

microsonic  
mic+25-F-  
TC  
Ultrasoni  
c Sensors



# microsonic mic+25-F-TC Ultrasonic Sensors Instruction Manual

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# microsonic

microsonic mic+25-F-TC Ultrasonic Sensors



## Specifications

- Model Variants: mic+25/F/TC, mic+35/F/TC, mic+130/F/TC, mic+340/F/TC, mic+600/F/TC
- Switching Output: One switching output
- Communication: IO-Link
- Additional Features: TouchControl, Three-color LEDs, Teach-in Procedure, Add-on-menu
- Compatibility: IO-Link specification V1.1, Smart Sensor Profile

## Product Usage Instructions

### Setting Up the Sensor

1. Press T1 and T2 simultaneously for about 3 seconds until the welcome message has passed.
2. Set the switching output T1 as needed.
3. Adjust the detect distance in mm or cm using the appropriate buttons.

### Switching Output Configuration

For single switching mode, refer to the displayed instructions.

For window mode operation, set the far switching point in mm or cm.

### Safety Notes

Read the operating instructions thoroughly before starting.

Connection, installation, and adjustment works should be carried out by expert personnel. Ensure compliance with safety regulations.

### Proper Use

The mic+ ultrasonic sensors are designed for non-contact detection of objects. Use them as per the specified guidelines.

## Synchronization

If using multiple sensors with assembly distance below-specified values, use integrated synchronization. Connect Sync/Com channels of all sensors for proper functionality.

## FAQ

### Q: What is the factory setting for mic+ sensors?

A: The factory setting includes switching output on NOC, detecting distance at operating range, and measurement range set to maximum range.

## 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.
- All settings are done with two push-buttons and a three-digit LED-display (TouchControl).
- Three-colour LEDs indicate the switching status.
- The output functions are changeable from NOC to NCC.
- The sensors are adjustable manually via TouchControl or via Teach-in procedure.
- Useful additional functions are set in the Add-on-menu.
- Using the LinkControl adapter (optional accessory) all TouchControl and additional sensor parameter settings can be adjusted by a Windows® Software.

## IO-Link

The mic+ sensors are IO-Link-capable in accordance with IO-Link specification V1.1 and support Smart Sensor Profile like Digital Measuring Sensor.

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.

## 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

## Proper Use

mic+ ultrasonic sensors are used for non-contact detection of objects.

## Synchronisation

If the assembly distance of multiple sensors falls below the values shown in Fig. 1 the integrated synchronisation should be used. Connect Sync/Com-channels (pin 5 at the units receptable) of all sensors (10 maximum).

		
mic+25...	$\geq 0.35 \text{ m}$	$\geq 2.50 \text{ m}$
mic+35...	$\geq 0.40 \text{ m}$	$\geq 2.50 \text{ m}$
mic+130...	$\geq 1.10 \text{ m}$	$\geq 8.00 \text{ m}$
mic+340...	$\geq 2.00 \text{ m}$	$\geq 18.00 \text{ m}$
mic+600...	$\geq 4.00 \text{ m}$	$\geq 30.00 \text{ m}$

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

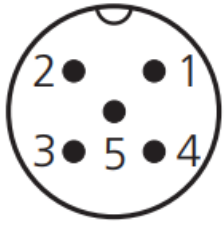

### Multiplex mode

The Add-on-menu allows to assign an individual address »01« to »10« to each sensor connected via the Sync/Com-channel (Pin5). The sensors perform the ultrasonic measurement sequentially from low to high address. Therefore any influence between the sensors is rejected.

The address »00« is reserved to synchronisation mode and deactivates the multiplex mode. To use synchronised mode all sensors must be set to address »00«.

### Installation

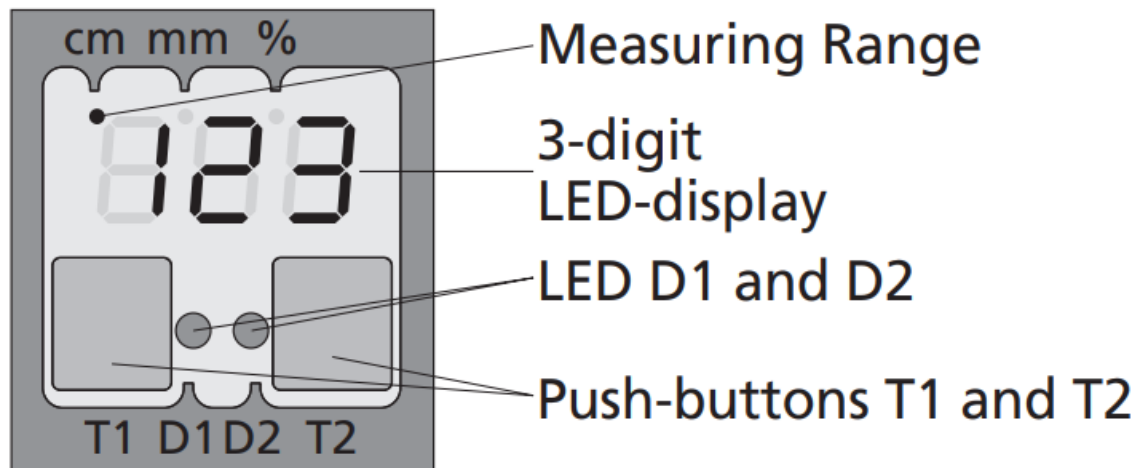
- Assemble the sensor at the installation location.
- Plug in the connector cable to the M12 connector, see Fig. 2.

		
1	$+U_B$	<b>colour</b> brown
3	$-U_B$	blue
4	F	black
2	–	white
5	Sync/Com	grey

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

### Start-up

- Connect the power supply.
- Set the parameters of the sensor manually via TouchControl (see Fig. 3 and Diagram 1)
- or use the Teach-in procedure to adjust the detect points (see Diagram 2).



**Fig. 3:** *TouchControl/LED display*

#### Factory setting

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

- Switching output on NOC
- Detecting distance at operating range
- Measurement range set to maximum range

#### 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

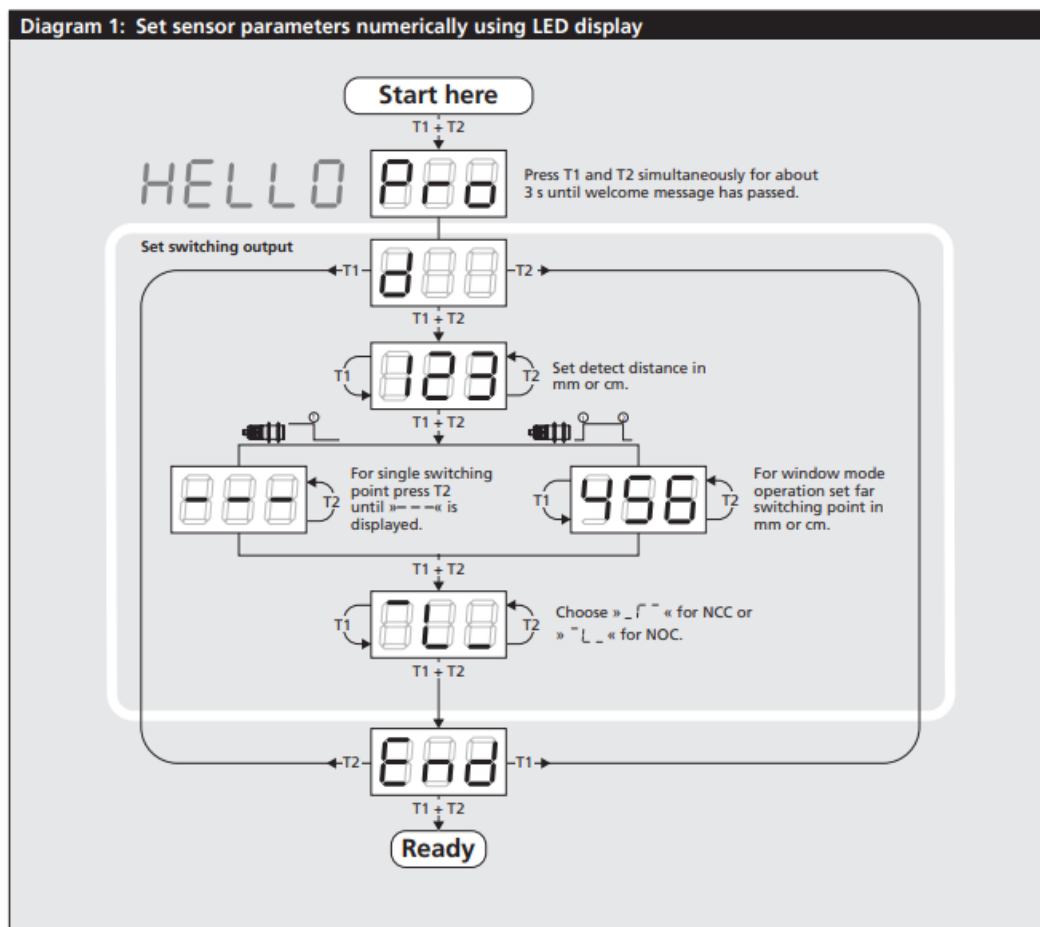
- mic+ sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approx. 30 minutes of operation.
- During normal operating mode, a yellow LED D2 signals that the switching output has connected.
- During normal operating mode, 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.
- During Teach-in mode, the hysteresis loops are set back to factory settings.
- 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 made changes are stored and the sensor returns to normal operating mode.
- The sensor can be reset to its factory setting, see »Key lock and factory setting«, Diagram 3.
- The latest IODD file and informations about start-up and configuration of pico+ sensors with IO-Link, you will find online at [www.microsonic.de/en/mic+](http://www.microsonic.de/en/mic+).

#### Show parameters

In normal operating mode shortly push T1. The LED display shows »PAr.«

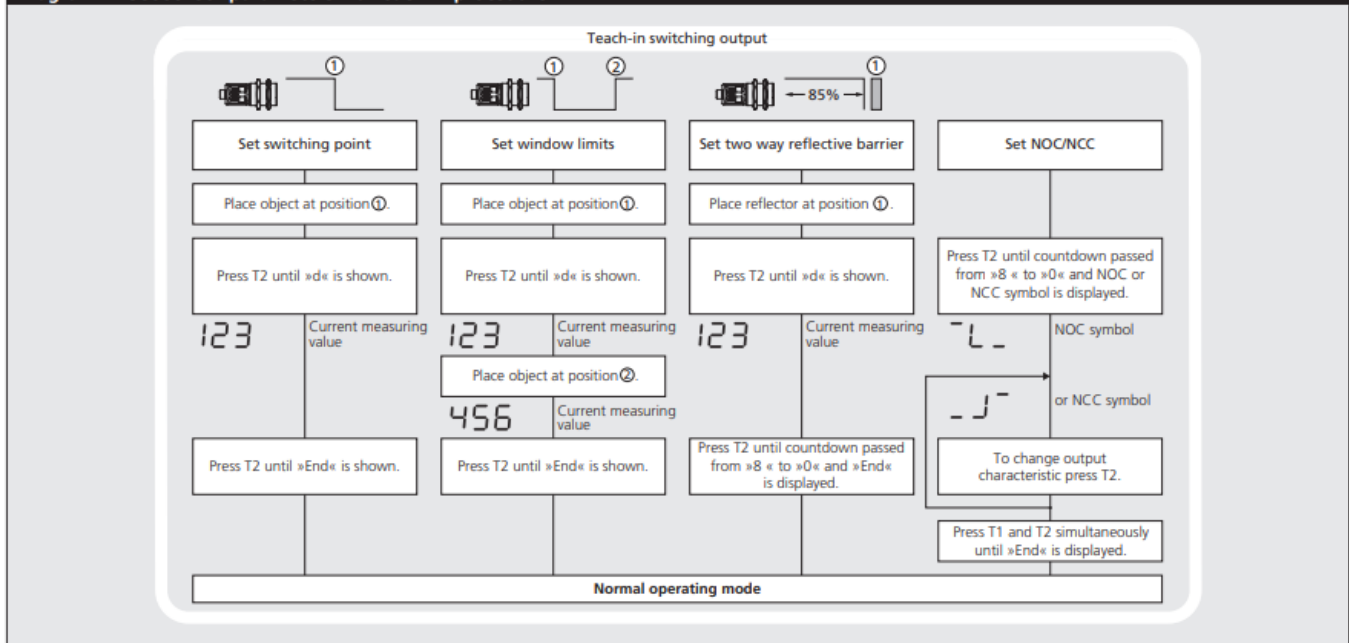
Each time you tap push-button T1 the actual settings of the analogue output are shown.

**Diagram 1: Set sensor parameters numerically using LED display**

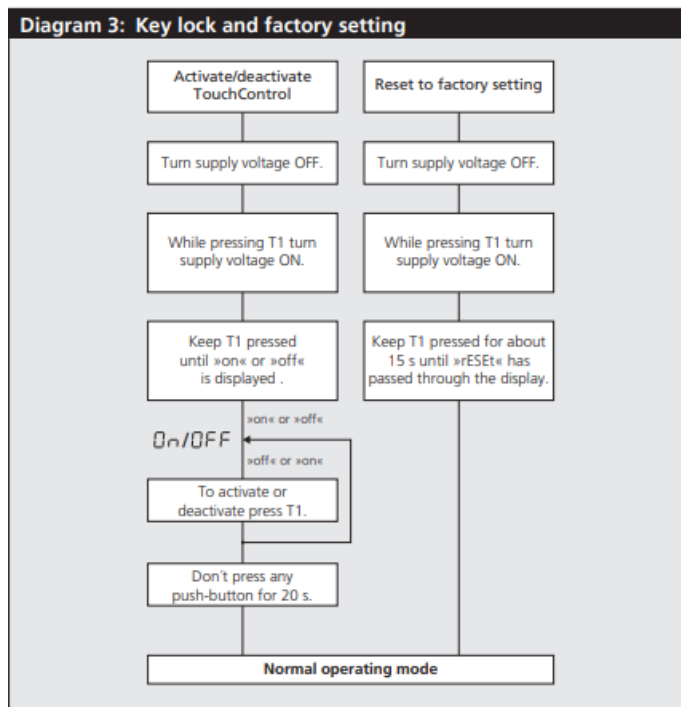


**Diagram 2: Set sensor parameters via Teach-in procedure**

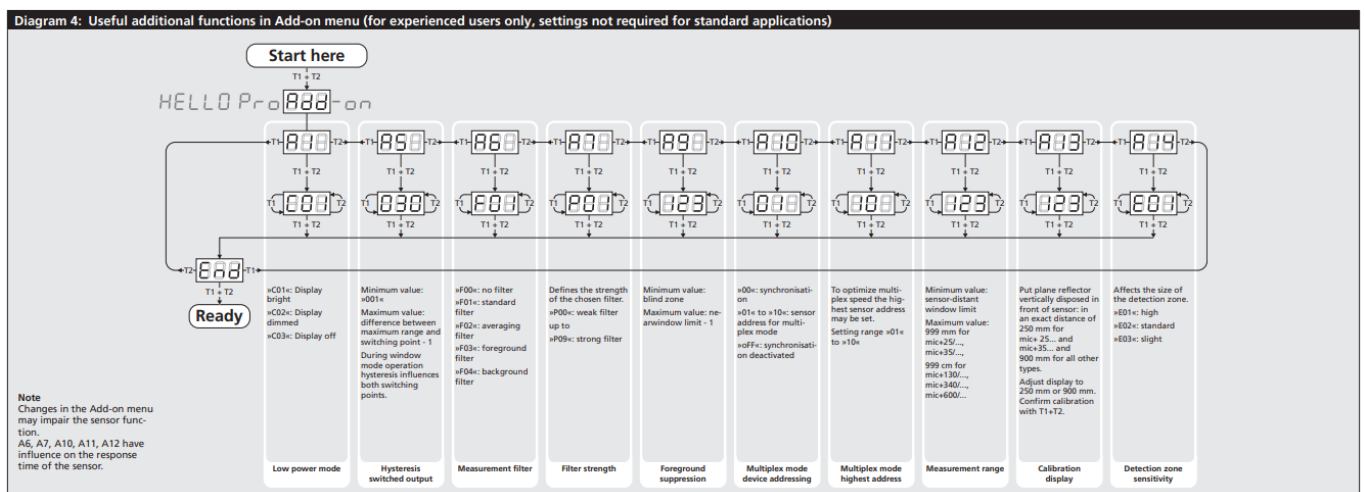
**Diagram 2: Set sensor parameters via Teach-in procedure**



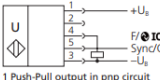
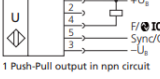

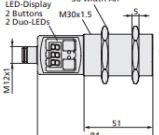

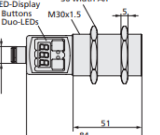

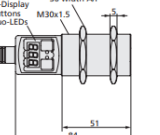

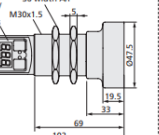

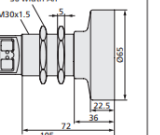
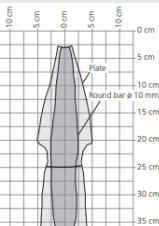
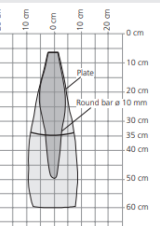
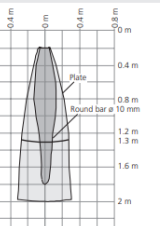
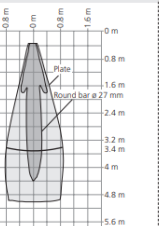
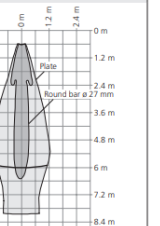
**Diagram 3: Key lock and factory setting**



**Diagram 4: Useful additional functions in Add-on menu (for experienced users only, settings not required for standard applications)**



## Technical data

 	<b>mic+25...</b>  	<b>mic+35...</b>  	<b>mic+130...</b>  	<b>mic+340...</b>  	<b>mic+600...</b>  
<b>blind zone</b> <b>operating range</b> <b>maximum range</b> <b>angle of beam spread</b> <b>transducer frequency</b> <b>resolution</b>	0 to 30 mm 250 mm 350 mm 320 kHz 0.025 mm	0 to 65 mm 350 mm 600 mm 320 kHz 0.025 mm	0 to 200 mm 1,300 mm 2,000 mm 320 kHz 0.18 mm	0 to 350 mm 3,400 mm 5,000 mm 320 kHz 0.18 mm	0 to 600 mm 6,000 mm 8,000 mm 320 kHz 0.18 mm
<b>detection zones</b> 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.					
<b>reproducibility</b> <b>accuracy</b> <b>operating voltage <math>U_b</math></b> <b>voltage ripple</b> <b>no-load supply current</b> <b>housing</b> <b>class of protection to EN 60529</b> <b>norm conformity</b> <b>type of connection</b> <b>controls</b> <b>indicators</b> <b>programmable</b> <b>operating temperature</b> <b>storage temperature</b> <b>weight</b> <b>switching hysteresis</b> <b>switching frequency</b> <b>response time</b> <b>time delay before availability</b>	±0.15 % ±1 % (Temperature drift internal compensated, may be deactivated $\frac{1}{10}$ , 0.17%/K without compensation) 9 to 30 V DC, short-circuit-proof, Class 2 ±10 % ≤ 80 mA Brass sleeve, nickel-plated, plastic parts: PBT, TPU, Ultrasonic transducer: polyurethane foam, epoxy resin with glass content IP 67 EN 60947-5-2 5-pin initiator plug, PBT 2 push-buttons (TouchControl) 3-digit LED display, 2 three-colour LEDs with TouchControl and LinkControl -25 to +70 °C -40 to +85 °C 150 g 3 mm 12 Hz 64 ms 32 ms <300 ms	±0.15 % ±1 % (Temperature drift internal compensated, may be deactivated $\frac{1}{10}$ , 0.17%/K without compensation) 9 to 30 V DC, short-circuit-proof, Class 2 ±10 % ≤ 80 mA Brass sleeve, nickel-plated, plastic parts: PBT, TPU, Ultrasonic transducer: polyurethane foam, epoxy resin with glass content IP 67 EN 60947-5-2 5-pin initiator plug, PBT 2 push-buttons (TouchControl) 3-digit LED display, 2 three-colour LEDs with TouchControl and LinkControl -25 to +70 °C -40 to +85 °C 150 g 3 mm 8 Hz 92 ms 32 ms <300 ms	±0.15 % ±1 % (Temperature drift internal compensated, may be deactivated $\frac{1}{10}$ , 0.17%/K without compensation) 9 to 30 V DC, short-circuit-proof, Class 2 ±10 % ≤ 80 mA Brass sleeve, nickel-plated, plastic parts: PBT, TPU, Ultrasonic transducer: polyurethane foam, epoxy resin with glass content IP 67 EN 60947-5-2 5-pin initiator plug, PBT 2 push-buttons (TouchControl) 3-digit LED display, 2 three-colour LEDs with TouchControl and LinkControl -25 to +70 °C -40 to +85 °C 150 g 20 mm 8 Hz 92 ms 32 ms <300 ms	±0.15 % ±1 % (Temperature drift internal compensated, may be deactivated $\frac{1}{10}$ , 0.17%/K without compensation) 9 to 30 V DC, short-circuit-proof, Class 2 ±10 % ≤ 80 mA Brass sleeve, nickel-plated, plastic parts: PBT, TPU, Ultrasonic transducer: polyurethane foam, epoxy resin with glass content IP 67 EN 60947-5-2 5-pin initiator plug, PBT 2 push-buttons (TouchControl) 3-digit LED display, 2 three-colour LEDs with TouchControl and LinkControl -25 to +70 °C -40 to +85 °C 210 g 50 mm 4 Hz 172 ms 450 ms <380 ms	±0.15 % ±1 % (Temperature drift internal compensated, may be deactivated $\frac{1}{10}$ , 0.17%/K without compensation) 9 to 30 V DC, short-circuit-proof, Class 2 ±10 % ≤ 80 mA Brass sleeve, nickel-plated, plastic parts: PBT, TPU, Ultrasonic transducer: polyurethane foam, epoxy resin with glass content IP 67 EN 60947-5-2 5-pin initiator plug, PBT 2 push-buttons (TouchControl) 3-digit LED display, 2 three-colour LEDs with TouchControl and LinkControl -25 to +70 °C -40 to +85 °C 270 g 100 mm 3 Hz 240 ms 450 ms <450 ms
<b>order No.</b> <b>switching output</b>	<b>mic+25-F/TC</b> Push-Pull, $U_b = 3\text{ V}$ , $-U_b + 3\text{ V}$ , $I_{max} = 100\text{ mA}$ switchable NOC/NCC, short-circuit-proof	<b>mic+35-F/TC</b> Push-Pull, $U_b = 3\text{ V}$ , $-U_b + 3\text{ V}$ , $I_{max} = 100\text{ mA}$ switchable NOC/NCC, short-circuit-proof	<b>mic+130-F/TC</b> Push-Pull, $U_b = 3\text{ V}$ , $-U_b + 3\text{ V}$ , $I_{max} = 100\text{ mA}$ switchable NOC/NCC, short-circuit-proof	<b>mic+340-F/TC</b> Push-Pull, $U_b = 3\text{ V}$ , $-U_b + 3\text{ V}$ , $I_{max} = 100\text{ mA}$ switchable NOC/NCC, short-circuit-proof	<b>mic+600-F/TC</b> Push-Pull, $U_b = 3\text{ V}$ , $-U_b + 3\text{ V}$ , $I_{max} = 100\text{ mA}$ switchable NOC/NCC, short-circuit-proof

<sup>1)</sup> Can be programmed via TouchControl, LinkControl and IO-Link.

<sup>2)</sup> With TouchControl, LinkControl and IO-Link, the selected filter setting and the maximum range influence the switching frequency and the response time.

<sup>3)</sup> Can be deactivated via LinkControl.

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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.

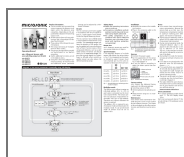
Enclosure Type 1  
For use only in industrial  
machinery NFPA 79 applications

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.

**Registration**  
no. 75330-19

**Approved on**  
June 25th, 2019

## Documents / Resources



[microsonic mic+25-F-TC Ultrasonic Sensors \[pdf\] Instruction Manual](#)  
mic 25-F-TC, mic 35-F-TC, mic 130-F-TC, mic 340-F-TC, mic 600-F-TC, mic 25-F-TC Ultrasonic Sensors, mic 25-F-TC, Ultrasonic Sensors, Sensors

## References

- [microsonic | ultrasonic sensors | Made in Germany](#)
- [User Manual](#)



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