



## Operating manual

### mic Ultrasonic Sensors with one analogue output

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

#### Product description

- The mic-sensor with one analogue output measures the distance to an object within the detection zone contactless. A signal proportional to distance is created according to the adjusted window margins of the analogue characteristic curve.
- The sensor automatically detects the load put to the analogue output and switches to current output or voltage output respectively.
- Choosing between rising and falling output characteristic is possible.
- 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.

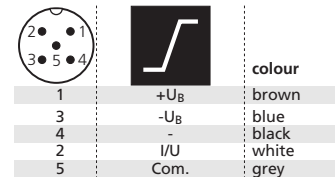


Fig. 1: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

#### 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).

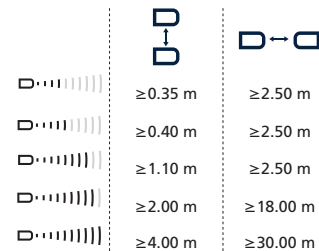


Fig. 2: Assembly distances

#### Start-up

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

- Rising analogue characteristic
- Window margins for the analogue output set to blind zone and operating range
- Maximum detection range set to maximum range

Set the parameters of the sensor using the Teach-in procedure to adjust the analogue characteristic curve.

#### Operation

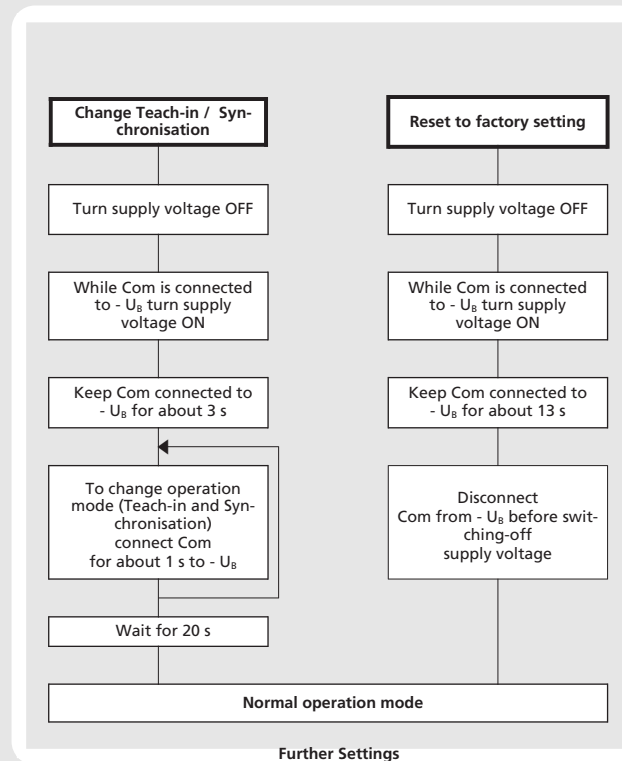
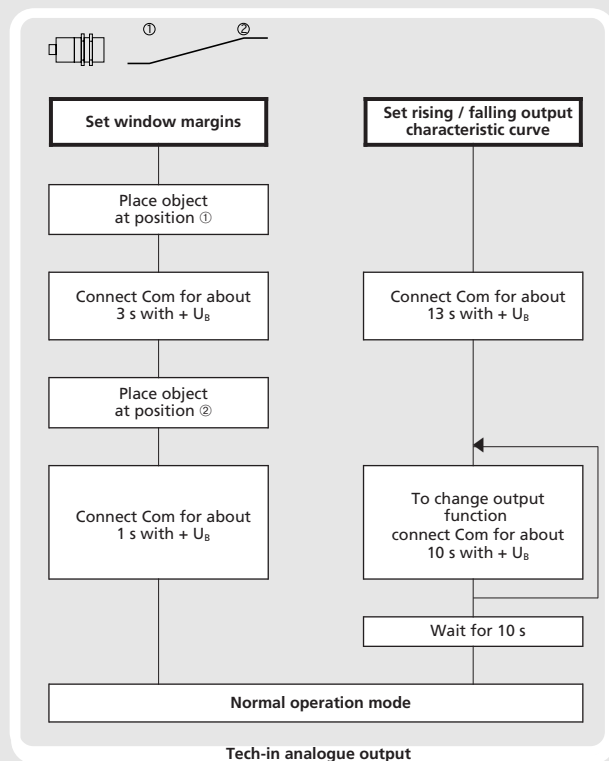
mic-sensors work maintenance free. Small amounts of dirt on the surface do not influence function. Thick layers of dirt and caked-on dirt affect sensor function and therefore must be removed.

#### Note

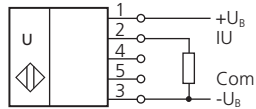
- mic-sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approx. 30 minutes of operation.
- The load put to the analogue output is detected automatically when turning supply voltage on.
- If no 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 settings«.

CE 89/336/EEC

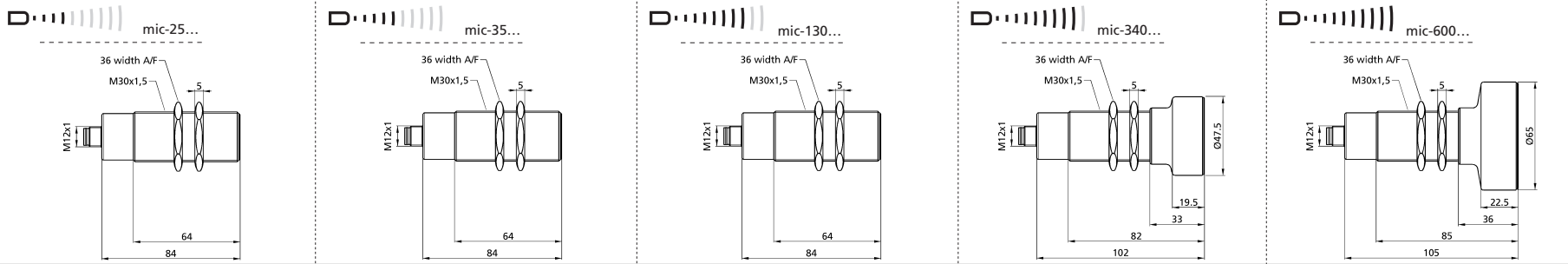
## Set the mic-sensor using the Teach-in procedure



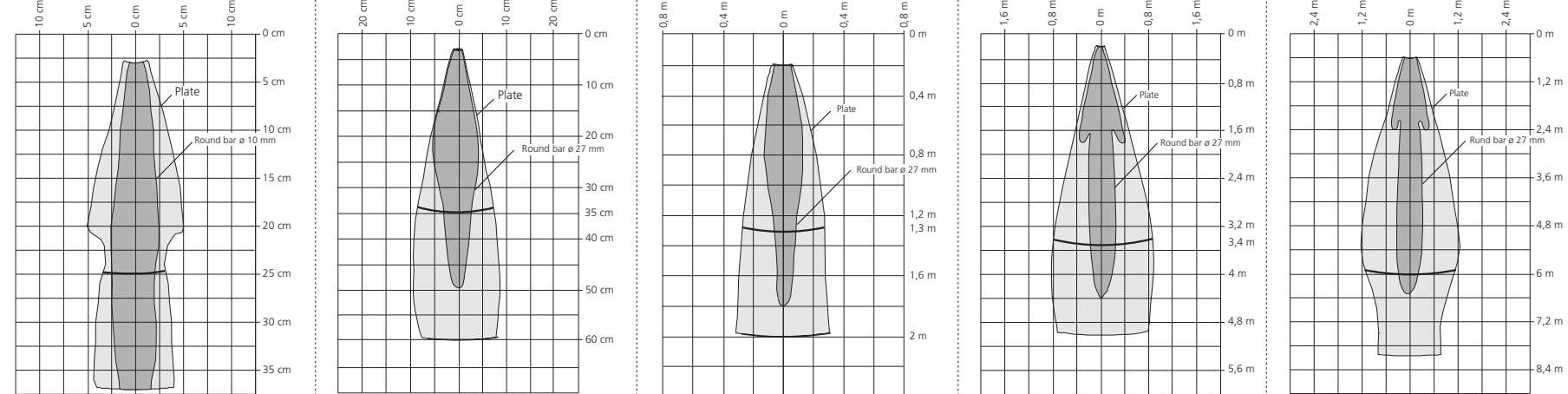
# Technical data



Analogue output



<b>Blind zone</b>	0 to 30 mm	0 to 65 mm	0 to 200 mm	0 to 350 mm	0 to 600 mm
<b>Operating range</b>	250 mm	350 mm	1,300 mm	3,400 mm	6,000 mm
<b>Maximum range</b>	350 mm	600 mm	2,000 mm	5,000 mm	8,000 mm
<b>Angle of beam spread</b>	Please see detection zone				
<b>Transducer frequency</b>	320 kHz	400 kHz	200 kHz	120 kHz	80 kHz
<b>Resolution, sampling rate</b>	0.025 mm to 0.10 mm, depending on the analogue window				



<b>Reproducibility</b>	± 0,15 %	± 0,15 %	± 0,15 %	± 0,15 %	± 0,15 %
<b>Accuracy</b>	± 1 % (Temperature drift internal compensated, may be deactivated <sup>1)</sup> , 0,17%/K without compensation)				

<b>Operating voltage U<sub>B</sub></b>	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection
<b>Voltage ripple</b>	±10 %	±10 %	±10 %	±10 %	±10 %
<b>No-load supply current</b>	≤ 80 mA	≤ 80 mA	≤ 80 mA	≤ 80 mA	≤ 80 mA
<b>Housing</b>	Brass sleeve, nickel-plated, plastic parts: PBT; Ultrasonic transducer: polyurethane foam, epoxy resin with glass content				
<b>Class of protection to EN 60529</b>	IP 67				
<b>Norm conformity</b>	EN 60947-5-2				
<b>Type of connection</b>	5-pin initiator plug, Brass, nickel-plated				
<b>Controls</b>	Yes, via Com-channel				
<b>Indicators</b>	No				
<b>Programmable</b>	Yes, with Teach-in and LinkControl				
<b>Operating temperature</b>	-25°C bis +70°C				
<b>Storage temperature</b>	-40°C bis +85°C				
<b>Weight</b>	200 g	200 g	200 g	260 g	320 g
<b>Response time<sup>1)</sup></b>	32 ms	64 ms	92 ms	172 ms	240 ms
<b>Time delay before availability</b>	< 390 ms				
<b>Order No.</b>	mic-25/IU/M	mic-35/IU/M	mic-130/IU/M	mic-340/IU/M	mic-600/IU/M
<b>Current output 4 – 20 mA</b>	R <sub>i</sub> ≤ 100 Ω at 9 V ≤ U <sub>B</sub> ≤ 20 V; R <sub>i</sub> ≤ 500 Ω at U <sub>B</sub> ≥ 20 V				
<b>Voltage output 0 – 10 V</b>	R <sub>i</sub> ≥ 100 kΩ at U <sub>B</sub> ≥ 15 V, short-circuit-proof				

1) Can be programmed with LinkControl

