



**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 ultrasonic transducer surface of the pico+ sensors is laminated with a PTFE film. The transducer itself is sealed against the housing by a joint ring. This composition permits measurement in up to 0,5 bar over pressure. The window limits of the analogue output and its characteristic can be adjusted via Teach-in procedure. Two LEDs indicate operation and the state of the analogue output.

## Operating Manual

### Ultrasonic sensor with one analogue output

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

**Safety instructions**

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

**Use for intended purpose only**  
 pico+ ultrasonic sensors are used for non-contact detection of objects.

**Installation**  
 → Mount the sensor at the place of fitting.  
 For the pico+100/TF we recommend not to use for mounting the first 5 mm of the M22 thread on the side of the transducer.

→ 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 cables

**Start-up**  
 → Connect the power supply.  
 → Carry out sensor adjustment in accordance with Diagram 1.

**Factory setting**  
 ■ 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 Diagram 1 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 cleaning 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

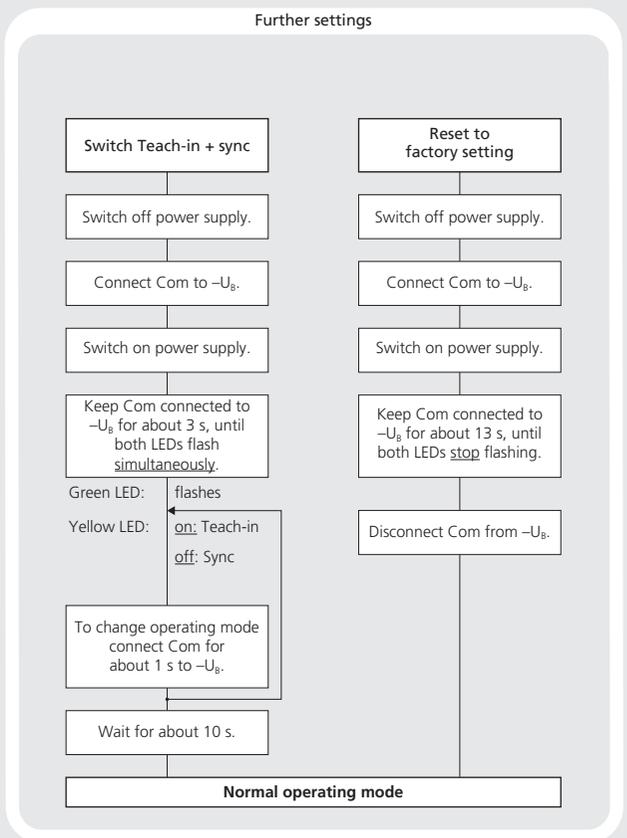
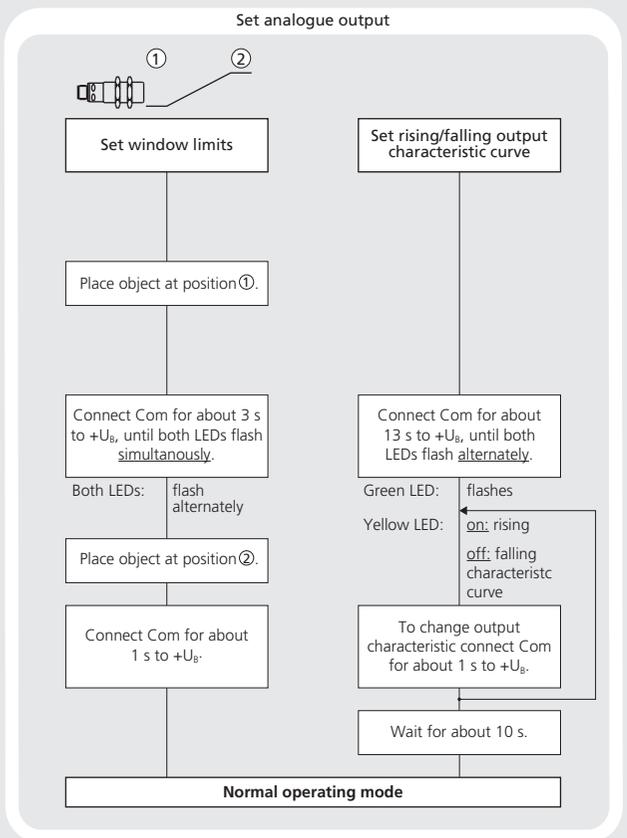
Fig. 2: Assembly distances.

**Notes**

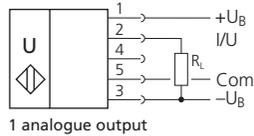
- The sensors of the pico+ family have a blind zone. Within this zone a distance measurement is not possible.
- Every time the power supply is switched on, the sensor detects its actual operating temperature and transmits it to the internal temperature compensation. The adjusted value is taken over after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

- In the normal operating mode, an illuminated yellow LED signals the object is within the adjusted window limits.
- If synchronization 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 made using the LinkControl adapter (optional accessory) and the LinkControl software for Windows®.

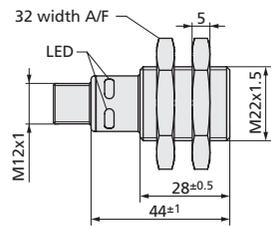
## Diagram 1: Set sensor parameters via Teach-in procedure



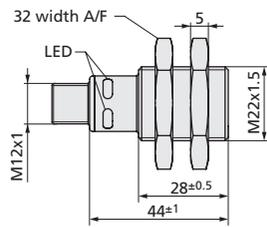
Technical data



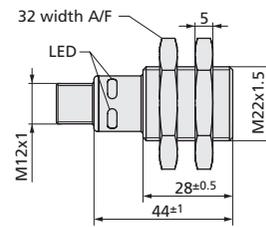
pico+15...



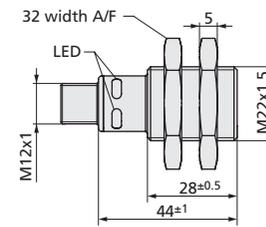
pico+25...



pico+35...



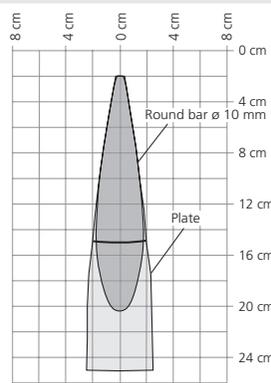
pico+100...



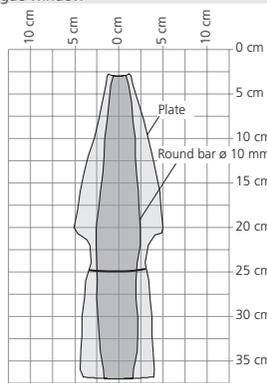
**Blind zone**: 20 mm  
**Operating range**: 150 mm  
**Maximum range**: 250 mm  
**Angle of beam spread**: see detection zone  
**Transducer frequency**: 380 kHz  
**resolution**: 0.069 mm

**detection zones**

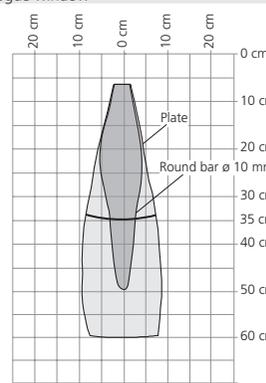
for different objects:  
 The dark grey areas represent the zone where it is easy to recognise the normal reflector (round bar). This indicates the typical operating range of the sensors. The light grey areas represent the zone where a very large reflector – for instance a plate – can still be recognised. The requirement here is for an optimum alignment to the sensor. It is not possible to evaluate ultrasonic reflections outside this area.



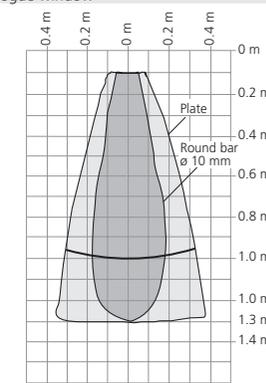
**Blind zone**: 30 mm  
**Operating range**: 250 mm  
**Maximum range**: 350 mm  
**Angle of beam spread**: see detection zone  
**Transducer frequency**: 320 kHz  
**resolution**: 0.069 to 0.10 mm, depending on the analogue window



**Blind zone**: 70 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



**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <40 mA  
**operating voltage ripple**: ±10 %

**housing**: plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM  
**ambient pressure**: up to 0.5 bar over pressure

**Weight**: 30 g  
**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)

**indicators**: LED green, LED yellow  
**programmable**: Teach-in, LinkControl  
**synchronisation**: internal synchronisation up to 10 sensors

**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time** 1): 32 ms  
**time delay before availability** 1): <300 ms

**analogue output 4 to 20 mA**:  $R_L \leq 500 \Omega$ , rising/falling characteristic  
**operating voltage  $U_B$** : 10 to 30 V DC for  $R_L \leq 100 \Omega$   
 20 to 30 V DC for  $R_L > 100 \Omega$   
 terminal reverse polarity protected

**order no.**: pico+15/TF/I

**analogue output 0 bis 10 V**:  $R_L \geq 100 \text{ k}\Omega$ , short circuit proof, rising/falling characteristic  
**operating voltage  $U_B$** : 15 to 30 V DC, terminal reverse polarity protected

**order no.**: pico+15/TF/U

**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <40 mA  
**operating voltage ripple**: ±10 %

**housing**: plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM  
**ambient pressure**: up to 0.5 bar over pressure

**Weight**: 30 g  
**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)

**indicators**: LED green, LED yellow  
**programmable**: Teach-in, LinkControl  
**synchronisation**: internal synchronisation up to 10 sensors

**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time** 1): 32 ms  
**time delay before availability** 1): <300 ms

**analogue output 4 to 20 mA**:  $R_L \leq 500 \Omega$ , rising/falling characteristic  
**operating voltage  $U_B$** : 10 to 30 V DC for  $R_L \leq 100 \Omega$   
 20 to 30 V DC for  $R_L > 100 \Omega$   
 terminal reverse polarity protected

**order no.**: pico+25/TF/I

**analogue output 0 bis 10 V**:  $R_L \geq 100 \text{ k}\Omega$ , short circuit proof, rising/falling characteristic  
**operating voltage  $U_B$** : 15 to 30 V DC, terminal reverse polarity protected

**order no.**: pico+25/TF/U

**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <40 mA  
**operating voltage ripple**: ±10 %

**housing**: plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM  
**ambient pressure**: up to 0.5 bar over pressure

**Weight**: 30 g  
**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)

**indicators**: LED green, LED yellow  
**programmable**: Teach-in, LinkControl  
**synchronisation**: internal synchronisation up to 10 sensors

**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time** 1): 64 ms  
**time delay before availability** 1): <300 ms

**analogue output 4 to 20 mA**:  $R_L \leq 500 \Omega$ , rising/falling characteristic  
**operating voltage  $U_B$** : 10 to 30 V DC for  $R_L \leq 100 \Omega$   
 20 to 30 V DC for  $R_L > 100 \Omega$   
 terminal reverse polarity protected

**order no.**: pico+35/TF/I

**analogue output 0 bis 10 V**:  $R_L \geq 100 \text{ k}\Omega$ , short circuit proof, rising/falling characteristic  
**operating voltage  $U_B$** : 15 to 30 V DC, terminal reverse polarity protected

**order no.**: pico+35/TF/U

**reproducibility**: ±0.15 %  
**accuracy**: ±1 % (Temperature drift internal compensated)  
**no-load current consumption**: <40 mA  
**operating voltage ripple**: ±10 %

**housing**: plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM  
**ambient pressure**: up to 0.5 bar over pressure

**Weight**: 30 g  
**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)

**indicators**: LED green, LED yellow  
**programmable**: Teach-in, LinkControl  
**synchronisation**: internal synchronisation up to 10 sensors

**operating temperature**: -25 to +70 °C  
**storage temperature**: -40 to +85 °C  
**response time** 1): 80 ms  
**time delay before availability** 1): <300 ms

**analogue output 4 to 20 mA**:  $R_L \leq 500 \Omega$ , rising/falling characteristic  
**operating voltage  $U_B$** : 10 to 30 V DC for  $R_L \leq 100 \Omega$   
 20 to 30 V DC for  $R_L > 100 \Omega$   
 terminal reverse polarity protected

**order no.**: pico+100/TF/I

**analogue output 0 bis 10 V**:  $R_L \geq 100 \text{ k}\Omega$ , short circuit proof, rising/falling characteristic  
**operating voltage  $U_B$** : 15 to 30 V DC, terminal reverse polarity protected

**order no.**: pico+100/TF/U

1) Can be programmed via LinkControl.