



## Operating Instructions

### Ultrasonic sensor with one analogue output

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

### 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 (Teflon 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 with the Teach-in procedure. Two LEDs indicate operation and the state of the analogue output.

### Safety Notes

- Read the operating instructions 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.

### Proper use

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

### Installation

- Mount the sensor at the installation site.
- For the pico+ 100/TF/F 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, s. fig. 1.

### Start-Up

- Connect the power supply.
- Carry out the sensor adjustment in accordance with the diagram.

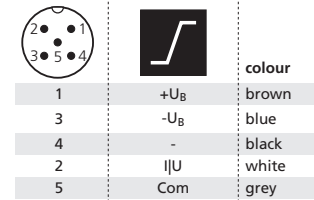


Fig. 1: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

### Factory Setting

- Rising analogue characteristic curve between the blind zone and the operating range.
- Multifunctional input »Com« set to »Teach-in«.

### Synchronization

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«). Finally connect pin 5 of the sensors plug of all sensors.

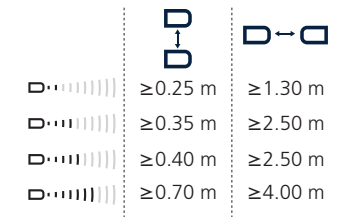


Fig. 2: Assembly distances, indicating synchronization

### Maintenance

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

### Notes

- The sensors of the pico+ family have a blind zone. Within this zone a distance measurement is not possible.
- The pico+ sensors are equipped with an internal temperature compensation. Due to the sensor's self heating, the temperature compensation reaches its optimum working-point after approx. 20 minutes of operation.
- 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«).
- The sensor can be reset to its factory setting (see »Further settings«).
- Optionally all Teach-in and additional sensor parameter settings can be made using the LinkControl adapter (optional accessory) and the LinkControl software for windows®.

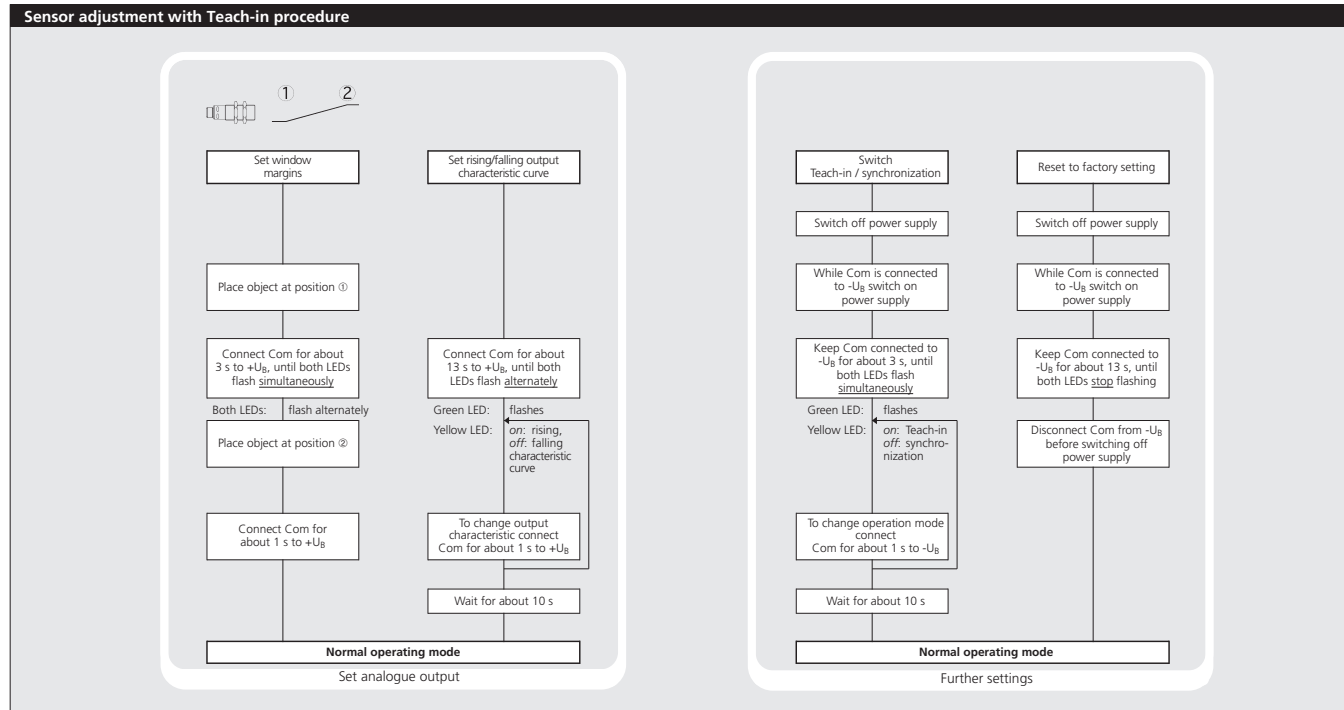
## Contact

### Sensor Partners BV

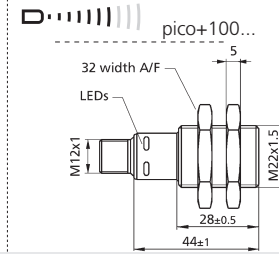
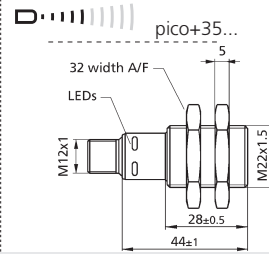
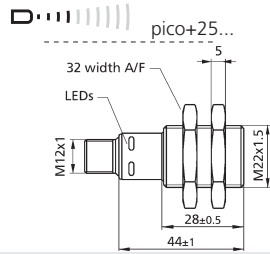
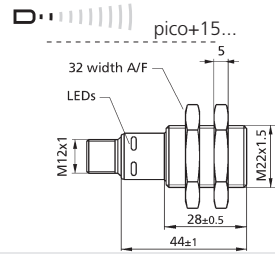
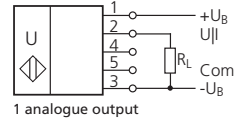
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**Technical data**



	<b>pico+15...</b>	<b>pico+25...</b>	<b>pico+35...</b>	<b>pico+100...</b>
<b>Blind zone</b>	25 mm	30 mm	70 mm	120 mm
<b>Operating range</b>	150 mm	250 mm	350 mm	1,000 mm
<b>Maximum range</b>	250 mm	350 mm	600 mm	1,300 mm
<b>Angle of beam spread</b>	See detection zone	See detection zone	See detection zone	See detection zone
<b>Transducer frequency</b>	380 kHz	320 kHz	400 kHz	200 kHz
<b>resolution</b>	0.069 mm	0.069 mm to 0.10 mm, depending on the analogue window	0.069 mm to 0.17 mm, depending on the analogue window	0.069 mm to 0.38 mm, depending on the analogue window
<b>detection zones for different objects:</b> 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.  Displayed is the detection zone at <b>standard pressure</b> . At 1 bar overpressure the sensitivity of the sensor will increase <b>5 times</b> .				
<b>eproducibility</b>	± 0.15 %	± 0.15 %	± 0.15 %	± 0.15 %
<b>accuracy</b>	± 1 % (Temperature drift internal compensated)	± 1 % (Temperature drift internal compensated)	± 1 % (Temperature drift internal compensated)	± 1 % (Temperature drift internal compensated)
<b>no-load current consumption</b>	< 40 mA	< 40 mA	< 40 mA	< 40 mA
<b>operating voltage ripple</b>	±10 %	±10 %	±10 %	±10 %
<b>housing</b>	plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM	plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM	plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM	plastic parts: PVDF, PBT; ultrasonic transducer: PTFE, FFKM
<b>ambient pressure</b>	up to 0.5 bar over pressure	up to 0.5 bar over pressure	up to 0.5 bar over pressure	up to 0.5 bar over pressure
<b>Weight</b>	25 g	25 g	25 g	25 g
<b>max. tightening torque of nuts</b>	1 Nm	1 Nm	1 Nm	1 Nm
<b>class of protection to EN 60 529</b>	IP 67	IP 67	IP 67	IP 67
<b>type of connection</b>	5-pin M12 initiator plug	5-pin M12 initiator plug	5-pin M12 initiator plug	5-pin M12 initiator plug
<b>controls</b>	Teach-in via pin 5 (Com)	Teach-in via pin 5 (Com)	Teach-in via pin 5 (Com)	Teach-in via pin 5 (Com)
<b>indicators</b>	LED green (operation) LED yellow (state of analogue output)	LED green (operation) LED yellow (state of analogue output)	LED green (operation) LED yellow (state of analogue output)	LED green (operation) LED yellow (state of analogue output)
<b>programmable</b>	Teach-in, LinkControl	Teach-in, LinkControl	Teach-in, LinkControl	Teach-in, LinkControl
<b>synchronisation</b>	internal synchronisation up to 10 sensors	internal synchronisation up to 10 sensors	internal synchronisation up to 10 sensors	internal synchronisation up to 10 sensors
<b>operating temperature</b>	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
<b>storage temperature</b>	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
<b>response time 1)</b>	32 ms	32 ms	64 ms	80 ms
<b>time delay before availability 1)</b>	< 300 ms	< 300 ms	< 300 ms	< 300 ms
<b>norm conformity</b>	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
<b>analogue output 4-20 mA</b>	R <sub>L</sub> ≤ 500 Ω, rising/falling characteristic	R <sub>L</sub> ≤ 500 Ω, rising/falling characteristic	R <sub>L</sub> ≤ 500 Ω, rising/falling characteristic	R <sub>L</sub> ≤ 500 Ω, rising/falling characteristic
<b>operating voltage U<sub>B</sub></b>	10 - 30 V DC for R <sub>L</sub> ≤ 100 Ω, 20 - 30 V DC for R <sub>L</sub> > 100 Ω, terminal reverse polarity protected	10 - 30 V DC for R <sub>L</sub> ≤ 100 Ω, 20 - 30 V DC for R <sub>L</sub> > 100 Ω, terminal reverse polarity protected	10 - 30 V DC for R <sub>L</sub> ≤ 100 Ω, 20 - 30 V DC for R <sub>L</sub> > 100 Ω, terminal reverse polarity protected	10 - 30 V DC for R <sub>L</sub> ≤ 100 Ω, 20 - 30 V DC for R <sub>L</sub> > 100 Ω, terminal reverse polarity protected
<b>order no.</b>	<b>pico+15/TF/I</b>	<b>pico+25/TF/I</b>	<b>pico+35/TF/I</b>	<b>pico+100/TF/I</b>
<b>analogue output 0-10 V</b>	R <sub>L</sub> ≥ 100 kΩ, short circuit proof, rising/falling characteristic	R <sub>L</sub> ≥ 100 kΩ, short circuit proof, rising/falling characteristic	R <sub>L</sub> ≥ 100 kΩ, short circuit proof, rising/falling characteristic	R <sub>L</sub> ≥ 100 kΩ, short circuit proof, rising/falling characteristic
<b>operating voltage U<sub>B</sub></b>	15 - 30 V DC, terminal reverse polarity protected	15 - 30 V DC, terminal reverse polarity protected	15 - 30 V DC, terminal reverse polarity protected	15 - 30 V DC, terminal reverse polarity protected
<b>order no.</b>	<b>pico+15/TF/U</b>	<b>pico+25/TF/U</b>	<b>pico+35/TF/U</b>	<b>pico+100/TF/U</b>

1) Can be programmed with LinkControl

