Baumer
Passion for Sensors

Ultrasonic sensors

ELTRA trade

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Ultrasonic sensors determine the position of an object using an ultrasonic signal.

Baumer produces the following types of ultrasonic sensors:

- Miniature
- Robust with flexible parameterization
- With teach button
- With large sensing distances
- High-speed sensors
- With sonic nozzles
- Chemically robust
- With IO-Link

ELTRA trade

To find out stock ability and delivery time to your region, please contact our manager.

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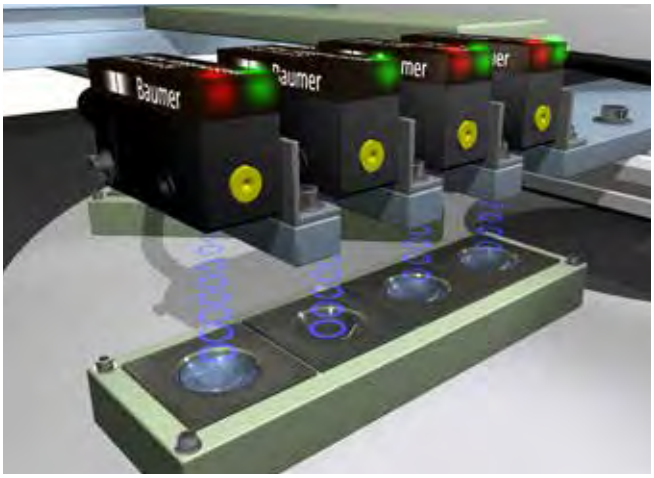
Ultrasonic Miniature sensors

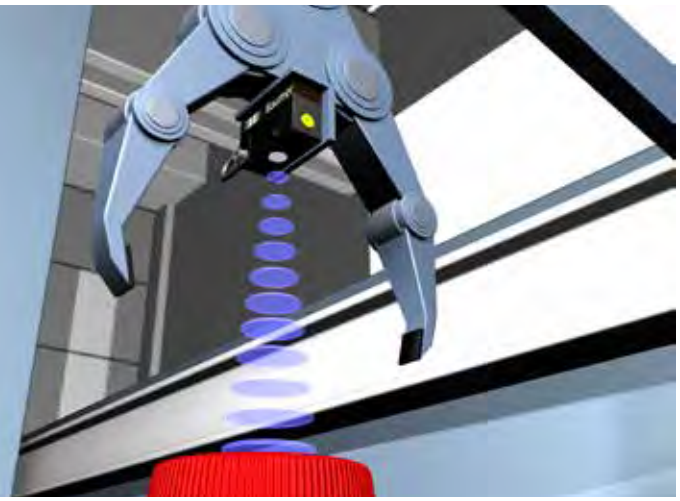
Baumer offers a large portfolio of small and light miniaturized ultrasonic sensors for very cramped spaces.

- Wide range of round and rectangular designs
- Proximity switches, retro-reflective and trough beam sensors as well as distance sensors
- Sensing distances up to 400 mm
- Narrow sonic beam for object detection in even the smallest openings
- Lightweight with only 4 grams



Height measurement

- Miniature ultrasonic sensors reliably measure the distance to the object, regardless of surface color, reflectivity or transparency.



Distance measurement in micro grippers

- Thanks to the small design and the low weight, miniature ultrasonic sensors can also be installed in micro-grippers, which offer only little space for sensors.

Liquid level detection

- Miniaturized ultrasonic sensors are ideally suited to measure liquid levels in small containers. The miniature housing design allows the installation of several sensors in close proximity.

Detailed information:

- Miniature proximity switches … page 20
- Miniature retro-reflective sensors …page 62
- Miniature distance sensors …page 92

Fast and robust – always the right solution

High-speed ultrasonic sensors

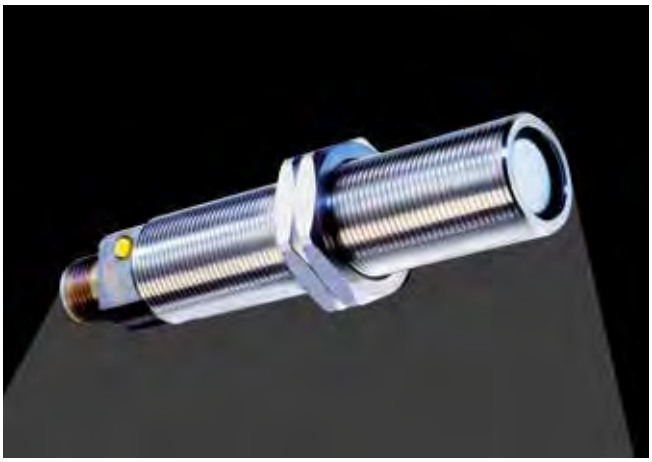
- With a response time of only 1.3 ms, Baumer high-speed ultrasonic sensors ate up to 10 times faster than offered to date. This makes them comparable with optical sensors and means that the reputation of the slow ultrasonic sensor belongs to the past.
  These ultrasonic sensors are specially designed for the detection of fast-moving, transparent and closely spaced objects even in surroundings susceptible to soiling.

The highlights:

- Response times <1.3 ms for detecting fast moving objects
- Sensing distances up to 70 mm
- Vertical and horizontal repeat accuracy of up to 0.5 mm
- No blind region
- Variants with a narrow sonic nozzle for detection in the smallest openings (down to Ø 3 mm)

Detailed information:

- High-speed proximity switches …page 18
- High-speed retro-reflective sensors … page 72



Robust ultrasonic sensors for use in harsh ambient conditions

- Our robust UNAR series ultrasonic sensors are suitable for the detection of aggressive media in difficult or sensitive environments. They measure acid and lye levels as well as accurately detect objects in the vicinity of solvents. They do all of this completely reliably thanks to their special design.

The highlights:

- High chemical resistance thanks to Parylene-coated sensor front
- Robust V4A stainless steel enclosure
- Consistent use of FDA-compliant materials
- Pressure-resistant sensor front up to 6 bar
- Range of up to 1 m
- Constant resolution of 0.3 mm

Detailed information:

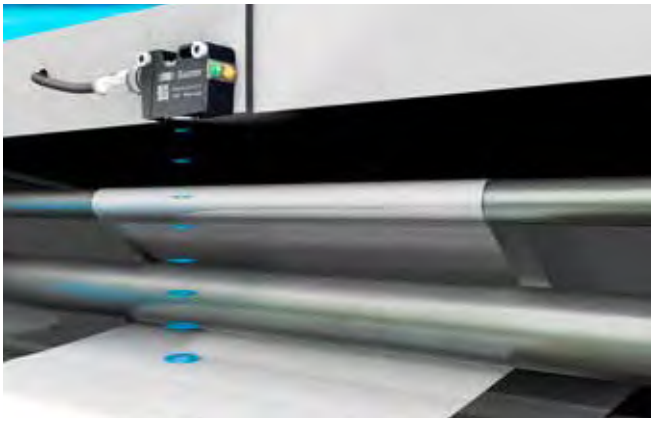
- Robust proximity switches …page 40
- Robust retro-reflective sensors … page 74

Ultrasonic sensors with extra capacity – U500

Universally applicable and extremely resilient
- Large sensing distances up to 1000 mm
- Easy commissioning and operation
- Maximum process safety thanks to expanded reserve capacity
- Very robust thanks to extremely resilient transducer

Detailed information:

- U500 proximity sensors … page 31
- U500 retro-reflective sensors … page 70
- U500 distance sensors … page 110



Reliable and flexible in use

- Ultrasonic sensors enable detection of transparent, high-gloss and multicolor objects
- Greatest range in its class (1000 mm) opens up new application potential
- Reliable operation thanks to enhanced interference immunity

Liquid and solid media in every environment

- The sensors are ideal for monitoring fill level of liquids, granules, and bulk material
- Slender, symmetrical sonic cone enables detection even in small container openings
- Fast cycle times in process applications are possible thanks to short response times

Precise Ultrasonic sensors

Distance measurement to transparent objects

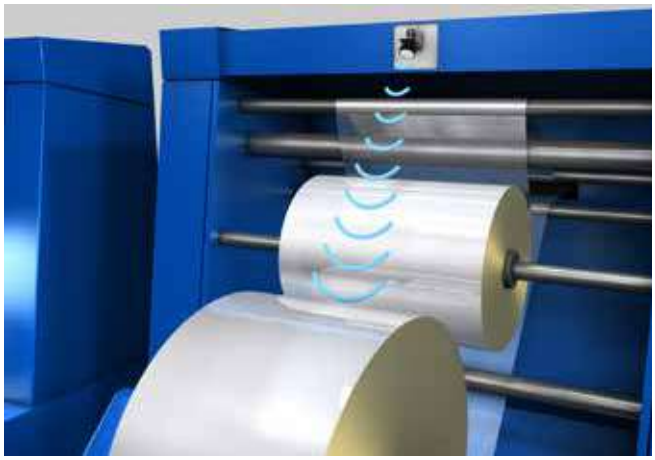
- Precise distance measurements for controlling the material feed of transparent films (sag control).
- Reliable detection of foil breaks or small cracks in the material of transparent foils even in fast applications
- Edge control with transparent materials

Ultrasonic distance sensors allow an accurate distance measurement regardless of material, surface, color or transparency.

- Small and light miniature sensors, e.g. for robotics
- Measurements in very small containers or openings
- Large measuring ranges up to 6000 mm
- Sturdy sensors also for demanding environments

Detailed information:

- Distance sensors ... page 86



Determination of roll diameter

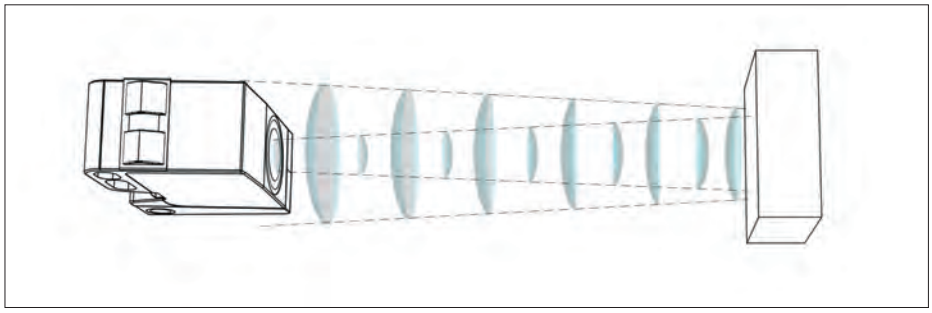
- Measurement of outside diameters of rolls with materials such as plastic film, metal sheet, paper and cardboard, veneer, etc.

Level control

- The sensors are predestined for monitoring the fill level of liquids, granules and bulk material
- High cycle times in process process thanks to short response times

Design and operation

A special sonic transducer is used for the ultrasonic proximity sensors, which allows for alternate transmission and reception of sound waves. The sonic waves emitted by the transducer are reflected by an object and received back in the transducer. After having emitted the sound waves, the ultrasonic sensor will switch to receive mode. The time elapsed between emitting and receiving is proportional to the distance of the object from the sensor.



Digital output

Sensing is only possible within the detection area. The required sensing range can be adjusted with the sensor's potentiometer or by electronic Teach-in (Teach-in button or remote Teach-in). If an object is detected within the set area, the output will change state which is visualized by the integrated LED.

Target detection

Sonic waves are best reflected from hard surfaces. Targets may be solids, liquids, granules or powders. In general, ultrasonic sensors are deployed for object detection where optical principles would lack reliability.

Standard target

The standard target is defined as a square flat object of following sizes:

- 15 x 15 mm for Sde up to 250 mm
- 30 x 30 mm for Sde up to 1000 mm
- 100 x 100 mm for Sde > 1000 mm

The target should be mounted perpendicular to the axis of the sensor.

Size

To ensure a reliable object detection, the reflected signal must be large enough. The intensity of the signal depends on the size of the object. Using a standard object, the full scanning distance Sd is available.

Surfaces

Detection of sound absorbent materials will result in a reduction of the maximum sensing distance.

The maximum sensing distance can be achieved as long as the maximum roughness of the object does not exceed 0,2 mm.

Typical sound absorbing materials are:

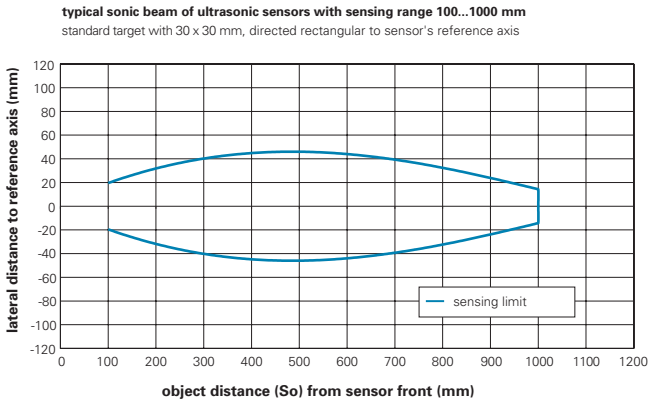
- foam rubber
- cotton / wool / cloth / felt
- very porous materials

Sonic cone profiles

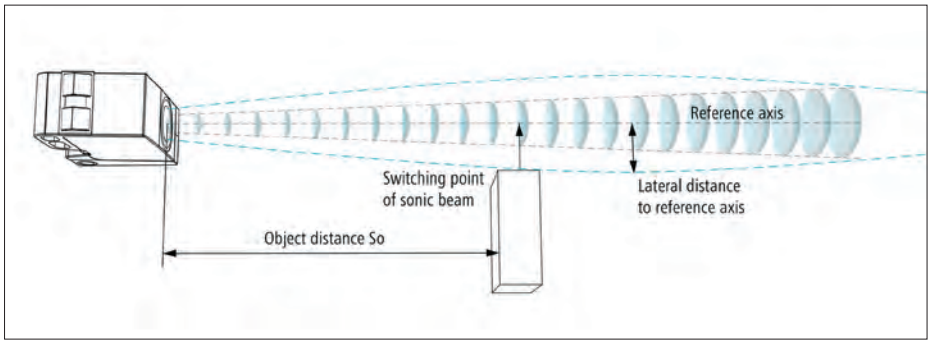
The sonic cone profile charts as found in the spec sheets of this catalog represent the active sensing areas for ultrasonic sensors. The charts demonstrate the short-range sonic side lobes, which widen the sensor's close-range aperture angle. Due to sound absorption and air diffusion, the lobes decrease at longer ranges.

Size, shape, surface properties and the direction of target detection have very high influence on the lateral detecting region of an ultrasonic sensor.

Sonic cone profiles apply to the whole product family, e.g. a 100 - 1000 mm profile is representative for all related sensors of the same sensing range - digital or analog outputs, etc.



Measuring method



Standard square targets made of steel are used to determine the shape of typical sonic cone profiles.

- 15 x 15 mm for Sde up to 250 mm
- 30 x 30 mm for Sde up to 1000 mm
- 100 x 100 mm for Sde > 1000 mm

The targets are positioned perpendicularly to the sensor's reference axis, approached sideways at different distances. The sonic cone profile is then plotted by connecting the measured points with a line.

The cone shape can vary if round or differently shaped objects are detected.

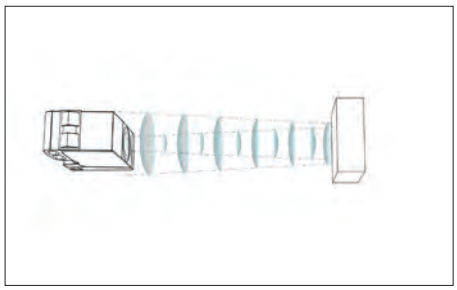
Ultrasonic sensor principles – the right solution for any application

Sensor principles

Most ultrasonic sensors are based on the principle of measuring the propagation time of sound between send and receive (proximity switch). The barrier principle determines the distance from the sensor to the reflector (retro-reflective sensor) or to an object (through-beam sensor) in the measuring range.

Proximity switches

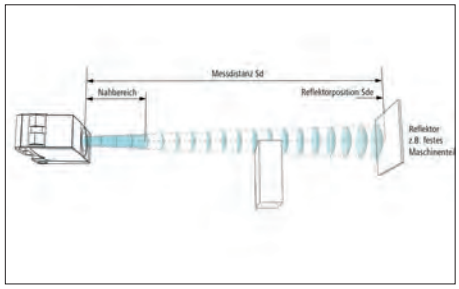
Ultrasonic proximity switches are the simplest form of ultrasonic object detection. The transmitter and receiver are integrated in one housing. The ultrasound is reflected directly from the object to be measured to the receiver. Ultrasonic sensors with teach-in function differ from conventional types in that they offer easier and more varied operability with the simple push of a button.



Typical applications:
- Distance measurement
- Stack height measurement

Retro-reflective sensors

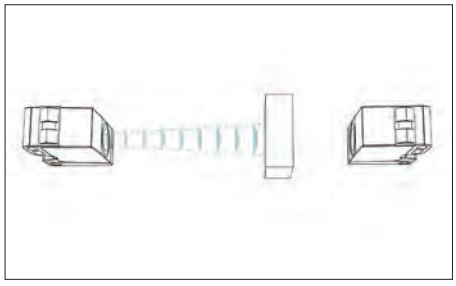
The retro-reflective sensor operates in accordance with the same principle as the ultrasonic proximity switch. Sound propagation measurement determines the distance from the sensor to the reflector or to an object in the measuring range. Any sound reflecting, stationary object can be used as the reflector.



Typical applications:
- Irregularly shaped and inclined objects
- Sound deflecting target objects
- Sound absorbing materials such as cotton and foam rubber

Through beam sensors

Ultrasonic through-beam sensors have short response times and large ranges. The transmitter and receiver are accommodated in two separate housings. The transmitter permanently emits sound waves through air to the receiver. The receiver switches through the output stage when an object interrupts the sound waves.



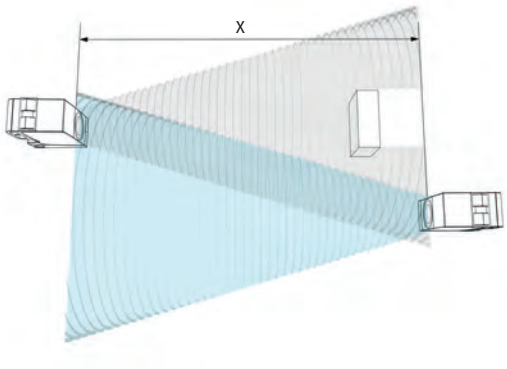
Typical applications:
- Detection of object in fast succession
- Counting objects from materials that are difficult to detect (glass containers, PET bottles)
- Monitoring transparent materials
- Film break monitoring
- Level monitoring in tanks and silos

Mounting

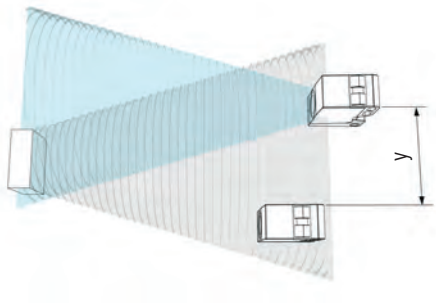
Baumer ultrasonic sensors offer a high degree of flexibility in installation. The only prerequisite during mounting is to ensure that no materials can settle in the area of the sonic beam. Sound-absorbing materials such as cotton wool or soft foam rubber can reduce the scanning range. Liquids and solid materials are very good reflectors of sound.

Minimum spacings

To avoid mutual influencing of the sensors, depending on the type of sensor, a specific spacing must be maintained between the sensors:



mounting opposite (x)



mounting parallel (y)

Minimum spacings table

Sensor type	x	y	max. no. of sensors	Action to take	max. control wire	Response time
Standard - without multiplex or synch.	3 x scanning range Sd	2 x Sd	no limit	none	-	according to technical specs.
with multiplex feature	2 x scanning range Sd	no space required	2	connect control pin	5 m	2 x technical specs.
with synchronization feature	3 x scanning range Sd	1 x Sd	8	connect control pin	7 m	according to technical specs.

Synchronization or Multiplex feature

Minimum spacing cannot always be maintained in all applications. Sensors with synchronization mode are used for this purpose. Such sensors synchronize the transfer cycles of the individual sensors with the aim of reducing the minimum spacing.

Synchronization feature

Link the control pin of all sensors within a limited area to each other. This triggers the measurement of all sensors at the same time. Interference signals which arrive later at the sensor due to their longer sensing distance, will be ignored. Up to eight sensors can be synchronized via control pin.

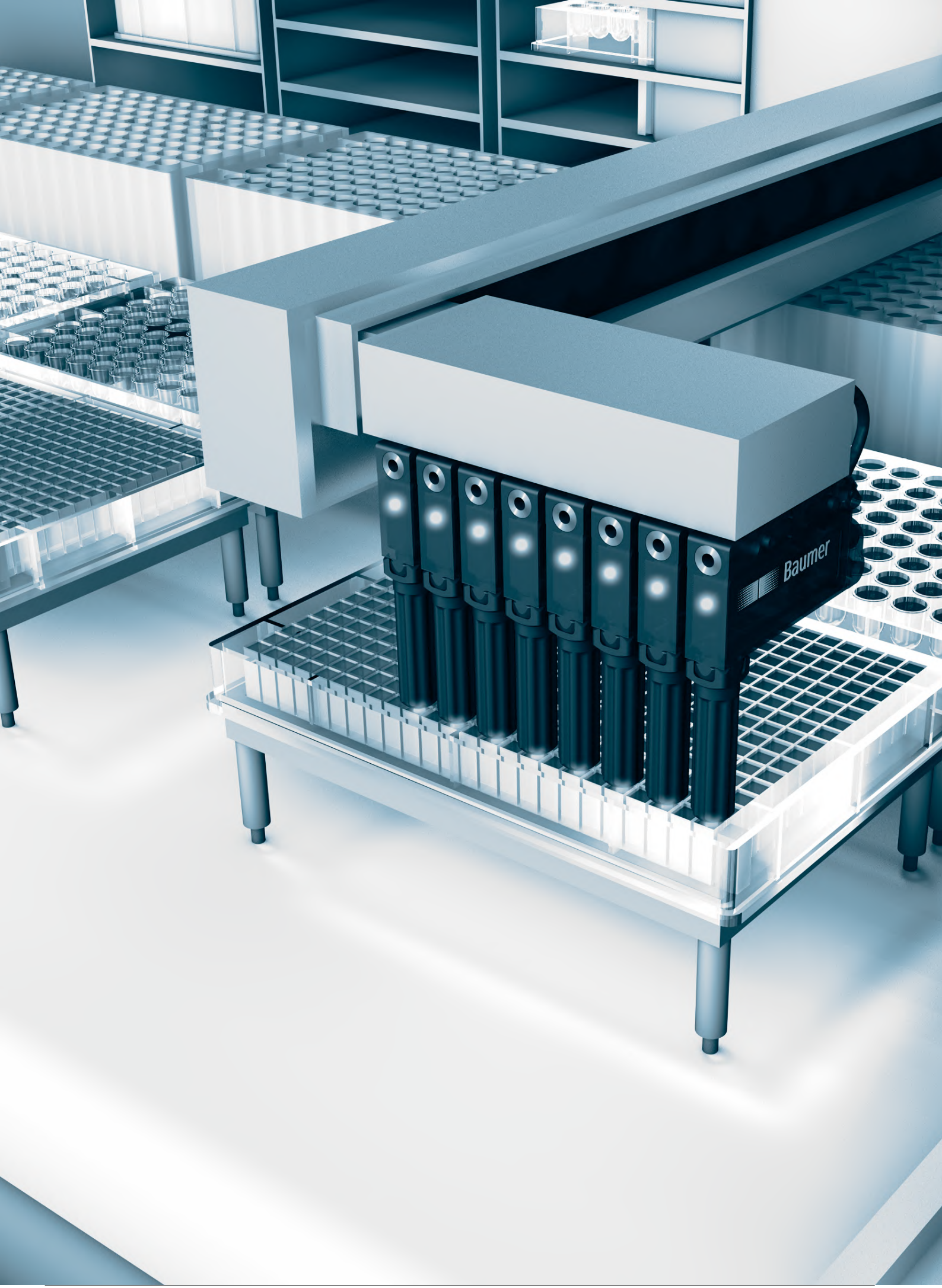
Multiplex feature

Link the control pin of both sensors to each other. While the first sensor is measuring, the second is disabled. After the first measurement is completed, the second sensor is allowed to send and receive its signals. In maximum two sensors can be interconnected. The multiplex function increases the sensor response time to the double of the specified value.

Note: The control pin must be closed on sensors utilizing either the synchronization or multiplex feature. If the feature is not in use the pin must be connected to the following potentials to ensure the standard response time:

Synchronization: Connect the control pin to supply voltage (+Vs)

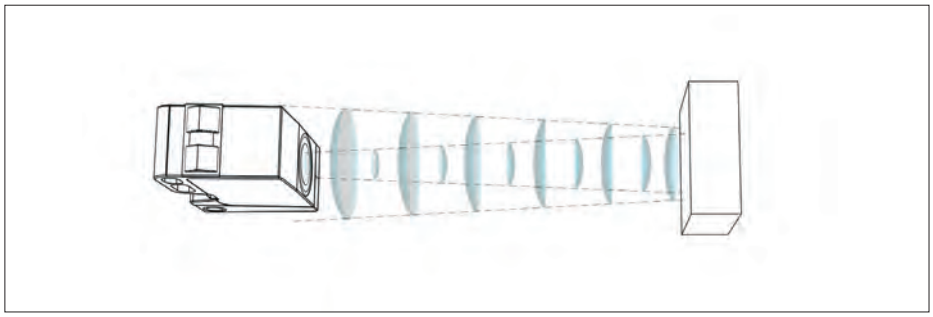
Multiplex: Connect the control pin to ground (GND)


Baumer

Proximity sensors

Design and operation

A special sonic transducer is used for the ultrasonic proximity sensors, which allows for alternate transmission and reception of sound waves. The transducer emits a number of sonic waves which are reflected by an object, back to the transducer. After emission of the sound waves, the ultrasonic sensor will switch to receive mode. The time elapsed between emitting and receiving is proportional to the distance of the object from the sensor.



Digital output
Sensing is only possible within the detection area. The required sensing range can be adjusted with the sensor's potentiometer. If an object is detected within the set area, the output changes its state. The built-in LED indicates this change.

... with Teach-in

Teach-in procedures
All adjustments are carried out via the internal Teach-in button or the external Teach-in wire.

Adjustment switching point Sde

1. Adjustment mode: Press the Teach-in button or connect the white Teach-in wire to +Vs for approx. 2 secs until the LED flashes green. Release the button or disconnect Teach-in wire.
2. LED flashes green. Place the target at the required scanning range and press the Teach-in button or connect the external white Teach-in wire shortly to +Vs.
3. Succesful completion of Teach-in procedure is confirmed by LED being „on" for approx. 2 secs.

Teach-in lock
The Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

Resetting to original factory settings
Holding the button down or connecting the white Teach-in wire to +Vs for > 6 secs, will automatically restore the original factory setting. Fast flashing of the LED indicates successful completion of the resetting.

qTeach™

With *qTeach*™ we are introducing a new, convenient and wear-free teach procedure. Teaching of O500 sensors is just by a touch with any ferromagnetic tool. A blue LED light provides clear optical feedback. To prevent user errors, *qTeach*™ locks autonomously after 5 minutes.

Ultrasonic proximity sensors

rectangular designs

product family	UNCK 09	UNCK 09	UNDK 09	UNDK 09	UNDK 10	UNDK 20	UNDK 20
							
	Miniature	Miniature with beam columnator	Miniature	Miniature with beam columnator	Miniature	Standard	Standard
width / diameter	8,6 mm	8,6 mm	8,6 mm	8,6 mm	10,4 mm	20 mm	20 mm
scanning range Sd	30 ... 200 mm	3 ... 150 mm	30 ... 200 mm	3 ... 150 mm	10 ... 200 mm	10 ... 200 mm	40 ... 400 mm
potentiometer							
Teach-in	■	■	■	■	■	■	■
qTeach							
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
operating temperature	0 ... +60 °C	0 ... +60 °C	0 ... +60 °C	0 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C
housing material	PA 12	PA 12	PA 12	PA 12	plastic (ASA)	polyester	polyester
cable PUR 4 x 0,08, 2 m	■	■	■	■			
cable PUR 4 x 0,25, 2 m							
cable, 2 m					■		
flylead connector M8, L=200 mm	■	■	■	■	■		
connector M8					■	■	■
connector M12							
page	**20**	**21**	**22**	**23**	**24**	**25**	**26**

cylindrical designs

product family	UNAM 12	UNAM 12	UNAM 12	UNAM 12	UNAM 12	UNAM 18	UNAM 18
							
special type	High-speed	Standard	High-speed	Standard	Standard	Standard	Standard
width / diameter	12 mm	12 mm	12 mm	12 mm	12 mm	18 mm	18 mm
scanning range Sd	0 ... 40 mm	5 ... 70 mm	10 ... 70 mm	10 ... 200 mm	40 ... 400 mm	100 ... 700 mm	100 ... 1000 mm
potentiometer						■	
external Teach-in	■	■	■	■	■		
Teach-in							■
qTeach							
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
operating temperature	-10 ... +60 °C	0 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C
housing material	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated
cable, 2 m						■	
connector M12	■	■	■	■	■		■
page	**32**	**33**	**34**	**35**	**36**	**37**	**38**

UNDK 20	UNDK 30	UNDK 30	UNDK 30	U500.PA0
				
Standard	Standard	Standard	Standard	Extra performance
20 mm	30 mm	30 mm	30 mm	18 mm
100 ... 1000 mm	30 ... 250 mm	60 ... 400 mm	100 ... 1000 mm	100 ... 1000 mm
	■	■	■	
■				
				■
< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
-10 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C	-10 ... +60 °C	-25 ... +65 °C
polyester	polyester / die-cast zinc	polyester / die-cast zinc	polyester / die-cast zinc	plastic (ASA, PMMA)
				■
	■	■	■	
■				
	■	■	■	■
27	28	29	30	31

UR18.PA0	UNAR 18	UNAR 18	UNAM 30	UNAM 50
				
Standard	Standard	Standard	Standard	Large sensing distance
18 mm	18 mm	18 mm	30 mm	30 mm
100 ... 1000 mm	60 ... 400 mm	100 ... 1000 mm	200 ... 1500 mm	350 ... 2500 mm
			■	■
	■	■		
■				
< 0,5 mm	< 0,5 mm	< 0,5 mm	< 1 mm	< 1 mm
-25 ... +70 °C	0 ... +60 °C	0 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C
brass nickel plated / TR90	stainless steel 1.4435 (V4A)	stainless steel 1.4435 (V4A)	brass nickel plated	brass nickel plated
			■	■
■	■	■	■	■
39	40	41	42	43

Sd = 200 mm

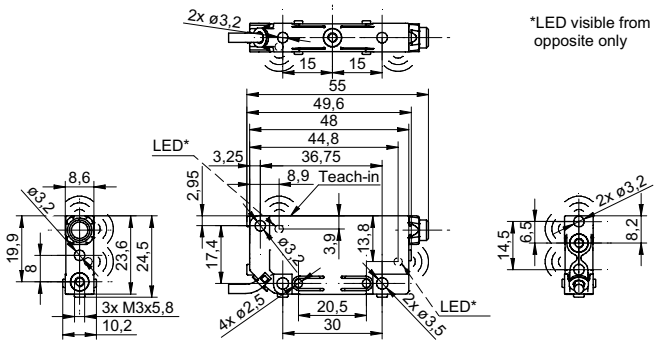
- short response time
- high resolution
- detects the smallest objects

general data	
scanning range Sd	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

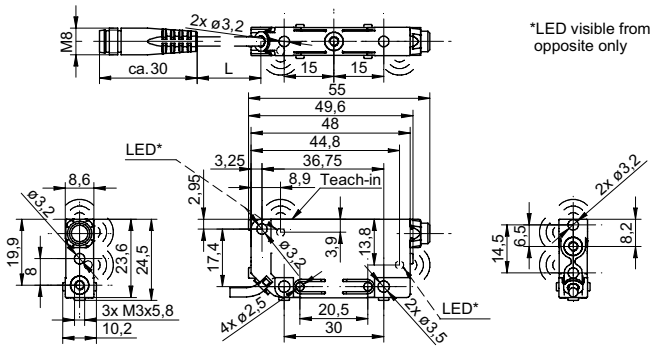
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	connection types
UNCK 09G8914	cable PUR 4 x 0,08, 2 m
UNCK 09G8914/KS35A	flylead connector M8, L=200 mm

dimension drawing

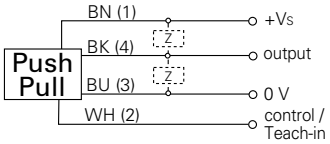


flylead connector version

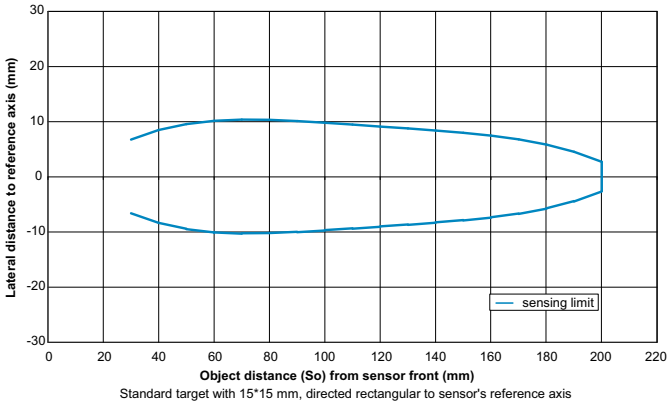


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

Sd = 150 mm

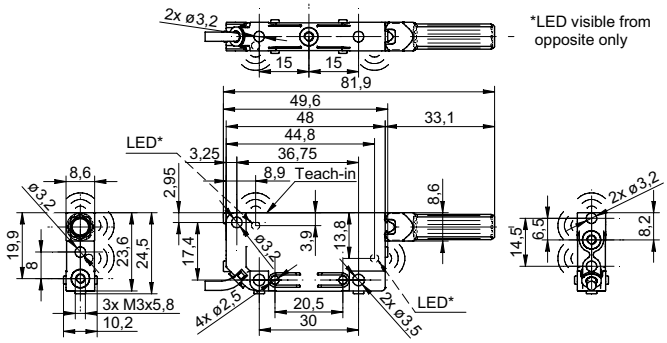
- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

general data	
scanning range Sd	3 ... 150 mm
scanning range far limit Sde	3 ... 150 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	82 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

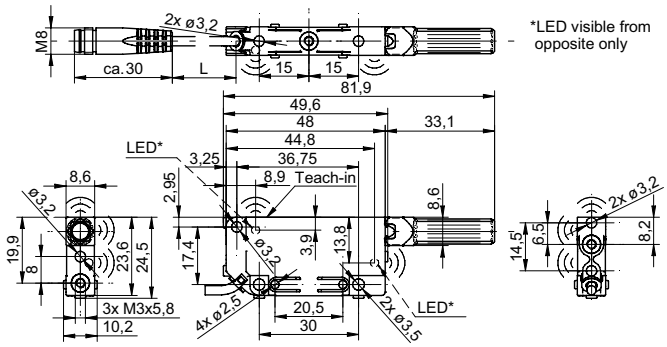
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	connection types
UNCK 09G8914/D1	cable PUR 4 x 0,08, 2 m
UNCK 09G8914/KS35AD1	flylead connector M8, L=200 mm

dimension drawing

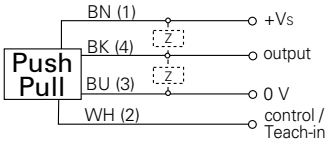


flylead connector version

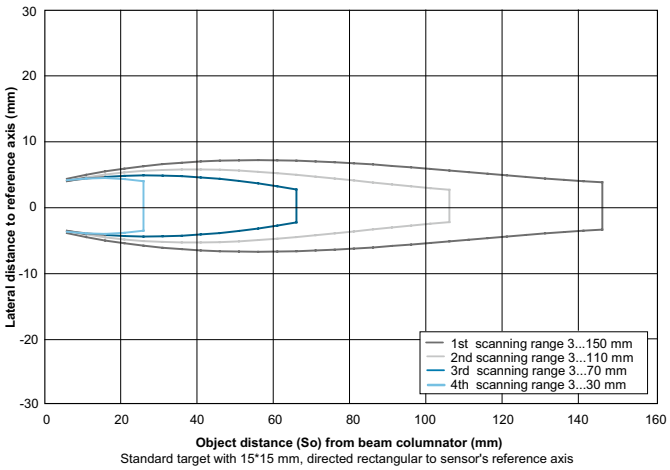


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Object distance (So) from beam columnator (mm)
Standard target with 15*15 mm, directed rectangular to sensor's reference axis

Sd = 200 mm

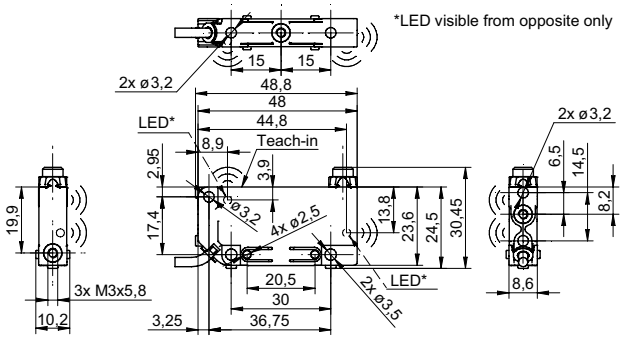
- short response time
- detects the smallest objects
- internal and external Teach-in

general data	
scanning range Sd	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

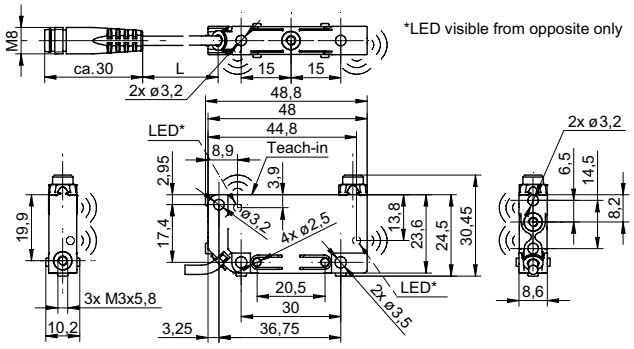
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	connection types
UNDK 09G8914	cable PUR 4 x 0,08, 2 m
UNDK 09G8914/KS35A	flylead connector M8, L=200 mm

dimension drawing

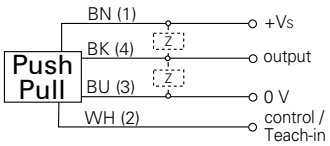


flylead connector version

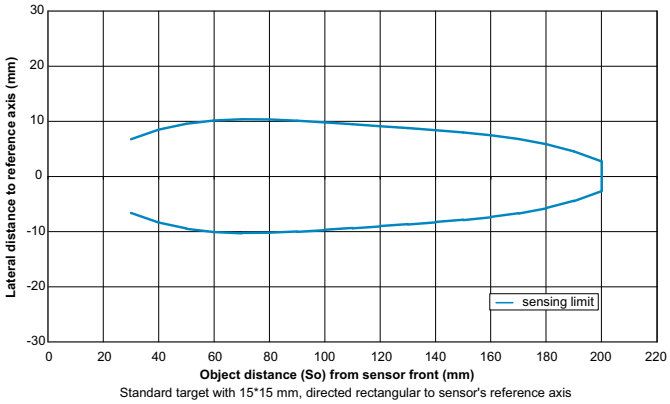


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

Sd = 150 mm

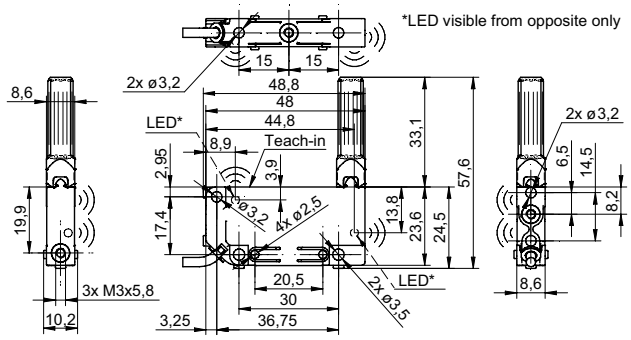
- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

general data	
scanning range Sd	3 ... 150 mm
scanning range far limit Sde	3 ... 150 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	57,7 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

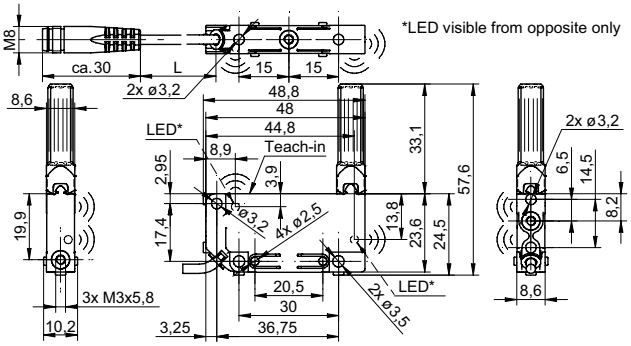
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	connection types
UNDK 09G8914/D1	cable PUR 4 x 0,08, 2 m
UNDK 09G8914/KS35AD1	flylead connector M8, L=200 mm

dimension drawing

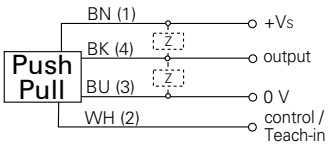


flylead connector version

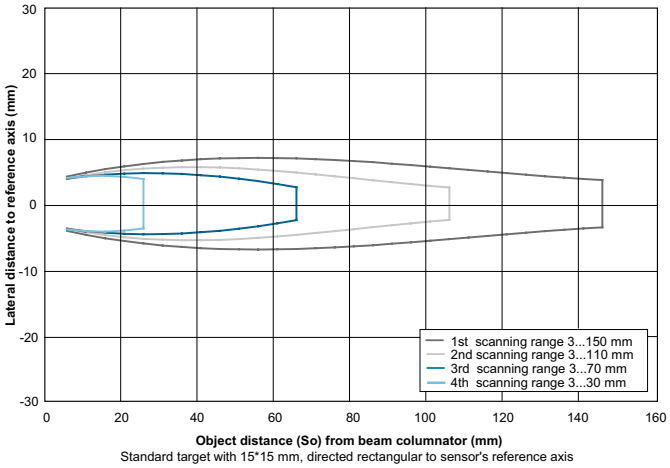


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Object distance (So) from beam columnator (mm)
Standard target with 15*15 mm, directed rectangular to sensor's reference axis

Sd = 200 mm

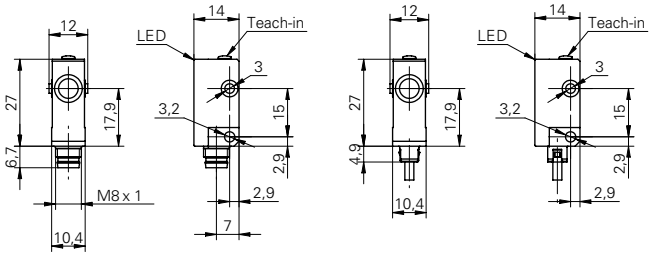

- compact housing
- very low mass (4 g)
- long sensing range / small blind range

general data	
scanning range Sd	10 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 15 ms
release time toff	< 15 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA)
width / diameter	10,4 mm
height / length	27 mm
depth	14 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

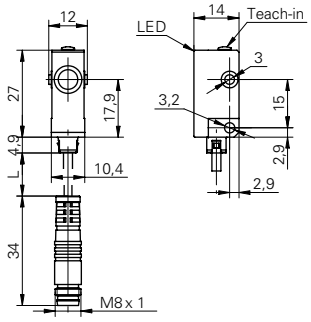
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10150326	Sensofix series 10 / series 20
10133792	Mounting bracket series 10 (L design)
10114501	Mounting bracket series 10 (U design)
10162083	Mounting panel for sensors series 10
10118798	Mounting bracket series 10
10162376	Sonic beam deflector for ultrasonic sensors series 10
for details: see accessories section	

dimension drawings

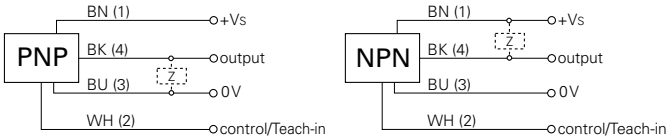


flylead connector version

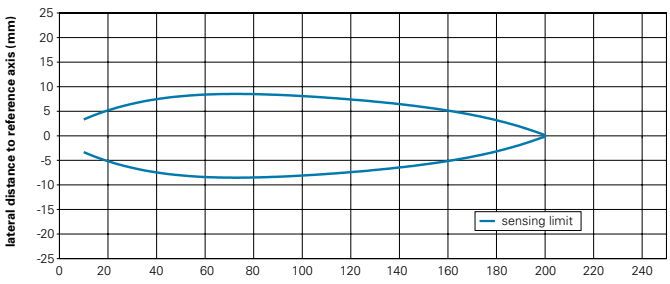


standard cable length 200 mm (L)

connection diagrams



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

order reference	output circuit	connection types
UNDK 10N8914	NPN make function (NO) / break function (NC)	cable, 2 m
UNDK 10N8914/KS35A	NPN make function (NO) / break function (NC)	flylead connector M8, L=200 mm
UNDK 10N8914/S35A	NPN make function (NO) / break function (NC)	connector M8
UNDK 10P8914	PNP make function (NO) / break function (NC)	cable, 2 m
UNDK 10P8914/KS35A	PNP make function (NO) / break function (NC)	flylead connector M8, L=200 mm
UNDK 10P8914/S35A	PNP make function (NO) / break function (NC)	connector M8

Sd = 200 mm

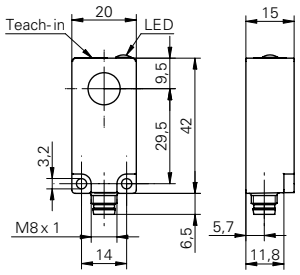
- internal and external Teach-in
- small sonic beam angle

general data	
scanning range Sd	10 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 10 ms
release time toff	< 10 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

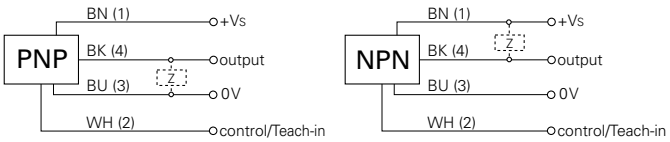
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

order reference	output circuit
UNDK 20N6914/S35A	NPN make function (NO)
UNDK 20N7914/S35A	NPN break function (NC)
UNDK 20P6914/S35A	PNP make function (NO)
UNDK 20P7914/S35A	PNP break function (NC)

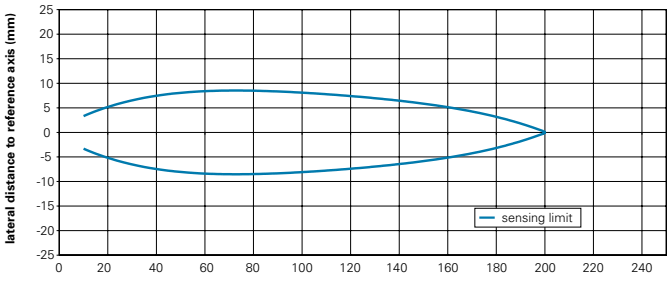
dimension drawing



connection diagrams



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

Sd = 400 mm

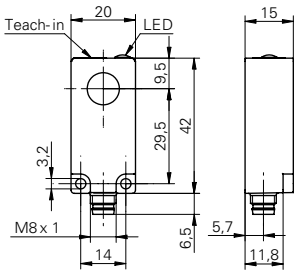
- internal and external Teach-in
- wide sonic beam angle

general data	
scanning range Sd	40 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	290 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

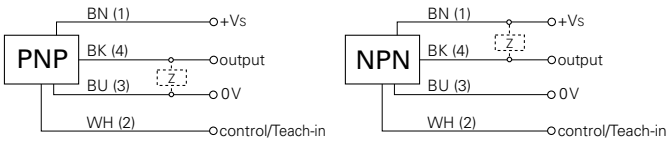
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

order reference	output circuit
UNDK 20N6912/S35A	NPN make function (NO)
UNDK 20N7912/S35A	NPN break function (NC)
UNDK 20P6912/S35A	PNP make function (NO)
UNDK 20P7912/S35A	PNP break function (NC)

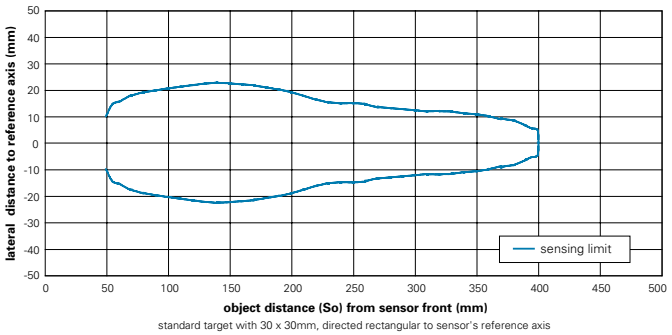
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

Sd = 1000 mm

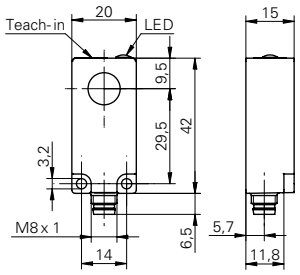
- internal and external Teach-in
- long sensing range

general data	
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

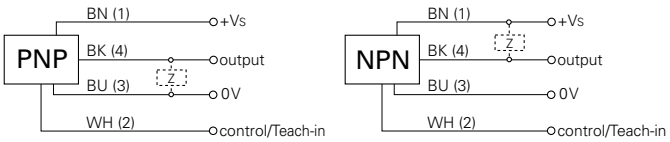
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

order reference	output circuit
UNDK 20N6903/S35A	NPN make function (NO)
UNDK 20N7903/S35A	NPN break function (NC)
UNDK 20P6903/S35A	PNP make function (NO)
UNDK 20P7803/S35A	PNP break function (NC)

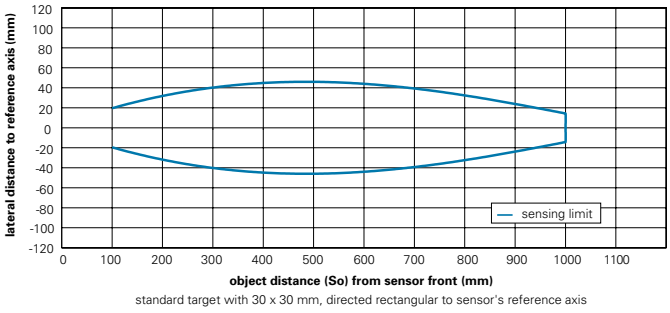
dimension drawing



connection diagrams



typical sonic cone profile



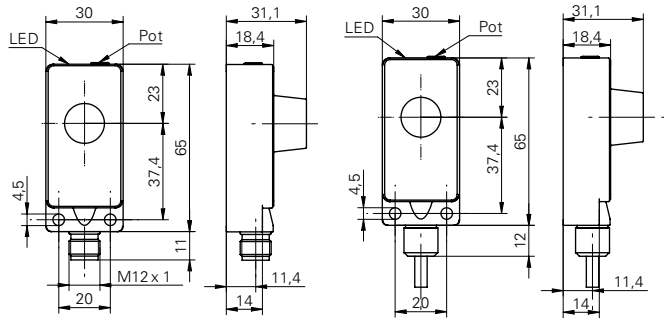
standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

Sd = 250 mm

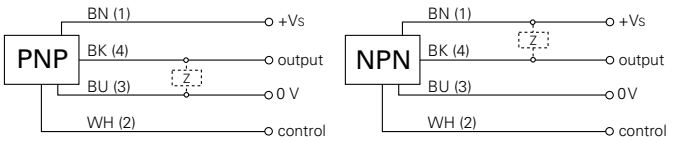
- potentiometer
- synchronization output
- small blind range

general data	
scanning range Sd	30 ... 250 mm
scanning range far limit Sde	30 ... 250 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
multiplex version	on request
temperature drift	< 0,18 % Sde/K
response time ton (sync on)	< 10 ms
release time toff (sync on)	< 10 ms
sonic frequency	300 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-25 ... +60 °C
protection class	IP 67

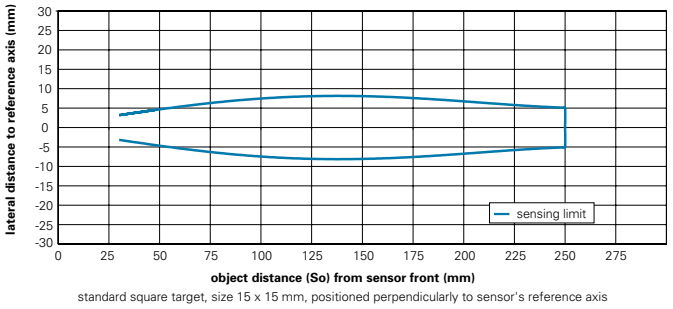
dimension drawings



connection diagrams



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10152386	Sensofix series 30
for details: see accessories section	

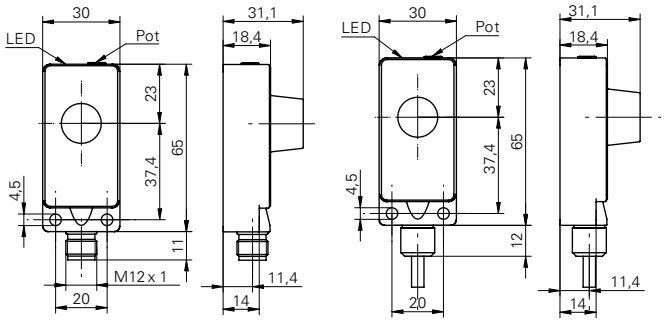
order reference	output circuit	connection types
UNDK 30N1713	NPN make function (NO)	cable, 2 m
UNDK 30N1713/S14	NPN make function (NO)	connector M12
UNDK 30N3713	NPN break function (NC)	cable, 2 m
UNDK 30N3713/S14	NPN break function (NC)	connector M12
UNDK 30P1713	PNP make function (NO)	cable, 2 m
UNDK 30P1713/S14	PNP make function (NO)	connector M12
UNDK 30P3713	PNP break function (NC)	cable, 2 m
UNDK 30P3713/S14	PNP break function (NC)	connector M12

Sd = 400 mm

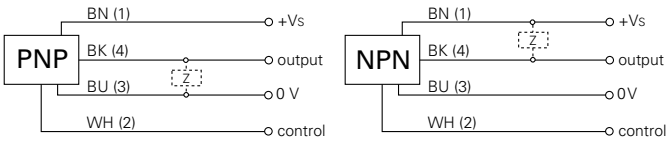
- potentiometer
- synchronization output

general data	
scanning range Sd	60 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
multiplex version	on request
temperature drift	< 0,18 % Sde/K
response time ton (sync on)	< 25 ms
release time toff (sync on)	< 25 ms
sonic frequency	400 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-25 ... +60 °C
protection class	IP 67

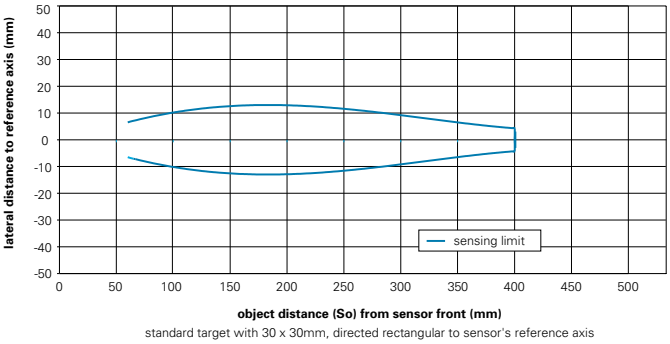
dimension drawings



connection diagrams



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10152386	Sensofix series 30
for details: see accessories section	

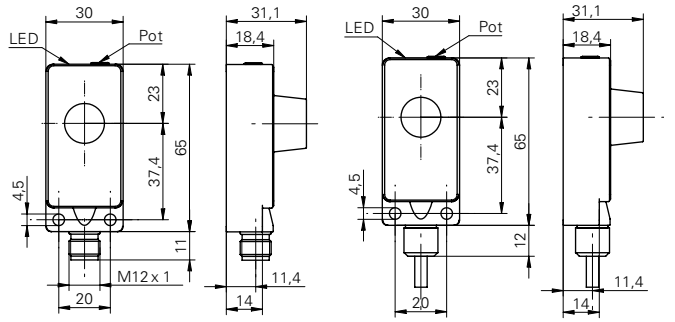
order reference	output circuit	connection types
UNDK 30N1712	NPN make function (NO)	cable, 2 m
UNDK 30N1712/S14	NPN make function (NO)	connector M12
UNDK 30N3712	NPN break function (NC)	cable, 2 m
UNDK 30N3712/S14	NPN break function (NC)	connector M12
UNDK 30P1712	PNP make function (NO)	cable, 2 m
UNDK 30P1712/S14	PNP make function (NO)	connector M12
UNDK 30P3712	PNP break function (NC)	cable, 2 m
UNDK 30P3712/S14	PNP break function (NC)	connector M12

Sd = 1000 mm

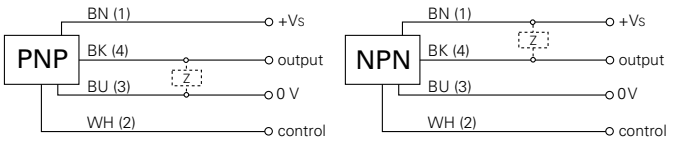
- potentiometer
- synchronization output
- temperature compensation

general data	
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
multiplex version	on request
temperature drift	< 0,1 % Sde/K
response time ton (sync on)	< 50 ms
release time toff (sync on)	< 50 ms
sonic frequency	240 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

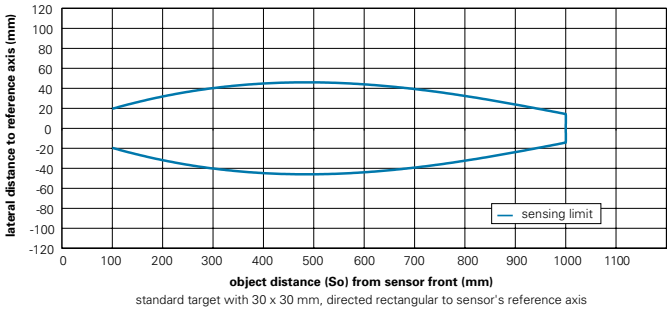
dimension drawings



connection diagrams



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10152386	Sensofix series 30
for details: see accessories section	

order reference	output circuit	connection types
UNDK 30N1703	NPN make function (NO)	cable, 2 m
UNDK 30N1703/S14	NPN make function (NO)	connector M12
UNDK 30N3703	NPN break function (NC)	cable, 2 m
UNDK 30N3703/S14	NPN break function (NC)	connector M12
UNDK 30P1703	PNP make function (NO)	cable, 2 m
UNDK 30P1703/S14	PNP make function (NO)	connector M12
UNDK 30P3703	PNP break function (NC)	cable, 2 m
UNDK 30P3703/S14	PNP break function (NC)	connector M12

Sd = 1000 mm

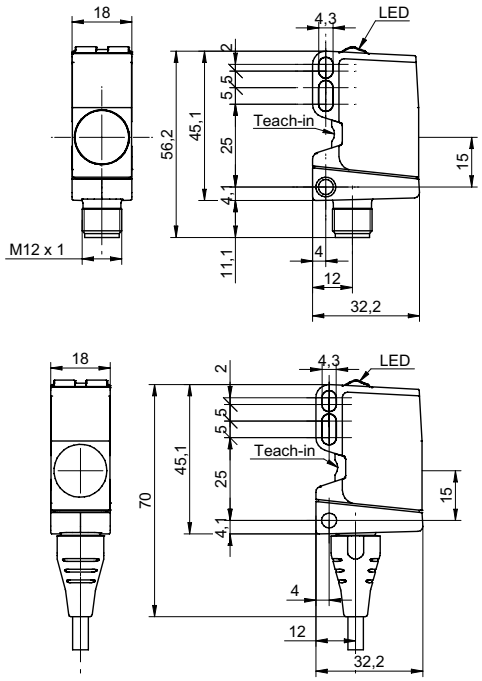
- external Teach-in
- Teach-in adapter
- small sonic beam angle

general data	
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
power-up drift	compensated after 15 min.
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption typ.	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 3,5 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA, PMMA)
width / diameter	18 mm
height / length	45 mm
depth	32 mm
ambient conditions	
operating temperature	-25 ... +65 °C
storage temperature	-40 ... +75 °C
protection class	IP 67

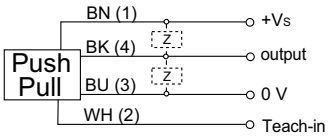
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11099942	Sensofix O500/U500
11092246	Mounting bracket O500/U500 (L design)
11111164	Mounting bracket O500/U500 - Retrofit for sensors series 30
11111163	Sonic beam deflector for sensors U500
for details: see accessories section	

order reference	connection types
U500.PA0-11120936	cable PUR 4 x 0,25, 2 m
U500.PA0-11110577	connector M12

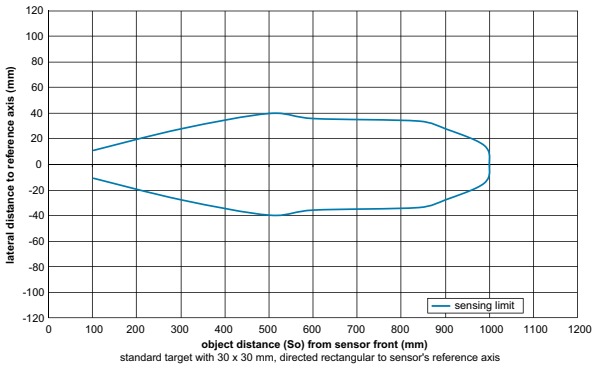
dimension drawings



connection diagram



typical sonic cone profile



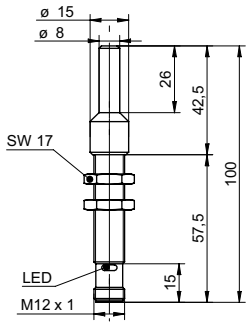
Sd = 40 mm

- high speed sensors
- with beam columnator for measurement in very small containers

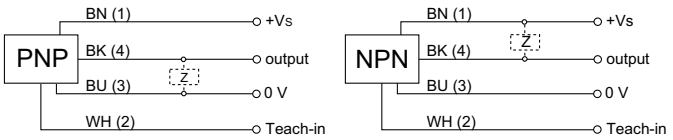
general data	
special type	Highspeed
scanning range Sd	0 ... 40 mm
scanning range far limit Sde	0 ... 40 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 1,3 ms
release time toff	< 1,3 ms
switching frequency	< 225 Hz
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	100 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

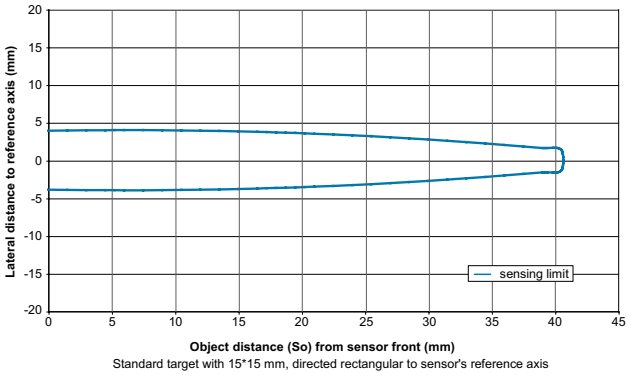
dimension drawing



connection diagrams



typical sonic cone profile



order reference	output circuit
UNAM 12N8910/S14OD	NPN make function (NO) / break function (NC)
UNAM 12P8910/S14OD	PNP make function (NO) / break function (NC)

Sd = 70 mm

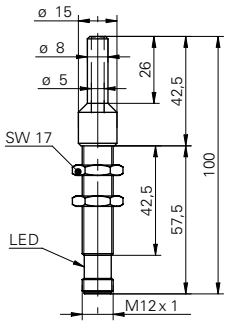
- with beam columnator for measurement in very small containers
- external Teach-in

general data	
scanning range Sd	5 ... 70 mm
scanning range far limit Sde	5 ... 70 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 10 ms
release time toff	< 10 ms
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	100 mm
connection types	connector M12
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

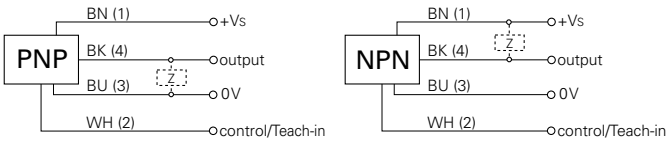
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

order reference	output circuit
UNAM 12N1914/S14D	NPN make function (NO)
UNAM 12P1914/S14D	PNP make function (NO)

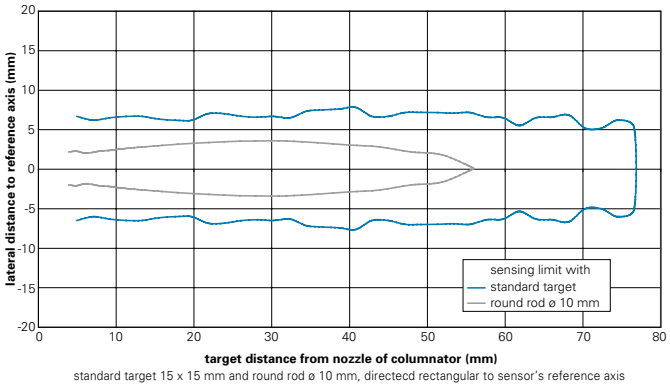
dimension drawing



connection diagrams



typical sonic cone profile



standard target 15 x 15 mm and round rod ø 10 mm, directecd rectangular to sensor's reference axis

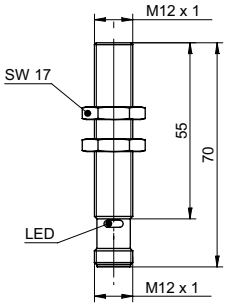
Sd = 70 mm

- high speed sensoren
- external Teach-in
- small sonic beam angle

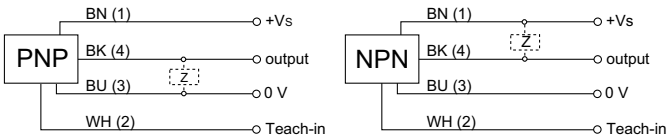
general data	
special type	Highspeed
scanning range Sd	10 ... 70 mm
scanning range far limit Sde	30 ... 70 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 1,3 ms
release time toff	< 1,3 ms
switching frequency	< 225 Hz
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

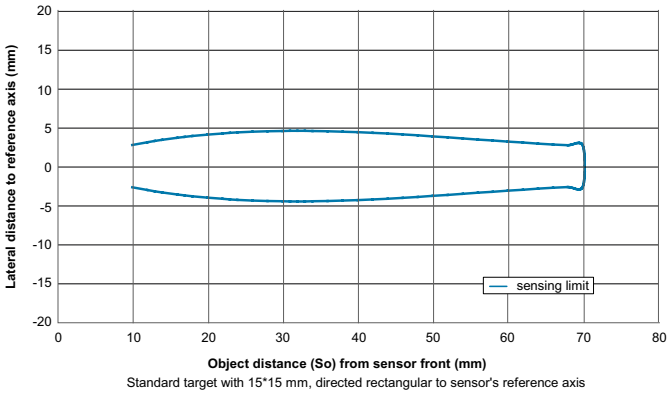
dimension drawing



connection diagrams



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

order reference	output circuit
UNAM 12N8910/S14O	NPN make function (NO) / break function (NC)
UNAM 12P8910/S14O	PNP make function (NO) / break function (NC)

Sd = 200 mm

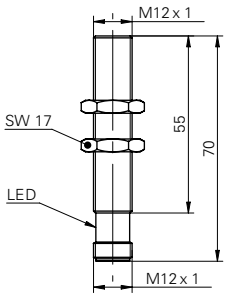
- external Teach-in
- Teach-in adapter
- small sonic beam angle

general data	
scanning range Sd	10 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 10 ms
release time toff	< 10 ms
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

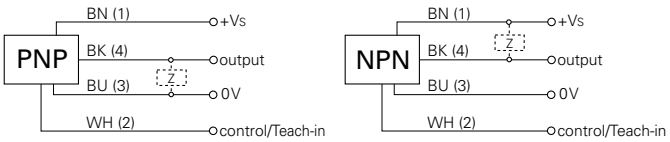
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

order reference	output circuit
UNAM 12N1914/S14	NPN make function (NO)
UNAM 12N3914/S14	NPN break function (NC)
UNAM 12P1914/S14	PNP make function (NO)
UNAM 12P3914/S14	PNP break function (NC)

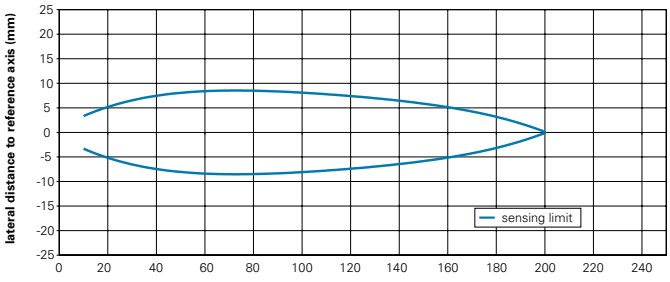
dimension drawing



connection diagrams



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

Sd = 400 mm

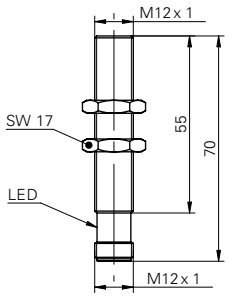
- external Teach-in
- Teach-in adapter
- wide sonic beam angle

general data	
scanning range Sd	40 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	290 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

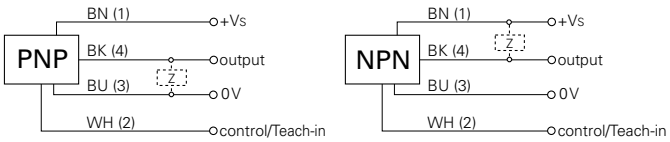
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

order reference	output circuit
UNAM 12N1912/S14	NPN make function (NO)
UNAM 12N3912/S14	NPN break function (NC)
UNAM 12P1912/S14	PNP make function (NO)
UNAM 12P3912/S14	PNP break function (NC)

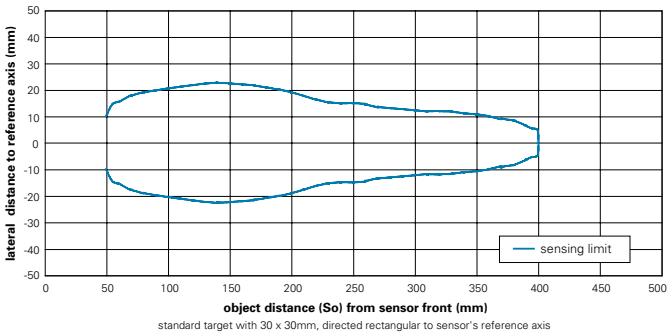
dimension drawing



connection diagrams



typical sonic cone profile



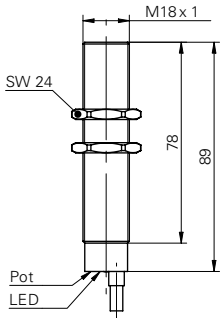
standard target with 30 x 30mm, directed rectangular to sensor's reference axis

Sd = 700 mm

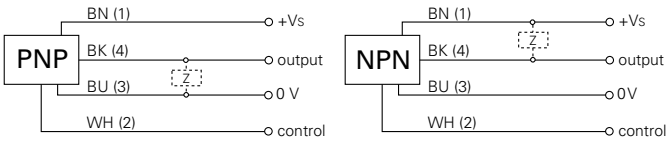
- potentiometer
- synchronization output

general data	
scanning range Sd	100 ... 700 mm
scanning range far limit Sde	110 ... 700 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
temperature drift	< 0,18 % Sde/K
response time ton (sync on)	< 50 ms
release time toff (sync on)	< 50 ms
sonic frequency	240 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	30 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	18 mm
height / length	89 mm
connection types	cable, 2 m
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

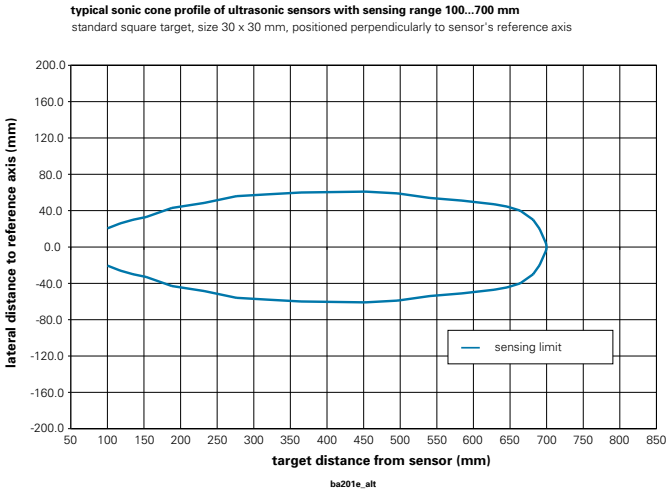
dimension drawing



connection diagrams



typical sonic cone profile



Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

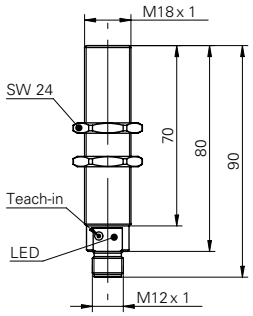
order reference	output circuit
UNAM 18N1703	NPN make function (NO)
UNAM 18N3703	NPN break function (NC)
UNAM 18P1703	PNP make function (NO)
UNAM 18P3703	PNP break function (NC)

Sd = 1000 mm

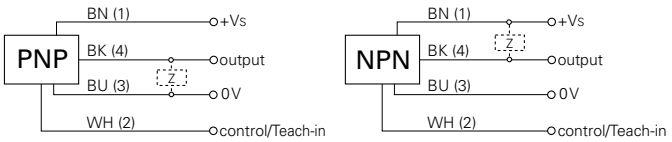
- internal and external Teach-in

general data	
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	18 mm
height / length	90 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

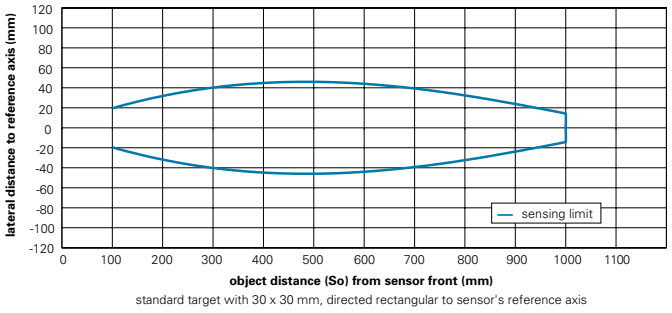
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

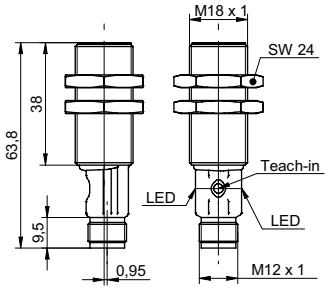
order reference	output circuit
UNAM 18N6903/S14	NPN make function (NO)
UNAM 18P6903/S14	PNP make function (NO)
UNAM 18P7903/S14	PNP break function (NC)

Sd = 1000 mm

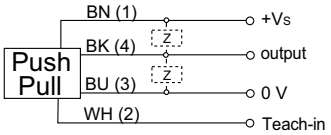
- external Teach-in
- Teach-in adapter
- small sonic beam angle

general data	
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
power-up drift	compensated after 10 min.
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption typ.	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 3,5 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated / TR90
width / diameter	18 mm
height / length	64 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 ... +70 °C
storage temperature	-40 ... +85 °C
protection class	IP 67
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	
order reference	
UR18.PA0-11120038	

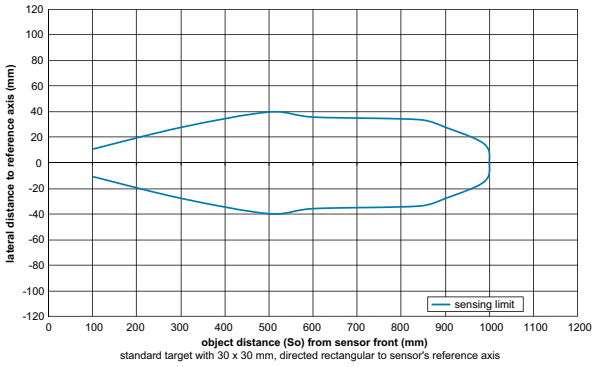
dimension drawing



connection diagram



typical sonic cone profile



Sd = 400 mm

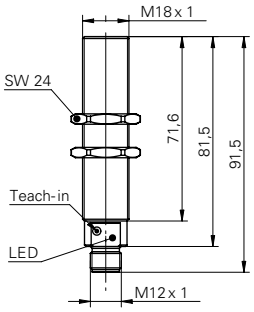
- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

general data	
special type	chemically resistant
scanning range Sd	60 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	400 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

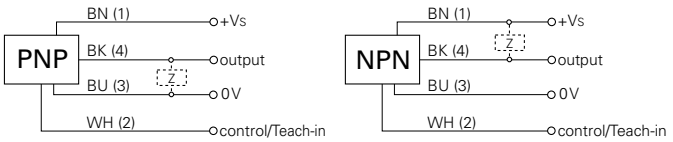
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

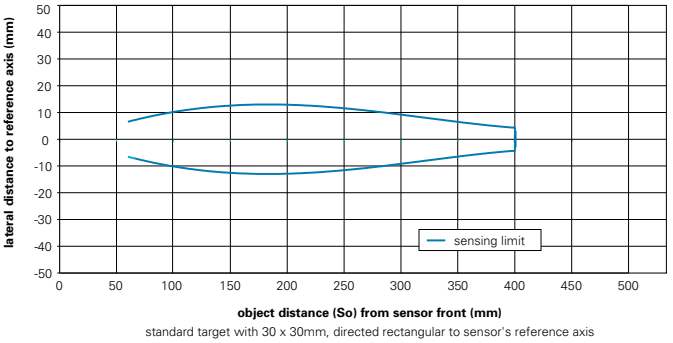
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

order reference	output circuit
UNAR 18N6912/S14G	NPN make function (NO)
UNAR 18N7912/S14G	NPN break function (NC)
UNAR 18P6912/S14G	PNP make function (NO)
UNAR 18P7912/S14G	PNP break function (NC)

Sd = 1000 mm

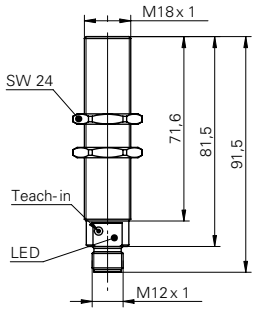
- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

general data	
special type	chemically resistant
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

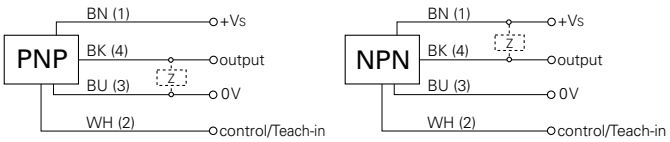
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

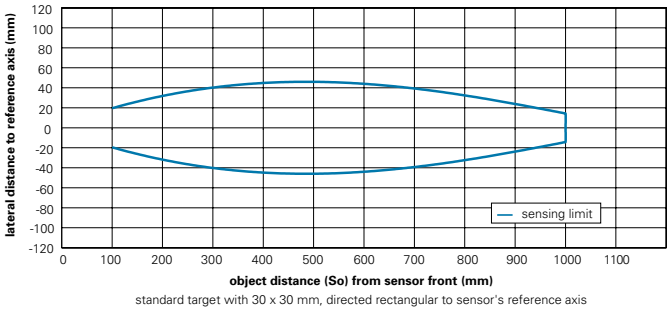
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

order reference	output circuit
UNAR 18N6903/S14G	NPN make function (NO)
UNAR 18N7903/S14G	NPN break function (NC)
UNAR 18P6903/S14G	PNP make function (NO)
UNAR 18P7903/S14G	PNP break function (NC)

Sd = 1500 mm

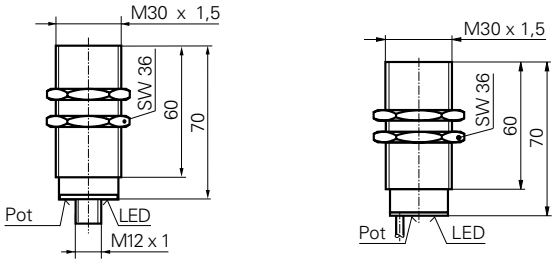
- potentiometer
- increased sensing range

general data	
scanning range Sd	200 ... 1500 mm
scanning range far limit Sde	200 ... 1500 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 1 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 100 ms
release time toff	< 100 ms
sonic frequency	200 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	30 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	70 mm
ambient conditions	
operating temperature	-25 ... +60 °C
protection class	IP 67

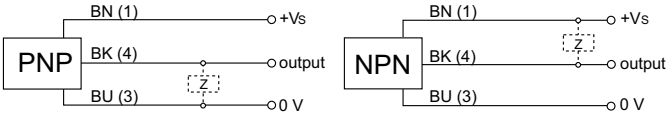
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	output circuit	connection types
UNAM 30N1104	NPN make function (NO)	cable, 2 m
UNAM 30N1104/S14	NPN make function (NO)	connector M12
UNAM 30N3104	NPN break function (NC)	cable, 2 m
UNAM 30N3104/S14	NPN break function (NC)	connector M12
UNAM 30P1104	PNP make function (NO)	cable, 2 m
UNAM 30P1104/S14	PNP make function (NO)	connector M12
UNAM 30P3104	PNP break function (NC)	cable, 2 m
UNAM 30P3104/S14	PNP break function (NC)	connector M12

dimension drawings

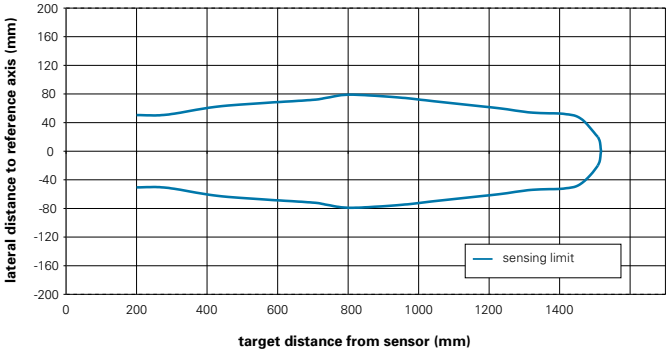


connection diagrams



typical sonic cone profile

typical sonic beam of ultrasonic sensors with sensing range 200...1500 mm
standard target 100 x 100 mm, positioned perpendicularly to sensor's reference axis



Sd = 2500 mm

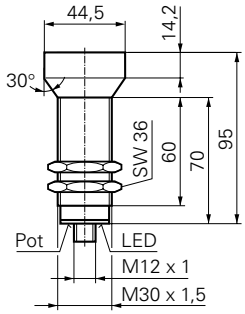
- potentiometer
- synchronization output
- long sensing range

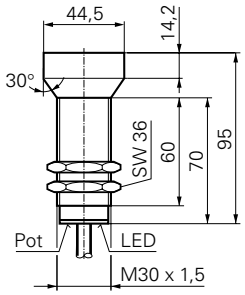
general data	
scanning range Sd	350 ... 2500 mm
scanning range far limit Sde	350 ... 2500 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 1 mm
synchronization	yes
temperature drift	< 0,18 % Sde/K
response time ton	< 160 ms
release time toff	< 160 ms
sonic frequency	120 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
ambient conditions	
operating temperature	-25 ... +60 °C
protection class	IP 67

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

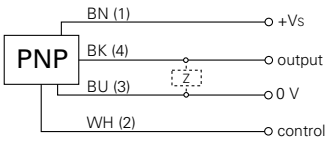
order reference	output circuit	connection types
UNAM 50N1721	NPN make function (NO)	cable, 2 m
UNAM 50N1721/S14	NPN make function (NO)	connector M12
UNAM 50N3721	NPN break function (NC)	cable, 2 m
UNAM 50N3721/S14	NPN break function (NC)	connector M12
UNAM 50P1721	PNP make function (NO)	cable, 2 m
UNAM 50P1721/S14	PNP make function (NO)	connector M12
UNAM 50P3721	PNP break function (NC)	cable, 2 m
UNAM 50P3721/S14	PNP break function (NC)	connector M12

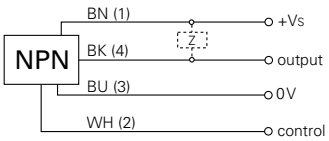
dimension drawings





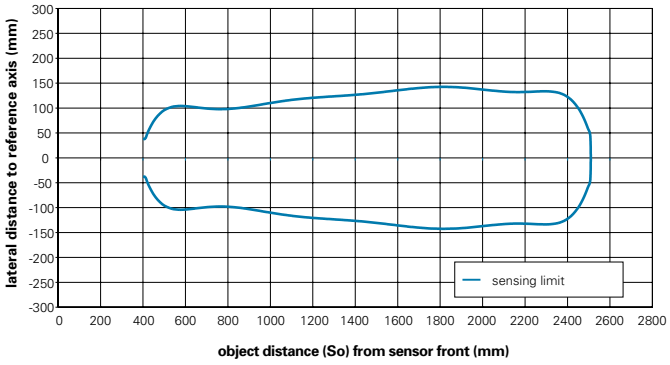
connection diagrams





typical sonic cone profile

typical sonic beam of ultrasonic sensors with sensing range 400...2500 mm
standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis



2 point proximity switches

Ultrasonic 2 point proximity switches

The button that thinks

Ultrasonic sensors with the "Teach-in" function are similar to the standard range of products but have the added versatility of a simple touch key set up. The switching points (Sde 1 and Sde 2) may be easily programmed within the sensing range by means of the built-in Teach-in button.

Simple operation

Adjustment switching point Sde 1

1. Adjustment mode:

   Press the Teach-in button for approximately 2 secs until the LED flashes green. Release button.

2. LED flashes green. Place the target at the required scanning range and press the Teach-in button.

3. Successful completion of Teach-in procedure is confirmed by LED „on" for approximately 2 secs.

Adjustment switching point Sde 2

1. Adjustment mode:

   Press the Teach-in button for approximately 4 secs until the LED flashes yellow. Release button.

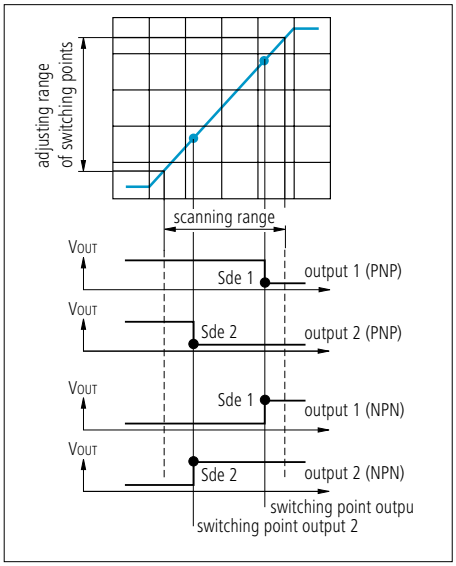
2. LED flashes yellow. Place the target at the required scanning range and press the Teach-in button.

3. Successful completion of Teach-in procedure is confirmed by LED „on" for approximately 2 secs.

Resetting to original factory settings

Holding the button down for > 6 secs, will automatically restore the original factory setting. Fast flashing of the green/yellow LED indicates successful completion of the resetting.

Functional diagram



Options

- Remote Teach-in input
- Synchronization- / Multiplex output

Advantages

- Set up configuration is saved on an internal EEPROM ensuring long term stability.
- Simple one button set up, no tools required.
- Teach-in lock: the Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

rectangular designs

product family	UZDK 30	UZDK 30	UZDK 30	UZDK 30
				
width / diameter	30 mm	30 mm	30 mm	30 mm
scanning range Sd	30 ... 250 mm	60 ... 400 mm	100 ... 1000 mm	200 ... 2000 mm
Teach-in	■	■	■	■
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 1 mm
operating temperature	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C
housing material	polyester / die-cast zinc	polyester / die-cast zinc	polyester / die-cast zinc	polyester / die-cast zinc
cable, 2 m	■		■	■
connector M12	■	■	■	■
protection class	IP 67	IP 67	IP 67	IP 67
page	**48**	**49**	**50**	**51**

cylindrical designs

product family	UZAM 30	UZAM 50	UZAM 70
			
width / diameter	30 mm	30 mm	30 mm
scanning range Sd	100 ... 1000 mm	350 ... 2500 mm	600 ... 6000 mm
Teach-in	■	■	■
repeat accuracy	< 0,5 mm	< 1 mm	< 3 mm
operating temperature	-10 ... +60 °C	-10 ... +60 °C	-25 ... +60 °C
housing material	brass nickel plated	brass nickel plated	brass nickel plated
cable, 2 m	■	■	
connector M12	■	■	■
protection class	IP 67	IP 67	IP 67
page	**52**	**53**	**54**

Sd = 250 mm

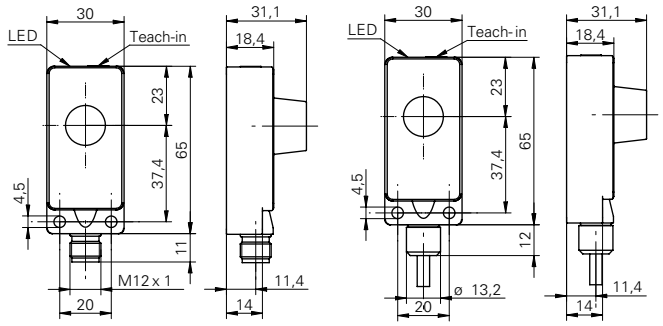
- Teach-in
- small blind range
- two separate outputs

general data	
special type	2 point proximity switch
scanning range Sd	30 ... 250 mm
scanning range far limit Sde	30 ... 250 mm
hysteresis typ.	5 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
response time ton	< 20 ms
release time toff	< 20 ms
sonic frequency	300 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	PNP make function (NO)
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

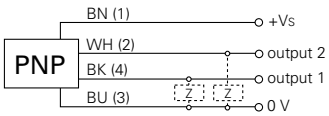
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152386	Sensofix series 30
for details: see accessories section	

order reference	connection types
UZDK 30P6113	cable, 2 m
UZDK 30P6113/S14	connector M12

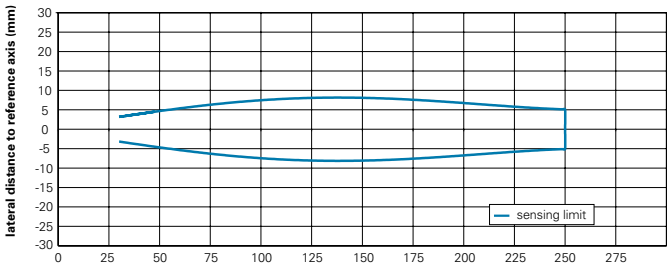
dimension drawings



connection diagram



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

Sd = 400 mm

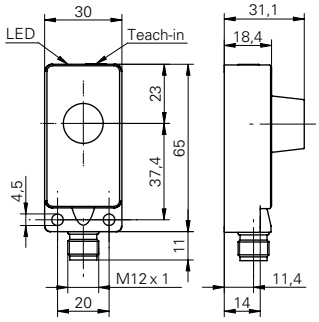
- Teach-in
- two separate outputs

general data	
special type	2 point proximity switch
scanning range Sd	60 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
response time ton	< 30 ms
release time toff	< 30 ms
sonic frequency	400 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	40 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

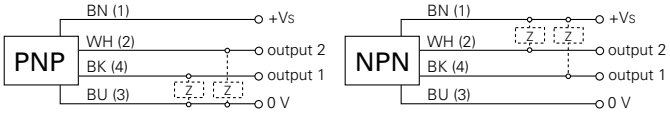
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152386	Sensofix series 30
for details: see accessories section	

order reference	output circuit
UZDK 30N6112/S14	NPN make function (NO)
UZDK 30P6112/S14	PNP make function (NO)

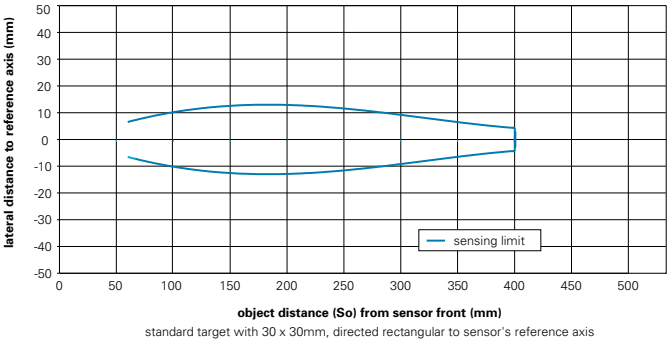
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

Sd = 1000 mm

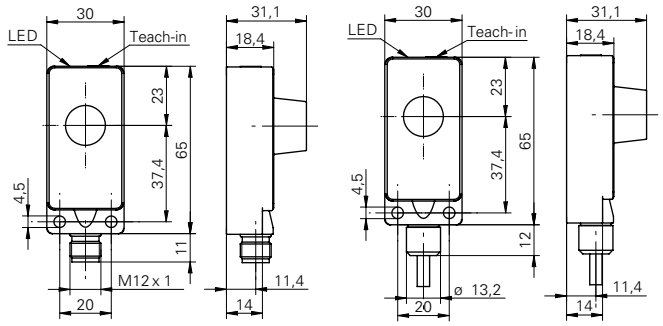
- Teach-in
- two separate outputs

general data	
special type	2 point proximity switch
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
response time ton	< 40 ms
release time toff	< 40 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	PNP make function (NO)
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

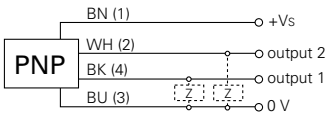
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152386	Sensofix series 30
for details: see accessories section	

order reference	connection types
UZDK 30P6103	cable, 2 m
UZDK 30P6103/S14	connector M12

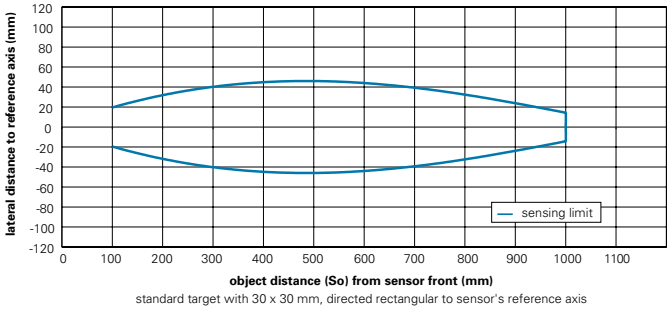
dimension drawings



connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

Sd = 2000 mm

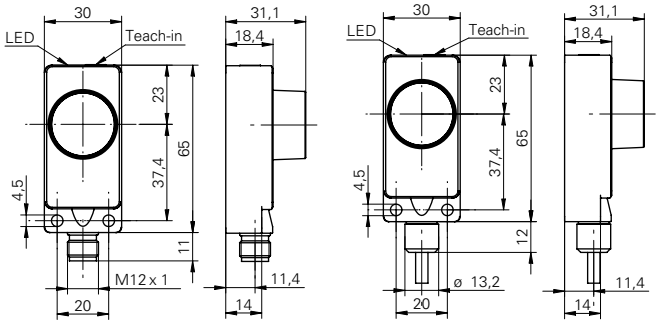
- Teach-in
- two separate outputs

general data	
special type	2 point proximity switch
scanning range Sd	200 ... 2000 mm
scanning range far limit Sde	200 ... 2000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 1 mm
temperature drift	< 2 % Sde
response time ton	< 80 ms
release time toff	< 80 ms
sonic frequency	200 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	PNP make function (NO)
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

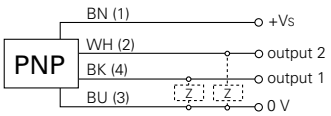
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152386	Sensofix series 30
for details: see accessories section	

order reference	connection types
UZDK 30P6104	cable, 2 m
UZDK 30P6104/S14	connector M12

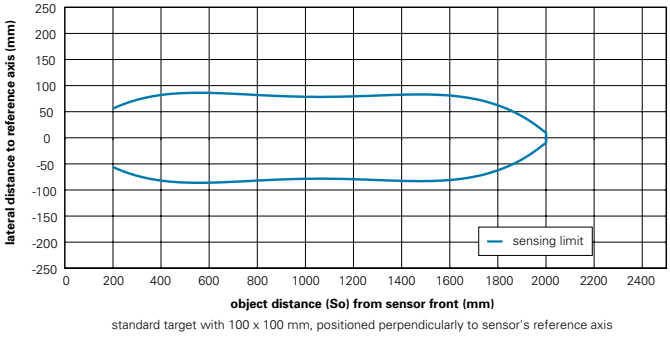
dimension drawings



connection diagram



typical sonic cone profile



standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis

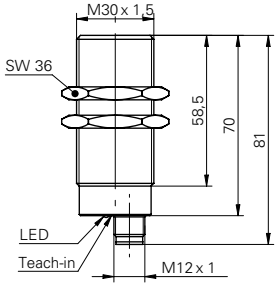
Sd = 1000 mm

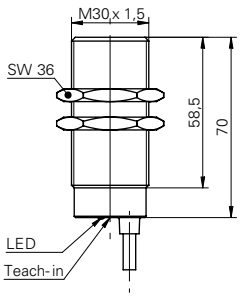
- Teach-in
- two separate outputs
- Multiplex-Function

general data	
special type	2 point proximity switch
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
response time ton	< 40 ms
release time toff	< 40 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	70 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

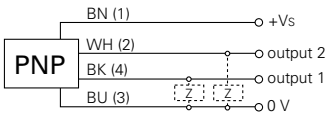
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
additional cable connectors and field wireable connectors: see accessories	

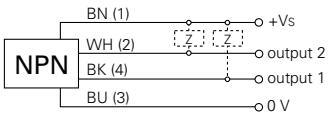
dimension drawings



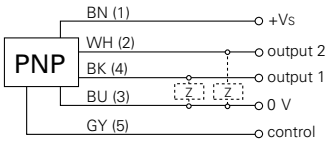


connection diagrams

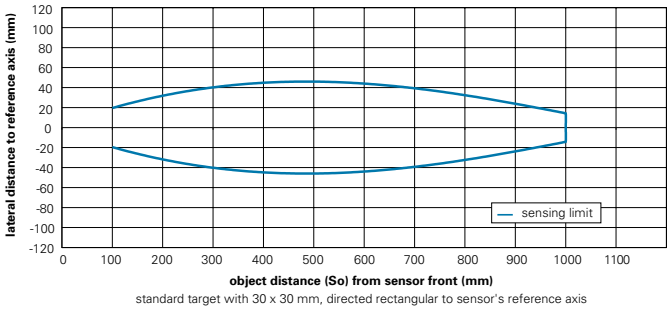




connection diagram multiplex version



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

order reference	version	output circuit	connection types
UZAM 30N6103/S14	standard	NPN make function (NO)	connector M12
UZAM 30P6103	standard	PNP make function (NO)	cable, 2 m
UZAM 30P6103/S14	standard	PNP make function (NO)	connector M12
UZAM 30P6803/S14C	multiplex version	PNP make function (NO)	connector M12

Sd = 2500 mm

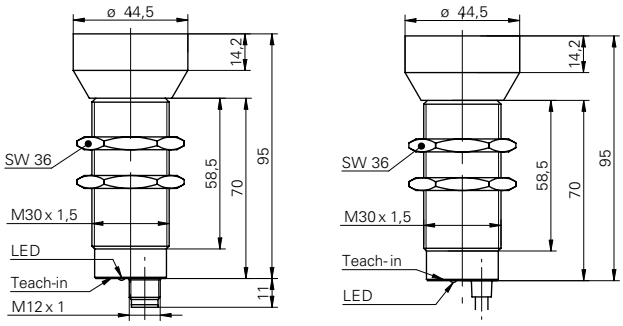
- Teach-in
- two separate outputs
- long sensing range

general data	
special type	2 point proximity switch
scanning range Sd	350 ... 2500 mm
scanning range far limit Sde	350 ... 2500 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 1 mm
temperature drift	< 2 % Sde
response time ton	< 160 ms
release time toff	< 160 ms
sonic frequency	120 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	40 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

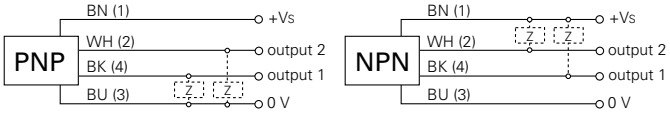
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	output circuit	connection types
UZAM 50N6121	NPN make function (NO)	cable, 2 m
UZAM 50N6121/S14	NPN make function (NO)	connector M12
UZAM 50P6121	PNP make function (NO)	cable, 2 m
UZAM 50P6121/S14	PNP make function (NO)	connector M12

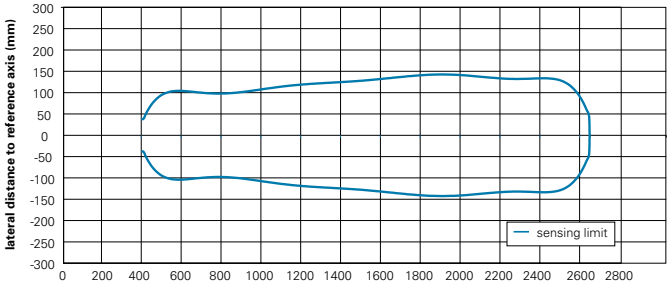
dimension drawings



connection diagrams



typical sonic cone profile



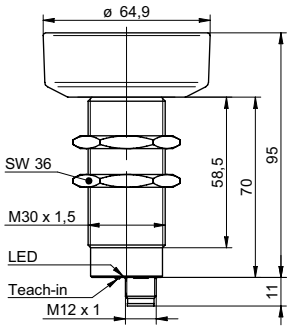
standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis

Sd = 6000 mm

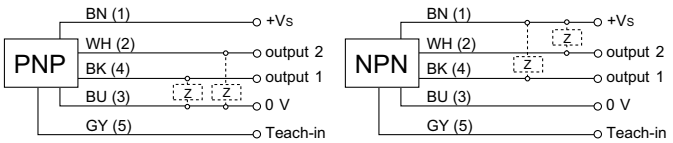
- Teach-in
- two separate outputs
- long sensing range

general data	
special type	2 point proximity switch
scanning range Sd	600 ... 6000 mm
scanning range far limit Sde	600 ... 6000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
response time ton	< 240 ms
release time toff	< 240 ms
sonic frequency	80 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	40 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 ... +60 °C
protection class	IP 67

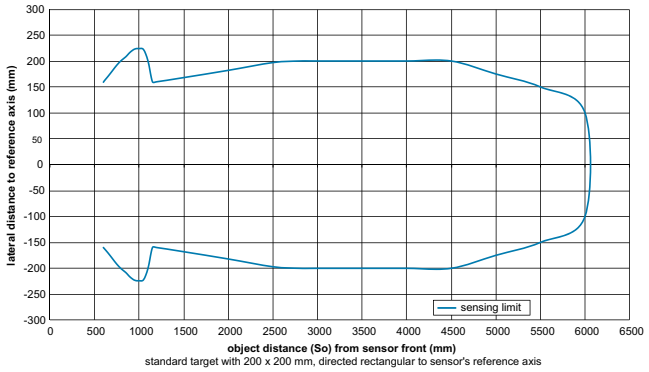
dimension drawing



connection diagrams

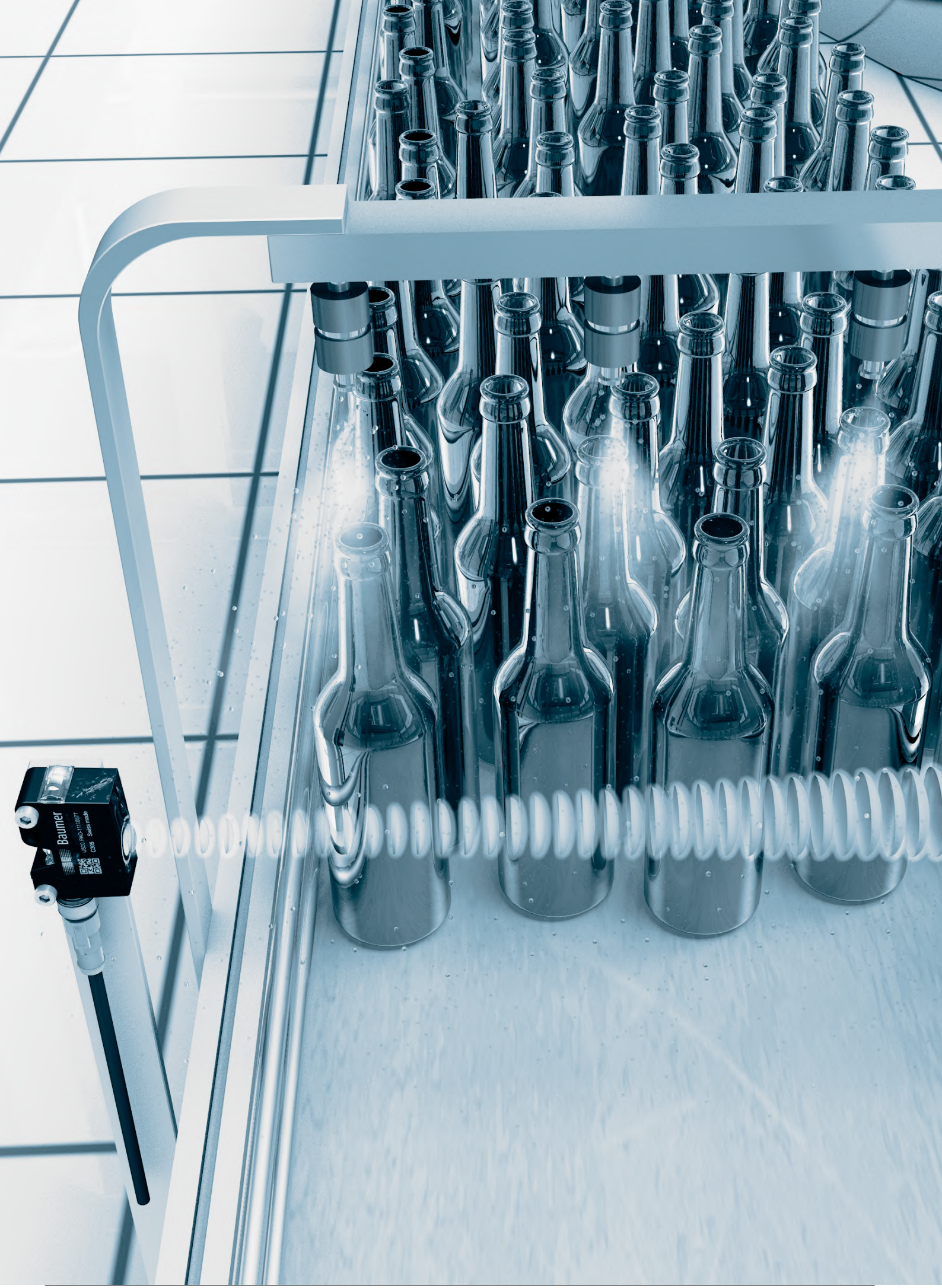


typical sonic cone profile



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
additional cable connectors and field wireable connectors: see accessories	

order reference	output circuit
UZAM 70N8131/S14C	NPN make function (NO) / break function (NC)
UZAM 70P8131/S14C	PNP make function (NO) / break function (NC)


Baumer

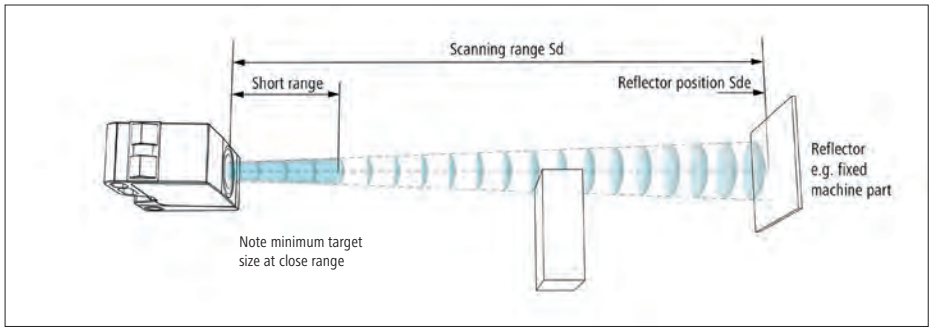
Retro-reflective sensors

Ultrasonic retro-reflective sensors

Description

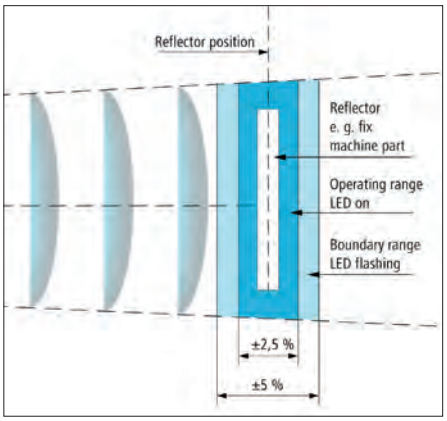
The retro-reflective ultrasonic sensor is similar in operation to the ultrasonic proximity sensor. The distance from the sensor to the reflector or to an object within the sensing distance is determined by measuring the propagation time. Any sound reflecting, stationary object can be used as a reflector. The sensing distance Sd (distance sensor-reflector) can be adjusted to the set up conditions with the sensor's potentiometer.

As long as the measured propagation time of the ultrasonic signal corresponds to the distance from the sensor to the reflector, the device is in the non-active state. When an object comes within the sensing distance, the propagation time changes and the sensor changes to the active state. This also allows detection of sound absorbent and sound deflecting objects.



Setting Sde reflector distance

The sensor's potentiometer allows the user to adjust the set up conditions for a specific reflector position (Sde). The output LED is also an adjustment aid as follows:



1. Reflector in operating range
If the setting of Sde deviates from the actual reflector position by less than ±2,5 %, the reflector is in the operating range. The LED lights steadily, the output is inactive.

2. Reflector in the boundary range
Up to a deviation of ±5 % the output remains inactive but the LED flashes. This indicates that the setting of Sde is not optimal and needs to be corrected.

Retro-reflective sensor with Teach-in

All adjustments are made using the single built-in Teach-in button.

Teach-in of reflector's position
To enter the adjustment mode, push the Teach-in button for more than two seconds. You will know you have pushed it long enough by the indicating LED flashing green. When the button is released, the LED continues to flash. Any subsequent push of the button will teach the position of the reflector.

Resetting to original factory settings
Connecting the white Teach-in wire to +Vs for > 6 sec, will automatically restore the original factory settings. Fast flashing of the LED indicates successful completion of the resetting.

qTeach™

With *qTeach*™ we are introducing a new, convenient and wear-free teach procedure. Teaching of O500 sensors is just by a touch with any ferromagnetic tool. A blue LED light provides clear optical feedback. To prevent user errors, *qTeach*™ locks autonomously after 5 minutes.

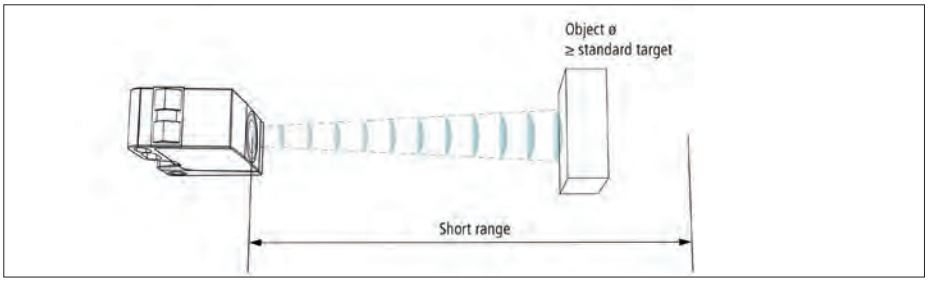
Object detection

Standard object/reflector

The standard target is defined as a square, level object with an edge length of 30 mm (Sde > 1000 mm: 100 mm edge length, Sde ≥ 2500 mm: 300 mm edge length) which is perpendicular to the sensor reference axis. The reflector must be made of a material with good sound reflection properties and be at least the same size as the target.

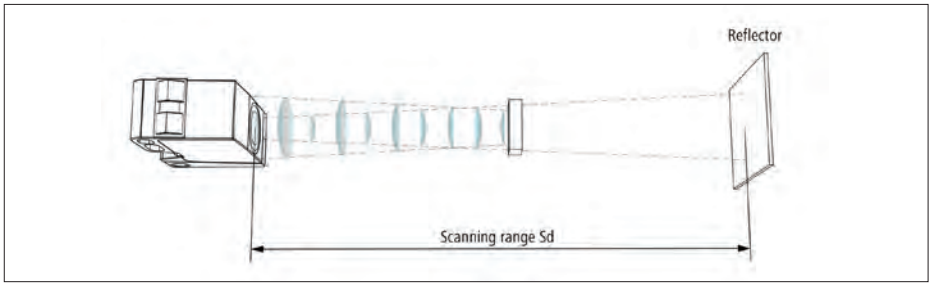
Object at close range

For reliable detection, the sound cone must be covered completely so that no echo is returned from the reflector. The object diameter necessary for this is at least 30 mm in URDK 30 and at least 100 mm in URAM 50.



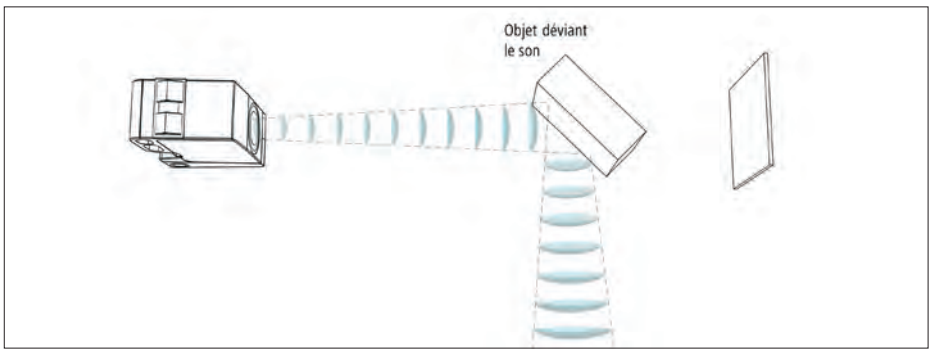
Object in the rest of the operating range

To ensure reliable object detection, the reflected signal must be strong enough. The strength of the reflected signal is dependent on the size of the object. For a standard object, or larger, the full sensing distance Sd is available.



Advantages

- Easy detection even for 100 % sound absorbent materials
- Reliable detection of sound deflecting objects
- No blind region in front of the sensor for objects ≥ standard object



rectangular designs

product family	URCK 09	URDK 09	URDK 10	URDK 20	URDK 20	URDK 20	URDK 30
							
	Miniature	Miniature	Miniature	Standard	Standard	Standard	Standard
width / diameter	8,6 mm	8,6 mm	10,4 mm	20 mm	20 mm	20 mm	30 mm
scanning range Sd	0 ... 200 mm	0 ... 200 mm	0 ... 200 mm	0 ... 200 mm	0 ... 400 mm	0 ... 1000 mm	0 ... 1000 mm
potentiometer							■
Teach-in	■	■	■	■	■	■	
qTeach							
repeat accuracy	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 3 mm
operating temperature	0 ... +60 °C	0 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C
housing material	PA 12	PA 12	plastic (ASA)	polyester	polyester	polyester	polyester / die-cast zinc
cable PUR 4 x 0,25, 2 m							
cable, 2 m	■	■	■				
flylead connector M8, L=200 mm	■	■	■				
connector M8			■	■	■	■	
connector M12							■
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
page	**62**	**63**	**64**	**66**	**67**	**68**	**69**

cylindrical designs

product family	URAM 12	URAM 12	URAR 18	UR18.RA0	URAM 50
					
special type	High-speed	High-speed	Robust	Standard	Large sensing distance
width / diameter	12 mm	12 mm	18 mm	18 mm	30 mm
scanning range Sd	0 ... 40 mm	0 ... 70 mm	0 ... 400 mm	0 ... 1000 mm	0 ... 3000 mm
potentiometer					■
external Teach-in	■	■			
Teach-in			■		■
qTeach				■	
repeat accuracy	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 3 mm	< 3 mm
operating temperature	-10 ... +60 °C	-10 ... +60 °C	0 ... +60 °C	-25 ... +70 °C	-10 ... +60 °C
housing material	brass nickel plated	brass nickel plated	stainless steel 1.4435 (V4A)	brass nickel plated / TR90	brass nickel plated
cable, 2 m					■
connector M12	■	■	■	■	■
protection class	IP 67	IP 67	IP 67	IP 67	IP 67
page	**73**	**74**	**75**	**77**	**78**

	U500.RA0	URDK 30
		
	Extra performance	Standard
	18 mm	30 mm
	0 ... 1000 mm	0 ... 2000 mm
		■
	■	
	< 3 mm	< 3 mm
	-25 ... +65 °C	-10 ... +60 °C
	plastic (ASA, PMMA)	polyester / die-cast zinc
	■	
	■	■
	IP 67	IP 67
	70	**72**

Sd = 200 mm

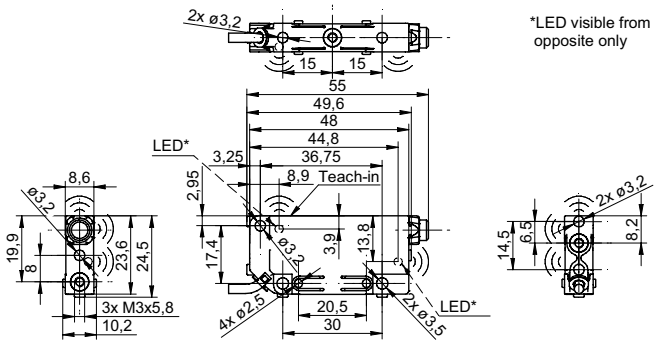
- detects sound absorbing objects
- long sensing range / no blind range
- short response time

general data	
scanning range Sd	0 ... 200 mm
reflector position Sde	60 ... 200 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

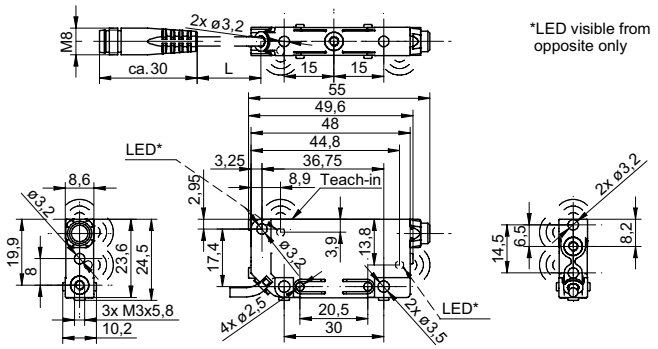
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	connection types
URCK 09G8914	cable, 2 m
URCK 09G8914/KS35A	flylead connector M8, L=200 mm

dimension drawing

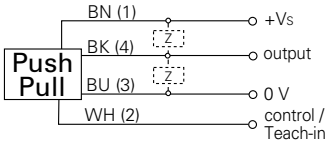


flylead connector version

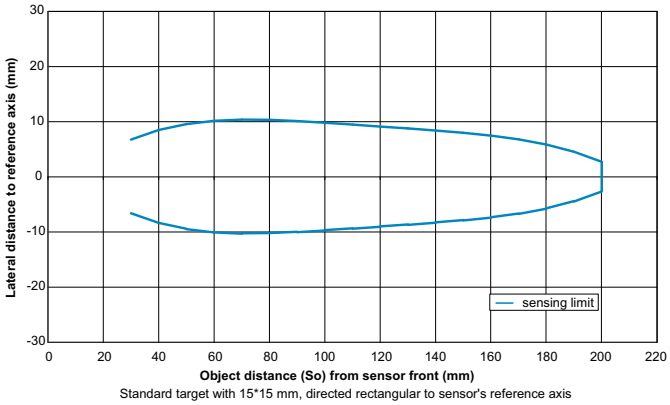


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

Sd = 200 mm

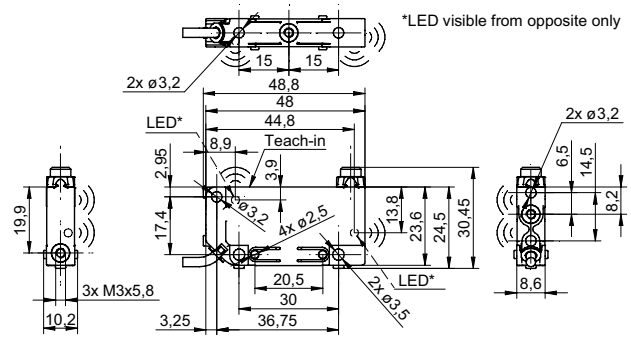
- detects sound absorbing objects
- long sensing range / no blind range
- short response time

general data	
scanning range Sd	0 ... 200 mm
reflector position Sde	60 ... 200 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

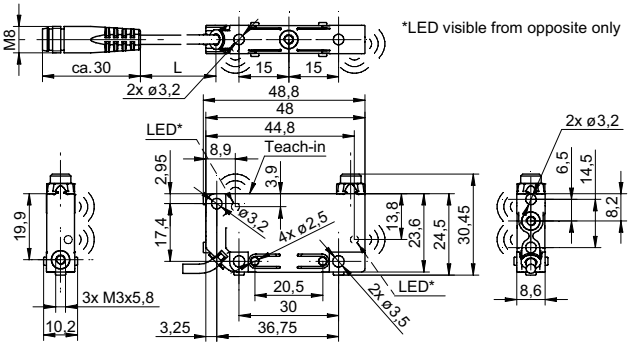
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

order reference	connection types
URDK 09G8914	cable, 2 m
URDK 09G8914/KS35A	flylead connector M8, L=200 mm

dimension drawing

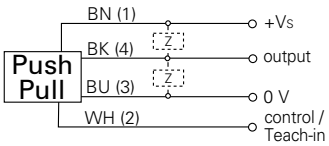


flylead connector version

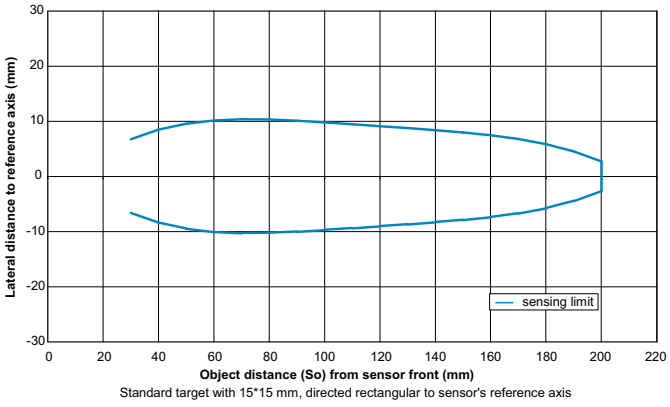


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

Sd = 200 mm

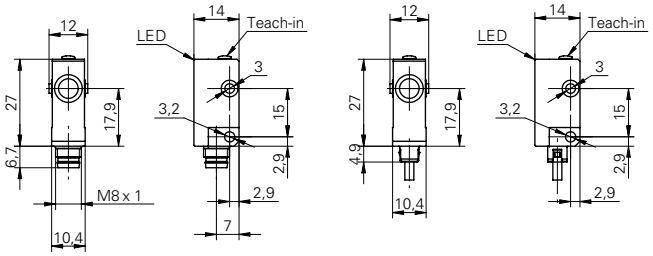
- small housing dimensions
- very low mass (4 g)
- long sensing range / no blind range

general data	
scanning range Sd	0 ... 200 mm
reflector position Sde	40 ... 200 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 15 ms
release time toff	< 15 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	30 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA)
width / diameter	10,4 mm
height / length	27 mm
depth	14 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

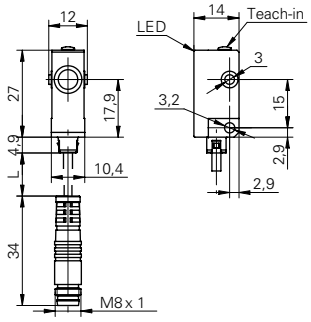
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10150326	Sensofix series 10 / series 20
10133792	Mounting bracket series 10 (L design)
10114501	Mounting bracket series 10 (U design)
10162083	Mounting panel for sensors series 10
10118798	Mounting bracket series 10
10162376	Sonic beam deflector for ultrasonic sensors series 10
for details: see accessories section	

dimension drawings

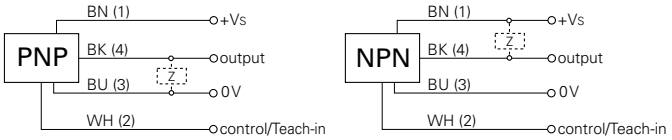


flylead connector version

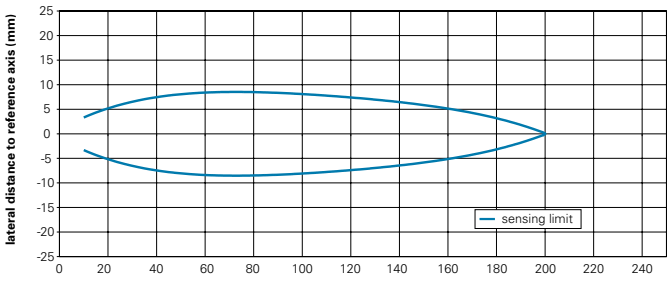


standard cable length 200 mm (L)

connection diagrams



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

order reference	output circuit	connection types
URDK 10N8914	NPN make function (NO) / break function (NC)	cable, 2 m
URDK 10N8914/KS35A	NPN make function (NO) / break function (NC)	flylead connector M8, L=200 mm
URDK 10N8914/S35A	NPN make function (NO) / break function (NC)	connector M8
URDK 10P8914	PNP make function (NO) / break function (NC)	cable, 2 m
URDK 10P8914/KS35A	PNP make function (NO) / break function (NC)	flylead connector M8, L=200 mm
URDK 10P8914/S35A	PNP make function (NO) / break function (NC)	connector M8

Sd = 200 mm

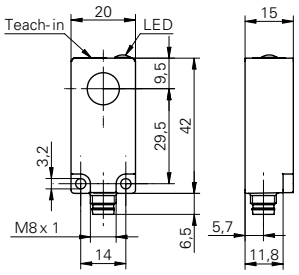
- internal and external Teach-in
- small sonic beam angle
- compact housing

general data	
scanning range Sd	0 ... 200 mm
reflector position Sde	40 ... 200 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 10 ms
release time toff	< 10 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

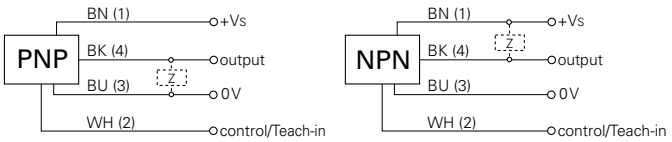
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

order reference	output circuit
URDK 20N6914/S35A	NPN make function (NO)
URDK 20N7914/S35A	NPN break function (NC)
URDK 20P6914/S35A	PNP make function (NO)
URDK 20P7914/S35A	PNP break function (NC)

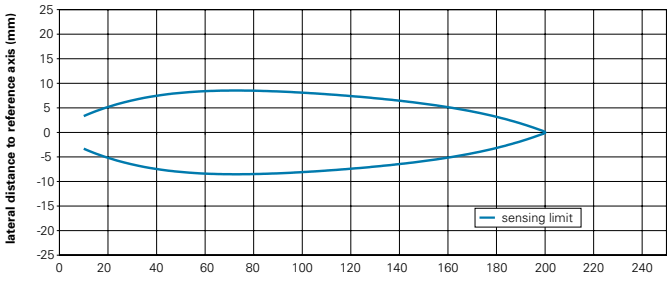
dimension drawing



connection diagrams



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

Sd = 400 mm

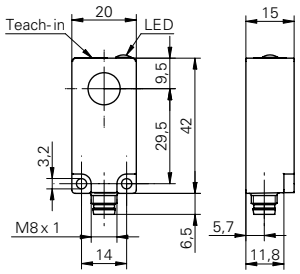
- internal and external Teach-in
- wide sonic beam angle
- compact housing

general data	
scanning range Sd	0 ... 400 mm
reflector position Sde	100 ... 400 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	290 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

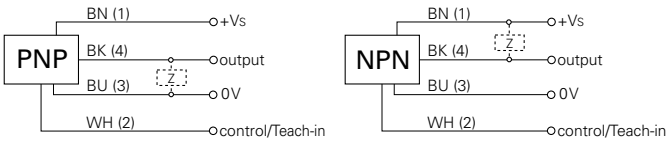
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

order reference	output circuit
URDK 20N6912/S35A	NPN make function (NO)
URDK 20N7912/S35A	NPN break function (NC)
URDK 20P6912/S35A	PNP make function (NO)
URDK 20P7912/S35A	PNP break function (NC)

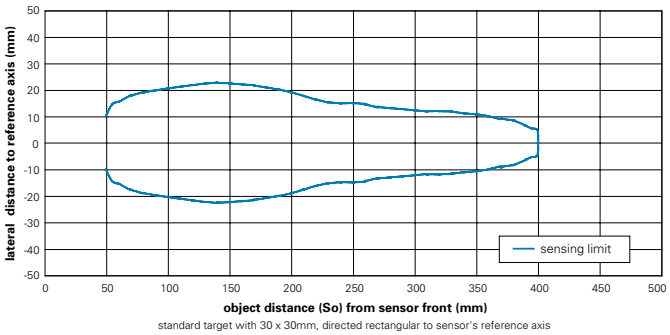
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

Sd = 1000 mm

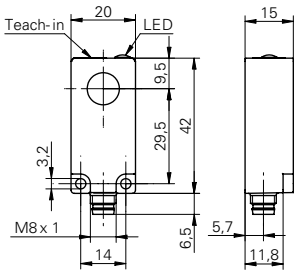
- internal and external Teach-in
- small sonic beam angle
- compact housing

general data	
scanning range Sd	0 ... 1000 mm
reflector position Sde	200 ... 1000 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

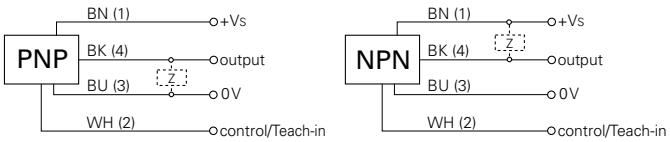
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

order reference	output circuit
URDK 20N6903/S35A	NPN make function (NO)
URDK 20N7903/S35A	NPN break function (NC)
URDK 20P6903/S35A	PNP make function (NO)
URDK 20P7903/S35A	PNP break function (NC)

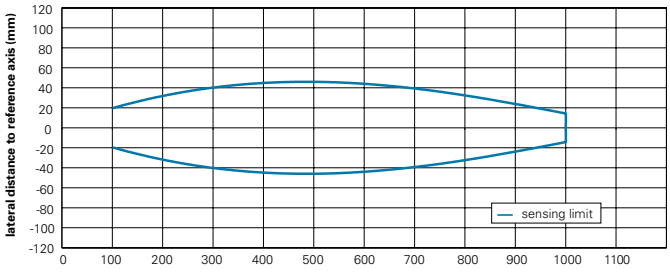
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

Sd = 1000 mm

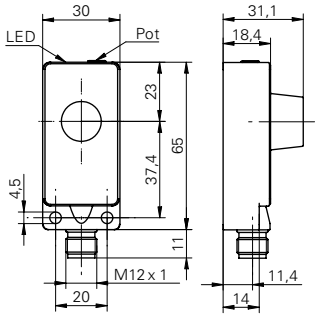
- potentiometer
- synchronization output
- detects sound absorbing objects

general data	
scanning range Sd	0 ... 1000 mm
reflector position Sde	200 ... 1000 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
synchronization	yes
multiplex version	on request
response time ton (sync on)	< 50 ms
release time toff (sync on)	< 50 ms
sonic frequency	240 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

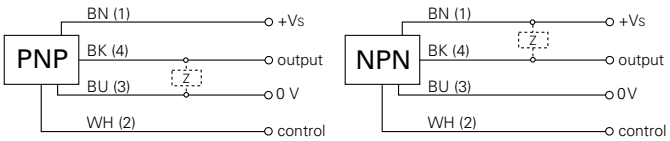
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152386	Sensofix series 30
for details: see accessories section	

order reference	output circuit
URDK 30N1703/S14	NPN make function (NO)
URDK 30N3703/S14	NPN break function (NC)
URDK 30P1703/S14	PNP make function (NO)
URDK 30P3703/S14	PNP break function (NC)

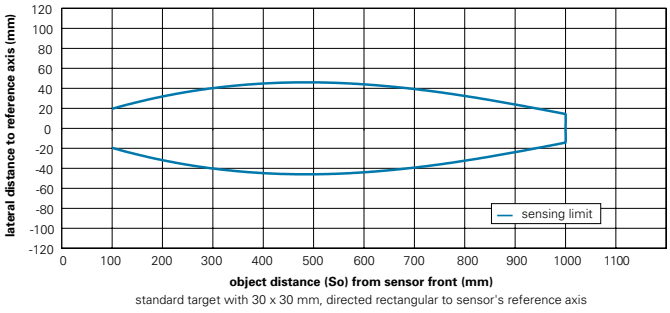
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

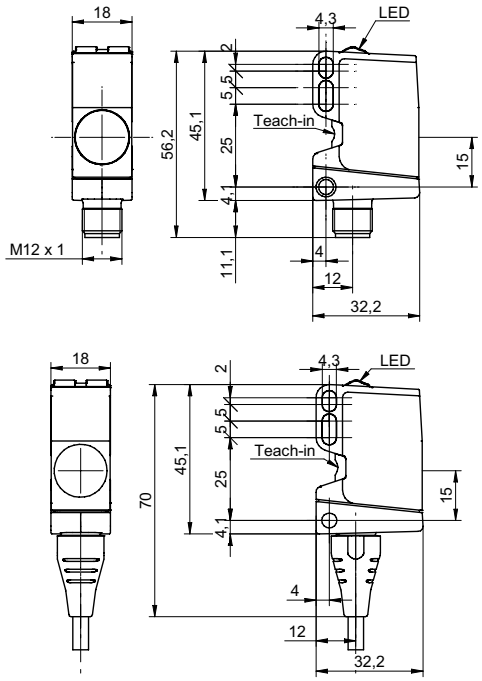
Sd = 1000 mm

- detects sound absorbing objects
- long sensing range / no blind range
- short response time

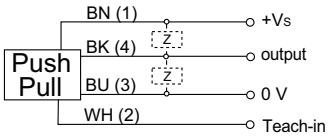
general data	
scanning range Sd	0 ... 1000 mm
reflector position Sde	200 ... 1000 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
power-up drift	compensated after 15 min.
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption typ.	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 3,5 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA, PMMA)
width / diameter	18 mm
height / length	45 mm
depth	32 mm
ambient conditions	
operating temperature	-25 ... +65 °C
storage temperature	-40 ... +75 °C
protection class	IP 67
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11099942	Sensofix O500/U500
11092246	Mounting bracket O500/U500 (L design)
11111164	Mounting bracket O500/U500 - Retrofit for sensors series 30
11111163	Sonic beam deflector for sensors U500
for details: see accessories section	

order reference	connection types
U500.RA0-11127347	cable PUR 4 x 0,25, 2 m
U500.RA0-11110579	connector M12

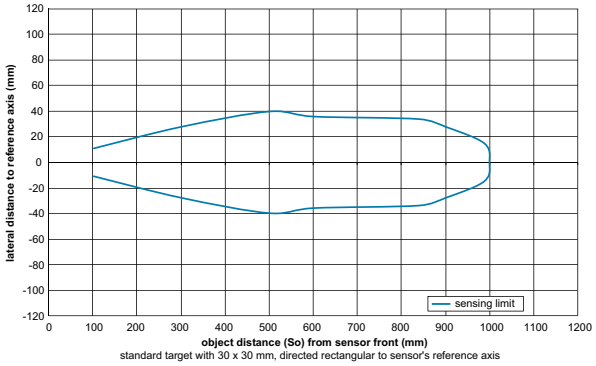
dimension drawings



connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

Sd = 2000 mm

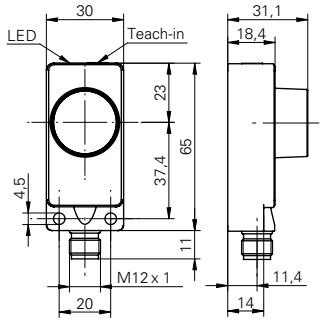
- internal Teach-in
- long sensing range
- detects sound absorbing objects

general data	
scanning range Sd	0 ... 2000 mm
reflector position Sde	400 ... 2000 mm
adjusting range reflector (operating range)	± 4 % Sde
adjusting range reflector (limit range)	± 6 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
response time ton	< 80 ms
release time toff	< 80 ms
sonic frequency	200 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

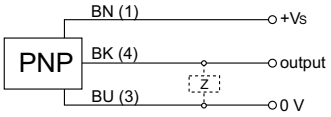
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152386	Sensofix series 30
for details: see accessories section	

order reference	output circuit
URDK 30P6104/S14	PNP make function (NO)
URDK 30P7104/S14	PNP break function (NC)

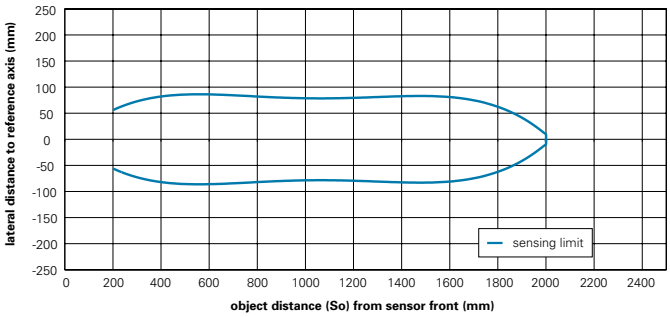
dimension drawing



connection diagram



typical sonic cone profile



standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis

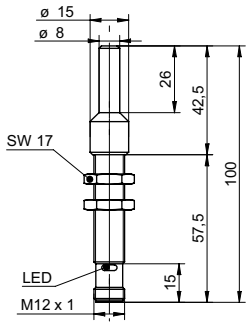
Sd = 40 mm

- high speed sensors
- with beam columnator for measurement in very small containers

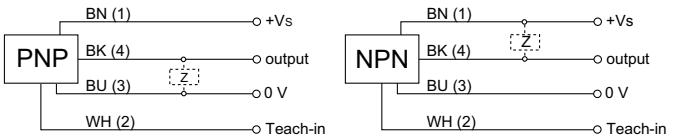
general data	
special type	Highspeed
scanning range Sd	0 ... 40 mm
reflector position Sde	10 ... 40 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 1,5 ms
release time toff	< 1,5 ms
switching frequency	< 200 Hz
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	100 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

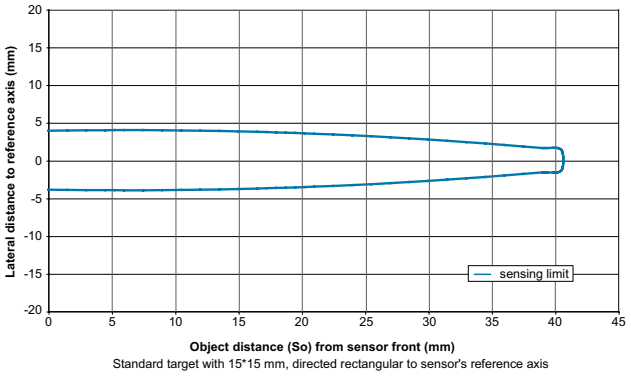
dimension drawing



connection diagrams



typical sonic cone profile



order reference	output circuit
URAM 12N8910/S14OD	NPN make function (NO) / break function (NC)
URAM 12P8910/S14OD	PNP make function (NO) / break function (NC)

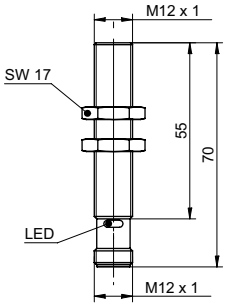
Sd = 70 mm

- high speed sensoren
- small sonic beam angle
- external Teach-in

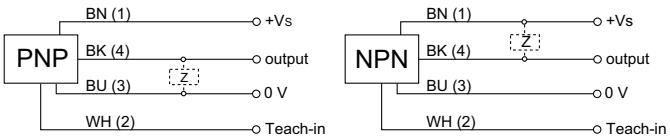
general data	
special type	Highspeed
scanning range Sd	0 ... 70 mm
reflector position Sde	40 ... 70 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 1,5 ms
release time toff	< 1,5 ms
switching frequency	< 200 Hz
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

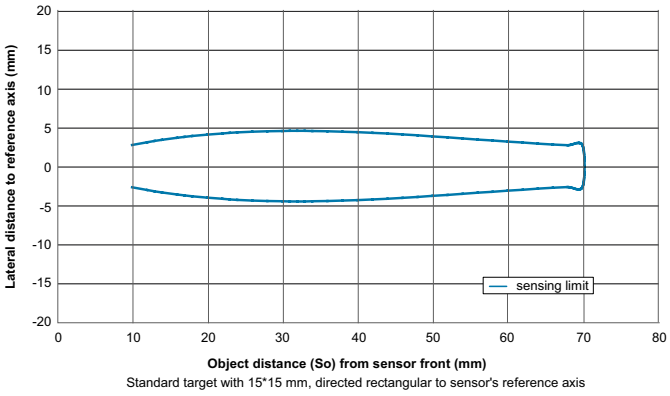
dimension drawing



connection diagrams



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

order reference	output circuit
URAM 12N8910/S14O	NPN make function (NO) / break function (NC)
URAM 12P8910/S14O	PNP make function (NO) / break function (NC)

Sd = 400 mm

- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

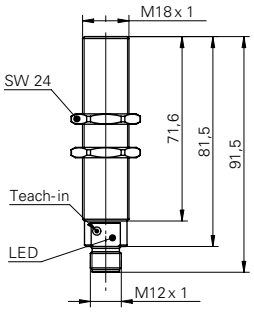
general data	
special type	chemically resistant
scanning range Sd	0 ... 400 mm
reflector position Sde	120 ... 400 mm
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	400 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

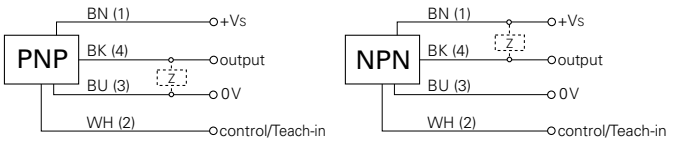
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

order reference	output circuit
URAR 18N6912/S14G	NPN make function (NO)
URAR 18N7912/S14G	NPN break function (NC)
URAR 18P6912/S14G	PNP make function (NO)
URAR 18P7912/S14G	PNP break function (NC)

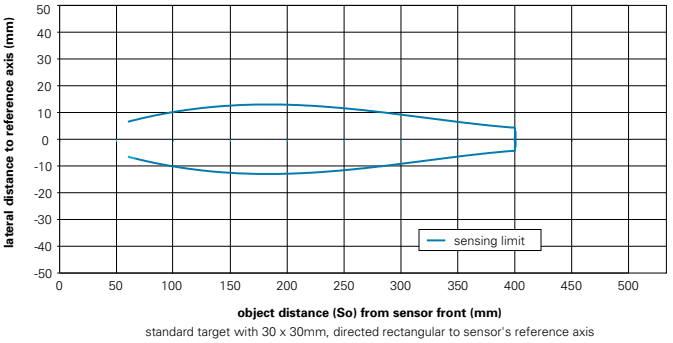
dimension drawing



connection diagrams



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

Sd = 1000 mm

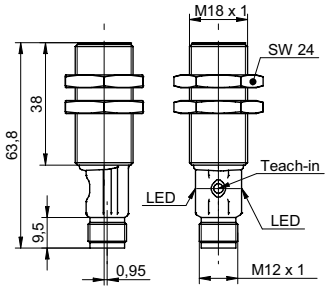
- detects sound absorbing objects
- long sensing range / no blind range
- short response time

general data	
scanning range Sd	0 ... 1000 mm
reflector position Sde	200 ... 1000 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
power-up drift	compensated after 10 min.
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption typ.	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 3,5 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated / TR90
width / diameter	18 mm
height / length	64 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 ... +70 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

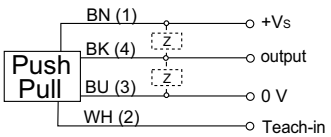
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151658	Sensofix series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

order reference
UR18.RA0-11120042

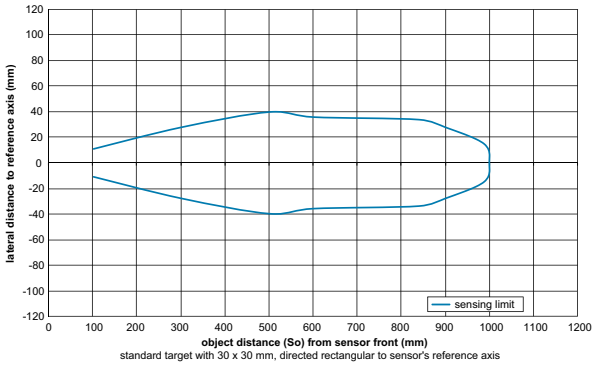
dimension drawing



connection diagram



typical sonic cone profile

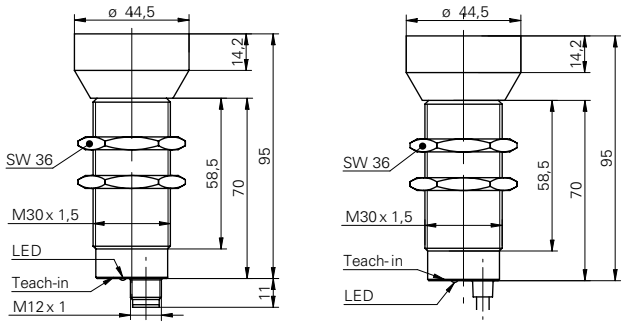


Sd = 3000 mm

- Teach-in or potentiometer
- synchronization output
- long sensing range

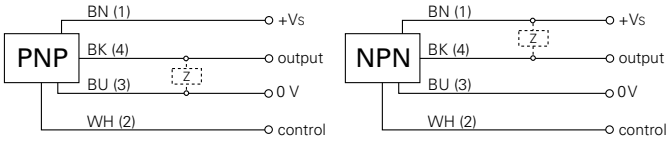
general data	
scanning range Sd	0 ... 3000 mm
reflector position Sde	600 ... 3000 mm
adjusting range reflector (operating range)	± 4 % Sde
adjusting range reflector (limit range)	± 6 % Sde
repeat accuracy	< 3 mm
synchronization	yes
multiplex version	on request
response time ton	< 160 ms
release time toff	< 160 ms
sonic frequency	120 kHz
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

dimension drawings

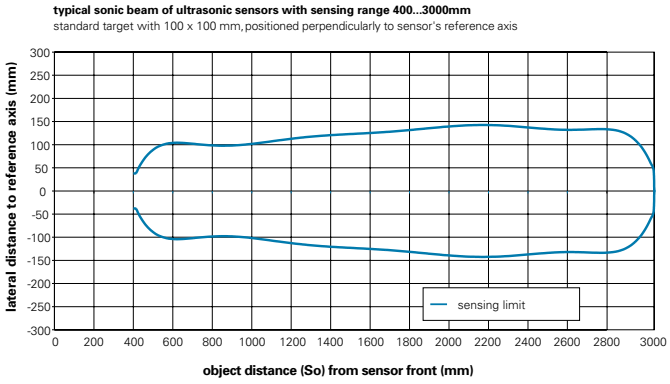


Teach-in = Teach-in or potentiometer

connection diagrams



typical sonic cone profile

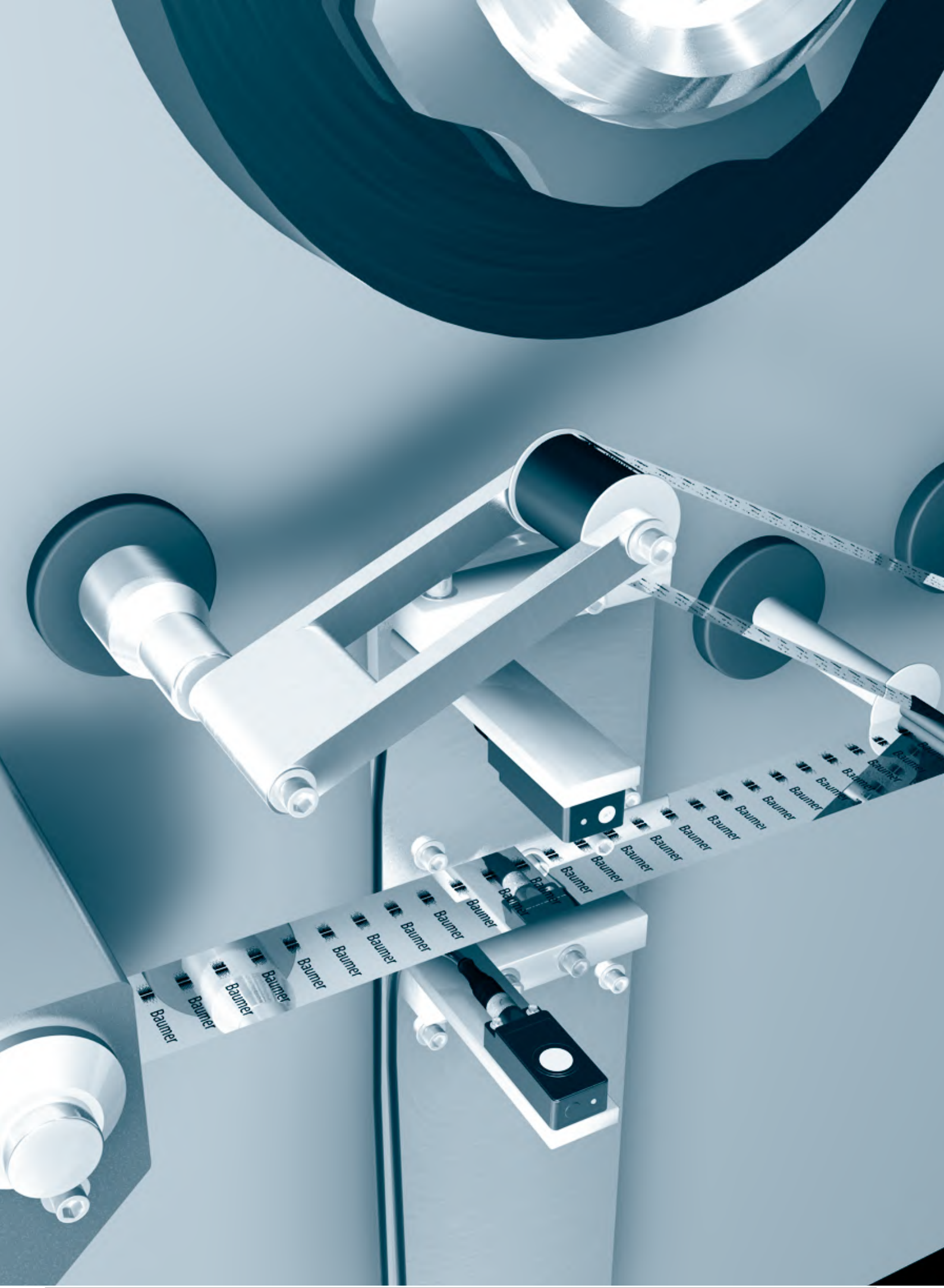


connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

order reference	adjustment	output circuit	temperature drift	connection types
URAM 50N1721	potentiometer	NPN make function (NO)	< 0,18 % Sde/K	cable, 2 m
URAM 50N1721/S14	potentiometer	NPN make function (NO)	< 0,18 % Sde/K	connector M12
URAM 50P6121	Teach-in	PNP make function (NO)	< 2 % Sde	cable, 2 m
URAM 50P6121/S14	Teach-in	PNP make function (NO)	< 2 % Sde	connector M12
URAM 50P7121	Teach-in	PNP break function (NC)	< 2 % Sde	cable, 2 m
URAM 50P7121/S14	Teach-in	PNP break function (NC)	< 2 % Sde	connector M12


Baumer

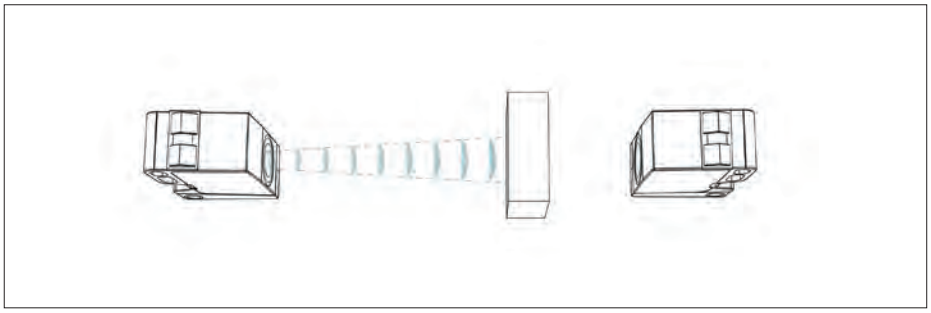
Through beam sensors

Description

The emitter and the receiver are in two separate housings. The continuous signal by the emitter is picked up by the receiver. An object interrupting the sonic beam will make the receiver react by giving an output signal. The user may adjust the amplification of the input signal where required.

When an object interrupts the sonic beam, the receiver will react and give an output signal. With the help of the built in potentiometer, the user can adjust the amplification of the input signal, as necessary.

The state of the output stage as well as the signal intensity are indicated by an LED.



Hysteresis

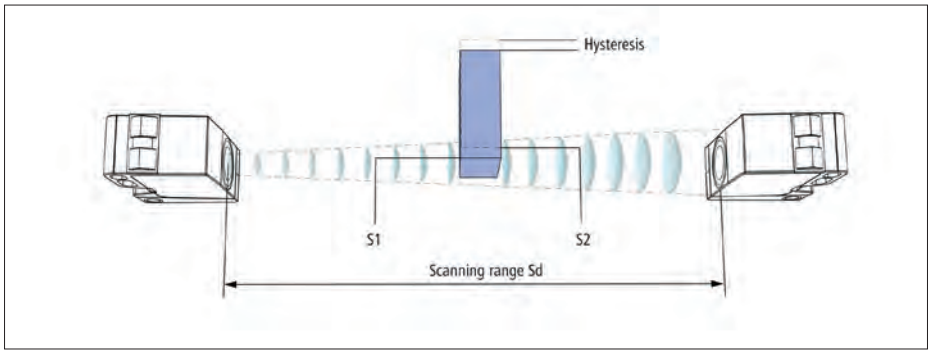
Hysteresis is the difference between the operating point (S1) and the release point (S2). If an object interrupts the sonic beam, the signal level must be increased by about 75 % in order to reset the output signal. Objects which follow one another in quick succession can therefore be easily detected.

Sonic beam angle α

The sonic beam angle (α) defines the boundaries of the emitted conical beam of the ultrasonic through beam sensor.

Repeatability

Due to the narrow angle of the sonic beam the repeatability of the switching point of two successive targets, under identical conditions, is better than 3 mm.



Teach-in procedure Series 20

All adjustments can be made with the internal Teach-in key.

Sensitivity Adjustment
The LEDs on the display indicate the receiver's sensitivity. The sensitivity can be called up at any time by pressing the Teach-in key, even with locked teaching functionality.

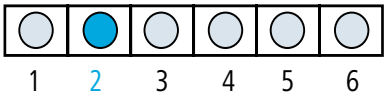
Move the emitter and receiver to the desired position.

Switch the emitter to its adjustment mode by pressing and holding the Teach-in key for approx. two seconds until the green LED begins flashing. Release the Teach-in key. The green LED now indicates the switching state. Press the Teach-in key repeatedly until the desired sensitivity is achieved and the green LED is continuously on.
Sensitivity is indicated by the yellow LEDs on the display.

To complete the Teach-in process, press and hold the Teach-in key for approx. two seconds until the green LED begins flashing rapidly. Release the Teach-in key.
The LED is off!

Response Time
Switch the sensor to teach mode by pressing and holding the Teach-in key for approx. four seconds until the red LED begins flashing. Release the Teach-in key. The red LED lights up continuously. Press the Teach-in key repeatedly until the desired response time is achieved.

LED display:



no LED on; approximately 5 ms response time delay

1. LED on; approximately 10 ms response time delay

2. LED on; approximately 20 ms response time delay

3. LED on; approximately 40 ms response time delay

4. LED on; approximately 80 ms response time delay

5. LED on; approximately 160 ms response time delay

6. LED on; approximately 320 ms response time delay

To complete the Teach-in process, press and hold the Teach-in key for approx. two seconds until the red LED begins flashing rapidly. Release the Teach-in key. The response time is now set.

Resetting the receiver to its original factory settings
Pressing and holding the Teach-in key for longer than six seconds will return the sensor to its factory settings. This is indicated on the receiver by the rapid flashing of the green/red LED.

Teach-in lock
The Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

Sd = 1000 mm

- Teach-in
- LED Display
- response time adjustable <= 5 … 320 ms

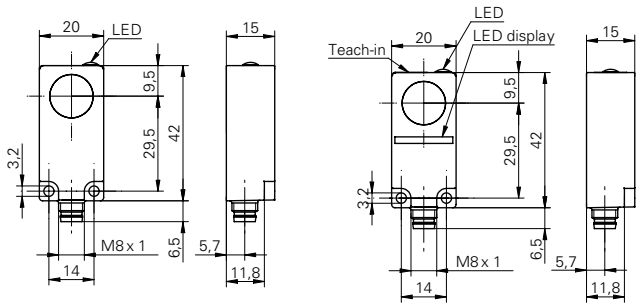
general data	
scanning range Sd	0 ... 1000 mm
scanning range far limit Sde	0 ... 1000 mm
alignment aid	target indication flashing
receiver	
object size (at Sd = 50 mm)	> 2 cm²
hysteresis typ.	5 mm
repeat accuracy	< 3 mm
response time ton	< 5 ms
release time toff	< 5 ms
adjustment	Teach-in
output indicator	LED green
emitter	
sonic frequency	250 kHz
power on indication	LED yellow
electrical data	
voltage supply range +Vs	15 ... 30 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
receiver	
current consumption max. (no load)	30 mA
output circuit	PNP make function (NO)
output current	< 200 mA
voltage drop Vd	< 2 VDC
emitter	
current consumption max. (no load)	40 mA
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10150326	Sensofix series 10 / series 20
for details: see accessories section	

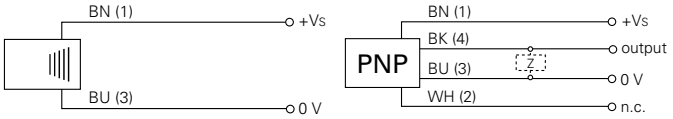
order reference	emitter / receiver
UEDK 20P6103/S35A	receiver
USDK 20D9003/S35A	emitter

dimension drawings



emitter receiver

connection diagrams

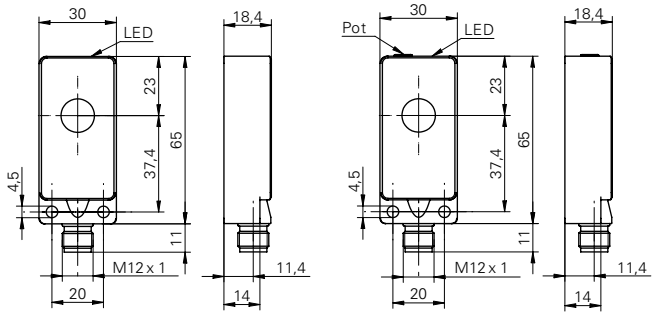


Sd = 700 mm

- potentiometer
- complementary outputs
- response time <= 5 ms

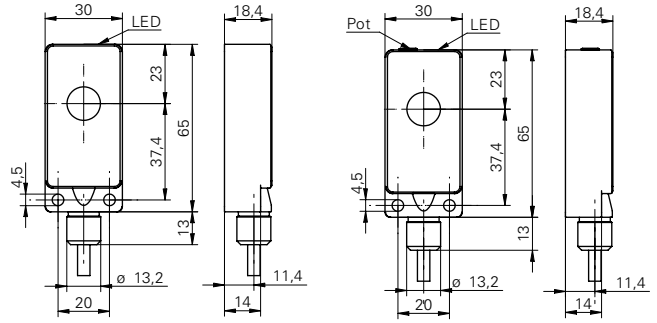
general data	
scanning range Sd	0 ... 700 mm
scanning range far limit Sde	0 ... 700 mm
alignment aid	target indication flashing
receiver	
object size (at Sd = 50 mm)	> 2 cm²
hysteresis typ.	5 mm
repeat accuracy	< 3 mm
response time ton	< 5 ms
release time toff	< 5 ms
adjustment	potentiometer
output indicator	LED green
emitter	
sonic frequency	220 kHz
power on indication	LED yellow
electrical data	
voltage supply range +Vs	12 ... 30 VDC
residual ripple	< 10 % Vs
reverse polarity protection	yes
receiver	
current consumption max. (no load)	30 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
emitter	
current consumption max. (no load)	22 mA
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	18,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152386	Sensofix series 30
for details: see accessories section	

dimension drawings connector



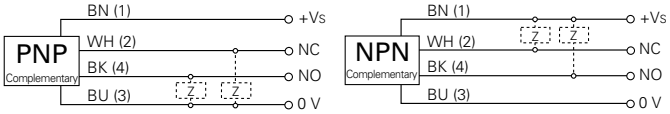
emitter receiver

dimension drawings cable

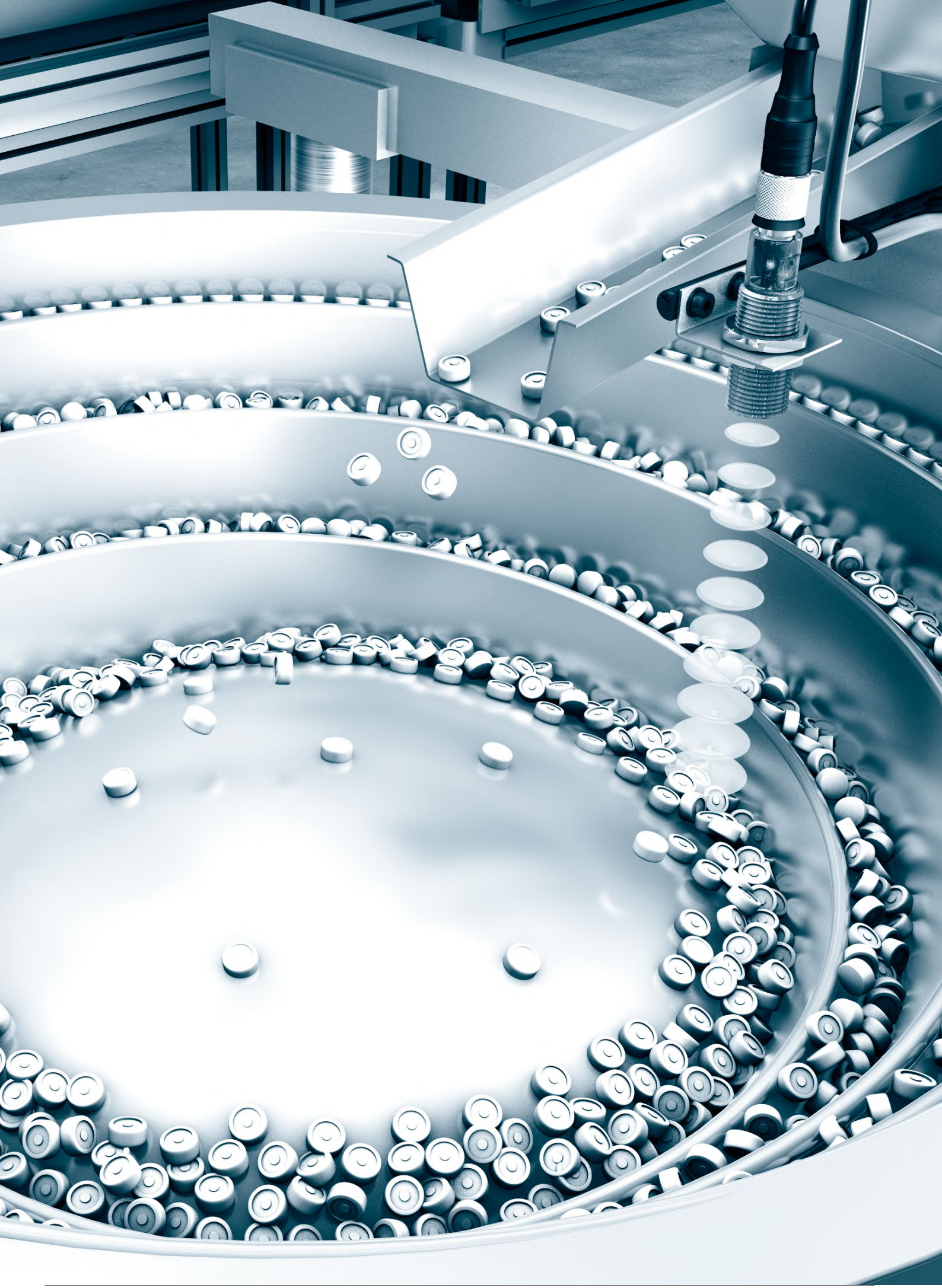


emitter receiver

connection diagrams

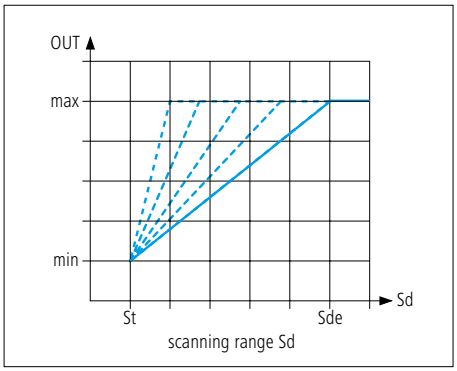


order reference	emitter / receiver	output circuit	connection types
UEDK 30N5103	receiver	NPN complementary	cable, 2 m
UEDK 30N5103/S14	receiver	NPN complementary	connector M12
UEDK 30P5103	receiver	PNP complementary	cable, 2 m
UEDK 30P5103/S14	receiver	PNP complementary	connector M12
USDK 30D9003	emitter	-	cable, 2 m
USDK 30D9003/S14	emitter	-	connector M12



Distance sensors

Sensors with potentiometer

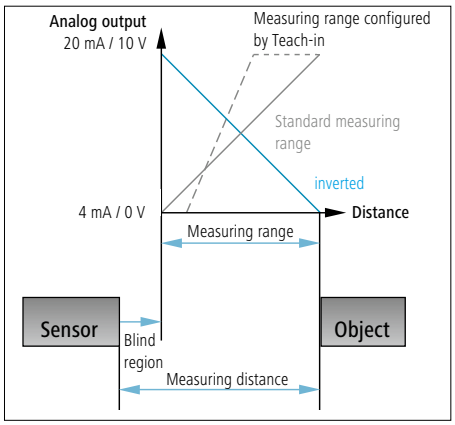


The sensor provides a distance proportional analog current or analog voltage output, allowing simply applied, non-contact distance measurement. The user can change the slope of the output curve using the built-in potentiometer. By doing so, they are able to define the required resolution. Sensor versions, which have a built-in D/A-Converter, generate output signals divided into discrete steps. Applications having long cable runs where there might be EMI or RFI interferences, should use sensors with an analog current output.

Sensors with Teach-in

Adjustment of 0 ... 10 V output function

To switch the sensor into Teach mode, hold the Teach-in button for 2 seconds or more. Successful entry into Teach-mode is signaled by the flashing bicolor LED. Upon release of the Teach button the red LED will flash. Another press on the button will teach in the close limit (Sdc) which is followed by the far limit (Sde). The sensor LED lighting up for 2 seconds will confirm the completed teaching operation. At this point, you may set the close limit (Sdc) by placing the target at the required distance from the sensor (the closest the target will be to the sensor face) and briefly pushing the button or connecting the Teach-in wire with +VS. The LED will then flash Amber. Far limit (Sde) may now be programmed by placing the target at the farthest required distance from the sensor by briefly pressing the button or connecting the Teach-in wire with +VS. Both LEDs will be „on" for 2 seconds to confirm proper completion of Teach-in process.



Programmable output curve

Optional on request

Separate digital PNP output with one switching point which may be set using the Teach-in function.

Inverting the output function to 10 ... 0 V

Sensor output signal can be inverted to 10 ... 0 V by teaching the far limit Sde first and the sensor close limit Sdc second.

Restore default settings or improper set up

Press teach-in button and hold for more than 6 seconds. Both sensor LEDs flashing fast indicate the restore operation.

Teach-in lock

The Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

qTeach™

With *qTeach*™ we are introducing a new, convenient and wear-free teach procedure. Teaching of O500 sensors is just by a touch with any ferromagnetic tool. A blue LED light provides clear optical feedback. To prevent user errors, *qTeach*™ locks autonomously after 5 minutes.

Linearity

Deviations in linearity are mainly generated within the sensor and by changes in ambient temperature. Resolution, temperature drift and repeatability define the linearity error.

Minimum load resistance

The voltage drop across t he load resistance is proportional to the current, using a sensor with current output. To ensure a proper functioning of the output stage do not exceed the maximum permissible load resistance as stated in the data sheet.

Resolution

Defines the smallest position change of the object which causes a change in voltage or current at the sensor output.

rectangular designs

product family	UNCK 09	UNCK 09	UNCK 09	UNCK 09	UNCK 09	UNDK 09	UNDK 09
		 IO-Link					 IO-Link
	Miniature	Miniature	Miniature	Miniature with beam columnator	Miniature with beam columnator	Miniature	Miniature
width / diameter	8,6 mm	8,6 mm	8,6 mm	8,6 mm	8,6 mm	8,6 mm	8,6 mm
scanning range Sd	30 ... 200 mm	30 ... 200 mm	30 ... 200 mm	3 ... 150 mm	3 ... 150 mm	30 ... 200 mm	30 ... 200 mm
adjustment	Teach-in	Teach-in and IO-Link		Teach-in		Teach-in	Teach-in and IO-Link
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
push-pull / IO-Link		■					■
RS 232			■		■		
voltage output	■			■		■	
operating temperature	0 ... +60 °C	0 ... +60 °C	0 ... +60 °C	0 ... +60 °C	0 ... +60 °C	0 ... +60 °C	0 ... +60 °C
housing material	PA 12	PA 12	PA 12	PA 12	PA 12	PA 12	PA 12
cable PUR 4 x 0,08, 2 m	■	■	■	■	■	■	■
flylead connector M8, L=200 mm	■	■	■	■	■	■	■
page	**96**	**97**	**98**	**100**	**102**	**104**	**105**

product family	UNDK 10	UNDK 20	UNDK 20	UNDK 20	UNDK 30	UNDK 30	UNDK 30
							
	Miniature	Standard	Standard	Standard	Standard	Standard	Standard
width / diameter	10,4 mm	20 mm	20 mm	20 mm	30 mm	30 mm	30 mm
scanning range Sd	20 ... 200 mm	20 ... 200 mm	60 ... 400 mm	100 ... 1000 mm	30 ... 250 mm	60 ... 400 mm	100 ... 1000 mm
adjustment	Teach-in	Teach-in	Teach-in	Teach-in	Teach-in potentiometer	Teach-in potentiometer	Teach-in potentiometer
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
voltage - / current output							
voltage output	■	■	■	■	■	■	■
current output		■	■	■	■	■	■
operating temperature	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C
housing material	plastic (ASA)	polyester	polyester	polyester	polyester / die-cast zinc	polyester / die-cast zinc	polyester / die-cast zinc
cable PUR 4 x 0,08, 2 m	■						
cable PUR 4 x 0,25, 2 m							
cable, 2 m					■	■	■
flylead connector M8, L=200 mm	■						
connector M8	■	■	■	■			
connector M12					■	■	■
page	**112**	**114**	**115**	**116**	**117**	**118**	**119**

UNDK 09	UNDK 09	UNDK 09
		
Miniature	Miniature with beam columnator	Miniature with beam columnator
8,6 mm	8,6 mm	8,6 mm
30 ... 200 mm	3 ... 150 mm	3 ... 150 mm
	Teach-in	
< 0,5 mm	< 0,5 mm	< 0,5 mm
■		■
	■	
0 ... +60 °C	0 ... +60 °C	0 ... +60 °C
PA 12	PA 12	PA 12
■	■	■
■	■	■
106	**108**	**110**

U500.DA0	UNDK 30
	
Extra performance	Standard
18 mm	30 mm
100 ... 1000 mm	200 ... 2000 mm
qTeach	Teach-in
< 0,5 mm	< 1 mm
■	
■	■
■	■
-25 ... +60 °C -25 ... +65 °C (+60 °C current mode)	-10 ... +60 °C
plastic (ASA, PMMA)	polyester / die-cast zinc
■	
	■
■	■
120	**122**

cylindrical designs

product family	UNAM 12	UNAM 12	UNAM 12	UNAM 18	UR18.DA0	UNAR 18	UNAR 18
							
special type	Miniature with beam columnator	Miniature	Miniature	Standard	Standard	Chemically resistant	Chemically resistant
width / diameter	12 mm	12 mm	12 mm	18 mm	18 mm	18 mm	18 mm
scanning range Sd	2 ... 82 mm	20 ... 200 mm	60 ... 400 mm	100 ... 1000 mm	100 ... 1000 mm	60 ... 400 mm	100 ... 1000 mm
adjustment	external Teach-in	external Teach-in	external Teach-in	Teach-in	qTeach	Teach-in	Teach-in
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
voltage output	■	■	■	■	■	■	■
current output		■	■	■	■	■	■
operating temperature	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C	-25 ... +60 °C -25 ... +70 °C	0 ... +60 °C	0 ... +60 °C
housing material	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated / TR90	stainless steel 1.4435 (V4A)	stainless steel 1.4435 (V4A)
cable, 2 m							
connector M12	■	■	■	■	■	■	■
page	**123**	**124**	**125**	**126**	**127**	**128**	**129**

	UNAM 30	UNAM 50	UNAM 70
			
	Standard	Large sensing distance	Large sensing distance
	30 mm	30 mm	30 mm
	100 ... 1000 mm	400 ... 2500 mm	600 ... 6000 mm
	Teach-in potentiometer	Teach-in	Teach-in
	< 0,5 mm	< 1 mm	< 3 mm
	■	■	■
	■	■	■
	-10 ... +60 °C	-10 ... +60 °C	-25 ... +60 °C
	brass nickel plated	brass nickel plated	brass nickel plated
	■	■	
	■	■	■
	130	**131**	**132**

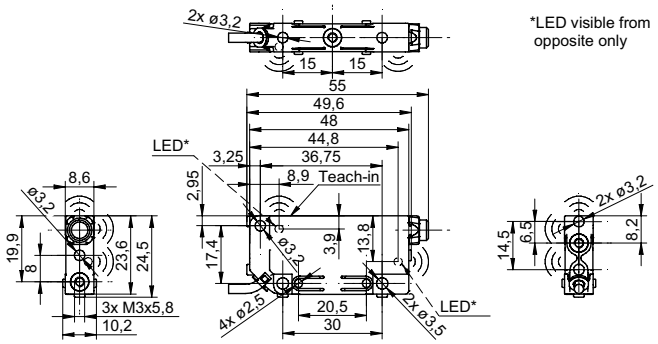
Sd = 200 mm

- short response time
- high resolution
- detects the smallest objects

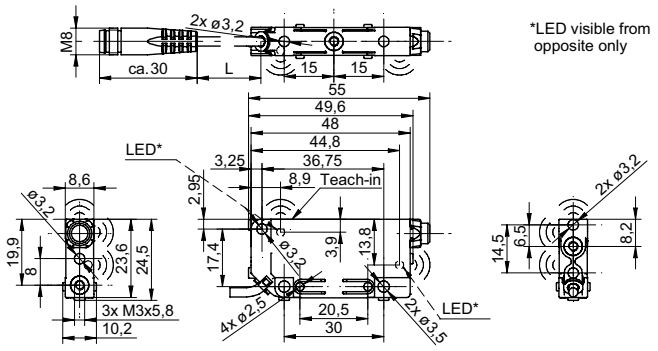
general data	
scanning range Sd	30 ... 200 mm
scanning range close limit Sdc	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 35 ms
release time toff	< 35 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 ... 10 V / 10 ... 0 V
output current	< 15 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNCK 09U6914	cable PUR 4 x 0,08, 2 m
UNCK 09U6914/KS35A	flylead connector M8, L=200 mm

dimension drawing

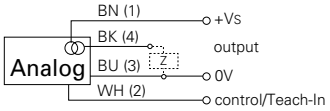


flylead connector version

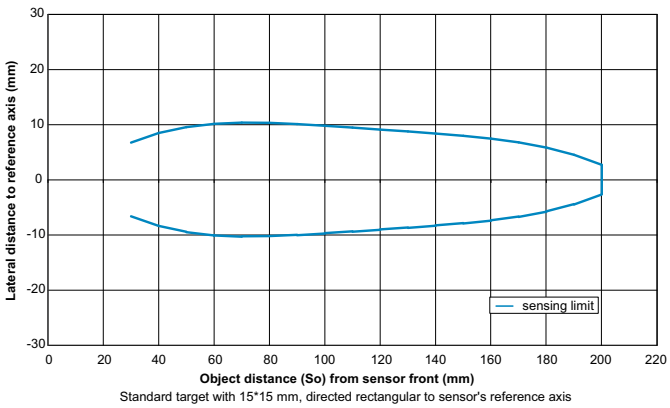


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Sd = 200 mm

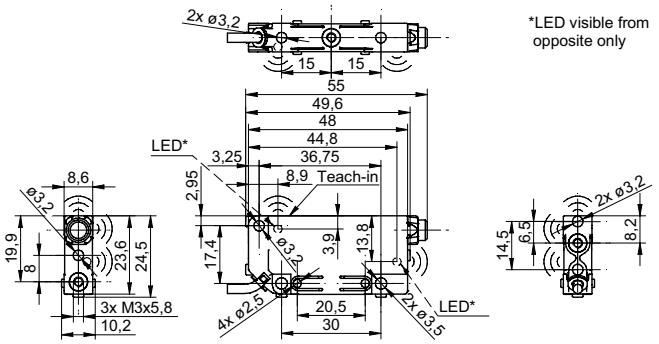
IO-Link

- IO-Link
- short response time
- high resolution

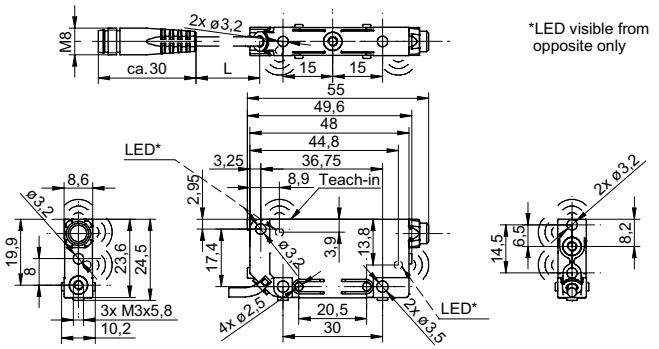
general data	
scanning range Sd	30 ... 200 mm
scanning range close limit Sdc	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in and IO-Link
alignment aid	target indication flashing
light indicator	green LED / red LED
electrical data	
voltage supply range +Vs	18 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull / IO-Link
baud rate	38400
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNCK 09G8914/IO	cable PUR 4 x 0,08, 2 m
UNCK 09G8914/KS35A/IO	flylead connector M8, L=200 mm

dimension drawing

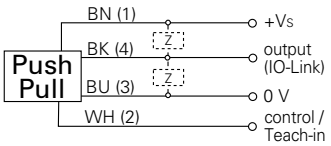


flylead connector version

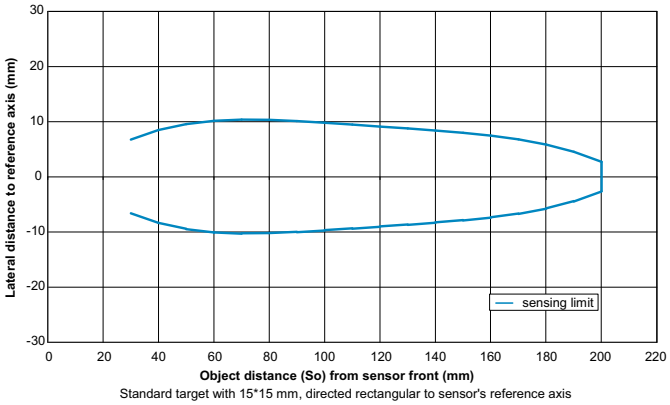


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

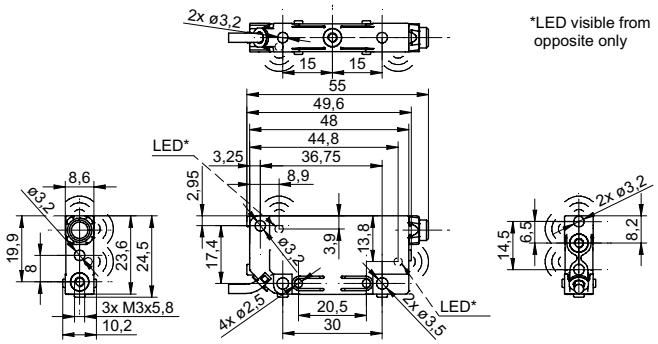
Sd = 200 mm

- serial interface RS 232
- high resolution
- short response time

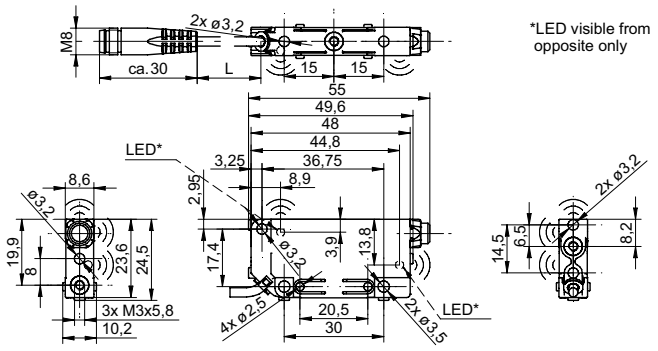
general data	
scanning range Sd	30 ... 200 mm
scanning range close limit Sdc	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNCK 09T9114	cable PUR 4 x 0,08, 2 m
UNCK 09T9114/KS35A	flylead connector M8, L=200 mm

dimension drawing

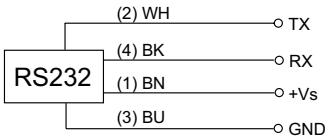


flylead connector version



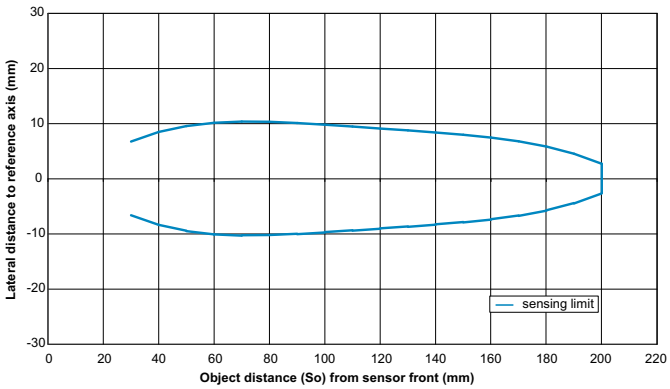
standard cable length 200 mm (L)

connection diagram



Sensor PINs

typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

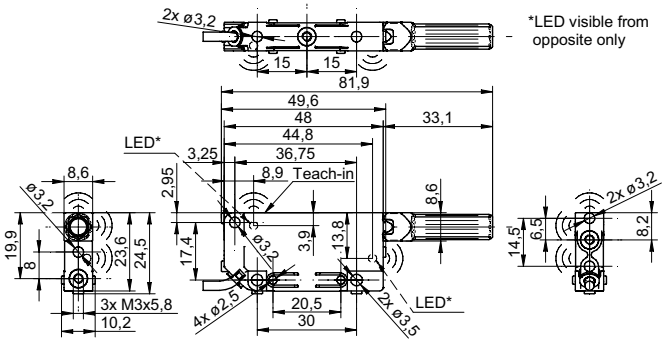
Sd = 150 mm

- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

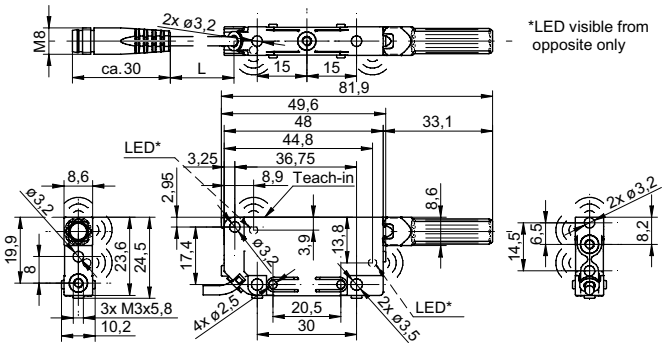
general data	
scanning range Sd	3 ... 150 mm
scanning range close limit Sdc	3 ... 150 mm
scanning range far limit Sde	3 ... 150 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 35 ms
release time toff	< 35 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 ... 10 V / 10 ... 0 V
output current	< 15 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
material (beam columnator)	POM
width / diameter	8,6 mm
height / length	82 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNCK 09U6914/D1	cable PUR 4 x 0,08, 2 m
UNCK 09U6914/KS35AD1	flylead connector M8, L=200 mm

dimension drawing

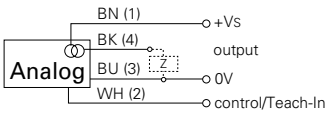


flylead connector version

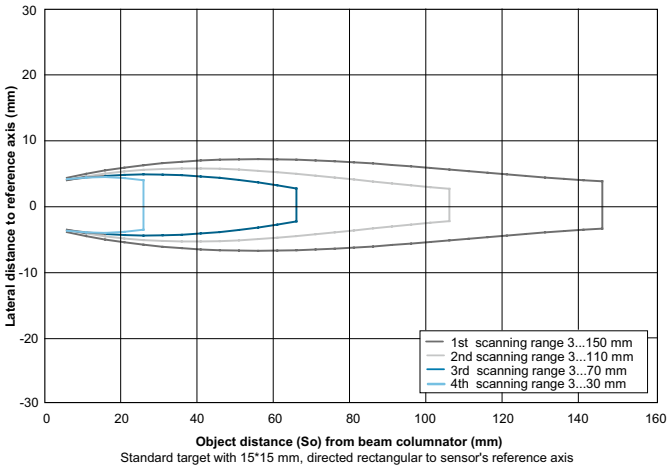


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

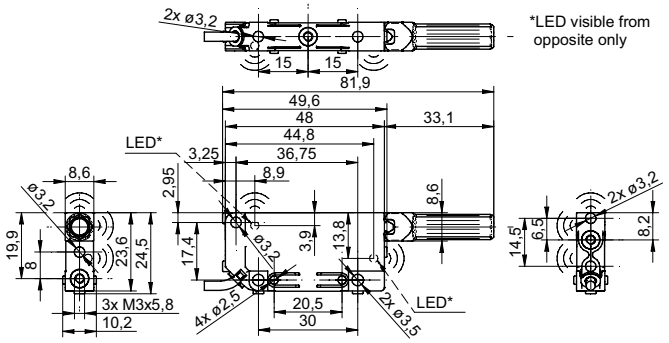
Sd = 150 mm

- serial interface RS 232
- measurement in very small containers
- high resolution

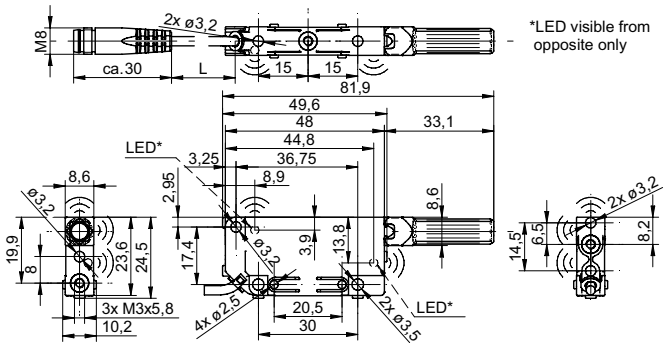
general data	
scanning range Sd	3 ... 150 mm
scanning range close limit Sdc	3 ... 150 mm
scanning range far limit Sde	3 ... 150 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
material (beam columnator)	POM
width / diameter	8,6 mm
height / length	82 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNCK 09T9114/D1	cable PUR 4 x 0,08, 2 m
UNCK 09T9114/KS35AD1	flylead connector M8, L=200 mm

dimension drawing

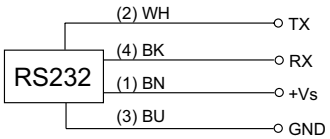


flylead connector version



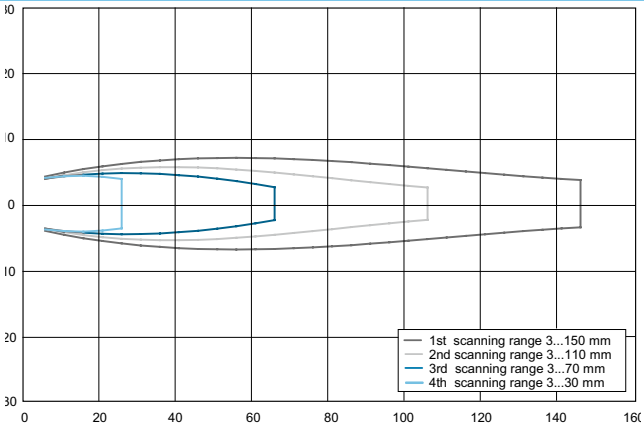
standard cable length 200 mm (L)

connection diagram



Sensor PINs

typical sonic cone profile



Object distance (So) from beam columnator (mm)
Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

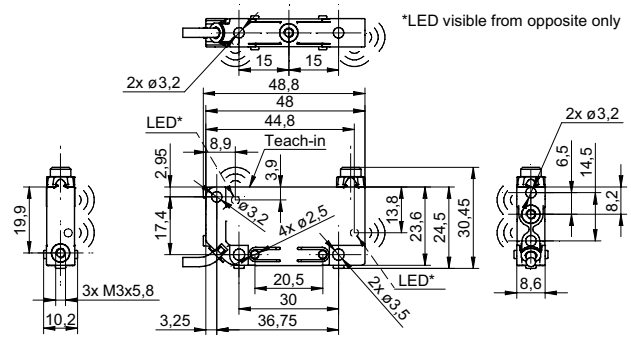
Sd = 200 mm

- short response time
- internal and external Teach-in
- detects the smallest objects

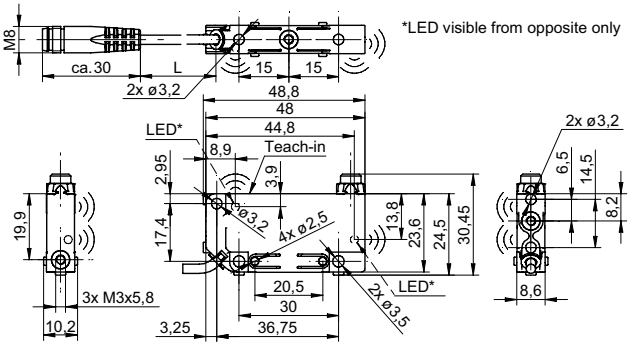
general data	
scanning range Sd	30 ... 200 mm
scanning range close limit Sdc	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 35 ms
release time toff	< 35 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 ... 10 V / 10 ... 0 V
output current	< 15 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNDK 09U6914	cable PUR 4 x 0,08, 2 m
UNDK 09U6914/KS35A	flylead connector M8, L=200 mm

dimension drawing

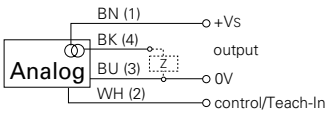


flylead connector version

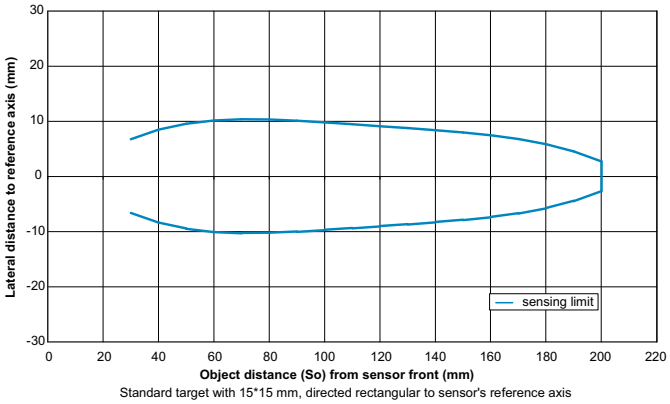


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Sd = 200 mm

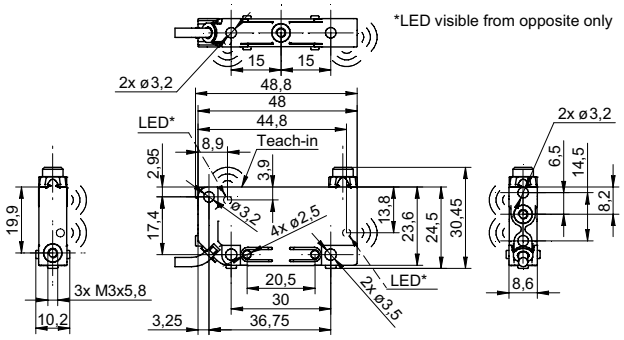
IO-Link

- IO-Link
- short response time
- high resolution

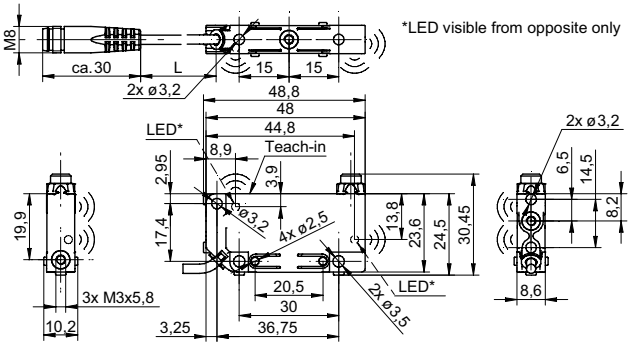
general data	
scanning range Sd	30 ... 200 mm
scanning range close limit Sdc	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in and IO-Link
alignment aid	target indication flashing
light indicator	green LED / red LED
electrical data	
voltage supply range +Vs	18 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull / IO-Link
baud rate	38400
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNDK 09G8914/IO	cable PUR 4 x 0,08, 2 m
UNDK 09G8914/KS35A/IO	flylead connector M8, L=200 mm

dimension drawing

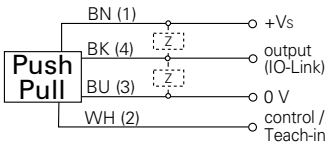


flylead connector version

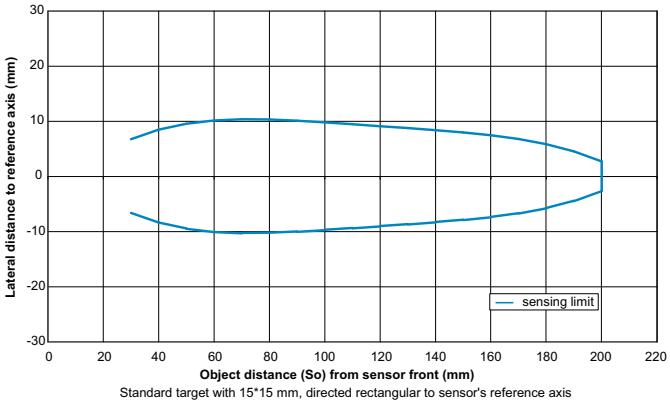


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

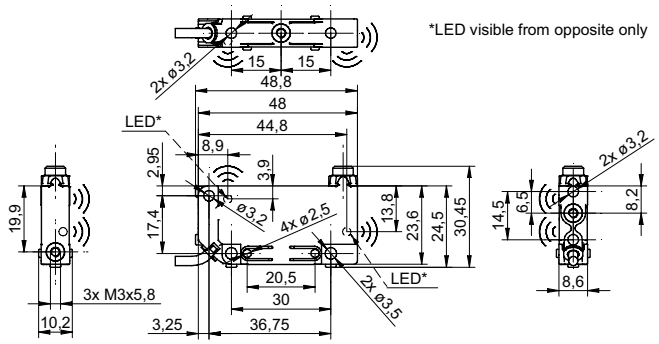
Sd = 200 mm

- serial interface RS 232
- high resolution
- short response time

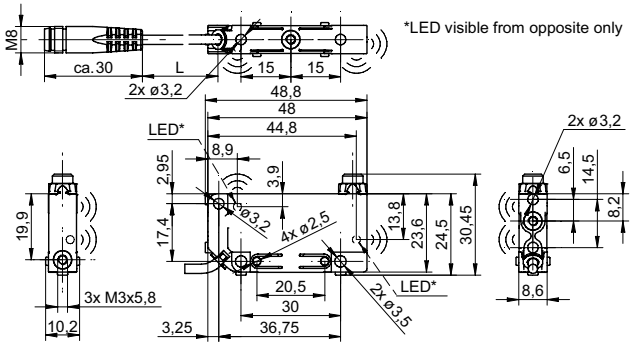
general data	
scanning range Sd	30 ... 200 mm
scanning range close limit Sdc	30 ... 200 mm
scanning range far limit Sde	30 ... 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNDK 09T9114	cable PUR 4 x 0,08, 2 m
UNDK 09T9114/KS35A	flylead connector M8, L=200 mm

dimension drawing

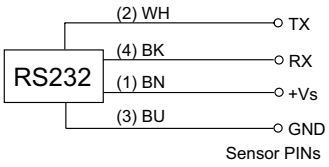


flylead connector version



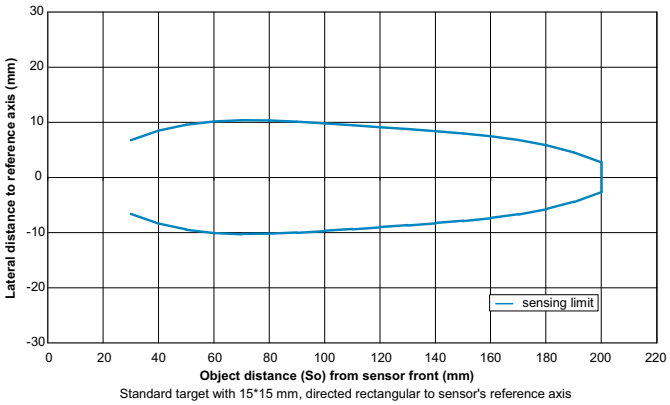
standard cable length 200 mm (L)

connection diagram



Sensor PINs

typical sonic cone profile



Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

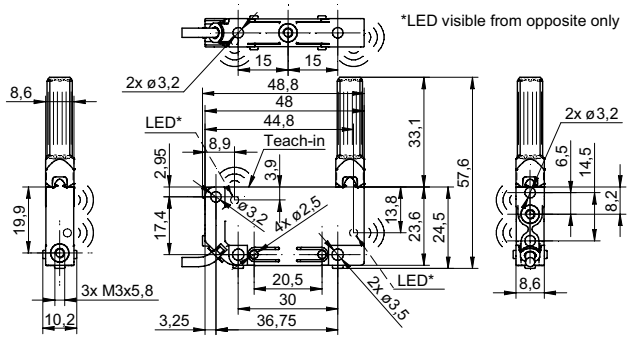
Sd = 150 mm

- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

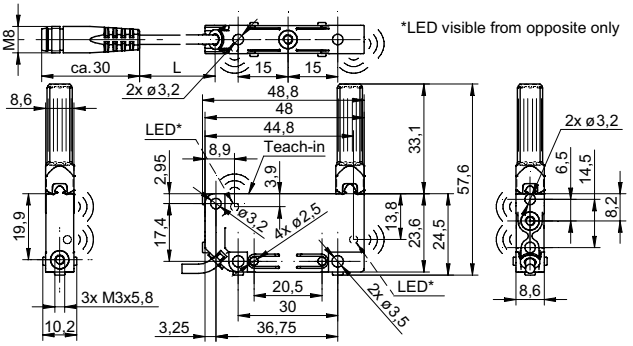
general data	
scanning range Sd	3 ... 150 mm
scanning range close limit Sdc	3 ... 150 mm
scanning range far limit Sde	3 ... 150 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 35 ms
release time toff	< 35 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 ... 10 V / 10 ... 0 V
output current	< 15 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
material (beam columnator)	POM
width / diameter	8,6 mm
height / length	48,8 mm
depth	57,7 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNDK 09U6914/D1	cable PUR 4 x 0,08, 2 m
UNDK 09U6914/KS35AD1	flylead connector M8, L=200 mm

dimension drawing

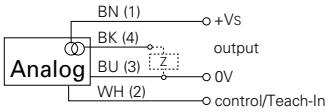


flylead connector version

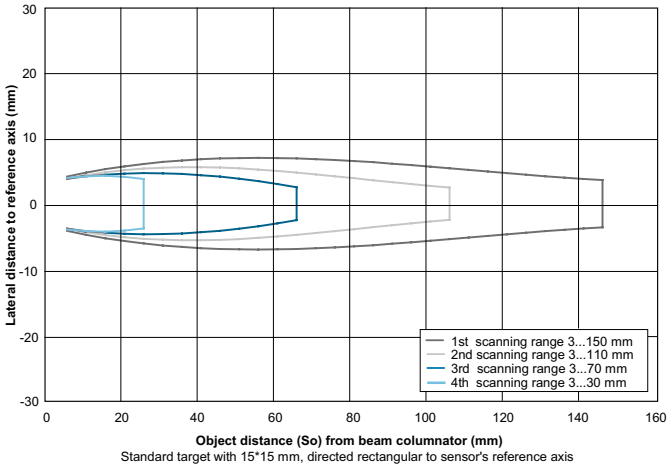


standard cable length 200 mm (L)

connection diagram



typical sonic cone profile



connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

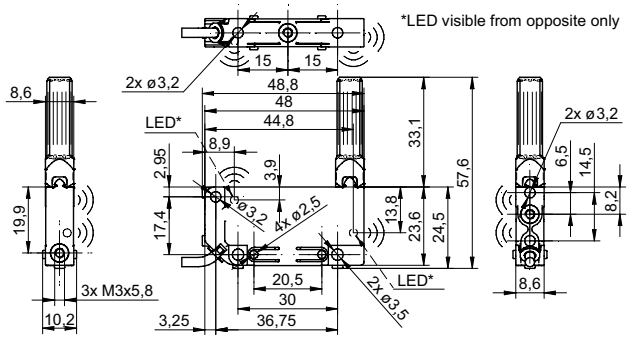
Sd = 150 mm

- serial interface RS 232
- measurement in very small containers
- high resolution

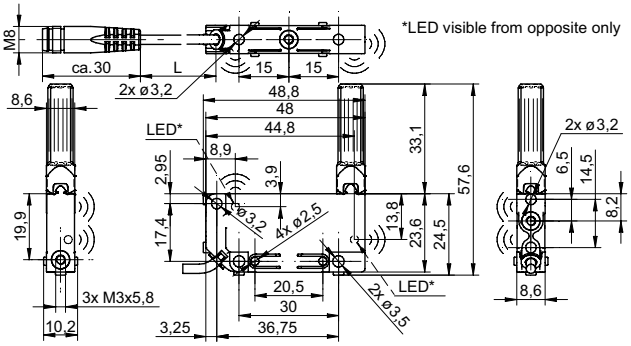
general data	
scanning range Sd	3 ... 150 mm
scanning range close limit Sdc	3 ... 150 mm
scanning range far limit Sde	3 ... 150 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
material (beam columnator)	POM
width / diameter	8,6 mm
height / length	48,8 mm
depth	57,7 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	connection types
UNDK 09T9114/D1	cable PUR 4 x 0,08, 2 m
UNDK 09T9114/KS35AD1	flylead connector M8, L=200 mm

dimension drawing

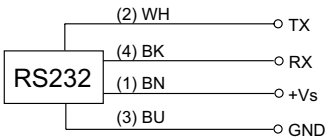


flylead connector version



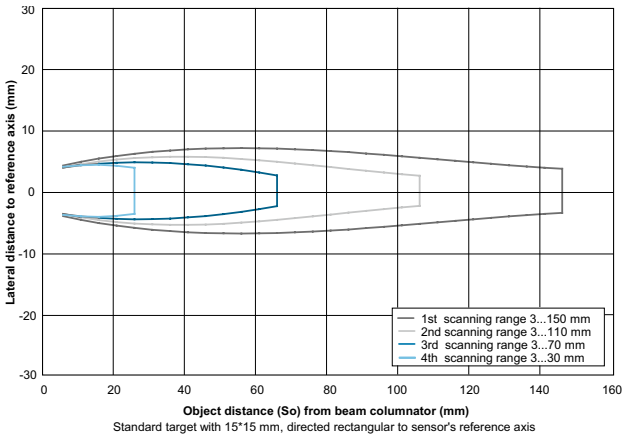
standard cable length 200 mm (L)

connection diagram



Sensor PINs

typical sonic cone profile



Object distance (So) from beam columnator (mm)

Standard target with 15*15 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

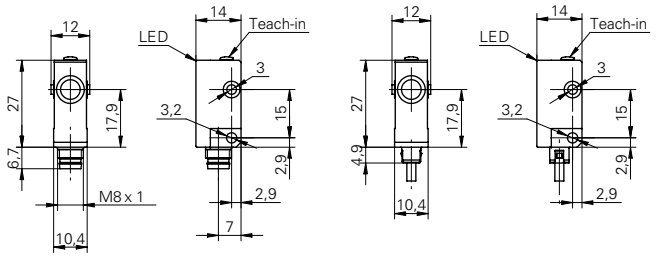
Sd = 200 mm

- compact housing
- very low mass (4 g)
- high resolution

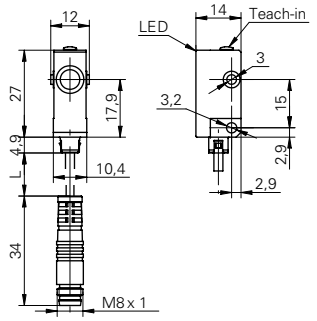
general data	
scanning range Sd	20 ... 200 mm
scanning range close limit Sdc	20 ... 200 mm
scanning range far limit Sde	20 ... 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 ... 10 V / 10 ... 0 V
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA)
width / diameter	10,4 mm
height / length	27 mm
depth	14 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	connection types
UNDK 10U6914	cable PUR 4 x 0,08, 2 m
UNDK 10U6914/KS35A	flylead connector M8, L=200 mm
UNDK 10U6914/S35A	connector M8

dimension drawings



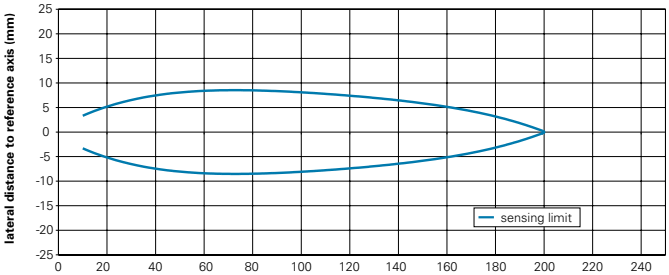
flylead connector version



standard cable length 200 mm (L)

connection diagram

typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

connectors and mating connectors	
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10150326	Sensofix series 10 / series 20
10133792	Mounting bracket series 10 (L design)
10114501	Mounting bracket series 10 (U design)
10162083	Mounting panel for sensors series 10
10118798	Mounting bracket series 10
10162376	Sonic beam deflector for ultrasonic sensors series 10
for details: see accessories section	

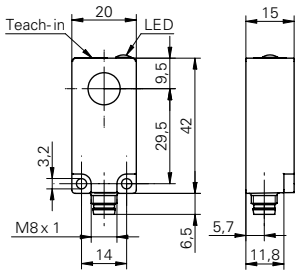
Sd = 200 mm

- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA invertible
- small sonic beam angle

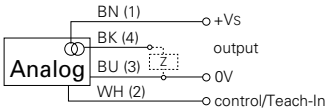
general data	
scanning range Sd	20 ... 200 mm
scanning range close limit Sdc	20 ... 200 mm
scanning range far limit Sde	20 ... 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 30 ms
release time toff	< 30 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit
UNDK 20I6914/S35A	current output
UNDK 20U6914/S35A	voltage output

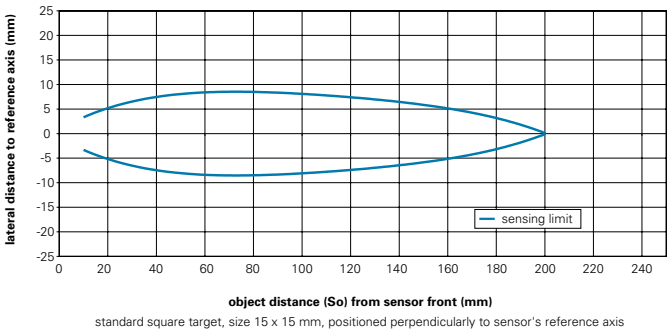
dimension drawing



connection diagram



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

connectors and mating connectors	
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

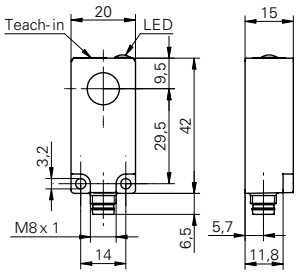
Sd = 400 mm

- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA invertible
- wide sonic beam angle

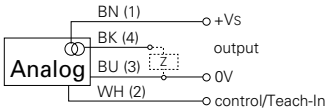
general data	
scanning range Sd	60 ... 400 mm
scanning range close limit Sdc	60 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	290 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit
UNDK 20I6912/S35A	current output
UNDK 20U6912/S35A	voltage output

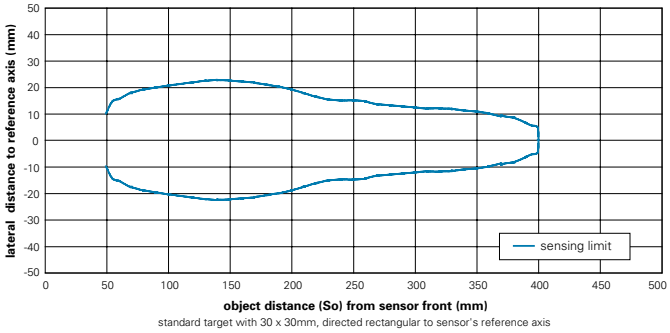
dimension drawing



connection diagram



typical sonic cone profile



connectors and mating connectors	
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

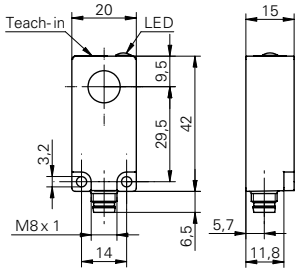
Sd = 1000 mm

- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA invertible
- long sensing range

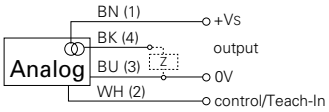
general data	
scanning range Sd	100 ... 1000 mm
scanning range close limit Sdc	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit
UNDK 20I6903/S35A	current output
UNDK 20U6903/S35A	voltage output

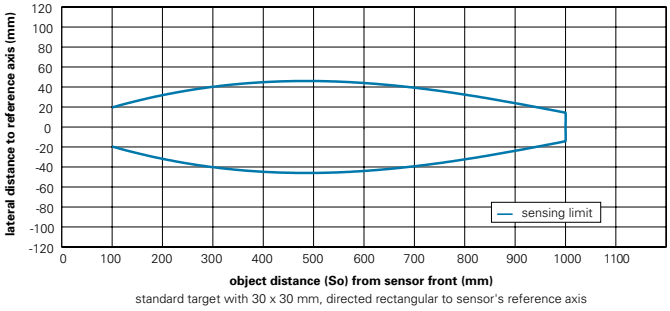
dimension drawing



connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors	
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

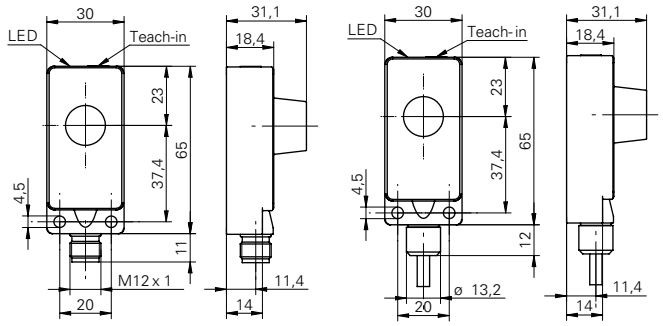
Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

Sd = 250 mm

- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

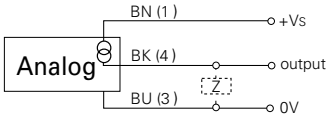
general data	
scanning range Sd	30 ... 250 mm
scanning range far limit Sde	30 ... 250 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 50 ms
release time toff	< 50 ms
temperature drift	< 2 % of distance to target So
sonic frequency	300 kHz
alignment aid	target indication flashing
potentiometer	
light indicator	LED green
Teach-in	
scanning range close limit Sdc	30 ... 250 mm
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
current output	
current consumption max. (no load)	55 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

dimension drawings

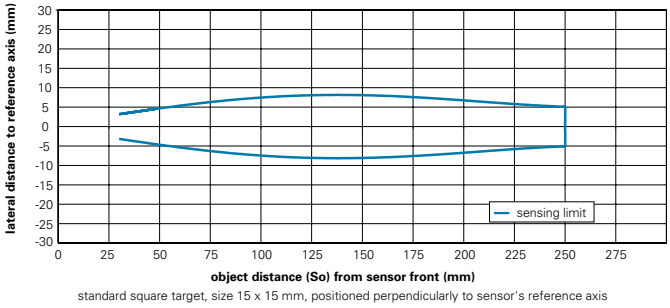


Teach-in = Teach-in or potentiometer

connection diagram



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10152386	Sensofix series 30

for details: see accessories section

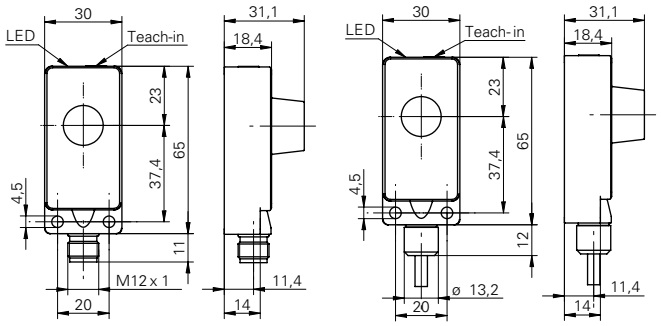
order reference	adjustment	output circuit	output signal	connection types
UNDK 30I6113	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	cable, 2 m
UNDK 30I6113/S14	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	connector M12
UNDK 30U6113	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	cable, 2 m
UNDK 30U6113/S14	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	connector M12
UNDK 30U9113	potentiometer	voltage output	0 ... 10 VDC	cable, 2 m
UNDK 30U9113/S14	potentiometer	voltage output	0 ... 10 VDC	connector M12

Sd = 400 mm

- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

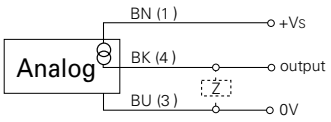
general data	
scanning range Sd	60 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	400 kHz
alignment aid	target indication flashing
potentiometer	
light indicator	LED green
Teach-in	
scanning range close limit Sdc	60 ... 400 mm
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
current output	
current consumption max. (no load)	55 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

dimension drawings

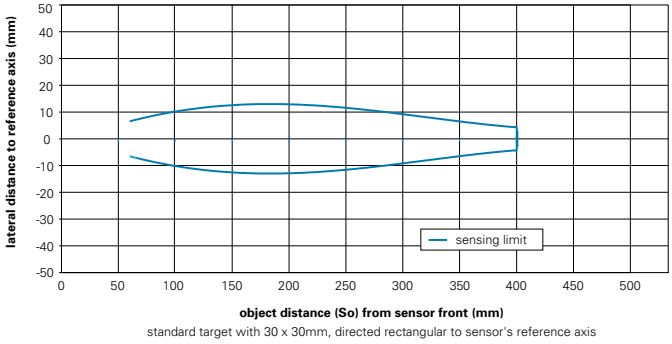


Teach-in = Teach-in or potentiometer

connection diagram



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10152386 Sensofix series 30

for details: see accessories section

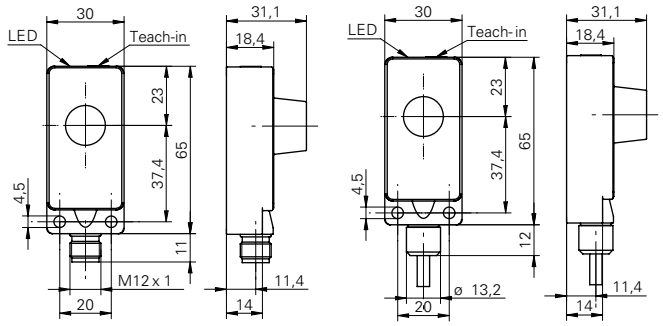
order reference	adjustment	output circuit	output signal	connection types
UNDK 30I6112	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	cable, 2 m
UNDK 30I6112/S14	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	connector M12
UNDK 30U6112	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	cable, 2 m
UNDK 30U6112/S14	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	connector M12
UNDK 30U9112	potentiometer	voltage output	0 ... 10 VDC	cable, 2 m
UNDK 30U9112/S14	potentiometer	voltage output	0 ... 10 VDC	connector M12

Sd = 1000 mm

- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

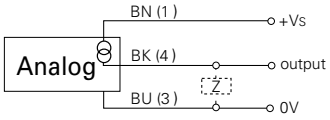
general data	
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
sonic frequency	240 kHz
alignment aid	target indication flashing
potentiometer	
light indicator	LED green
Teach-in	
scanning range close limit Sdc	100 ... 1000 mm
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
current output	
current consumption max. (no load)	55 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

dimension drawings

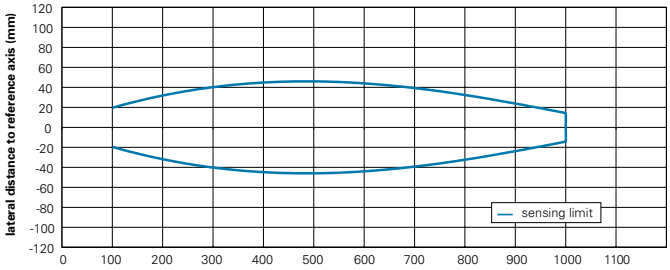


Teach-in = Teach-in or potentiometer

connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10152386	Sensofix series 30

for details: see accessories section

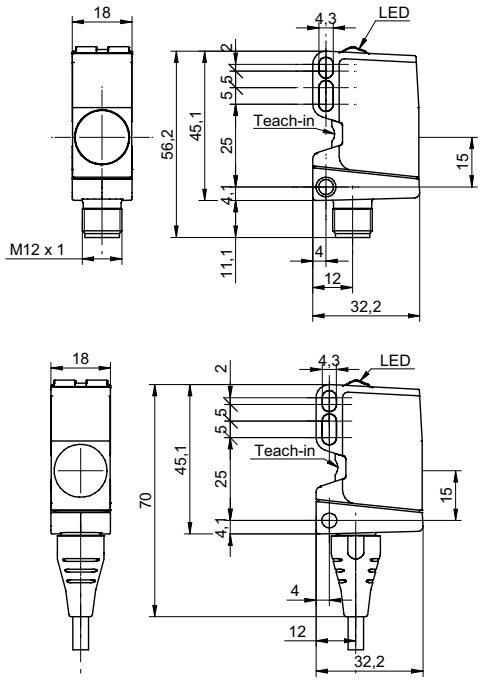
order reference	adjustment	output circuit	output signal	connection types
UNDK 30I6103	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	cable, 2 m
UNDK 30I6103/S14	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	connector M12
UNDK 30U6103	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	cable, 2 m
UNDK 30U6103/S14	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	connector M12
UNDK 30U9103	potentiometer	voltage output	0 ... 10 VDC	cable, 2 m
UNDK 30U9103/S14	potentiometer	voltage output	0 ... 10 VDC	connector M12

Sd = 1000 mm

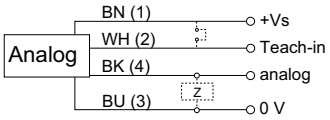
- short response time
- high resolution
- detects the smallest objects

general data	
scanning range Sd	100 ... 1000 mm
scanning range close limit Sdc	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
power-up drift	compensated after 15 min.
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption typ.	38 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
voltage - / current output	
output signal	4 ... 20 mA / 0 ... 10 VDC
voltage output	
output signal	0 ... 10 V / 10 ... 0 V
current output	
output signal	4 ... 20 mA / 20 ... 4 mA
mechanical data	
type	rectangular
housing material	plastic (ASA, PMMA)
width / diameter	18 mm
height / length	45 mm
depth	32 mm
ambient conditions	
storage temperature	-40 ... +75 °C
protection class	IP 67

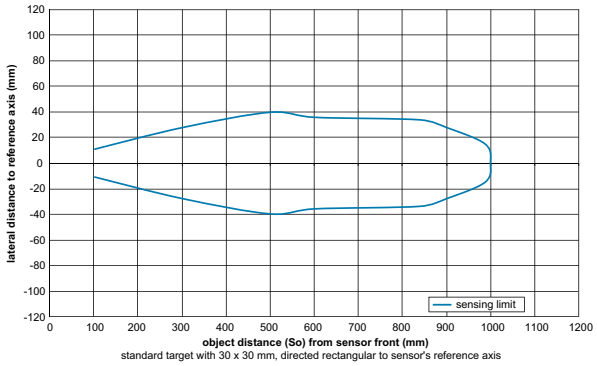
dimension drawings



connection diagram



typical sonic cone profile



connectors and mating connectors	
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
11099942	Sensofix O500/U500
11092246	Mounting bracket O500/U500 (L design)
11111164	Mounting bracket O500/U500 - Retrofit for sensors series 30
11111163	Sonic beam deflector for sensors U500
for details: see accessories section	

order reference	output circuit	operating temperature	connection types
U500.DA0-11127346	voltage - / current output	-25 ... +65 °C (+60 °C current mode)	cable PUR 4 x 0,25, 2 m
U500.DA0-11110575	voltage - / current output	-25 ... +65 °C (+60 °C current mode)	connector M12
U500.DA0-11135757	current output	-25 ... +60 °C	cable PUR 4 x 0,25, 2 m
U500.DA0-11135756	current output	-25 ... +60 °C	connector M12
U500.DA0-11135772	voltage output	-25 ... +65 °C	cable PUR 4 x 0,25, 2 m
U500.DA0-11126857	voltage output	-25 ... +65 °C	connector M12

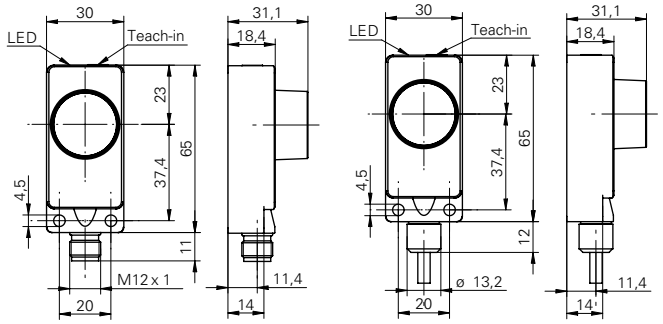
Sd = 2000 mm

- Teach-in
- 0 ... 10 V / 4 ... 20 mA
- output signals invertible

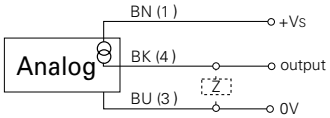
general data	
scanning range Sd	200 ... 2000 mm
scanning range close limit Sdc	200 ... 2000 mm
scanning range far limit Sde	200 ... 2000 mm
repeat accuracy	< 1 mm
resolution	< 0,5 mm
response time ton	< 150 ms
release time toff	< 150 ms
temperature drift	< 2 % of distance to target So
sonic frequency	200 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit	connection types
UNDK 30I6104/S14	current output	connector M12
UNDK 30U6104	voltage output	cable, 2 m
UNDK 30U6104/S14	voltage output	connector M12

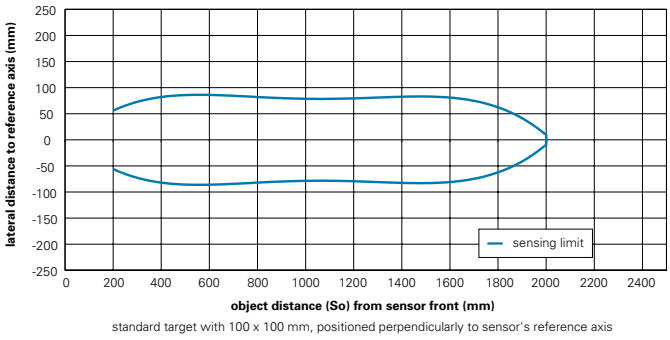
dimension drawings



connection diagram



typical sonic cone profile



standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10152386 Sensofix series 30

for details: see accessories section

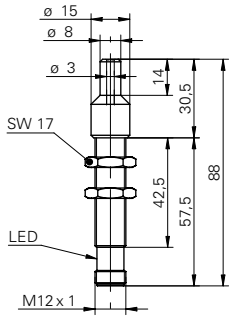
Sd = 82 mm

- external Teach-in
- with beam columnator for measurement in very small containers

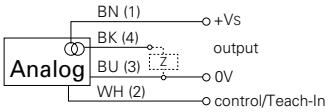
general data	
scanning range Sd	2 ... 82 mm
scanning range close limit Sdc	2 ... 82 mm
scanning range far limit Sde	2 ... 82 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 30 ms
release time toff	< 30 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 ... 10 V / 10 ... 0 V
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	88 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference
UNAM 12U9914/S14D

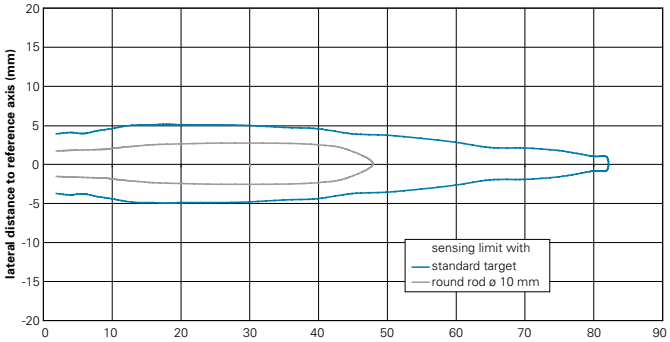
dimension drawing



connection diagram



typical sonic cone profile



standard target 15 x 15 mm and round rod ø 10 mm, directecd rectangular to sensor's reference axis

connectors and mating connectors	
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

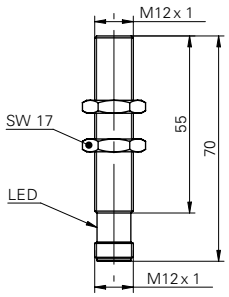
Sd = 200 mm

- external Teach-in
- 0 ... 10 V / 0 ... 10 mA invertible
- Teach-in adapter

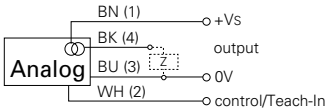
general data	
scanning range Sd	20 ... 200 mm
scanning range close limit Sdc	20 ... 200 mm
scanning range far limit Sde	20 ... 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 30 ms
release time toff	< 30 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	45 mA
output signal	0 ... 10 mA / 10 ... 0 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit
UNAM 12I9914/S14	current output
UNAM 12U9914/S14	voltage output

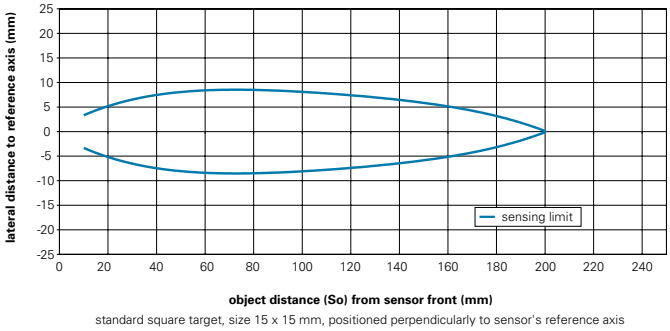
dimension drawing



connection diagram



typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12

for details: see accessories section

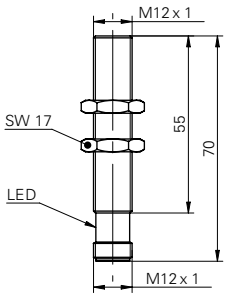
Sd = 400 mm

- external Teach-in
- 0 ... 10 V / 0 ... 10 mA invertible
- Teach-in adapter

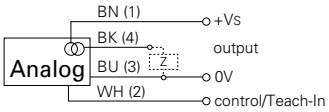
general data	
scanning range Sd	60 ... 400 mm
scanning range close limit Sdc	60 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	290 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	45 mA
output signal	0 ... 10 mA / 10 ... 0 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit
UNAM 12I9912/S14	current output
UNAM 12U9912/S14	voltage output

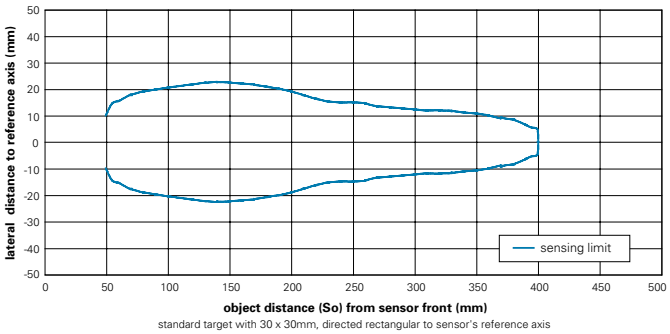
dimension drawing



connection diagram



typical sonic cone profile



connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12

for details: see accessories section

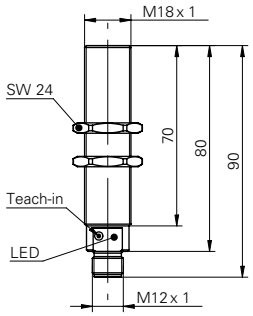
Sd = 1000 mm

- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA
- output signals invertible

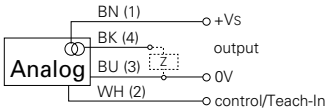
general data	
scanning range Sd	100 ... 1000 mm
scanning range close limit Sdc	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	18 mm
height / length	90 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit
UNAM 18I6903/S14	current output
UNAM 18U6903/S14	voltage output

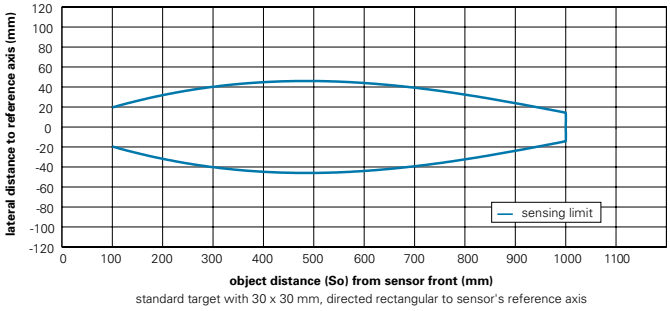
dimension drawing



connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular

for details: see accessories section

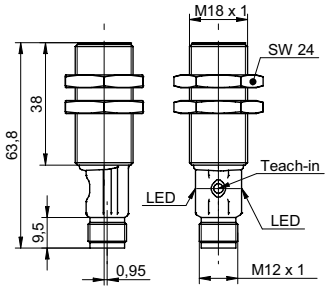
Sd = 1000 mm

- short response time
- high resolution
- detects the smallest objects

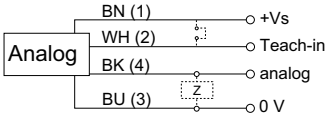
general data	
scanning range Sd	100 ... 1000 mm
scanning range close limit Sdc	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
power-up drift	compensated after 10 min.
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption typ.	38 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
voltage output	
output signal	0 ... 10 V / 10 ... 0 V
current output	
output signal	4 ... 20 mA / 20 ... 4 mA
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated / TR90
width / diameter	18 mm
height / length	64 mm
connection types	connector M12
ambient conditions	
storage temperature	-40 ... +85 °C
protection class	IP 67

order reference	output circuit	operating temperature
UR18.DA0-11135775	current output	-25 ... +60 °C
UR18.DA0-11119994	voltage output	-25 ... +70 °C

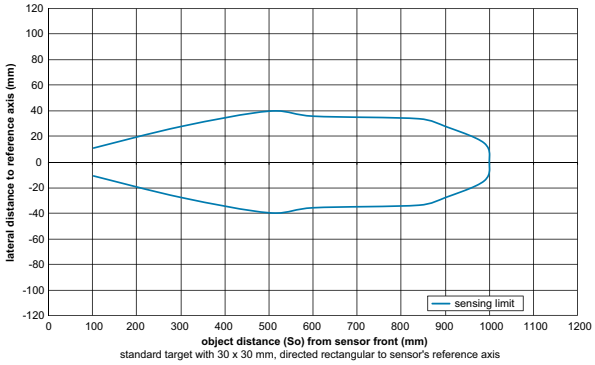
dimension drawing



connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular

for details: see accessories section

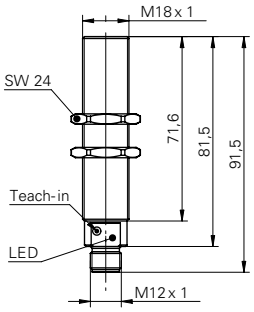
Sd = 400 mm

- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

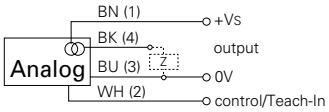
general data	
special type	chemically resistant
scanning range Sd	60 ... 400 mm
scanning range close limit Sdc	60 ... 400 mm
scanning range far limit Sde	60 ... 400 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	400 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	output circuit
UNAR 18I6912/S14G	current output
UNAR 18U6912/S14G	voltage output

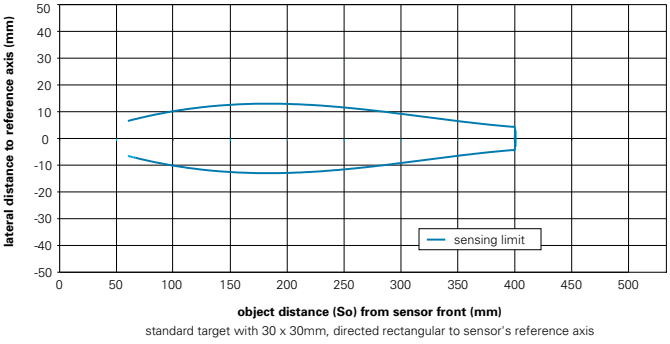
dimension drawing



connection diagram



typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular

for details: see accessories section

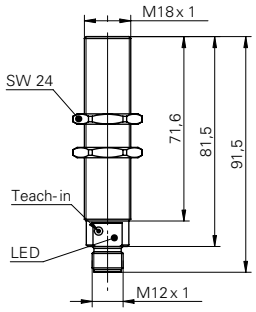
Sd = 1000 mm

- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

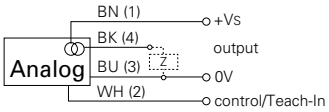
general data	
special type	chemically resistant
scanning range Sd	100 ... 1000 mm
scanning range close limit Sdc	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference	output circuit
UNAR 18I6903/S14G	current output
UNAR 18U6903/S14G	voltage output

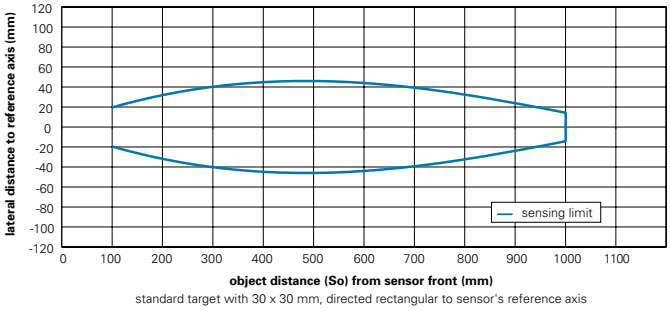
dimension drawing



connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories

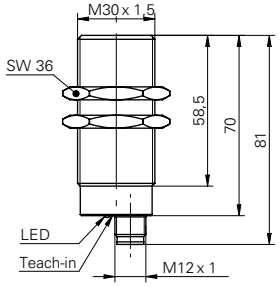
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

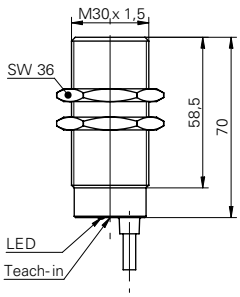
Sd = 1000 mm

- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

general data	
scanning range Sd	100 ... 1000 mm
scanning range far limit Sde	100 ... 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
sonic frequency	240 kHz
alignment aid	target indication flashing
potentiometer	
light indicator	LED green
Teach-in	
scanning range close limit Sdc	100 ... 1000 mm
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
current output	
current consumption max. (no load)	55 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	70 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

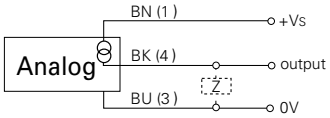
dimension drawings



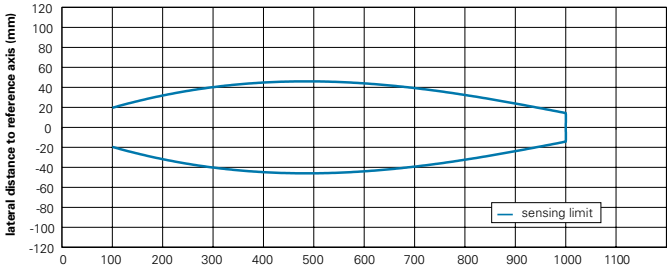


Teach-in = Teach-in or potentiometer

connection diagram



typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

order reference	version	adjustment	output circuit	output signal	connection types
UNAM 30I6103	standard	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	cable, 2 m
UNAM 30I6103/S14	standard	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	connector M12
UNAM 30I6803/S14	multiplex version	Teach-in	current output	4 ... 20 mA / 20 ... 4 mA	connector M12
UNAM 30U6103	standard	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	cable, 2 m
UNAM 30U6103/S14	standard	Teach-in	voltage output	0 ... 10 V / 10 ... 0 V	connector M12
UNAM 30U9103	standard	potentiometer	voltage output	0 ... 10 VDC	cable, 2 m
UNAM 30U9103/S14	standard	potentiometer	voltage output	0 ... 10 VDC	connector M12

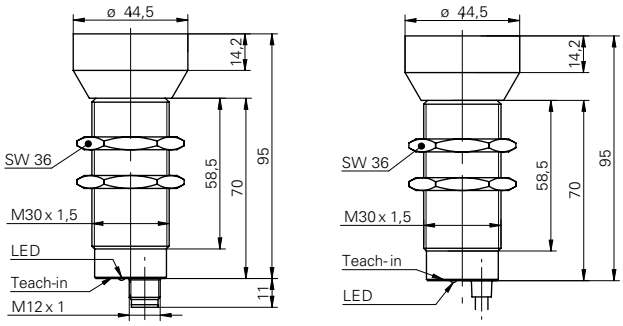
Sd = 2500 mm

- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

general data	
scanning range Sd	400 ... 2500 mm
scanning range close limit Sdc	400 ... 2500 mm
scanning range far limit Sde	400 ... 2500 mm
repeat accuracy	< 1 mm
resolution	< 0,3 mm
response time ton	< 160 ms
release time toff	< 160 ms
temperature drift	< 2 % of distance to target So
sonic frequency	120 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 ... 10 V / 10 ... 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

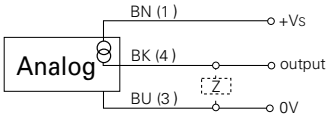
order reference	output circuit	connection types
UNAM 50I6121	current output	cable, 2 m
UNAM 50I6121/S14	current output	connector M12
UNAM 50U6121	voltage output	cable, 2 m
UNAM 50U6121/S14	voltage output	connector M12

dimension drawings

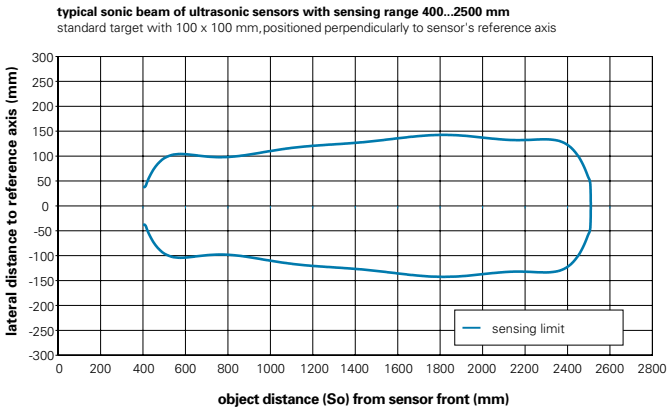


Teach-in = Teach-in or potentiometer

connection diagram



typical sonic cone profile



connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

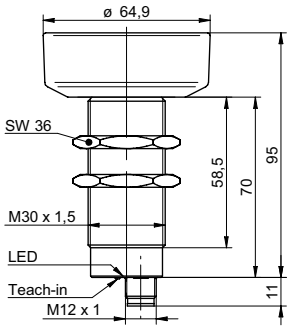
Sd = 6000 mm

- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

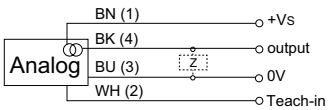
general data	
scanning range Sd	600 ... 6000 mm
scanning range close limit Sdc	600 ... 6000 mm
scanning range far limit Sde	600 ... 6000 mm
repeat accuracy	< 3 mm
resolution	< 2 mm
response time ton	< 640 ms
release time toff	< 640 ms
temperature drift	< 2 % of distance to target So
sonic frequency	80 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	35 mA
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
output signal	0 ... 10 V / 10 ... 0 V
current output	
output signal	4 ... 20 mA / 20 ... 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 ... +60 °C
protection class	IP 67

order reference	output circuit
UNAM 70I6131/S14	current output
UNAM 70U6131/S14	voltage output

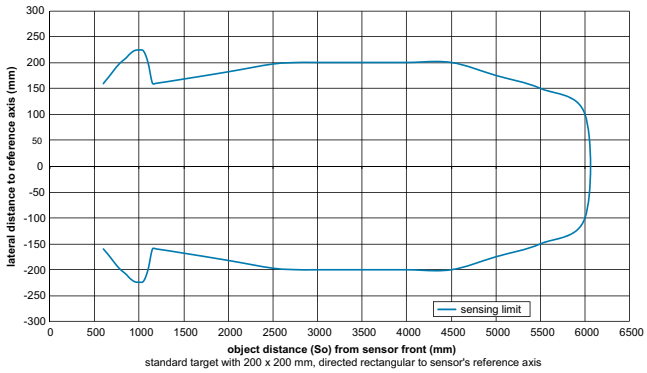
dimension drawing



connection diagram

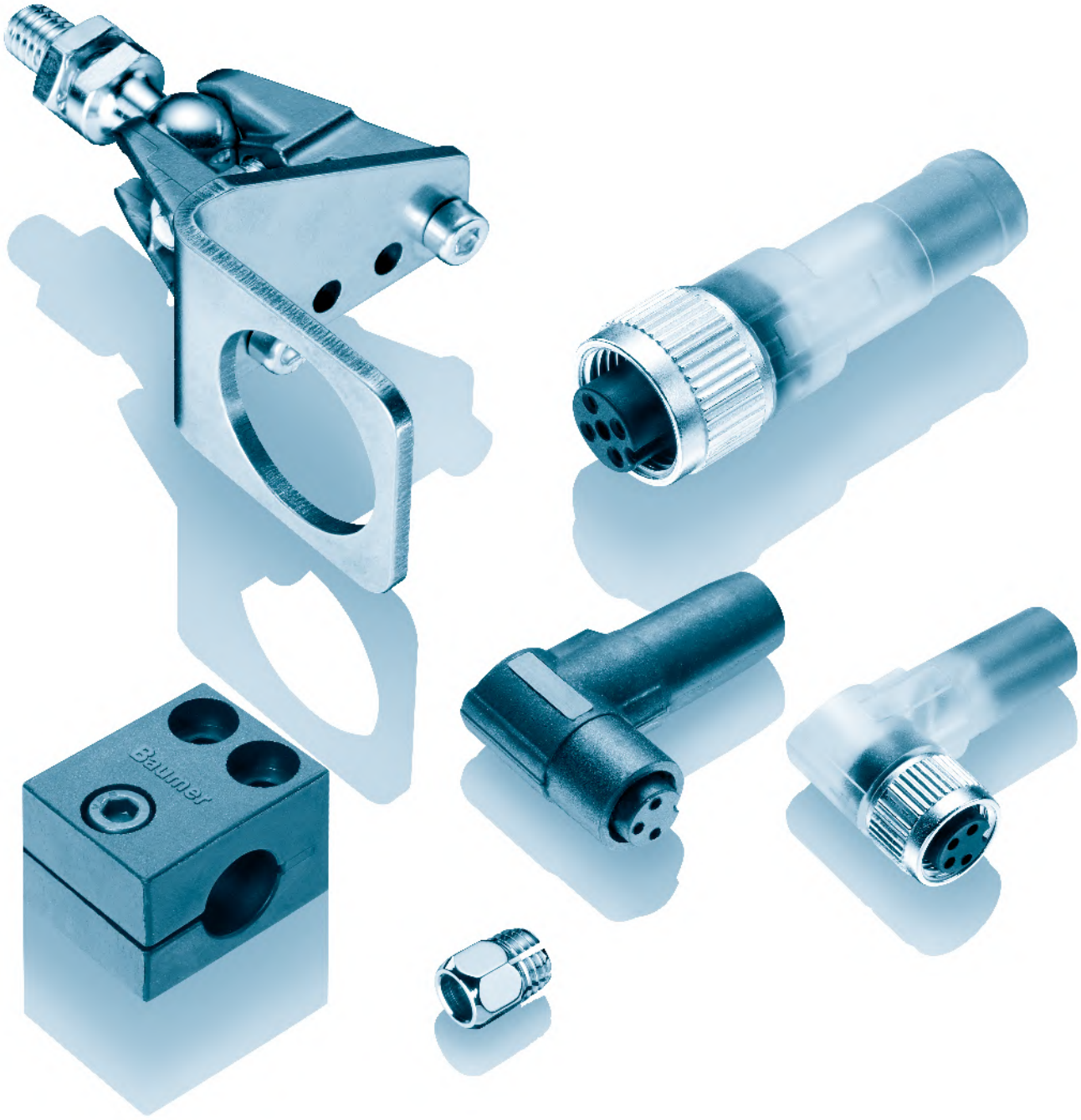


typical sonic cone profile



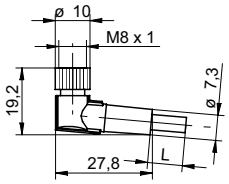
connectors and mating connectors

ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	



Accessories

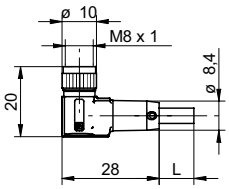
ESW 31 - Connector M8 angular



order reference	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESW 31AH0500	Connector M8, 4 pin, angular, 5 m
ESW 31AH1000	Connector M8, 4 pin, angular, 10 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESW 31SH0500	Connector M8, 3 pin, angular, 5 m
ESW 31SH1000	Connector M8, 3 pin, angular, 10 m

- Connector unshielded
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836
- Meet EN 60079-25 requirements for intrinsically safe ATEX applications

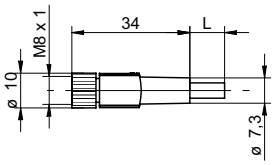
ESW 31G - Connector M8 angular, shielded



order reference	
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
ESW 31AH0500G	Connector M8, 4 pin, angular, 5 m, shielded
ESW 31AH1000G	Connector M8, 4 pin, angular, 10 m, shielded
ESW 31SH0200G	Connector M8, 3 pin, angular, 2 m, shielded
ESW 31SH0500G	Connector M8, 3 pin, angular, 5 m, shielded

- Connector shielded, screen connected with cap nut
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

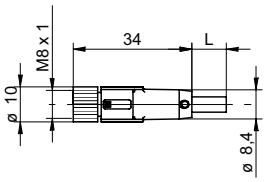
ESG 32 - Connector M8 straight



order reference	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESG 32AH0500	Connector M8, 4 pin, straight, 5 m
ESG 32AH1000	Connector M8, 4 pin, straight, 10 m
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESG 32SH0500	Connector M8, 3 pin, straight, 5 m
ESG 32SH1000	Connector M8, 3 pin, straight, 10 m

- Connector unshielded
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836
- Meet EN 60079-25 requirements for intrinsically safe ATEX applications

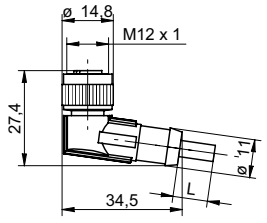
ESG 32G - Connector M8 straight, shielded



order reference	
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESG 32AH0500G	Connector M8, 4 pin, straight, 5 m, shielded
ESG 32AH1000G	Connector M8, 4 pin, straight, 10 m, shielded
ESG 32SH0500G	Connector M8, 3 pin, straight, 5 m, shielded
ESG 32SH1000G/T	Connector M8, 3 pin, straight, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

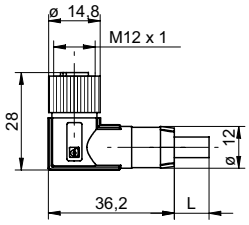
ESW 33 - Connector M12 angular



order reference	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESW 33AH0500	Connector M12, 4 pin, angular, 5 m
ESW 33AH1000	Connector M12, 4 pin, angular, 10 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33SH0500	Connector M12, 3 pin, angular, 5 m
ESW 33SH1000	Connector M12, 3 pin, angular, 10 m

- Connector unshielded
- 3, 4 and 5 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

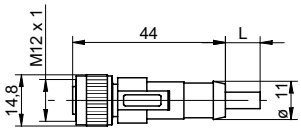
ESW 33G - Connector M12 angular, shielded



order reference	
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
ESW 33AH0500G	Connector M12, 4 pin, angular, 5 m, shielded
ESW 33AH1000G	Connector M12, 4 pin, angular, 10 m, shielded
ESW 33CH0500G	Connector M12, 5 pin, angular, 5 m, shielded
ESW 33FH0200G	Connector M12, 8 pin, angular, 2 m, shielded
ESW 33FH0500G	Connector M12, 8 pin, angular, 5 m, shielded
ESW 33FH1000G	Connector M12, 8 pin, angular, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 4, 5 and 8 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

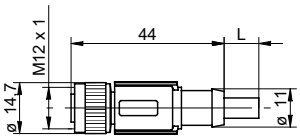
ESG 34 - Connector M12 straight



order reference	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESG 34AH0500	Connector M12, 4 pin, straight, 5 m
ESG 34AH1000	Connector M12, 4 pin, straight, 10 m
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESG 34CH0500	Connector M12, 5 pin, straight, 5 m
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESG 34SH0500	Connector M12, 3 pin, straight, 5 m
ESG 34SH1000	Connector M12, 3 pin, straight, 10 m

- Connector unshielded
- 3, 4 and 5 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

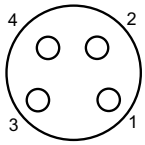
ESG 34G - Connector M12 straight, shielded



order reference	
ESG 34AH0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESG 34AH0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH1000G	Connector M12, 4 pin, straight, 10 m, shielded
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
ESG 34CH0500G	Connector M12, 5 pin, straight, 5 m, shielded
ESG 34CH1000G	Connector M12, 5 pin, straight, 10 m, shielded
ESG 34FH0200G	Connector M12, 8 pin, straight, 2 m, shielded
ESG 34FH0500G	Connector M12, 8 pin, straight, 5 m, shielded
ESG 34FH1000G	Connector M12, 8 pin, straight, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 4, 5 and 8 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

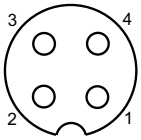
M8 4 pin



1 = BN
2 = WH
3 = BU
4 = BK

ESG 32
ESG 32G
ESW 31
ESW 31G

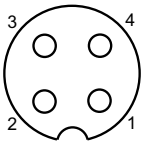
M12 3 pin



1 = BN
2 = n.c.
3 = BU
4 = BK

ESG 34S
ESW 33S

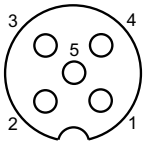
M12 4 pin



1 = BN
2 = WH
3 = BU
4 = BK

ESG 34A
ESW 33A

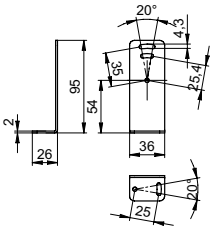
M12 5 pin



1 = BN
2 = WH
3 = BU
4 = BK
5 = GY

ESG 34C
ESW 33C

Mounting bracket for sensors O500/U500 (L design)

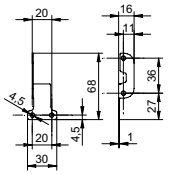


- Material: Steel

For use with O500

order reference	
11092246	Mounting bracket O500/U500 (L design)

Mounting bracket for sensors O500/U500

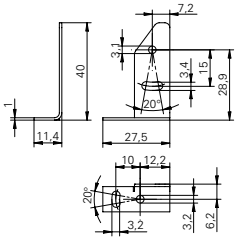


- Material: Steel

For use with U500

order reference	
11111164	Mounting bracket O500/U500 - Retrofit for sensors series 30

Mounting bracket for sensors series 10

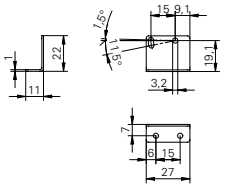


- Material: Steel

For use with UxDK 10, FxDK 10, OxDK 10

order reference	
10118798	Mounting bracket series 10

Mounting bracket for sensors series 10 (L design)

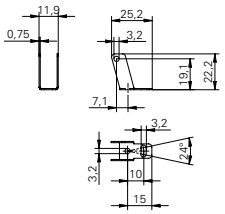


- Material: Steel

For use with UxDK 10, FxDK 10, OxDK 10

order reference	
10133792	Mounting bracket series 10 (L design)

Mounting bracket for sensors series 10 (U design)

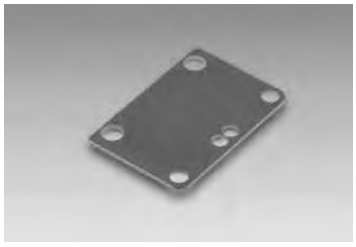


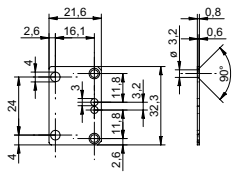
- Material: Steel

For use with UxDK 10, FxDK 10, OxDK 10 (only cabel versions)

order reference	
10114501	Mounting bracket series 10 (U design)

Mounting panel for sensors series 10

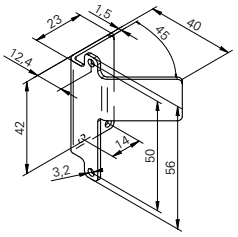




For use with UxDK 10, FxDK 10, OxDK 10

order reference	
10162083	Mounting panel for sensors series 10

Sonic beam deflector for ultrasonic sensors U500

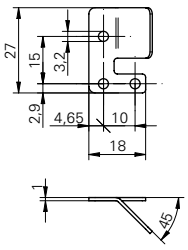


- Sonic beam deflector for ultrasonic sensors

For ultrasonic sensors series 20

order reference	
11111163	Sonic beam deflector for sensors U500

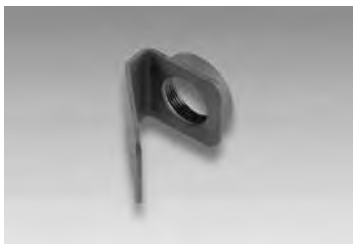
Sonic beam deflector for ultrasonic sensors series 10

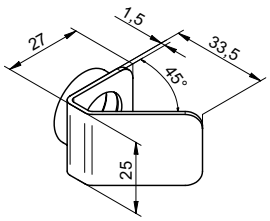


- Set of 2 included 1 x left, 1 x right

order reference	
10162376	Sonic beam deflector for ultrasonic sensors series 10

Sonic beam deflector for ultrasonic sensors series 18 round



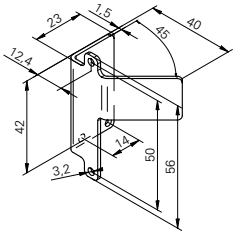


- Sonic beam deflector for ultrasonic sensors

For ultrasonic sensors series 18

order reference	
10164264	Sonic beam deflector series 18 rectangular

Sonic beam deflector for ultrasonic sensors series 20

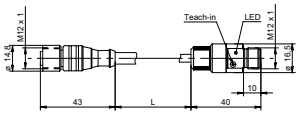


- Sonic beam deflector for ultrasonic sensors

For ultrasonic sensors series 20

order reference	
10153290	Sonic beam deflector series 20

Teach-in Adapter M12



order reference	
10141584	Teach-in Adapter M12

Test unit for sensors analog & digital

- Output via display (V or mA) or LED (PNP/NPN)
- Teach-in of sensors with integrated Teach- button
- Connection for plug in power supply (available as accessory)

Test- and configuration device for analog and digital PNP/NPN sensors with 18 VDC supply voltage

order reference	
11084376	Test unit for sensors analog & digital

Test unit for sensors digital

- LED (red/green) for digital PNP/NPN signals
- Teach-in of sensors with integrated Teach- button
- Connection for plug in power supply (available as accessory)

Test- and configuration device for digital PNP/NPN sensors with 18 VDC supply voltage

order reference	
11084377	Test unit for sensors digital

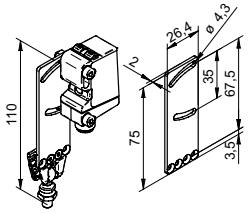
Power supply for sensor test unit

- Input 90-260 VAC
- Output 24 V/0,75 A
- Interchangeable plug-Type A, C, G and I

Protects the batteries of the sensor tester analog & digital for extended lifetime

order reference	
11087165	Test unit for sensors

Sensofix-Mounting kit for sensors O500/U500

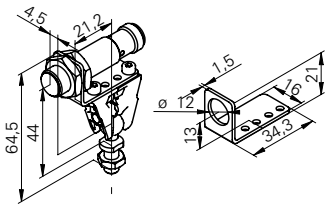


- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with photoelectric sensors O500

order reference	
11099942	Sensofix O500/U500

Sensofix-Mounting kit for sensors series 12 round

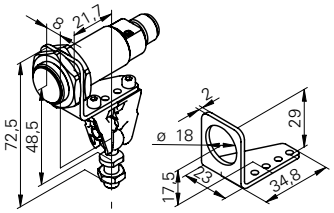


- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with all sensors in M12 housing

order reference	
10151720	Sensofix series 12 round

Sensofix-Mounting kit for sensors series 18 round

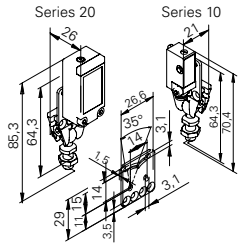


- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with all sensors in M18 housing

order reference	
10151658	Sensofix series 18

Sensofix-Mounting kit for sensors series 10/20

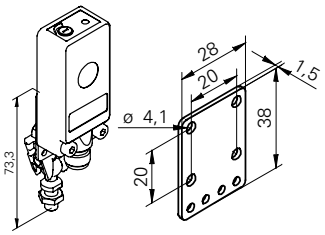


- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with photoelectric and ultrasonic sensors series 10, series 20

order reference	
10150326	Sensofix series 10 / series 20

Sensofix-Mounting kit for sensors series 30



- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with inductive and ultrasonic sensors series 30

order reference	
10152386	Sensofix series 30

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