**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-25/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 margings 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.
- 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. pebble stones) or diffusely reflect (e.g. plastic foam) or the detection zone contactless. A signal measures the distance to an object within the maximum range.
- The mic-sensors work maintenance free. Small amounts of dirt on the surface do not influence function. Thick layers of dirt can affect sensor function and therefore must be removed.

### 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 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.

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

1. **Set window margins**
   - Place object at position
   - Connect Com for about 3 s with $+ U_B$
   - Connect Com for about 1 s with $+ U_B$
   - Wait for 10 s

2. **Set rising / falling output characteristic curve**
   - Place object at position
   - Connect Com for about 13 s with $+ U_B$
   - To change output function, connect Com for about 10 s with $+ U_B$
   - Wait for 10 s

3. **Change Teach-in / Synchronisation**
   - Turn supply voltage OFF
   - While Com is connected to $- U_B$, turn supply voltage ON
   - Keep Com connected to $- U_B$ for about 3 s
   - To change operation mode (Teach-in and synchronisation) connect Com for about 1 s to $- U_B$
   - Disconnect Com from $- U_B$ before switching-off supply voltage

4. **Reset to factory setting**
   - Turn supply voltage OFF
   - While Com is connected to $- U_B$, turn supply voltage ON
   - Keep Com connected to $- U_B$ for about 13 s
   - Disconnect Com from $- U_B$ before switching-off supply voltage

### Further Settings

- **Tech-in analogue output**
- **Normal operation mode**
- **Normal operation mode**
- **Synchronisation**

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

**Fig. 2:** Assembly distances
## Technical Data

**U1)** Can be programmed with LinkControl and indicate the typical operating range with a thin round bar (10 or 27 mm dia.). This therefore indicates the maximum plate and sensor is always employed. The dark grey areas are determind outside this area.

### Class of protection to EN 60529
- **Mic 25**…: IP 67
- **Mic 35**…: IP 67
- **Mic 130**…: IP 67
- **Mic 340**…: IP 67
- **Mic 600**…: IP 67

### Resolution, sampling rate

- **Mic 25**…: 0.18 mm to 0.7 mm, depending on the analogue window
- **Mic 35**…: 0.18 mm to 0.7 mm, depending on the analogue window
- **Mic 130**…: 0.18 mm to 0.7 mm, depending on the analogue window
- **Mic 340**…: 0.18 mm to 0.7 mm, depending on the analogue window
- **Mic 600**…: 0.18 mm to 2.4 mm, depending on the analogue window

### No-load supply current

- **Mic 25**…: 55 mA at 9 V
- **Mic 35**…: 55 mA at 9 V
- **Mic 130**…: 55 mA at 9 V
- **Mic 340**…: 55 mA at 9 V
- **Mic 600**…: 55 mA at 9 V

### Time delay before availability

- **Mic 25**…: 64 ms
- **Mic 35**…: 64 ms
- **Mic 130**…: 64 ms
- **Mic 340**…: 64 ms
- **Mic 600**…: 64 ms

### Maximum range

- **Mic 25**…: 350 mm
- **Mic 35**…: 350 mm
- **Mic 130**…: 350 mm
- **Mic 340**…: 350 mm
- **Mic 600**…: 600 mm

### Time to 30 V DC

- **Mic 25**…: < 240 ms
- **Mic 35**…: < 240 ms
- **Mic 130**…: < 240 ms
- **Mic 340**…: < 240 ms
- **Mic 600**…: < 240 ms

### Ultrasonic transducer

- **Mic 25**…: Polyurethane foam, epoxy resin with glass content
- **Mic 35**…: Polyurethane foam, epoxy resin with glass content
- **Mic 130**…: Polyurethane foam, epoxy resin with glass content
- **Mic 340**…: Polyurethane foam, epoxy resin with glass content
- **Mic 600**…: Polyurethane foam, epoxy resin with glass content

### Housing

- **Mic 25**…: Brass sleeve, nickel-plated
- **Mic 35**…: Brass sleeve, nickel-plated
- **Mic 130**…: Brass sleeve, nickel-plated
- **Mic 340**…: Brass sleeve, nickel-plated
- **Mic 600**…: Brass sleeve, nickel-plated

### No-load supply current

- **Mic 25**…: ≤ 55 mA
- **Mic 35**…: ≤ 55 mA
- **Mic 130**…: ≤ 55 mA
- **Mic 340**…: ≤ 55 mA
- **Mic 600**…: ≤ 55 mA

### Temperature drift

- **Mic 25**…: ± 1 % (Temperature drift internal compensated, may be deactivated (0.17%/K without compensation)
- **Mic 35**…: ± 1 % (Temperature drift internal compensated, may be deactivated (0.17%/K without compensation)
- **Mic 130**…: ± 1 % (Temperature drift internal compensated, may be deactivated (0.17%/K without compensation)
- **Mic 340**…: ± 1 % (Temperature drift internal compensated, may be deactivated (0.17%/K without compensation)
- **Mic 600**…: ± 1 % (Temperature drift internal compensated, may be deactivated (0.17%/K without compensation)

### Rising/falling output characteristic

- **Mic 25**…: Yes, via Com-channel
- **Mic 35**…: Yes, via Com-channel
- **Mic 130**…: Yes, via Com-channel
- **Mic 340**…: Yes, via Com-channel
- **Mic 600**…: Yes, via Com-channel

### Controls

- **Mic 25**…: Yes, with Teach-in and LinkControl
- **Mic 35**…: Yes, with Teach-in and LinkControl
- **Mic 130**…: Yes, with Teach-in and LinkControl
- **Mic 340**…: Yes, with Teach-in and LinkControl
- **Mic 600**…: Yes, with Teach-in and LinkControl

### Operating temperature

- **Mic 25**…: -25°C bis +70°C
- **Mic 35**…: -25°C bis +70°C
- **Mic 130**…: -25°C bis +70°C
- **Mic 340**…: -25°C bis +70°C
- **Mic 600**…: -25°C bis +70°C

### Storage temperature

- **Mic 25**…: -40°C bis +85°C
- **Mic 35**…: -40°C bis +85°C
- **Mic 130**…: -40°C bis +85°C
- **Mic 340**…: -40°C bis +85°C
- **Mic 600**…: -40°C bis +85°C

### Weight

- **Mic 25**…: 80 g
- **Mic 35**…: 80 g
- **Mic 130**…: 80 g
- **Mic 340**…: 80 g
- **Mic 600**…: 80 g

**Note:** 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.