microsonic
Ultrasonic Sensors

A comprehensive solution for industrial applications

ULTRASONIC SENSORS

Extract from our online catalogue:

nano ultrasonic sensors

Current to: 2013-07-30

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nano – what's in a name? At just 55 mm long, including plug, the nano is the shortest M12 ultrasonic sensor on the market.

Highlights

- **M12 threaded sleeve**
- **Threaded sleeve just 55 mm long**
- **Housing's design and mounting is compatible with many inductive and capacitive sensors**

Basics

- **1 pnp- or npn- switching output**
- **Analogue output 4-20 mA or 0-10 V**
- **2 detection ranges: 250 mm, 350 mm**
- **microsonic-Teach-in on Pin 2**
- **resolution of 69 µm**
- **operating voltage 10–30 V**

Description

At just 55 mm long

including plug, the nano with one switched Output is the shortest M12 ultrasonic sensor on the market. The sensor is 60 mm short with analogue output. The nano has a four pin M12 circular connector with teach-in on Pin 2.

For sensors of the nano sensor range

4 output versions and 2 measuring ranges are available:

1 switching output optionally in
pnp or npn circuitry

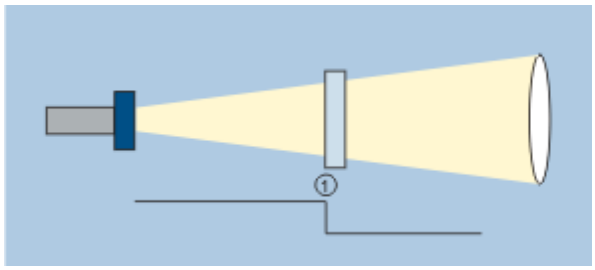
1 analogue output 4-20 mA
or 0-10 V

The nano sensors with switched output have three operating modes:

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

A single detect point is set by:

- positioning the object to be detected within the desired distance (1) to the sensor
- connecting pin 2 to +Ub for approx. 3 seconds
- once more connecting pin 2 to +UB for approx. 1 second

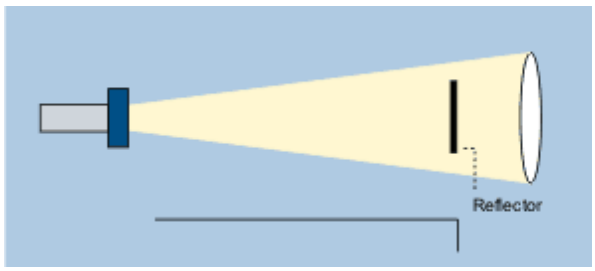


Teach-in of a detect point

A two-way reflective barrier

can be very easily set with the help of a permanently mounted reflector.

- connecting pin 2 to +Ub for approx. 3 seconds
- once more connecting pin 2 to +UB for approx. 10 second



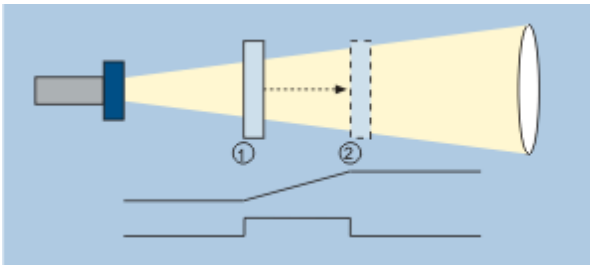
Teach-in of a two-way reflective barrier

For setting a window

- initially positioning the object to be detected on the sensor-close window limit (1)
- connecting pin 2 to +Ub for approx. 3 seconds until both LEDs start to flash
- shifting the object to the sensor-far window limit (2)
- once more connecting pin 2 to +UB for approx. 1 second until LED2 extinguishes

For setting an analogue output

- initially positioning the object to be detected on the sensor-close window limit (1)
- connecting pin 2 to +Ub for approx. 3 seconds
- shifting the object to the sensor-far window limit (2)
- once more connecting pin 2 to +UB for approx. 1 second



Teach-in of an analogue characteristic or of a window with two detect points

For setting a window

with two detect points on a single switched output, the procedure is the same as setting the analogue

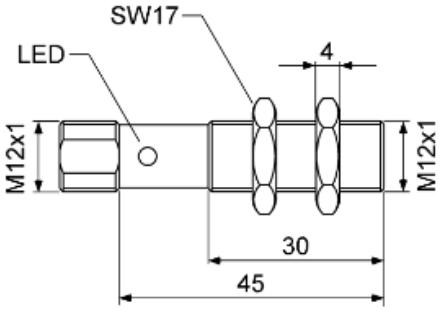
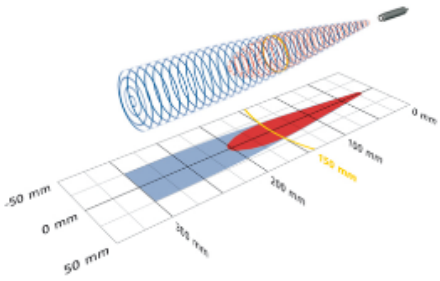
The NCC/COC function

and rising/falling analoge characteristic can also be set via pin 2.

One green and one yellow LED

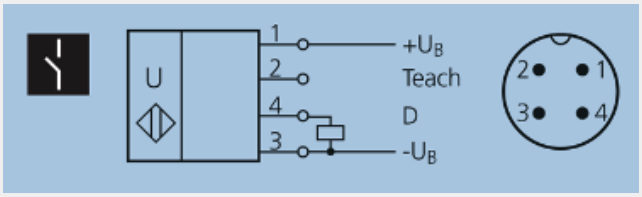
indicate the sensor output states and support the teach-in procedures

nano-15/CD

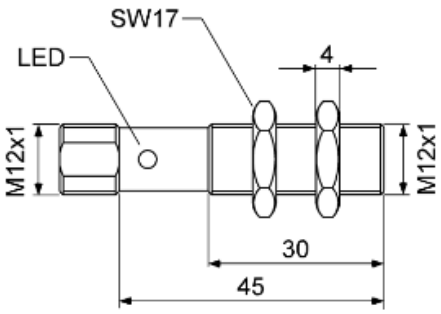
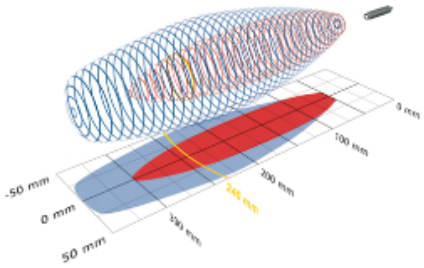
scale drawing	detection zone
	

1 x pnp	250 mm
operating range	20 - 150 mm
design	cylindrical M12
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	380 kHz
blind zone	20 mm
operating range	150 mm
maximum range	250 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	25 mA
type of connection	4-pin M12 initiator plug

nano-15/CD

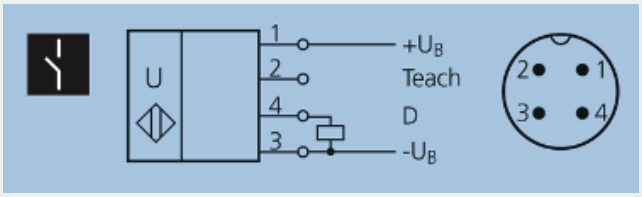
outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	2.0 mm
switching frequency	30 Hz
response time	24 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	narrow sound field
documentation (download)	
pin assignment	

nano-24/CD

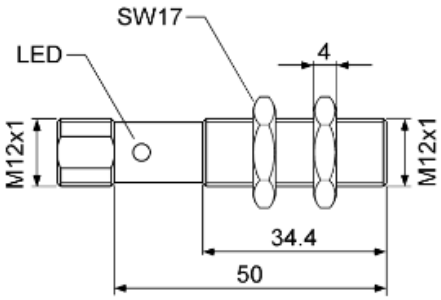
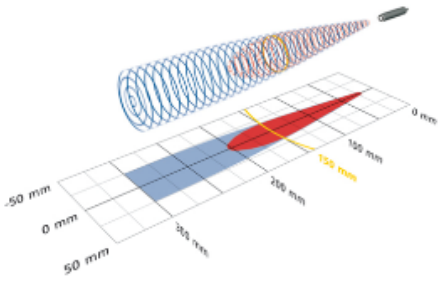
scale drawing	detection zone
	

1 x pnp	350 mm
operating range	40 - 240 mm
design	cylindrical M12
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	500 kHz
blind zone	40 mm
operating range	240 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	35 mA
type of connection	4-pin M12 initiator plug

nano-24/CD

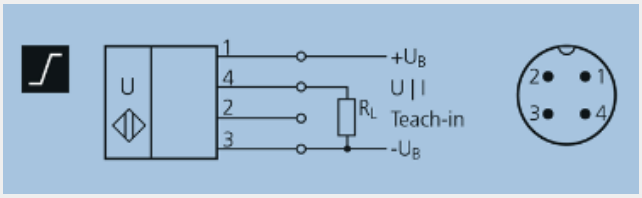
outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	3 mm
switching frequency	25 Hz
response time	30 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	narrow sound field
documentation (download)	
pin assignment	

nano-15/CI

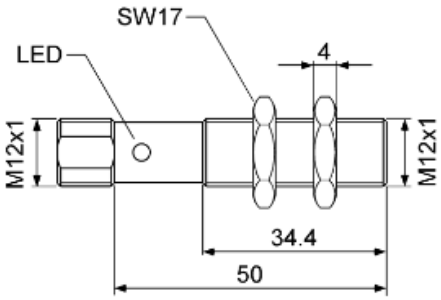
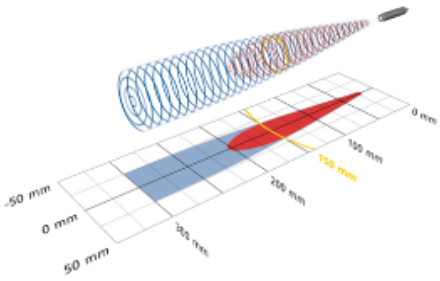
scale drawing	detection zone
	

1 x analogue 4-20 mA	250 mm
operating range	20 - 150 mm
design	cylindrical M12
operating mode	analogue distance measurements
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	380 kHz
blind zone	20 mm
operating range	150 mm
maximum range	250 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	25 mA
type of connection	4-pin M12 initiator plug

nano-15/CI

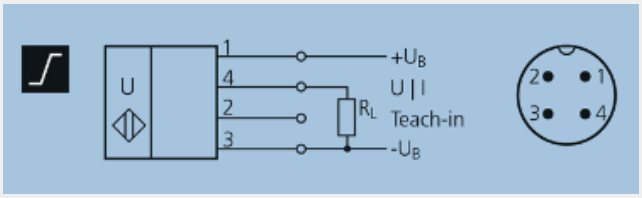
outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	24 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	narrow sound field
documentation (download)	
pin assignment	

nano-15/CU

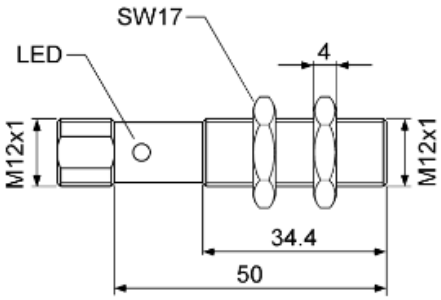
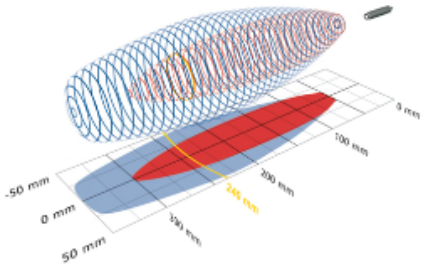
scale drawing	detection zone
	

1 x analogue 0-10 V	250 mm
operating range	20 - 150 mm
design	cylindrical M12
operating mode	analogue distance measurements
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	380 kHz
blind zone	20 mm
operating range	150 mm
maximum range	250 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	15 V bis 30 V DC, verpolfest
voltage ripple	± 10 %
no-load current consumption	25 mA
type of connection	4-pin M12 initiator plug

nano-15/CU

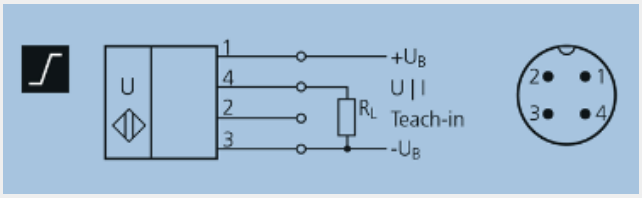
outputs	
output 1	analogue output voltage: 0-10 V (at U_B 15 V), short-circuit-proof switchable rising/falling
response time	24 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	narrow sound field
documentation (download)	
pin assignment	

nano-24/CI

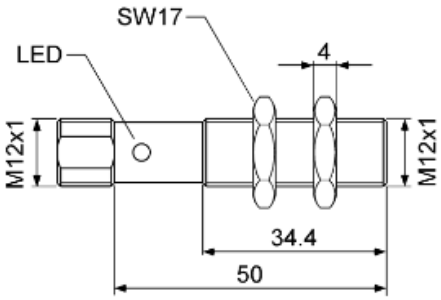
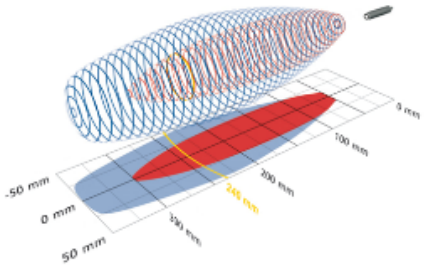
scale drawing	detection zone
	

1 x analogue 4-20 mA	350 mm
operating range	40 - 240 mm
design	cylindrical M12
operating mode	analogue distance measurements
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	500 kHz
blind zone	40 mm
operating range	240 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	35 mA
type of connection	4-pin M12 initiator plug

nano-24/CI

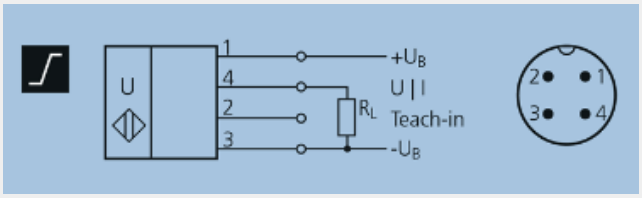
outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	30 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	narrow sound field
documentation (download)	
pin assignment	

nano-24/CU

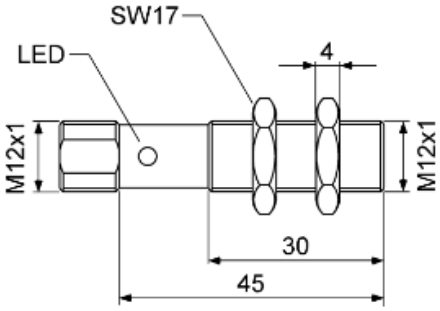
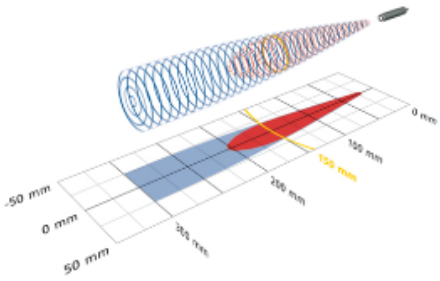
scale drawing	detection zone
	

1 x analogue 0-10 V	350 mm
operating range	40 - 240 mm
design	cylindrical M12
operating mode	analogue distance measurements
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	500 kHz
blind zone	40 mm
operating range	240 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	15 V bis 30 V DC, verpolfest
voltage ripple	± 10 %
no-load current consumption	35 mA
type of connection	4-pin M12 initiator plug

nano-24/CU

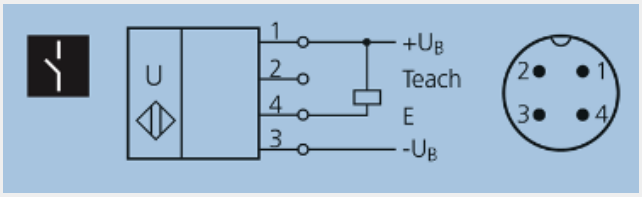
outputs	
output 1	analogue output voltage: 0-10 V (at U_B 15 V), short-circuit-proof switchable rising/falling
response time	30 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	narrow sound field
documentation (download)	
pin assignment	

nano-15/CE

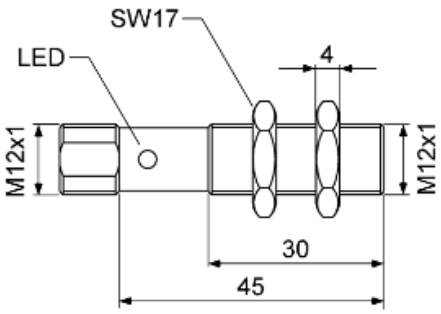
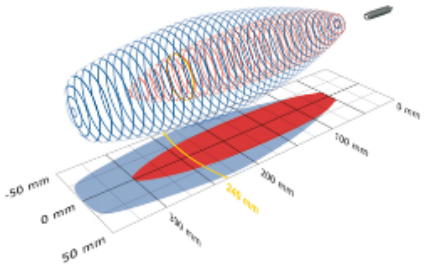
scale drawing	detection zone
	

1 x npn	250 mm
operating range	20 - 150 mm
design	cylindrical M12
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	380 kHz
blind zone	20 mm
operating range	150 mm
maximum range	250 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	25 mA
type of connection	4-pin M12 initiator plug

nano-15/CE

outputs	
output 1	switching output npn: I_{max} = 200 mA (-U_B+2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	2.0 mm
switching frequency	30 Hz
response time	24 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	narrow sound field
documentation (download)	
pin assignment	

nano-24/CE

scale drawing	detection zone
	

1 x npn	350 mm
operating range	40 - 240 mm
design	cylindrical M12
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	narrow sound field
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	500 kHz
blind zone	40 mm
operating range	240 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
reproducibility	± 0.15 %
accuracy	temperature drift 0.17 %/K
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	35 mA
type of connection	4-pin M12 initiator plug

nano-24/CE

outputs	
output 1	switching output npn: I_{max} = 200 mA (-U_B+2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	3 mm
switching frequency	25 Hz
response time	30 ms
delay prior to availability	< 300 ms
inputs	
input 1	Teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	15 g
technical features/characteristics	
scope for settings	Teach-in Teach-in über Com-Eingang an Pin 2
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	narrow sound field
documentation (download)	
pin assignment