microsonic

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
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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 via Teach-in procedure.
Two LEDs indicate operation and the state of the analogue output.

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.

		colour
1	$+U_B$	brown
3	$-U_B$	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.

HM-2210

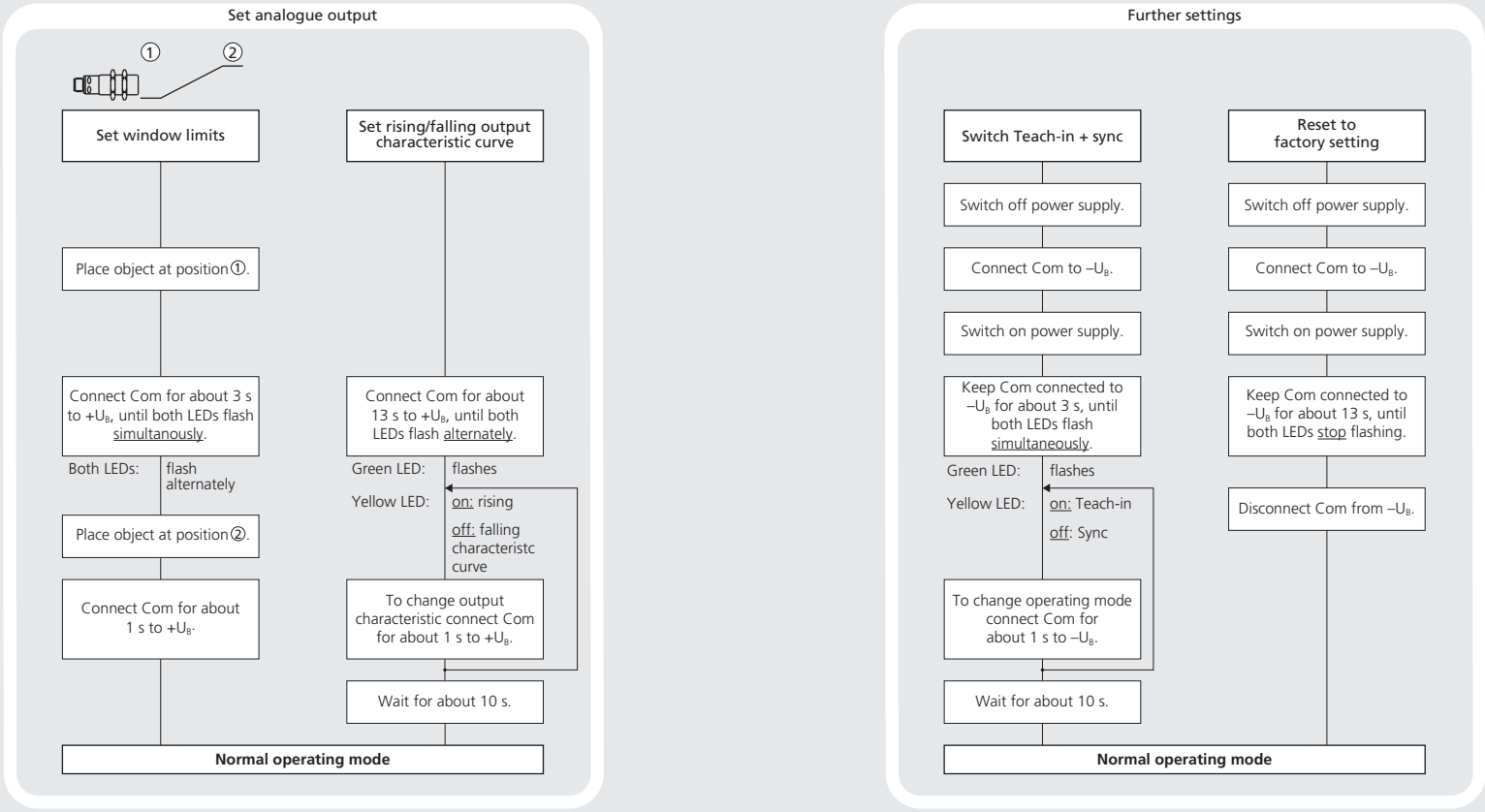
		
pico+15...	≥0.25 m	≥1.30 m
pico+25...	≥0.35 m	≥2.50 m
pico+35...	≥0.40 m	≥2.50 m
pico+100...	≥0.70 m	≥4.00 m

Fig. 2: Assembly distances.

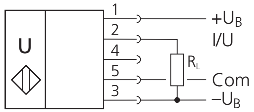
Notes

- 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©.

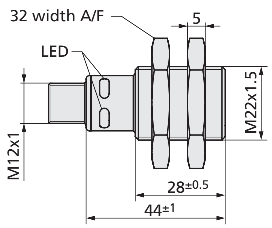
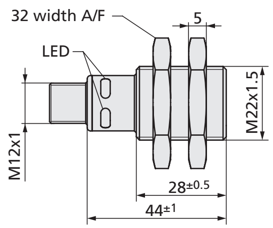
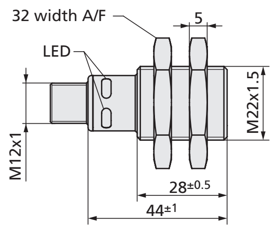
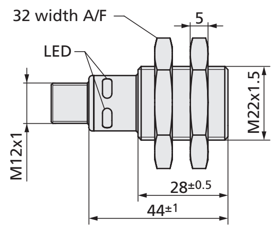
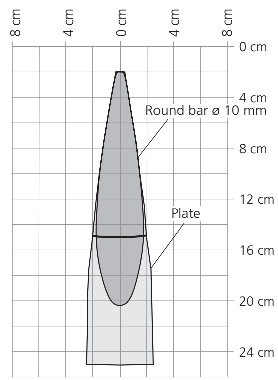
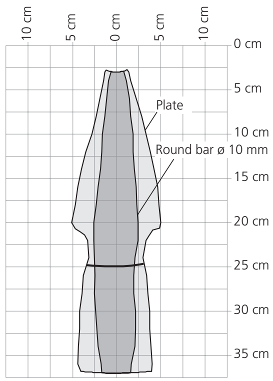
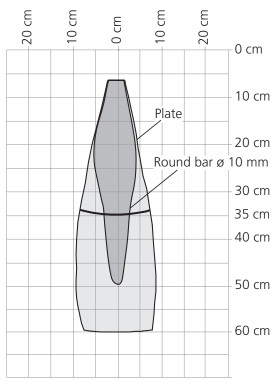
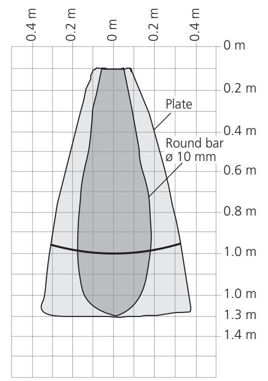
Diagram 1: Set sensor parameters via Teach-in procedure



Technichal data



1 analogue output

	pico+15...	pico+25...	pico+35...	pico+100...
				
Blind zone	20 mm	30 mm	70 mm	120 mm
Operating range	150 mm	250 mm	350 mm	1,000 mm
Maximum range	250 mm	350 mm	600 mm	1,300 mm
Angle of beam spread	see detection zone	see detection zone	see detection zone	see detection zone
Transducer frequency	380 kHz	320 kHz	400 kHz	200 kHz
resolution	0.069 mm	0.069 to 0.10 mm, depending on the analogue window	0.069 to 0.17 mm, depending on the analogue window	0.069 to 0.38 mm, depending on the analogue window
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.				
reproducibility	±0.15 %	±0.15 %	±0.15 %	±0.15 %
accuracy	±1 % (Temperature drift internal compensated)	±1 % (Temperature drift internal compensated)	±1 % (Temperature drift internal compensated)	±1 % (Temperature drift internal compensated)
no-load current consumption	<40 mA	<40 mA	<40 mA	<40 mA
operating voltage ripple	±10 %	±10 %	±10 %	±10 %
housing	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
ambient pressure	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
Weight	30 g	30 g	30 g	30 g
max. tightening torque of nuts	1 Nm	1 Nm	1 Nm	1 Nm
class of protection to EN 60529	IP 67	IP 67	IP 67	IP 67
norm conformity	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
type of connection	5-pin M12 initiator plug	5-pin M12 initiator plug	5-pin M12 initiator plug	5-pin M12 initiator plug
controls	Teach-in via pin 5 (Com)	Teach-in via pin 5 (Com)	Teach-in via pin 5 (Com)	Teach-in via pin 5 (Com)
indicators	LED green, LED yellow	LED green, LED yellow	LED green, LED yellow	LED green, LED yellow
programmable	Teach-in, LinkControl	Teach-in, LinkControl	Teach-in, LinkControl	Teach-in, LinkControl
synchronisation	internal synchronisation up to 10 sensors	internal synchronisation up to 10 sensors	internal synchronisation up to 10 sensors	internal synchronisation up to 10 sensors
operating temperature	–25 to +70 °C	–25 to +70 °C	–25 to +70 °C	–25 to +70 °C
storage temperature	–40 to +85 °C	–40 to +85 °C	–40 to +85 °C	–40 to +85 °C
response time [1]	32 ms	32 ms	64 ms	80 ms
time delay before availability [1]	<300 ms	<300 ms	<300 ms	<300 ms
analogue output 4 to 20 mA	$R_L \leq 500\ \Omega$, rising/falling characteristic	$R_L \leq 500\ \Omega$, rising/falling characteristic	$R_L \leq 500\ \Omega$, rising/falling characteristic	$R_L \leq 500\ \Omega$, 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	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	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	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**	**pico+25/TF/I**	**pico+35/TF/I**	**pico+100/TF/I**
analogue output 0 bis 10 V	$R_L \geq 100\ k\Omega$, short circuit proof, rising/falling characteristic	$R_L \geq 100\ k\Omega$, short circuit proof, rising/falling characteristic	$R_L \geq 100\ k\Omega$, short circuit proof, rising/falling characteristic	$R_L \geq 100\ k\Omega$, short circuit proof, rising/falling characteristic
operating voltage U_B	15 to 30 V DC, terminal reverse polarity protected	15 to 30 V DC, terminal reverse polarity protected	15 to 30 V DC, terminal reverse polarity protected	15 to 30 V DC, terminal reverse polarity protected
order no.	**pico+15/TF/U**	**pico+25/TF/U**	**pico+35/TF/U**	**pico+100/TF/U**

[1] Can be programmed via LinkControl.

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