

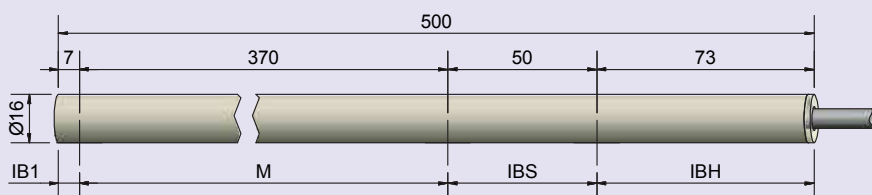
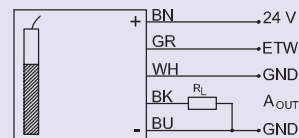
Accessories for mounting (is not delivered with the probe) please see our selection of accessories.

*Where applicable

EasyTeach chart:

LED green / Adjustment function

- Adjustment Min.
- Adjustment Max.
- Factory set
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)

**CAPACITIVE FILLING
LEVEL MEASURING
SYSTEM**

i-LEVEL



Pages

General description	32 - 33
Adjustment	33
Mounting	34
Applications	35
Capacitive Filling Level Probe KFI-51-...	36 - 39
Capacitive Filling Level Probe KFI-52-...	40 - 43

All specifications are subject to change without notice. (02/2017)

CAPACITIVE PROBE FOR LEVEL CONTROL OF 1 OR 2 LIMIT VALUES

In this section we describe a variant of the i-Level probe which is designed for binary measurement of 1 or 2 limit values. The adjustment of the switching points is made by RECHNER's Easy-Teach by Wire function.

The following options are available:

PROBE WITH

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

The switching points can be set at any position within the measuring range.

The position of the switching points can be positioned at any place within the measuring range. The adjustment is made by EasyTeach by wire and it can be can be changed again with the EasyTeach by Wire function

Maximum probe length 2000 mm.

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 end. 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.

**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.

Measurement possible with product temperature of up to 100°C

Even of the compact design of the probe it is possible to realise measurements in high temperature ranges. For this case we offer variants of the level probes with temperature barriers in order to protect the integrated evaluation electronics. The product temperature at the probe rod can be up to 100 provided, that at the same time it is guaranteed that the temperature at the sensor head, where the evaluation electronic is placed do not exceed a value of +70°C.

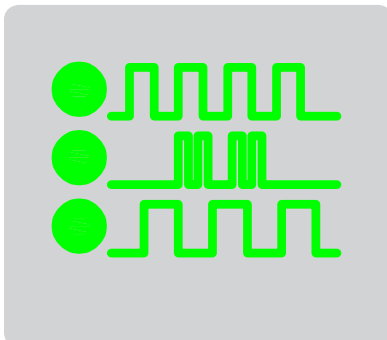


All specifications are subject to change without notice. (02/2017)

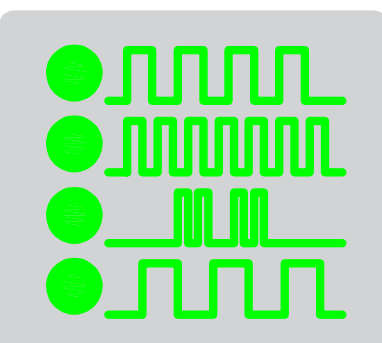
i-LEVEL

- Position of the switching points can be set at any position within the measuring range.
- With intelligent PNP /NPN recognition
- Supply voltage 18...30 V DC
- EasyTeach by Wire function

Adjustment



ETW Chart 1-Point probe



ETW Chart 2-Point probe

EasyTeach Adjustment:

The adjustment or the analogue measuring area is made by means of the teach wire. This is supported by a variant of the well-poven EasyTeach technology.

The Adjustment is mady by disconnection of the ETW-wire from the supply voltage (+) at the desired menue point.

The LED display is an adjustment help with its flashing sequenes for each menue point.

The general interaction of sensor and control system can be checked with the test mode. With the reset function the sensor can be re-adjusted to the factory setting at any time.

MOUNTING

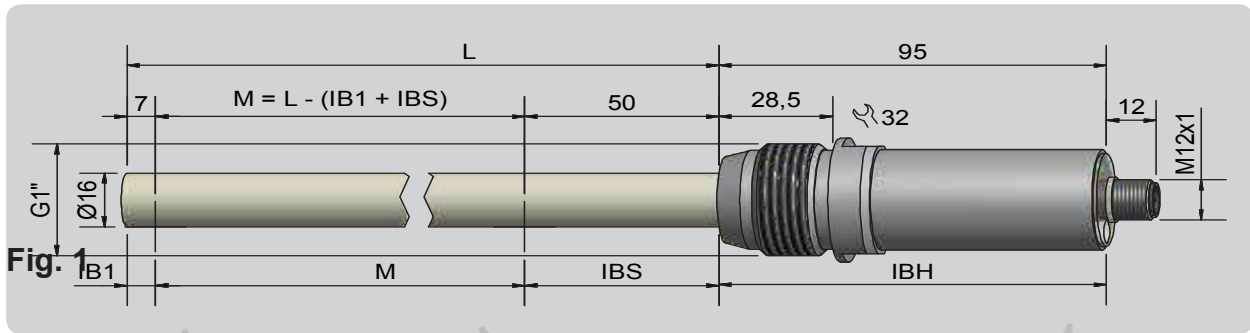


Fig. 1

The **inactive area (IB1)** is 7 mm as standard.

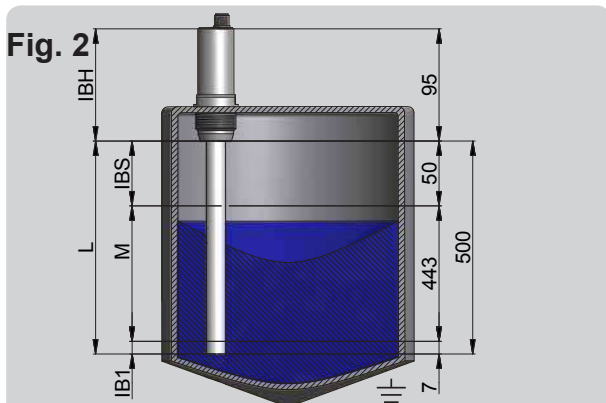
The length of the **Measuring range (M)** is dependent from the ordered total probe length (L = max. 2 m).

The **measuring range (M)** of the probe must be mounted in a range of the container without change in diameter of the cross section.

The position of the switching points S1 and S2 (depending on type) can be set with the EasyTeach by Wire function.

Der **inaktive Bereich TB** (falls vorhanden) dient als Temperaturbarriere und ist außerhalb des heißen Bereichs anzuordnen.

Der **inaktive Bereich 2 (IB2)** sollte ab Ende der Messstrecke bis Behälterdeckel (wenn aus Metall) 1/3 des Behälterdurchmessers, jedoch mindestens 50 mm betragen, um Nichtlinearitäten zu vermeiden.



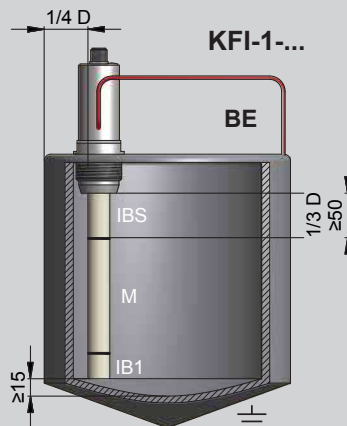
Example for a sensor with 1 switching point, PTFE-body and G1" connection head (VA), sensor length L = 500 mm. For IBS the minimum of 50 mm is determined. This results in an available measuring area of M = 443 mm. The calculation is as follows:

$$M = L - (IB1 + IBS)$$

$$M = 500 - (7 + 50)$$

$$M = 443$$

→ KFI-51-500-443-S-PTFE/VA-G1"-Y10-ETW



The probe can be mounted centrally or eccentrically. For a measurement independent of the filling cone, we recommend that the probe be mounted at a 1/4 of the diameter. The minimum distance between the end of the measuring range and the conductive lid of the container is 50 mm.

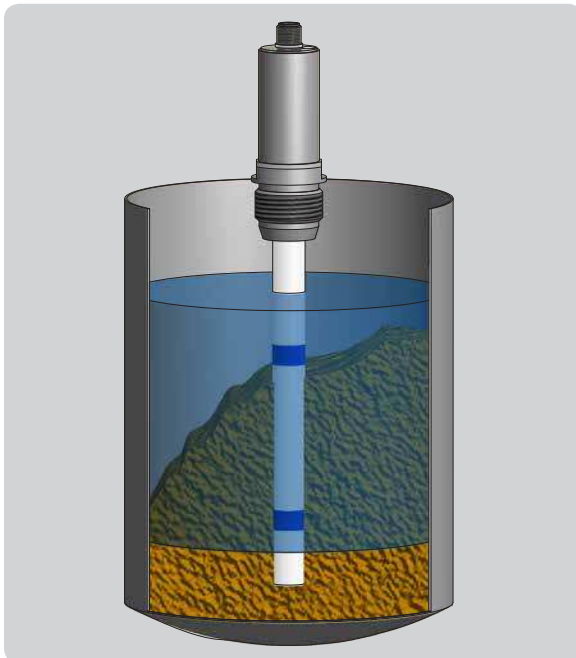
Connect the BE over the process connection or by means of the rear screw connection.

All specifications are subject to change without notice. (02/2017)

APPLICATION EXAMPLE

i-LEVEL

We use for these analogue level systems our patented three electrode measuring principle. With this measuring principle the container is part of the measurement. The container must be metal or a metal foil has to be fixed on the container (foil length > probe length). The resulting large measuring volume is the reason why material depositions on the probe surface are irrelevant for the measurement.



On the left you see a schematic drawing of the possible measuring range of a i-Level probe of the KFI-52 series. You see the maximum possible measuring range between the inactive areas at the probe tip and the top and the measuringfield of the switching points that reaches in this case up to the container wall.

ADJUSTMENT BY MEANS OF EASYTEACH BY WIRE

The user adjusts the desired switching point S1 for the KFI-51 or S1 and S2 for KFI-52- by means of the teach wire. The switching points can be placed at any position, whereas with the 2 point variant one has to consider a minimum distance between the 2 switching points of 50 mm.

Level control of bulk material, pastes, or liquids in storage or dosing systems. These analogue probes are applied in various industries, thanks to the different housing materials that are available, so for instance:

**FOOD OR PHARMACEUTICAL INDUSTRY, CHEMICAL INDUSTRY,
RECYCLING TECHNOLOGY, AUTOMOTIVE TECHNOLOGY,
PACKAGING INDUSTRY, PRINTING TECHNOLOGY.**

All specifications are subject to change without notice. (02/2017)



I-Level Probes

**Small sensor body
designs - great for
applications in
small
dosing systems**

**Measurement of
1 switching point**



L&V&L Capacitive Filling Level Probe - KFI 2 Limit value switching points

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: GFK, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Automatic identification of NPN / PNP function
- With flange connector M 12 x 1 (5-pin Teach function included)



Technical data

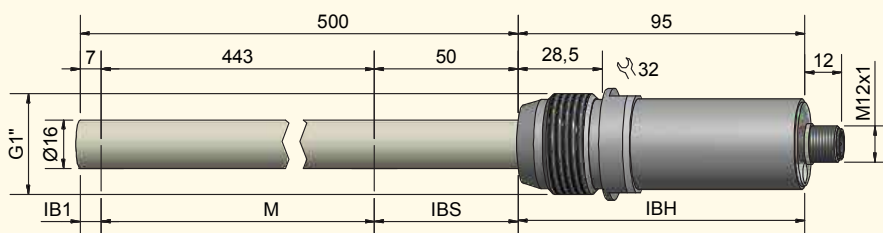
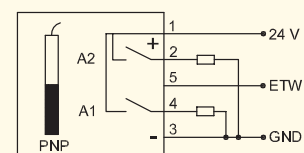
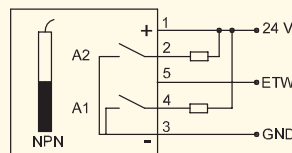
Active zones [M]	443 mm
Electrical version	4 - pin DC
Output function	2 limit value switching points, normally open
Type	KFI-52-500-443-GFK/VAb-D16-G1-S-ETW-Y10
Art.-No.	KI 0060
Operating voltage (U _B)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1 (5-pin)
Housing material	VA No. 1.4305 / AISI 303
Active zone	GFK
Lid	PA / PPO
For matching connectors please see our selection of accessories.	

*Where applicable

EasyTeach chart:

LED green / Adjustment function

- Adjustment S1
- Adjustment S2
- Factory set
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)



i-LEVEL Capacitive Filling Level Probe - KFI 2 Limit value switching points

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: PTFE, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Automatic identification of NPN / PNP function
- With flange connector M 12 x 1 (5-pin Teach function included)



Technical data

Active zones [M]	443 mm
Electrical version	4 - pin DC
Output function	2 limit value switching points, normally open
Type	KFI-52-500-443-PTFE/VAb-D16-G1-S-ETW-Y10
Art.-No.	KI 0078
Operating voltage (U _b)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1 (5-pin)
Housing material	VA No. 1.4305 / AISI 303
Active zone	PTFE (FDA 21 CFR 177.1550)
Lid	PC (FDA 21 CFR 177.1580)
For matching connectors please see our selection of accessories.	

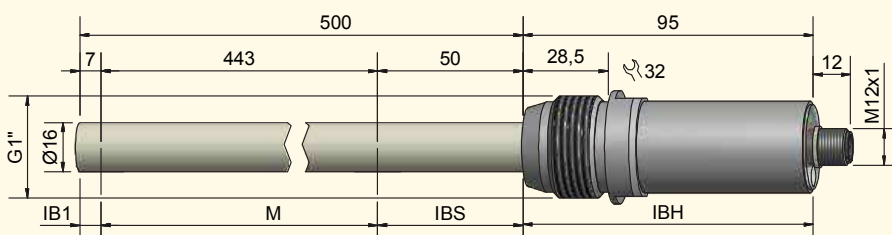
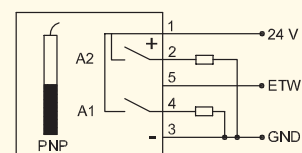
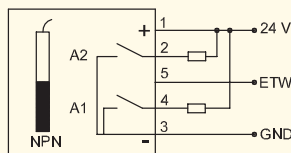
All specifications are subject to change without notice. (02/2017)

*Where applicable

EasyTeach chart:

LED green / Adjustment function

- Adjustment S1
- Adjustment S2
- Factory set
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany



L&V&L Capacitive Filling Level Probe - KFI 2 Limit value switching points

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: GFK, Ø 16 mm
- Automatic identification of NPN / PNP function



Technical data

Active zones [M]	370 mm
Electrical version	4 - wire DC
Output function	2 limit value switching points, normally open
Type	KFI-52-500-370-GFK-D16-S-ETW-Z02
Art.-No.	KI 0022
Operating voltage (U _B)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection cable	2 m, PVC, 5 x 0.34 mm ²
Housing material	GFK
Active zone	GFK
Lid	PC (FDA 21 CFR 177.1580)

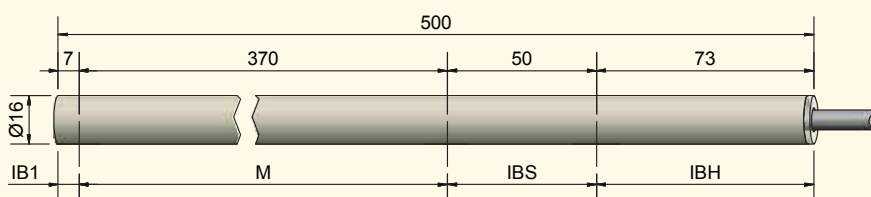
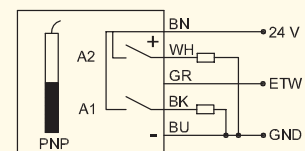
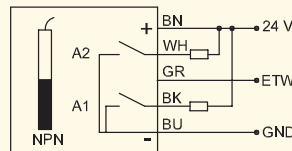
Accessories for mounting (is not delivered with the probe) please see our selection of accessories.

*Where applicable

EasyTeach chart:

LED green / Adjustment function

- Adjustment S1
- Adjustment S2
- Factory set
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)



i-LEVEL Capacitive Filling Level Probe - KFI 2 Limit value switching points

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: PTFE, Ø 16 mm
- Automatic identification of NPN / PNP function



Technical data

Active zones [M]	370 mm
Electrical version	4 - wire DC
Output function	2 limit value switching points, normally open
Type	KFI-52-500-370-PTFE-D16-S-ETW-Z02
Art.-No.	KI 0073
Operating voltage (U _b)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection cable	2 m, PVC, 5 x 0.34 mm ²
Housing material	PTFE (FDA 21 CFR 177.1550)
Active zone	PTFE (FDA 21 CFR 177.1550)
Lid	PC (FDA 21 CFR 177.1580)

Accessories for mounting (is not delivered with the probe) please see our selection of accessories.

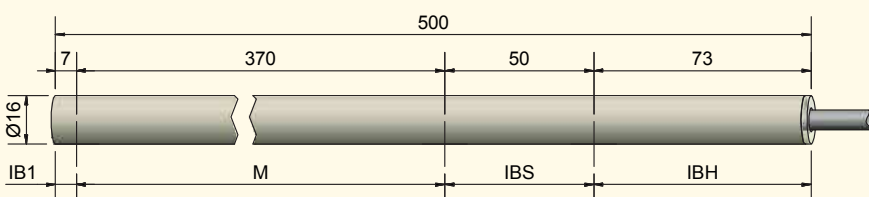
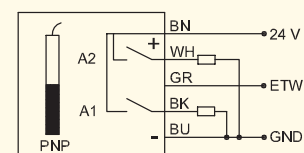
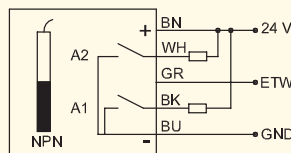
All specifications are subject to change without notice. (02/2017)

*Where applicable

EasyTeach chart:

LED green / Adjustment function

- Adjustment S1
- Adjustment S2
- Factory set
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany



L&V&L Capacitive Filling Level Probe - KFI 1 Limit value switching point

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: PTFE, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Automatic identification of NPN / PNP function
- With flange connector M 12 x 1 (5-pin Teach function included)



Technical data

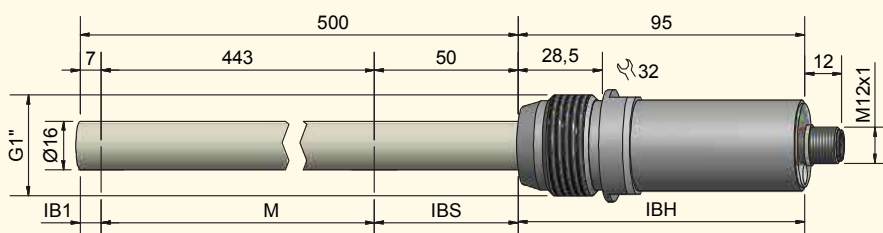
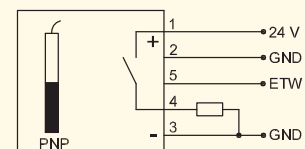
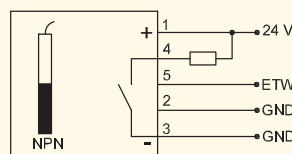
Active zones [M]	443 mm
Electrical version	4 - pin DC
Output function	1 limit value switching point, normally open
Type	KFI-51-500-443-GFK/VAb-D16-G1-S-ETW-Y10
Art.-No.	KI 0076
Operating voltage (U _B)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1 (5-pin)
Housing material	VA No. 1.4305 / AISI 303
Active zone	PTFE (FDA 21 CFR 177.1550)
Lid	PC (FDA 21 CFR 177.1580)

For matching connectors please see our selection of accessories.

*Where applicable

EasyTeach chart:
LED green / Adjustment function

- Adjustment
- Factory set
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

All specifications are subject to change without notice. (02/2017)



i-LEVEL Capacitive Filling Level Probe - KFI 1 Limit value switching point

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: PTFE, Ø 16 mm
- Connection head and process connection stainless steel VA no. 1.4305 / AISI 303
- Process connection G1"
- Automatic identification of NPN / PNP function
- With flange connector M 12 x 1 (5-pin Teach function included)



Technical data

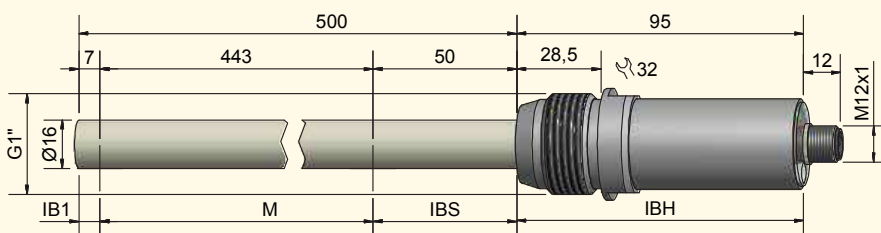
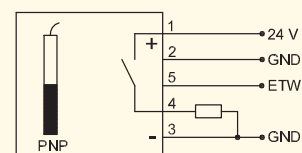
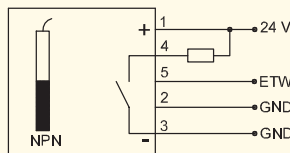
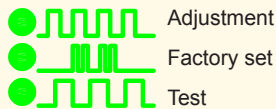
Active zones [M]	443 mm
Electrical version	4 - pin DC
Output function	1 limit value switching point, normally open
Type	KFI-51-500-443-PTFE/VAb-D16-G1-S-ETW-Y10
Art.-No.	KI 0076
Operating voltage (U _b)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection	Flange connector M 12 x 1 (5-pin)
Housing material	VA No. 1.4305 / AISI 303
Active zone	PTFE (FDA 21 CFR 177.1550)
Lid	PC (FDA 21 CFR 177.1580)
For matching connectors please see our selection of accessories.	

All specifications are subject to change without notice. (02/2017)

*Where applicable

EasyTeach chart:

LED green / Adjustment function



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany



i-LEVEL Capacitive Filling Level Probe - KFI 1 Limit value switching point

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: GFK, Ø 16 mm
- Automatic identification of NPN / PNP function



Technical data

Active zones [M]	370 mm
Electrical version	4 - wire DC
Output function	1 limit value switching point, normally open
Type	KFI-51-500-370-GFK-D16-G1-S-ETW-Z02
Art.-No.	KI 0021
Operating voltage (U _B)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection cable	2 m, PVC, 5 x 0.34 mm ²
Housing material	GFK
Active zone	GFK
Lid	PC (FDA 21 CFR 177.1580)

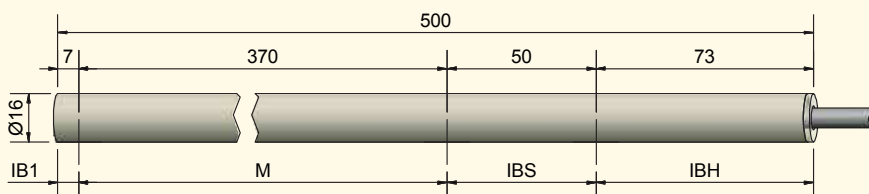
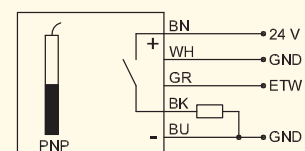
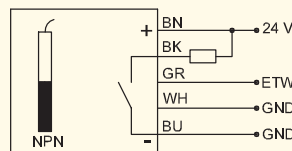
Accessories for mounting (is not delivered with the probe) please see our selection of accessories.

*Where applicable

EasyTeach chart:

LED green / Adjustment function

- Adjustment
- Factory set
- Test



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)



L&VEL Capacitive Filling Level Probe - KFI 1 Limit value switching point

- Integrated evaluation electronics
- Easy Teach by wire
- Housing material: PTFE, Ø 16 mm
- Automatic identification of NPN / PNP function



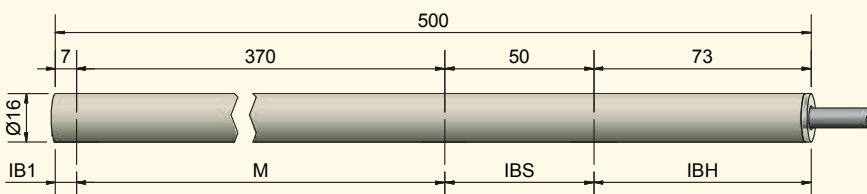
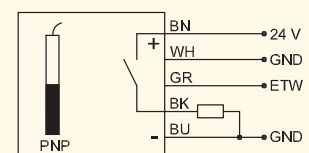
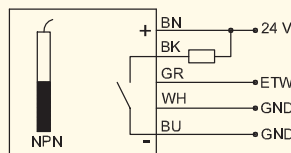
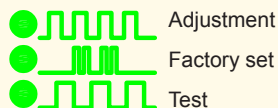
Technical data

Active zones [M]	370 mm
Electrical version	4 - wire DC
Output function	1 limit value switching point, normally open
Type	KFI-51-500-370-PTFE-D16-G1-S-ETW-Z02
Art.-No.	KI 0072
Operating voltage (U _b)	15...30 V DC
Permitted residual ripple max.	5 %
Output current max.	100 mA
Power consumption (outputs no-load)	0,9 W
Frequency of operating cycles max.	1 Hz
Permitted ambient temperature	-25...+70 °C
LED-Display	Green
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2*
Connection cable	2 m, PVC, 5 x 0.34 mm ²
Housing material	PTFE (FDA 21 CFR 177.1550)
Active zone	PTFE (FDA 21 CFR 177.1550)
Lid	PC (FDA 21 CFR 177.1580)

Accessories for mounting (is not delivered with the probe) please see our selection of accessories.

*Where applicable

EasyTeach chart:
LED green / Adjustment function



Other housing materials for the active zone (probe), like PE, PTFE, PVDF or PEEK on request.

Made in Germany

All specifications are subject to change without notice. (02/2017)

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CANADA

Rechner Automation Inc
348 Bronte St. South - Unit 11
Milton, ON L9T 5B6

Tel. 905 6360 866
Fax. 905 6360 867
contact@rechner.com
www.rechner.com

GREAT BRITAIN

Rechner (UK) Limited
Unit 6, The Old Mill
61 Reading Road
Pangbourne, Berks, RG8 7HY

Tel. +44 118 976 6450
Fax. +44 118 976 6451
info@rechner-sensors.co.uk
www.rechner-sensors.co.uk

ITALY

Rechner Italia SRL
Via Isarco 3
39100 Bolzano (BZ)
Office:
Via Gueffa 5
40138 Bologna
Tel. +39 051 0015498
Fax. +39 051 0015497
info@rechneritalia.it
www.rechneritalia.it

PEOPLE'S REPUBLIC OF CHINA

RECHNER SENSORS SIP CO.LTD.
Building H,
No. 58, Yang Dong Road
Suzhou Industrial Park
Jiangsu Province

Tel. +8651267242858
Fax. +8651267242868
assist@rechner-sensor.cn
www.rechner-sensor.cn

REPUBLIC OF KOREA (SOUTH)

Rechner-Korea Co. Ltd.
A-1408 Ho,
Keumgang Penterium IT Tower,
Hakeuiro 282, Dongan-gu
Anyang City, Gyunggi-do, Seoul

Tel. +82 31 422 8331
Fax. +82 31 423 83371
sensor@rechner.co.kr
www.rechner.co.kr

UNITED STATES OF AMERICA

Rechner Electronics Ind. Inc.
6311 Inducon Corporate Drive,
Suite 5
Sanborn, NY. 14132

Tel. 800 5444 106
Fax. 905 6360 867
contact@rechner.com
www.rechner.com

RECHNER

INDUSTRIE-ELEKTRONIK GMBH

Gaußstraße 8-10 • 68623 Lampertheim • Germany

T: +49 6206 5007-0 • F: +49 6206 5007-36 • F Intl. +49 6206 5007-20

www.rechner-sensors.com • E-mail: info@rechner-sensors.de