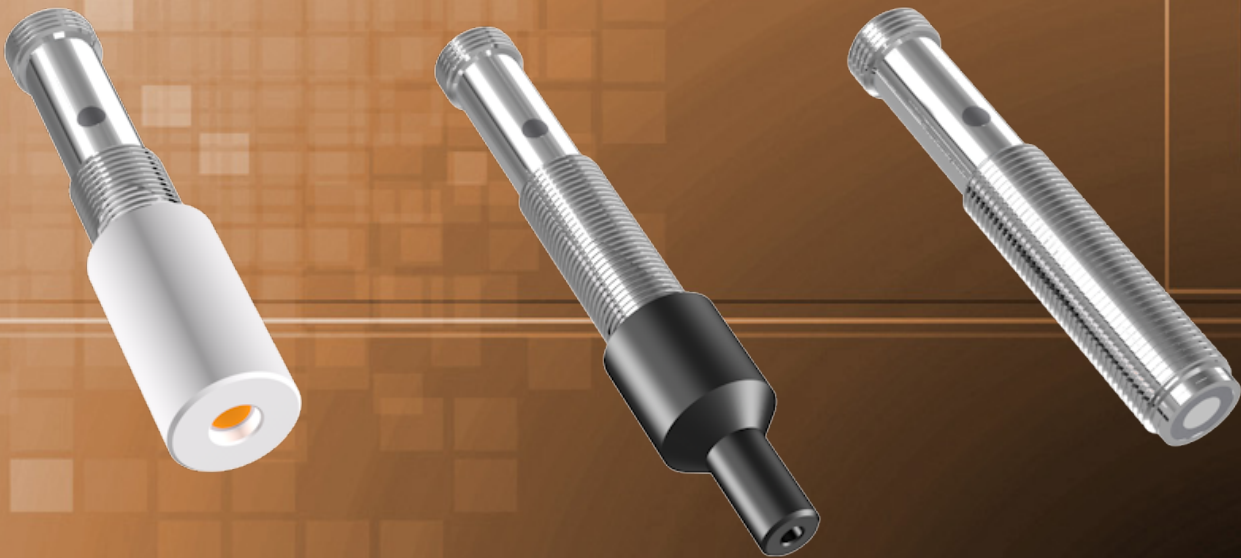


# ULTRASONIC SENSORS



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## Series UFA2 and UFA-150-CP

### Key-Features:

- Measurement is independent of the targets material, surface, colour or transparency
- Teachable measurement range of 20...200 mm
- Linearity <math><0.4\%</math> of full scale
- Analog or switching output
- Operating temperature -25...+70 °C
- Protection class IP67
- Focus beam: no blind range, very narrow sound beam
- Radial beam: no blind range, radial measurement
- Chemical resistant version

## TECHNICAL DATA UFA2

Output type		Analog output		Switching output	
		Focus beam	Standard	Focus beam	Standard
Version					
Measurement range	[mm]	0...150 <sup>1)</sup>	20...200 <sup>2)</sup>	0...150 <sup>1)</sup>	20...200 <sup>2)</sup>
Linearity max.	[%]	<0.4		-	
Repeatability	[mm]	<0.5			
Resolution	[mm]	1		-	
Sound frequency	[kHz]	400			
Readiness delay	[ms]	<300			
Analog output		0...10 V / 4...20 mA (switchable)		-	
Load resistance	[kΩ]	Voltage: >10 / Current: <0.4		-	
Switching output		-		Push pull, NPN, PNP, NO/NC (switchable)	
Switching current max.	[mA]	-		150	
Switching hysteresis	[mm]	-		2	
Switching frequency	[Hz]	-		20	
Power supply	[VDC]	18...30			
No-load current at 24 VDC	[mA]	<40		<30	
Voltage drop	[V]	<2		<2.5	
Inverse-polarity protection		Yes			
Short circuit protection		Yes			
Isolation voltage	[V]	500			
Connection		Connector M12, 4 poles			
Protection class		IP67			
Operating temperature	[°C]	-25...+70			
Temperature drift		0.2 %/K (uncompensated)			
Mounting distance	[mm]	>60 (sensor to sensor)			
Housing		nickel-plated brass, epoxy resin, PUR			

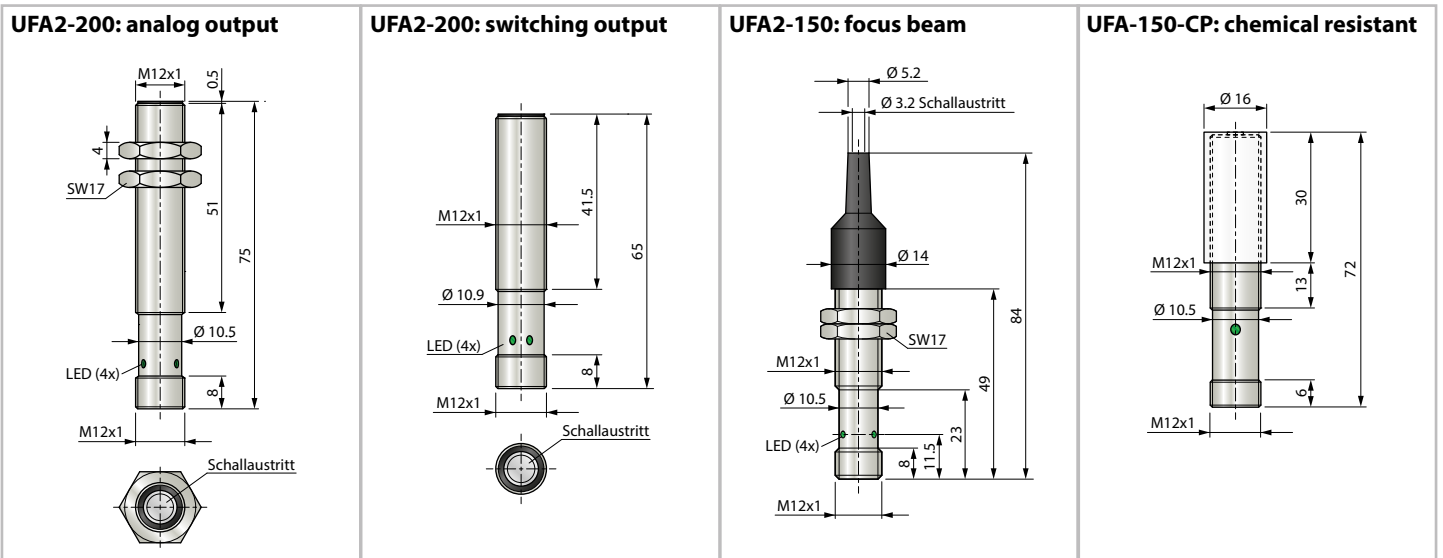
<sup>1)</sup> on a standardized measurement plate 20 x 20 mm

<sup>2)</sup> on a standardized measurement plate 100 x 100 mm

## TECHNICAL DATA UFA-150-CP - CHEMICAL RESISTANT

Output type		Voltage output		Current output		Switching output	
Measurement range	[mm]	20...150					
Linearity max.	[%]	<1				-	
Repeatability	[mm]	<0.5					
Sound frequency	[kHz]	400					
Analog output		0...10 V		4...20 mA		-	
Load resistance	[kΩ]	1		0.3		-	
Switching output		-		-		PNP, NO/NC	
Switching hysteresis	[%]	-		-		≤1	
Switching frequency	[Hz]	-		-		13	
Switching time t <sub>on</sub>	[ms]	-		-		approx. 30	
Power supply	[VDC]	15...30		10...30			
Ripple of supply voltage	[%]	10					
Current consumption average	[mA]	approx. 30					
Isolation voltage	[V]	500					
Connection		Connector M12, 4 poles					
Protection class		IP67					
Operating temperature	[°C]	0...+70					
Temperature drift	[%]	≤1.5					
Housing		nickel-plated brass, epoxy resin, PUR					

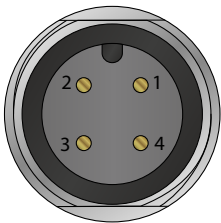
## TECHNICAL DRAWING



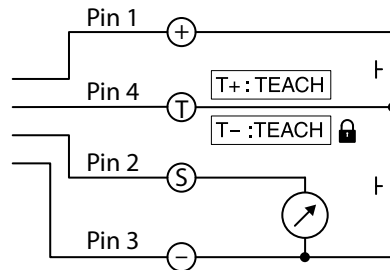
## ELECTRICAL CONNECTION

Pin	UFA2		UFA2-150-CP		Connection cable K4P cable colours
	Analog output	Switching output	Analog output	Switching output	
1	+V	+V	+V	+V	BN
2	Analog	Teach	Teach	Teach	WH
3	GND	GND	GND	GND	BU
4	Teach	Switching output	Analog	Switching output	BK

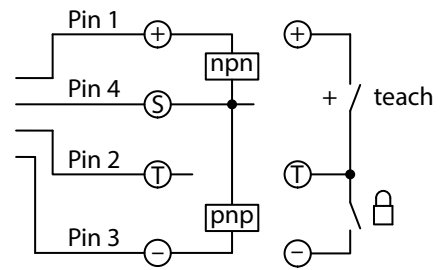
connector M12, male



circuit diagram UFA2 analog output

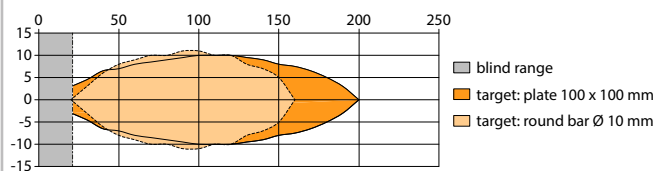


circuit diagram UFA2 switching output

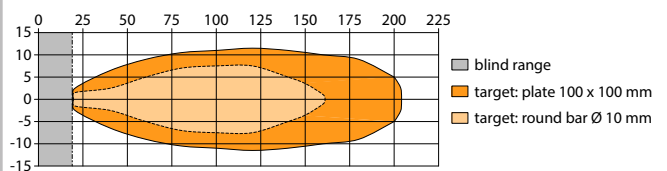


## DETECTION BEAMS

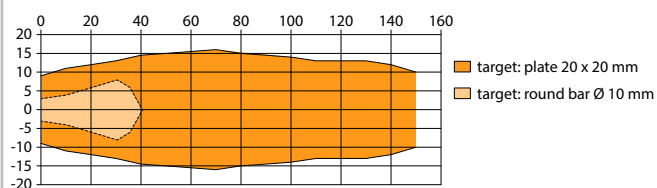
UFA2-200-A: Standard version with analog output



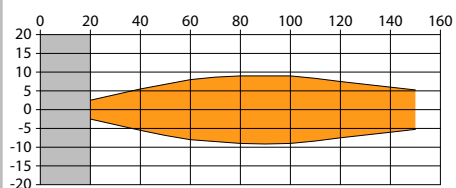
UFA2-200-PN: Standard version with switching output



UFA2-FB-150: Focus beam version



UFA2-150-CP: Chemical resistant version



## FOCUS BEAM VERSION

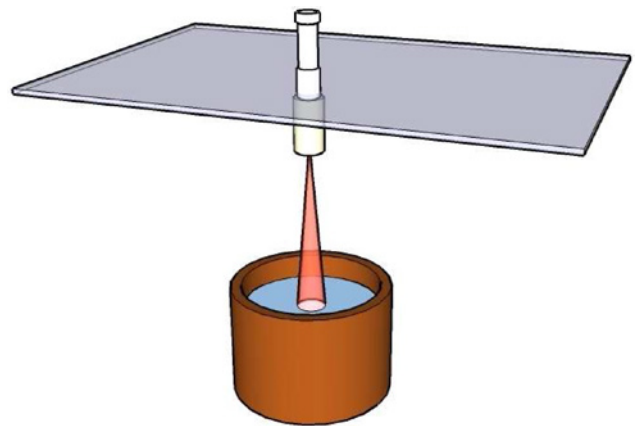
The ultrasonic sensors of the UFA2-FB version are equipped with a focusing device made of glass fibre reinforced polypropylene, which makes the sound beam particularly narrow. They are therefore suitable for looking into narrow openings in the close range from 0 mm to 150 mm. A typical application is level measurement in small tubes and containers.

With a small distance between the sensor and the tube and depending on the measuring height, levels can be measured in tubes with a diameter of a few millimetres. In very narrow conditions, only an experiment can clarify whether a measurement is possible.



## CHEMICAL RESISTANT VERSION

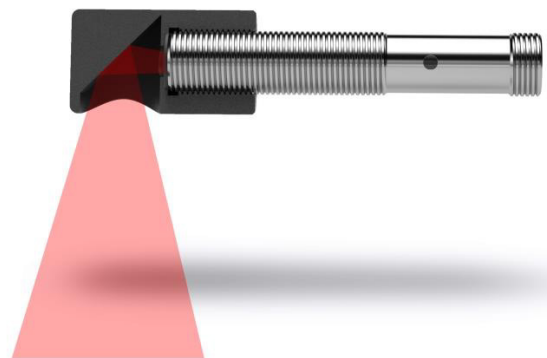
The diaphragm of the UFA-150-CP (Chemical Protection) series is coated with a thin PTFE foil. The cap made of chemically resistant PVDF is used for mechanical fixation of the foil and protection of the sensor front. Thus the front part of the ultrasonic sensor becomes resistant to most chemicals.



## ACCESSORY RADIAL BEAM CAP

By means of the radial beam attachment UFA2-RB an axial measuring sensor becomes a radial measuring sensor. The UFA2-RB can be used for the standard version of the UFA2 with switching output or analog output.

By using it, the blind range of 20 mm is eliminated and the measuring range is deflected by 90°.



## SAFETY NOTICES

- These products are neither allowed to be used as safety- or emergency shut-off devices, nor in other applications, where a malfunction of this product may result in personal injury.
- Failure to follow this notice may result in serious or fatal injury.

## ORDER CODE UFA2

UFA2 - [ ] - [ ] - SA12

<b>Version and measurement range</b> Standard, range 20...200 mm Focus beam, range 0...150 mm	200 FB-150	A PN	<b>Output types</b> Analog output 0...10 V / 4...20 mA Switching output
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## ORDER CODE UFA-150-CP - CHEMICAL RESISTANT VERSION

UFA-150 - [ ] - [ ] - 24 - [ ]

<b>Version</b> Chemical resistant	CP	C CU CI	<b>Output signal</b> PNP (only with TVPA) Voltage 0...10 V (only with TOR) Current 4...20 mA (only with TOR)
<b>Output types</b> Switching output Analog output	TVPA TOR		

## ACCESSORIES

### Cable with mating connector M12 (female), 4 poles, shielded, IP67

K4P2M-S-M12	2 m, connector straight
K4P5M-S-M12	5 m, connector straight
K4P10M-S-M12	10 m, connector straight
K4P2M-SW-M12	2 m, connector angular
K4P5M-SW-M12	5 m, connector angular
K4P10M-SW-M12	10 m, connector angular

### Mating connector M12 (female) for self assembly, 4 poles, IP67

D4-G-M12-S	connector straight
D4-W-M12-S	connector angular

### Digital displays for sensors with analog output, 2 channel

WAY-AX-S	touch screen, supply: 18...30 VDC
WAY-AX-S-AC	touch screen, supply: 115...230 VAC

For more information and options please refer to the [WAY-AX data sheet](#).

### Deflection cap radial beam

UFA2-RB	Deflection of 90°, measurement range 0...180 mm
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Subject to change without prior notice.

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