



Operating Manual

Ultrasonic sensor with one analogue output

nano-15/CI nano-15/CU
nano-24/CI nano-24/CU

Product Description

The nano 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 with the Teach-in procedure. A duo-LED indicates operation and the state of the analogue output.

Proper Use

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

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

Installation

- ➔ Mount the sensor at the installation site.
- ➔ Connect a connection cable to the M12 device plug, see Fig. 1.
- ➔ The assembly distances shown in Fig. 2 for two or more sensors should not be fallen below in order to avoid mutual interference.

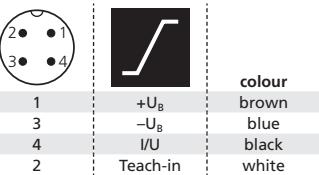


Fig. 1: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

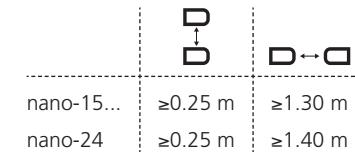


Fig. 2: Minimum mounting distances

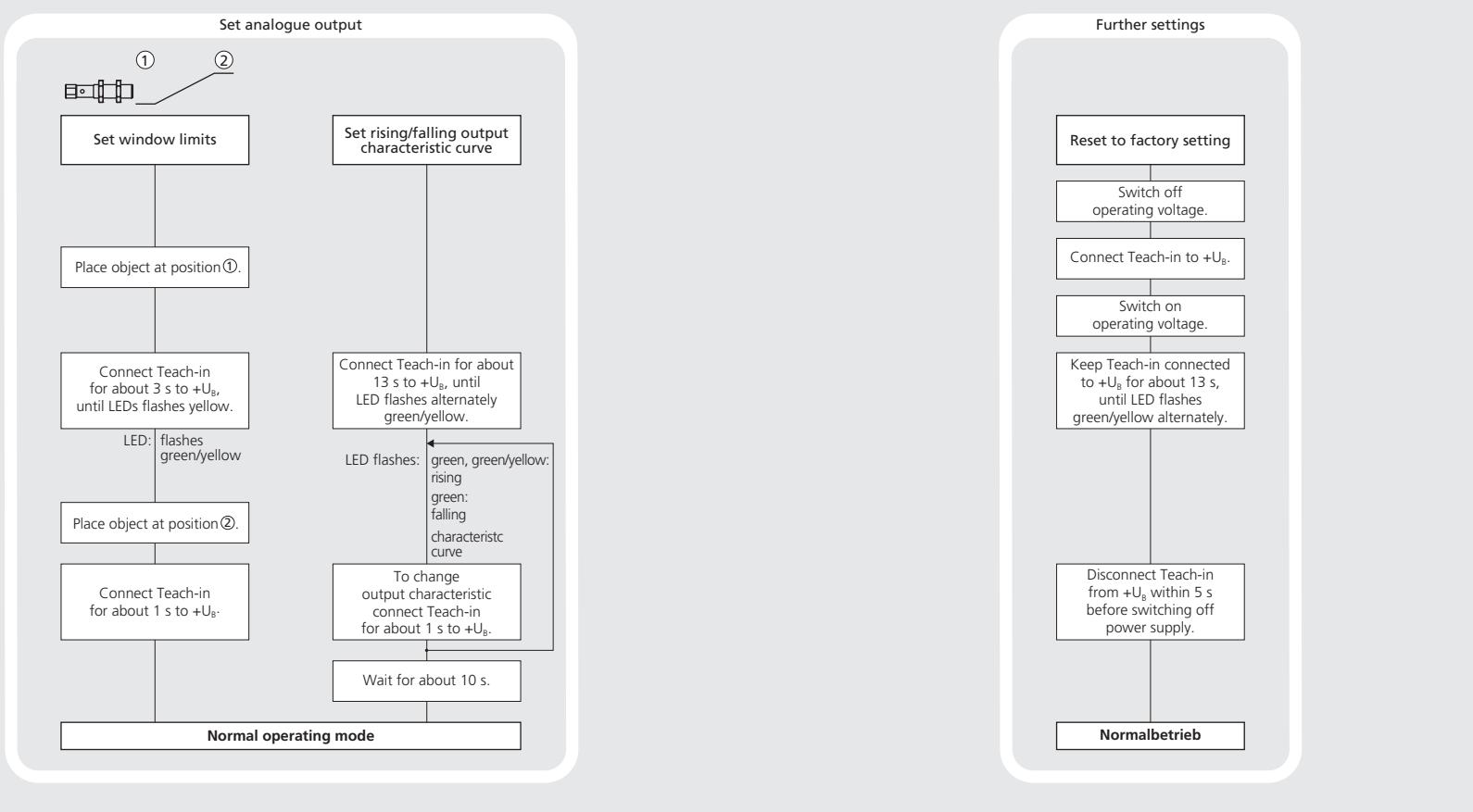
Maintenance

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

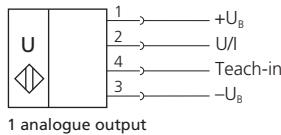
Notes

- Every time the power supply is switched on, the sensor detects its actual operating temperature and transmits it to the internal temperature compensation. This results in a slight correction of the analogue output value after 45 seconds.
- If the sensor was switched off for at least 30 minutes and after power on an object is placed in the middle of the adjusted analogue window for 30 minutes (the analogue output value is in the range of 11 to 13 mA or 4.4 to 5.6 V) a new adjustment of the internal temperature compensation to the actual mounting conditions takes place.
- The sensors of the nano family have a blind zone. Within this zone a distance measurement is not possible.
- In the normal operating mode, an illuminated yellow LED signals the object is within the adjusted window limits.
- The sensor can be reset to its factory setting (see »Further settings«).

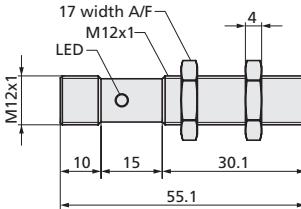
Diagram 1: Set Sensor via Teach-in procedure



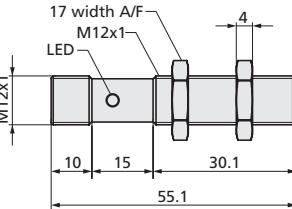
Technical data



nano-15...

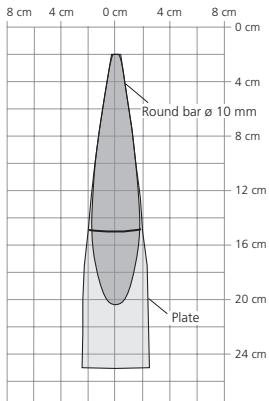


nano-24...



blind zone	20 mm
operating range	150 mm
maximum range	250 mm
angle of beam spread	see detection zone
transducer frequency	380 kHz
resolution	500 kHz
reproducibility	69 µm
detection zone	±0.15 %

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 is an optimal alignment to the sensor.
It is not possible to evaluate ultrasonic reflections outside this area.



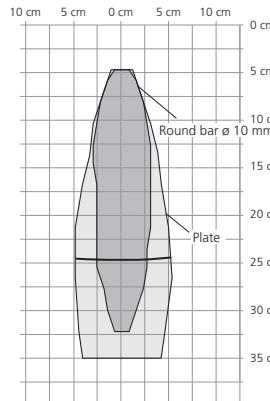
40 mm
240 mm
350 mm
see detection zone
500 kHz

380 kHz

500 kHz

69 µm

±0.15 %



accuracy	±1 % (temperature drift internally compensated)
no-load current consumption	<30 mA

housing

brass sleeve, nickel-plated, plastic parts: PBT; ultrasonic transducer: polyurethane foam, epoxy resin with glass content

max. tightening torque of nuts

1 Nm

class of protection per EN 60529

IP 67

norm conformity

EN 60947-5-2

type of connection

4-pin M12 circular plug

controls

Teach-in via Pin 2

indicators

LED green/yellow

scope of settings

Teach-in

operating temperature

-25 to +70 °C

storage temperature

-40 to +85 °C

weight

15 g

response time

24 ms

time delay before availability

<300 ms

order no.

nano-15/CI

analogue output 4 to 20 mA

$R_L \leq 500 \Omega$, rising/falling characteristic

operating voltage U_B

10 to 30 V DC for $R_L \leq 100 \Omega$ (Class 2)

15 to 30 V DC for $R_L > 100 \Omega$ (Class 2)

order no.

nano-15/CU

analogue output 0 to 10 V

$R_L \geq 100 \text{ k}\Omega$, short circuit proof, (Class 2)

rising/falling characteristic

operating voltage U_B

15 to 30 V DC, reverse polarity protection (Class 2)

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Enclosure Type 1
For use only in industrial
machinery NFPA 79 applications.

The proximity switches shall be used with a Listed (CYW77) cable/connector assembly rated minimum 23 Vdc, minimum 290 mA, in the final installation.



CE 2014/30/EU

