



Operating manual

mic Ultrasonic Sensors with one switched 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 switched output measures the distance to an object within the detection zone contactless. Depending on the adjusted detect distance the switched 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 Teach-in and additional sensor parameter settings may be made by a Windows-Software.

Important instructions for assembly and application

All employee and plant safety-relevant measures must be taken prior to assembly, start-up, or maintenance work (see operation manual for the entire plant and the operator instruction of the plant).

The sensors are not considered as safety equipment and may not be used to ensure human or machine safety!

The mic-sensors indicate a **blind zone**, in which the distance cannot be measured. 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.

Assembly instructions

- Assemble the sensor at the installation location.
- Plug in the connector cable to the M 12 connector, see fig. 1.

Synchronisation

If the assembly distances shown in fig. 2 for two or more sensors are exceeded

the integrated synchronisation should be used. Connect Sync/Com-channels (pin 5 at the units receptable) of all sensors (10 maximum).

Start-up

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

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

Set the parameters of the sensor using the Teach-in procedure to adjust the detect points.

Operation

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.

Note

- 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 »Reset to factory setting«.

	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

	≥ 0.35 m	≥ 2.50 m
	≥ 0.40 m	≥ 2.50 m
	≥ 1.10 m	≥ 8.00 m
	≥ 2.00 m	≥ 18.00 m
	≥ 4.00 m	≥ 30.00 m

Fig. 2: Minimum assembly distance



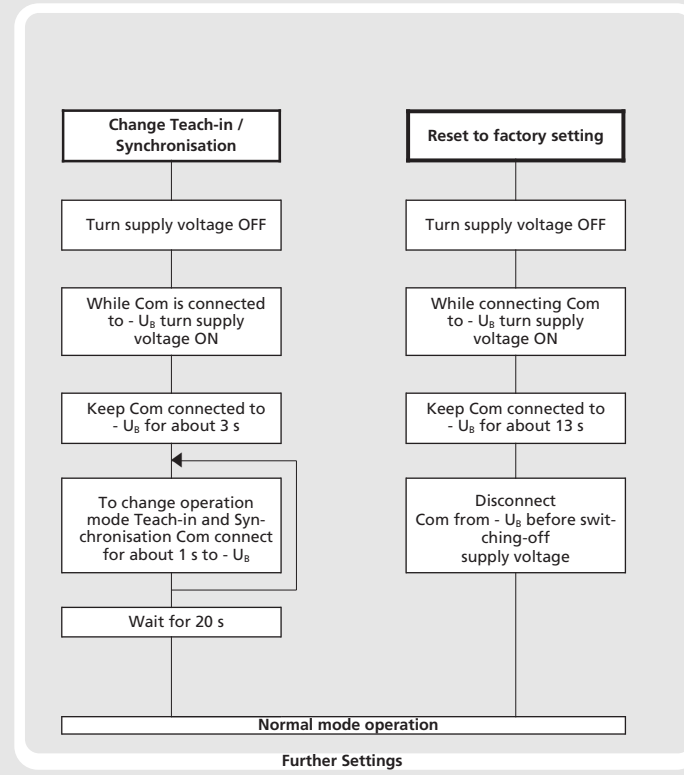
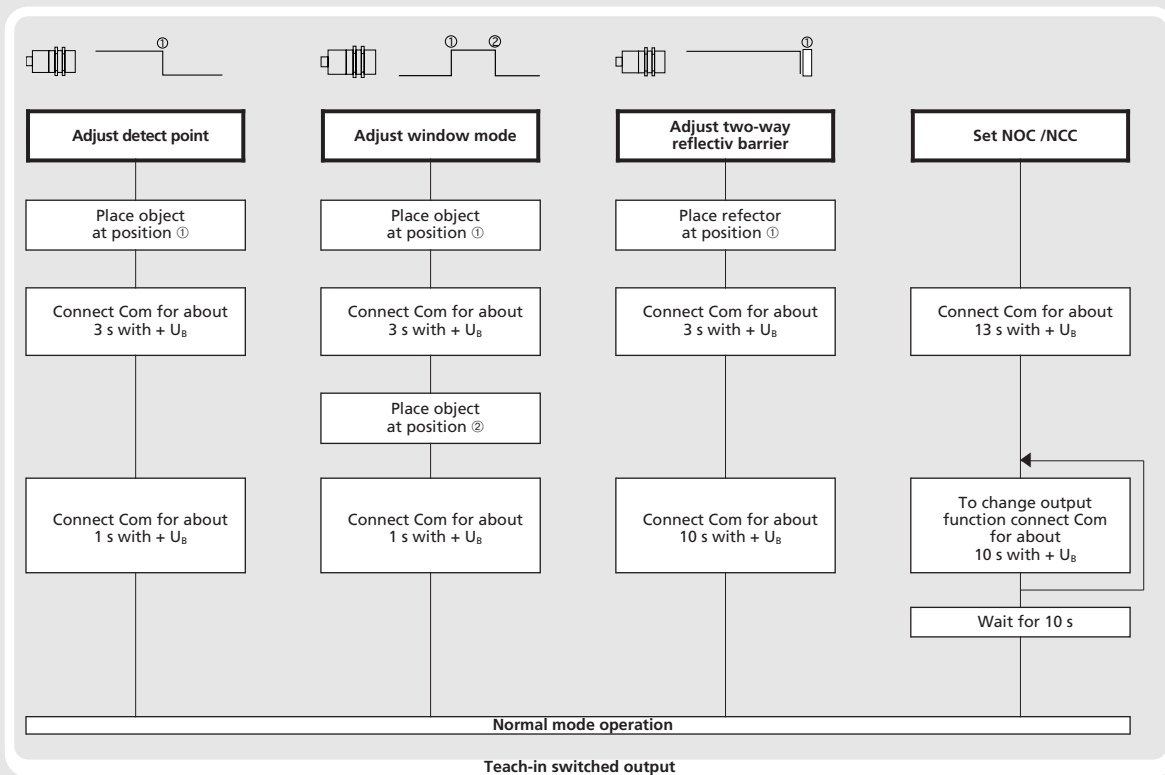
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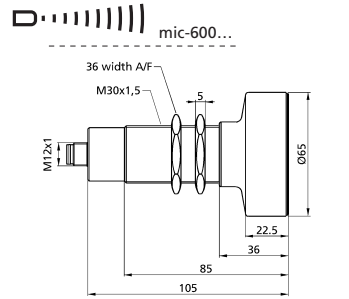
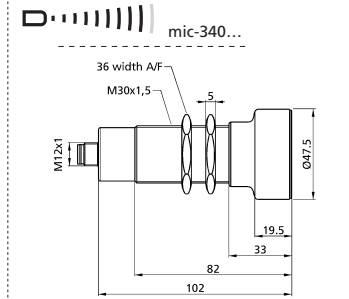
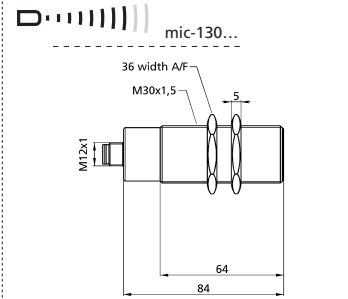
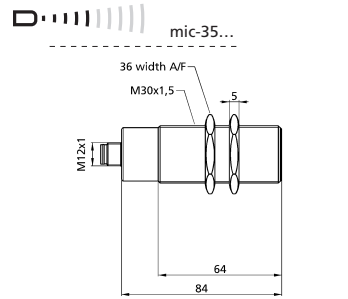
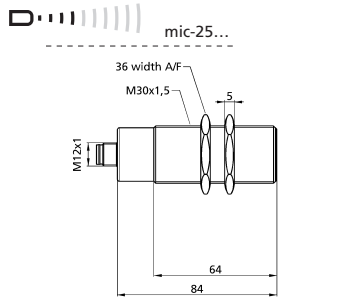
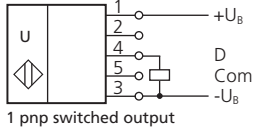
Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.

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.

Set the mic-sensor using the Teach-in procedure

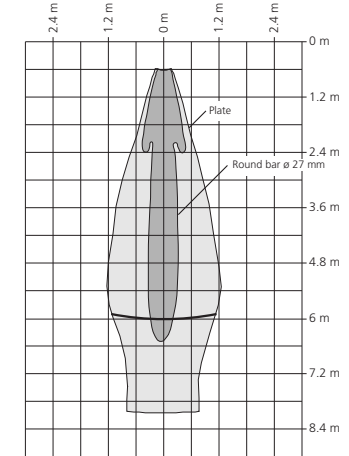
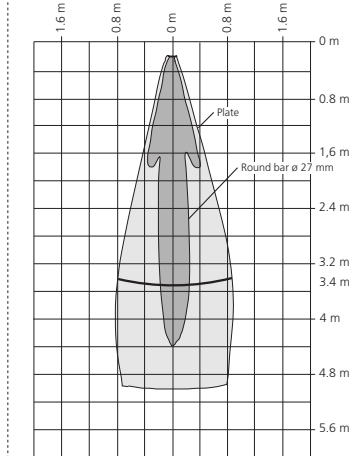
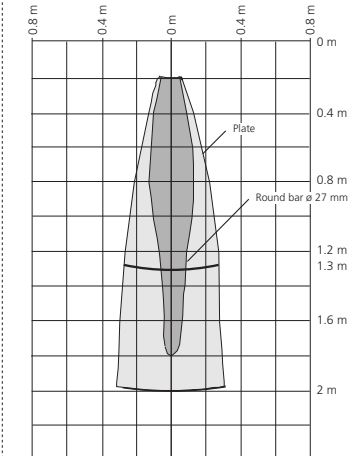
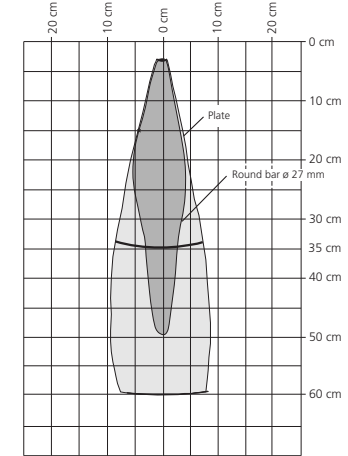
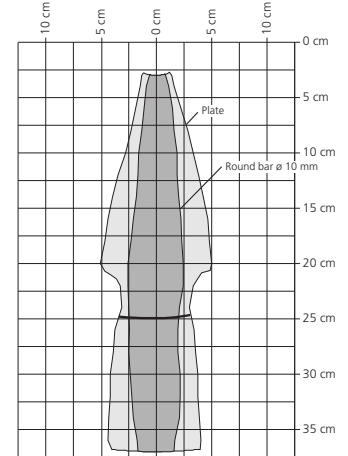


Technical data



Blind zone	0 to 30 mm	0 to 60 mm	0 to 200 mm	0 to 350 mm	0 to 800 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	Please see detection zone				
Transducer frequency	320 kHz	400 kHz	200 kHz	120 kHz	80 kHz
Resolution, sampling rate	0,18 mm	0,18 mm	0,18 mm	0,18 mm	0,18 mm
Reproducibility	± 0,15 %				
Accuracy	± 1 %, Temperature drift internal compensated may be deactivated ¹⁾ (0,17%/K without compensation)				

Detection zones for different objects:
The dark grey areas are determined with a thin round bar (10 or 27 mm dia.) and indicate the typical operating range of a sensor. In order to obtain the light grey areas, a plate (500 x 500 mm) is introduced into the beam spread from the side. In doing so, the optimum angle between plate and sensor is always employed. This therefore indicates the maximum detection zone of the sensor. It is not possible to evaluate ultrasonic reflections outside this area.



Operating voltage U_B	9 V to 30 V DC, reverse polarity protection (Class 2)	9 V to 30 V DC, reverse polarity protection (Class 2)	9 V to 30 V DC, reverse polarity protection (Class 2)	9 V to 30 V DC, reverse polarity protection (Class 2)	9 V to 30 V DC, reverse polarity protection (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	Yes, via Com-channel	Yes, via Com-channel	Yes, via Com-channel	Yes, via Com-channel	Yes, via Com-channel
Indicators	No	No	No	No	No
Programmable	Yes, with Teach-in and LinkControl	Yes, with Teach-in and LinkControl	Yes, with Teach-in and LinkControl	Yes, with Teach-in and LinkControl	Yes, with Teach-in and LinkControl
Operating temperature	-25°C bis +70°C	-25°C bis +70°C	-25°C bis +70°C	-25°C bis +70°C	-25°C bis +70°C
Storage temperature	-40°C bis +85°C	-40°C bis +85°C	-40°C bis +85°C	-40°C bis +85°C	-40°C bis +85°C
Weight	200 g	200 g	200 g	260 g	320 g
Switching hysteresis¹⁾	3 mm	5 mm	20 mm	50 mm	100 mm
switching frequency¹⁾	11 Hz	8 Hz	6 Hz	3 Hz	2 Hz
Response time¹⁾	32 ms	64 ms	92 ms	172 ms	240 ms
Time delay before availability	< 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
Switched 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 with LinkControl