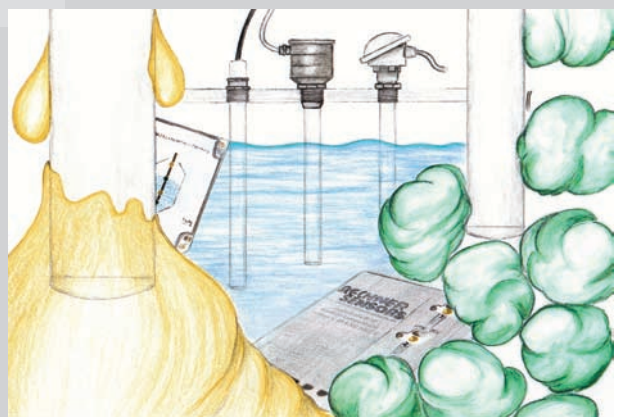


**CATALOGUE**

**CAPACITIVE  
LEVEL  
MEASURING  
SYSTEMS**



TRUE **LEVEL**®  
PER **LEVEL**®

CE



Registration-No: 1327-01



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.

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**Edition October 2008**

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

All specifications are subject to change without notice. (10/2008)

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## TECHNOLOGY

Capacitive level measurement has proven itself as one of the most universal level measurement principles. The reason for this is the possibility of the measurement of almost all products, no matter if liquids, bulk materials or pastes. This capacitive level measurement is based on the generation of an electric field between container and probe. Herewith a measuring capacitor is formed. Within this measuring capacitor the filling material works as a dielectric that changes its capacity. These capacity changes are electronically evaluated and are converted in to the desired output signals.

### Three-Electrode-Principle

The measurement systems now introduced all operate according to the three-electrode-principle. With the three-electrode-principle the container or an additional electrode serve as a counter-electrode to the probe electrodes. For this reason it is necessary with this system that the container is of a conductive material or a "substitute electrode" is fixed to the container wall, e.g. copper foil. This principle allows almost total elimination of the undesirable parasitic capacities and their effects, which inevitable appear in the practical operation, (e. g. generated via the probe connection cable – evaluation unit).

On the basis of the patented circuit principles, outstanding parameters are achieved and the solution of exceptional applications are possible, e. g. multiple measurements and the DC-compensating analogue measurement (DC = dielectric constant).

### The basis system

In principle the level measurement consists of

#### Probe + Connection Cable + Electronic Evaluation Unit

##### Probe

The probe is a passive component part with an insulating outer cover.

Standard housing: GFK (glassfibre reinforced plastic). Outer diameter 16 mm with outstanding mechanical properties. Recommended for use in applications with bulk materials or viscous materials.

Optional: Other plastic housings are available on request, such as PE, PVDF, PTFE. PEEK for use in the food industry, pharmaceutical and chemical industry. Also recommended for use in applications with non viscous fluids.

##### Electronic Evaluation Units

Available options

Limit value evaluation units	with 1; 2; 4; 4+n <sup>4</sup> measuring positions. - with fixed limit value switching points. - or/and with variable limit value switching points.
Analogue evaluation units	with automatic DC-compensation

## TECHNOLOGY

On the basis of the evaluation principle we offer 2 distinct versions:

- **TRUE LEVEL®** for analogue measurements
- **PER LEVEL®** for limit value measurements

### Advantages for **TRUE LEVEL®**

- Filling level measurements in containers and tubes up to approximately 5 m in diameter.
- For liquids and bulk materials  $\epsilon_r \geq 1,2$
- Due to its large measuring capacity it is also suitable for non-homogenous media.
- With the suitable mounting, virtually independent of the discharge cone.
- Probe applicable in an ambient temperature range of  $-70\text{ °C}$  up to  $+250\text{ °C}$ .
- Insensitive to static electrification.
- Because of automatic compensation of the dielectric constants useable for different materials without re-adjustment.
- complete adjustment in the empty-condition, easily practicable with adjustment-aids.

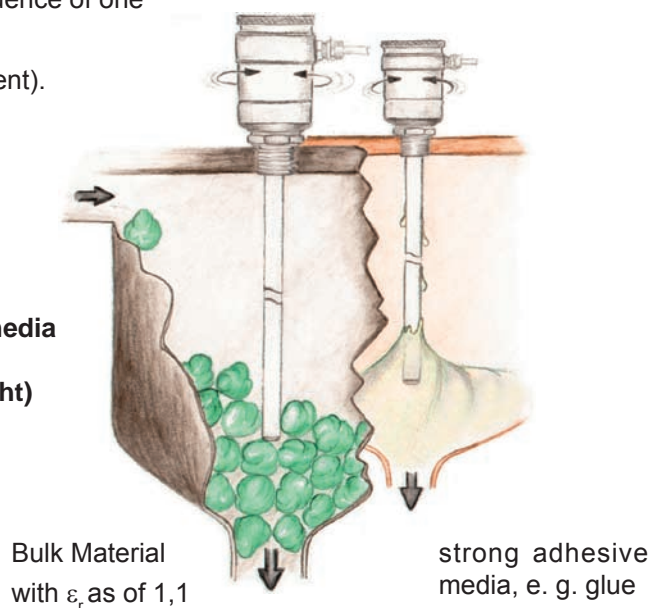
### Advantages for **PER LEVEL®**

In additions to the aforementioned advantages:

- Suitable for detection of highly viscous, adhesive products (glues or similar)
- Suitable for products as of  $\epsilon_r = 1,1$  – also for extremely small filling density (e. g. polystyrene)
- Negligible influence on the measurement from deposits on the sensor.
- Suitable for all container sizes.
- Fixed limit values independent from changes in the dielectric constant.
- Multiple measurements without influence of one to another.
- Simple adjustment („blind“-adjustment).

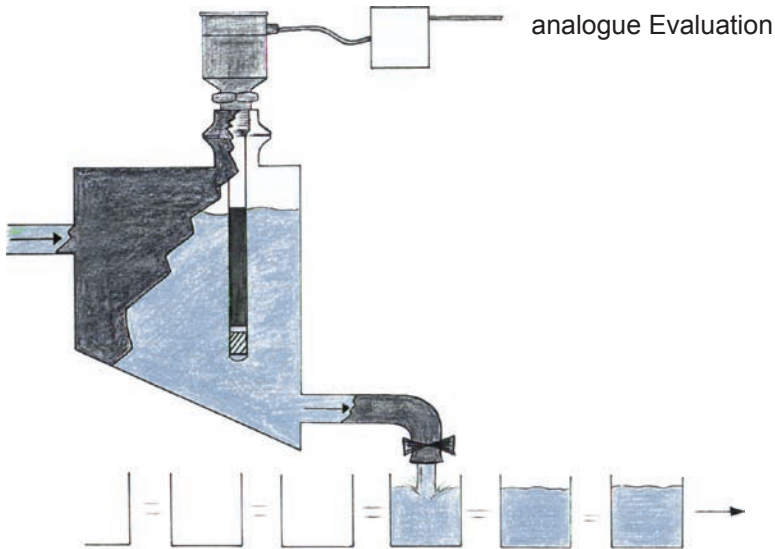
### Application Example:

**Level control of different media  
bulk material (left) and  
strong adhesive media (right)**



## APPLICATION EXAMPLES

KFS/KFA - analogue - Triclamp



### Level Control In The Food Industry

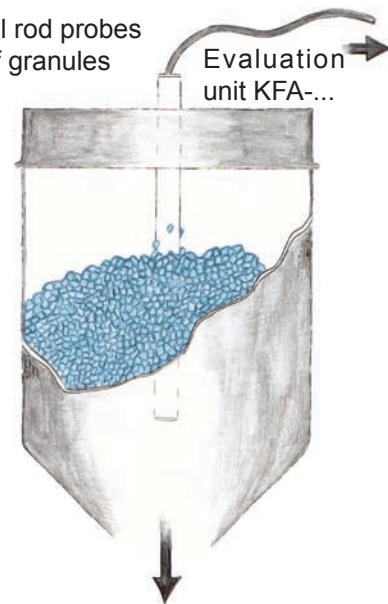
In this application an analogue level probe is used with stainless steel connection head and Triclamp process connection. The analogue probe indicates the exact filling level within the selected measuring range. The analogue model has automatic compensation for the change of the dielectric constant of the product to be detected. This is advantageous in applications with regularly changing materials (Oil, spice, sugar, flour, mineral water, juice, etc.)

### Level Control In The Plastics Industry

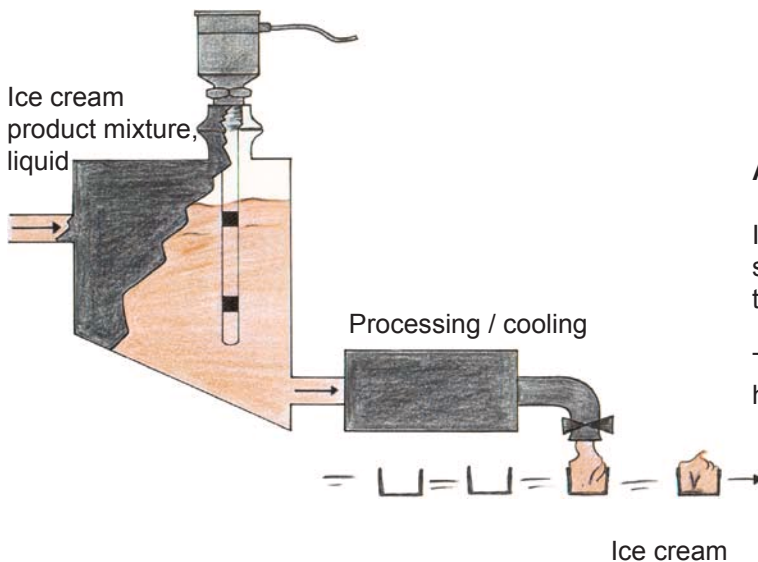
Dependent on the application and the desired information, analogue or digital probes can be used.

Suitable for products with a dielectric constant as of  $\epsilon_r$  1,1 ( $\geq 1,2$  analogue) - also for extremely small filling density (e.g. Polystyrene)

TRUE- or PER-Level rod probes used for detection of granules



KFX - PER-Level Probe - Triclamp



### Application In The Food Industry

In this case a PER-Level probe with two switching points is used in order to detect the minimum and maximum filling level.

The probe has a stainless steel connection head with triclamp process connection.

All specifications are subject to change without notice. (10/2008)

## 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.

### - 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.

*89/336/EWG*

EMC Directive (EN 60 947-5-2)

*73/23/EWG*

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 TERMS

### *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.

### *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  $-5^{\circ}\text{C}$ . 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 destined for continuous movement/flexible use. When routing please consider the bending radius of minimum  $10 \times \varnothing$ .

### *Enclosure rating*

IP 20: Protection against ingress of medium size objects

IP 54: Protection against harmful dust deposits and splashing water

IP 65: Protection against contact with voltage-carrying parts, protection against ingress of dust and water jet.

IP 67: Protection against contact with voltage-carrying parts, protection against ingress of dust and protection against ingress of water when the equipment is immersed in water, up to 1 m depths and for a period of 30 minutes.



**SERIES** • *Analogue Measurement***TRUE LEVEL®****Level control systems for analogue measurements.**

The capacitive measurements systems of the True Level series are designed for analogue measurement. The system comprises:

- **Filling level probe KFS-1-...**
- **Evaluation unit KFA-1-...**

The analogue level measurement automatically makes a compensation for the changes in the dielectric constant of the filling material, which is very advantageous for applications with changing products. For the DC-compensation (DC = dielectric constant) a reference measurement is made. For that reason a reference area is in the tip of the probe.

The probes. **KFS-1-.../** are available from **400 mm** up to **2000 mm** in length. The position and the length of the measuring area are user-definable within the possible effective range and therefore it can be determined for optimal matching of each application.

The available evaluation units are

- Analogue output KFA-1-...-UL-KL = Voltage 0...10 V DC
- Analogue output KFA-1-...-IL4-KL = Current 4...20 mA
- Analogue output KFA-1-...-FL-KL = Frequency 0...10 kHz

The adjustment of the measurement can be made in the empty-condition and it is easy due to adjustment-aids. The effective direction of that output signal is programmable by means of a jumper, and with an adjustable damper slop motions can be eliminated. Additionally a safety relay output is available, which is activated as soon as the filling level falls below the reference-range at the probe tip, thus preventing a total emptying of the container.

In addition an overflow safety output is available on request, which also has a relay output and it works independently from the analogue measurement. In this case the probe contains a further measuring electrode at the desired limit area.

**Probes with process connection**

The analogue rod-probes series is completed with probes with process-connection with different adaptation possibilities:

- **Process connection G1“**
- **Triclamp**
- **Varivent**
- **Milk-tube-screwing**

For further information, please see the accessories chapter.

**The evaluation electronics remains separate.**

For the possible model variations please see the type code.



## SERIES • *Limit Value Measurement*

### PER LEVEL®

#### Level control system for limit value measurements

The Per Level capacitive measuring systems are designed for limit value measurements of filling levels. The system comprises:

Models with *fixed* limit value switching points:

- **Filling level probe KFS-5-...**
- **Evaluation electronics KFA-5-...**

The fixed limit values are determined by means of the defined low-volumed measuring ranges. The limit value signals are practically independent of changes of the dielectric constant of the filling material.

Models with *variable* limit value switching points:

- **Filling level probe KFS-4-...**
- **Evaluation electronics KFA-4-...**

With this model, by means of adjustment, the limit value switching points can be moved over the complete large-volume measuring range. The position and the width of the variable area is the customers choice. These systems are an advantage for applications with regularly varying filling levels.

Please note: DC-changes after the adjustment will lead to changes of the switching point.

The probes **KFS-5(4)-...** are available from **100 mm** up to **2000 mm** in length. They are available with 1, 2, 3 or 4 fixed or variable switching points. The position of the fixed and the variable limit value switching points are user-definable within the possible area and therefore they can be determined for optimal matching of each application.

The available evaluation units are:

- One point evaluation unit (KFA-5-1-.../KFA-4-1...)
- Two point evaluation unit (KFA-5-2-...)
- Four point evaluation unit **Master** (KFA-5-4-...)
- Extension possible with use of Master/Slave systems. Extension of 4 measuring points per slave.

### Compact Probes KFX-

In addition, we offer compact-probes with process-connection-head KFX -... **The evaluation electronic is integrated into the connection-head.** Present variations available:

- KFX-5-... ➤ **with 1 or 2 fixed limit value switching points**
- KFX-4-... ➤ **with 1 or 2 variable limit value switching points**  
(mix of 1 fixed and 1 variable limit value switching point is also possible)

Process-connection with different adaptation possibilities:

- **Process connection G1“**
- **Triclamp**
- **Varivent**
- **Milk-tube-screwing**

For further information, please see the accessories chapter.

For the possible model variations please see the type code.

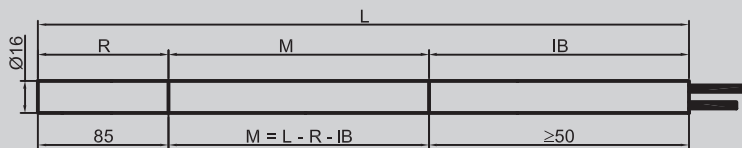
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## MOUNTING • Analogue Measurement

TRUE LEVEL®

The analogue probe consists of a **reference system (R)** at the top of the probe to determine the existing material characteristics. This reference range stretches over 85 mm independent of type. Then follows the actual **analogue measuring range (M)** customer specified, but with regard to the total length ( $L = \max. 2 \text{ m}$ ). The **inactive range (IB)**, a minimum of 50 mm, serves to mount the probe. The mounting can also be a metallic holder (fig. 1)

Fig. 1

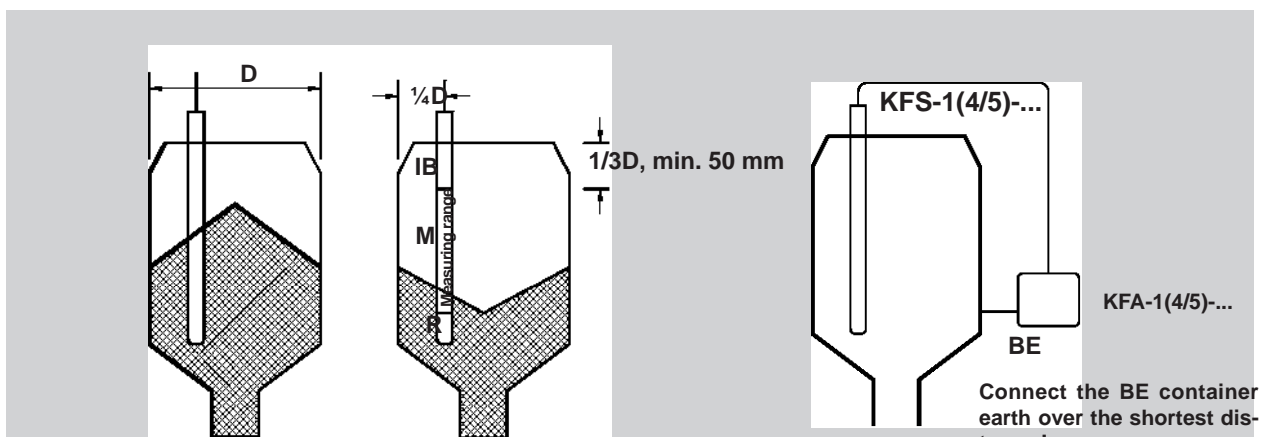


**The measuring range (M)** of the probe must be mounted in a range of the container without change in diameter of the cross section in order to guarantee the linearity of the output signal. Changes in cross section lead to non-linearity, due to conductive installations such as wipers for example.

**The reference system (R)** does not require a constant cross section of the container. Thus it can project into the cone of the container.

**The non-active range (IB)** from the measuring range to the top of the container (if metal) should be not less than 50 mm in order to prevent non-linearity (Fig. 2)

Fig. 2



**Measuring range (M) Reference range (R) non-active range (IB)**

Do not mount the measuring range in the area of the container with changes in the cross section, like the cone range.

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 upper switching point and the conductive lid of the container is 50 mm.

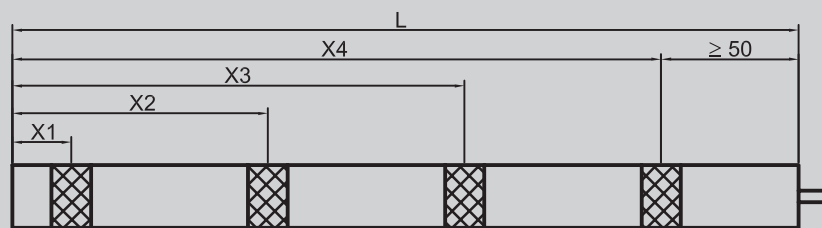
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## MOUNTING • Limit Value Measurement

PER **LeVEL**®

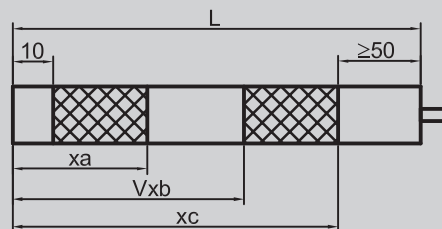
The limit probe can be equipped with one, two, three or four fixed or variable switching points. The first switching point is always placed 15 mm from the beginning of the probe. The position of the other switching points, X2, X3 or X4, can be determined according to the customer's specifications, taking into account however that the minimum distance between each switching point should be 50 mm. The distance from the upper switching point of the probe should be increased by at least 80 mm for mounting purposes with for example a KB-PG 16 squeeze/clamp holder (fig. 3 / 4)

Fig.3



KFS-5... or KFX-5... probe with fixed limit value switching points  
(KFX-5-... 2 switching points max.)

Fig. 4



KFS-4... or KFX-4...probe with variable limit value switching points

**The lowest switching point is 15 mm** from the beginning of the probe, because of an internal screening of the probe's tip.

**A minimum distance of 50 mm between the switching points** has to be taken into consideration due to the internal screening ranges of the probe.

Smaller distances, depending on the medium and the geometrical form of the container, are possible on request.

**The total length (L)** is obtained by taking the position of the upper switching point and adding at least 80 mm for the internal screening range of the probe (ca. 50 mm) and mounting area.

The higher the relative dielectric permittivity, conductivity and/or degree of adhesiveness of the product to be detected, the larger the range of the probe's internal screening should be.

The parameters for the mounting position and minimum distance to the container wall, container earth and so on are the same as for the analogue measuring system, See fig. 2 on page 10.



**ANALOGUE  
MEASUREMENT**

*TRUE* **LEVEL**<sup>®</sup>

**LEVEL PROBE KFS-1-...  
EVALUATION UNIT KFA-1-...**

Pages

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Level probe analogue	15 - 16
Evaluation unit analogue	17 - 19

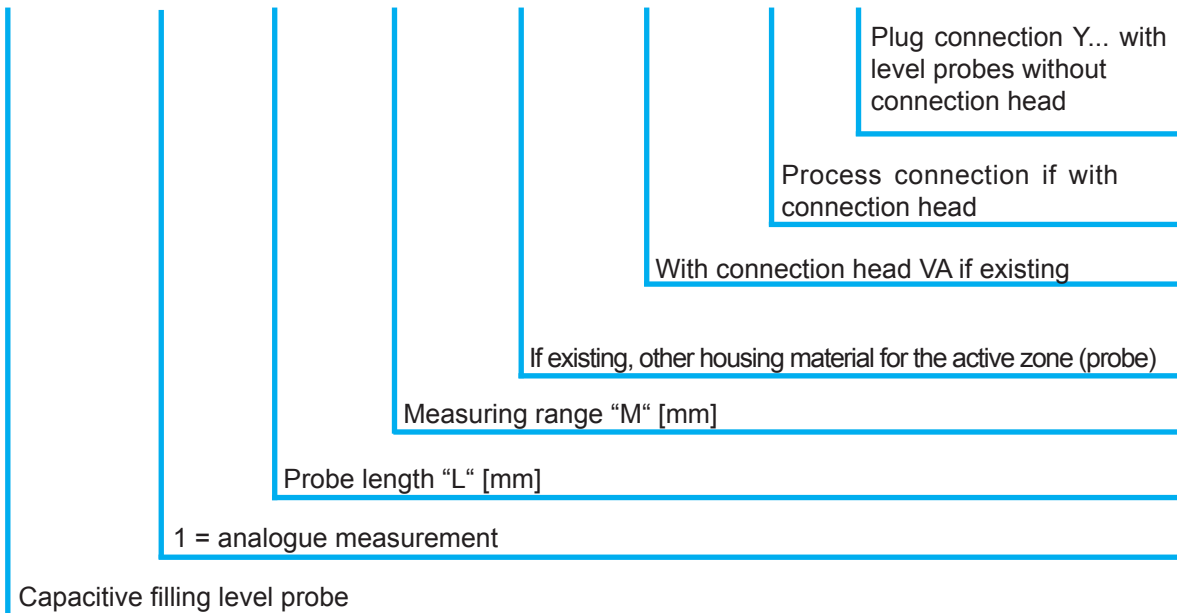
All specifications are subject to change without notice. (10/2008)

## TYPE CODE

TRUE **LEVEL**®

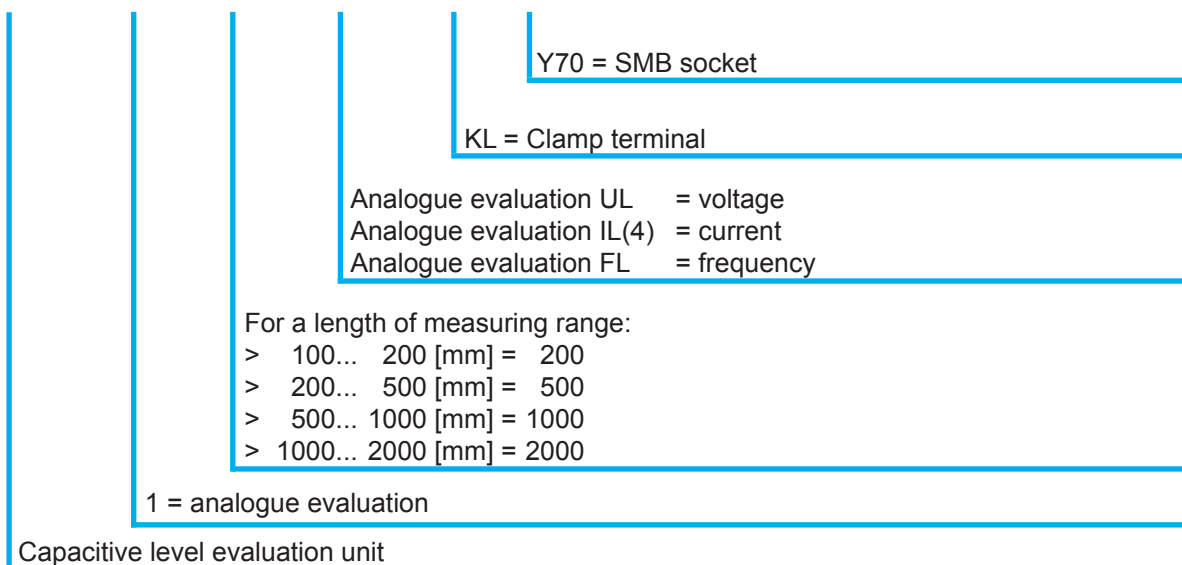
Capacitive Level Probe - Analogue

**KFS - 1 - ... - ... - ... - ... - ...**

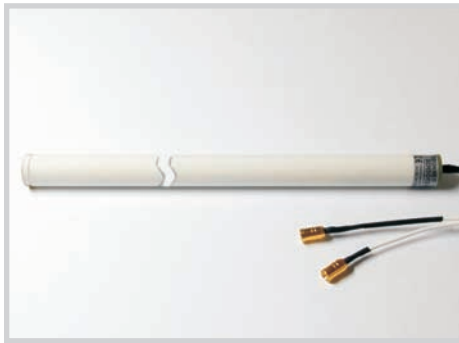


Capacitive evaluation unit - analogue

**KFA - 1 - ... - ... - ... - ...**



All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFS**

Series: **TRUE LEVEL**

With analogue measuring range

- For connection to the capacitive amplifier KFA-1-...-KL-Y70
- Housing material: GFK, 16 mm Ø
- Probe length max. 2000 mm
- Automatic compensation of changes of the dielectric constant

Certificate:



Technical data

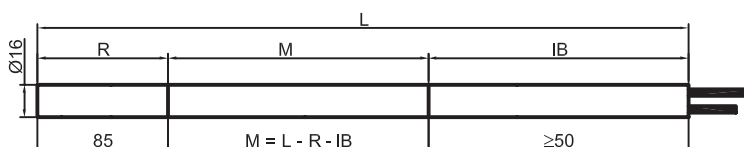
Active Zone [mm]	Measuring range begins from 85, related on the probe tip
Type	KFS-1-“L“-“M“-Y75
Permitted ambient temperature (for active zone)	-70...+250 °C
Degree of protection IEC 60529 (probe)	IP 67
Norm	EN 60947-5-2
Connection cable to the evaluation unit KFA-1-...-KL-Y70	2 m coax-cable with SMB-connectors
Housing material	GFK
Housing material active zone	GFK

Technical data for connectors on request.

A connection device for the probe is available as an accessory (KB-PG 16): see page 65

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

Please determine the total length “L” and the measuring range “M” when ordering.



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## Capacitive Filling Level Probe - KFS

Series: **TRUE LEVEL**

With analogue measuring range

- For connection to the capacitive amplifier KFA-1-...-KL-Y70
- Housing material: GFK, 16 mm Ø
- Connection head and process connection made of stainless steel VA
- Probe length max. 2000 mm
- Automatic compensation of changes of the dielectric constant.

Certificate:



### Technical data

Active Zone [mm]	Measuring range begins from 85, related on the probe tip
Type	KFS-1-"L"- "M"-VA-1
Permitted ambient temperature	-25 ... +100 °C
Permitted ambient temperature (for active zone)	-25 ... +150 °C
Degree of protection IEC 60529 (Housing)	IP 67
Degree of protection IEC 60529 (Screwing* Cable connection)	IP 54
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-1-...-KL-Y70	SMB-sockets within the connection head
Housing material	VA No. 1.4571
Active zone	GFK
Pressure	25 bar

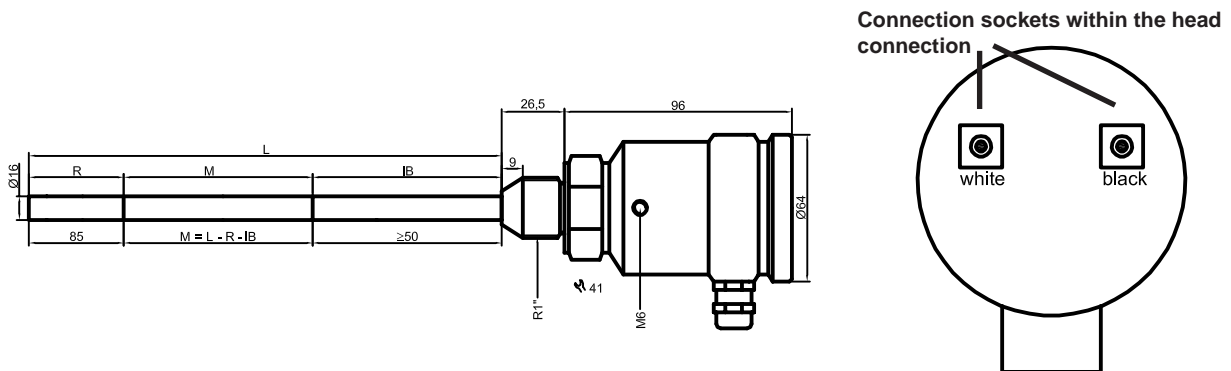
Technical data for connectors on request.

Connection cable (with Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 65

The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

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

Please determine the total length "L" and the measuring range "M" when ordering.



Made in Germany

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**Capacitive Evaluation Unit - KFA**  
**Series: TRUE LEVEL**  
**Analogue frequency output 0...10 kHz**

- For capacitive level probes with analogue measuring range KFS-1-...
- Operating voltage 18...36 V DC
- Potential-free change over contact as signal output
- For materials with  $\epsilon_r$  1,2...30

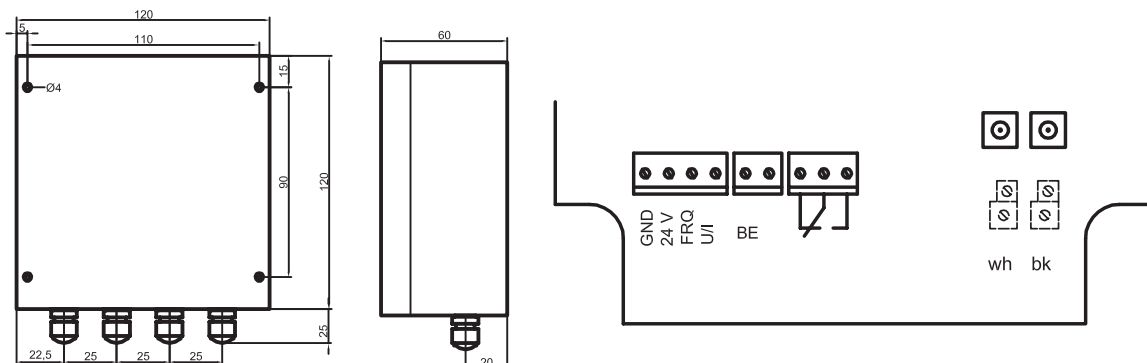
Certificate:



Technical data

Output function	Analogue
Type Analogue	KFA-1-200-FL-KL-Y70
Art.- No.	AF 0010
Type Analogue	KFA-1-500-FL-KL-Y70
Art.-No.	AF 0011
Type Analogue	KFA-1-1000-FL-KL-Y70
Art.-No.	AF 0012
Type Analogue	KFA-1-2000-FL-KL-Y70
Art.-No.	AF 0013
Operating voltage ( $U_B$ )	18...36 V DC
Analogue output	0...10 kHz / TTL-pegel
Permitted residual ripple max.	40 %
Power consumption (outputs no-load)	Typ. 3.5 W
Permitted ambient temperature	-25 ... +55 °C
LED-Display	Green / $U_B$ standby
LED-Display	Green-yellow / filling level-tendency
Protective circuit	Built-in
Degree of protection IEC 60529	IP 54
Norm	EN 60947-5-2
Connection	Screwing clamp terminals and SMB sockets
Housing material	ABS

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**Capacitive Evaluation Unit - KFA**  
**Series: TRUE LEVEL®**  
**Analogue current output 4...20 mA**

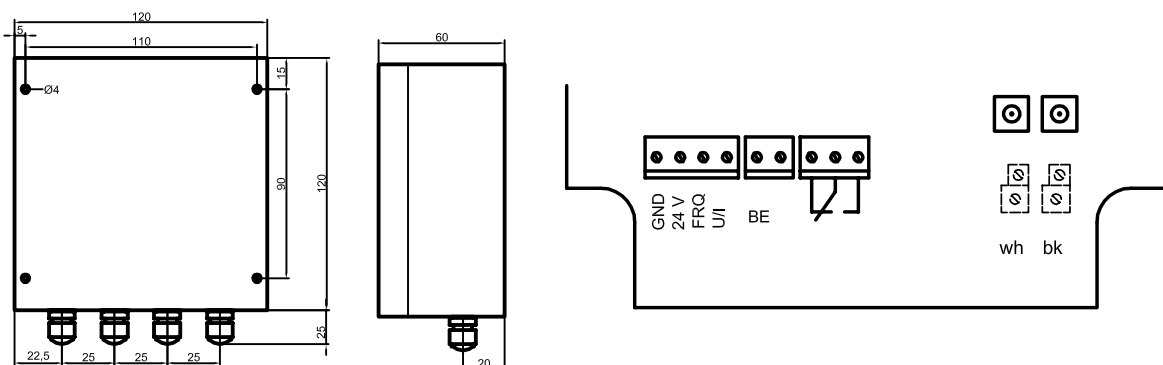
- For capacitive level probes with analogue measuring range KFS-1-...
- Operating voltage 18...36 V DC
- Potential-free change over contact as signal output
- For materials with  $\epsilon_r$  1,2...30

Certificate:



Technical data

Output function	Analogue
Type Analogue	KFA-1-200-IL4-KL-Y70
Art.- No.	AF 0014
Type Analogue	KFA-1-500-IL4-KL-Y70
Art.-No.	AF 0015
Type Analogue	KFA-1-1000-IL4-KL-Y70
Art.-No.	AF 0016
Type Analogue	KFA-1-2000-IL4-KL-Y70
Art.-No.	AF 0017
Operating voltage ( $U_B$ )	18...36 V DC
Analogue output	4...20 mA
Permitted residual ripple max.	40 %
Power consumption (outputs no-load)	Typ. 3.5 W
Permitted ambient temperature	-25 ... +55 °C
LED-Display	Green / $U_B$ standby
LED-Display	Green-yellow / filling level
Protective circuit	Built-in
Degree of protection IEC 60529	IP 54
Norm	EN 60947-5-2
Connection	Screwing clamp terminals and SMB sockets
Housing material	ABS



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**Capacitive Evaluation Unit - KFA**  
**Series: TRUE LEVEL**  
**Analogue voltage output 0...10 V**

- For capacitive level probes with analogue measuring range KFS-1-...
- Operating voltage 18...36 V DC
- Potential-free change over contact as signal output
- For materials with  $\epsilon_r$  1,2...30

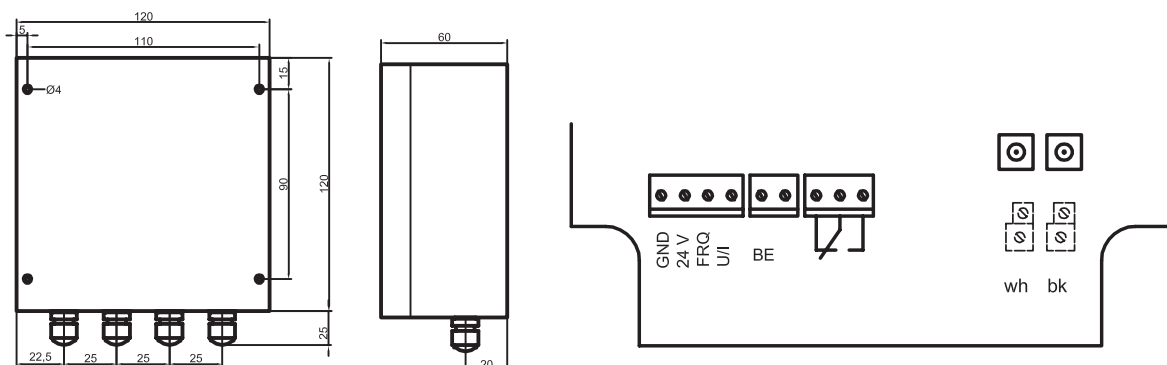
Certificate:



Technical data

Output function	Analogue
Type Analogue	KFA-1-200-UL-KL-Y70
Art.- No.	AF 0018
Type Analogue	KFA-1-500-UL-KL-Y70
Art.-No.	AF 0019
Type Analogue	KFA-1-1000-UL-KL-Y70
Art.-No.	AF 0020
Type Analogue	KFA-1-2000-UL-KL-Y70
Art.-No.	AF 0021
Operating voltage ( $U_B$ )	18...36 V DC
Analogue output	0...10 V
Permitted residual ripple max.	40 %
Power consumption (outputs no-load)	Typ. 3.5 W
Permitted ambient temperature	-25 ... +55 °C
LED-Display	Green / $U_B$ standby
LED-Display	Green-yellow / filling level
Protective circuit	Built-in
Degree of protection IEC 60529	IP 54
Norm	EN 60947-5-2
Connection	Screwing clamp terminals and SMB sockets
Housing material	ABS

All specifications are subject to change without notice. (10/2008)



Made in Germany



**LIMIT VALUE MEASUREMENT**

**PER LEVEL®**

**LEVEL PROBE KFS-5-...  
EVALUATION UNIT KFA-5-...**

**Pages:**

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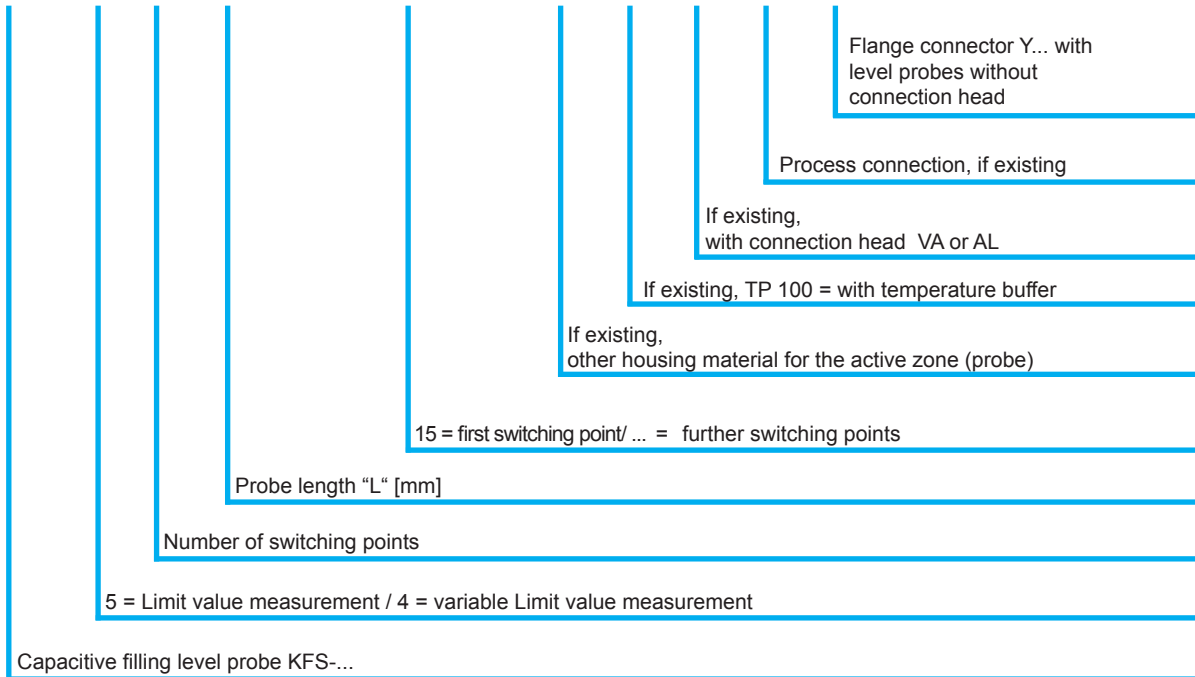
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## TYPE CODE

PER **L&VEL**®

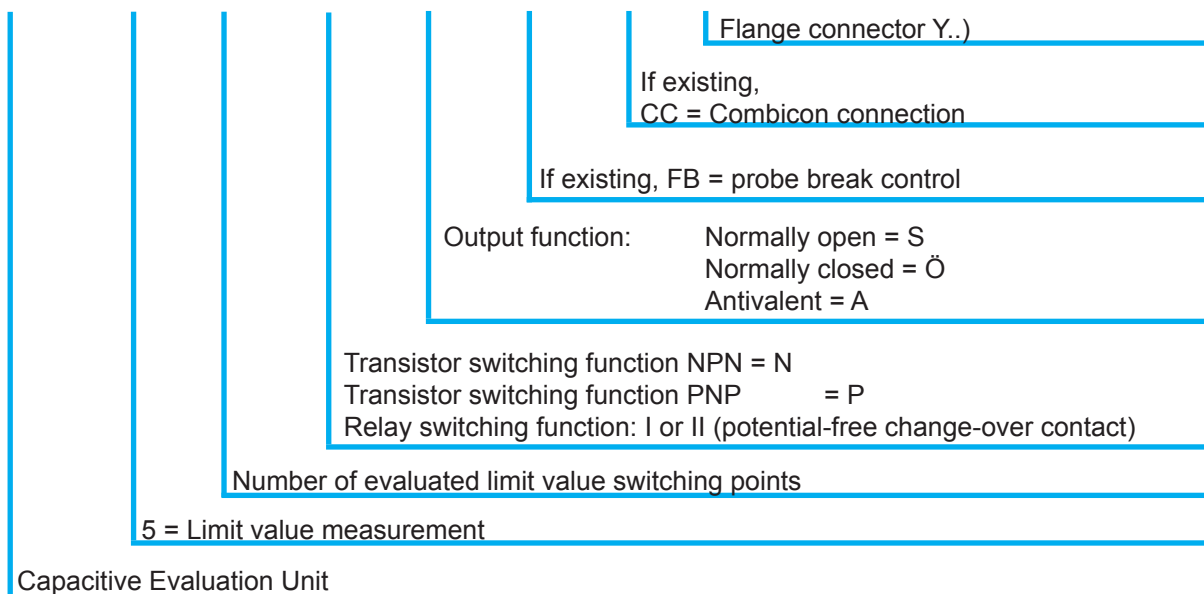
Capacitive Filling level probe with limit value switching point

**KFS-5-...-...-15/.../.../...-...-...-...-...-...**



Capacitive evaluation unit for level probes with limit value switching points

**KFA - 5 - ... - ... - ... - ... - ...-...**



All specifications are subject to change without notice. (10/2008)





**Capacitive Filling Level Probe - KFS**

Series: <sup>PER</sup> **LEVEL**

**1 Limit value switching point**

- For connection to the capacitive amplifier KFA-5-...-Y50
- Housing material: GFK, 16 mm Ø
- Probe length max. 2000 mm

Certificate:



Technical data

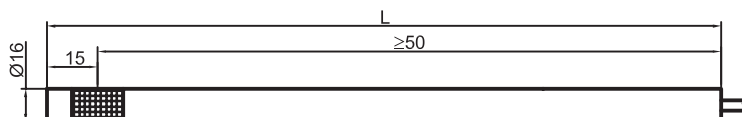
Active zone [mm]	10...25, related to probe tip
Type	KFS-5-1-“L“-15-Y55
Permitted ambient temperature (for active zone)	-70... +250 °C
Degree of protection IEC 60529 (Probe)	IP 67
Norm	EN 60947-5-2
Connection cable to the evaluation unit KFA-5-...-Y50	2 m coax-cable with coax-connector
Housing material	GFK
Active zone	GFK

Technical data for connectors on request.

A mounting device for the probe is available as an accessory (KB PG 16)  
Order details: see page 65

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

Please determine the total length “L” when ordering.



All specifications are subject to change without notice. (10/2008)

Made in Germany



## Capacitive Filling Level Probe - KFS

Series: **PER LEVEL**

1 Limit value switching point

- For connection to the capacitive amplifier KFA-5-...-Y70
- Housing material: GFK, 16 mm Ø
- Probe length max. 2000 mm

Certificate:



### Technical data

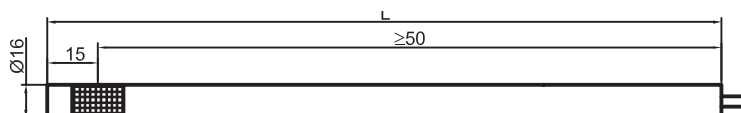
Active zone [mm]	10...25, related to probe tip
Type	KFS-5-1-"L"-15-Y76
Permitted ambient temperature (for active zone)	-70... +250 °C
Degree of protection IEC 60529 (Probe)	IP 67
Norm	EN 60947-5-2
Connection cable to the evaluation unit KFA-5-...-Y70	2 m coax-cable with angled coax-connector
Housing material	-
Active zone	GFK

Technical data for connectors on request.

A mounting device for the probe is available as an accessory (KB PG 16)  
Order details: See page 65

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

Please determine the total length "L" when ordering.



Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFS**  
**Series:** PER **LEVEL**  
**2 Limit value switching points**

- For connection to the capacitive amplifier KFA-5-...-Y70
- Housing material: GFK, 16 mm Ø
- Probe length max. 2000 mm

Certificate:



Technical data

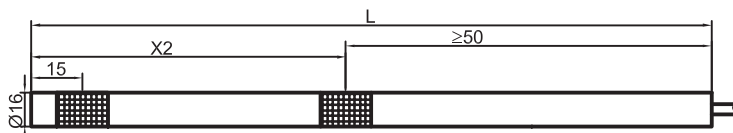
Active zones [mm]	10...25, related to probe tip + 1 x type specific X2
Type	KFS-5-2-"L"-15/X2-Y76
Permitted ambient temperature (for active zone)	-70... +250 °C
Degree of protection IEC 60529 (Probe)	IP 67
Norm	EN 60947-5-2
Connection cable to the evaluation unit KFA-5-...-Y70	2 m coax-cable with angled coax-connector
Housing material	-
Active zone	GFK
	-

Technical data for connectors on request.

A mounting device for the probe is available as an accessory (KB PG 16)  
 Order details: See page 65

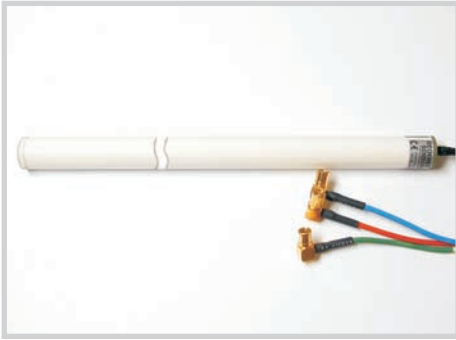
Other housing materials for the active zone (probe), like PE, PVDF, PTFE or PEEK on request.

Please determine the total length "L" and the position of the second switching point "X2" when ordering.



All specifications are subject to change without notice. (10/2008)

Made in Germany



## Capacitive Filling Level Probe - KFS

Series: *PER* **LEVEL**

3 Limit value switching points

- For connection to the capacitive amplifier KFA-5-...-Y70
- Housing material: GFK, 16 mm Ø
- Probe length max. 2000 mm

Certificate:



### Technical data

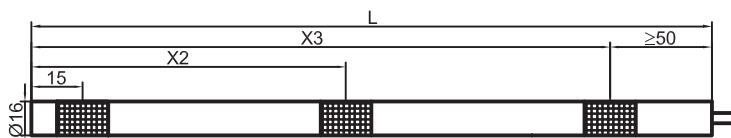
Active zones [mm]	10...25, related to the probe tip + 2 x type specific X2 / X3
Type	KFS-5-3-"L"-15/X2/X3-Y76
Permitted ambient temperature (for active zone)	-70...+250 °C
Degree of protection IEC 60529 (Probe)	IP 67
Norm	EN 60947-5-2
Connection cable to the evaluation unit KFA-5-...-Y70	2 m coax-cable with angled coax-connectors
Housing material	-
Active zone	GFK

Technical data for connectors on request.

A mounting device for the probe is available as an accessory (KB PG 16)  
Order details: see page 65

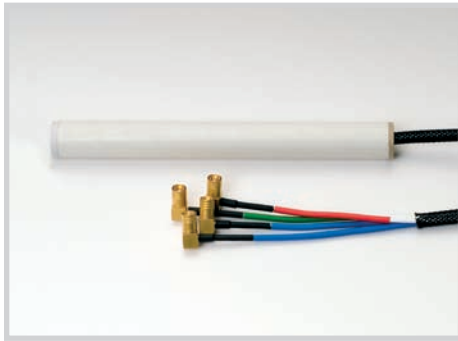
Other housing materials for the active zone (probe), like PE, PVDF, PTFE or PEEK on request.

Please determine the total length "L" and the position of the second and third switching point "X2 / X3" when ordering.



Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFS**  
**Series: <sup>PER</sup>LEVEL**  
**4 Limit value switching points**

- For connection to the capacitive amplifier KFA-5-...-Y70
- Housing material: GFK, 16 mm Ø
- Probe length max. 2000 mm

Certificate:



Technical data

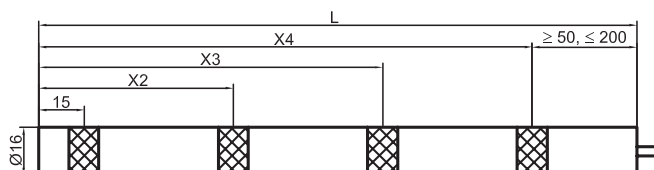
Active zones [mm]	10...25, related to the probe tip + 2 x type specific X2 / X3 / X4
Type	KFS-5-4-"L"-15/X2/X3/X4-Y76
Permitted ambient temperature (for active zone)	-70...+250 °C
Degree of protection IEC 60529 (Probe)	IP 67
Norm	EN 60947-5-2
Connection cable to the evaluation unit KFA-5-...-Y70	2 m coax-cable with angled coax-connectors
Housing material	-
Active zone	GFK

Technical data for connectors on request.

A mounting device for the probe is available as an accessory (KB PG 16)  
 Order details: see page 65

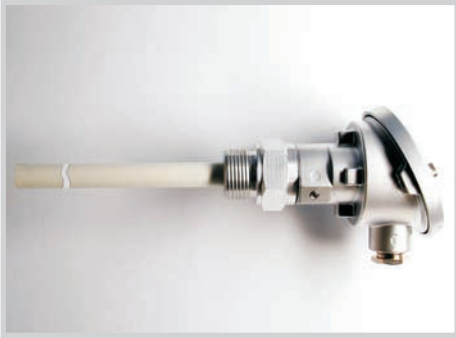
Other housing materials for the active zone (probe), like PE, PVDF, PTFE or PEEK on request.

Please determine the total length "L" and the position of the second, third and fourth switching point "X2 / X3 / X4" when ordering.



All specifications are subject to change without notice. (10/2008)

Made in Germany



## Capacitive Filling Level Probe - KFS

Series: *PER* **LEVEL**

1 Limit value switching point

- For connection to the capacitive amplifier:  
KFA-5-...-Y50 with plug connection Art.-No. 66101213  
KFA-5-...-Y70 with plug connection Art.-No. 66101203
- Housing material: GFK, 16 mm Ø
- Connection head and process connection aluminium die cast
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



### Technical data

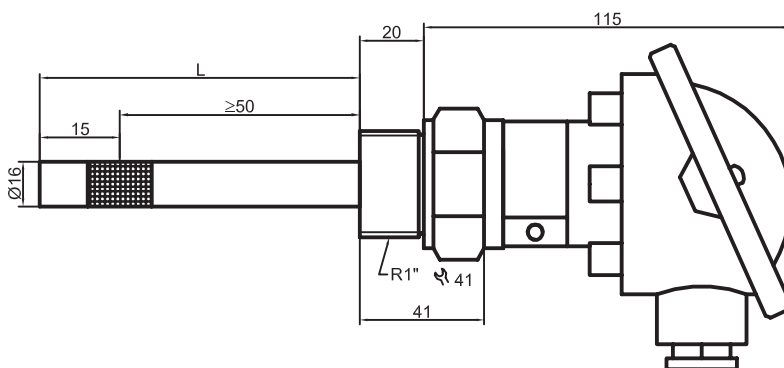
Active zone [mm]	10...25, related to the probe tip
Type	KFS-5-1-"L"-15-AL-1"
Permitted ambient temperature	-25...+100 °C
Permitted ambient temperature (for active zone)	-25...+150 °C
Degree of protection IEC 60529 (housing)	IP 67
Degree of protection IEC 60529 (screwing*cable connection)	IP 54
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...	SMB-sockets within the connection head
Housing material	AL
Active zone	GFK
Pressure	6 bar

Connection cable (with Y75/Y55 or Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66.

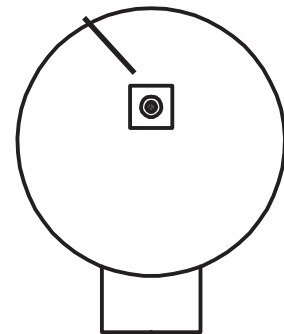
\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

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

Please determine the total length "L" when ordering.

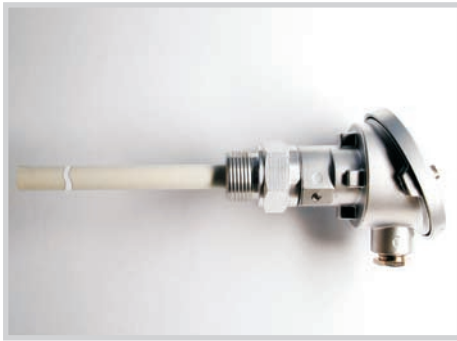


Connection socket within connection head



Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFS**

Series: <sup>PER</sup>LEVEL

**2 Limit value switching points**

- For connection to the capacitive amplifier:  
KFA-5-...-Y50 with plug connection Art.-No. 66101242  
KFA-5-...-Y70 with plug connection Art.-No. 66101204
- Housing material: GFK, 16 mm Ø
- Connection head and process connection aluminium die cast
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

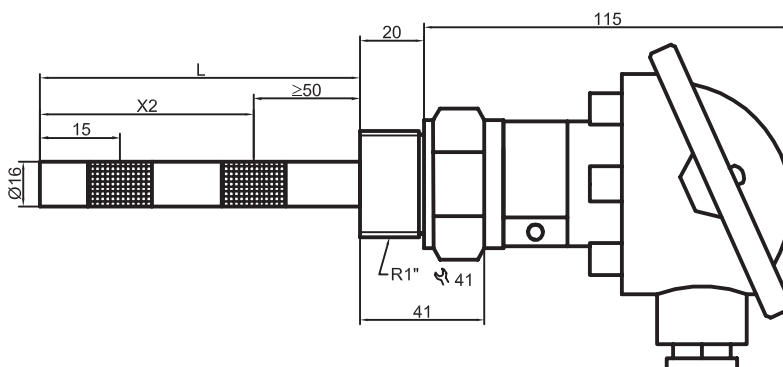
Active zones [mm]	10...25, related to probe tip + 1 x type specific X2
Type	KFS-5-2-"L"-15/X2-AL-1"
Permitted ambient temperature	-25... +100 °C
Permitted ambient temperature (for active zone)	-25...+150 °C
Degree of protection IEC 60529 (housing)	IP 67
Degree of protection IEC 60529 (screwing*cable connection)	IP 54
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...	SMB-sockets within the connection head
Housing material	AL
Active zone	GFK
Pressure	6 bar

Connection cable (with Y55/Y75 or Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66.

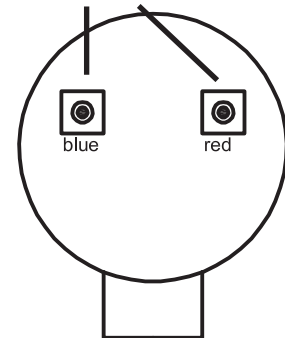
\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

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

Please determine the total length "L" and the position of the second switching point "X2" when ordering.



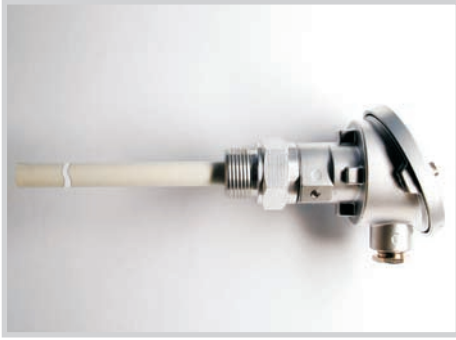
Connection sockets within connection head



Made in Germany

All specifications are subject to change without notice. (10/2008)





## Capacitive Filling Level Probe - KFS

Series: <sup>PER</sup>LEVEL

### 3 Limit value switching points

- For connection to the capacitive amplifier:  
KFA-5-...-Y70 with plug connection Art.-No. 66101254
- Housing material: GFK, 16 mm Ø
- Connection head and process connection aluminium die cast
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



#### Technical data

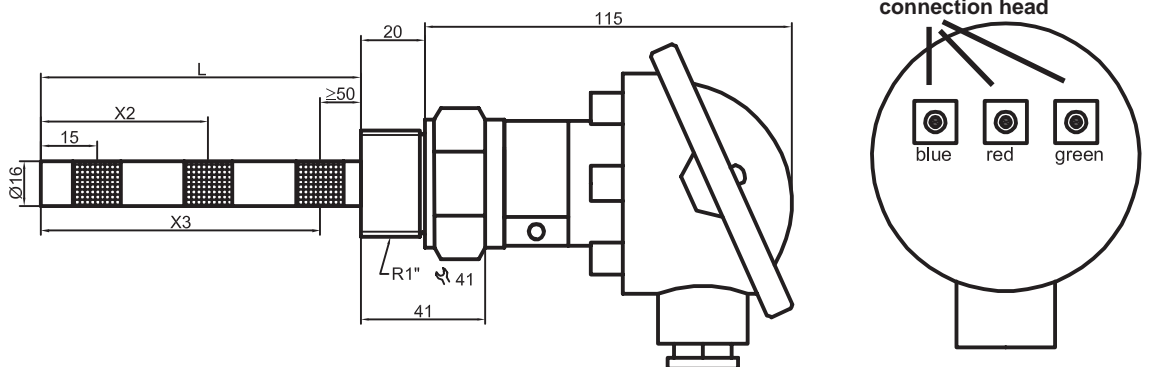
Active zones [mm]	10...25, related to probe tip + 2 x type specific X2 / X3
Type	KFS-5-3-"L"-15/X2/X3-AL-1"
Permitted ambient temperature	-25... +100 °C
Permitted ambient temperature (for active zone)	-25...+150 °C
Degree of protection IEC 60529 (housing)	IP 67
Degree of protection IEC 60529 (screwing*cable connection)	IP 54
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...-Y70	SMB-sockets within the connection head
Housing material	AL
Active zone	GFK
Pressure	6 bar

Connection cable (with Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66

\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

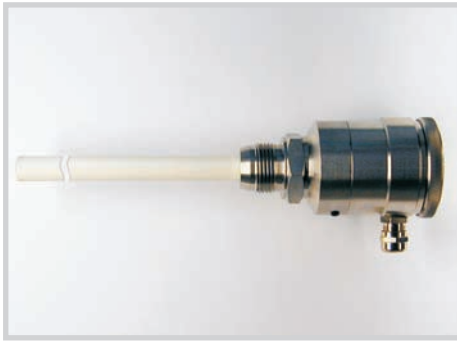
Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.

Please determine the total length "L" and the position of the second and third switching point "X2 / X3" when ordering.



Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFS**

Series: *PER LEVEL*

**1 Limit value switching point**

- For connection to the capacitive amplifier:  
KFA-5-...-Y50 with plug connection Art.-No. 66101213  
KFA-5-...-Y70 with plug connection Art.-No. 66101203
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

Active zone [mm]	10...25, related to the probe tip
Type	KFS-5-1-“L“-15-VA-1“
Permitted ambient temperature	-25...+100 °C
Permitted ambient temperature (for active zone)	-25...+150 °C
Degree of protection IEC 60529 (housing)	IP 67
Degree of protection IEC 60529 (screwing*cable connection)	IP 54
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...	SMB-sockets within the connection head
Housing material	VA No. 1.4571
Active zone	GFK
Pressure	25 bar

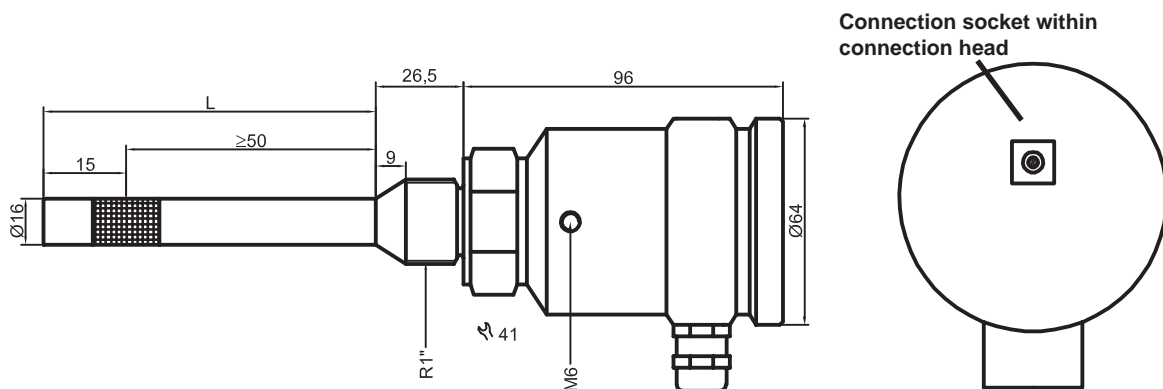
Connection cable (with Y75/Y55 or Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66.

\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

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

Please determine the total length “L” when ordering.

All specifications are subject to change without notice. (10/2008)



Made in Germany



## Capacitive Filling Level Probe - KFS

Series: **PER LEVEL**

2 Limit value switching points

- For connection to the capacitive amplifier:  
KFA-5-...-Y50 with plug connection Art.-No. 66101242  
KFA-5-...-Y70 with plug connection Art.-No. 66101204
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

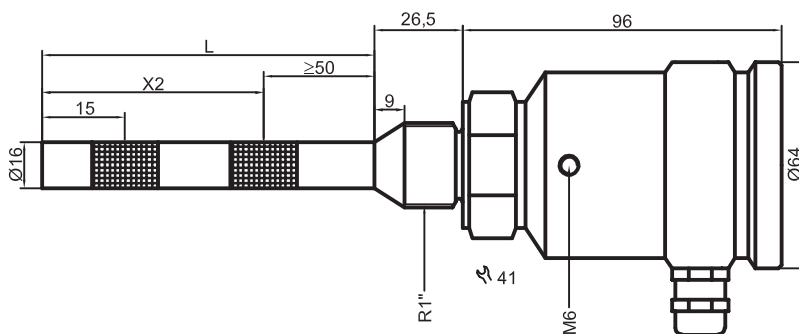
Active zones [mm]	10...25, related to the probe tip + 1 x type specific X2
Type	KFS-5-2-"L"-15/X2-VA-1"
Permitted ambient temperature	-25...+100 °C
Permitted ambient temperature (for active zone)	-25...+150 °C
Degree of protection IEC 60529 (housing)	IP 67
Degree of protection IEC 60529 (screwing*cable connection)	IP 54
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...	SMB-sockets within the connection head
Housing material	VA No. 1.4571
Active zone	GFK
Pressure	25 bar

Connection cable (with Y55/Y75 or Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66.

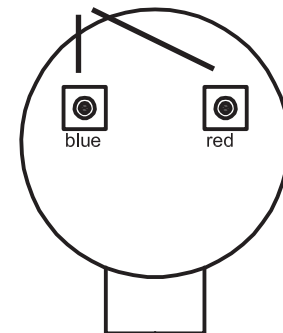
\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

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

Please determine the total length "L" and the position of the second switching point "X2" when ordering.

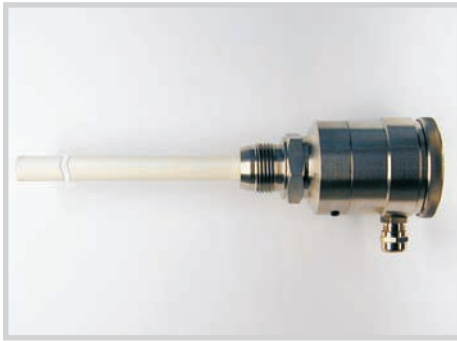


Connection sockets within connection head



Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFS**

Series: *PER* **LEVEL**

**3 Limit value switching points**

- For connection to the capacitive amplifier:  
KFA-5-...-Y70 with plug connection Art.-No. 66101205
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

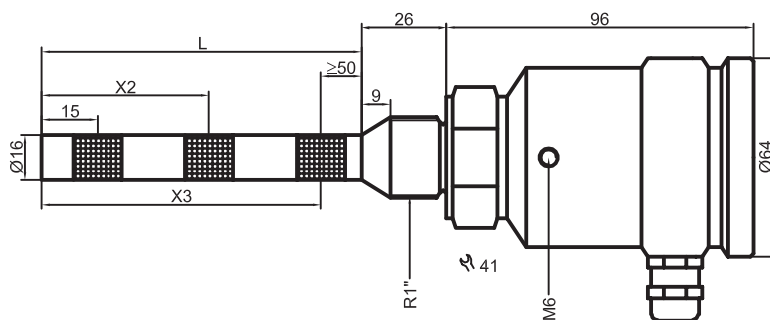
Active zones [mm]	10...25, related to probe tip + 2 x type specific X2 / X3
Type	KFS-5-3-"L"-15/X2/X3-VA-1"
Permitted ambient temperature	-25...+100 °C
Permitted ambient temperature (for active zone)	-25...+150 °C
Degree of protection IEC 60529 (housing)	IP 67
Degree of protection IEC 60529 (screwing*cable connection)	IP 54
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...-Y70	SMB-sockets within the connection head
Housing material	VA No. 1.4571
Active zone	GFK
Pressure	25 bar

Connection cable (with Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66.

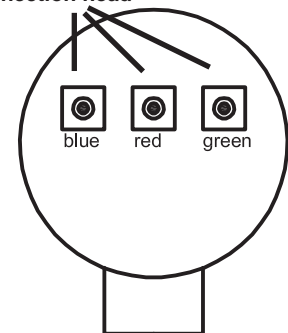
\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

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

Please determine the total length "L" and the position of the second and third switching point "X2 / X3" when ordering.

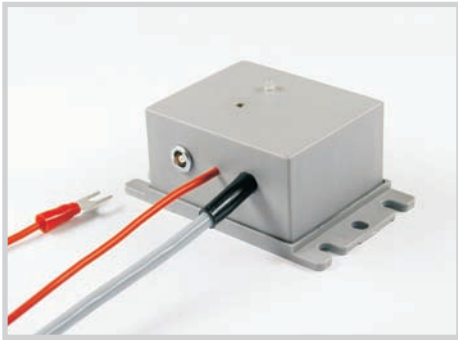


Connection sockets within connection head



All specifications are subject to change without notice. (10/2008)

Made in Germany



**Capacitive evaluation unit - KFA**  
**Series <sup>PER</sup> LEVEL**  
**NPN output**  
**PNP output**

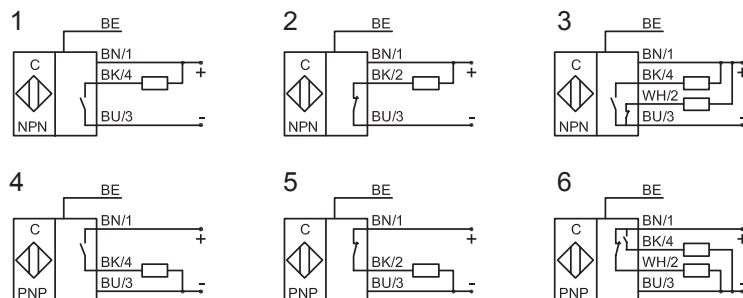
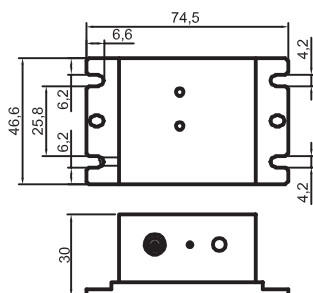
- For capacitive filling level probes with 1 limit value switching point: KFS-5-1-"L"-15-Y55  
 KFS-5-1-"L"-15-AL-1" with plug connection Art.-No. 66101213  
 KFS 5-1-"L"-15-VA-1" with plug connection Art.-No. 66101213
- Operating voltage: 18...36 V DC

Certificate:



Technical data

Electrical version	4-wire DC
Output function	Antivalent
Type NPN	KFA-5-1-N-Y-Y50
Art. No.	AF 0005
Connection diagram No.	3
Type PNP	KFA-5-1-P-A-Y50
Art. No.	AF 0004
Connection diagram No.	6
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	$\leq 2,5$ V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 54
Norm	EN 60947-5-2
Connection cable	2 m, PUR, 4 x 0.14 mm <sup>2</sup>
Housing material	PA



Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive evaluation unit - KFA**  
**Series** PER **LEVEL**  
**NPN output**  
**PNP output**

- For capacitive filling level probes with 1 limit value switching point:  
 KFS-5-1-...-15-Y55  
 KFS-5-1-"L"-15-AL-1" with plug connection Art.-No. 66101213  
 KFS-5-1-"L"-15-VA-1" with plug connection Art.-No. 66101213
- Operating voltage: 18...36 V DC

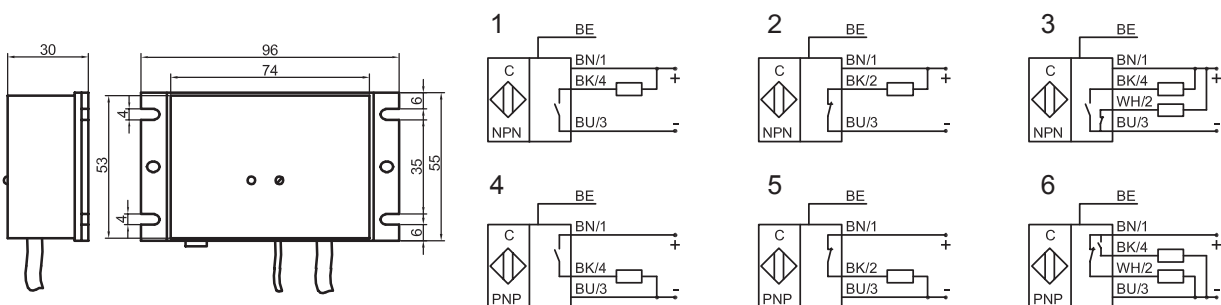
Certificate:



Technical data

Electrical version	4 wire DC
Output function	Antivalent
Type NPN	KFA-5-1-L-N-A-Y50
Art. No	AF 0068
Connection diagram No.	3
Type PNP	KFA-5-1-L-P-A-Y50
Art. No.	AF 0064
Connection diagram No.	6
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_o$ )	$\leq 2,5$ V
Permitted ripple max.	40 %
No-load current ( $I_o$ )	Typ. 75 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
LED display	Green / yellow
Protection circuit	Built-in
Degree of protection IEC 60529	IP 54
Norm	EN 60947-5-2
Connection cable	2 m, PVC, 4 x 0,34 mm <sup>2</sup>
Housing material	PA

All specifications are subject to change without notice. (10/2008)



Made in Germany



## Capacitive evaluation unit - KFA

Series <sup>PER</sup>LEVEL

NPN output

PNP output

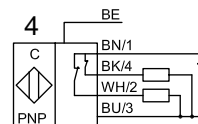
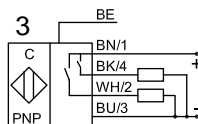
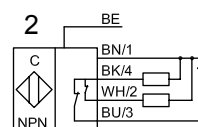
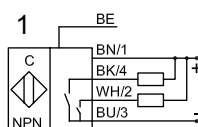
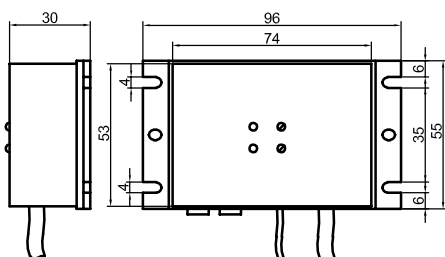
- For 2 capacitive filling level probes with 1 limit value switching point:  
KFS-5-1-...-15-Y55  
KFS-5-1-"L"-15-AL-1" with plug connection Art.-No. 66101213  
KFS-5-1-"L"-15-VA-1" with plug connection Art.-No. 66101213
- For 1 capacitive filling level probe with 2 limit value switching points  
KFS-5-2-...-15/X2-Y55
- Operating voltage: 18...36 V DC

Certificate:



### Technical data

Electrical version	4 wire DC	4 wire DC
Output function	NO	NC
Type NPN	KFA-5-2-L-N-S-Y50	KFA-5-2-L-N-Ö-Y50
Art. No	AF 0066	AF 0067
Connection diagram No.	1	2
Type PNP	KFA-5-2-L-P-S-Y50	KFA-5-2-L-P-Ö-Y50
Art. No.	AF 0065	AF 0062
Connection diagram No.	3	4
Operating voltage ( $U_b$ )	18...36 V DC	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA	2 x 250 mA
Voltage drop max. ( $U_d$ )	$\leq 2,5$ V	$\leq 2,5$ V
Permitted ripple max.	40 %	40 %
No-load current ( $I_o$ )	Typ. 75 mA	Typ. 75 mA
Switching frequency max.	4 Hz	4 Hz
Permitted ambient temperature	-25...+55 °C	-25...+55 °C
LED display	Green / yellow	Green / yellow
Protection circuit	Built-in	Built-in
Degree of protection IEC 60529	IP 54	IP 54
Norm	EN 60947-5-2	EN 60947-5-2
Connection cable	2 m, PVC, 4 x 0,34 mm <sup>2</sup>	2 m, PVC, 4 x 0,34 mm <sup>2</sup>
Housing material	PA	PA



Made in Germany

All specifications are subject to change without notice. (10/2008)





**Capacitive Filling Level Evaluator - KFA - Master**  
**Series *PER LEVEL***  
**NPN output**  
**PNP output**

- For capacitive filling level probes with 1, 2 3 or 4 limit value switching points KFS-5-...
- Operating voltage 18...36 V DC

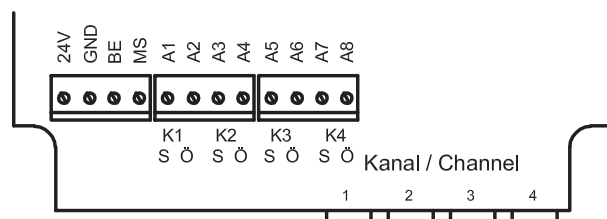
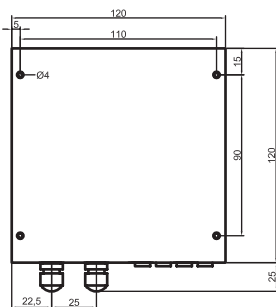
Certificate:



Technical data

Output function	4 x antivalent
Type NPN	KFA-5-4-N-A-CC-Y50
Art. No	AF 0086
Type PNP	KFA-5-4-P-A-CC-Y50
Art. No.	AF 0063
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	250 mA each channel
Voltage drop max. ( $U_d$ )	$\leq 2,5$ V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 120 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25... +55 °C
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 54
Norm	EN 60947-5-2
Connection	Screwing clamp terminals and sockets
Housing material	ABS

All specifications are subject to change without notice. (10/2008)



Made in Germany



## Capacitive Filling Level Evaluator - KFA Series <sup>PER</sup> LEVEL

### PNP Output

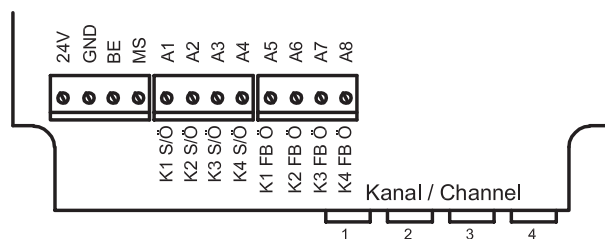
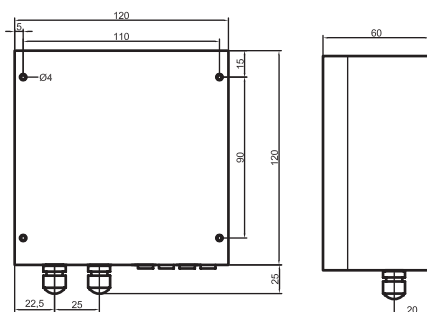
- For capacitive filling level probes with 1, 2 3 or 4 limit value switching points KFS-5-...
- With sensor break control
- Operating voltage 18...36 V DC

Certificate:



### Technical data

Output function	4 x antivalent	4 x antivalent
Type NPN	KFA-5-4-N-S-4FB-Ö-CC-Y50	KFA-5-4-N-Ö-4FB-Ö-CC-Y50
Art. No	AF 0091	AF 0090
Type PNP	KFA-5-4-P-S-4FB-Ö-CC-Y50	KFA-5-4-P-Ö-4FB-Ö-CC-Y50
Art. No.	AF 0046	AF 0089
Operating voltage ( $U_B$ )	18...36 V DC	18...36 V DC
Output current max. ( $I_o$ )	250 mA each channel	250 mA each channel
Voltage drop max. ( $U_d$ )	$\leq 2,5$ V	$\leq 2,5$ V
Permitted residual ripple max.	40 %	40 %
No-load current ( $I_o$ )	Typ. 130 mA	Typ. 130 mA
Switching frequency max.	4 Hz	4 Hz
Permitted ambient temperature	-25...+55 °C	-25...+55 °C
LED-Display	Green / yellow	Green / yellow
Protective circuit	Built-in	Built-in
Degree of protection IEC 60529	IP 54	IP 54
Norm	EN 60947-5-2	EN 60947-5-2
Connection	Screwing clamp terminals and sockets	Screwing clamp terminals and sockets
Housing material	ABS	ABS



Made in Germany

All specifications are subject to change without notice. (10/2008)



## Capacitive Filling Level Evaluator - KFA - Master Series <sup>PER</sup>LEVEL®

### PNP Output

- For capacitive filling level probes with 1, 2 3 or 4 limit value switching points KFS-5-...
- Operating voltage 18...36 V DC

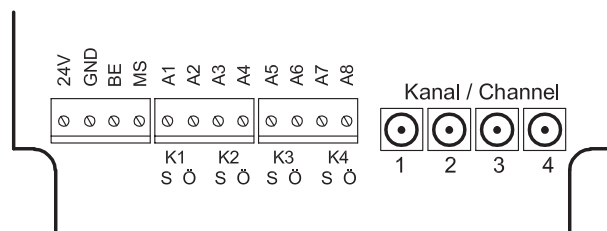
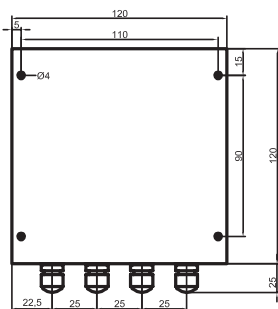
Certificate:



### Technical data

Output function	4 x antivalent
Type NPN	KFA-5-4-N-A-CC-Y70
Art. No.	AF 0096
Type PNP	KFA-5-4-P-A-CC-Y70
Art. No.	AF 0080
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	250 mA each channel
Voltage drop max. ( $U_d$ )	≤ 2,5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 120 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25... +55 °C
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 54
Norm	EN 60947-5-2
Connection	Screwing clamp terminals and sockets
Housing material	ABS

All specifications are subject to change without notice. (10/2008)



Made in Germany



## Capacitive Filling Level Evaluator - KFA Series <sup>PER</sup> LEVEL

### PNP Output

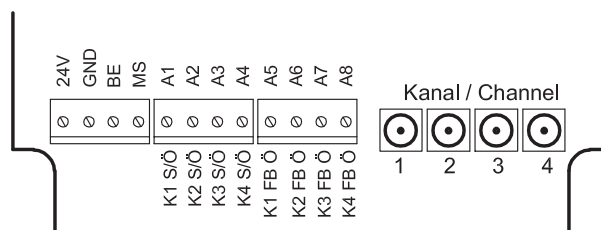
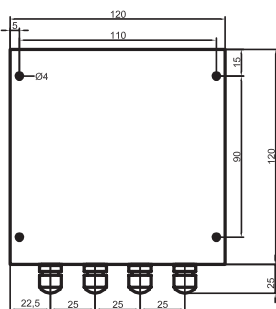
- For capacitive filling level probes with 1, 2 3 or 4 limit value switching points KFS-5-...
- With sensor break control
- Operating voltage 18...36 V DC

Certificate:



### Technical data

Output function	4 x antivalent	4 x antivalent
Type NPN	KFA-5-4-N-S-4FB-Ö-CC-Y70	KFA-5-4-N-Ö-4FB-Ö-CC-Y70
Art. No.	AF 0097	AF 0098
Type PNP	KFA-5-4-P-S-4FB-Ö-CC-Y70	KFA-5-4-P-Ö-4FB-Ö-CC-Y70
Art. No.	AF 0099	AF 0100
Operating voltage ( $U_B$ )	18...36 V DC	18...36 V DC
Output current max. ( $I_o$ )	250 mA each channel	250 mA each channel
Voltage drop max. ( $U_o$ )	$\leq 2,5$ V	$\leq 2,5$ V
Permitted residual ripple max.	40 %	40 %
No-load current ( $I_o$ )	Typ. 130 mA	Typ. 130 mA
Switching frequency max.	4 Hz	4 Hz
Permitted ambient temperature	-25...+55 °C	-25...+55 °C
LED-Display	Green / yellow	Green / yellow
Protective circuit	Built-in	Built-in
Degree of protection IEC 60529	IP 54	IP 54
Norm	EN 60947-5-2	EN 60947-5-2
Connection	Screwing clamp terminals and sockets	Screwing clamp terminals and sockets
Housing material	ABS	ABS



Made in Germany

All specifications are subject to change without notice. (10/2008)



## Capacitive Evaluation Unit - KFA Series <sup>PER</sup>LEVEL Relay output

- For connection of one capacitive level probes with 1 limit value switching point KFS-5-1-...
- Operating voltage 115 / 230 V AC
- With wire break control

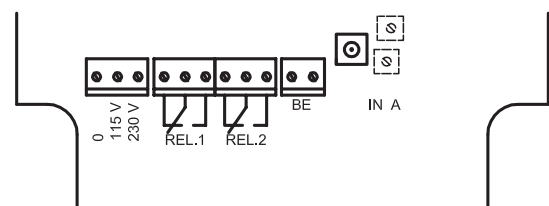
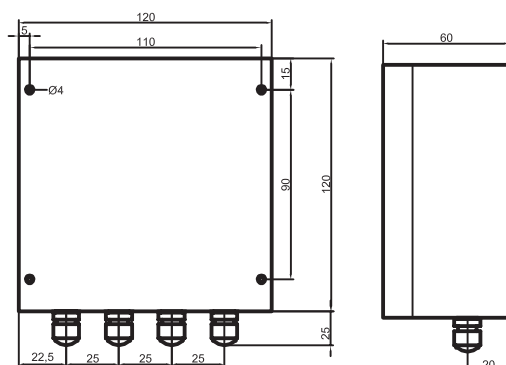
Certificate:



Technical data

Output	2 x change-over contact
Type	KFA-5-1-I-KL
Art.-No.	972 210
Operating voltage ( $U_B$ )	105...125/207...253 AC 50/60 Hz
Contact rating each relay max.	Max. 120 V DC/1A-250 V AC/4A
Permitted residual ripple max.	-
Power consumption	Typ. 3 VA
Permitted ambient temperature	-25...+55 °C
LED-display	Green ( $U_B$ stand by)
LED-display	Static: green / red (full / empty)
Wire break control	Green (flashing)
Protective circuit	-
Norm	EN 60947-5-2
Degree of protection IEC 60529	IP 54
Connection	Screwing clamp terminals and SMB-sockets
Housing material	ABS

All specifications are subject to change without notice. (10/2008)



Made in Germany



## Capacitive Evaluation Unit - KFA Series *PER* LEVEL Relay output

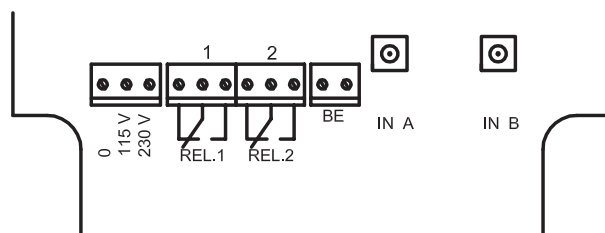
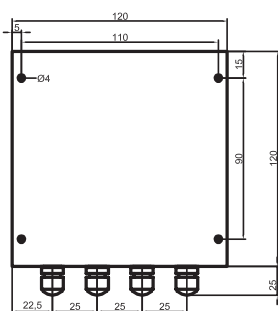
- For capacitive filling level probes with 2 limit value switching points KFS-5-2-... or 2 probes with 1 limit value switching point
- Operating voltage 115 / 230 V AC

Certificate:



### Technical data

Output	1 x change-over contact each channel
Type	KFA-5-2-II-KL-PG9
Art.-No.	AF 0049
Operating voltage (U <sub>B</sub> )	105...125/207...253 AC 50/60 Hz
Contact rating each relay max.	Max. 120 V DC/1A-250 V AC/4A
Permitted residual ripple max.	-
Power consumption	Typ. 3 VA
Permitted ambient temperature	-25...+55 °C
LED-display	Green (U <sub>B</sub> stand by)
LED-display	Static: green / red (full / empty)
Protective circuit (over temperature)	Built-in
Norm	EN 60947-5-2
Degree of protection IEC 60529	IP 54
Connection	Screwing clamp terminals and SMB-sockets
Housing material	ABS



Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Evaluation Unit - KFA**  
**Series PER LEVEL**  
**Relay output**

- For connection of one capacitive level probes with 1 limit value switching point KFS-5-1-...-Y55
- Operating voltage 115 / 230 V AC

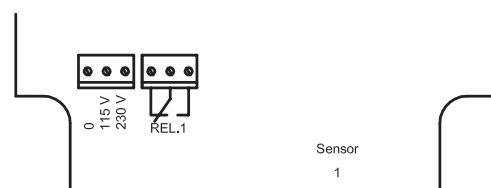
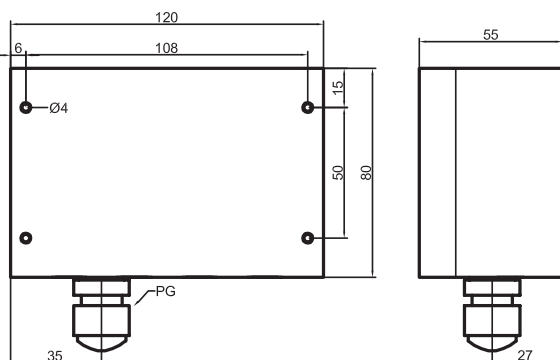
Certificate:



Technical data

Output	1 x change-over contact
Type	KFA-5-1-XL-I-CC-Y50
Art.-No.	AF 0101
Operating voltage ( $U_B$ )	105...125/207...253 AC 50/60 Hz
Contact rating each relay max.	Max. 120 V DC/1A-250 V AC/4A
Permitted residual ripple max.	-
Power consumption	Typ. 3 VA
Permitted ambient temperature	-25...+55 °C
LED-display	Green ( $U_B$ stand by)
LED-display	Static: green / red (full / empty)
Protective circuit	-
Norm	EN 60947-5-2
Degree of protection IEC 60529	IP 54
Connection	CC-Screwing clamp terminals and ODU-sockets
Housing material	ABS

All specifications are subject to change without notice. (10/2008)



Made in Germany



**Capacitive Evaluation Unit - KFA**  
**Series** *PER* **LEVEL**  
**Relay output**

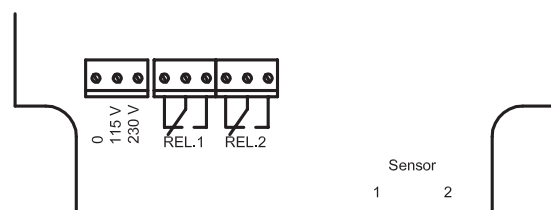
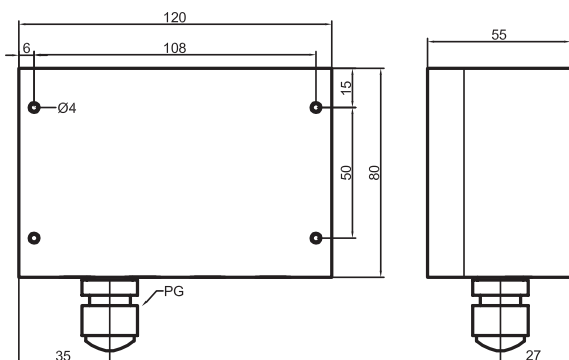
- For capacitive filling level probes with 2 limit value switching points KFS-5-2-...-Y55 or 2 probes with 1 limit value switching point KFS-5-1-...-Y55
- Operating voltage 115 / 230 V AC

Certificate:



Technical data

Output	2 x change-over contact each channel
Type	KFA-5-2-XL-II-CC-Y50
Art.-No.	AF 0102
Operating voltage (U <sub>B</sub> )	105...125/207...253 AC 50/60 Hz
Contact rating each relay max.	Max. 120 V DC / 1A - 250 V AC/4A
Permitted residual ripple max.	-
Power consumption	Typ. 3 VA
Permitted ambient temperature	-25...+55 °C
LED-display	Green (U <sub>B</sub> stand by)
LED-display	Static: green / red (full / empty)
Protective circuit	-
Norm	EN 60947-5-2
Degree of protection IEC 60529	IP 54
Connection	CC-Screwing clamp terminals and ODU-sockets
Housing material	ABS



Made in Germany

All specifications are subject to change without notice. (10/2008)



**LIMIT VALUE MEASUREMENT  
COMPACT**

*PER* **LEVEL**<sup>®</sup>

**LEVEL PROBE KFX-5-...  
LEVEL PROBE KFX-4-...**

Pages:

Type code	46
Capacitive Filling Level Probe Compact with 1 or 2 switching points KFX-5...	47 - 52
Capacitive Filling Level Probe Compact with min/max Control	53
Capacitive Filling Level Probe Compact with 1 or 2 variable switching points KFX-4...	54 - 55

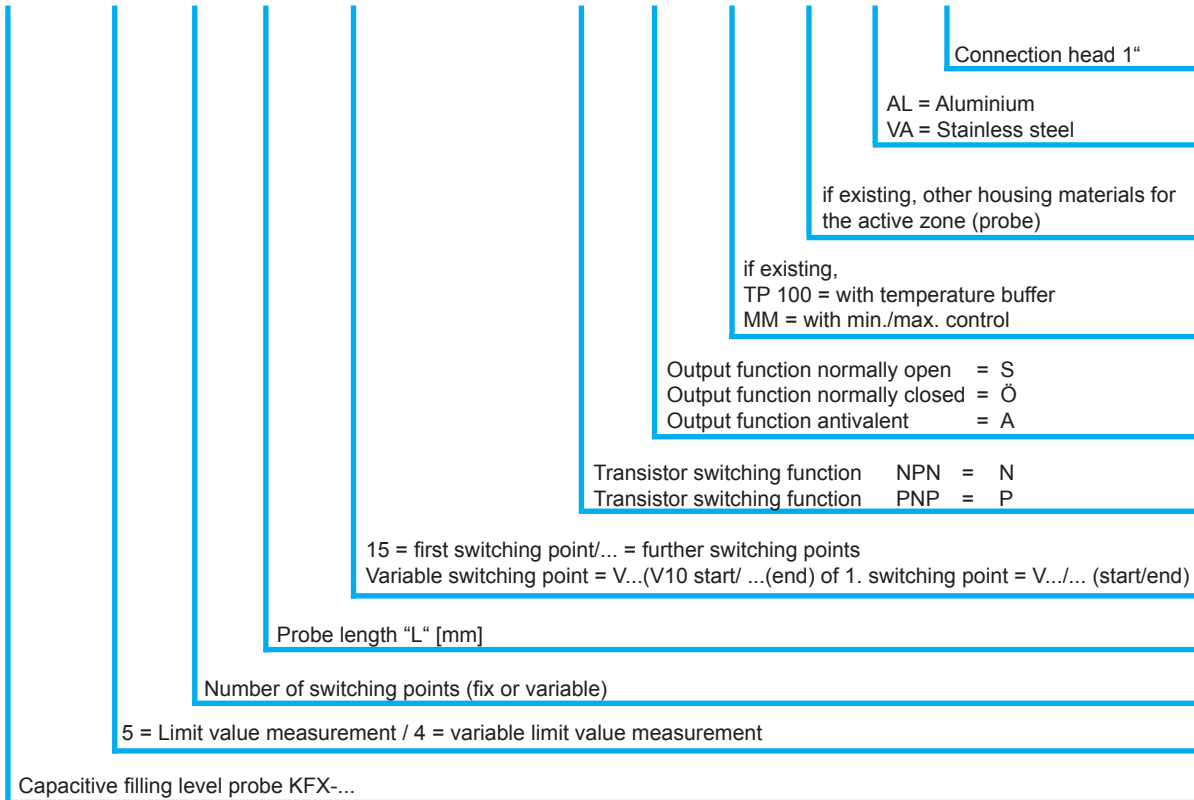
All specifications are subject to change without notice. (10/2008)

## TYPE CODE

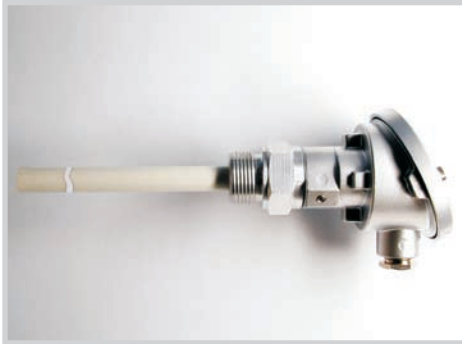
PER **L&VEL**®

### Capacitive Filling level probe with limit value switching point

KFX-.....-15/.../.....-1“



All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFX**  
**Series: <sup>PER</sup>LEVEL COMPACT**  
**NPN Output - Antivalent**  
**PNP Output - Antivalent**  
**1 Limit value switching point**

- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection aluminium die cast
- Process connection 1"
- Probe length max. 2000 mm

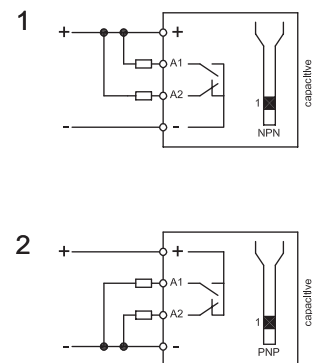
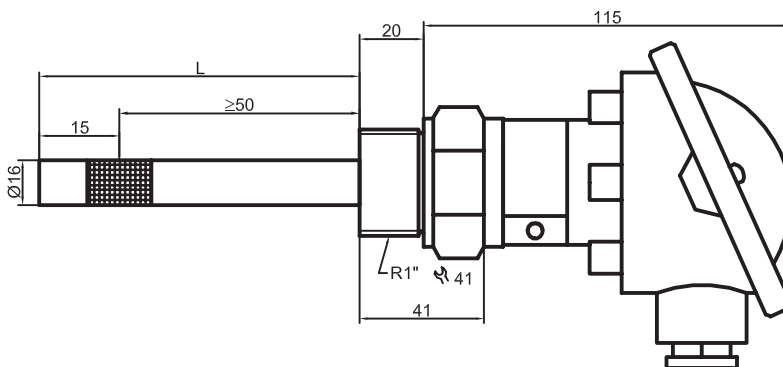
Certificate:



Technical data

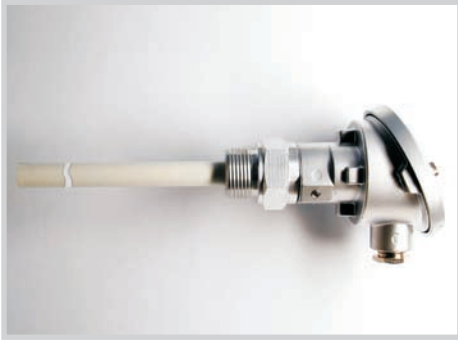
Active zone [mm]	10...25, related to probe tip
Electrical version	4 connections DC
Output function	Antivalent
Type NPN	KFX-5-1-"L"-15-N-A-AL-1"
Connection diagram No.	1
Type PNP	KFX-5-1-"L"-15-P-A-AL-1"
Connection diagram No.	2
Operating voltage ( $U_b$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	6 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	AL
Active zone	GFK

All specifications are subject to change without notice. (10/2008)



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ when ordering.

Made in Germany



**Capacitive Filling Level Probe - KFX**  
**Series: *PER* LEVEL COMPACT**  
**NPN Output - Normally Open**  
**PNP Output - Normally Open**  
**2 Limit value switching points**

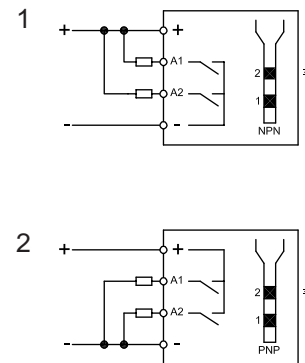
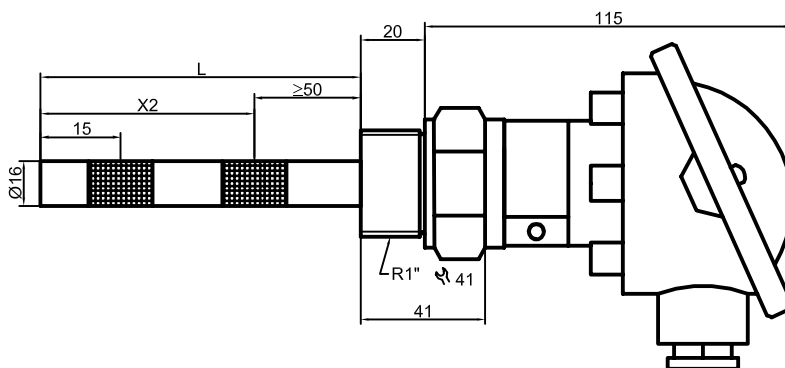
- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection aluminium die cast
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

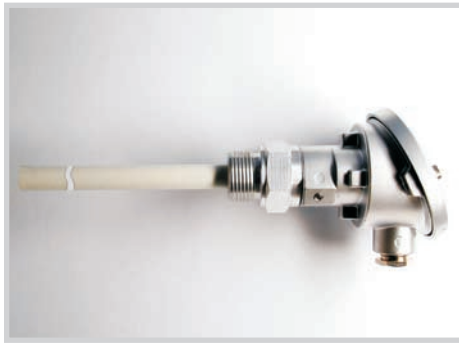
Active zones [mm]	10...25, related to probe tip + 1 x type specific X2
Electrical version	4 connections DC
Output function	NO
Type NPN	KFX-5-2-"L"-15/X2-N-S-AL-1"
Connection diagram No.	1
Type PNP	KFX-5-2-"L"-15/X2-P-S-AL-1"
Connection diagram No.	2
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	6 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	AL
Active zone	GFK



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ and the position of the second switching point “X2” when ordering.

Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFX**  
**Series: *PER LEVEL* COMPACT**  
**NPN Output - Normally Closed**  
**PNP Output - Normally Closed**  
**2 Limit value switching points**

- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection aluminium die cast
- Process connection 1"
- Probe length max. 2000 mm

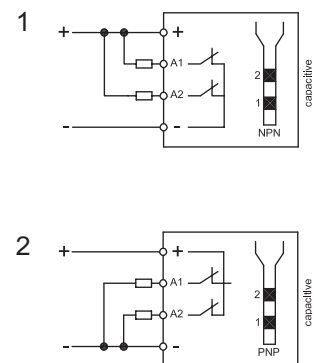
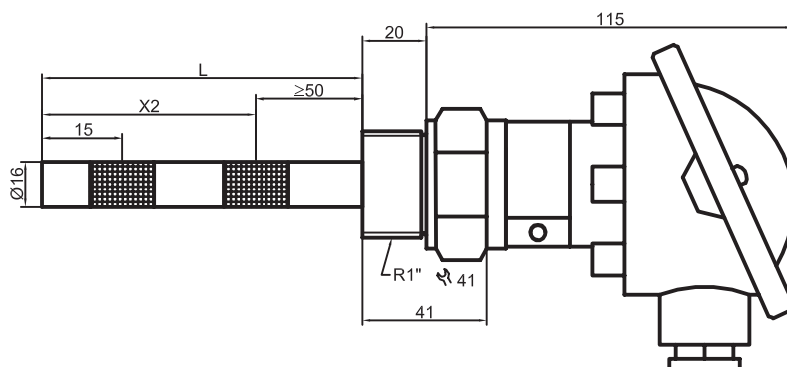
Certificate:



Technical data

Active zones [mm]	10...25, related to probe tip + 1 x type specific X2
Electrical version	4 connections DC
Output function	NC
Type NPN	KFX-5-2-"L"-15/X2-N-Ö-AL-1"
Connection diagram No.	1
Type PNP	KFX-5-2-"L"-15/X2-P-Ö-AL-1"
Connection diagram No.	2
Operating voltage ( $U_b$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	6 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	AL
Active zone	GFK

All specifications are subject to change without notice. (10/2008)



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ and the position of the second switching point „X2“ when ordering.

Made in Germany



**Capacitive Filling Level Probe - KFX**  
**Series: PER LEVEL COMPACT**  
**NPN Output - Antivalent**  
**PNP Output - Antivalent**  
**1 Limit value switching point**

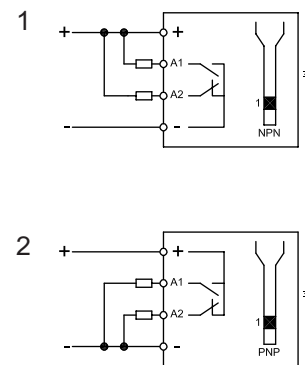
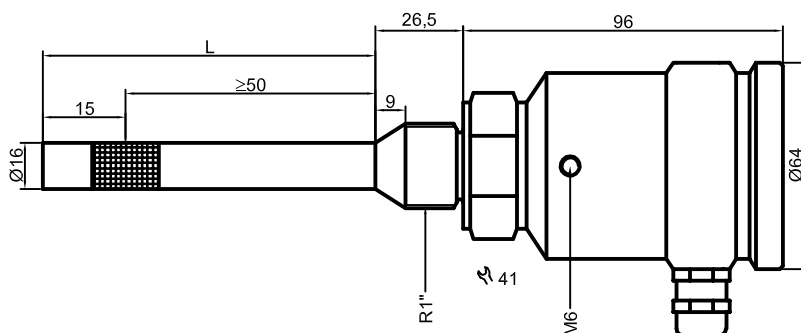
- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

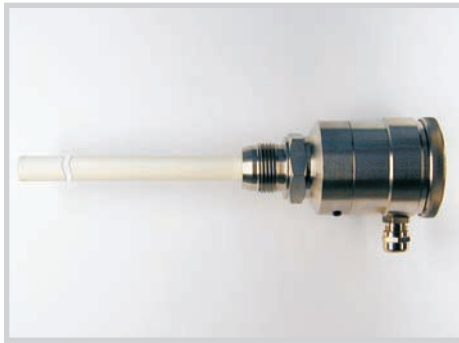
Active zone [mm]	10...25, related to probe tip
Electrical version	4 connections DC
Output function	Antivalent
Type NPN	KFX-5-1-"L"-15-N-A-VA-1"
Connection diagram No.	1
Type PNP	KFX-5-1-"L"-15-P-A-VA-1"
Connection diagram No.	2
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	25 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminals within the connection head
Housing material	VA No. 1.4571
Active zone	GFK



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ when ordering.

Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFX**  
**Series: *PER* LEVEL COMPACT**  
**NPN Output - Normally Open**  
**PNP Output - Normally Open**  
**2 Limit value switching points**

- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

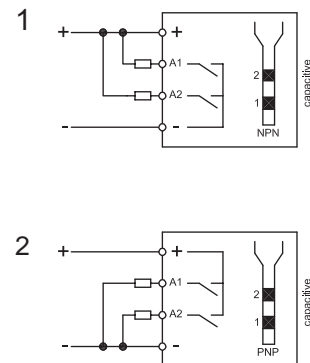
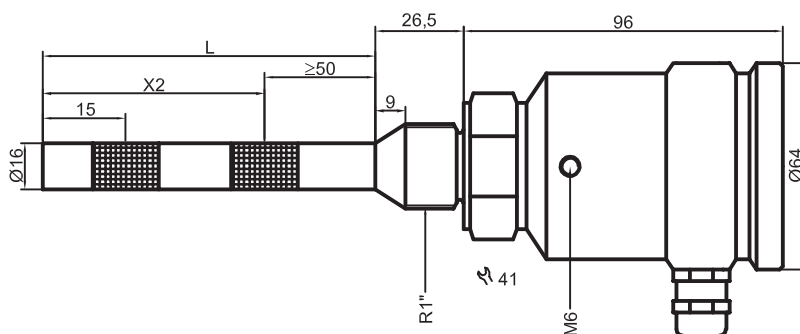
Certificate:



Technical data

Active zones [mm]	10...25, related to probe tip + 1 x type specific X2
Electrical version	4 connections DC
Output function	NO
Type NPN	KFX-5-2-"L"-15/X2-N-S-VA-1"
Connection diagram No.	1
Type PNP	KFX-5-2-"L"-15/X2-P-S-VA-1"
Connection diagram No.	2
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	25 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	VA No. 1.4571
Active zone	GFK

All specifications are subject to change without notice. (10/2008)



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ and the position of the second switching point “X2” when ordering.

Made in Germany



**Capacitive Filling Level Probe - KFX**  
**Series: <sup>PER</sup>LEVEL COMPACT**  
**NPN Output - Normally Closed**  
**PNP Output - Normally Closed**  
**2 Limit value switching points**

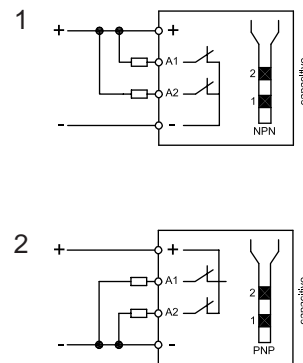
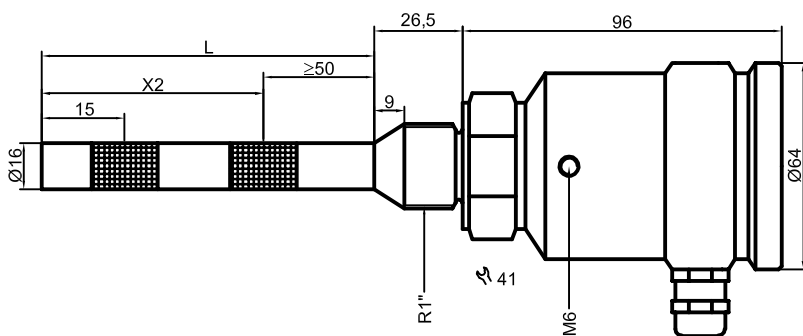
- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

Active zones [mm]	10...25, related to probe tip + 1 x type specific X2
Electrical version	4 connections DC
Output function	NC
Type NPN	KFX-5-2-"L"-15/X2-N-Ö-VA-1"
Connection diagram No.	1
Type PNP	KFX-5-2-"L"-15/X2-P-Ö-VA-1"
Connection diagram No.	2
Operating voltage (U <sub>B</sub> )	18...36 V DC
Output current max. (I <sub>e</sub> )	2 x 250 mA
Voltage drop max. (U <sub>d</sub> )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current (I <sub>o</sub> )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	25 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	VA No. 1.4571
Active zone	GFK



Other housing materials for the active zone (probe) like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ and the position of the second switching point „X2“ when ordering.

Made in Germany

All specifications are subject to change without notice. (10/2008)





**Capacitive Filling Level Probe - KFX**  
**Series: *PER* LEVEL COMPACT**  
**NPN Output - Antivalent**  
**PNP Output - Antivalent**  
**2 Limit value switching points / MIN/MAX-Control**

- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

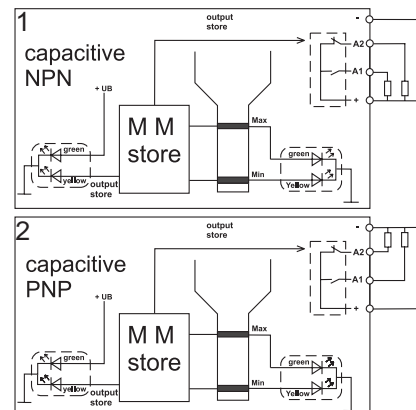
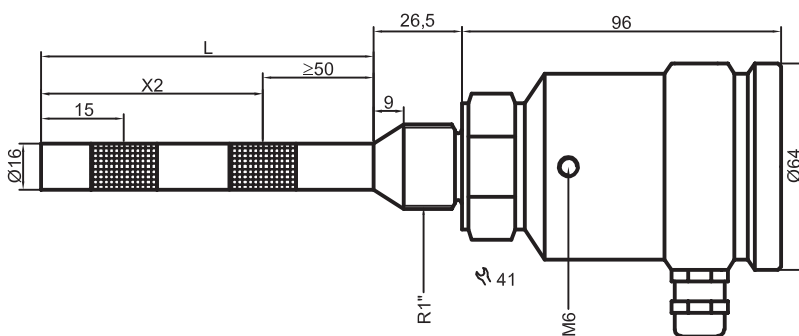
Certificate:



Technical data

Active zones [mm]	10...25, related to probe tip + 1 x type specific X2
Electrical version	4 connections DC
Output function	Antivalent
Type NPN	KFX-5-2-"L"-15/X2-N-A-MM-VA-1"
Connection diagram No.	1
Type PNP	KFX-5-2-"L"-15/X2-P-A-MM-VA-1"
Connection diagram No.	2
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	25 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	VA No. 1.4571
Active zone	GFK

All specifications are subject to change without notice. (10/2008)



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ and the position of the second switching point „X2“ when ordering.

Made in Germany



**Capacitive Filling Level Probe - KFX**  
**Series: <sup>PER</sup>LEVEL COMPACT**  
**NPN Output - Antivalent**  
**PNP Output - Antivalent**  
**1 Variable limit value switching point**

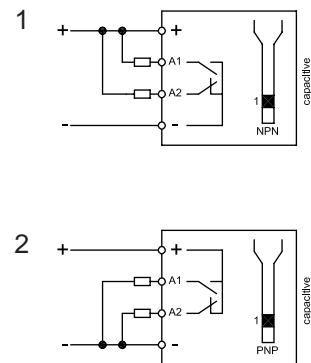
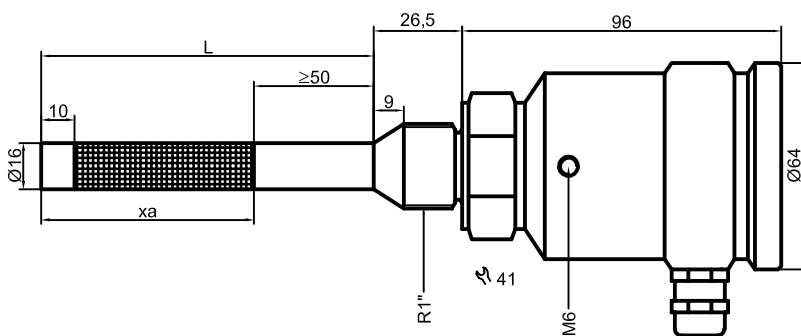
- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



Technical data

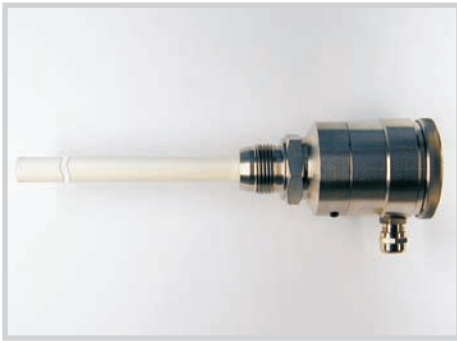
Active zones [mm]	10...25, related to probe tip + 1 x type specific xa
Electrical version	4 connections DC
Output function	Antivalent
Type NPN	KFX-4-1-"L"-V10/xa-N-A-VA-1"
Connection diagram No.	1
Type PNP	KFX-4-1-"L"-V10/xa-P-A-VA-1"
Connection diagram No.	2
Operating voltage (U <sub>B</sub> )	18...36 V DC
Output current max. (I <sub>e</sub> )	2 x 250 mA
Voltage drop max. (U <sub>d</sub> )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current (I <sub>0</sub> )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	25 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	VA No. 1.4571
Active zone	GFK



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ when ordering.

Made in Germany

All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFX**  
**Series: *PER LEVEL* COMPACT**  
**NPN Output - Normally Open**  
**PNP Output - Normally Open**  
**2 Variable limit value switching points**

- Integrated evaluation electronics
- Housing material: GFK, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

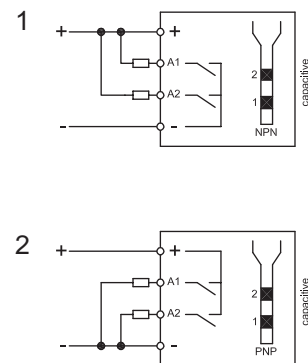
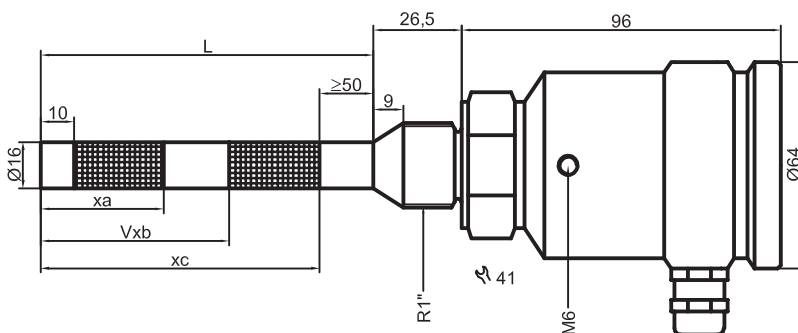
Certificate:



Technical data

Active zones [mm]	10...25, related to probe tip + 2 x type specific xa-Vxb/xc
Electrical version	4 connections DC
Output function	NO
Type NPN	KFX-4-2-"L"-V10/xa-Vxb/xc-N-S-VA-1"
Connection diagram No.	1
Type PNP	KFX-4-2-"L"-V10/xa-Vxb/xc-P-S-VA-1"
Connection diagram No.	2
Operating voltage ( $U_B$ )	18...36 V DC
Output current max. ( $I_o$ )	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
Pressure	25 bar
LED-Display	Green / yellow
Protective circuit	Built-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection	Clamp terminal within the connection head
Housing material	VA No. 1.4571
Active zone	GFK

All specifications are subject to change without notice. (10/2008)



Other housing materials for the active zone (probe), like PE, PVDF or PEEK on request.  
 Please determine the total length „L“ and the position of the second switching points “V10/xa and Vxb/xc”  
 when ordering.

Made in Germany



**CAPACITIVE FILLING LEVEL  
PROBE (COMPACT) ATEX**

*TRUE* **LEVEL®**

*PER* **LEVEL®**

**SENSOR KFS-1/5-...  
SENSOR KFX-5-...**

Pages:

Type code	58
Filling level probe analogue	59
Filling level probe with 1 or 2 switching points	60 - 61
Filling level probe Compact with 1 or 2 switching points	62 - 64

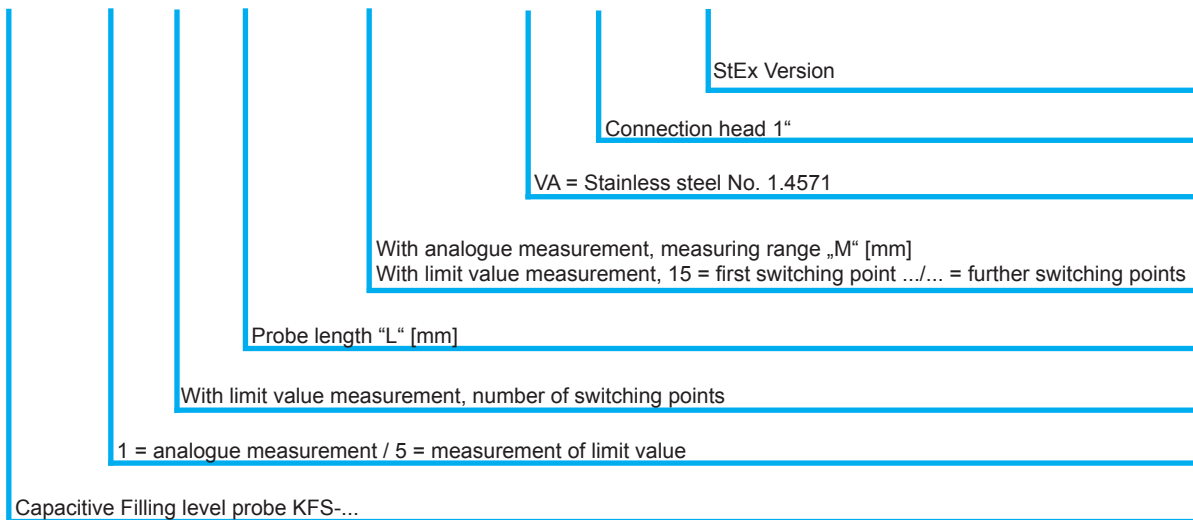
## TYPE CODE

TRUE **LEVEL**®

PER **LEVEL**®

Capacitive Filling level probe - analogue  
Capacitive Filling level probe with limit value switching point

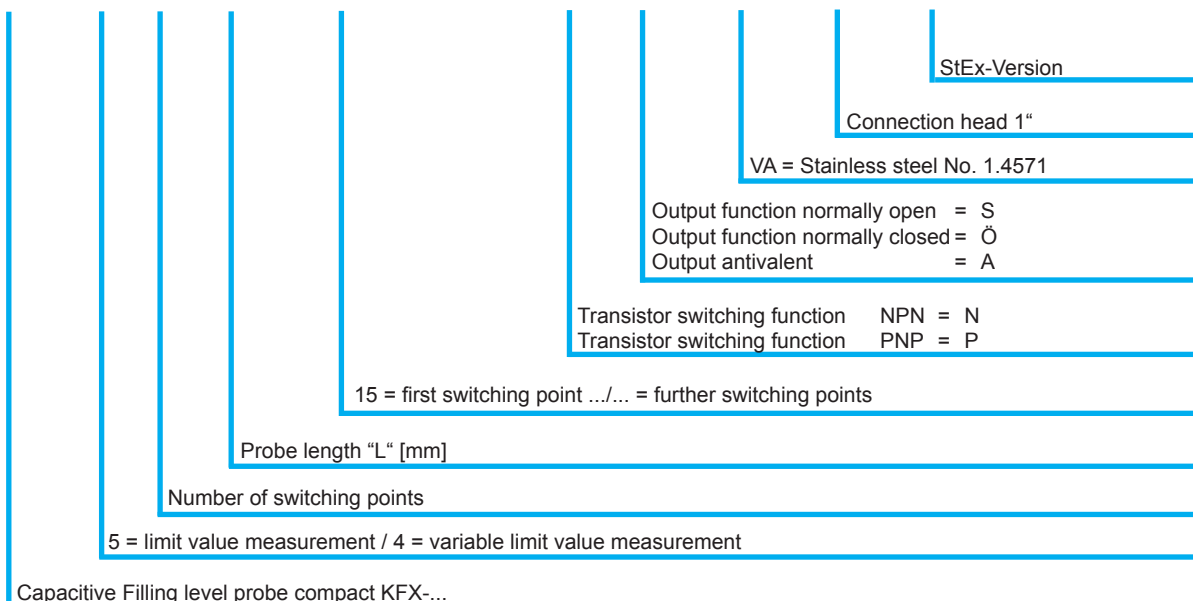
### KFS-...-...-...-15/.../...-VA-1"-StEx



PER **LEVEL**®

Capacitive Filling level probe with limit value switching point  
with integrated evaluation electronics

### KFX-5-...-...-15/.../...-...-...-VA-1"-StEx



All specifications are subject to change without notice. (10/2008)



**Capacitive Filling Level Probe - KFS**  
Series: **TRUE LEVEL** - ATEX  
With analogue measuring range

- For connection to the capacitive amplifier KFA-1-...-KL-Y70
- For use in areas with the risk of dust explosion, zone 20
- For use in areas with the risk of gas explosion, zone 1
- Housing material: PTFE, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



BVS 05 ATEX E 185	IECEx BVS 07.0032
⚡ II 2G Ex mb II T4	Ex mb II T4
⚡ II 1/2 D IP 67 T 110°C	Ex tD A20/21 IP 67 T110°C

Technical data

Active zone	Measuring range begins from 85, related to the probe tip
Type	KFS-1-"L"- "M"-VA-1"-StEx
Permitted ambient temperature	-25...+100 °C
Permitted ambient temperature (active zone)	-25...+100 °C
Degree of protection IEC 60529	IP 67*
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-1-...-KL-Y70	SMB-sockets within the connection head
Housing material	VA No. 1.4571
Active Zone	PTFE

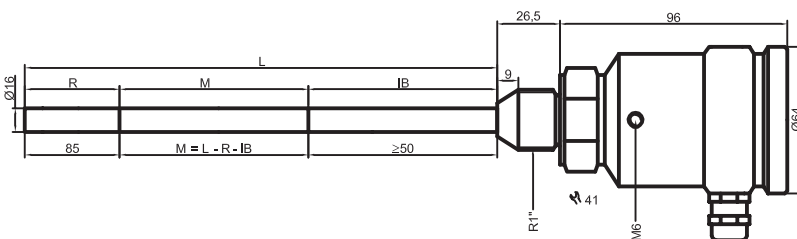
Technical data for connectors on request.

Connection cable (with Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66

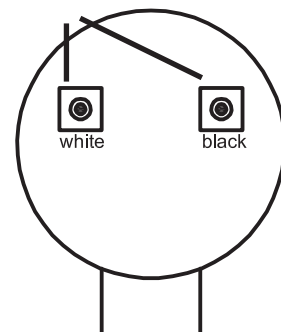
\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

Please determine the total length „L“ and the measuring range „M“ when ordering.

All specifications are subject to change without notice. (10/2008)



Connection sockets within the head connection



**Made in Germany**



**Capacitive Filling Level Probe - KFS**  
**Series: <sup>PER</sup>LEV&L - ATEX**  
**1 Limit value switching point**

- For connection to the capacitive amplifier:  
 KFA-5-...-Y50 with plug connection Art.-No. 66101213  
 KFA-5-...-Y70 with plug connection Art.-No. 66101203
- For use in areas with the risk of dust explosion, zone 20
- For use in areas with the risk of gas explosion, zone 1
- Housing material: PTFE, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



BVS 05 ATEX E 185	IECEx BVS 07.0032
Ex II 2G Ex mb II T4	Ex mb II T4
Ex II 1/2 D IP 67 T 110°C	Ex tD A20/21 IP 67 T110°C

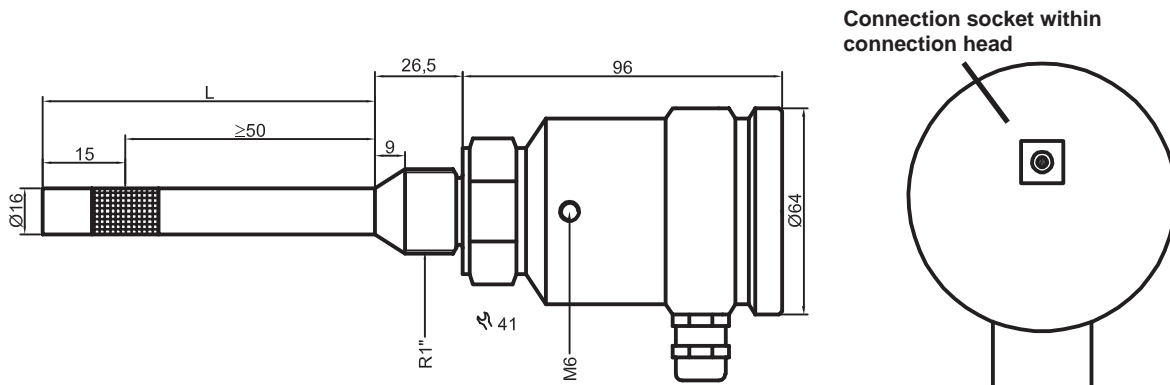
Technical data

Active zone	10...25 mm, related to the probe tip
Type	KFS-5-1-“L“-15-VA-1“-StEx
Permitted ambient temperature	-25...+100 °C
Permitted ambient temperature (active zone)	-25...+100 °C
Degree of protection IEC 60529	IP 67*
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...	SMB-sockets within the connection head
Housing material	VA No. 1.4571
Active Zone	PTFE

Connection cable (with Y75/Y55 or Y75/Y75 SMB connector) is not delivered with the probe  
 Order specifications: see page 66.

\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

Please determine the total length „L“ when ordering.



All specifications are subject to change without notice. (10/2008)





## Capacitive Filling Level Probe - KFS

Series: **PER L&V&L** - ATEX

2 Limit value switching points

- For connection to the capacitive amplifier:  
KFA-5-...-Y50 with plug connection Art.-No. 66101242  
KFA-5-...-Y70 with plug connection Art.-No. 66101204
- For use in areas with the risk of dust explosion, zone 20
- For use in areas with the risk of gas explosion, zone 1
- Housing material: PTFE, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:



BVS 05 ATEX E 185	IECEX BVS 07.0032
⚡ II 2G Ex mb II T4	Ex mb II T4
⚡ II 1/2 D IP 67 T 110°C	Ex tD A20/21 IP 67 T110°C

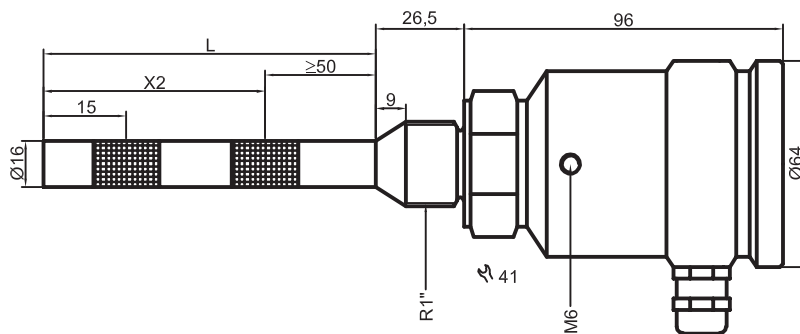
### Technical data

Active zone	10...25 mm, related to the probe tip + 1 x type specific X2
Type	KFS-5-2-"L"-15/X2-VA-1"-StEx
Permitted ambient temperature	-25...+100 °C
Permitted ambient temperature (active zone)	-25...+100 °C
Degree of protection IEC 60529	IP 67*
Norm	EN 60947-5-2
Connection to the evaluation unit KFA-5-...	SMB-sockets within the connection head
Housing material	VA No. 1.4571
Active Zone	PTFE

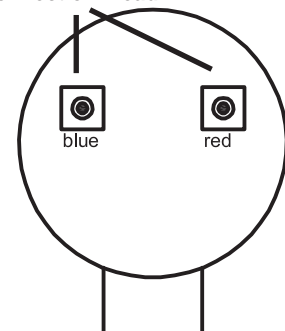
Connection cable (with Y55/Y75 or Y75/Y75 SMB connector) is not delivered with the probe  
Order specifications: see page 66.

\* The degree of protection may be increased by means of special measures at mounting (e. g. injection of silicone mixture).

Please determine the total length „L“ and the position of the second switching point “X2” when ordering.



Connection sockets within connection head



All specifications are subject to change without notice. (10/2008)

Made in Germany



**Capacitive Filling Level Probe - KFX - ATEX**  
**Series: PER LEVEL COMPACT**  
**NPN Output - Antivalent**  
**PNP Output - Antivalent**  
**1 Limit value switching point**

- Integrated evaluation electronics
- For use in areas with the risk of dust explosion, zone 20
- For use in areas with the risk of gas explosion, zone 1
- Housing material: PTFE 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

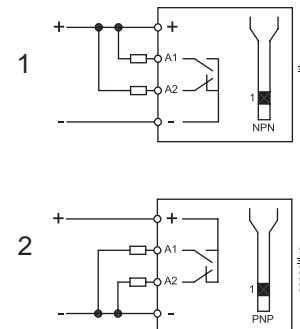
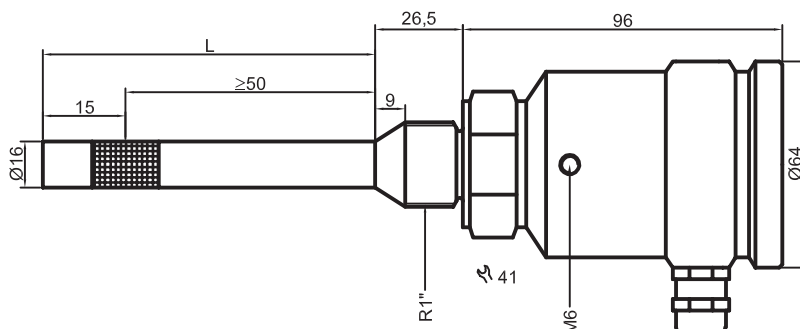
Certificate:



BVS 05 ATEX E 185	IECEx BVS 07.0032
Ex II 2G Ex mb II T4	Ex mb II T4
Ex II 1/2 D IP 67 T 110°C	Ex tD A20/21 IP 67 T110°C

Technical data

Active zone	10...25 mm, related to probe tip
Electrical version	4 connections DC
Output function	Antivalent
Type	KFX-5-1-"L"-15-N-A-VA-1"-StEx
Connection diagram No.	1
Type	KFX-5-1-"L"-15-P-A-VA-1"-StEx
Connection diagram No.	2
Operating voltage (U <sub>B</sub> )	18...30 V DC
Output current max. (I <sub>o</sub> )	2 x 100 mA
Voltage drop max. (U <sub>v</sub> )	≤ 2,5 V
Permitted residual ripple max.	40 %
No-load current (I <sub>o</sub> )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
LED-display	Green / yellow
Protective circuit	Build-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection cable	10 m, PVC, 4 x 0,5 mm <sup>2</sup>
Housing material	VA No. 1.4571
Active zone	PTFE



Please determine the total length „L“ when ordering.

**Made in Germany**



**Capacitive Filling Level Probe - KFX - ATEX**  
**Series: <sup>PER</sup>LEV&L COMPACT**  
**NPN Output - Normally Closed**  
**PNP Output - Normally Closed**  
**2 Limit value switching points**

- Integrated evaluation electronics
- For use in areas with the risk of dust explosion, zone 20
- For use in areas with the risk of gas explosion, zone 1
- Housing material: PTFE, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

Certificate:

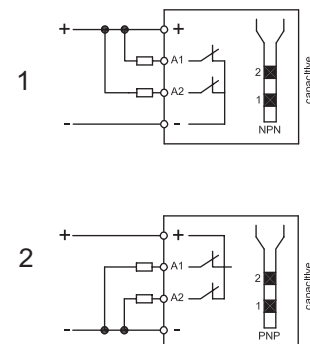
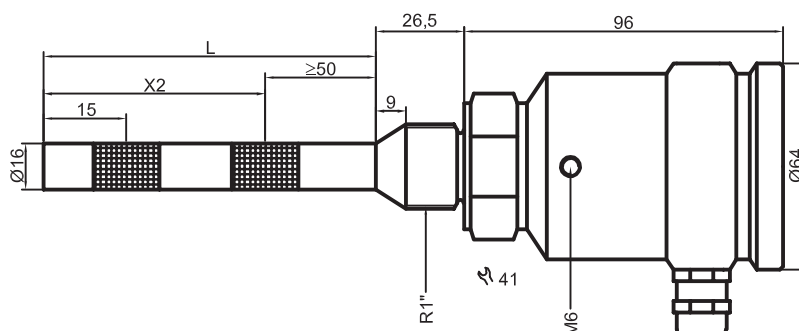


BVS 05 ATEX E 185	IECEX BVS 07.0032
⇄ II 2G Ex mb II T4	Ex mb II T4
⇄ II 1/2 D IP 67 T 110°C	Ex tD A20/21 IP 67 T110°C

Technical data

Active zone	10...25 mm, related to probe tip + 1 x type specific X2
Electrical version	4 connections DC
Output function	Normally closed
Type	KFX-5-2-"L"-15/X2-N-Ö-VA-1"-StEx
Connection diagram No.	1
Type	KFX-5-2-"L"-15/X2-P-Ö-VA-1"-StEx
Connection diagram No.	2
Operating voltage ( $U_b$ )	18...30 V DC
Output current max. ( $I_o$ )	2 x 100 mA
Voltage drop max. ( $U_d$ )	≤ 2,5 V
Permitted residual ripple max.	40 %
No-load current ( $I_o$ )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
LED-display	Green / yellow
Protective circuit	Build-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection cable	10 m, PVC, 4 x 0,5 mm <sup>2</sup>
Housing material	VA No. 1.4571
Active zone	PTFE

All specifications are subject to change without notice. (10/2008)



Please determine the total length „L“ and the position of the second switching point „X2“ when ordering.

**Made in Germany**



**Capacitive Filling Level Probe - KFX - ATEX**  
**Series: <sup>PER</sup>LEV&L COMPACT**  
**NPN Output - Normally Open**  
**PNP Output - Normally Open**  
**2 Limit value switching points**

- Integrated evaluation electronics
- For use in areas with the risk of dust explosion, zone 20
- For use in areas with the risk of gas explosion, zone 1
- Housing material: PTFE, 16 mm Ø
- Connection head and process connection stainless steel VA
- Process connection 1"
- Probe length max. 2000 mm

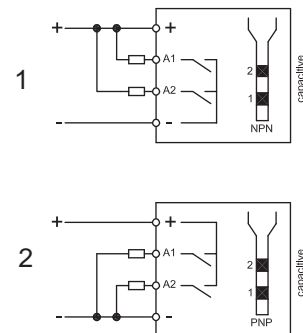
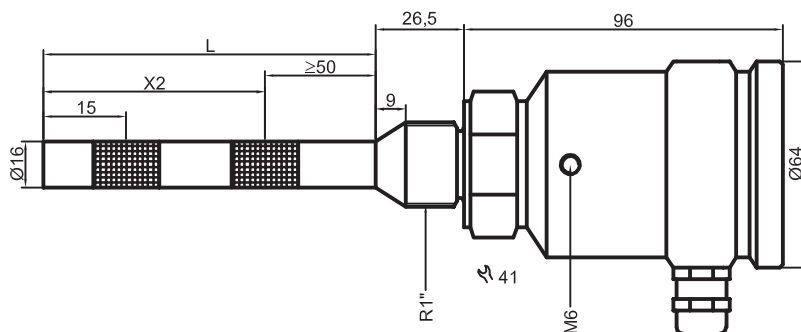
Certificate:



BVS 05 ATEX E 185	IECEx BVS 07.0032
⚡ II 2G Ex mb II T4	Ex mb II T4
⚡ II 1/2 D IP 67 T 110°C	Ex tD A20/21 IP 67 T110°C

Technical data

Active zone	10...25 mm, related to probe tip + 1 x type specific X2
Electrical version	4 connections DC
Output function	Normally open
Type	KFX-5-2-"L"-15/X2-N-S-VA-1"-StEx
Connection diagram No.	1
Type	KFX-5-2-"L"-15/X2-P-S-VA-1"-StEx
Connection diagram No.	2
Operating voltage (U <sub>B</sub> )	18...30 V DC
Output current max. (I <sub>B</sub> )	2 x 100 mA
Voltage drop max. (U <sub>d</sub> )	≤ 2,5 V
Permitted residual ripple max.	40 %
No-load current (I <sub>0</sub> )	Typ. 50 mA
Switching frequency max.	4 Hz
Permitted ambient temperature	-25...+55 °C
Permitted ambient temperature (for active zone)	-25...+100 °C
LED-display	Green / yellow
Protective circuit	Build-in
Degree of protection IEC 60529	IP 67
Norm	EN 60947-5-2
Connection cable	10 m, PVC, 4 x 0,5 mm <sup>2</sup>
Housing material	VA No. 1.4571
Active zone	PTFE



Please determine the total length „L“ and the position of the second switching point „X2“ when ordering.

**Made in Germany**

## ACCESSORIES



Milk pipe screwing according to  
DIN 11851  
Art.-No.: 75002900



Tri-Clamp Connection according to DIN 32676, DN 50 and ISO 2852  
Art.-No.: 75003050



Varivent flange Type N DN 50 (50/40), according to Factory  
norm Tuchenhagen  
Art.-No.: 75002800



KB PG 16 Mounting device for probes without connection head  
Art.- No.: 194000

KB PG 16 200 °C Mounting device for probes without connection  
head for 200 °C  
Art.-No.: 194001



SMB T-Connection device for extension of several slave  
evaluation units  
Art. No.: 67004100

All specifications are subject to change without notice. (10/2008)

## CONNECTION CABLE WITH CONNECTORS



Plug connection Y75 / Y75  
for KFS / KFA <sup>TRUE</sup> **LEVEL**  
for analogue sensors  
Cable length 2 m Art.-No.: 66101201  
Cable length 5 m Art.-No.: 66101202



Plug connection Y75 / Y55  
for KFS / KFA-...-Y50) <sup>PER</sup> **LEVEL**  
with 1 limit value switching point  
Cable length 2 m Art.-No. 66101213



Plug connection Y75 / Y75  
for KFS / KFA <sup>PER</sup> **LEVEL**  
with 1 limit value switching point  
Cable length 2 m Art.-No.: 66101203



Plug connection Y75 / Y55  
for KFS / KFA-...-Y50) <sup>PER</sup> **LEVEL**  
with 2 limit value switching points  
Cable length 2 m Art.-No. 66101242



Plug connection Y75 / Y75  
for KFS / KFA <sup>PER</sup> **LEVEL**  
with 2 limit value switching points  
Cable length 2 m Art.-No.: 66101204



Plug connection Y75 / Y75  
for KFS / KFA <sup>PER</sup> **LEVEL**  
with 3 limit value switching points  
Cable length 2 m Art.-No.: 66101205

## TYPE SELECTION IN ARTICLE NUMBER ORDER

Art.-No.	Type Description	Page	Art.-No.	Type Description	Page
AF0004	KFA-5-1-P-A-Y50	34		KFS-1-"L"-M"-VA-1"	16
AF0005	KFA-5-1-N-A-Y50	34		KFS-1-"L"-M"-VA-1"-StEx	59
AF0010	KFA-1-200-FL-KL-Y70	17		KFS-1-"L"-M"-Y75	15
AF0011	KFA-1-500-FL-KL-Y70	17		KFS-5-1-"L"-15-Y55	23
AF0012	KFA-1-1000-FL-KL-Y70	17		KFS-5-1-"L"-15-AL-1"	28
AF0013	KFA-1-2000-FL-KL-Y70	17		KFS-5-1-"L"-15-VA-1"	31
AF0014	KFA-1-200-IL4-KL-Y70	18		KFS-5-1-"L"-15-VA-1"-StEx	60
AF0015	KFA-1-500-IL4-KL-Y70	18		KFS-5-1-"L"-15-Y76	24
AF0016	KFA-1-1000-IL4-KL-Y70	18		KFS-5-2-"L"-15/X2-AL-1"	29
AF0017	KFA-1-2000-IL4-KL-Y70	18		KFS-5-2-"L"-15/X2-VA-1"	32
AF0018	KFA-1-200-UL-KL-Y70	19		KFS-5-2-"L"-15/X2-VA-1"-StEx	61
AF0019	KFA-1-500-UL-KL-Y70	19		KFS-5-2-"L"-15/X2-Y76	25
AF0020	KFA-1-1000-UL-KL-Y70	19		KFS-5-3-"L"-15/X2/X3-AL-1"	30
AF0021	KFA-1-2000-UL-KL-Y70	19		KFS-5-3-"L"-15/X2/X3-VA-1"	33
AF0046	KFA-5-4-P-S-4FB-Ö-CC-Y50	38		KFS-5-3-"L"-15/X2/X3-Y76	26
AF0049	KFA-5-2-II-KL-PG9	42		KFS-5-4-"L"-15/X2/X3/X4-Y76	27
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AF0064	KFA-5-1-L-P-A-Y50	35		KFX-4-1-"L"-V10/xa-P-A-VA-1"	54
AF0063	KFA-5-4-P-A-CC-Y50	37		KFX-4-2-"L"-V10/xa-Vxb/xc-N-S-VA-1"	55
AF0065	KFA-5-1-L-P-S-Y50	36		KFX-4-2-"L"-V10/xa-Vxb/xc-P-S-VA-1"	55
AF0066	KFA-5-1-L-N-S-Y50	36		KFX-5-1-"L"-15-N-A-AL-1"	47
AF0067	KFA-5-1-L-N-Ö-Y50	36		KFX-5-1-"L"-15-N-A-VA-1"	50
AF0068	KFA-5-1-L-N-A-Y50	35		KFX-5-1-"L"-15-P-A-AL-1"	47
972210	KFA-5-1-I-KL	41		KFX-5-1-"L"-15-P-A-VA-1"	50
AF0080	KFA-5-4-P-A-CC-Y70	39		KFX-5-1-"L"-15-N-A-VA-1"-StEx	62
AF0086	KFA-5-4-N-A-CC-Y50	37		KFX-5-1-"L"-15-P-A-VA-1"-StEx	62
AF0089	KFA-5-4-P-Ö-4FB-Ö-CC-Y50	38		KFX-5-2-"L"-15/X2-N-A-MM-VA-1"	53
AF0090	KFA-5-4-N-Ö-4FB-Ö-CC-Y50	38		KFX-5-2-"L"-15/X2-N-Ö-AL-1"	49
AF0091	KFA-5-4-N-S-4FB-Ö-CC-Y50	38		KFX-5-2-"L"-15/X2-N-Ö-VA-1"	52
AF0096	KFA-5-4-N-A-CC-Y70	39		KFX-5-2-"L"-15/X2-N-Ö-VA-1"-StEx	63
AF0097	KFA-5-4-N-S-4FB-Ö-CC-Y70	40		KFX-5-2-"L"-15/X2-N-S-AL-1"	48
AF0098	KFA-5-4-N-Ö-4FB-Ö-CC-Y70	40		KFX-5-2-"L"-15/X2-N-S-VA-1"	51
AF0099	KFA-5-4-P-S-4FB-Ö-CC-Y70	40		KFX-5-2-"L"-15/X2-N-S-VA-1"-StEx	64
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KFA-1-1000-UL-KL-Y70	AF0020	19	KFS-1-"L"- "M"-Y75		15
KFA-1-200-FL-KL-Y70	AF0010	17	KFS-5-1-"L"-15-Y55		23
KFA-1-200-IL4-KL-Y70	AF0014	18	KFS-5-1-"L"-15-AL-1"		28
KFA-1-200-UL-KL-Y70	AF0018	19	KFS-5-1-"L"-15-VA-1"		31
KFA-1-2000-FL-KL-Y70	AF0013	17	KFS-5-1-"L"-15-VA-1"-StEx		60
KFA-1-2000-IL4-KL-Y70	AF0017	18	KFS-5-1-"L"-15-Y76		24
KFA-1-2000-UL-KL-Y70	AF0021	19	KFS-5-2-"L"-15/X2-AL-1"		29
KFA-1-500-FL-KL-Y70	AF0011	17	KFS-5-2-"L"-15/X2-VA-1"		32
KFA-1-500-IL4-KL-Y70	AF0015	18	KFS-5-2-"L"-15/X2-VA-1"-StEx		61
KFA-1-500-UL-KL-Y70	AF0019	19	KFS-5-2-"L"-15/X2-Y76		25
KFA-5-1-I-KL	972210	41	KFS-5-3-"L"-15/X2/X3-AL-1"		30
KFA-5-1-L-N-A-Y50	AF0068	35	KFS-5-3-"L"-15/X2/X3-VA-1"		33
KFA-5-1-L-N-Ö-Y50	AF0067	36	KFS-5-3-"L"-15/X2/X3-Y76		26
KFA-5-1-L-N-S-Y50	AF0066	36	KFS-5-4-"L"-15/X2/X3/X4-Y76		27
KFA-5-1-L-P-A-Y50	AF0064	35	KFX-4-1-"L"-V10/xa-N-A-VA-1"		54
KFA-5-1-L-P-Ö-Y50	AF0062	36	KFX-4-1-"L"-V10/xa-P-A-VA-1"		54
KFA-5-1-L-P-S-Y50	AF0065	36	KFX-4-2-"L"-V10/xa-Vxb/xc-N-S-VA-1"		55
KFA-5-1-N-A-Y50	AF0005	34	KFX-4-2-"L"-V10/xa-Vxb/xc-P-S-VA-1"		55
KFA-5-1-P-A-Y50	AF0004	34	KFX-5-1-"L"-15-N-A-AL-1"		47
KFA-5-1-XL-I-CC-Y50	AF0101	43	KFX-5-1-"L"-15-N-A-VA-1"		50
KFA-5-2-II-KL-PG9	AF0049	42	KFX-5-1-"L"-15-P-A-AL-1"		47
KFA-5-2-XL-II-CC-Y50	AF0102	44	KFX-5-1-"L"-15-P-A-VA-1"		50
KFA-5-4-N-A-CC-Y50	AF0086	37	KFX-5-1-"L"-15-N-A-VA-1"-StEx		62
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KFA-5-4-N-Ö-4FB-Ö-CC-Y70	AF0098	40	KFX-5-2-"L"-15/X2-N-Ö-AL-1"		49
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KFA-5-4-N-S-4FB-Ö-CC-Y70	AF0097	40	KFX-5-2-"L"-15/X2-N-Ö-VA-1"-StEx		63
KFA-5-4-P-A-CC-Y50	AF0063	37	KFX-5-2-"L"-15/X2-N-S-AL-1"		48
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KFA-5-4-P-Ö-4FB-Ö-CC-Y50	AF0089	38	KFX-5-2-"L"-15/X2-N-S-VA-1"-StEx		64
KFA-5-4-P-Ö-4FB-Ö-CC-Y70	AF0100	40	KFX-5-2-"L"-15/X2-P-A-MM-VA-1"		53
KFA-5-4-P-S-4FB-Ö-CC-Y50	AF0046	38	KFX-5-2-"L"-15/X2-P-Ö-AL-1"		49
KFA-5-4-P-S-4FB-Ö-CC-Y70	AF0099	40	KFX-5-2-"L"-15/X2-P-Ö-VA-1"		52
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			KFX-5-2-"L"-15/X2-P-S-VA-1"-StEx		64

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