**Operating manual**

**mic+ Ultrasonic Sensors with one analogue output**

**mic+25/IU/TC**  
**mic+35/IU/TC**  
**mic+340/IU/TC**  
**mic+600/IU/TC**

**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.
- All settings are done with two push-buttons and a three-digit LED-display (TouchControl).
- Light emitting diodes (three-colour LEDs) indicate all operation conditions.
- The sensors are adjustable manually using the numerical LED-display or may be trained using Teach-in processes.
- Useful additional functions are set in the Add-on-menu.
- Using the LinkControl adapter (optional accessory) all TouchControl and additional sensor parameter settings may be made by a Windows-Software.

**Important instructions for assembly and application**

- All employee and plant safety-relevant instructions must be set to address »00«.)
- 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.
- The proximity switches are suitable for industrial machinery applications.
- The proximity switches are suitable for machinery NFPA 79 applications.
- If no objects are placed within the detection zone the LED-indicator shows »- - -«.
- If no push-buttons are pressed for 20 seconds during parameter setting mode the compensation reaches its optimum working point after approx. 30 minutes of operation.
- If an object is within the set window margins of the analogue output, then LED D1 lights up green, if the object is outside the window margins, then LED D1 lights up red.
- The load put to the analogue output is detected automatically when turning supply voltage on.
- During normal mode operation, the measured distance value is displayed on the LED-indicator in mm (up to 999 mm) or cm (from 100 cm). Scale switches automatically and is indicated by a point on top of the digits. Alternatively a percentage scale may be set in the add-on menu. In this connection 0% and 100% correspond to the set window margins of the analogue output.
- If no push-buttons are pressed for 20 seconds during setting mode the made changes are stored and the sensor returns to normal mode operation.

**Show parameters**

Tapping push-button T1 shortly during normal mode operation shows »Par« on the LED-display. Each time you tap push-button T1 the actual settings of the analogue output are shown.

**Assembly instructions**

- Set the parameters of the sensor manually or use the Teach-in procedure to adjust the detect points.

**Set sensor parameters alternatively numerically using LED-display...**

**Start here**

Press T1 and T2 simultaneously for about 3 s until welcome message has passed

**HELLO**

Press T1 and T2 simultaneously for about 3 s until welcome message has passed

**Pro**

Set sensor-close window margin in mm or cm

**123**

Set sensor-distant window margin in mm or cm

**456**

Choose rising (↑↑) / falling (↑↓) output characteristic curve

**End**

**Ready**

**measuring range**

<table>
<thead>
<tr>
<th>colour</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>-U</td>
<td>+U</td>
<td>+U</td>
<td>+U</td>
<td>+U</td>
<td>+U</td>
</tr>
<tr>
<td>brown</td>
<td>white</td>
<td>blue</td>
<td>black</td>
<td>grey</td>
<td></td>
</tr>
</tbody>
</table>

**Set analogue output**

**Fig. 1:** Assembly distances, indicating synchronisation/multiplex

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

**Fig. 3:** TouchControl
...or with the Teach-in procedure

**Useful additional functions in Add-on menu** (for experienced users only; settings not required for standard applications)

**Start here**

Press T1 and T2 simultaneously for about 13 s until “Add” is shown in the LED-display

Press T1 and T2 simultaneously until “End” is displayed

**Key lock and factory setting**

- Activate/deactivate TouchControl
- Reset to factory setting
- Turn supply voltage OFF
- Turn supply voltage ON
- While pressing T1 turn supply voltage ON
- While pressing T1 turn supply voltage OFF
- Keep T1 pressed for ca. 3 s until “on” or “off” is displayed
- Keep T1 pressed for ca. 13 s until “001” has passed through the display
- Don’t press any push-button for 25 s

**Normal mode operation**

**Teach-in analogue output**
# Technical Data

## D+ 21... and D+ 25...

### Technical Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Micrometer Range</th>
<th>Voltage Output</th>
<th>Operating Temperature</th>
<th>Storage Temperature</th>
<th>Radiated Power</th>
<th>Response Time</th>
<th>Time Delay</th>
<th>Blind Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mic-25...</td>
<td>0 to 30 mm</td>
<td>0 to 65 mm</td>
<td>-25°C to +70°C</td>
<td>-40°C to +85°C</td>
<td>&lt; 50 µW</td>
<td>32 ms</td>
<td>&lt; 390 ms</td>
<td>0.15 µm</td>
</tr>
<tr>
<td>Mic-35...</td>
<td>0 to 200 mm</td>
<td>0 to 600 mm</td>
<td>-25°C to +70°C</td>
<td>-40°C to +85°C</td>
<td>&lt; 50 µW</td>
<td>150 g</td>
<td>&lt; 420 ms</td>
<td>0.5 µm</td>
</tr>
</tbody>
</table>

### Operating Conditions

- **Operating Voltage**: U \( \geq 9 V \) to 30 V DC, short-circuit-proof, Class 2
- **Supply Voltage ripple**: ≤ 20 V; ≤ 500 mV at 9 V
- **Supply Voltage drop-out**: ≤ 20 V; ≤ 500 mV at 9 V
- **Frequency Response**: 80 kHz to 800 kHz
- **Input Impedance**: 500 kΩ
- **Output Characteristics**: Rising/falling output characteristic
- **Accuracy**: ±10 %

### Application Notes

- **Micrometer Range**: Suitable for various micrometer applications.
- **Output Type**: Analogue output (0 to 10 V).