microsonic

Operating Manual

mic Ultrasonic Sensors with one switching output

mic-25/D/M
mic-35/D/M
mic-130/D/M
mic-340/D/M
mic-600/D/M

Product description

- The mic-sensor with one switching output measures the distance to an object within the detection zone contactless. Depending on the adjusted detect distance the switching output is set.
- The output functions are changeable from NOC to NCC.
- The sensors are adjustable using Teach-in processes via the Com-channel (Pin 5).
- Using the LinkControl adapter (optional accessory) all sensor parameter settings can be adjusted by a Windows® Software.

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 in the area of personal and machine protection not permitted

The mic-sensors have a **blind zone** in which distance measurement is not possible. The **operating range** indicates the distance of the sensor that can be applied with normal reflectors with sufficient function reserve. When using good reflectors, such as a calm water surface, the sensor can also be used up to its **maximum range**. Objects that strongly absorb (e.g. plastic foam) or diffusely reflect sound (e.g. pebble stones) can also reduce the defined operating range.

Installation

➔ Assemble the sensor at the installation location.
➔ Plug in the connector cable to the M12 connector, see Fig. 1.

		colour
1	$+U_B$	brown
3	$-U_B$	blue
4	D	black
2	–	white
5	Com	grey

Fig. 1: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

Start-up

➔ Connect the power supply.
➔ Set detect points via the Teach-in procedure (see Diagram 1)

Factory setting

mic-sensors are delivered factory made with the following settings:

- Switching output on NOC
- Detecting distance at operating range and half operating range
- Maximum detection range set to maximum range

Synchronisation

If the assembly distance of multiple sensors falls below the values shown in Fig. 2 the integrated synchronisation should be used. Connect Sync/Com-channels (pin 5 at the units receptable) of all sensors (10 maximum).

Maintenance

mic-sensors work maintenance free. Small amounts of dirt on the surface do not influence function. Thick layers of dirt and caked-on dirt affect sensor function and therefore must be removed.

Notes

- mic-sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approx. 30 minutes of operation.
- During Teach-in mode, the hysteresis loops are set back to factory settings.
- If no signal is detected for 20 seconds during Teach-in procedure the made changes are stored and the sensor returns to normal mode operation.
- You can reset the factory settings at any time, see Diagram 2.

mic-25...	≥0.35 m	≥2.50 m
mic-35...	≥0.40 m	≥2.50 m
mic-130...	≥1.10 m	≥8.00 m
mic-340...	≥2.00 m	≥18.00 m
mic-600...	≥4.00 m	≥30.00 m

Fig. 2: Assembly distances, indicating synchronisation

Diagram 1: Set sensor parameters via Teach-in procedure

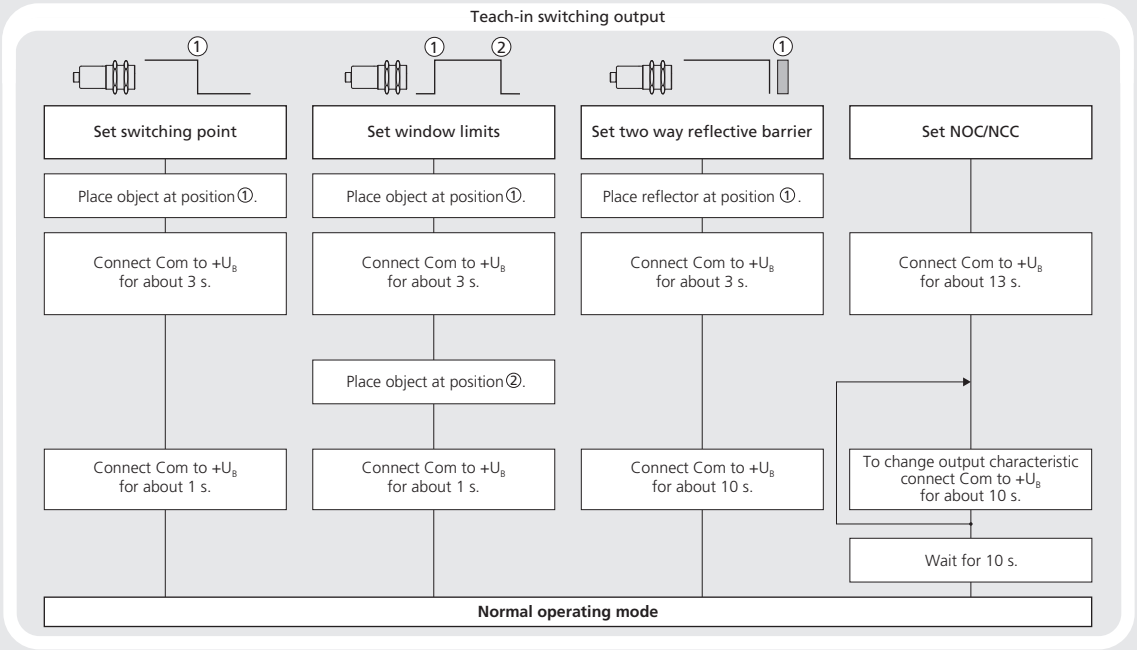
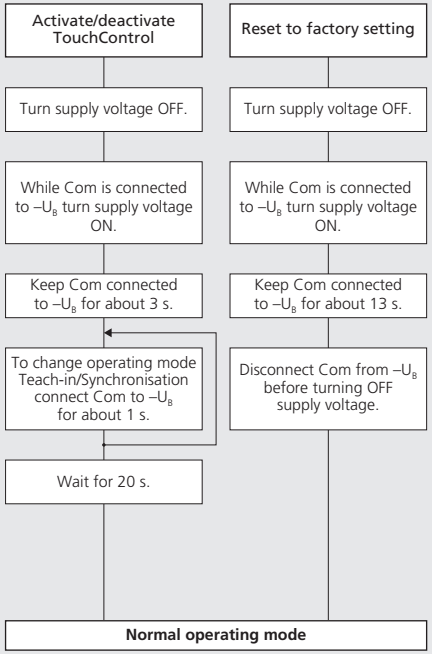
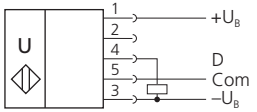


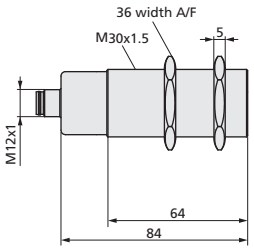
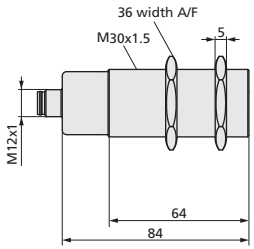
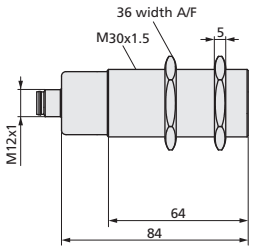
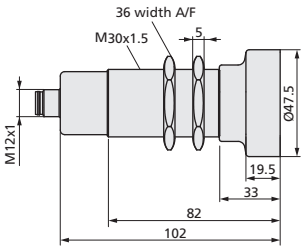
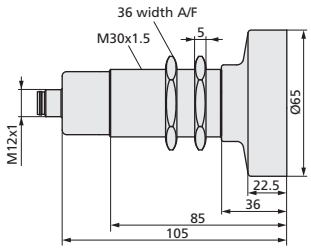
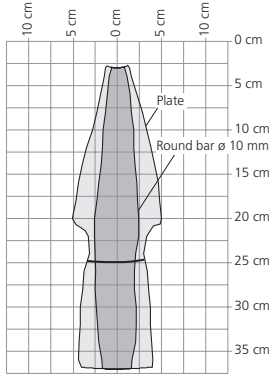
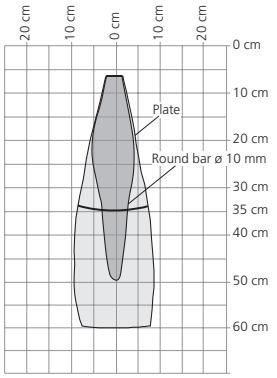
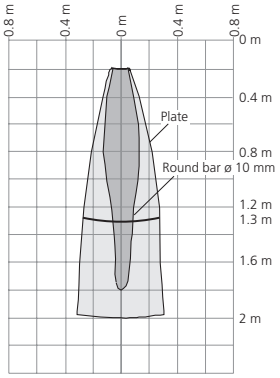
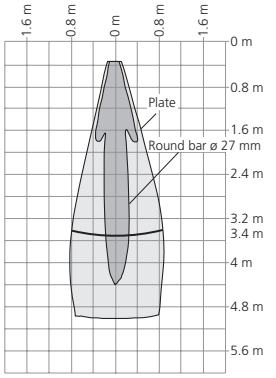
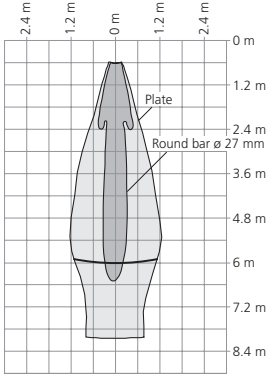
Diagram 2: Operating mode and factory setting



Technical data



1 pnp switching output

	mic-25...	mic-35...	mic-130...	mic-340...	mic-600...
					
blind zone	0 to 30 mm	0 to 65 mm	0 to 200 mm	0 to 350 mm	0 to 600 mm
operating range	250 mm	350 mm	1,300 mm	3,400 mm	6,000 mm
maximum range	350 mm	600 mm	2,000 mm	5,000 mm	8,000 mm
angle of beam spread	see detection zone	see detection zone	see detection zone	see detection zone	see detection zone
transducer frequency	320 kHz	400 kHz	200 kHz	120 kHz	80 kHz
resolution	0.018 mm	0.018 mm	0.18 mm	0.18 mm	0.18 mm
reproducibility	±0.15 %	±0.15 %	±0.15 %	±0.15 %	±0.15 %
accuracy	±1 % (Temperature drift internal compensated, may be deactivated [1], 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated [1], 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated [1], 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated [1], 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated [1], 0.17%/K without compensation)
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.					
operating voltage U_B	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2
voltage ripple	±10 %	±10 %	±10 %	±10 %	±10 %
no-load supply current	≤80 mA	≤80 mA	≤80 mA	≤80 mA	≤80 mA
housing	Brass sleeve, nickel-plated, plastic parts: PBT; Ultrasonic transducer: polyurethane foam, epoxy resin with glass content	Brass sleeve, nickel-plated, plastic parts: PBT; Ultrasonic transducer: polyurethane foam, epoxy resin with glass content	Brass sleeve, nickel-plated, plastic parts: PBT; Ultrasonic transducer: polyurethane foam, epoxy resin with glass content	Brass sleeve, nickel-plated, plastic parts: PBT; Ultrasonic transducer: polyurethane foam, epoxy resin with glass content	Brass sleeve, nickel-plated, plastic parts: PBT; 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	5-pin initiator plug, Brass, nickel-plated	5-pin initiator plug, Brass, nickel-plated	5-pin initiator plug, Brass, nickel-plated	5-pin initiator plug, Brass, nickel-plated	5-pin initiator plug, Brass, nickel-plated
controls	via Com-channel	via Com-channel	via Com-channel	via Com-channel	via Com-channel
programmable	via Teach-in and LinkControl	via Teach-in and LinkControl	via Teach-in and LinkControl	via Teach-in and LinkControl	via Teach-in and LinkControl
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	200 g	200 g	200 g	260 g	320 g
switching hysteresis [1]	3 mm	5 mm	20 mm	50 mm	100 mm
switching frequency [1]	11 Hz	8 Hz	6 Hz	3 Hz	2 Hz
response time [1]	32 ms	64 ms	92 ms	172 ms	240 ms
time delay before availability [1]	<300 ms	<300 ms	<300 ms	<300 ms	<300 ms
order No.	**mic-25/D/M**	**mic-35/D/M**	**mic-130/D/M**	**mic-340/D/M**	**mic-600/D/M**
switching output	pnp, U_B – 2 V, I_{max} = 200 mA switchable NOC/NCC, short-circuit-proof	pnp, U_B – 2 V, I_{max} = 200 mA switchable NOC/NCC, short-circuit-proof	pnp, U_B – 2 V, I_{max} = 200 mA switchable NOC/NCC, short-circuit-proof	pnp, U_B – 2 V, I_{max} = 200 mA switchable NOC/NCC, short-circuit-proof	pnp, U_B – 2 V, I_{max} = 200 mA switchable NOC/NCC, short-circuit-proof

[1] Can be programmed via LinkControl.

c UL us LISTED

Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.

The proximity switches shall be used with a Listed (CYJV/7) cable/connector assembly rated minimum 32 Vdc, minimum 290 mA, in the final installation.

UK CA CE 2014/30/EU

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