



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. 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 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.

Start-Up

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

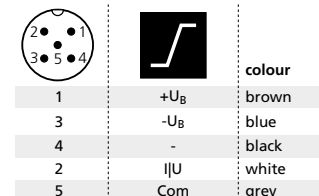


Fig. 1: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

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.

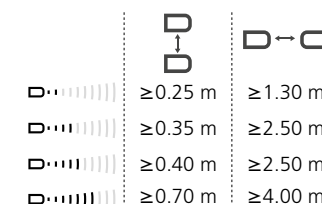


Fig. 2: Assembly distances, indicating synchronization

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.
- 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«).
- 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

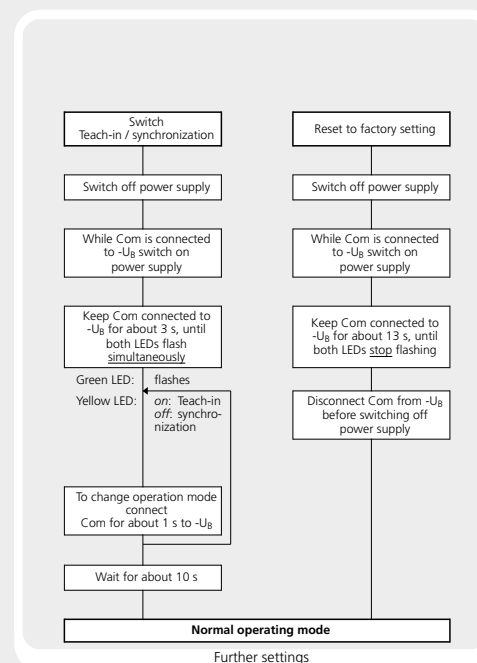
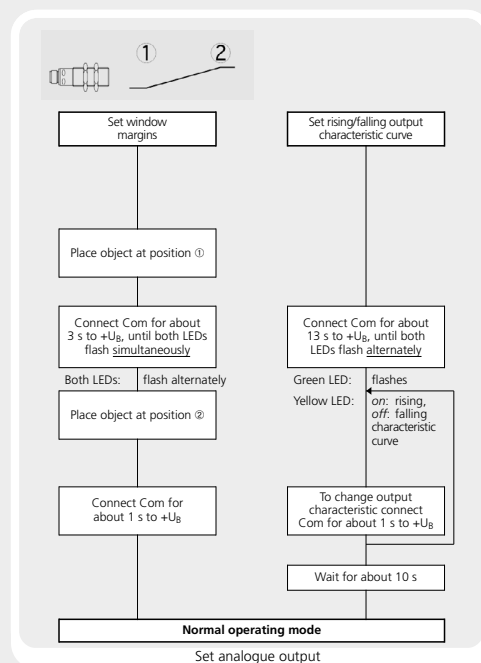
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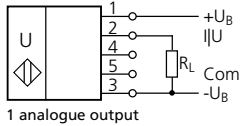
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Sensor adjustment with Teach-in procedure



Technical data



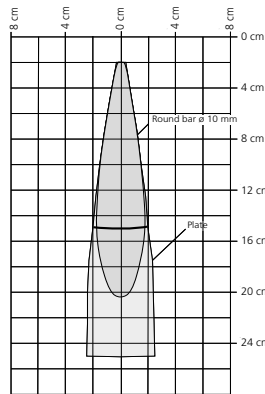
Blind zone
Operating range
Maximum range
Angle of beam spread
Transducer frequency
resolution

20 mm
 150 mm
 250 mm
 See detection zone
 380 kHz
 0.069 mm

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.

Displayed is the detection zone at **standard pressure**. At 1 bar overpressure the sensitivity of the sensor will increase **5 times**.



reproducibility
accuracy
no-load current consumption
operating voltage ripple
housing

± 0.15 %
 ± 1 % (Temperature drift internal compensated)
 < 40 mA
 ± 10 %
 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 60 529

IP 67

type of connection

5-pin M12 initiator plug

Teach-in via pin 5 (Com)

LED green (operation)

LED yellow (state of analogue output)

programmable

Teach-in, LinkControl

synchronisation

internal synchronisation up to 10 sensors

operating temperature

-25°C to +70°C

storage temperature

-40°C to +85°C

response time 1)

32 ms

time delay before availability 1)

< 300 ms

norm conformity

EN 60947-5-2

analogue output 4-20 mA

operating voltage U_B

$R_L \leq 500 \Omega$, rising/falling characteristic
 10 - 30 V DC for $R_L \leq 100 \Omega$,
 20 - 30 V DC for $R_L > 100 \Omega$,
 terminal reverse polarity protected

order no.

pico+15/TF/I

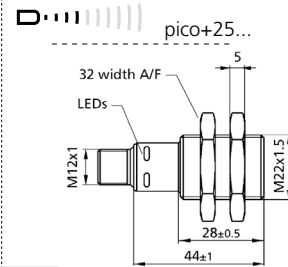
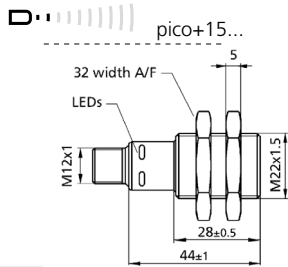
analogue output 0-10 V

operating voltage U_B

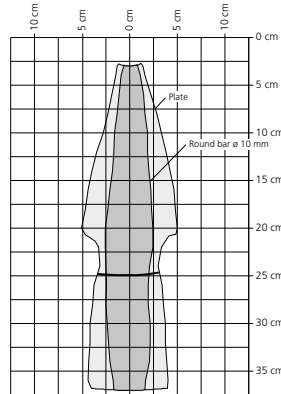
$R_L \geq 100 k\Omega$, short circuit proof, rising/falling characteristic
 15 - 30 V DC, terminal reverse polarity protected

order no.

pico+15/TF/U



30 mm
 250 mm
 350 mm
 See detection zone
 320 kHz
 0.069 mm to 0.10 mm, depending on the analogue window



± 0.15 %
 ± 1 % (Temperature drift internal compensated)
 < 40 mA
 ± 10 %
 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 60 529

IP 67

type of connection

5-pin M12 initiator plug

Teach-in via pin 5 (Com)

LED green (operation)

LED yellow (state of analogue output)

programmable

Teach-in, LinkControl

synchronisation

internal synchronisation up to 10 sensors

operating temperature

-25°C to +70°C

storage temperature

-40°C to +85°C

response time 1)

32 ms

time delay before availability 1)

< 300 ms

norm conformity

EN 60947-5-2

$R_L \leq 500 \Omega$, rising/falling characteristic
 10 - 30 V DC for $R_L \leq 100 \Omega$,
 20 - 30 V DC for $R_L > 100 \Omega$,
 terminal reverse polarity protected

order no.

pico+25/TF/I

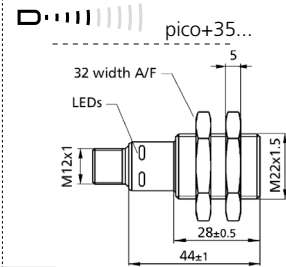
analogue output 0-10 V

operating voltage U_B

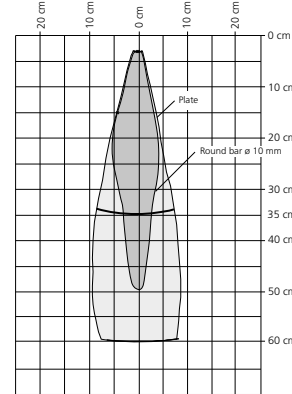
$R_L \geq 100 k\Omega$, short circuit proof, rising/falling characteristic
 15 - 30 V DC, terminal reverse polarity protected

order no.

pico+25/TF/U



70 mm
 350 mm
 600 mm
 See detection zone
 400 kHz
 0.069 mm to 0.17 mm, depending on the analogue window



± 0.15 %
 ± 1 % (Temperature drift internal compensated)
 < 40 mA
 ± 10 %
 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 60 529

IP 67

type of connection

5-pin M12 initiator plug

Teach-in via pin 5 (Com)

LED green (operation)

LED yellow (state of analogue output)

programmable

Teach-in, LinkControl

synchronisation

internal synchronisation up to 10 sensors

operating temperature

-25°C to +70°C

storage temperature

-40°C to +85°C

response time 1)

64 ms

time delay before availability 1)

< 300 ms

norm conformity

EN 60947-5-2

$R_L \leq 500 \Omega$, rising/falling characteristic
 10 - 30 V DC for $R_L \leq 100 \Omega$,
 20 - 30 V DC for $R_L > 100 \Omega$,
 terminal reverse polarity protected

order no.

pico+35/TF/I

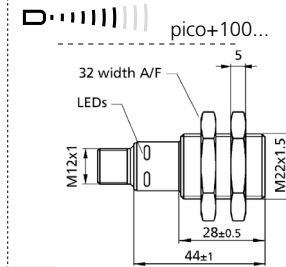
analogue output 0-10 V

operating voltage U_B

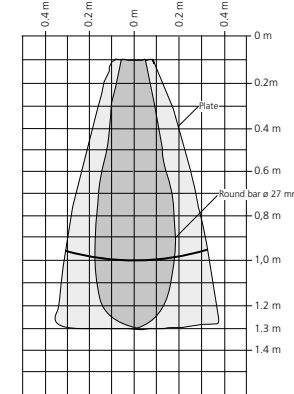
$R_L \geq 100 k\Omega$, short circuit proof, rising/falling characteristic
 15 - 30 V DC, terminal reverse polarity protected

order no.

pico+35/TF/U



120 mm
 1,000 mm
 1,300 mm
 See detection zone
 200 kHz
 0.069 mm to 0.38 mm, depending on the analogue window



± 0.15 %
 ± 1 % (Temperature drift internal compensated)
 < 40 mA
 ± 10 %
 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 60 529

IP 67

type of connection

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LED green (operation)

LED yellow (state of analogue output)

programmable

Teach-in, LinkControl

synchronisation

internal synchronisation up to 10 sensors

operating temperature

-25°C to +70°C

storage temperature

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response time 1)

80 ms

time delay before availability 1)

< 300 ms

norm conformity

EN 60947-5-2

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 10 - 30 V DC for $R_L \leq 100 \Omega$,
 20 - 30 V DC for $R_L > 100 \Omega$,
 terminal reverse polarity protected

order no.

pico+100/TF/I

analogue output 0-10 V

operating voltage U_B

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order no.

pico+100/TF/U



2014/30/EU



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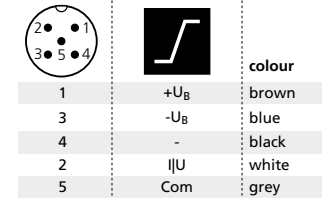


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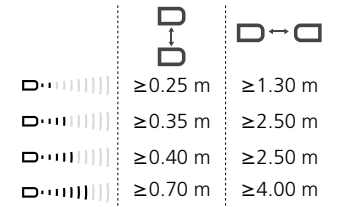


Fig. 2: Assembly distances, indicating synchronization

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