

## *Capacitive Filling Level systems KFS*



CE



Registration-no.: 1327-01



For all transactions, the latest version of the „General Conditions of Sale and Delivery for Products and Services of the Electrical Industry ZVEI“ shall apply, along with the supplementary conditions „extended reservation of proprietary rights“, together with the supplements listed on our order confirmations and/or invoices.

All specifications are subject to change without notice. Reprint, even in part, only with our consent.

© RECHNER Germany 05/2010 GB - Printed in EU, all rights reserved.

**Edition May 2010**

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

# TABLE OF CONTENTS

## CAPACITIVE FILLING LEVEL MEASURING SYSTEMS

PER LEVEL®

TECHNOLOGY	4 - 5
MOUNTING	6
NORMS	7
TECHNICAL TERMS	7
APPLICATION EXAMPLES	8 - 9
LEVEL PROBES, 1 LIMIT VALUE SWITCHING POINT, KFS-5-1-...	10 - 18
LEVEL PROBES, 2 LIMIT VALUE SWITCHING POINTS, KFS-5-2...	19 - 21
CAPACITIVE EVALUATION UNITS , PNP / NPN, KFA-5-1...	22 - 23
CAPACITIVE EVALUATION UNITS , PNP / NPN, KFA-5-2...	24 - 25
CAPACITIVE EVALUATION UNITS , PNP / NPN, KFA-5-4...	26 - 27
CAPACITIVE EVALUATION UNITS , RELAY OUTPUT KFA-5-...	28 - 29
COMPACT SERIES, PROBE AND EVALUATION UNIT FIX CONNECTED KFK-...	30 - 31
ACCESSORIES	32 - 33
TYPE SELECTION IN ARTICLE NUMBER ORDER	34
TYPE SELECTION IN DESCRIPTION ORDER	35

## TECHNOLOGY

In the field of filling level control, very often the capacitive measuring technology is applied, because of its universal use and reliability. There is a wide range of sensors on the user's disposal, which are suited to level control of liquids or bulk materials.

More and more mechanical units, like float switches, rotating paddle switches and vibrating forks, etc. are replaced with capacitive measuring systems. With the electronic systems no physical actuating force is required for operation. There is no contact bounce, no probe wear, no maintenance and the service life is independent of the switching frequency.

The choice of available capacitive filling level sensors are limited, for applications where products have to be detected with temperatures from  $-70^{\circ}\text{C}$  to  $+250^{\circ}\text{C}$ . Even more so, for products that change their conditions within the process cycle, which can be for instance solid, liquid, granulate form or viscous. This is the case with hot melt. Particularly when material deposits on the probe lead to measuring failures, due to the product contact.

With the capacitive filling level measuring systems (KFS), according to our patented three electrode principle, we provide a large assortment of level measuring systems which problem less fulfil the aforementioned requirements without a problem..

The basic technology relies on the use of the three-electrode measuring 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, and also especially caused from material deposits at the probe).

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). For further information about the analogue measuring systems, please see our TrueLevel catalogue.

### Advantages:

- For liquids and bulk material with  $\epsilon_r \geq 1,1$ .
- Due to its large measuring capacity it is also suitable for non-homogenous media.
- Probe suitable for an ambient temperature range of  $-70^{\circ}\text{C}$  up to  $+250^{\circ}\text{C}$ .
- Insensitive to effects of static.
- Suitable for detection of highly viscous, adhesive products (glues or similar).
- 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 cross talk one point to another.
- Simple adjustment („blind“-adjustment).
- Extremely strong glass-fibre reinforced sensor bodies, that survive the action of glue that has solid in to a block.
- No readjustment with change of glue.

# TECHNOLOGY

## THE BASIC SYSTEM

In principle the level measuring system consists of

### Probe + Connection Cable + Electronic Evaluation Unit

#### PROBE

The probes **KFS-5-...** are available from **50 mm** up to **2000 mm** in length. They are available with 1, 2, 3 or 4 fixed switching points. The position of the fixed switching points are user-definable according to the application and therefore they can be determined for optimal matching of each application.

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

Standard housing: GFK (glass fibre reinforced plastic). Outer diameter 10 or 16 mm with outstanding mechanical properties. Recommended for use in applications with bulk materials or viscous materials. Total length maximum 2000 mm.

Optional: Other plastic housings are available on request, such as:  
 PE (Polyethylene)  
 PEEK (Polyetheretherketone) FDA 21 CFR 177.2415  
 PTFE (Polytetrafluorethylene) FDA 21 CFR 177.1550  
 PVC (Polyvinylchloride)  
 PVDF (Polyvinylidenfluoride) FDA 21 CFR 177.2510

For the holding device or for the process connection metals used are:

Brass / chrome or nickel plated  
 Stainless steel VA, material No. 1.4301, 1.4305 or 1.4404 (FDA conform)

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

#### EVALUATION UNIT

The evaluation unit generates and provides the necessary output signals. There are evaluation units available for 1, 2 or 4 switching points. The versions are:

- KFA-5-1-... - One point evaluation unit
- KFA-5-2... - Two point evaluation unit
- KFA-5-4-... Four point evaluation unit. Extension possible by using the Master/Slave principle  
 Extension of 4 measuring points per slave

Optional variants are available with adjustable time delay or with intelligent probe break control.

The definition „probe break control“ is used as a common term from the measuring and control technology. Based on the mode of operation the definition „self-functions control“ would be more precise.

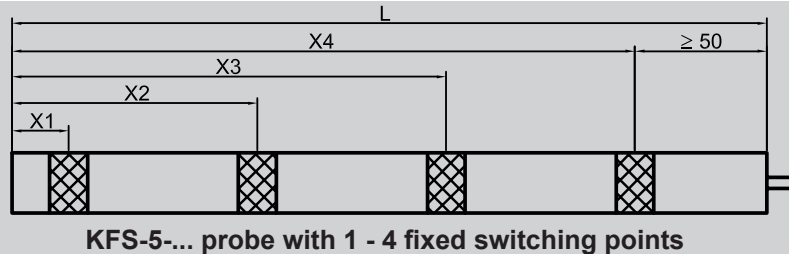
Two variants of evaluations with wire break control (FB) are available:

- Evaluation units with separate FB outputs. With these units the user needs to integrate the FB-Signals into his control system in order to achieve an over-fill protection.
- Evaluation units without separate FB outputs. In the case of malfunction of the unit, the switching outputs are generally switched to “full” position. Additionally an optical signal is given.

## MOUNTING

The limit probe can be equipped with 1, 2, 3 or 4 fixed switching points. Dependent on the model the first switching point is placed 5, 7, 10 or 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 the minimum distance between each switching point.

Fig. 1



The lowest switching point (X1) is dependent on the model 5, 7, 10 or 15 mm from the beginning of the probe, because of an internal screening of the probe's tip.

A minimum distance between the switching points has to be taken into consideration due to the internal screening ranges of the probe. Normally it is 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 (Page 33). Smaller distances are possible on request, depending on probe parameters, the medium and the geometrical form of the container.

The total length (L) is obtained by taking the position of the upper switching point and adding a minimum internal screening range to the container cover / or probe holding device. The screening range should be larger:

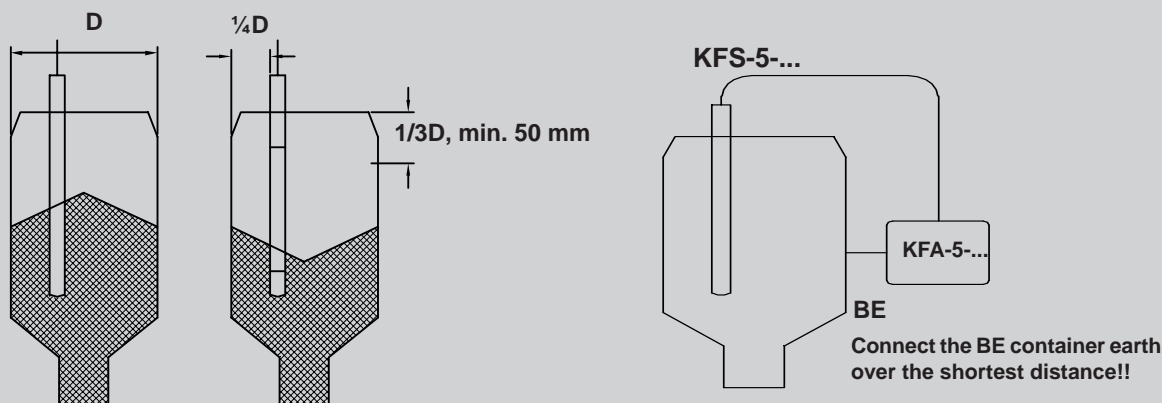
- with conductive container cover / conductive probe holder
- with conductive container cover and large container diameter
- with increasing conductivity and viscosity of the product to be measured.

Normally the minimum internal screening range is 50 mm.

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

It is favourable to mount the filling level probes as shown on fig. 2. If necessary horizontal or preferably diagonal mounting is also possible.

Fig. 2



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  $\frac{1}{4}$  of the diameter. The minimum distance between the upper switching point and the conductive lid of the container is 50 mm.

Distance to the container wall min.  $\frac{1}{4} D$  or  $\geq$  probe diameter. Please take care that there is no material bridging between probe and container wall.

## NORMS

### **CE** - Marking

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

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 Sensors comply with the recommendation of the ZVEI for voluntary self-obligation to achieve the directives RoHS and WEEE in our production.

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 of probes COAX or TRIAX cable are used and for the amplifier connection PVC- or PUR-cable are used. One has to take into consideration that the cable should not be moved with ambient temperatures below  $-5\text{ }^{\circ}\text{C}$ . 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.

## APPLICATION EXAMPLES

The capacitive filling level systems shown in this brochure are especially suitable for level control of material with a very high viscosity, like, for instance, hot melt glue. They are used for a large variety of applications in the food industry, chemical and pharmaceutical industry. They measure the level in glue containers and in the related storage tanks. Furthermore they are used for the level control of the end products that have to be filled into packages, bottles, bags, etc.



As mentioned before in the general description, we use for these level systems our patented three electrode measuring principle. With this measuring principle the container is part of the measurement. The container need to be metal or a metal foil has to be fixed on the container (foil length  $\geq$  probe length). The resulting large measuring volume is the reason why material depositions on the probe surface are irrelevant for the measurement.

On the left you see a schematic drawing of the measuring ranges of a filling level probe with two measuring points. You see, that the probe measures a range that is like a disc and not just a small area around the probe.

The probe can be in direct contact with the bottom because the sector from the probe tip downwards is screened.

With application that have a grid at the container bottom the measurement with binary level probes can be made directly at the top edge of the grid. This means measured on- or off switching point of the probe is the level at the grid top edge.



*Also some cm deposition of glue do not influence the measurement. Switching point displacement max.  $\pm 0,5$  cm.*



**Measurement directly at grid top edge possible!**

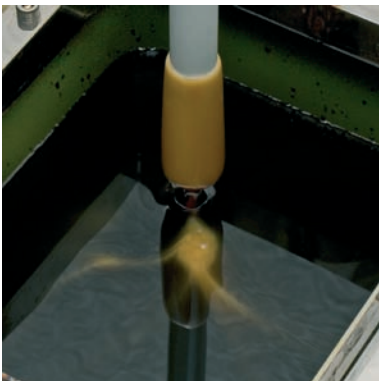
The same is valid for analogue probes. The reference range can be within the grid so that the measurement also can start with the top edge of the grid.



## APPLICATION EXAMPLES



The capacitive filling level probes measure the levels of hot glue reliable whatever the state of the materials within the container. It does not matter if the glue is in a molten, partly molten or granulate form or in a mixed state within the container.



**Change of the switching position can be made easily in seconds. Just move the probe in to the desired position.**

The probe also switch off reliably even if there is still a glue thread connection between a probe and the residual glue at the bottom of the empty container.

The probes operate independ-

ently of temperature up to the max. ambient temperature. Practically there is no temperature drift.




**Even with adhesive media like glue 2, 3 or 4 point measurements are possible**

Also for application with adhesive media like glue it is possible to measure several switching points with only one probe. For example for a system with automatic refilling it is possible to make a min-max control with a 2 point level probe.

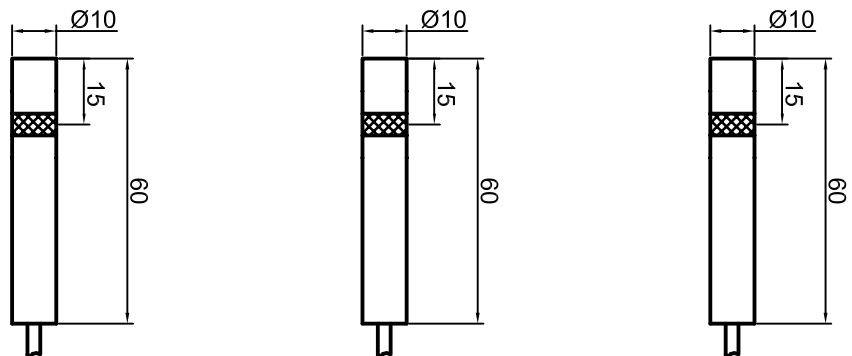
The same is valid for system which have no automatic refilling the 2 point level probe is recommended for instance, using one point for the indication of the empty state and the second switching point for emergency switch off.

**Our patented measuring method allows temperature and filling measurement with the same probe. This function is available on request.**

## Level measuring probes with 1 limit value switching point

Type of construction	Ø 10 mm	Ø 10 mm	Ø 10 mm
			
<b>Technical data</b>			
Active Zone [mm] - related to sensor tip	15 mm	15 mm	15 mm
<b>Type</b>	<b>KFS-5-1-60-15-D10-PEEK-Y55</b>	<b>KFS-5-1-60-15-D10-PEEK-Y95</b>	<b>KFS-5-1-60-15-D10-PEEK-250°C-Y75</b>
<b>Art.-No.</b>	<b>KF 0331</b>	<b>KF 0315</b>	<b>KF 0277</b>
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Permitted ambient temperature	-70...+250 °C	-70...+250 °C	-70...+250 °C
Degree of protection IEC 60529	IP 67	IP 67	IP 67
Connection to evaluation unit	2 m FEP coax cable, with coax connector	2 m FEP coax cable, with triax connector	2 m FEP coax cable, with SMB connector
Housing material	PEEK	PEEK	PEEK
Active zone	PEEK	PEEK	PEEK
For connection to the amplifier	KFA-5-...Y50	KFA-5-...Y90	KFA-5-...Y70

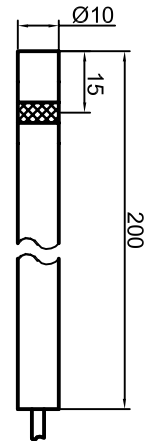
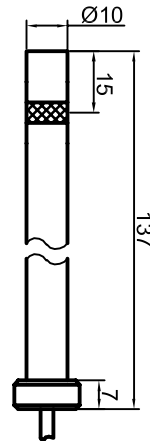
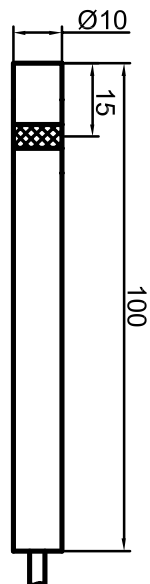
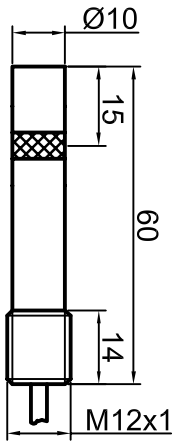
Technical data for connectors on request.



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

Other cable length for probes on request. With these measuring systems the length of the probe cable does not influence the measuring result.

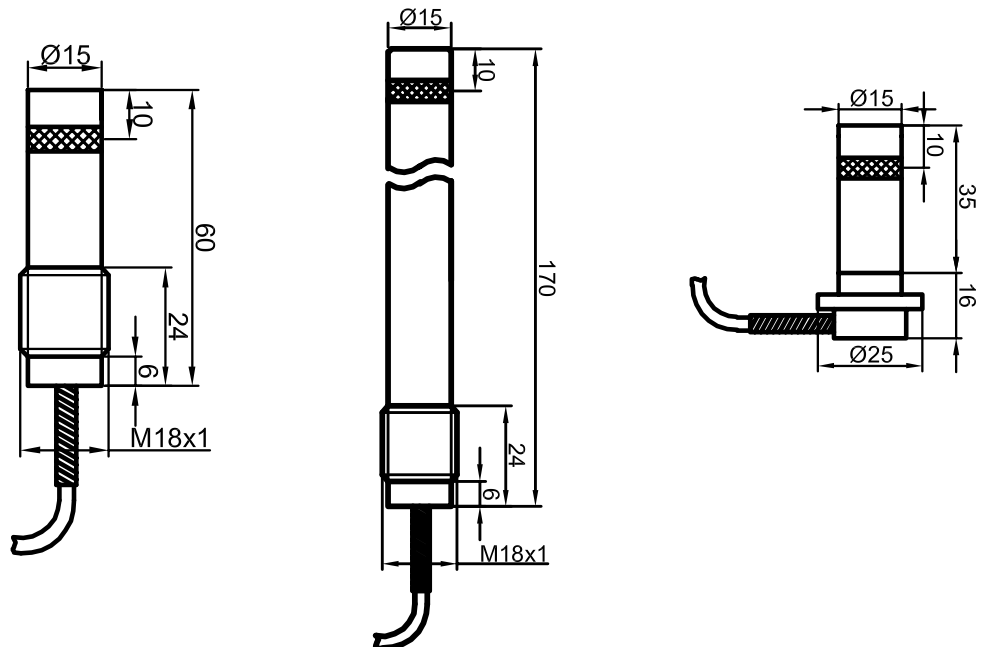
Ø 10 mm / M 12 x 1	Ø 10 mm	Ø 10 mm	Ø 10 mm
15 mm	15 mm	15 mm	15 mm
<b>KFS-5-1-60-15-D10/M12-Y55</b>	<b>KFS-5-1-100-15-D10-PEEK-Y55</b>	<b>KFS-5-1-137-15-D10-Y55</b>	<b>KFS-5-1-200-15-D10-250°C-Y75</b>
<b>KF 0249</b>	<b>KF 0304</b>	<b>KF 0173</b>	<b>KF 0285</b>
CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
-70...+250 °C	-70...+250 °C	-70...+250 °C	-70...+250 °C
IP 67	IP 67	IP 67	IP 67
2 m FEP coax cable, with coax connector	2 m FEP coax cable, with coax connector	1 m FEP coax cable, with coax connector	2 m FEP coax cable, with SMB connector
PEEK	PEEK	GFK	GFK
PEEK	PEEK	GFK	GFK
KFA-5-...Y50	KFA-5-...Y50	KFA-5-...Y50	KFA-5-...Y70



## Level measuring probes with 1 limit value switching point

Type of construction	Ø 15 mm / M 18 x 1	Ø 15 mm / M 18 x 1	Ø 15 mm
<b>Technical data</b>			
Active Zone [mm] - related to sensor tip	10 mm	10 mm	10 mm
Type	KFS-5-1-GL-60-10-PTFE/VA-M18-Y95	KFS-5-1-GL-170-10-PTFE/VA-M18-Y95	KFS-5-1-GL-35-10-PTFE/VA-Y95
Art.-No.	KF 0316	KF 0317	KF 0158
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Permitted ambient temperature	-70...+250 °C	-70...+250 °C	-70...+250 °C
Degree of protection IEC 60529	IP 67	IP 67	IP 67
Connection to evaluation unit	2 m FEP triax cable with triax connector	2 m FEP triax cable with triax connector	2 m FEP triax cable with triax connector
Housing material	VA No. 1.4305	VA No. 1.4305	VA No. 1.4305
Active zone	PTFE	PTFE	PTFE
For connection to the amplifier	KFA-5-...Y90	KFA-5-...Y90	KFA-5-...Y90

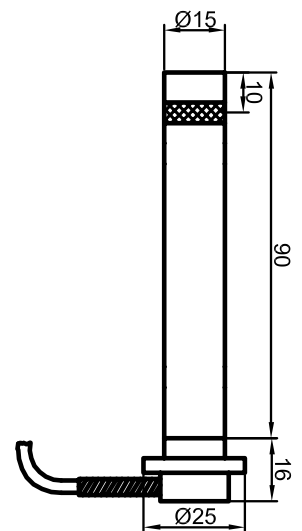
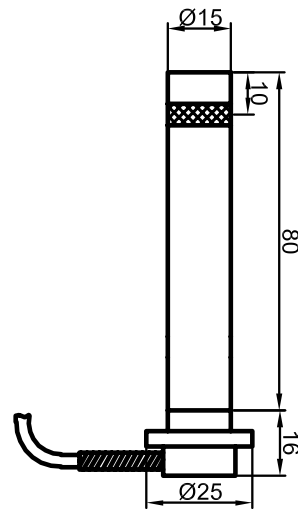
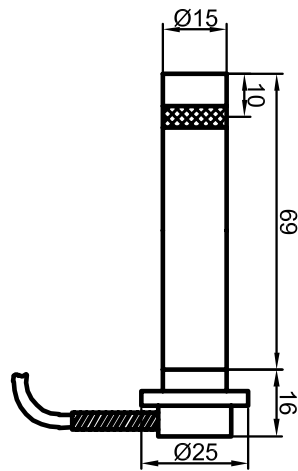
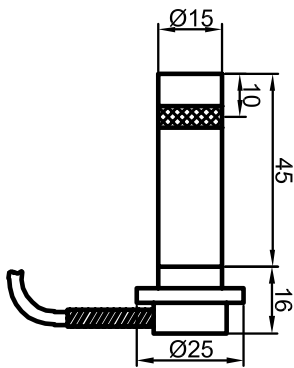
Technical data for connectors on request.




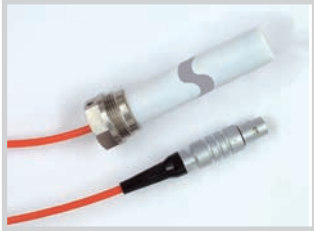

Other housing materials for active zone (probe), like PTFE, PVDF, PE and PEEK on request

Other cable length for probes on request. With these measuring systems the length of the probe cable does not influence the measuring result.

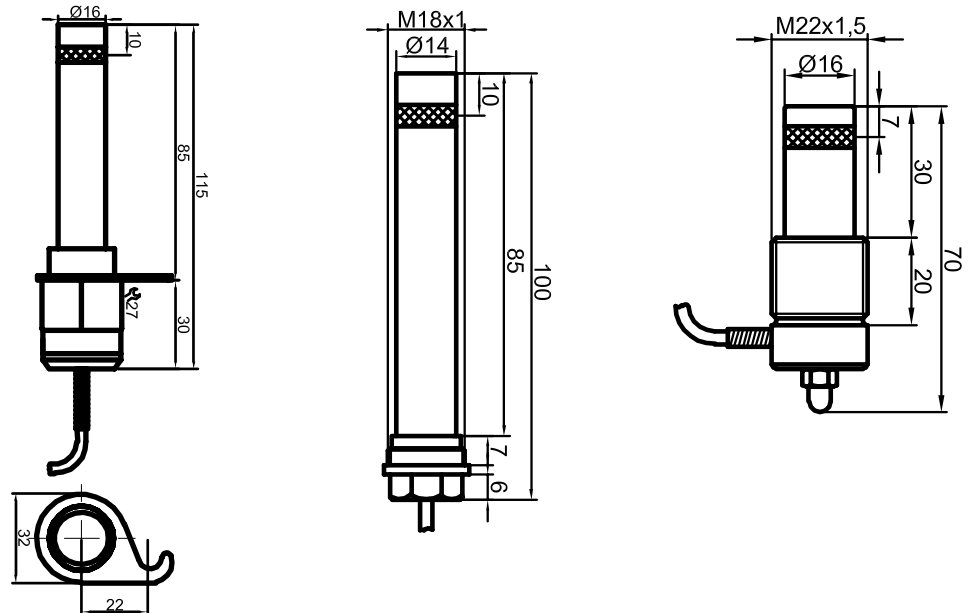
Ø 15 mm	Ø 15 mm	Ø 15 mm	Ø 15 mm
10 mm	10 mm	10 mm	10 mm
<b>KFS-5-1-GL-45-10-PTFE/VA-Y95</b>	<b>KFS-5-1-GL-69-10-PTFE/VA-Y95</b>	<b>KFS-5-1-GL-80-10-PTFE/VA-Y95</b>	<b>KFS-5-1-GL-90-10-PTFE/VA-Y95</b>
<b>KF 0063</b>	<b>KF 0332</b>	<b>KF 0065</b>	<b>KF 0352</b>
CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
-70...+250 °C	-70...+250 °C	-70...+250 °C	-70...+250 °C
IP 67	IP 67	IP 67	IP 67
2 m FEP triax cable with triax connector	2 m FEP triax cable with triax connector	2 m FEP triax cable with triax connector	2 m FEP triax cable with triax connector
VA No. 1.4305	VA No. 1.4305	VA No. 1.4305	VA No. 1.4305
PTFE	PTFE	PTFE	PTFE
KFA-5-...-Y90	KFA-5-...-Y90	KFA-5-...-Y90	KFA-5-...-Y90



## Level measuring probes with 1 limit value switching point

Type of construction	Ø 16 mm	Ø 14 mm / M 18 x 1	Ø 16 mm / M 22 x 1,5
			
<b>Technical data</b>			
Active Zone [mm] - related to sensor tip	10 mm	10 mm	7 mm
Type	KFS-5-1-GL-85-10-PTFE/VA-H-Y95	KFS-5-1-GL-100-10-M18-PTFE/VA-Y95	KFS-5-1-30-7-M22-Y95
Art.-No.	KF 0062	KF 0329	KF 0241
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Permitted ambient temperature	-70...+250 °C	-70...+250 °C	-70...+250 °C
Degree of protection IEC 60529	IP 67	IP 67	IP 67
Connection to evaluation unit	2 m FEP triax cable with triax connector	2 m FEP triax cable with triax connector	2 m FEP triax cable with triax connector
Housing material	VA No. 1.4305	VA No. 1.4305	VA No. 1.4305
Active zone	PTFE	PTFE	PTFE
For connection to the amplifier	KFA-5-...Y90	KFA-5-...Y90	KFA-5-...Y90

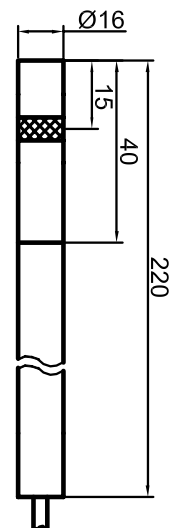
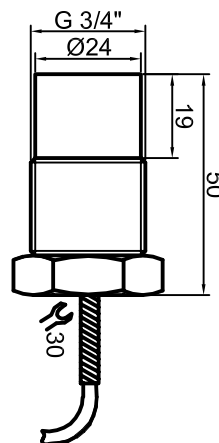
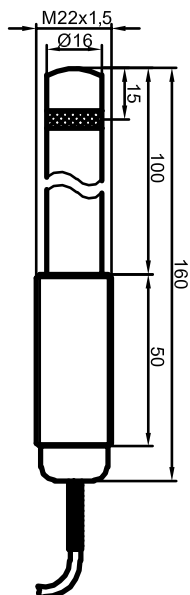
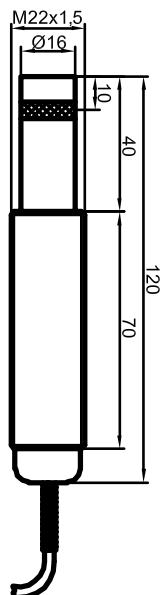
Technical data for connectors on request.





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

Other cable length for probes on request. With these measuring systems the length of the probe cable does not influence the measuring result.

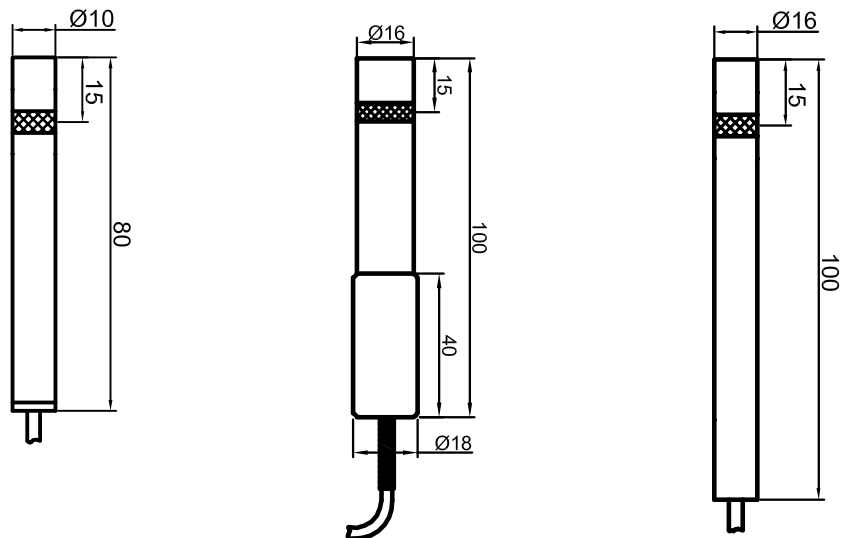
Ø 16 mm / M 22 x 1,5	Ø 16 mm / M 22 x 1,5	Ø 24 mm / G3/4"	Ø 16 mm
10 mm	15 mm	15 mm	15mm
KFS-5-1-GL-120-10-M22-PTFE/VA-250°C-Y55	KFS-5-1-160-15-M22-VA-250°C-Y55	KFS-5-1-GL-PTFE/VA-3/4"-Y95	KFS-5-1-220-15-PEEK/VA-Y55
<b>KF 0240</b>	<b>KF 0080</b>	<b>KF 0318</b>	<b>KF 0325</b>
CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
-70...+250 °C	-70...+250 °C	-70...+250 °C	-70...+250 °C
IP 67	IP 67	IP 67	IP 67
2,5 m FEP coax cable with coax connector	2,5 m FEP coax cable with coax connector	2 m FEP triax cable with triax connector	2 m FEP coax cable with coax connector
VA No. 1.4305	VA No. 1.4305	VA No. 1.4305	VA No. 1.4305
PTFE	GFK	PTFE	PEEK
KFA-5-...Y50	KFA-5-...Y50	KFA-5-...Y90	KFA-5-...Y50



## FILLING LEVEL PROBE WITH 1 LIMIT VALUE SWITCHING POINT

Type of construction	Ø 10 mm	Ø 16 mm	Ø 16 mm
			
<b>Technical data</b>			
Active Zone [mm] - related to sensor tip	15 mm	15 mm	15 mm
<b>Type</b>	<b>KFS-5-1-80-15-PEEK-Y55</b>	<b>KFS-5-1-100-15-GFK/VA-Y95</b>	<b>KFS-5-1-100-15-Y55</b>
<b>Art.-No.</b>	<b>KF 0333</b>	<b>KF 0328</b>	<b>KF 0099</b>
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Permitted ambient temperature	-70...+250 °C	-70...+250 °C	-70...+250 °C
Degree of protection IEC 60529	IP 67	IP 67	IP 67
Connection to evaluation unit	2 m FEP, coax cable with coax connector	2 m FEP, triax cable with triax connector	2 m FEP, coax cable with coax connector
Housing material	PEEK	VA No. 1.4305	GFK
Active zone	PEEK	GFK	GFK
For connection to the amplifier	KFA-5-...Y50	KFA-5-...Y90	KFA-5-...Y50

Technical data for connectors on request.







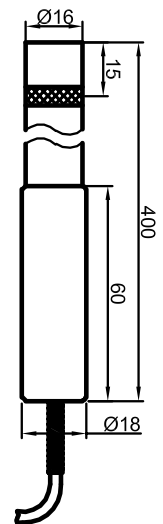
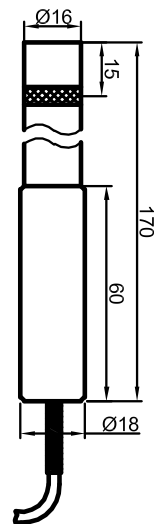
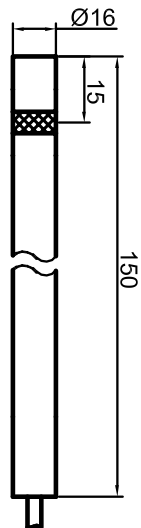
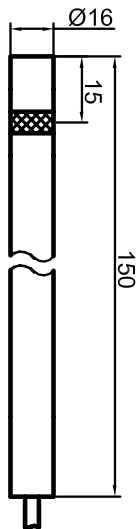
A mounting device for the 16 mm diameter probe is available as an accessory. Order details: see page 33

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

Other cable length for probes on request. With these measuring systems the length of the probe cable does not influence the measuring result.



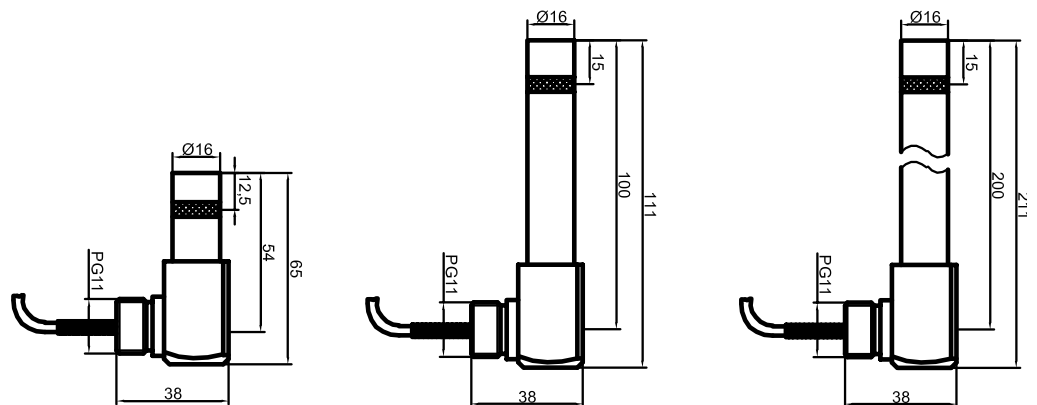
Ø 16 mm	Ø 16 mm	Ø 16 mm	Ø 16 mm
			
15 mm	15 mm	15 mm	15 mm
<b>KFS-5-1-150-15-PEEK-Y55</b>	<b>KFS-5-1-150-15-Y55</b>	<b>KFS-5-1-170-15-GFK/VA-Y95</b>	<b>KFS-5-1-400-15-GFK/VA-Y95</b>
<b>KF 0078</b>	<b>KF 0136</b>	<b>KF 0326</b>	<b>KF 0327</b>
CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
-70...+250 °C	-70...+250 °C	-70...+250 °C	-70...+250 °C
IP 67	IP 67	IP 67	IP 67
0,6 m FEP, coax cable with coax connector	0,6 m FEP, coax cable with coax connector	2 m FEP, triax cable with triax connector	2 m FEP, triax cable, with triax connector
PEEK	GFK	VA No. 1.4305	VA No. 1.4305
PEEK	GFK	GFK	GFK
KFA-5-...Y50	KFA-5-...Y50	KFA-5-...Y90	KFA-5-...Y90



## Level measuring probes with 1 limit value switching point

Type of construction	Ø 16 mm	Ø 16 mm	Ø 16 mm
Technical data			
Active Zone [mm] - related to sensor tip	12.5 mm	15 mm	15 mm
Type	<b>KFS-5-1-54-15-W-Y55</b>	<b>KFS-5-1-100-15-W-Y55</b>	<b>KFS-5-1-200-15-W-Y55</b>
Art.-No.	<b>KF 0314</b>	<b>KF 0307</b>	<b>KF 0320</b>
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Permitted ambient temperature	-70...+250 °C	-70...+250 °C	-70...+250 °C
Degree of protection IEC 60529	IP 67	IP 67	IP 67
Connection to evaluation unit	2 m FEP, coax cable with coax connector	2 m FEP, coax cable with coax connector	2 m FEP, coax cable with coax connector
Housing material	Aluminium	Aluminium	Aluminium
Active zone	GFK	GFK	GFK
For connection to the amplifier	KFA-5-...Y50	KFA-5-...Y50	KFA-5-...Y50

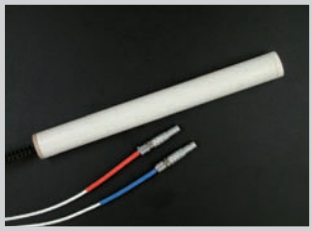

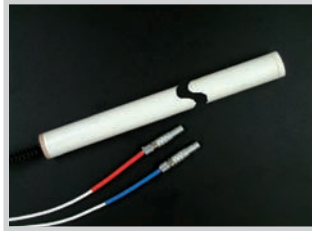
Technical data for connectors on request.



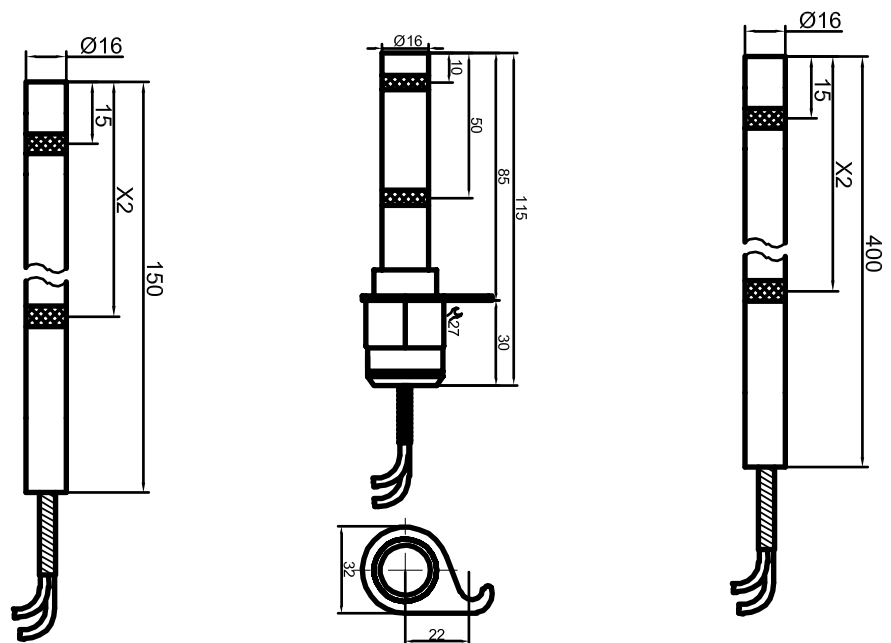
Other housing materials for active zone (probe), like PTFE, PVDF, PE and PEEK on request

Other cable length for probes on request. With these measuring systems the length of the probe cable does not influence the measuring result.

## Level measuring probes with 2 limit value switching points

Type of construction	Ø 16 mm	Ø 16 mm	Ø 16 mm
			
Technical data			
Active Zone [mm] - related to sensor tip	15 mm, X2 mm	10 mm, 50 mm	15 mm, X2 mm
Type	<b>KFS-5-2-150-15/X2-Y55</b>	<b>KFS-5-2-GL-85-10/50-PTFE/VA-H-Y95</b>	<b>KFS-5-2-400-15/X2-Y55</b>
Art.-No.	<b>KF 0323</b>	<b>KF 0353</b>	<b>KF 0351</b>
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Permitted ambient temperature	-70...+250 °C	-70...+250 °C	-70...+250 °C
Degree of protection IEC 60529	IP 67	IP 67	IP 67
Connection to the evaluation unit	2 m FEP, coax cable with coax connector	1 m m FEP, triax cable with triax connector	2 m FEP, coax cable with coax connector
Housing material	GFK	VA No. 1.4305	GFK
Housing material active zone	GFK	PTFE	GFK
For connection to the amplifier	KFA-5-...Y50	KFA-5-...Y90	KFA-5-...Y50

Technical data for the connectors on request.



A mounting device for the 16 mm diameter probe is available as an accessory (KB PG 16) Order details: see page 33

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

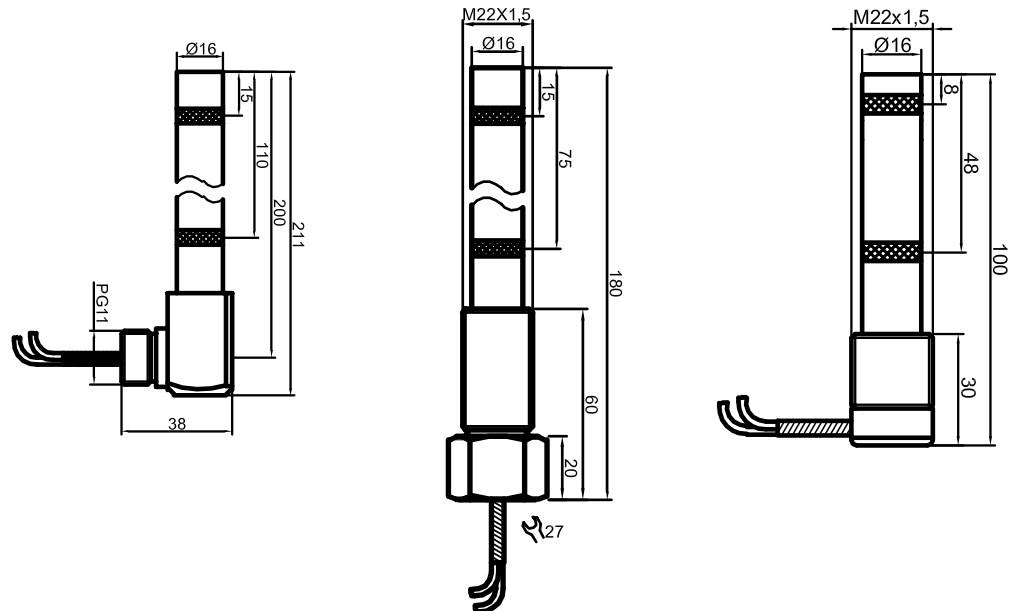
Other probe cable length on request. With these measuring systems the length of the probe cable does not influence the measuring result

The position of the second switching point "X2" is fixed with most of the items shown. This position "X2" can be modified on customers request.

## Level measuring probes with 2 limit value switching points

Type of construction	Ø 16 mm	Ø 16 mm / M 22 x 1.5	Ø 16 mm / M 22 x 1.5
<b>Technical data</b>			
Active Zone [mm] - related to sensor tip	15 mm, 110 mm	15 mm, 75 mm	8 mm, 48 mm
Type	KFS-5-2-200-15/110-W-Y55	KFS-5-2-180-15/75-M22-PTFE/ VA-Y55	KFS-5-2-100-8/48-M22-Y55
Art.-No.	KF0363	KF 0321	KF 0330
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Permitted ambient temperature	-70...+250 °C	-70...+250 °C	-70...+250 °C
Degree of protection IEC 60529	IP 67	IP 67	IP 67
Connection to evaluation unit	2 m FEP, coax cable with coax connector	2 m FEP, coax cable with coax connector	2 m FEP, coax cable with coax connector
Housing material	Aluminium	VA No. 1.4305	VA No. 1.4305
Active zone	GFK	PTFE	PTFE
For connection to the amplifier	KFA-5-...Y50	KFA-5-...Y50	KFA-5-...Y50

Technical data for connectors on request.



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

Other cable length for probes on request. With these measuring systems the length of the probe cable does not influence the measuring result.

The position of the second switching point "X2" is fixed with most of the items shown. This position "X2" can be modified on customers request.

Ø 16 mm



15 mm, X2 mm

**KFS-5-2-300-15/X2-GFK/VA-Y95**

**KF 0364**

CE, RoHS, UL-CSA

-70...+250 °C

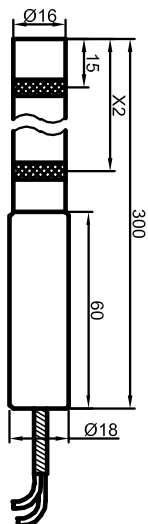
IP 67

2 m FEP, triax cable  
with triax-connector

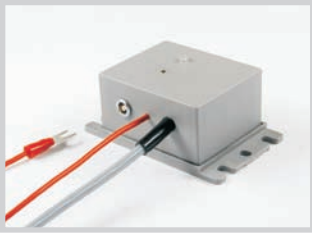

VA No. 1.4305

GFK

KFA-5-...Y90

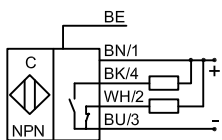


## Capacitive evaluation units for connection to filling level probes with 1 limit value switching point KFS-5-1-...

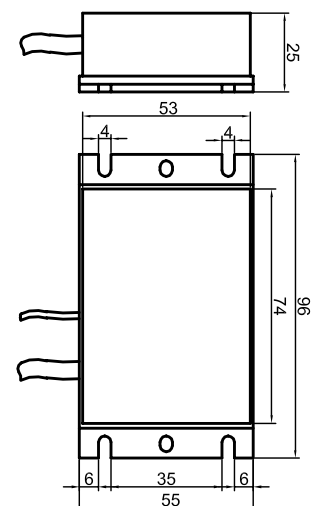
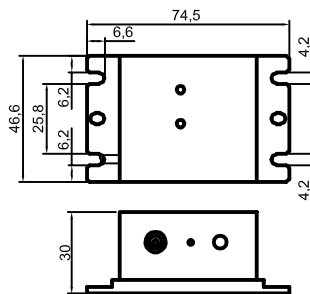
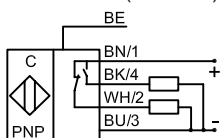
Type of construction	74,5 x 46,6 x 30 mm	96 x 55 x 25 mm
		
<b>Technical data</b>		
Electrical version	4 wire DC	4 wire DC
Type NPN Antivalent (NO + NC)	KFA-5-1-N-A-Y50	KFA-5-1-L-N-A-Y50
Art.-No.	AF 0005	AF 0068
Type PNP Antivalent (NO + NC)	KFA-5-1-P-A-Y50	KFA-5-1-L-P-A-Y50
Art.-No.	AF 0004	AF 0064
Type AC / Relay output	-	-
Art.-No.	-	-
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Operating voltage ( $U_B$ )	18...36 V DC	18...36 V DC
Output current max. ( $U_e$ )	2 x 250 mA	2 x 250 mA
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. 50 mA	Typ. 50 mA
Frequency of operating cycles 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 60 529	IP 54	IP 54
Norm	EN 60947-5-2	EN 60947-5-2
Probe connection	Connector Y55	Connector Y55
Connection cable	2 m, PUR, 4 x 0.14 mm <sup>2</sup>	2 m, PVC, 4 x 0.34 mm <sup>2</sup>
Housing material	PA	PA

\*Variants with LED red / green on request.

NPN Antivalent (NO + NC)



PNP Antivalent (NO + NC)



FB = probe break control  
 TD = adjustable time delay

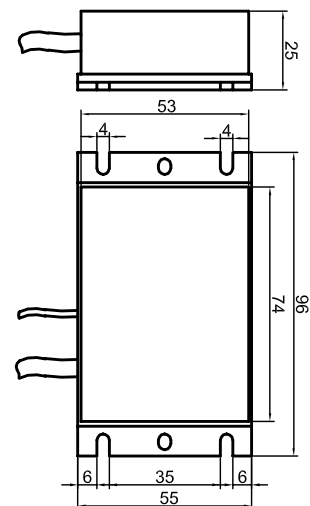
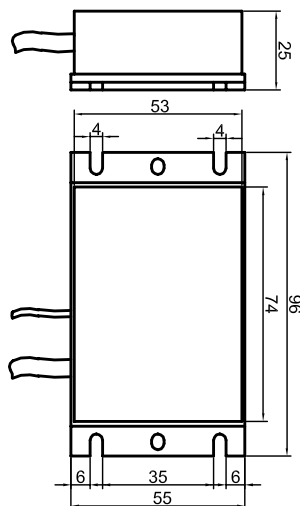
96 x 55 x 25 mm





96 x 55 x 25 mm



4 wire DC	4 wire DC
<b>KFA-5-1-L-P-A-FB-TD-Y50</b>	<b>KFA-5-1-L-P-A-FB-TD-Y90</b>
<b>AF 0081</b>	<b>AF 0082</b>
-	-
-	-
CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
18...36 V DC	18...36 V DC
2 x 250 mA	2 x 250 mA
≤ 2.5 V	≤ 2.5 V
40 %	40 %
Typ. 50 mA	Typ. 50 mA
4 Hz	4 Hz
-25...+55 °C	-25...+55 °C
Green / yellow*	Green / yellow*
Built-in	Built-in
IP 54	IP 54
EN 60947-5-2	EN 60947-5-2
Connector Y55	Connector Y95
2 m, PVC, 4 x 0.34 mm <sup>2</sup>	2 m, PVC, 4 x 0.34 mm <sup>2</sup>
PA	PA

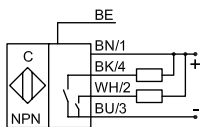


## Capacitive evaluation units for connection to 2 filling level probes with 1 limit value switching point KFS-5-1-... or of 1 probe with 2 limit value switching points KFS-5-2-...

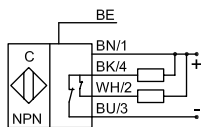
Type of construction	96 x 55 x 25 mm	96 x 55 x 25 mm
		
<b>Technical data</b>		
Electrical version	4 wire DC	4 wire DC
Type NPN normally open (NO)	KFA-5-2-L-N-S-Y50	KFA-5-2-L-N-S-Y90
Art.-No.	AF 0066	AF 0078
Typ NPN normally closed (NC)	KFA-5-2-L-N-Ö-Y50	KFA-5-2-L-N-Ö-Y90
Art.-No.	AF 0067	AF 0079
Typ PNP normally open (NO)	KFA-5-2-L-P-S-Y50	KFA-5-2-L-P-S-Y90
Art.-No.	AF 0065	AF 0077
Typ PNP normally closed (NC)	KFA-5-2-L-P-Ö-Y50	KFA-5-2-L-P-Ö-Y90
Art. No.	AF 0062	AF 0076
Typ AC / Relay output	-	-
Art.-No.	-	-
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Operating voltage ( $U_B$ )	18...36 V DC	18...36 V DC
Output current max. ( $U_e$ )	2 x 250 mA	2 x 250 mA
Voltage drop max. ( $U_d$ )	≤ 2.5 V	≤ 2.5 V
Contact charge	-	-
Permitted residual ripple max.	40 %	40 %
No-load current ( $I_0$ )	Typ. 50 mA	Typ. 50 mA
Frequency of operating cycles 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 60 529	IP 54	IP 54
Norms	EN 60947-5-2	EN 60947-5-2
Probe connection	Connector Y55	Connector Y95
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

\*Variants with LED red / green on request.

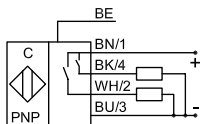
NPN 2 x NO



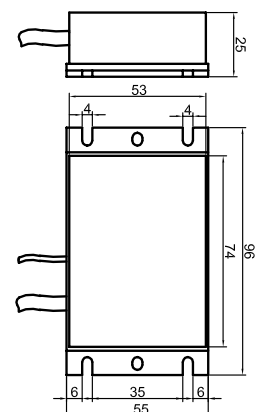
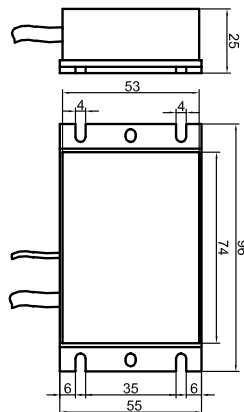
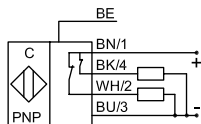
NPN 2 x NC



PNP 2 x NO






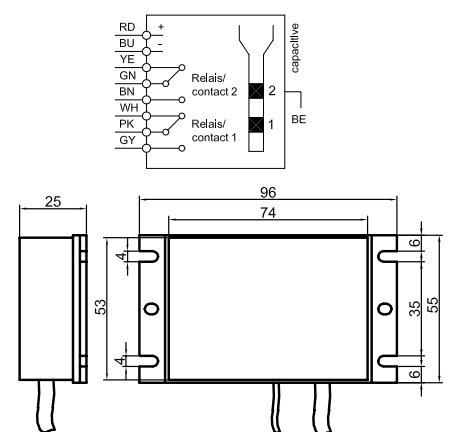
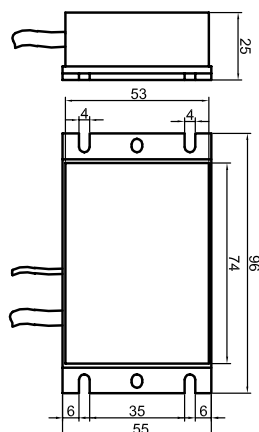
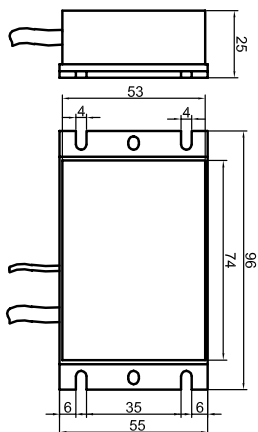
PNP 2 x NC







**FB = probe break control**  
**TD = adjustable time delay**

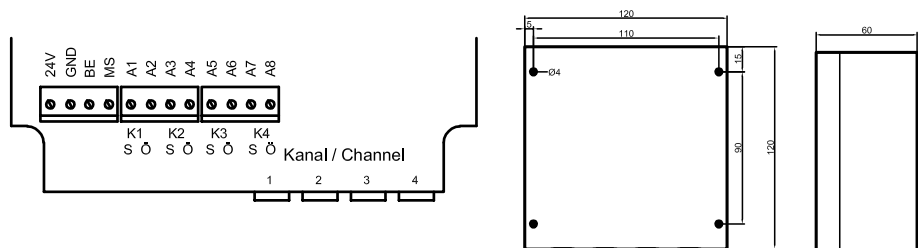
96 x 55 x 25 mm	96 x 55 x 25 mm	96 x 55 x 25 mm
		
4 wire DC	4 wire DC	8-wire DC
<b>KFA-5-2-L-N-Ö-1FB-1TD-Y50</b>	<b>KFA-5-2-L-N-Ö-1FB-1TD-Y90</b>	
<b>AF 0083</b>	<b>AF 0085</b>	
<b>KFA-5-2-L-P-Ö-1FB-1TD-Y50</b>	<b>KFA-5-2-L-P-Ö-1FB-1TD-Y90</b>	
<b>AF 0070</b>	<b>AF 0084</b>	
	-	<b>KFA-5-2-L-II-Y50</b>
	-	<b>AF 0073</b>
CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS
18...36 V DC	18...36 V DC	18...36 V DC
2 x 250 mA	2 x 250 mA	2 x Relay output
≤ 2.5 V	≤ 2.5 V	-
-	-	1,0 A with 30 V DC, 0,5 A with 125 V AC, 0,3 A with 60 V DC
40 %	40 %	40 %
Typ. 50 mA	Typ. 50 mA	Typ. 90 mA
4 Hz	4 Hz	4 Hz
-25...+55 °C	-25...+55 °C	-25...+55 °C
Green / yellow*	Green / yellow*	Green / yellow*
Built-in	Built-in	Built-in
IP 54	IP 54	IP 54
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Connector Y55	Connector Y95	Connector Y55
2 m, PVC, 4 x 0.34 mm <sup>2</sup>	2 m, PVC, 4 x 0.34 mm <sup>2</sup>	2 m, PUR, 8 x 0.25 mm <sup>2</sup>
PA	PA	PA



Capacitive evaluation units for connection to filling level probes with 1 to 4 limit value switching points KFS-5-1-..., KFS-5-2-..., KFS-5-3-... or KFS-5-4-...

Type of construction	120 x 120 x 60 mm	120 x 120 x 60 mm
		
<b>Technical data</b>		
Electrical version	Combicon Terminals	Combicon Terminals
Type NPN Antivalent (NO + NC)	<b>KFA-5-4-N-A-CC-Y50</b>	<b>KFA-5-4-N-A-CC-Y90</b>
Art.-No.	<b>AF 0086</b>	<b>AF 0087</b>
Typ NPN normally open (NO)		
Art.-No.		
Typ PNP normally closed (NC)		
Art.-No.		
Typ PNP Antivalent (NO + NC)	<b>KFA-5-4-P-A-CC-Y50</b>	<b>KFA-5-4-P-A-CC-Y90</b>
Art. No.	<b>AF 0063</b>	<b>AF 0088</b>
Typ PNP normally open (NO)		
Art.-No.		
Typ PNP normally closed (NC)		
Art. No.		
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Operating voltage $U_B$	18...36 V DC	18...36 V DC
Output current max. ( $I_o$ )	Each output 250 mA	Each output 250 mA
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. 120 mA	Typ. 120 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 60 529	IP 65	IP 65
Norms	EN 60947-5-2	EN 60947-5-2
Probe connection	Connector Y55	Connector Y95
Housing material	ABS	ABS

\*Variants with LED red / green on request.



**FB = probe break control**

**120 x 120 x 60 mm**



**120 x 120 x 60 mm**



Combicon Terminals

Combicon Terminals

**KFA-5-4-N-S-4FB-Ö-CC-Y50**

**KFA-5-4-N-S-4FB-Ö-CC-Y90**

**AF 0091**

**AF 0092**

**KFA-5-4-N-Ö-4FB-Ö-CC-Y50**

**KFA-5-4-N-Ö-4FB-Ö-CC-Y90**

**AF 0090**

**AF 0093**

**KFA-5-4-P-S-4FB-Ö-CC-Y50**

**KFA-5-4-P-S-4FB-Ö-CC-Y90**

**AF 0046**

**AF 0094**

**KFA-5-4-P-Ö-4FB-Ö-CC-Y50**

**KFA-5-4-P-Ö-4FB-Ö-CC-Y90**

**AF 0089**

**AF 0095**

CE, RoHS, UL-CSA

CE, RoHS, UL-CSA

18...36 V DC

18...35 V DC

Each output 250 mA

Each output 250 mA

≤ 2.5 V

≤ 2.5 V

40 %

40 %

Typ. 130 mA

Typ. 130 mA

4 Hz

4 Hz

-25...+55 °C

-25...+55 °C

Green / yellow\*

Green / yellow\*

Built-in

Built-in

IP 65

IP 65

EN 60947-5-2

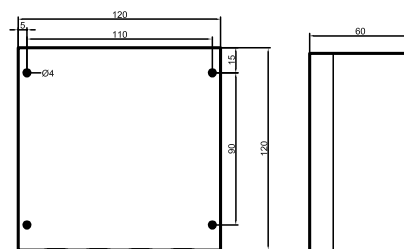
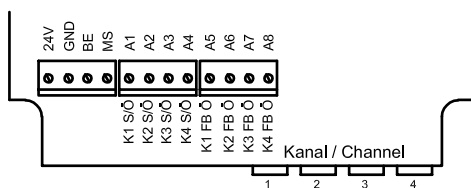
EN 60947-5-2

Connector Y55



Connector Y95

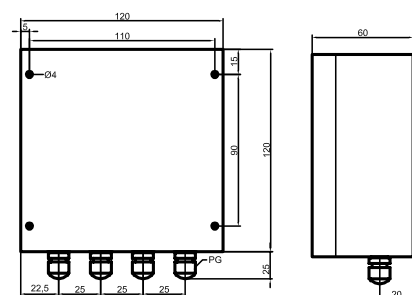
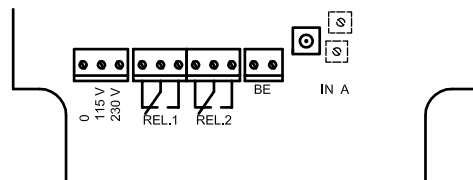
ABS

ABS



Capacitive evaluation units with relay output, type dependent for connection to level probes with 1 limit value switching point KFS-5-1-... or with 2 limit value switching points KFS-5-2-

Type of construction	120 x 120 x 60 mm	120 x 120 x 60 mm
		
<b>Technical data</b>		
Electrical version	115/230 V AC 50/60 Hz	115/230 V AC 50/60 Hz
Channel configuration	1 Channel	2 x Separate
Output function	1 potential-free change-over contact	2 x potential-free change-over contacts
<b>Type AC / Relay output</b>	<b>KFA-5-1-I-KL-Pg9</b>	<b>KFA-5-2-II-KL-Pg9</b>
<b>Art.-No.</b>	<b>972 210</b>	<b>AF 0049</b>
Certificates	CE, RoHS	CE, RoHS
Operating voltage (U <sub>B</sub> )	105...125/207...253 V AC 50/60 Hz	105...125/207...253 V AC 50/60 Hz
Contact charge each relay max.	120 V DC/1A - 250 V AC/4A-	120 V DC/1A - 250 V AC/4A
Power consumption	Typ. 3 VA	Typ. 3 VA
Permitted ambient temperature	-25...+55 °C	-25...+55 °C
De-energising delay		
LED display U <sub>B</sub> power on Level: Probe break control Time delay	Green Green / red (full / empty) Green (flashing)	Green Green / red (full / empty) Green (flashing)
Protective circuit (over-temperature)	Built-in	Built-in
Degree of protection IEC 60 529	IP 54	IP 54
Connection	Screw terminals and SMB sockets	Screw terminals and SMB sockets
Connection probe	SMB connector Y76	SMB connector Y76
Housing material	ABS	ABS



120 x 80 x 55 mm



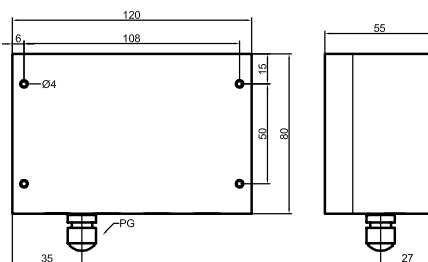
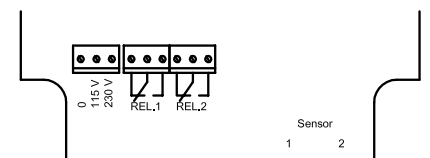
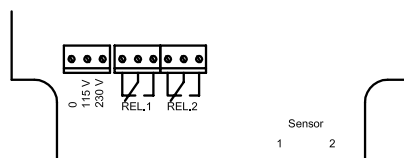
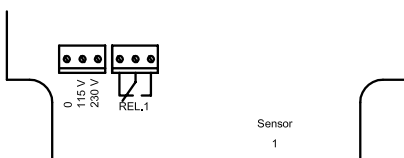
120 x 80 x 55 mm



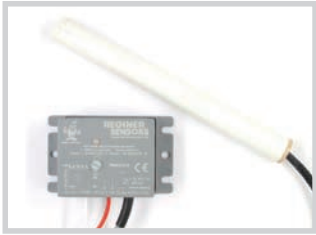

120 x 80 x 55 mm



115/230 V AC 50/60 Hz	115/230 V AC 50/60 Hz	115/230 V AC 50/60 Hz
1 Channel	2 x Separate	2 x Separate
1 potential-free change-over contact	2 x potential-free change-over contacts	2 x potential-free change-over contacts
<b>KFA-5-1-XL-I-CC-Y50</b>	<b>KFA-5-2-XL-II-CC-Y50</b>	<b>KFA-5-2-XL-II-2FB-2TD-CC-Y50</b>
<b>AF 0101</b>	<b>AF 0102</b>	<b>AF 0103</b>
CE, RoHS	CE, RoHS	CE, RoHS
105...125/207...253 V AC 50/60 Hz	105...125/207...253 V AC 50/60 Hz	105...125/207...253 V AC 50/60 Hz
120 V DC/1A - 250 V AC/4A	120 V DC/1A - 250 V AC/4A	120 V DC/1A - 250 V AC/4A
Typ. 3 VA	Typ. 3 VA	Typ. 3 VA
-25...+55 °C	-25...+55 °C	-25...+55 °C
		0...15 sec. adjustable
Green Green / red (full / empty)	Green Green / red (full / empty) Green (flashing)	Green Green / red (full / empty) Green (flashing) Orange (flashing)
Built-in	Built-in	Built-in
IP 54	IP 54	IP 54
Combicon-Screw terminals and SMB sockets	Combicon-Screw terminals and SMB sockets	Combico-Screw terminals and SMB sockets
Connector Y55	Connector Y55	Connector Y55
ABS	ABS	ABS

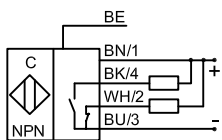


## COMPACT SERIES - EVALUATION UNIT AND PROBE FIX CONNECTED

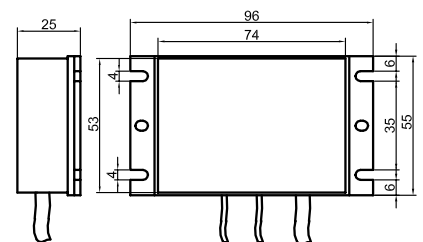
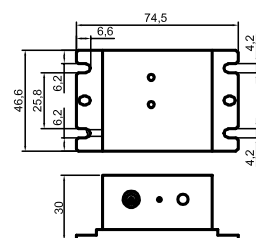
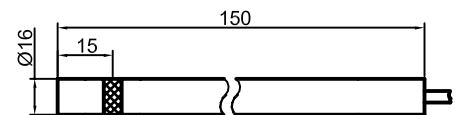
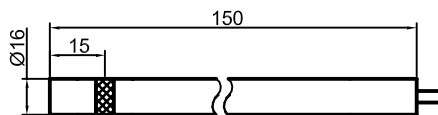
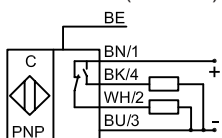
Type of construction	Ø 16 mm / 74,5 x 46,6 x 30 mm	Ø 16 mm / 96 x 55 x 25 mm
		
<b>Technical data</b>		
Electrical version	4 wire DC	4 wire DC
Type NPN Antivalent (NO + NC)		
Art.-No.		
Type PNP Antivalent (NO + NC)	KFS-5-1-150-15, 0,6 m & KFA-5-1-P-A	KFS-5-1-150-15, 0,6 m & KFA-5-1-L-P-A
Art.-No.	KFK 001	KFK 009
Certificates	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
Operating voltage (U <sub>B</sub> )	18...36 V DC	18...36 V DC
Output current max. (U <sub>e</sub> )	2 x 250 mA	2 x 250 mA
Voltage drop max. (U <sub>d</sub> )	≤ 2.5 V	≤ 2.5 V
Permitted residual ripple max.	40 %	40 %
No-load current (I <sub>0</sub> )	Typ. 50 mA	Typ. 50 mA
Frequency of operating cycles 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 60 529	IP 65	IP 54
Norm	EN 60947-5-2	EN 60947-5-2
Connection probe	Cable 0.6 m	Cable 0.6 m
Connection	2 m, PUR, 4 x 0.14 mm <sup>2</sup>	2 m, PUR, 4 x 0.34 mm <sup>2</sup>
Housing material	PA	PA

\*Variants with LED red / green on request.

NPN Antivalent (NO + NC)



PNP Antivalent (NO + NC)



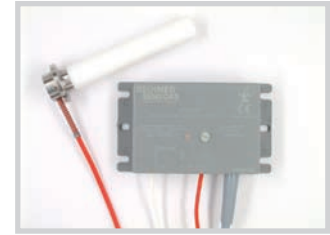
Ø 16 mm / 74,5 x 46,6 x 30 mm



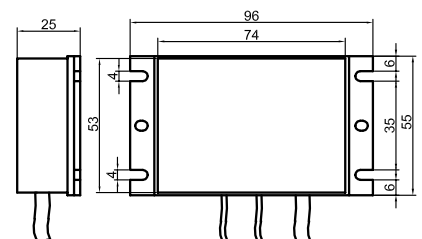
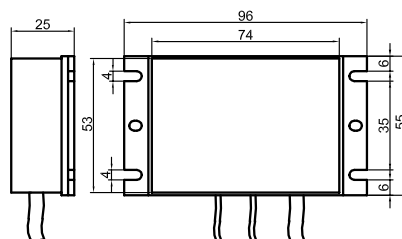
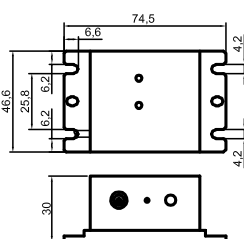
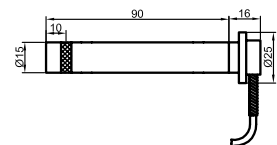
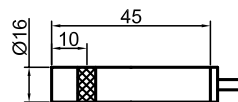
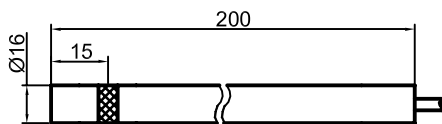
Ø 16 mm / 96 x 55 x 25 mm



Ø 15 mm / 96 x 55 x 25 mm



4 wire DC	4 wire DC	4 wire DC
<b>KFS-5-1-200-15, 0,4 m &amp; KFA-5-1-P-A, 5 m</b>	<b>KFS-5-1-GL-45-10-PEEK, 2 m &amp; KFA-5-1-L-P A</b>	<b>KFS-5-1-GL-90-10-PTFE/VA, 2 m, &amp; KFA-5-1-L-P-A</b>
<b>KFK 005</b>	<b>KFK 004</b>	<b>KFK 010</b>
CE, RoHS, UL-CSA	CE, RoHS, UL-CSA	CE, RoHS, UL-CSA
18...36 V DC	18...36 V DC	18...36 V DC
2 x 250 mA	2 x 250 mA	2 x 250 mA
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
40 %	40 %	40 %
Typ. 50 mA	Typ. 50 mA	Typ. 50 mA
4 Hz	4 Hz	4 Hz
-25...+55 °C	-25...+55 °C	-25...+55 °C
Green / yellow*	Green / yellow*	Green / yellow*
Built-in	Built-in	Built-in
IP 65	IP 54	IP 54
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Cable 0.4 m	Cable 2 m	Cable 2 m
5 m, PUR, 4 x 0.14 mm <sup>2</sup>	2 m, PUR, 4 x 0.34 mm <sup>2</sup>	2 m, PUR, 4 x 0.34 mm <sup>2</sup>
PA	PA	PA



## WELDED SOCKET G1“

For container and tubes



Type	Art. No.
AP 35	196368



Type	Art. No.
BP 35	196369

## MILK TUBE FITTING ACCORDING TO DIN 11851 G1“

Cone nut



Type	Art. No.
FP 35 - DN 40	196371
GP 35 - DN 50	196372
LP 35 - DN 65	196373

Coupling nut



Type	Art. No.
FÜ 15 - DN 40	196374
GÜ 15 - DN 50	196375
LÜ 15 - DN 65	196376

Varivent



Type	Art. No.
HP 35 -DN50 Type N	196377
IP 35 - DN 25 Type F	196378

Triclamp



Type	Art. No.
TP 35	196379

DRD-Flange



Type	Art. No.
GA 35	196380

## SEALING PLUG G1“

Sealing plug



Type	Art. No.
VES35	196381

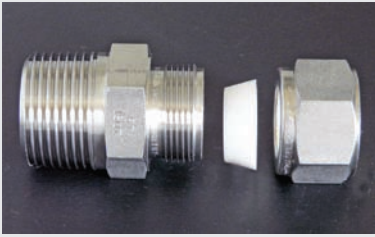
Welding plug



Type	Art. No.
ESS35	196382



## ACCESSORIES



Squeeze Clamp  
Stainless steel  
Process connection: R3/4" conical tube thread according to ISO 7/1  
With plastic ring (PTFE)  
Art.-No. 194201



Squeeze Clamp  
Stainless steel  
Process connection: R3/4" conical tube thread according to ISO 7/1  
With stainless steel ring  
Art.-No. 194202



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



KB PA-1"-VA-16 Adapter for 1" process connection for probes with 16 mm diameter, Material stainless steel (VA)  
Art.- No.: 194010

## TYPE SELECTION IN TYPE CODE ORDER

Art.-No.	Type Description	Page
194000	KB-PG 16	32
194001	KB-PG 16-200°C	32
194010	KB PA-1"-VA-16	33
194201	Squeeze Clamp R 3/4", ISO 7/1	33
194202	Squeeze Clamp R 3/4", ISO 7/1	33
196368	AP 35	32
196369	BP 35	32
196371	FP 35 - DN 40	32
196372	GP 35 - DN 50	32
196373	LP 35 - DN 65	32
196374	FÜ 15 - DN 40	32
196375	GÜ 15 - DN 50	32
196376	LÜ 15 - DN 65	32
196377	HP 35 - DN 50 Typ N	32
196378	IP 35 - DN 25 Typ F	32
196379	TP 35	32
196380	GA 35	32
196381	VES 35	32
196382	ESS 35	32
972210	KFA-5-I-KL-Pg9	28
AF0004	KFA-5-1-P-A-Y50	22
AF0005	KFA-5-1-N-A-Y50	22
AF0046	KFA-5-4-P-S-4FB-Ö-CC-Y50	27
AF0049	KFA-5-II-KL-Pg9	28
AF0062	KFA-5-2-L-P-Ö-Y50	24
AF0063	KFA-5-4-N-A-CC-Y50	26
AF0064	KFA-5-1-L-P-A-Y50	22
AF0065	KFA-5-2-L-P-S-Y50	24
AF0066	KFA-5-2-L-N-S-Y50	24
AF0067	KFA-5-2-L-N-Ö-Y50	24
AF0068	KFA-5-1-L-N-A-Y50	22
AF0070	KFA-5-2-L-P-Ö-1FB-1TD-Y50	25
AF0073	KFA-5-2-L-II-Y50	25
AF0076	KFA-5-2-L-P-Ö-Y90	24
AF0077	KFA-5-2-L-P-S-Y90	24
AF0078	KFA-5-2-L-N-S-Y90	24
AF0079	KFA-5-2-L-N-Ö-Y90	24
AF0081	KFA-5-1-L-P-A-FB-TD-Y50	23
AF0082	KFA-5-1-L-P-A-FB-TD-Y90	23
AF0083	KFA-5-2-L-N-Ö-1FB-1TD-Y50	25
AF0084	KFA-5-2-L-P-Ö-1FB-1TD-Y90	25
AF0085	KFA-5-2-L-N-Ö-1FB-1TD-Y90	25
AF0086	KFA-5-4-P-A-CC-Y50	26
AF0087	KFA-5-4-N-A-CC-Y90	26
AF0088	KFA-5-4-N-A-CC-Y90	26
AF0089	KFA-5-4-P-Ö-4FB-Ö-CC-Y50	27
AF0090	KFA-5-4-N-Ö-4FB-Ö-CC-Y50	27
AF0091	KFA-5-4-N-S-4FB-Ö-CC-Y50	27
AF0092	KFA-5-4-N-S-4FB-Ö-CC-Y90	27
AF0093	KFA-5-4-N-Ö-4FB-Ö-CC-Y90	27
AF0094	KFA-5-4-P-S-4FB-Ö-CC-Y90	27

Art.-No.	Type Description	Page
AF0095	KFA-5-4-P-Ö-4FB-Ö-CC-Y90	27
AF0101	KFA-5-1-XL-I-CC-Y50	29
AF0102	KFA-5-2-XL-II-CC-Y50	29
AF0103	KFA-5-1-XL-II-2FB-2TD-CC-Y50	29
KF0062	KFS-5-1-GL-85-10-PTFE/VA-H-Y95	14
KF0063	KFS-5-1-GL-45-10-PTFE/VA-Y95	13
KF0065	KFS-5-1-GL-80-10-PTFE/VA-Y95	13
KF0078	KFS-5-1-150-15-PEEK-Y55	17
KF0080	KFS-5-1-160-15-M22-VA-250°C-Y55	15
KF0099	KFS-5-1-100-15-Y55	16
KF0136	KFS-5-1-150-15-Y55	17
KF0158	KFS-5-1-GL-35-10-PTFE/VA-Y95	12
KF0173	KFS-5-1-137-15-D10-Y55	11
KF0240	KFS-5-1-GL-120-10-M22-PTFE/VA-250°C-Y55	15
KF0241	KFS-5-1-30-7-M22-Y95	14
KF0249	KFS-5-1-60-15-D10/M12-Y55	11
KF0277	KFS-5-1-60-16-D-10-PEEK-250°C-Y75	10
KF0285	KFS-5-1-200-15-D10-250°C-Y75	11
KF0304	KFS-5-1-100-15-D10-PEEK-Y55	11
KF0307	KFS-5-1-100-15-W-Y55	18
KF0314	KFS-5-1-54-15-W-Y55	18
KF0315	KFS-5-1-60-15-D10-PEEK-Y95	10
KF0316	KFS-5-1-GL-60-PTFE/VA-M18-Y95	12
KF0317	KFS-5-1-GL-170-PTFE/VA-M18-Y95	12
KF0318	KFS-5-1-GL-PTFE/VA-3/4"-Y95	15
KF0320	KFS-5-1-200-15-W-Y55	18
KF0321	KFS-5-2-180-15/75-M22-PTFE/VA-Y55	20
KF0323	KFS-5-2-150-15/X2-Y55	19
KF0325	KFS-5-1-220-15-PTFE/VA-Y55	15
KF0326	KFS-5-1-170-15-GFK/VA-Y95	17
KF0327	KFS-5-1-400-15-GFK/VA-Y95	17
KF0328	KFS-5-1-100-15-GFK/VA-Y95	16
KF0329	KFS-5-1-GL-100-15-M18-PTFE/VA-Y95	14
KF0330	KFS-5-2-100-8/48-M22-Y55	20
KF0331	KFS-5-1-60-15-D10-PEEK-Y55	10
KF0332	KFS-5-1-GL-69-10-PTFE-VA-Y95	13
KF0333	KFS-5-1-80-15-PEEK-Y55	16
KF0351	KFS-5-2-400-15/X2-Y55	19
KF0352	KFS-5-1-GL-90-10-PTFE/VA-Y95	13
KF0353	KFS-5-2-GL-85-10/50-PTFE/VA-H-Y95	19
KF0363	KFS-5-2-200-15/110-W-Y55	20
KF0364	KFS-5-2-300-15/X2-GFK/VA-Y95	21
KFK001	KFS-5-1-150-15, 0,6 m & KFA-5-1-P-A	30
KFK004	KFS-5-1-GL-45-10-PEEK, 2 m & KFA-5-1-L-P-A	31
KFK005	KFS-5-1-200-15, 0,4 m & KFA-5-1-P-A, 5 m	31
KFK009	KFS-5-1-150-15, 0,6 m & KFA-5-1-L-P-A	30
KFK010	KFS-5-1-GL-90-10-PTFE/VA, 2 m & KFA-5-1-L-P-A	31

## TYPE SELECTION IN TYPE CODE ORDER

Art.-No.	Description	Page	Art.-No.	Description	Page
196368	AP 35	32	KF0307	KFS-5-1-100-15-W-Y55	18
196369	BP 35	32	KF0099	KFS-5-1-100-15-Y55	16
196382	ESS 35	32	KF0173	KFS-5-1-137-15-D10-Y55	11
196371	FP 35 - DN 40	32	KFK009	KFS-5-1-150-15, 0,6 m & KFA-5-1-L-P-A	30
196374	FÜ 15 - DN 40	32	KFK001	KFS-5-1-150-15, 0,6 m & KFA-5-1-P-A	30
196380	GA 35	32	KF0078	KFS-5-1-150-15-PEEK-Y55	17
196372	GP 35 - DN 50	32	KF0136	KFS-5-1-150-15-Y55	17
196375	GÜ 15 - DN 50	32	KF0080	KFS-5-1-160-15-M22-VA-250°C-Y55	15
196377	HP 35 - DN 50 Typ N	32	KF0326	KFS-5-1-170-15-GFK/VA-Y95	17
196378	IP 35 - DN 25 Typ F	32	KFK005	KFS-5-1-200-15, 0,4 m & KFA-5-1-P-A-, 5 m	31
194010	KB PA-1"-VA-16	33	KF0285	KFS-5-1-200-15-D10-250°C-Y75	11
194000	KB-PG 16	32	KF0320	KFS-5-1-200-15-W-Y55	18
194001	KB-PG 16-200°C	32	KF0325	KFS-5-1-220-15-PTFE/VA-Y55	15
AF0068	KFA-5-1-L-N-A-Y50	22	KF0241	KFS-5-1-30-7-M22-Y95	14
AF0081	KFA-5-1-L-P-A-FB-TD-Y50	23	KF0327	KFS-5-1-400-15-GFK/VA-Y95	17
AF0082	KFA-5-1-L-P-A-FB-TD-Y90	23	KF0314	KFS-5-1-54-15-W-Y55	18
AF0064	KFA-5-1-L-P-A-Y50	22	KF0249	KFS-5-1-60-15-D10/M12-Y55	11
AF0005	KFA-5-1-N-A-Y50	22	KF0331	KFS-5-1-60-15-D10-PEEK-Y55	10
AF0004	KFA-5-1-P-A-Y50	22	KF0315	KFS-5-1-60-15-D10-PEEK-Y95	10
AF0101	KFA-5-1-XL-I-CC-Y50	29	KF0277	KFS-5-1-60-16-D-10-PEEK-250°C-Y75	10
AF0103	KFA-5-1-XL-II-2FB-2TD-CC-Y50	29	KF0333	KFS-5-1-80-15-PEEK-Y55	16
AF0073	KFA-5-2-L-II-Y50	25	KF0329	KFS-5-1-GL-100-15-M18-PTFE/VA-Y95	14
AF0083	KFA-5-2-L-N-Ö-1FB-1TD-Y50	25	KF0240	KFS-5-1-GL-120-10-M22-PTFE/VA-250°C-Y55	15
AF0085	KFA-5-2-L-N-Ö-1FB-1TD-Y90	25	KF0317	KFS-5-1-GL-170-PTFE/VA-M18-Y95	12
AF0067	KFA-5-2-L-N-Ö-Y50	24	KF0158	KFS-5-1-GL-35-10-PTFE/VA-Y95	12
AF0079	KFA-5-2-L-N-Ö-Y90	24	KFK004	KFS-5-1-GL-45-10-PEEK, 2 m & KFA-5-1-L-P-A	31
AF0066	KFA-5-2-L-N-S-Y50	24	KF0063	KFS-5-1-GL-45-10-PTFE/VA-Y95	13
AF0078	KFA-5-2-L-N-S-Y90	24	KF0316	KFS-5-1-GL-60-PTFE/VA-M18-Y95	12
AF0070	KFA-5-2-L-P-Ö-1FB-1TD-Y50	25	KF0332	KFS-5-1-GL-69-10-PTFE-VA-Y95	13
AF0084	KFA-5-2-L-P-Ö-1FB-1TD-Y90	25	KF0065	KFS-5-1-GL-80-10-PTFE/VA-Y95	13
AF0062	KFA-5-2-L-P-Ö-Y50	24	KF0062	KFS-5-1-GL-85-10-PTFE/VA-H-Y95	14
AF0076	KFA-5-2-L-P-Ö-Y90	24	KFK010	KFS-5-1-GL-90-10-PTFE/VA, 2 m & KFA-5-1-L-P-A	31
AF0065	KFA-5-2-L-P-S-Y50	24	KF0352	KFS-5-1-GL-90-10-PTFE/VA-Y95	13
AF0077	KFA-5-2-L-P-S-Y90	24	KF0318	KFS-5-1-GL-PTFE/VA-3/4"-Y95	15
AF0102	KFA-5-2-XL-II-CC-Y50	29	KF0330	KFS-5-2-100-8/48-M22-Y55	20
AF0063	KFA-5-4-N-A-CC-Y50	26	KF0323	KFS-5-2-150-15/X2-Y55	19
AF0087	KFA-5-4-N-A-CC-Y90	26	KF0321	KFS-5-2-180-15/75-M22-PTFE/VA-Y55	20
AF0088	KFA-5-4-N-A-CC-Y90	26	KF0363	KFS-5-2-200-15/110-W-Y55	20
AF0090	KFA-5-4-N-Ö-4FB-Ö-CC-Y50	27	KF0364	KFS-5-2-300-15/X2-GFK/VA-Y95	21
AF0093	KFA-5-4-N-Ö-4FB-Ö-CC-Y90	27	KF0351	KFS-5-2-400-15/X2-Y55	19
AF0091	KFA-5-4-N-S-4FB-Ö-CC-Y50	27	KF0353	KFS-5-2-GL-85-10/50-PTFE/VA-H-Y95	19
AF0092	KFA-5-4-N-S-4FB-Ö-CC-Y90	27	196373	LP 35 - DN 65	32
AF0086	KFA-5-4-P-A-CC-Y50	26	196376	LÜ 15 - DN 65	32
AF0089	KFA-5-4-P-Ö-4FB-Ö-CC-Y50	27	194201	Squeeze clamp R 3/4", ISO 7/1	33
AF0095	KFA-5-4-P-Ö-4FB-Ö-CC-Y90	27	194202	Squeeze clamp R 3/4", ISO 7/1	33
AF0046	KFA-5-4-P-S-4FB-Ö-CC-Y50	27	196379	TP 35	32
AF0094	KFA-5-4-P-S-4FB-Ö-CC-Y90	27	196381	VES 35	32
AF0049	KFA-5-II-KL-Pg9	28			
972210	KFA-5-I-KL-Pg9	28			
KF0304	KFS-5-1-100-15-D10-PEEK-Y55	11			
KF0328	KFS-5-1-100-15-GFK/VA-Y95	16			

# **SENSORS FOR INDUSTRIAL AUTOMATION**

## **CAPACITIVE • INDUCTIVE MAGNETORESISTIVE CALORIMETRIC**

Ask for further catalogues:

**CAPACITIVE SENSORS KAS  
CAPACITIVE SENSORS KXS  
CAPACITIVE LEVEL MEASURING SYSTEMS  
INDUCTIVE SENSORS  
MAGNETORESISTIVE SENSORS  
POWER SUPPLIES AND CONTROLLERS  
FLOW SENSORS  
ATEX CERTIFIED PRODUCTS**

**Your Representative**



**RECHNER**

**INDUSTRIE-ELEKTRONIK GmbH**

**Gaußstraße 8-10 68623 Lampertheim Germany**

**Tel. (0 62 06) 50 07-0 Fax (0 62 06) 50 07-36 Fax Intl. +49 (0) 62 06 50 07-20**

**www.rechner-sensors.com**

**e-mail: info@rechner-sensors.de**