nano

With a total length of only 55 mm, it is the shortest M12 ultrasonic sensor on the market.

HIGHLIGHTS

› Ultrasonic sensor in the M12 threaded sleeve

› The total length including plug is only 55 mm

› Improved temperature compensation › adjustment to working conditions within 45 seconds

BASICS

› 1 switching output in pnp or npn variant

› Analogue output 4–20 mA or 0–10 V

› 2 detection ranges with a measurement range of 20 mm to 350 mm

› microsonic Teach-in on pin 2

› 0.069 mm resolution

› Operating voltage 10–30 V › for use with various voltage networks

With a housing length of only 55 mm

nano sensors with switching outputs are the smallest ultrasonic sensors inside the M12 threaded sleeve on the market. Analogue sensors are 60 mm long. nano sensors have a 4-pole M12 circular plug and are taught via pin 2.

For the nano-sensor family

there are four output stages and two detection ranges available:

- 1 switching output in either pnp or npn switching technology
- 1 analogue output 4–20 mA or 0–10 V

Sensors with switching output have three operating modes:

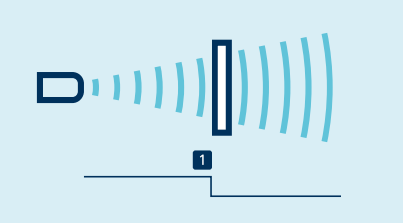
- Single switching point
- Two-way reflective barrier
- Window mode

The temperature compensation

of the nano sensors profits from a significant improvement. The sensors reach their operating point only 45 seconds after activation of the operating voltage. We now compensate for the influence of self-heating and installation conditions. This brings improved precision shortly after activation of the supply voltage and in running operation.

Teach-in of a single switching point

- Place object to be detected at the desired distance 1.
- Apply +U_B to pin 2 for about 3 seconds.
- Then apply +U_B to pin 2 again for about 1 second.

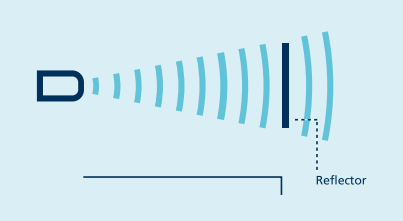


Teach-in of a switching point

Teach-in of a two-way reflective barrier

with a fixed mounted reflector

- Apply +U_B to pin 2 for about 3 seconds.
- Then apply +U_B to pin 2 again for about 10 seconds.



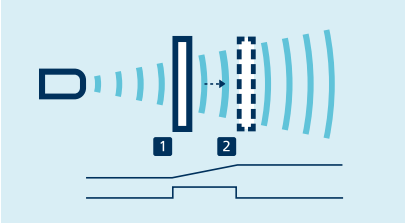
Teach-in of a two-way reflective barrier

To set a window with two switching points

- Place object to the sensor-close window limit 1.
- Apply +U_B to pin 2 for about 3 seconds until both LEDs flash.
- Then move the object to the sensor-distant window limit 2.
- Then apply +U_B to pin 2 again for about 1 second until LED 2 extinguishes.

For setting the analogue output

- Initially position the object to be detected to the sensor-close window limit 1.
- Apply +U_B to pin 2 for about 3 seconds until both LEDs flash.
- Then move the object to the sensor-distant window limit 2.
- Then apply +U_B to pin 2 again for about 1 second.



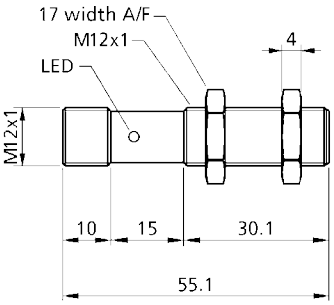
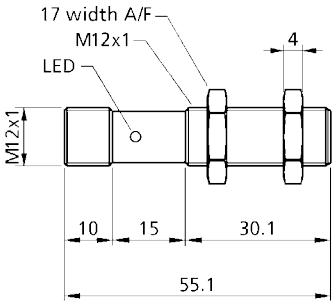
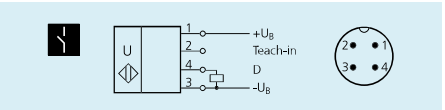
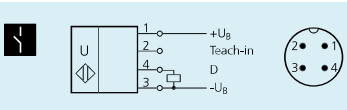
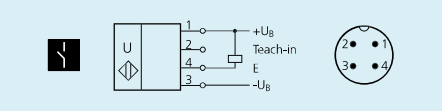
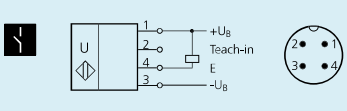
Teach-in of an analogue characteristics or a window with two switching points

NCC/NOC

and rising/falling analogue characteristics can also be set via pin 2.

One green and one yellow LED

indicate the state of the output and support microsonic Teach-in.

	nano-15	nano-24
	0.15 m	0.24 m
measuring range	**20–250 mm**	**40–350 mm**
		
blind zone	20 mm	40 mm
operating range	150 mm	240 mm
maximum range	250 mm	350 mm
angle of beam spread	please see ⓘ	please see ⓘ
transducer frequency	380 kHz	500 kHz
resolution/sampling rate	0.069 mm	0.069 mm
reproducibility	± 0.15 %	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)	± 1 % (temperature drift internally compensated)
operating voltage U_B	10 V to 30 V DC, reverse polarity protection	10 V to 30 V DC, reverse polarity protection
no-load current consumption	< 25 mA	< 35 mA
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
class of protection according to EN 60529	IP 67	IP 67
type of connection	4-pin M12 initiator plug	4-pin M12 initiator plug
scope for settings	Teach-in on pin 2	Teach-in on pin 2
controls	Teach-in	Teach-in
indicators	LED green: working; LED yellow: switch status	LED green: working; LED yellow: switch status
operating temperature	-25°C to +70°C	-25°C to +70°C
storage temperature	-40°C to +85°C	-40°C to +85°C
weight	15 g	15 g
switching hysteresis	2 mm	3 mm
switching frequency	25 Hz	20 Hz
response time	24 ms	30 ms
delay prior to availability	< 300 ms	< 300 ms
order number	**nano-15/CD**	**nano-24/CD**
switching output	pnp, U_B-2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof	pnp, U_B-2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof
		
	1 pnp switching output	1 pnp switching output
order number	**nano-15/CE**	**nano-24/CE**
switching output	npn, -U_B+2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof	npn, -U_B+2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof
		
	1 npn switching output	1 npn switching output

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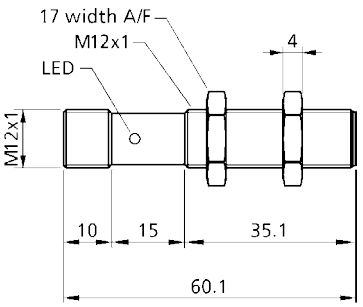
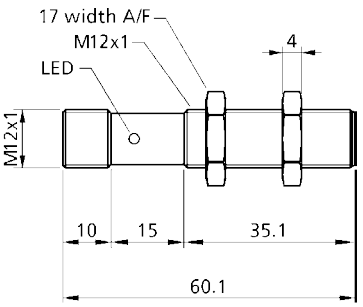
	0.15 m	0.24 m
measuring range	**20–250 mm**	**40–350 mm**
		
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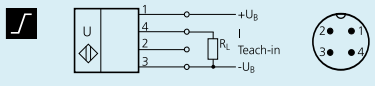
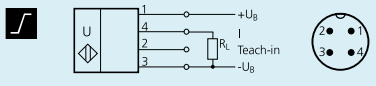
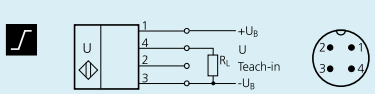
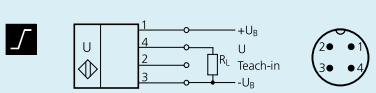
storage temperature	-40°C to +85°C	-40°C to +85°C
weight	15 g	15 g
response time	24 ms	30 ms
delay prior to availability	< 300 ms	< 300 ms
order number	**nano-15/CI**	**nano-24/CI**
analogue output	current output 4–20 mA switchable rising/falling	current output 4–20 mA switchable rising/falling
		
	analogue output 4–20 mA	analogue output 4–20 mA
order number	**nano-15/CU**	**nano-24/CU**
analogue output	voltage output 0–10 V (at $U_B \geq 15$ V) short-circuit-proof switchable rising/falling	voltage output 0–10 V (at $U_B \geq 15$ V) short-circuit-proof switchable rising/falling
		
	analogue output 0–10 V	analogue output 0–10 V