microsonic pico+15/I Ultrasonic Sensor with One Analogue Output User Manual

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Ultrasonic Sensor with One Analog Output

The pico+ sensor is a non-contact measurement device that detects the distance of an object within the sensor's detection zone. The device offers a distance-proportional analog signal output based on the set window limits. The window limits and its characteristics can be adjusted through the Teach-in procedure. The sensor has two LEDs that indicate the state of the analog output.

Product Description

- Model Numbers: 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, and pico+100/WK/U
- Non-contact measurement of object distance
- Distance-proportional analog signal output
- Adjustable window limits and characteristics through the Teach-in procedure
- Two LEDs indicate the state of the analog output

Product Usage Instructions

Safety Notes

- Read the operating manual before start-up
- Expert personnel should carry out connection, installation, and adjustment works
- Not permitted for use in the area of personal and machine protection as there are no safety components in accordance with the EU Machine Directive

Proper Use:

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

- Connect the M12 device plug as per the pin assignment and color coding shown in Fig. 1
- Adjust the sensor parameters through the Teach-in procedure shown in Diagram 1
- The factory settings have a rising analog characteristic curve between the blind zone and operating range
- The sensors of the pico+ family have a blind zone where distance measurement is not possible

Product Maintenance

- microsonic sensors are maintenance-free
- In case of excess caked-on dirt, clean the white sensor surface

Assembly Distances:

Refer to Fig. 2 for the assembly distances and indication synchronisation for each model:

- pico+15 – 0.25 m to 1.30 m
- pico+25 – 0.35 m to 2.50 m
- pico+35 – 0.40 m to 2.50 m
- pico+100 – 0.70 m to 4.00 m

Teach-in Procedure:

Refer to Diagram 1 for the Teach-in procedure to set the sensor parameters:

1. Set the analog output
2. Set the window limits
3. Set the rising/falling output characteristic curve
4. Place object at position 1
5. Connect Com for about 3 s to +UB until both LEDs flash simultaneously
6. Place object at position 2
7. Connect Com for about 1 s to +UB
8. Connect Com for about 13 s to +UB until both LEDs flash alternately

Further Settings:

- Switch Teach-in + Sync off the power supply to reset to factory settings
- 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 that the object is within the window limits
- To change the output characteristic, connect Com for about 1 s to +UB

Note:

- Wait for about 10 s after changing the output characteristic or resetting to factory settings before returning to normal operating mode

Pin Assignment:

Refer to Fig. 1 for the pin assignment with a view of the sensor plug and color coding of the microsonic connection cable:

Colour	Pin Number
brown	1
blue	2
black	3
white	4
grey	5

Operating Manual

- pico+15/I
- pico+15/WK/I
- pico+25/I
- pico+25/WK/I
- pico+35/I
- pico+35/WK/I
- pico+100/I
- pico+100/WK/I
- pico+15/U
- pico+15/WK/U
- pico+25/U
- pico+25/WK/U
- pico+35/U
- pico+35/WK/U
- pico+100/U
- pico+100/WK/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 window limits of the analogue output and its characteristic can be adjusted via Teach-in procedure. Two LEDs indicate the state of the analog output.

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.

		colour
1	$+U_B$	brown
3	$-U_B$	blue
4	–	black
2	I/U	white
5	Com	grey

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 analog characteristic curve between the blind zone and the operating range
- Multifunctional input »Com« set to »Teach-in« and »Synchronisation«

Synchronization
If the assembly distance falls below the values shown in fig. 2, 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

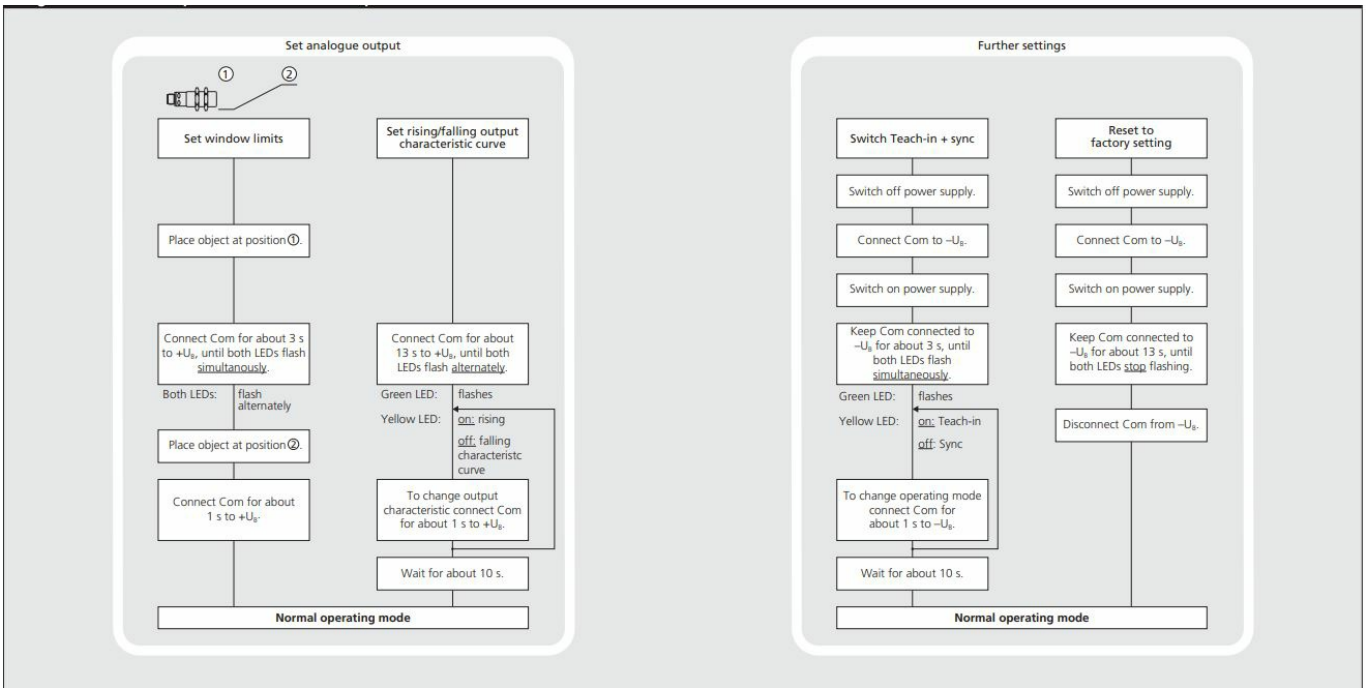
microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend to clean the white sensor surface.

	D ↕ D	D ↔ D
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

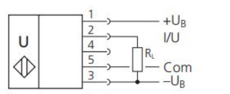
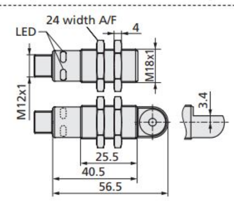
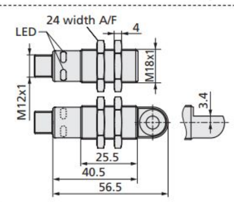
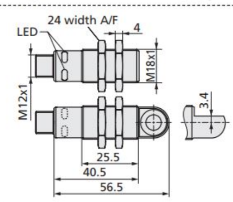
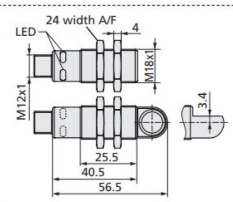
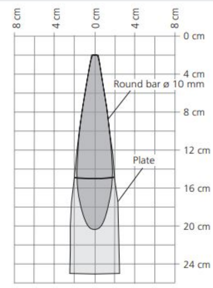
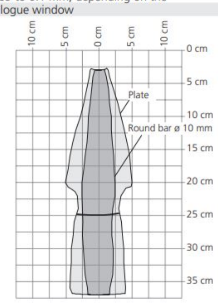
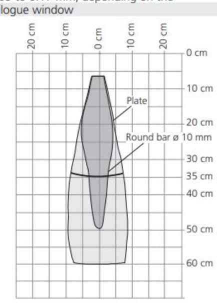
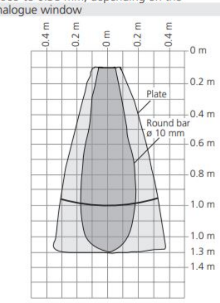
Notes

- The sensors of the pico+ family have a blind zone. Within this zone a distance measurement is not possible.
- very 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 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©.

Diagram 1: Set sensor parameters via Teach-in procedure



Technical data

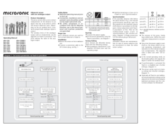
	pico+15...	pico+25...	pico+35...	pico+100...
 1 analogue output				
blind zone	20 mm	30 mm	65 mm	120 mm
operating range	150 mm	250 mm	350 mm	1.000 mm
maximum range	250 mm	350 mm	600 mm	1.300 mm
angle of beam spread	see detection zone	see detection zone	see detection zone	see detection zone
transducer frequency	380 kHz	320 kHz	400 kHz	200 kHz
resolution	0.069 mm	0.069 to 0.1 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 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 %	±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	brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content	brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content	brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content	brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content
max. tightening torque of nuts	15 Nm	1 Nm	15 Nm	15 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)
scope for setting	Teach-in, LinkControl	Teach-in, LinkControl	Teach-in, LinkControl	Teach-in, LinkControl
indicators	LED green, LED yellow	LED green, LED yellow	LED green, LED yellow	LED green, LED yellow
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	<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, Class 2	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, Class 2	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, Class 2	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, Class 2
order no. directly radiating	**pico+15/I**	**pico+25/I**	**pico+35/I**	**pico+100/I**
weight	30 g	30 g	30 g	30 g
order no. angular head	**pico+15/WK/I**	**pico+25/WK/I**	**pico+35/WK/I**	**pico+100/WK/I**
weight	35 g	35 g	35 g	35 g
analogue output 0 to 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, Cl. 2	15 to 30 V DC, terminal reverse polarity protected, Cl. 2	15 to 30 V DC, terminal reverse polarity protected, Cl. 2	15 to 30 V DC, terminal reverse polarity protected, Cl. 2
order no. directly radiating	**pico+15/U**	**pico+25/U**	**pico+35/U**	**pico+100/U**
weight	30 g	30 g	30 g	30 g
order no. angular head	**pico+15/WK/U**	**pico+25/WK/U**	**pico+35/WK/U**	**pico+100/WK/U**
weight	35 g	35 g	35 g	35 g

1) With LinkControl, the selected filter setting influences the response time.

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

microsonic GmbH / Phoenixseestraße 7 / 44263 Dortmund / Germany / T +49 231 975151-0 / F +49 231 975151-51 / E **info@microsonic.de** / W **microsonic.de** The content of this document is subject to technical changes. Specifications in this document are presented in a descriptive way only. They do not warrant any product features.

Documents / Resources

	**microsonic pico+15/I Ultrasonic Sensor with One Analogue Output** [pdf] User Manual pico 15 I, pico 15 WK I, pico 25 I, pico 25 WK I, pico 35 I, pico 35 WK I, pico 100 I, pico 100 WK I, pico 15 U, pico 15 WK U, pico 25 U, pico 25 WK U, pico 35 U, pico 35 WK U, pico 100 U, pico 100 WK U, pico 15 I, Ultrasonic Sensor with One Analogue Output, pico 15 I Ultrasonic Sensor, Ultrasonic Sensor, Sensor