

Operating manual ultrasonic sensors

UC30***350S/ UC30L***600S

IO-LINK

1 Analogue output / 1 digital output

Delivery

- 1x ultrasonic sensor
- Operation manual
- 2 metallic nuts SW36 (metallic version)
- 2 plastic nuts SW36 + 2 washer (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

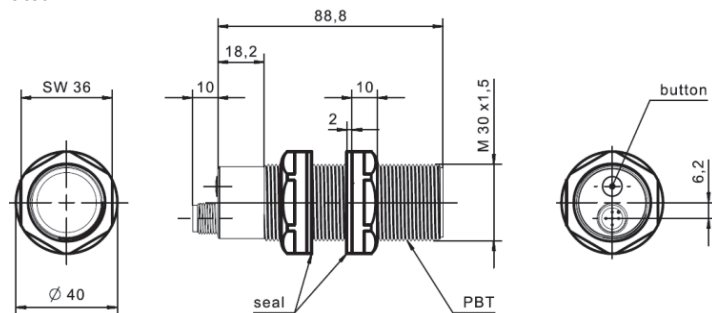
- Remove the black protective cap before use.
- Reliable measurement is not guaranteed within the blind zone.
- The ultrasonic sensors have internal temperature compensation. The optimum operating temperature is reached after approx. 20 minutes of operation. Rapid temperature changes require renewed 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:

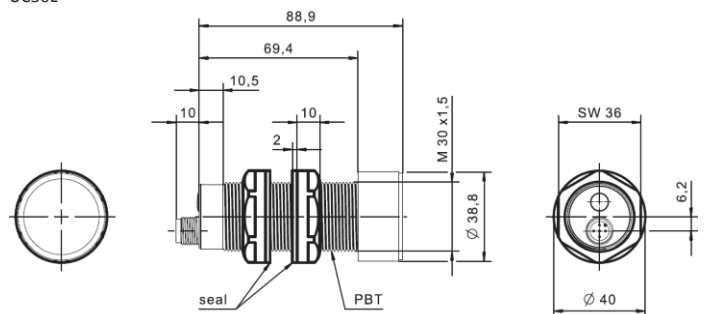
elobau ultrasonic sensors are maintenance-free. Nevertheless, it is advisable to clean the sensor surface with a damp cloth at regular intervals and to check the screw connections. Slight contamination of the sensor surface has no effect on the function. Heavy contamination or sticking of product may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

Dimensions

UC30*



UC30L*



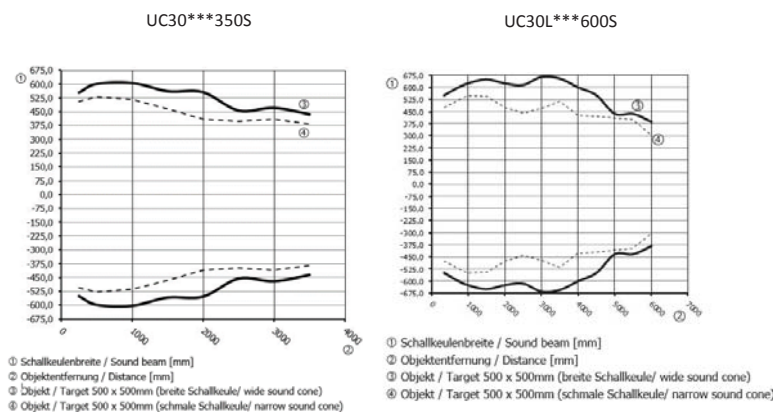
Technical data

	UC30***350S	UC30L***600S
Technology	Ultrasonic	
Operating mode	Diffuse/Retroreflective	
Sensing range	250...3500 ¹	300...6000 ¹
Minimum distance sensor/reflector	300mm	500mm
Minimum distance object/reflector	10% ²	
Blind zone	0...250mm	0...350mm
Opening angle of sound cone	15° ± 2°	18° ± 2°
Operating voltage	10...30V	
Ripple	5%	
Current consumption	<30mA	
Operating frequency	112kHz	75kHz
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	1Hz	1Hz
Linearity error	1%	
Repeating accuracy	0,1%	
Resolution	0,1%	
Temperature compensation	yes	
Thermal drift	±5%	
Overload protection	yes	
Short-circuit protection	yes	
Start-up time analogue output	600ms	
Start-up time digital output	600ms	
Response time analogue output	450ms	
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	100	
Housing design	cylindrical	
Thread	M30	
Housing material	DIN 1.4404 / PBT	PBT
Dimensions	M30x1,5; L=98,9mm	M30x1,5 (head=38,8mm); L=98,9mm
Material sound transducer	Epoxy resin with glass balls	
Connector type	M12 5-pol.	
Protection class	IP 67 ² (EN60529)	
Torque	1.5 Nm (plastic version)/ 100Nm (Metallic version)	1.5 Nm (plastic version)
Weight	140g (plastic version)/ 215g (metallic version)	170g (plastic version)
Accessories supplied	2 metallic nuts SW36 (metallic version) / 2 plastic nuts SW36 + 2 washers (plastic version)	2 plastic nuts SW36 + 2 washers (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	

¹Objekt / Target 500 x 500mm

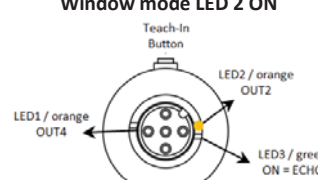
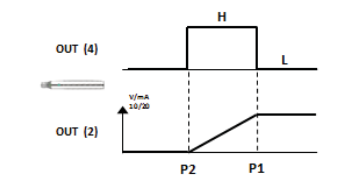
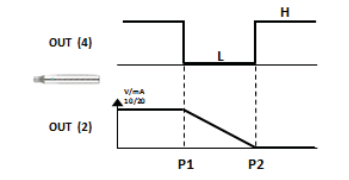
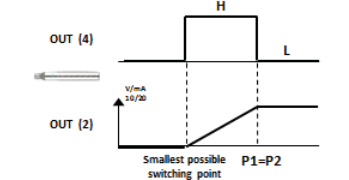
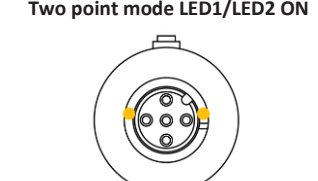
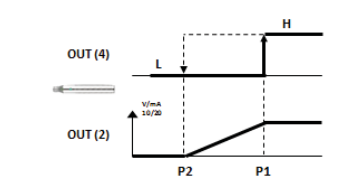
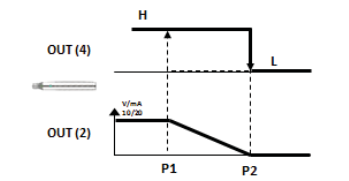
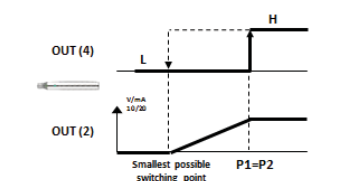
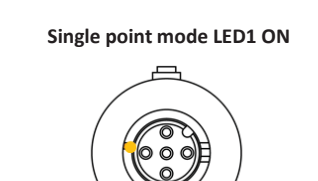
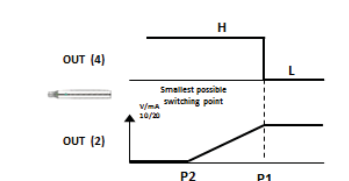
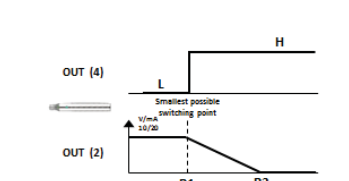
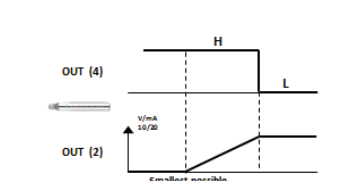
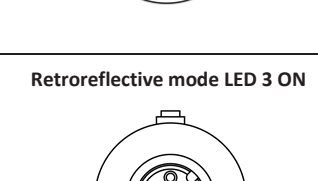
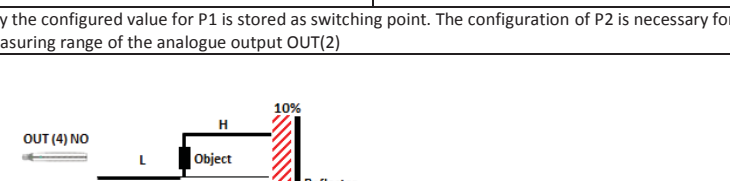
² Automatic calculation depending on the measuring length

Sound cone

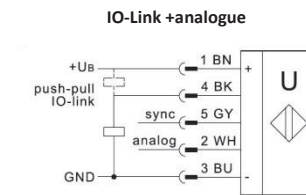


① Schallkeulenbreite / Sound beam [mm]
② Objektdistanz / Distance [mm]
③ Objekt / Target 500 x 500mm (breite Schallkeule / wide sound cone)
④ Objekt / Target 500 x 500mm (schmale Schallkeule / narrow sound cone)

Adjustment of the ultrasonic sensors with the teach-in button

Operating mode	Output function		
Selection of the operating mode:	Configuration of the switching points:	Change of logic NO/NC	
<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 <p>(*Not applicable for retroreflective mode)</p>	Change of the logic by changing switching points P1 and P2. NO: P1>P2 (P1 = far point / P2 = close point) NC: P1<P2 (P1 = close point / P2 = far point) NO: 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)
Window mode LED 2 ON 			
Two point mode LED1/LED2 ON 			
Single point mode LED1 ON 			
Retroreflective mode LED 3 ON 			
	Only 1 switching point P1 – logic NO		

Electrical connection



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:

UC30*350S:**

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

UC30L*600S:**

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

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)