

## Ultrasonic sensor with one analogue output



### Product Description

The pico+ sensor offers a non-contact measurement of the distance to an object that has to be present within the sensor's detection zone. Depending on the set window limits, a distance-proportional analogue signal is output.

The window limits of the analogue output and its characteristic can be adjusted via Teach-in procedure. Two LEDs indicate the state of the analogue output.

### Operating Manual

- pico+15/I
- pico+25/I
- pico+35/I
- pico+100/I
- pico+15/U
- pico+25/U
- pico+35/U
- pico+100/U
- pico+15/WK/I
- pico+25/WK/I
- pico+35/WK/I
- pico+100/WK/I
- pico+15/WK/U
- pico+25/WK/U
- pico+35/WK/U
- pico+100/WK/U

### Safety Notes

- Read the operating manual prior to start-up.
- Connection, installation and adjustment works should be carried out by expert personnel only.
- No safety component in accordance with the EU Machine Directive, use in the area of personal and machine protection not permitted

### Proper Use

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

### Installation

- ➔ Mount the sensor at the installation site.
- ➔ Connect a connection cable to the M12 device plug, see Fig. 1.

	1	+U <sub>B</sub>	brown
	3	-U <sub>B</sub>	blue
	4	-	black
	2	I/U	white
	5	Com	grey

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

### Start-Up

- ➔ Connect the power supply.
- ➔ Set the sensor parameters using the Teach-in procedure, see Diagram 1.

### Factory Setting

- pico+ sensors are delivered factory made with the following settings:
- Rising analogue characteristic curve between the blind zone and the operating range

- Multifunctional input »Com« set to »Teach-in«

### Synchronisation

If the assembly distance falls below the values shown in fig. 2, the internal synchronization should be used. For this purpose set the switched outputs of all sensors in accordance to the diagram »Sensor adjustment with Teach-in procedure« at first. Then set the multifunctional output »Com« to »synchronization« (see »Further settings«, Diagram 1). Finally connect pin 5 of the sensors plug of all sensors.

### Maintenance

microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend to clean the white sensor surface.

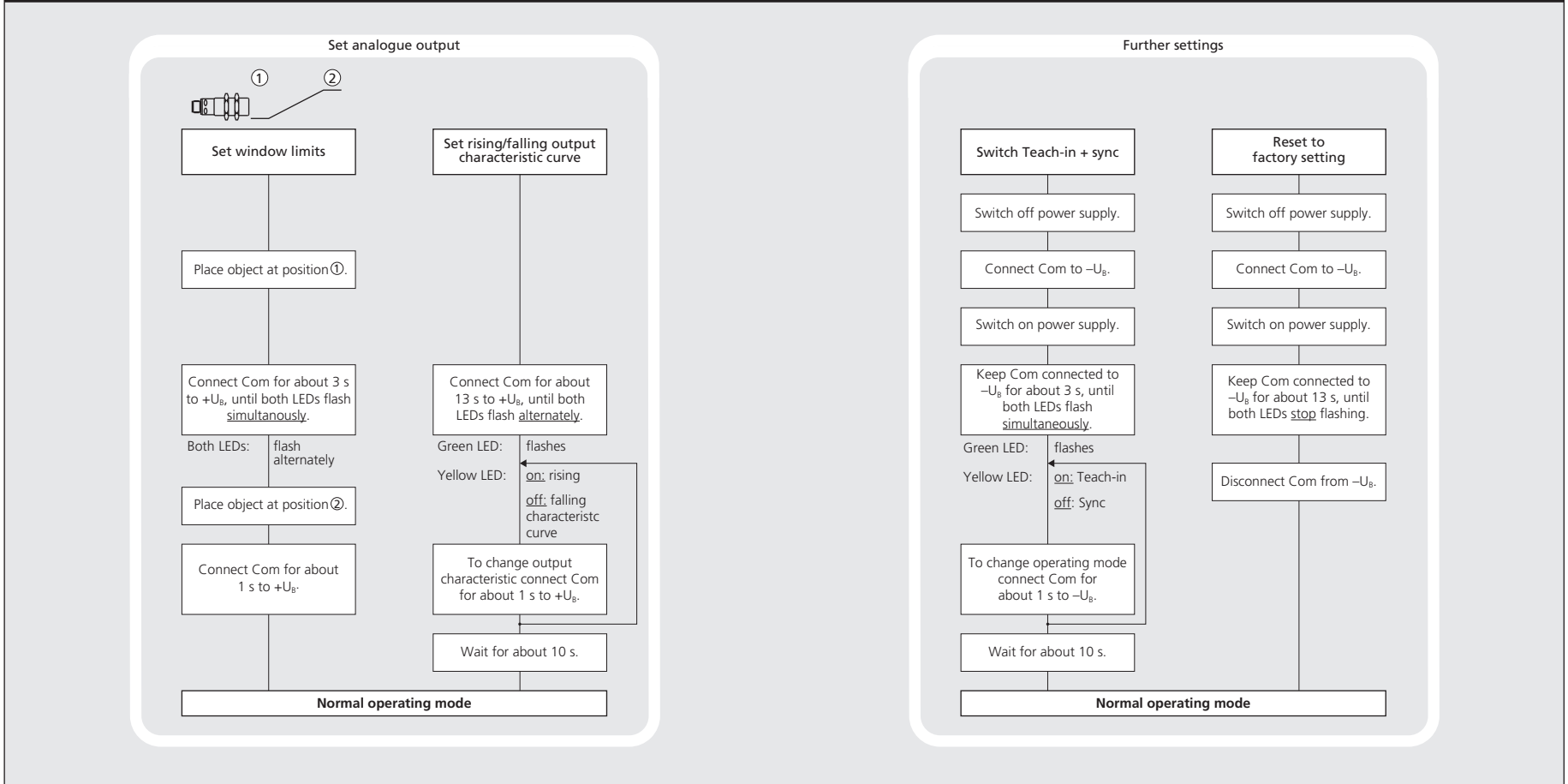
pico+15...	≥0.25 m	≥1.30 m
pico+25...	≥0.35 m	≥2.50 m
pico+35...	≥0.40 m	≥2.50 m
pico+100...	≥0.70 m	≥4.00 m

Fig. 2: Assembly distances, indication synchronization

### Notes

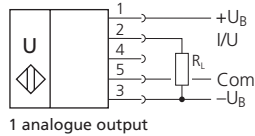
- The sensors of the pico+ family have a blind zone. Within this zone a distance measurement is not possible.
- Every time the power supply is switched on, the sensor detects its actual operating temperature and transmits it to the internal temperature compensation. The adjusted value is taken over after 120 seconds.

## Diagram 1: Set sensor parameters via Teach-in procedure

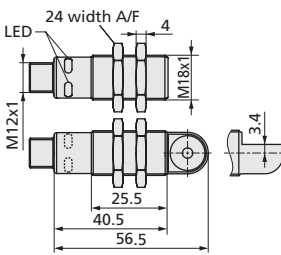


- In the normal operating mode, an illuminated yellow LED signals the object is within the window limits.
- If synchronisation is activated the Teach-in is disabled (see »Further settings«, Diagram 1).
- The sensor can be reset to its factory setting (see »Further settings«, Diagram 1).
- Optionally all Teach-in and additional sensor parameter settings can be adjusted via the LinkControl adapter (optional accessory) and the LinkControl software for Windows®.

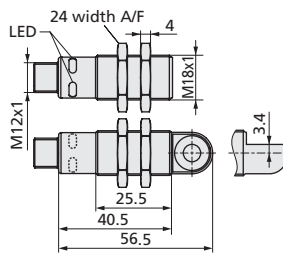
**Technical data**



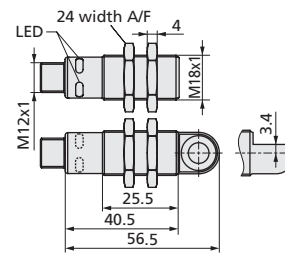
**pico+15... D**



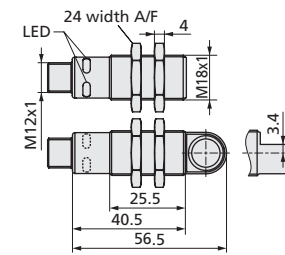
**pico+25... D**



**pico+35... D**



**pico+100... D**



**blind zone**: 20 mm  
**operating range**: 150 mm  
**maximum range**: 250 mm  
**angle of beam spread**: see detection zone  
**transducer frequency**: 380 kHz  
**resolution**: 0.069 mm

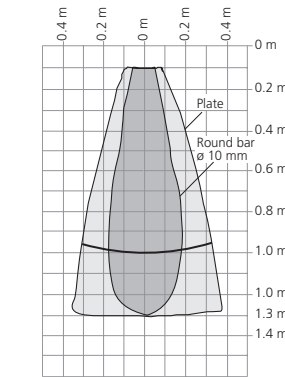
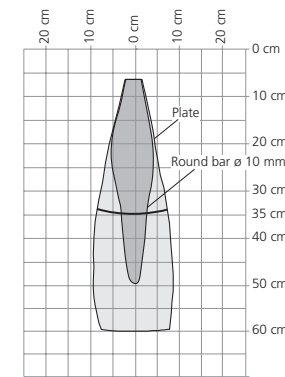
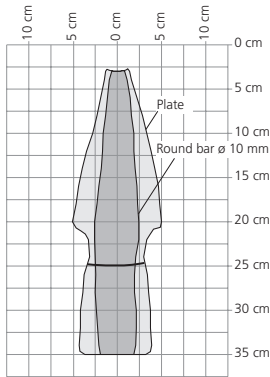
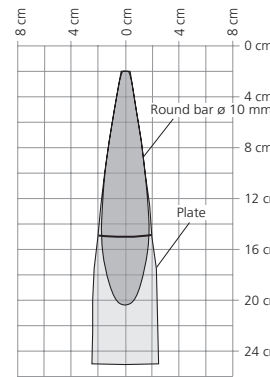
**blind zone**: 30 mm  
**operating range**: 250 mm  
**maximum range**: 350 mm  
**angle of beam spread**: see detection zone  
**transducer frequency**: 320 kHz  
**resolution**: 0.069 to 0.1 mm, depending on the analogue window

**blind zone**: 65 mm  
**operating range**: 350 mm  
**maximum range**: 600 mm  
**angle of beam spread**: see detection zone  
**transducer frequency**: 400 kHz  
**resolution**: 0.069 to 0.17 mm, depending on the analogue window

**blind zone**: 120 mm  
**operating range**: 1,000 mm  
**maximum range**: 1,300 mm  
**angle of beam spread**: see detection zone  
**transducer frequency**: 200 kHz  
**resolution**: 0.069 to 0.38 mm, depending on the analogue window

**detection zones**

for different objects:  
 The dark grey areas are determined with a round bar and indicate the typical operating range of a sensor. In order to obtain the light grey areas, a plate (100 x 100 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.



**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <40 mA  
**operating voltage ripple**: ±10 %  
**housing**: brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content

**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <45 mA  
**operating voltage ripple**: ±10 %  
**housing**: brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content

**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <45 mA  
**operating voltage ripple**: ±10 %  
**housing**: brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content

**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <45 mA  
**operating voltage ripple**: ±10 %  
**housing**: brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content

**max. tightening torque of nuts**: 15 Nm  
**class of protection to EN 60529**: IP 67  
**norm conformity**: EN 60947-5-2  
**type of connection**: 5-pin M12 initiator plug  
**controls**: Teach-in via pin 5 (Com)  
**scope for setting**: Teach-in, LinkControl  
**indicators**: LED green, LED yellow  
**synchronisation**: internal synchronisation up to 10 sensors  
**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time**: 32 ms  
**time delay before availability**: <300 ms  
**analogue output 4 to 20 mA**: R<sub>L</sub> ≤ 500 Ω, rising/falling characteristic  
**operating voltage U<sub>B</sub>**: 10 to 30 V DC for R<sub>L</sub> ≤ 100 Ω  
 20 to 30 V DC for R<sub>L</sub> > 100 Ω  
 terminal reverse polarity protected, Class 2

**max. tightening torque of nuts**: 1 Nm  
**class of protection to EN 60529**: IP 67  
**norm conformity**: EN 60947-5-2  
**type of connection**: 5-pin M12 initiator plug  
**controls**: Teach-in via pin 5 (Com)  
**scope for setting**: Teach-in, LinkControl  
**indicators**: LED green, LED yellow  
**synchronisation**: internal synchronisation up to 10 sensors  
**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time**: 32 ms  
**time delay before availability**: <300 ms  
**analogue output 4 to 20 mA**: R<sub>L</sub> ≤ 500 Ω, rising/falling characteristic  
**operating voltage U<sub>B</sub>**: 10 to 30 V DC for R<sub>L</sub> ≤ 100 Ω  
 20 to 30 V DC for R<sub>L</sub> > 100 Ω  
 terminal reverse polarity protected, Class 2

**max. tightening torque of nuts**: 15 Nm  
**class of protection to EN 60529**: IP 67  
**norm conformity**: EN 60947-5-2  
**type of connection**: 5-pin M12 initiator plug  
**controls**: Teach-in via pin 5 (Com)  
**scope for setting**: Teach-in, LinkControl  
**indicators**: LED green, LED yellow  
**synchronisation**: internal synchronisation up to 10 sensors  
**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time**: 64 ms  
**time delay before availability**: <300 ms  
**analogue output 4 to 20 mA**: R<sub>L</sub> ≤ 500 Ω, rising/falling characteristic  
**operating voltage U<sub>B</sub>**: 10 to 30 V DC for R<sub>L</sub> ≤ 100 Ω  
 20 to 30 V DC for R<sub>L</sub> > 100 Ω  
 terminal reverse polarity protected, Class 2

**max. tightening torque of nuts**: 15 Nm  
**class of protection to EN 60529**: IP 67  
**norm conformity**: EN 60947-5-2  
**type of connection**: 5-pin M12 initiator plug  
**controls**: Teach-in via pin 5 (Com)  
**scope for setting**: Teach-in, LinkControl  
**indicators**: LED green, LED yellow  
**synchronisation**: internal synchronisation up to 10 sensors  
**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time**: 80 ms  
**time delay before availability**: <300 ms  
**analogue output 4 to 20 mA**: R<sub>L</sub> ≤ 500 Ω, rising/falling characteristic  
**operating voltage U<sub>B</sub>**: 10 to 30 V DC for R<sub>L</sub> ≤ 100 Ω  
 20 to 30 V DC for R<sub>L</sub> > 100 Ω  
 terminal reverse polarity protected, Class 2

**order no. directly radiating weight**: **pico+15/I**  
 30 g  
**order no. angular head weight**: **pico+15/WK/I**  
 35 g

**order no. directly radiating weight**: **pico+25/I**  
 30 g  
**order no. angular head weight**: **pico+25/WK/I**  
 35 g

**order no. directly radiating weight**: **pico+35/I**  
 30 g  
**order no. angular head weight**: **pico+35/WK/I**  
 35 g

**order no. directly radiating weight**: **pico+100/I**  
 30 g  
**order no. angular head weight**: **pico+100/WK/I**  
 35 g

**analogue output 0 to 10 V**: R<sub>L</sub> ≥ 100 kΩ, short circuit proof, rising/falling characteristic  
**operating voltage U<sub>B</sub>**: 15 to 30 V DC, terminal reverse polarity protected, Cl. 2

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**operating voltage U<sub>B</sub>**: 15 to 30 V DC, terminal reverse polarity protected, Cl. 2

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**order no. directly radiating weight**: **pico+15/U**  
 30 g  
**order no. angular head weight**: **pico+15/WK/U**  
 35 g

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**order no. angular head weight**: **pico+25/WK/U**  
 35 g

**order no. directly radiating weight**: **pico+35/U**  
 30 g  
**order no. angular head weight**: **pico+35/WK/U**  
 35 g

**order no. directly radiating weight**: **pico+100/U**  
 30 g  
**order no. angular head weight**: **pico+100/WK/U**  
 35 g

<sup>1)</sup> With LinkControl, the selected filter setting influences the response time.



**UL LISTED** Enclosure Type 1  
 For use only in industrial machinery NFPA 79 applications.  
 The proximity switches shall be used with a Listed (CYJ/7) cable/connector assembly rated minimum 32 Vdc, minimum 290 mA, in the final installation.

