

**Operating manual ultrasonic sensors**

UC18\*\*\*090S/ UC18\*\*\*220S

IO-LINK

1 Analogue output / 1 digital output

**Delivery**

- 1x ultrasonic sensor
- Operation manual
- 2 metallic nuts SW24 (metallic version)
- 2 plastic nuts SW22 + 2 washer SW22 (plastic version)

**Intended use**

elobau ultrasonic sensors are used for non-contact detection of liquid media and objects.

**Safety instructions**

- Read the instructions before use
- Connection, installation and adjustment by qualified personnel only
- Protect the device against humidity and contamination during commissioning
- Not a safety component according to EU Machinery Directive

**Notes for effective use**

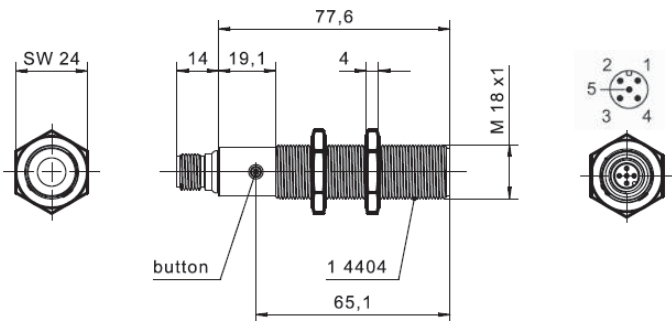
- Remove the black protective cap before use.
- Reliable measurement is not guaranteed within the blind zone.
- The ultrasonic sensors have internal temperature compensation. The optimum operating temperature is reached after approx. 20 minutes of operation. Rapid temperature changes require renewed internal temperature compensation.
- Ensure that the specified electrical data is complied with and not exceeded.
- Ensure that the sensor surface is not exposed to hot water (> 50 ° C), water vapour, acids or solvents.
- Sound-absorbing or diffusely reflecting materials can also reduce the specified measuring ranges.
- No flush mounting of sensor surface with object surface.
- The sensor retains the last set parameters after the operating voltage has been removed.

**Operation / Maintenance:**

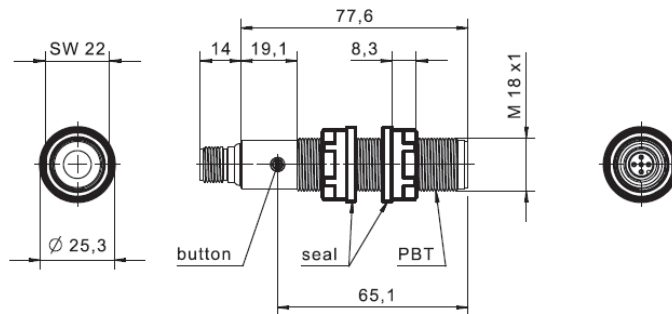
elobau ultrasonic sensors are maintenance-free. Nevertheless, it is advisable to clean the sensor surface with a damp cloth at regular intervals and to check the screw connections. Slight contamination of the sensor surface has no effect on the function. Heavy contamination or sticking of product may affect the function and must be removed.

**Dimensions**

UC18M\* - Stainless steel version



UC18P\* - Plastic version

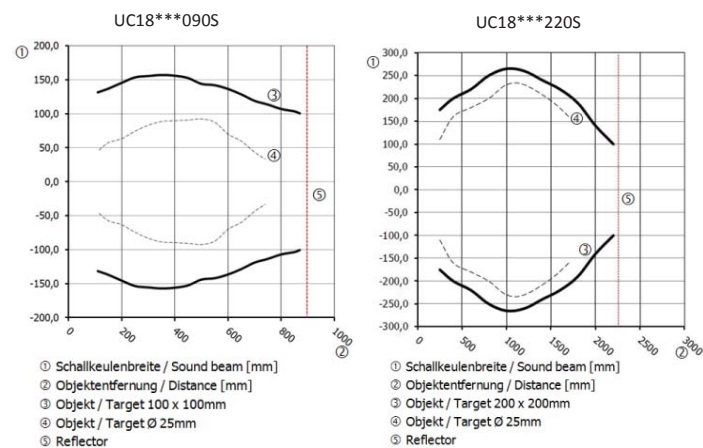


**Technical data**

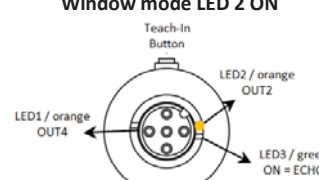
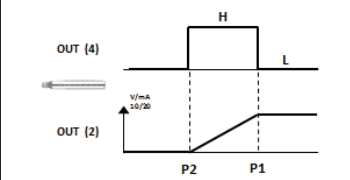
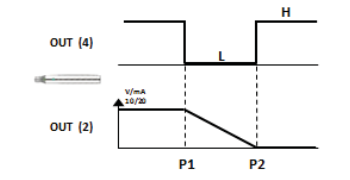
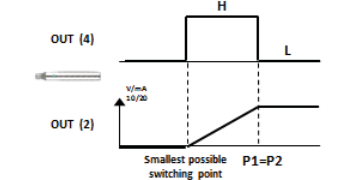
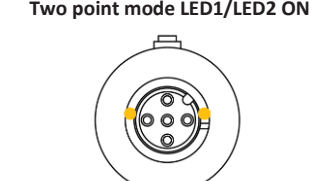
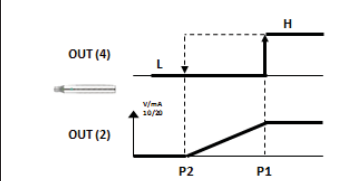
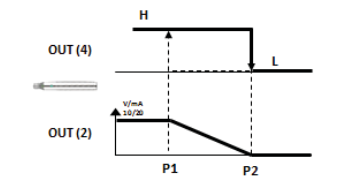
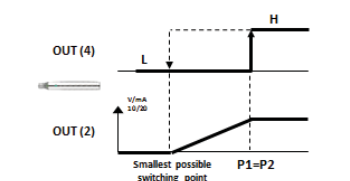
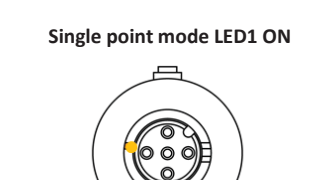
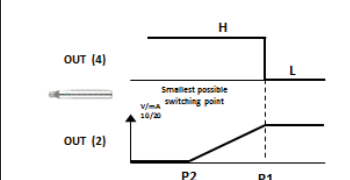
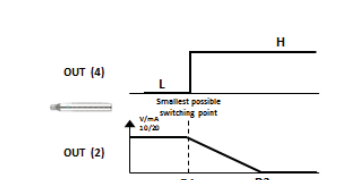
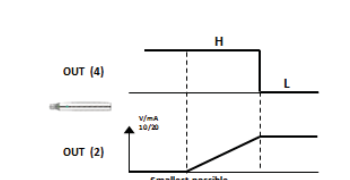
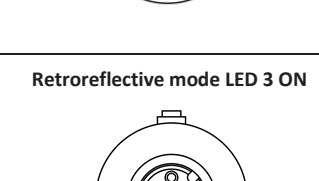
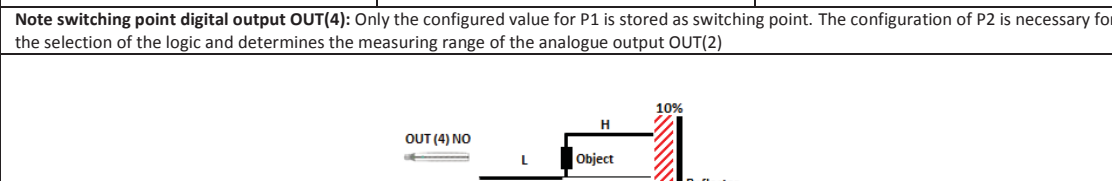
	UC18***090S	UC18***220S
Technology	Ultrasonic	
Operating mode	Diffuse/Retroreflective	
Sensing range	100...900mm <sup>1</sup>	200...2200mm <sup>2</sup>
Minimum distance sensor/reflector (Retroreflective mode sensor)	150mm	300mm
Minimum distance object/reflector (Retroreflective mode sensor)	10% <sup>4</sup>	
Blind zone	0...100mm	0...200mm
Opening angle of sound cone	7°±2°	8°±2°
Operating voltage	10...30V	
Ripple	5%	
Current consumption	<50mA	
Operating frequency	300kHz	200kHz
Polarity reversal protection	yes	
Outputs	Push-Pull (IO-Link) PNP/NPN 4...20mA 0...10V	
Output signal voltage	0...10V	
Output signal current	4...20mA	
Load resistance min (analogue output)	≥3000Ω	
Load resistance max (current output)	≤500Ω	
Switching output	Push-Pull/PNP/NPN - NO/NC selectable	
Continuous current	100mA	
Switching frequency	selectable (3Hz default)	selectable (2Hz default)
Linearity error	1%	
Repeating accuracy	0,5%	
Resolution	1mm	
Temperature compensation	yes	
Thermal drift	±2%	
Overload protection	yes	
Short-circuit protection	yes	
Start-up time analogue output	650ms	
Start-up time digital output	600ms	
Response time analogue output	400ms	
Synchronization	yes	
Multiplexing	no	
Controls	Teach-in button/IO-Link	
Indicators	Switching status: 2 LEDs orange, Echo: 1 LED green	
Application specific	IO-Link	
Operating temperature	-20°C...+70°C	
Storage temperature	-30°C...+80°C	
EMC	EN 60947-5-2	
CE label	yes	
UL approval	cULus listed	
CCC approval	<36V yes	
MTTF	126	
Housing design	cylindrical	
Thread	M18	
Housing material	DIN 1.4404 / PBT	
Dimensions	M18x1; L=91,6mm	
Material sound transducer	Epoxy resin with glass balls	
Connector type	M12 5-pol.	
Protection class	IP 67 <sup>3</sup> (EN60529)	
Torque	50Nm (metallic version)/1Nm (plastic version)	
Weight	100g (metallic version)/70g (plastic version)	
Accessories supplied	2 metallic nuts SW24 (metallic version) / 2 plastic nuts SW22 + 2 washer SW22 (plastic version)	
IO-Link	yes	
Master port class	port class A	
IO-Link version	1.1	
Transfer rate	38400bit/sec	
Cycle time	3.2ms	
Process data width	32bit	
SIO mode	yes	

<sup>1</sup>Objekt / Target 100 x 100mm      <sup>3</sup> IP67 only with well mounted cable connection  
<sup>2</sup>Objekt / Target 200 x 200mm      <sup>4</sup> Automatic calculation depending on the measuring length

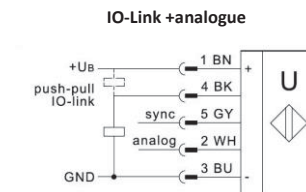
**Sound cone**



**Adjustment of the ultrasonic sensors with the teach-in button**

Operating mode	Output function		
<b>Selection of the operating mode:</b> 1. Hold teach-in button for 8 seconds until LED1 and LED2 start flashing 2. Select preferred mode with teach-in button 3. LED1 and LED2 flash 3x to confirm successful setting	<b>Configuration of the switching points:</b> 1. Position object at P1 (far point from sensor) 2. Press teach-in button 3. Position the object at P2 (close point to the sensor)* 4. Press teach-in button* 5. Successful setting is confirmed by flashing LED1 and LED2 6 times (*Not applicable for retroreflective mode)	<b>Change of logic NO/NC</b> Change of the logic by changing switching points P1 and P2. <b>NO:</b> P1>P2 (P1 = far point / P2 = close point) <b>NC:</b> P1<P2 (P1 = close point / P2 = far point) <b>NO:</b> P1=P2 : (close point = minimum value of measuring range / far point = configured value for P1/P2)	
H = LED on / L = LED off	P1>P2 (NO - positive slope)	P1<P2 (NC - negative slope)	P1=P2 (NO - positive slope)
<b>Window mode LED 2 ON</b> 			
<b>Two point mode LED1/LED2 ON</b> 			
<b>Single point mode LED1 ON</b> 			
<b>Note switching point digital output OUT(4):</b> Only the configured value for P1 is stored as switching point. The configuration of P2 is necessary for the selection of the logic and determines the measuring range of the analogue output OUT(2)			
<b>Retroreflective mode LED 3 ON</b> 			
Only 1 switching point P1 – logic NO			

**Electrical connection**



Each falling edge triggers the synchronization pulse and thus the transmission. All sensors must detect an identical (flat) surface, otherwise this may result in incorrect measurements.

**Factory settings**

**Resetting the switching points P1 / P2**

Actuate teach-in button without object (LED 3, green, off). LED 1 and LED 2 flash 5x to confirm successful reset. After the reset, the maximum and minimum values of the measuring range are set. Logic (NO / NC) and operating mode do not change.

(Exception: If this procedure is used in switch point mode, the logic is always normally open / NO)

**Synchronisation**

Several sensors can be connected via an external signal to work in parallel. With this mutual interferences will be avoided. The control signal must have the following properties:

**UC18\*\*\*090S:**

- T ≥ 9ms / 500µs ≤ width ≤ 1ms
- Minimum distance of the sensors: 40...50mm depending on the measuring distance and detected material.

**UC18\*\*\*220S:**

- T ≥ 20ms / 500µs ≤ width ≤ 1ms
- Minimum distance of the sensors: 30...40mm depending on the measuring distance and detected material.