microsonic

Operating Manual

Ultrasonic proximity switch with one analogue output

zws-15/CI/QS **zws-15/CU/QS**
zws-24/CI/QS **zws-24/CU/QS**
zws-25/CI/QS **zws-25/CU/QS**
zws-35/CI/QS **zws-35/CU/QS**
zws-70/CI/QS **zws-70/CU/QS**

Product Description

The zws sensor offers a non-contact measurement of the distance to an object which must be positioned within the sensor's detection zone. In dependence of the set window limits, a distance-proportional analogue signal is output.
Via the push-button, the window limits of the analogue output and its characteristic can be adjusted (Teach-in). Two LEDs indicate operation and the state of the analogue output.

Safety Notes

- Read the operating instructions prior to start-up.
- Connection, installation and adjustment works may only be carried out by expert personnel.
- No safety component in accordance with the EU Machine Directive

Use for intended purpose only

zws ultrasonic sensors are used for non-contact detection of objects.

Installation

➔ Mount the sensor at the installation site with the aid of the enclosed mounting plate (see Fig. 1). Maximum torque of attachment screw: 0,5 Nm
➔ Connect a connection cable to the M8 device plug (see Fig. 2).
➔ Avoid mechanical load on the connector.

Start-Up

➔ Connect the power supply.
➔ Carry out the adjustment in accordance with Diagram 1.

Factory Setting

- Rising analogue characteristic curve between the blind zone and the operating range

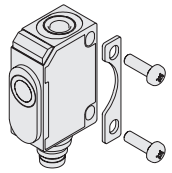
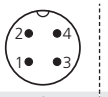


Fig. 1: Attachment with mounting plate



		colour
1	$+U_B$	brown
3	$-U_B$	blue
4	U/I	black
2	sync	white

Fig. 2: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

Synchronisation

You can synchronise as many sensors as you like.
➔ Apply a square-wave signal to the sync-input with pulse width t_i and repetition rate t_p (Fig. 3 and technical data).
A high level on the sync-input will disable the sensor.

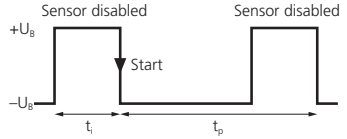


Fig. 3: External synchronisation signal

Checking operation mode

➔ In normal operating mode, shortly press the push-button. The green LED stops shining for one second, then it will show the current **characteristic of the analogue output**:

- 1x flashing = rising
- 2x flashing = falling

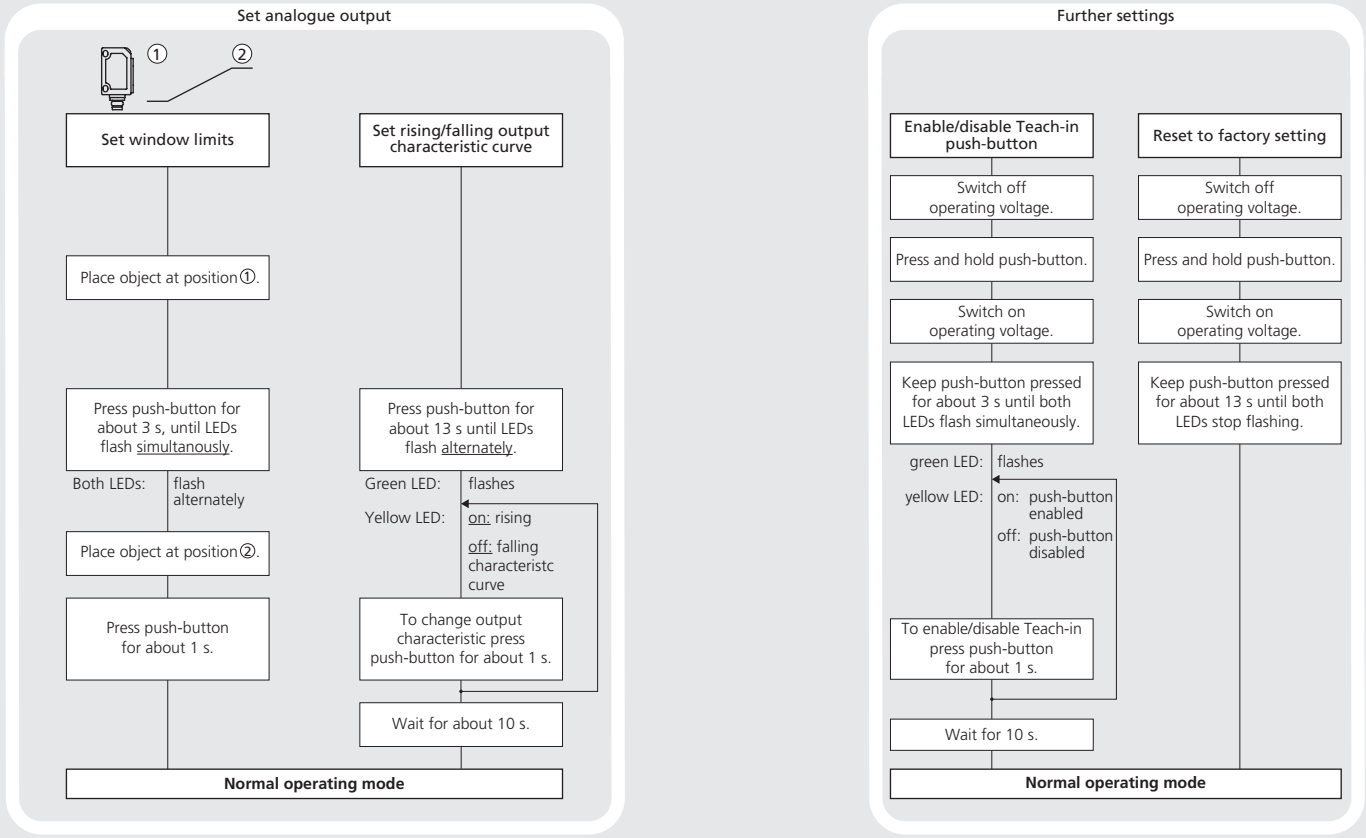
Maintenance

microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend cleaning the white sensor surface.

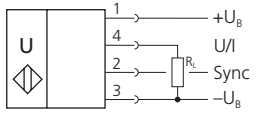
Notes

- Every time the power supply is switched on, the sensor detects its actual operating temperature and transmits it to the internal temperature compensation. This results in a slight correction of the analogue output value after 45 seconds.
- If the sensor was switched off for at least 30 minutes and after power on an object is placed in the middle of the adjusted analogue window for 30 minutes (the analogue output value is in the range of 11 to 13 mA or 4.4 to 5.6 V) a new adjustment of the internal temperature compensation to the actual mounting conditions takes place.
- The zws sensor has a blind zone, within which distance measurements are not possible.
- In the normal operating mode, an illuminated yellow LED signals the object is within the adjusted window limits.
- If the push-button is not pressed for 30 seconds during the teach-in setting, the settings made hitherto are deleted.
- The sensor can be reset to its factory setting (see »Further settings«, Diagram 1).

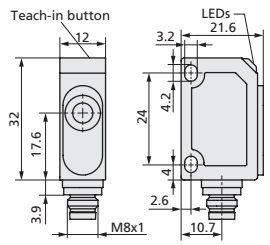
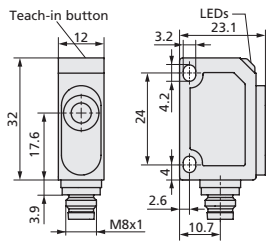
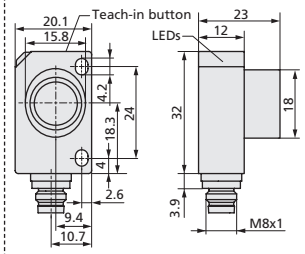
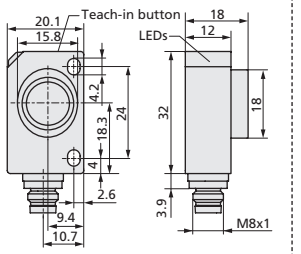
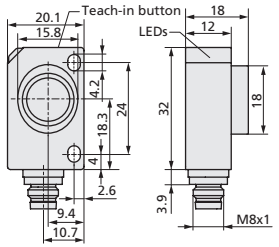
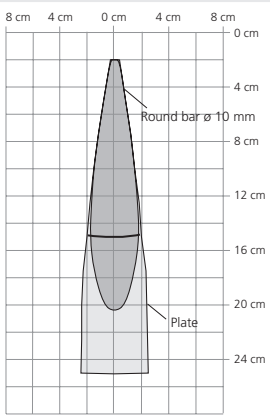
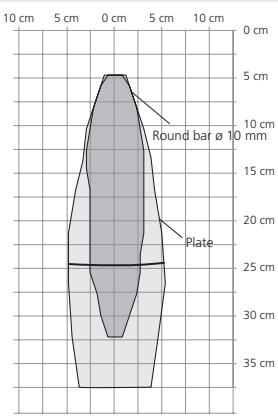
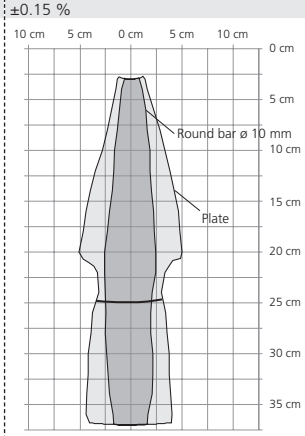
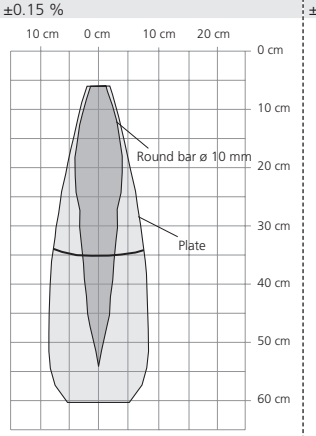
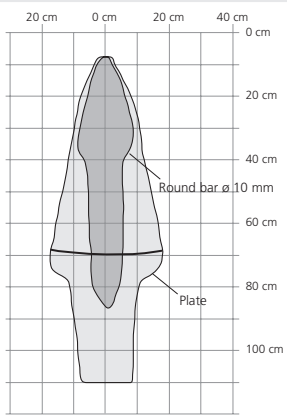
Diagram 1: Set sensor parameters via Teach-in procedure



Technical Data



1 analogue output

	zws-15...	zws-24...	zws-25...	zws-35...	zws-70...
					
blind zone	20 mm	50 mm	30 mm	64 mm	120 mm
operating range	150 mm	240 mm	250 mm	350 mm	700 mm
maximum range	250 mm	350 mm	350 mm	600 mm	1000 mm
angle of beam spread	see detection zone	see detection zone	see detection zone	see detection zone	see detection zone
transducer frequency	380 kHz	500 kHz	320 kHz	400 kHz	300 kHz
resolution	0.20 mm	0.20 mm	0.20 mm	0.20 mm	0.20 mm
reproducibility	±0.15 %	±0.15 %	±0.15 %	±0.15 %	±0.15 %
detection zones for different objects: The dark grey areas represent the zone where it is easy to recognise the normal reflector (round bar). This indicates the typical operating range of the sensors. The light grey areas represent the zone where a very large reflector – for instance a plate – can still be recognised. The requirement here is for an optimum alignment to the sensor. It is not possible to evaluate ultrasonic reflections outside this area.					
accuracy	±1 %; temperature drift internal compensated	±1 %; temperature drift internal compensated	±1 %; temperature drift internal compensated	±1 %; temperature drift internal compensated	±1 %; temperature drift internal compensated
operating voltage U_B	20 to 30 V DC, reverse polarity protection	20 to 30 V DC, reverse polarity protection	20 to 30 V DC, reverse polarity protection	20 to 30 V DC, reverse polarity protection	20 to 30 V DC, reverse polarity protection
voltage ripple	±10 %	±10 %	±10 %	±10 %	±10 %
no-load current consumption	<25 mA	<35 mA	<25 mA	<35 mA	<35 mA
housing	ABS ultrasonic transducer: polyurethane foam, epoxy resin with glass content	ABS ultrasonic transducer: polyurethane foam, epoxy resin with glass content	ABS ultrasonic transducer: polyurethane foam, epoxy resin with glass content	ABS ultrasonic transducer: polyurethane foam, epoxy resin with glass content	ABS ultrasonic transducer: polyurethane foam, epoxy resin with glass content
class of protection to EN 60529	IP 67	IP 67	IP 67	IP 67	IP 67
norm conformity	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
type of connection	4-pin M8 initiator plug	4-pin M8 initiator plug	4-pin M8 initiator plug	4-pin M8 initiator plug	4-pin M8 initiator plug
controls	Teach-in push-button	Teach-in push-button	Teach-in push-button	Teach-in push-button	Teach-in push-button
indicators	LED green (operation) LED yellow (state of output)	LED green (operation) LED yellow (state of output)	LED green (operation) LED yellow (state of output)	LED green (operation) LED yellow (state of output)	LED green (operation) LED yellow (state of output)
synchronisation	external	external	external	external	external
pulse width synchronisation signal t_i	>150 µs	>150 µs	>150 µs	>150 µs	>150 µs
cycle time synchronisation signal t_p	8 ms < t_p < 1 s	10 ms < t_p < 1 s	10 ms < t_p < 1 s	16 ms < t_p < 1 s	14 ms < t_p < 1 s
operating temperature	–25 to +70 °C	–25 to +70 °C	–25 to +70 °C	–25 to +70 °C	–25 to +70 °C
storage temperature	–40 to +85 °C	–40 to +85 °C	–40 to +85 °C	–40 to +85 °C	–40 to +85 °C
weight	10 g	10 g	11 g	11 g	11 g
response time	50 ms	50 ms	50 ms	80 ms	70 ms
switch-off delay time	<300 ms	<300 ms	<300 ms	<300 ms	<300 ms
order no.	**zws-15/CI/QS**	**zws-24/CI/QS**	**zws-25/CI/QS**	**zws-35/CI/QS**	**zws-70/CI/QS**
analogue output 4 to 20 mA	R_L ≤ 500 Ω rising/falling characteristic	R_L ≤ 500 Ω rising/falling characteristic	R_L ≤ 500 Ω rising/falling characteristic	R_L ≤ 500 Ω rising/falling characteristic	R_L ≤ 500 Ω rising/falling characteristic
order no.	**zws-15/CU/QS**	**zws-24/CU/QS**	**zws-25/CU/QS**	**zws-35/CU/QS**	**zws-70/CU/QS**
analogue output 0 to 10 V	R_L ≥ 100 kΩ, short-circuit-proof, rising/falling characteristic	R_L ≥ 100 kΩ, short-circuit-proof, rising/falling characteristic	R_L ≥ 100 kΩ, short-circuit-proof, rising/falling characteristic	R_L ≥ 100 kΩ, short-circuit-proof, rising/falling characteristic	R_L ≥ 100 kΩ, short-circuit-proof, rising/falling characteristic

microsonic GmbH / Phoenixseestraße 7 / 44263 Dortmund / Germany / T +49 231 975151-0 / **F** +49 231 975151-51 / **E** info@microsonic.de / **W** microsonic.de

The content of this document is subject to technical changes. Specifications in this document are presented in a descriptive way only. They do not warrant any product features.

UK CA CE 2014/30/EU

MV-DO-052890-763146