

# ULTRASCHALL

## Ultrasonic-Level sensors



### **Series UFA 1004... inV2A**

- Range 1000 mm
- Resolution 1,7mm, Linearity  $\pm 0,6\%$
- Analogue output 4...20 mA, 0...10 V (also inverted), incl. binary output
- Sluggish reception sensitivity of 2 sec. (attenuation needed for level measurement)
- Object detection  $>20 \text{ cm}^2$
- Protection class IP 67, fully encapsulated
- M18x1 length 90mm
- High noise immunity
- Teflon coated transducer, for water rejection
- Level measurement for bins, tanks, etc.
- High stability, slow measurement speed ideally for liquid level measurement.
- Distorsion immunity, complete installation possible

## Technische Daten

### System

Scanning range	150...1000 mm
Switch Response adjustment range (with 3-turn potentiometer)	approx. 180...1000 mm
Blind range	150 mm (keep clear from objects)
Hysteresis axial, radial not defined	typ. 30...60 mm (appropriate response distance)
Reproducibility of switch response point	typ. $\pm 0,2\%$ Sn max. (Target > 100 cm <sup>2</sup> )
Linearity of analogue output (Range from 200...1000 mm)	typ. $\pm 0,6\%$ (voltage output) typ. $\pm 1\%$ (current output)
Calibration accuracy	typ. $\pm 1\%$ in calibration point 500 mm
Resolution	$\pm 1,7$ mm
Temperature effect	typ. $+5$ mV/°C analogue output typ. $-0,6$ mm/°C binary output
Temperature sensitivity of air path	$+0,17\%/^{\circ}\text{C}$ in the air
Start-up drift	typ. 50 mV analogue output stable after approx. 2 min. (90% from rated value)
Response sensitivity	approx. 20 cm <sup>2</sup> for rectangular sound penetration at the temp. $-10...+50^{\circ}\text{C}$
detection angle	approx. 20 degree(diagram) maximum diameter of the core approx. 200 mm at a distance of 800 mm
Transmitter frequency	approx. 185 kHz
Transmission cycle	approx. 58 Hz

### Outputs

Binary output normally open	transistor, open collector, pnp, contact (opener optional) max. 0,1 A short-circuit-proof, 100% ED, voltage drop approx. 3 V at 0,1 A, red LED
Switching rate, typ	max. 15 switchings per minute (for distance switches from 15% to 90%)
Analogue output	0...+10 VDC RL>10kohm, Ri 100Ohm useful range approx. 180...1000 mm (1,8...10 V) (also inverted option +10...0 VDC)
Analogue voltage ripple	approx. 60 mV (2m long cable)
Current output	4...20mA impressed, RL max.500Ohm useful range approx. 7...20mA
Tracking speed of analogue outputs	approx. 2 sec. for full Scale

### Power supply

Voltage range	18...33 VDC
Consumption at US 24 VDC	approx. 32 mA (UFA 1004 PS 24 A switched, without load current)
Ripple of supply voltage	10% max.
Poles confusion security	given

### Additional inputs

synchronisation	on demand
respectively scanner inputs	

### Ambient Conditions

EMC noise immunity	to EN 50082-2
EMC pollution	to EN 50081-2
working temperature	$-10^{\circ}\text{C}...+65^{\circ}\text{C}$
Pressure	atmospheric, approx. 900...1100 millibar will not operate under vacuum pressure.
Humidity	up to 99% r.h., no icing transducer membran PTFE coated for a better water rejection
protection	IP 67, fully encapsulated
explosion proof	no

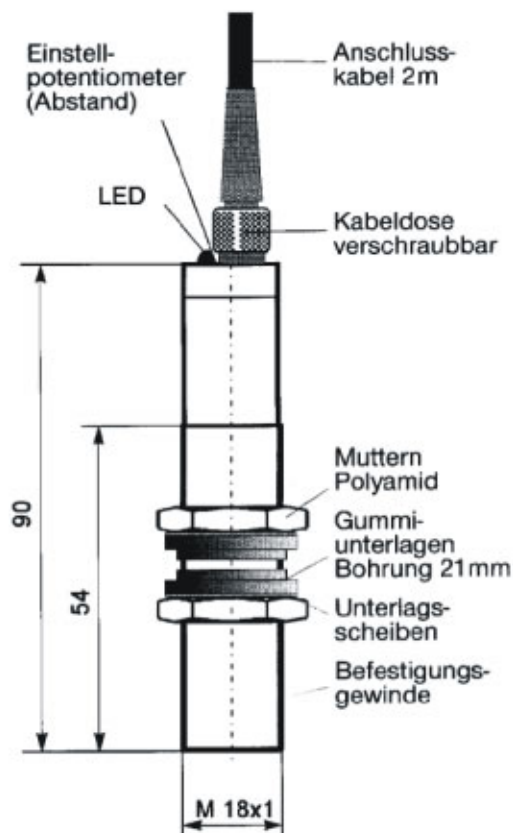
### Housing

Dimensions	see diagram
housing materials	AcB anodically treated and/or stainless steel V2A GF Polyamid transducer: Epoxy, Neoprene
Weight	approx. 50 g no cable
Connections	see diagram
Cable	PUR, 2 m long, 4-cores ( with plug connector) PVC, 2 m, 4-cores shielded (without plug connector)
Scope of delivery	sensor, 2 fixing nuts (M18x1), 2 rubber gaskets (GU 18), 2 washers. connector cable PUR with socket, straight (only plug connector mode)
Accessoires (to be ordered separately)	Fixing clip (BS 18), PUR connector cable with screwed angled socket (order no. KAB 2K 4WVP)

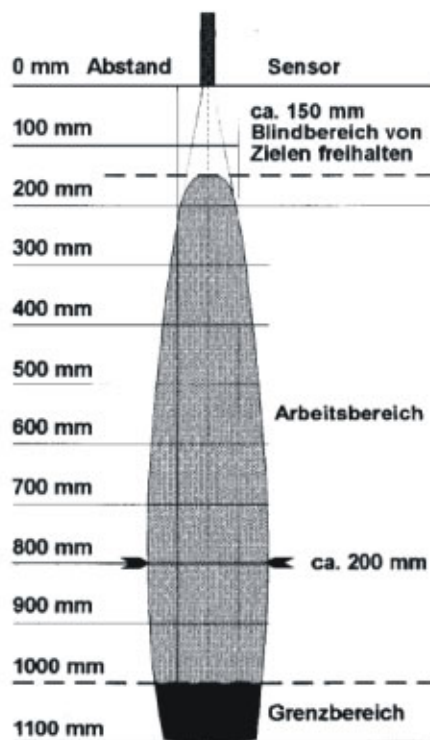
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## Housing types and coverage area

### Housing types



### Coverage area

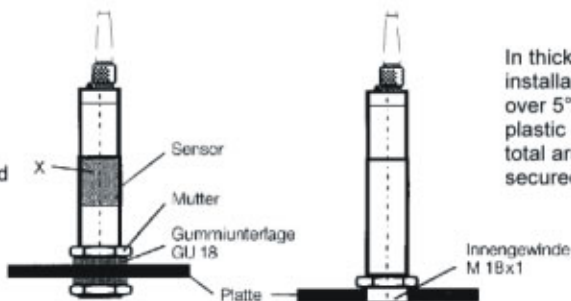


Operating voltage 24 VDC, temperature +20 °C, for temperatures > 50 °C the detection area is reduced.

## Installation and Connection

### Installation in platen

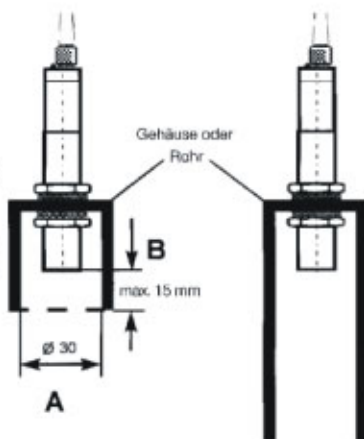
A minimum ultrasonic noise is coupled in directly from the sensors to the mounting plates. One drilling of  $\varnothing 21$  mm is planned. All the operable temperature range could be used. By lower temperatures the sensor should be preferably fixed in the X threaded area.



In thicker disks the final installation is at a temperature of over 5 °C possible. The use of plastic disks, allows to use the total area. The sensors must be secured with a lock.

### Installation in tubes

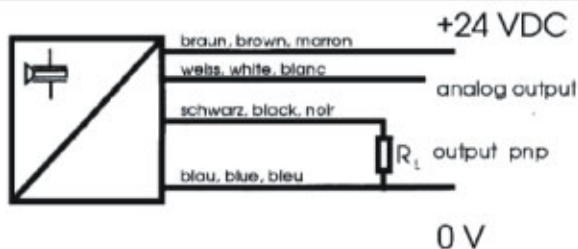
The installation of the sensors into short housings is possible for smooth interior areas and land-free fronts. The dimensions play however an essential role. In a tube diameter A of 30 mm is required to choose a distance B smaller as 15 mm. In larger diameters, B can be extended also. In case the walls from the sides get a funnel form, ist possible that the B distance becomes a big increase. Because of the influence of the surfaces quality of the tube inside are recommended beforehand trial.



The installation of the sensors of the series UFA 1004 into longer tubes with little diameter inside is not recommended. The reflections emerging at the same time in the tubes lead in to ambiguous echo and therewith to interferences. The sensor shows a value of the analogous output of <3 volts. The binary output is permanently turned on. In tubes or containers up to approx. 250 mm of inner diameter, sensors can be installed as far as the walls are smooth. In such cases beforehand trial is recommended.



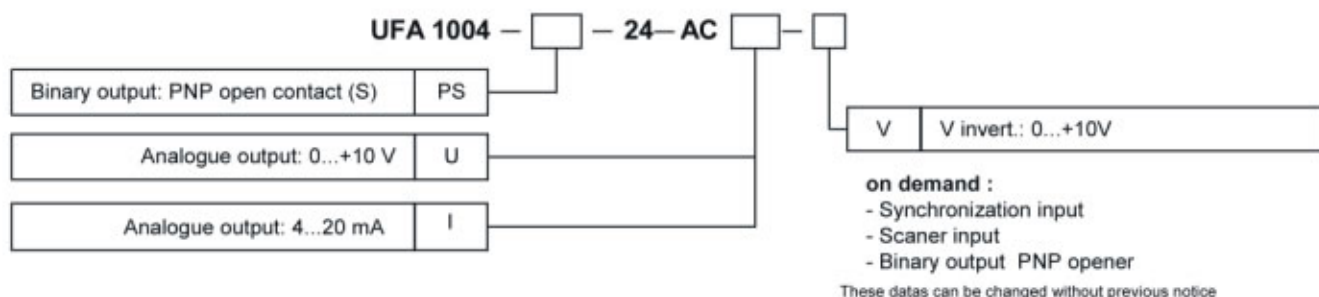
## Connection



The current output is recommended for applications where long cables are required. In case this is not possible an additional grounding of the signal is necessary. This ground is to be connected with the 0V potential of the e.g. plc. It is recommended to connect the (-)supply with GND and machine body. Main system components should satisfy the relevant standards concerning noise emission and safety.

Ultrasonic sensors have a relatively low steady-state power consumption approx. 40mA but a high peak demand of about 0,6A (current peaks in transmission cycle). One must therefore ensure that the power supply is able to meet this peak requirement, e.g. from back-up capacitor must be fitted directly at the sensor, or an additional back up capacitor (e.g. 470mF, 35V) is to be connected parallel to the power supply line, close to the sensor.

## ordercode



## The following types are on demand available

- Synchronised input  
(For the sake of synchronisation of more sensors which are installed in the same construction and are therefore not affected by each other )
- Scan input  
(to be used for measurement interrupts for defined periods )
- Adjustable zero and variable slope

## Included in the delivery

The delivery includes a rubber support GU18, a nut M18 and U-disks.

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