elobau sensor technology

Operating manual ultrasonic sensors

UD18*090S/ UD18***220S**
UDA18*090S/ UDA18***220S**
2 Digital outputs

Delivery

- 1x ultrasonic sensor
- Operation manual
- 2 metallic nuts SW24 (metallic version)
- 2 plastic nuts SW22 + 2 washer SW22 (plastic version)
- Safety information for hazardous areas (only ATEX version UDA18 *)
- CE Declaration of Conformity (only ATEX version UDA18)
- ATEX marking (only ATEX version UDA18)

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

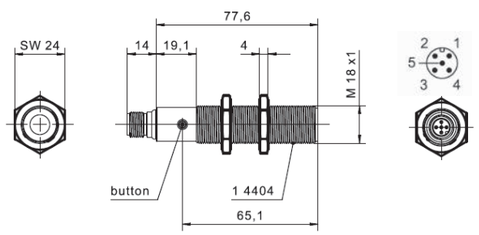
• Remove the black protective cap before use.
• Reliable measurement is not guaranteed within the blind zone.• The ultrasonic sensors have internal temperature compensation. The optimum operating temperature is reached after approx. 20 minutes of operation. Rapid temperature changes require renewed internal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

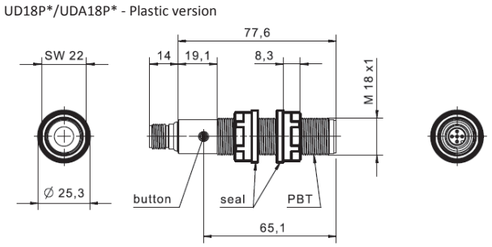
elobau ultrasonic sensors are maintenance-free. Nevertheless, it is advisable to clean the sensor surface with a damp cloth at regular intervals and to check the screw connections. Slight contamination of the sensor surface has no effect on the function. Heavy contamination or sticking of product may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

Dimensions

UD18M*/UDA18M* - Stainless steel version



UD18P*/UDA18P* - Plastic version

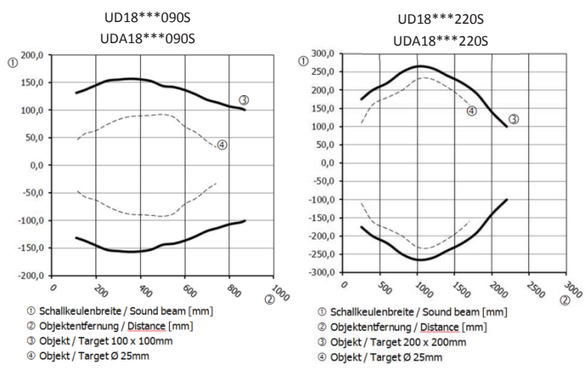


Technical data

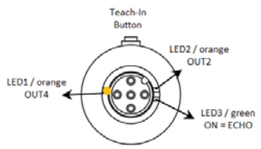
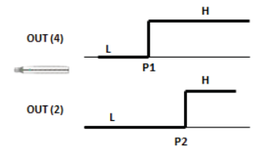
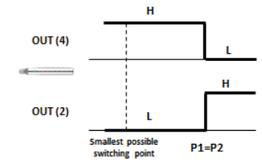
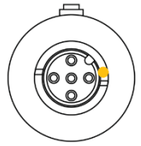
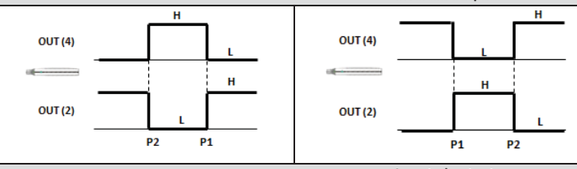
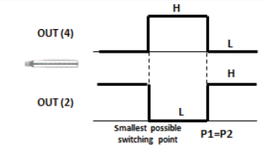
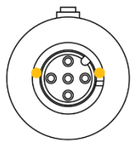
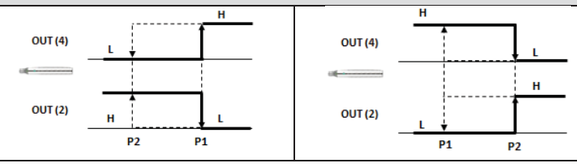
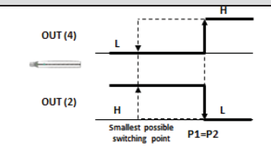
	UDA18***090S	UDA18***220S	UD18***090S	UD18***220S
Technology	Ultrasonic			
Operating mode	Diffuse			
Sensing range	100...900[1]mm	200...2200[2]mm	100...900[1]mm	200...2200[2]mm
Blind zone	0...100mm	0...200mm	0...100mm	0...200mm
Opening angle of sound cone	7°±2°	8°±2°	7°±2°	8°±2°
Operating voltage	10...30V			
Ripple	5%			
Current consumption	<50mA			
Operating frequency	300kHZ	200kHZ	300kHZ	200kHZ
Polarity reversal protection	yes			
Outputs	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	PNP/NPN NO/NC selectable			
Continuous current	100mA			
Switching frequency	3Hz	2Hz	3Hz	2Hz
Linearity error	1%			
Repeating accuracy	0,5%			
Resolution	≤3mm			
Temperature compensation	yes			
Thermal drift	±2%			
Overload protection	yes			
Short-circuit protection	yes			
Start-up time analogue output	500ms			
Start-up time digital output	400ms			
Response time analogue output	400ms			
Synchronization	yes			
Multiplexing	yes			
Controls	Teach-in button			
Indicators	Switching status: 2 LEDs orange, Echo: 1 LED green			
Application specific	ATEX		-	
Operating temperature	-20°C...+50°C		-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			
ATEX	yes		-	
Version gas (EX)	II 3G Ex nA IIC T6 Gc (Zone 2)		-	
Version dust (EX)	II 3D Ex tc IIIB T60°C Dc (Zone 22)		-	
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[3] (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)			

[1]Objekt / Target 100 x 100mm
[2]Objekt / Target 200 x 200mm
[3] IP67 only with well mounted cable connection

Sound cone

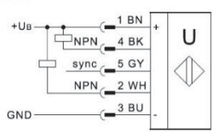


Adjustment of the ultrasonic sensors with the teach-in button

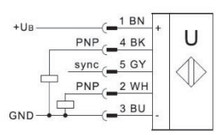
Operating mode	Output function		
Selection of the operating mode: 1. Hold teach-in button for 8 seconds until LED1 and LED2 start flashing 2. Select preferred mode with teach-in button 3. LED1 and LED2 flash 3x to confirm successful setting	**Configuration of the switching points:** 1. Position object 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		**Change of logic NO/NC)** 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)**	**P1<P2 (NC)**	**P1=P2 (NO)**
Single point mode / LED1 ON			
Window mode LED2 ON		**Inverted outputs** 	
Two point mode LED1/LED2 ON		**Inverted outputs** 	

Electrical connection

2x NPN



2x PNP



Synchronisation

The sensors connected to a network detect and transmit the signals in parallel and prevent mutual interference in confined spaces. In this mode, up to 10 sensors of the same type can be interconnected.
Connect the SYNC / MUX contact (PIN 5 / grey) of each sensor with each other. After applying the operating voltage, this operating mode is automatically available. The synchronisation signal is generated automatically. All sensors must detect an identical (flat) surface, otherwise this may result in incorrect measurements.

Multiplexing

In multiplex mode, up to 4 sensors of the same type can be interconnected. The sensors work successively with a time-delayed transmitted pulse. While the first sensor is measuring, the other sensors are locked. After completion of the first measurement, the second sensor becomes active. This procedure is repeated up until the last sensor. In this mode, the response time of the sensor in the network is increased as follows: Response time in the network = (response time sensor * n) + 25ms (n = number of sensors in the network).

Connect the SYNC / MUX contact (PIN 5 / grey) of each sensor with each other. To activate the multiplex mode, the SYNC / MUX line must be connected to ground / GND for at least 5s when the operating voltage is applied. The multiplex signal is generated automatically.

Factory settings

Option 1: Reset 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)

Option 2: Reset to factory settings
Configure the first switching point as usual. Now remove the object and Press the teach-in button without object (LED 3, green, off). The successful reset is confirmed by 5 flashes of LED3.

Note: To ensure optimum SYNC / MUX operation, after resetting to factory settings, it is recommended to de-energize the sensor for a short time.

Blocking Teach-in button

Keep the Teach-In button pressed for> 12s. The successful blocking is confirmed by fast (approx. 10Hz) alternating flashing of LED1 and LED2. To cancel, repeat the steps. Note: Do not confuse with flashing to select the operating mode!

CE cULus LISTED Ex

These products sensors are not safety sensors and are not suitable for safety applications

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