



Product description

The nero sensor offers a non-contact measurement of the distance to an object that has to be positioned 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. Two LEDs indicate operation and the state of the analogue output.

Operating Manual

Ultrasonic proximity switch with one analogue output

- nero-15/CI

nero-25/CI

nero-35/CI

nero-100/CI

nero-15/WK/CI

nero-25/WK/CI

nero-35/WK/CI

nero-100/WK/CI
- nero-15/CU

nero-25/CU

nero-35/CU

nero-100/CU

nero-15/WK/CU

nero-25/WK/CU

nero-35/WK/CU

nero-100/WK/CU

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

Installation

- Mount the sensor at the place of fitting.
 - 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.

		colour
1	+U _B	brown
3	-U _B	blue
4	Teach-in	black
2	U/I	white

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

Start-up

- Connect the power supply.
- Carry out sensor adjustment in accordance with Diagram 1.

Factory setting

- nero-sensors are delivered factory made with the following settings:
- Rising analogue characteristic curve between the blind zone and the operating range
 - »Teach-in« active

nero-15...	≥0.25 m	≥1.30 m
nero-25...	≥0.35 m	≥2.50 m
nero-35...	≥0.40 m	≥2.50 m
nero-100...	≥0.70 m	≥4.00 m

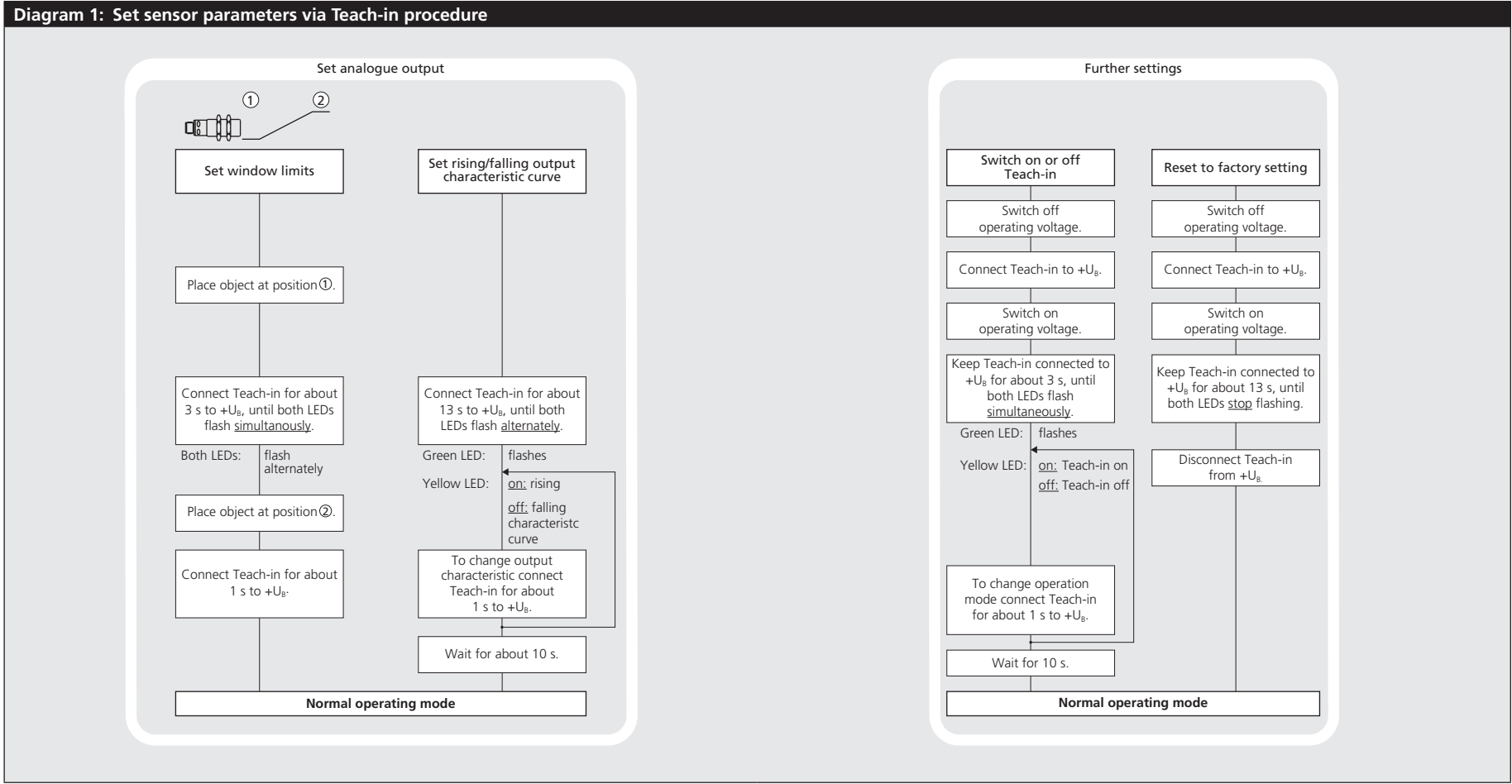
Fig. 2: Minimal assembly distances

Maintenance

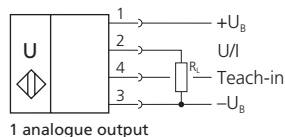
microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend cleaning the white sensor surface.

Notes

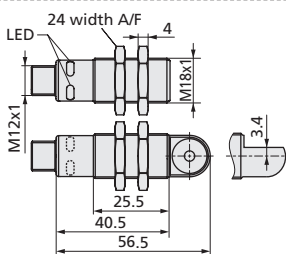
- The sensors of the nero family have a blind zone, within which a distance measurement is not possible.
- In the normal operating mode, an illuminated yellow LED signals the object is within the adjusted window limits.
- The sensor can be reset to its factory setting (see »Further settings«, Diagram 1).



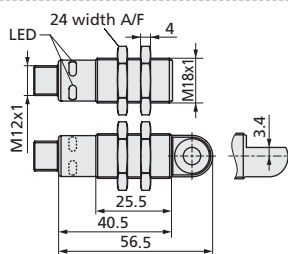
Technical data



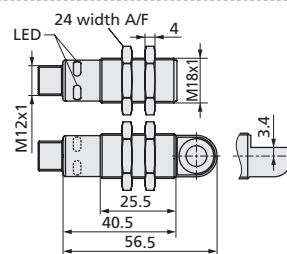
nero-15...



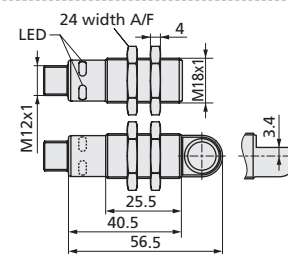
nero-25...



nero-35...



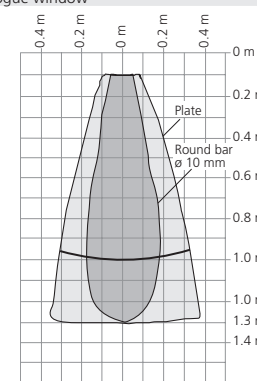
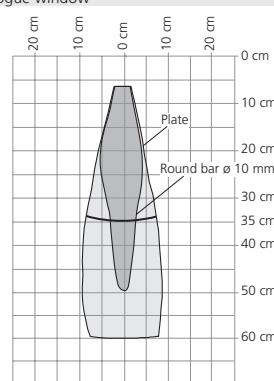
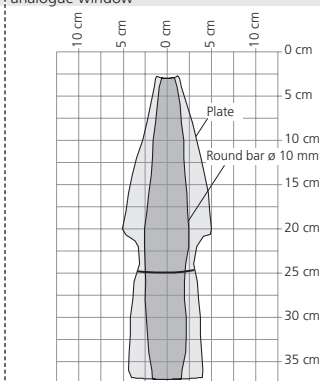
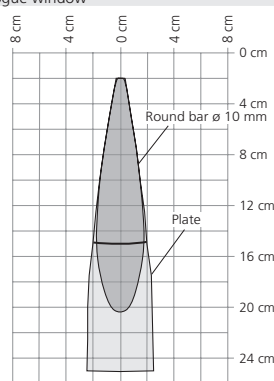
nero-100...



blind zone 20 mm
operating range 150 mm
maximum range 250 mm
angle of beam spread see detection zone
transducer frequency 380 kHz
resolution 0.056 to 0.297 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 $\pm 0.15\%$
accuracy temperature drift $0.17\%/^{\circ}\text{C}$
voltage ripple $\pm 10\%$
no-load current consumption $< 40\text{ mA}$
housing 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 4
indicators LED green, LED yellow
programmable Teach-in
operating temperature -25 to $+70\text{ }^{\circ}\text{C}$
storage temperature -40 to $+85\text{ }^{\circ}\text{C}$
response time 32 ms
time delay before availability $< 300\text{ ms}$

reproducibility $\pm 0.15\%$
accuracy temperature drift $0.17\%/^{\circ}\text{C}$
voltage ripple $\pm 10\%$
no-load current consumption $< 40\text{ mA}$
housing 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 4
indicators LED green, LED yellow
programmable Teach-in
operating temperature -25 to $+70\text{ }^{\circ}\text{C}$
storage temperature -40 to $+85\text{ }^{\circ}\text{C}$
response time 32 ms
time delay before availability $< 300\text{ ms}$

reproducibility $\pm 0.15\%$
accuracy temperature drift $0.17\%/^{\circ}\text{C}$
voltage ripple $\pm 10\%$
no-load current consumption $< 40\text{ mA}$
housing 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 4
indicators LED green, LED yellow
programmable Teach-in
operating temperature -25 to $+70\text{ }^{\circ}\text{C}$
storage temperature -40 to $+85\text{ }^{\circ}\text{C}$
response time 64 ms
time delay before availability $< 300\text{ ms}$

reproducibility $\pm 0.15\%$
accuracy temperature drift $0.17\%/^{\circ}\text{C}$
voltage ripple $\pm 10\%$
no-load current consumption $< 40\text{ mA}$
housing 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 4
indicators LED green, LED yellow
programmable Teach-in
operating temperature -25 to $+70\text{ }^{\circ}\text{C}$
storage temperature -40 to $+85\text{ }^{\circ}\text{C}$
response time 80 ms
time delay before availability $< 300\text{ ms}$

analogue output 4 to 20 mA $R_L \leq 500\text{ }\Omega$, rising/falling characteristic
operating voltage U_0 10 to 30 V DC for $R_L \leq 100\text{ }\Omega$,
20 to 30 V DC for $R_L > 100\text{ }\Omega$,
terminal reverse polarity protected, Class 2

order no. directly radiating nero-15/CI

weight 15 g

order no. angular head nero-15/WK/CI

weight 20 g

analogue output 0 to 10 V $R_L \geq 100\text{ k}\Omega$, short-circuit-proof, rising/falling characteristic
15 to 30 V DC, terminal reverse polarity protected, Class 2

order no. directly radiating nero-15/CU

weight 15 g

order no. angular head nero-15/WK/CU

weight 20 g

analogue output 4 to 20 mA $R_L \leq 500\text{ }\Omega$, rising/falling characteristic
10 to 30 V DC for $R_L \leq 100\text{ }\Omega$,
20 to 30 V DC for $R_L > 100\text{ }\Omega$,
terminal reverse polarity protected, Class 2

order no. directly radiating nero-25/CI

weight 15 g

order no. angular head nero-25/WK/CI

weight 20 g

analogue output 0 to 10 V $R_L \geq 100\text{ k}\Omega$, short-circuit-proof, rising/falling characteristic
15 to 30 V DC, terminal reverse polarity protected, Class 2

order no. directly radiating nero-25/CU

weight 15 g

order no. angular head nero-25/WK/CU

weight 20 g

analogue output 4 to 20 mA $R_L \leq 500\text{ }\Omega$, rising/falling characteristic
10 to 30 V DC for $R_L \leq 100\text{ }\Omega$,
20 to 30 V DC for $R_L > 100\text{ }\Omega$,
terminal reverse polarity protected, Class 2

order no. directly radiating nero-35/CI

weight 15 g

order no. angular head nero-35/WK/CI

weight 20 g

analogue output 0 to 10 V $R_L \geq 100\text{ k}\Omega$, short-circuit-proof, rising/falling characteristic
15 to 30 V DC, terminal reverse polarity protected, Class 2

order no. directly radiating nero-35/U

weight 15 g

order no. angular head nero-35/WK/CU

weight 20 g

analogue output 4 to 20 mA $R_L \leq 500\text{ }\Omega$, rising/falling characteristic
10 to 30 V DC for $R_L \leq 100\text{ }\Omega$,
20 to 30 V DC for $R_L > 100\text{ }\Omega$,
terminal reverse polarity protected, Class 2

order no. directly radiating nero-100/CI

weight 15 g

order no. angular head nero-100/WK/CI

weight 20 g

analogue output 0 to 10 V $R_L \geq 100\text{ k}\Omega$, short-circuit-proof, rising/falling characteristic
15 to 30 V DC, terminal reverse polarity protected, Class 2

order no. directly radiating nero-100/CU

weight 15 g

order no. angular head nero-100/WK/CU

weight 20 g



Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.
The proximity switches shall be used with a Listed (CYJ/V7) cable/connector assembly rated minimum 32 Vdc, minimum 290 mA, in the final installation.

