DATA SHEET

# Displacement Sensors

## Highly Accurate Distance Measurement for Short Distances

SICK
Sensor Intelligence.

# Dis|place|ment Sen|sor

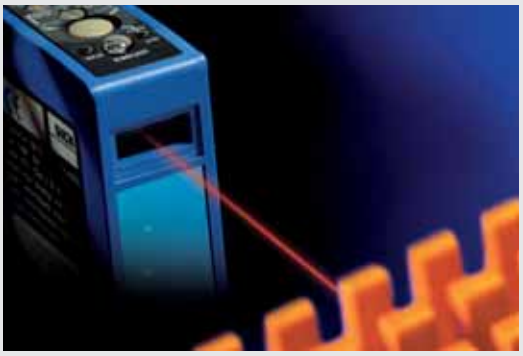
the; pl. -s <lat.> (deviation; tolerance) In automation, a device for non-contact high-accuracy distance measurement. It measures profiles, diameters and thicknesses of objects, controls processes and performs quality check functions in manufacturing processes. OD, OD Hi, OD Max and Profiler™ displacement sensors belong to the SENSICK series of optical distance sensors.

AUDIN - 8, avenue de la malle - 51370 Saint Brice Courcelles - Tel : 03.26.04.20.21 - Fax : 03.26.04.28.20 - Web : http: www.audin.fr - Email : info@audin.fr

## | Selecting economy |

Maximum reliability at a fair price – for smooth flow of goods.

Quick and easy commissioning with the possibility of high throughput rates – for short downtimes and set-up times.



## | Selecting customer satisfaction |

Ultimate reliability in measuring for a wide variety of materials with high to very high accuracy – to achieve good quality.

Non-contact measurement – for direct control of all products, even in dynamic environments.

## | Selecting the right solution |

Fine and focussed emitted beam with visible, red laser light – for detecting and measuring the smallest objects.

Offset option and the sensors' ability to measure accurately even when heavily tilted – for the solution of your application.

# Measuring in the millimetre range, which otherwise would be hard to reach

**Displacement sensors immediately detect the smallest deviations, indentations or unevenness – even in the µm range. Application areas are industries for which quality is of very high importance.**

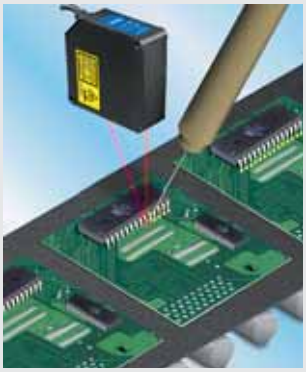
Automotive industry – double-sheet control prior to pressing

Automotive industry – brake pad quality control

## Testing – quality control

Good or bad – not a question of opinion, but of safeguarding existence e.g. for 'A' suppliers of cast, turned or similar parts. The verification of surface finish or dimensional accuracy is their central task. Other typical applications, however, are the detection of very small or very hard-to-detect parts.

Robotics –
Laser cutting head
Height control



Electronics industry –
Application of an insulating paste
Height control

## Process control – positioning

Always the correct distance – relevant to the result when controlling value-added or critical processes on the basis of distance measurements.
A typical application is adjusting the distance of a cutting laser to the object.

Automotive industry –
Brake disc
Classification

Automotive industry –
Ball joint
Sorting

## Classification – sorting

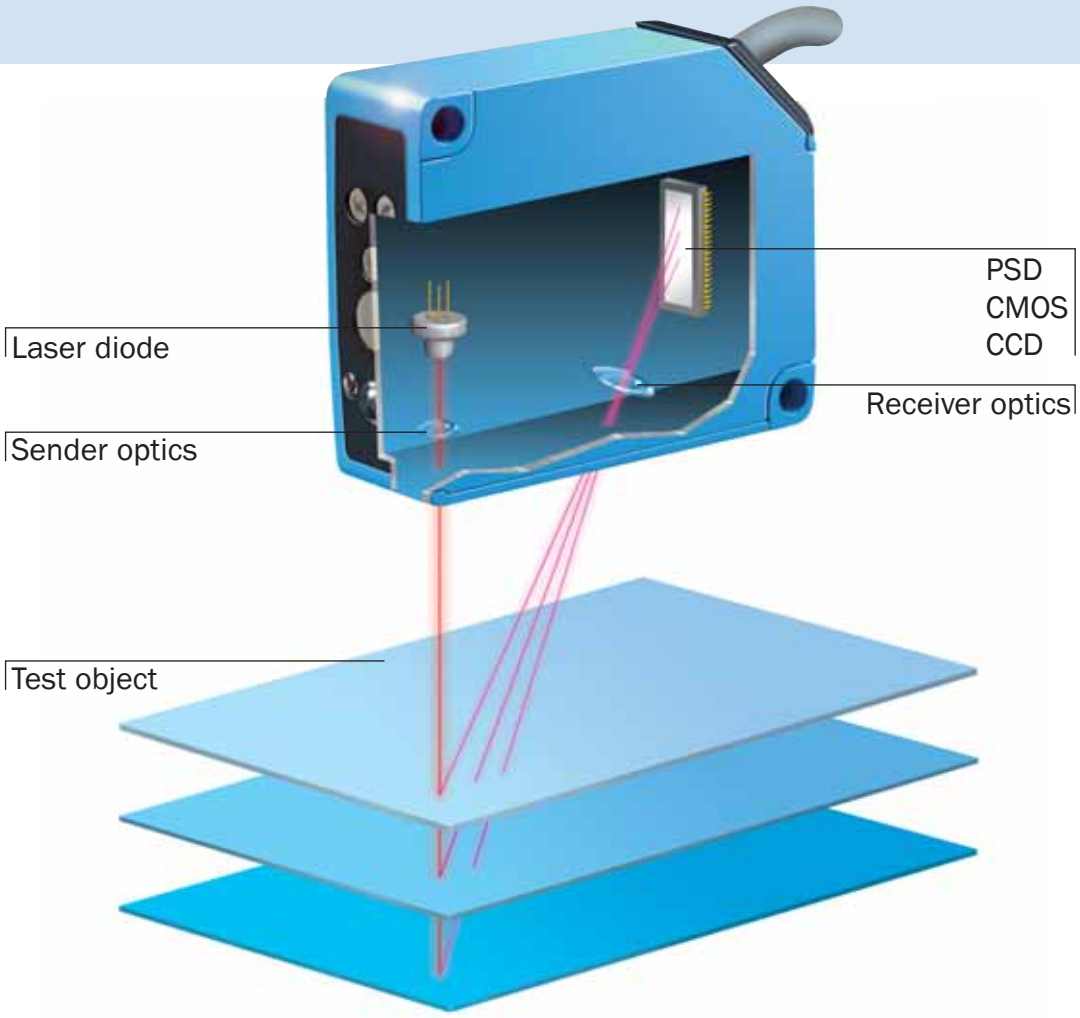
Group A, B or C – a question relevant to assembly when identifying components and their allocation to certain build types. A classic application is the unique allocation of different sizes of swivel joints to the corresponding suspension arrangement.

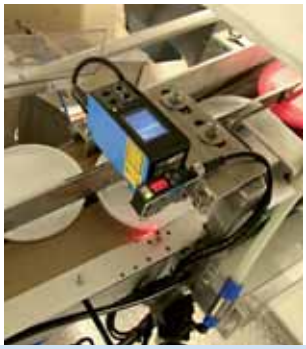
# The technology of distance measurement using displacement sensors

**Maximum accuracy and speed requirements when measuring objects in the millimetre range – SICK displacement sensors master this task using the ideal technology for these measuring ranges.**

## The measuring method – triangulation

A light spot is projected onto a measurement object, e.g. using a laser diode. By means of receiving optics, the reflection is mapped onto a light-sensitive element. Based on the position of the mapped light spot and the known geometry, the distance to the object can be determined.



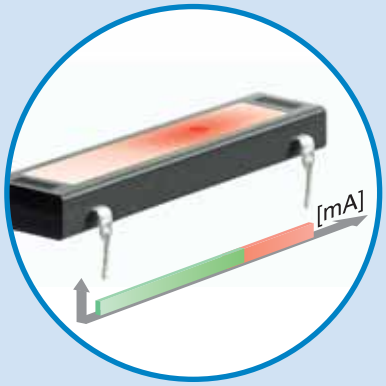


## The receiving elements

Combined with the correct receiving element, the triangulation method ensures highly accurate measurements.

### PSD – POSITION SENSITIVE DETECTOR

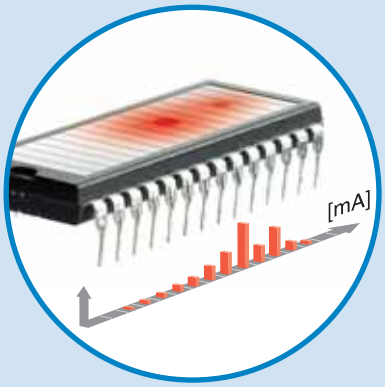
Photodiode with strip, light-sensitive area. The ratio of two output currents indicates the position of the light mapped onto the diode.




- Relatively good resolution on diffuse and homogeneous reflective materials
- Very cost-effective solution
- Enables small device types
- Relatively high measuring frequencies can be implemented
  → Ideal technology for cost-sensitive applications with a low complexity

### CMOS – COMPLEMENTARY METAL OXIDE SEMICONDUCTOR

Highly-integrated semiconductor component consisting of several “light-gathering” pixels incl. evaluation. The position of the measurement object is determined based on the brightness distribution.




- Highest resolution and accuracies on very different materials: matt ... shiny, light ... dark
- Highest reliability even for great differences in contrast (no blooming compared with CCD)
- High measuring frequencies possible
- Cost-effective solution
- Enables relatively small device types
  → Ideal technology for complex industrial measuring tasks

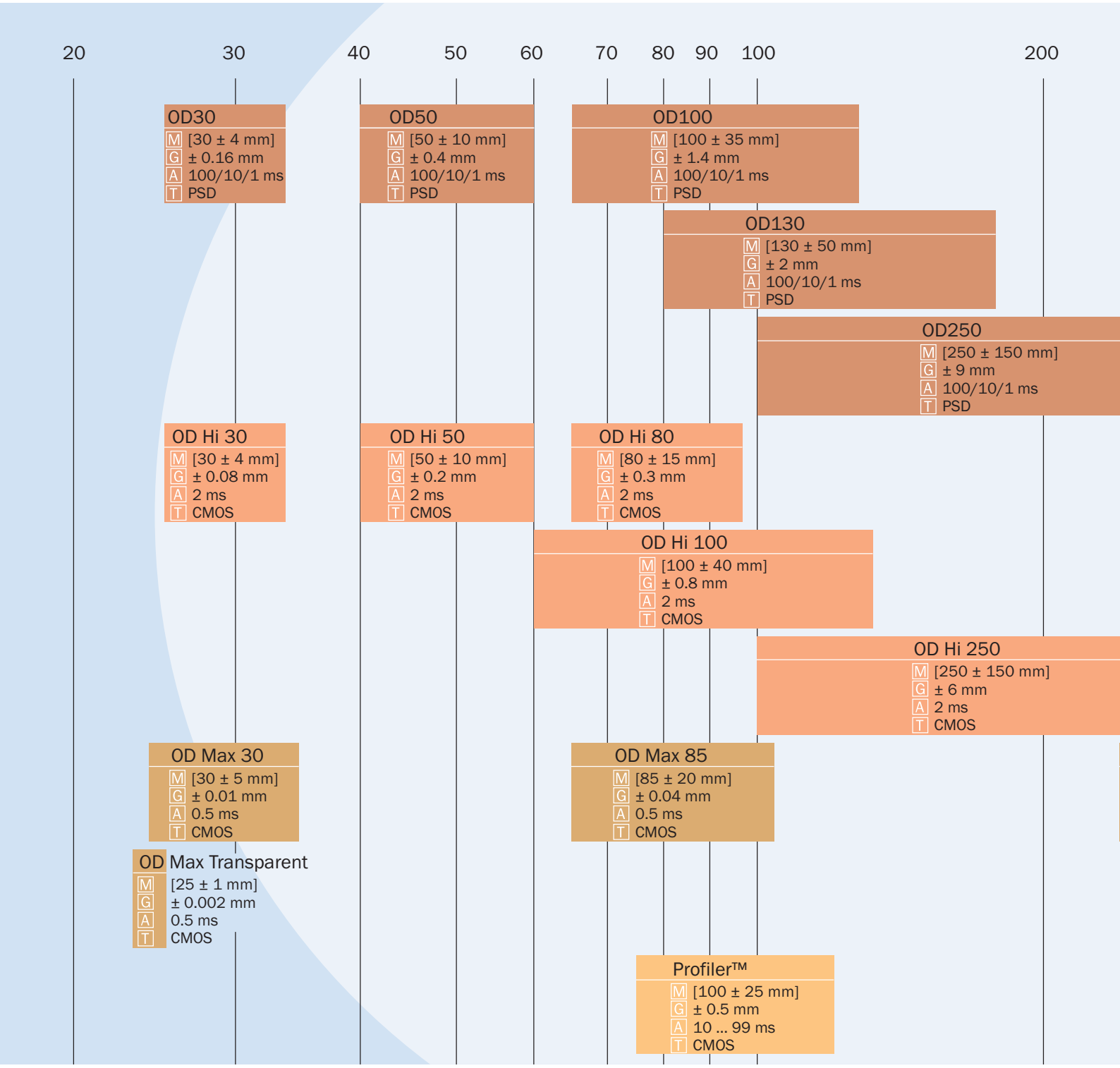
### CCD – CHARGE-COUPLED DEVICE

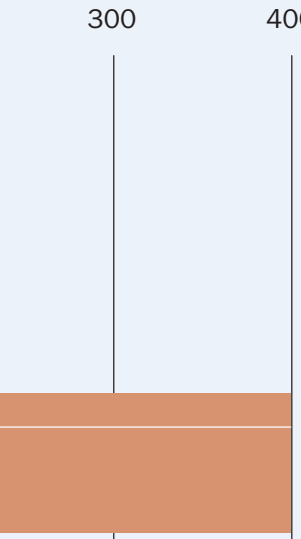
Semiconductor element made of photodiodes arranged in lines. Serial read-out of brightness information serves to determine the location of the light spot.

- Very high resolution and accuracy on very different materials: matt ... shiny, as well as light ... dark
- Relatively high measuring frequencies possible
- Photorealistic mapping properties
  → Ideal technology for digital photography

# Displacement sensors – matched to your application

**The diverse SENSICK displacement series offers the right sensor for any customer requirements.**






**OD SERIES** from p. 10 onwards

**Accurate and fast measurement of homogeneous reflecting objects**

**OD HI SERIES** from p. 16 onwards

**Non-surface dependent, accurate distance measurement**

**OD MAX AND OD MAX TRANSPARENT SERIES** from p. 22 onwards

**Highly accurate, non-surface dependent distance measurement**

**PROFILER™ SERIES** from p. 30 onwards

**Line sensor for profile measurement**

M Measuring range
G Accuracy
A Response time
T Technology

# Displacement Sensor OD – accurate and fast measurement of homogeneous reflecting materials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OD SERIES

## Accurate and fast measurement of homogeneous, reflecting materials

- Precise measurement and detection of even very small objects, implemented in a single device
- High resolution and reproducibility for homogeneous reflecting materials
- Very compact stand-alone device
- Very simple Teach-in

# OD series →

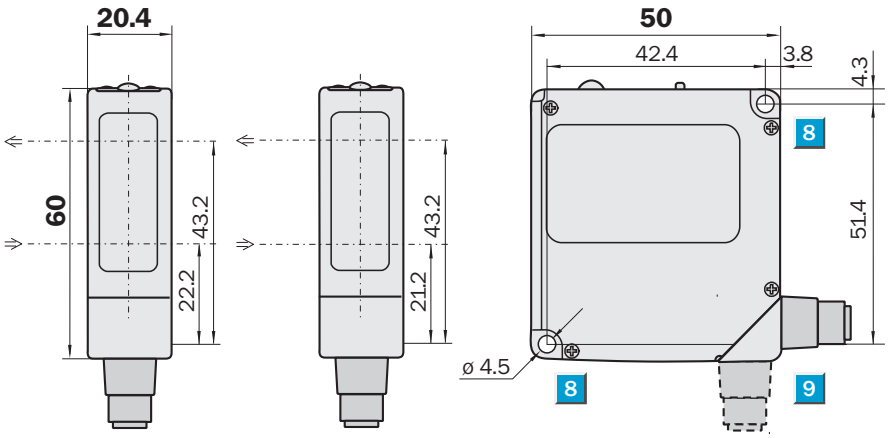
**Measuring ranges 30 ± 4 / 50 ± 10 / 100 ± 35 / 130 ± 50 / 250 ± 150 mm**

**Displacement sensor**

- Laser technology: Measurement or detection of very small objects
- PSD technology: Measurement of diffusely reflective surfaces

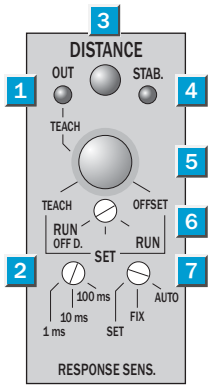
**Dimensional drawing**

| | |
|---|---|
| OD30 | OD50 |
| OD100 | |
| OD130 | |
| OD250 | |




**Adjustments possible**

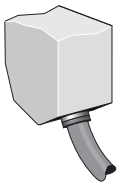
All types



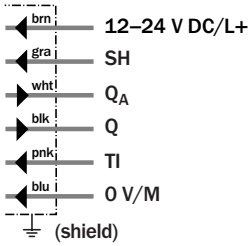

1 Teach-in indicator/output indicator
2 Response time selector
3 Distance indicator
4 Stable indicator
5 Teach-in button
6 Mode selector
7 Sensitivity selector
8 Mounting hole, ø 4.5 mm
9 Connecting cable 2 m (optional 5 m) or M12 plug; 90° rotatable

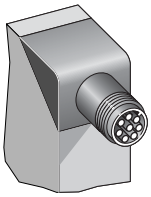
**Connection type**

| | | | |
|---|---|---|---|
| OD30-04P142 | OD50-10N142 | OD30-04P840 | OD50-10P840 |
| OD30-04N142 | OD100-35P142 | OD30-04N840 | OD50-10N840 |
| OD50-10P142 | OD100-35N142 | | |

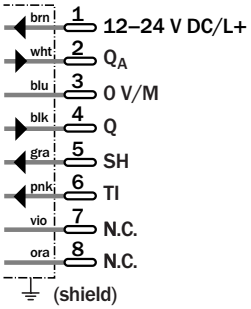


6 x 0.2 mm²



8-pin, M12



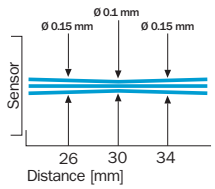

**Accessories**

Cables and connectors

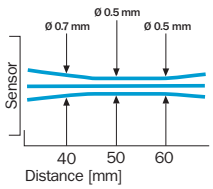
| Technical data | OD- | 30-04 P142 | 30-04 N142 | 30-04 P840 | 30-04 N840 | 50-10 P142 | 50-10 N142 | 50-10 P840 | 50-10 N840 | 100-35 P142 | 100-35 N142 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Light source** | Red laser diode 2 (II) [1] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring range** | 30 ± 4 mm | ■ | ■ | ■ | ■ | | | | | | |
| | 50 ± 10 mm | | | | | ■ | ■ | ■ | ■ | | |
| | 100 ± 35 mm | | | | | | | | | ■ | ■ |
| **Resolution [2]** | 1 µm | ■ | ■ | ■ | ■ | | | | | | |
| | 3 µm | | | | | ■ | ■ | ■ | ■ | | |
| | 15 µm | | | | | | | | | ■ | ■ |
| **Reproducibility [3]** | 3 µm | ■ | ■ | ■ | ■ | | | | | | |
| | 9 µm | | | | | ■ | ■ | ■ | ■ | | |
| | 45 µm | | | | | | | | | ■ | ■ |
| **Accuracy [4]** | ± 160 µm | ■ | ■ | ■ | ■ | | | | | | |
| | ± 400 µm | | | | | ■ | ■ | ■ | ■ | | |
| | ± 1.4 mm | | | | | | | | | ■ | ■ |
| **Effect of air temperature** | ± 0.01 % FS [5]/ °C | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Response time [6]** | 100/10/1 ms | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring frequency / Output rate** | 5 kHz | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **In- and outputs** | PNP | ■ | | ■ | | ■ | | ■ | | ■ | |
| | NPN | | ■ | | ■ | | ■ | | ■ | | ■ |
| **Outputs** | | | | | | | | | | | |
| 1 Analogue current output | 4 ... 20 mA [7] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Control output | Max. 100 mA/30 V DC | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Inputs** | | | | | | | | | | | |
| 1 Sample and Hold input | Synchronisation of the sensor | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Teach input | To reference the measurement | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Supply voltage $V_S$** | 12 ... 24 V DC, –5 %, +10 % | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Power consumption [8]** | ≤ 1.8 W | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Enclosure rating** | IP 67 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **VDE protection class** | III | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Ambient temperature** | Operation –10 °C ... +40 °C [9] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Storage –20 °C ... +60 °C | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Sensitivity to ambient light** | Max. 3.000 lx (artivicial light) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Max. 10.000 lx (sun) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Vibration resistance** | 10/s ... 55/s [10] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Shock resistance** | 50 G (500 m/s²) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Weight** | 200 g (plug), 300 g (cable) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Material** | Housing: Zinc | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Connection type** | 2 m connecting cable (optional 5 m) | ■ | ■ | | | ■ | ■ | | | ■ | ■ |
| | Plug M12, 8-pin [11] | | | ■ | ■ | | | ■ | ■ | | |

1) Wavelength 650 nm, max. output 1-mW
2) At a selected response time of 100 ms with 90 % remission
3) At a selected response time of 100 ms with 90 % remission and constant conditions
4) For 18 ... 90 % remission; equivalent ± 2 % of Full Scale
5) Full Scale = Measuring range:
OD30-04 ... = 8 mm
OD50-10 ... = 20 mm
OD100-35 ... = 70 mm
6) Dependent on the selected response time
7) Load impedance max. 300 Ω
8) Including analogue current output
9) Non-condensing; do not bend below 0 °C
10) Amplitude 1.5 mm; 2 h for axes XYZ
11) 2 m cable: 6020663
5 m cable: 6020664

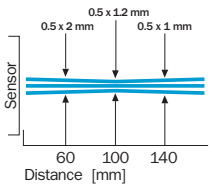
**OD30-04: Light spot diameter**




**OD50-10: Light spot diameter**




**OD100-35: Light spot diameter**




**Order information**

| Type | Order no. |
|---|---|
| OD30-04N142 | 6021840 |
| OD30-04P142 | 6021839 |
| OD30-04N840 | 6021842 |
| OD30-04P840 | 6021841 |
| OD50-10N142 | 6020636 |
| OD50-10P142 | 6020637 |
| OD50-10N840 | 6020640 |
| OD50-10P840 | 6020641 |
| OD100-35N142 | 6022477 |
| OD100-35P142 | 6022476 |

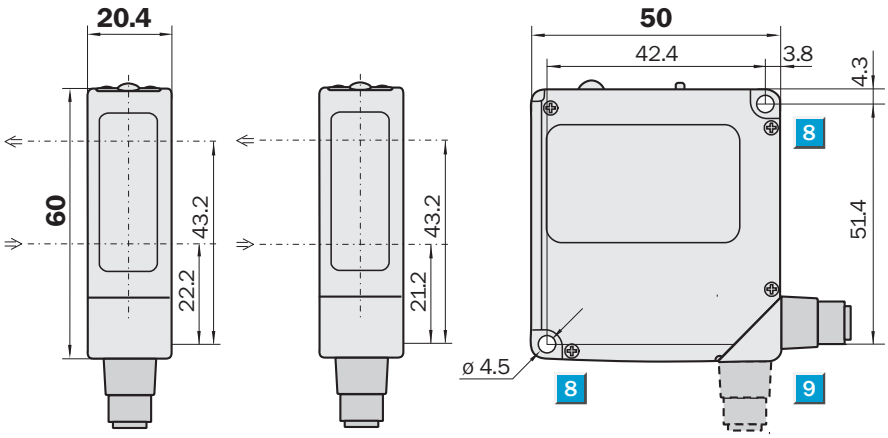
**Measuring ranges 30 ± 4 / 50 ± 10 / 100 ± 35 / 130 ± 50 / 250 ± 150 mm**

**Displacement sensor**

- Laser technology: Measurement or detection of very small objects
- PSD technology: Measurement of diffusely reflective surfaces

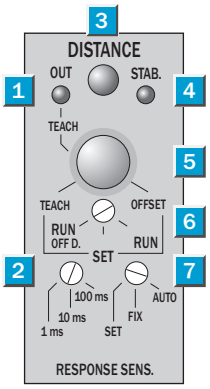
**Dimensional drawing**

| | |
|---|---|
| OD30 | OD50 |
| OD100 | |
| OD130 | |
| OD250 | |




**Adjustments possible**

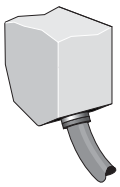
All types



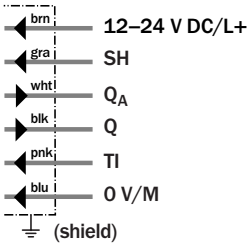

1 Teach-in indicator/output indicator
2 Response time selector
3 Distance indicator
4 Stable indicator
5 Teach-in button
6 Mode selector
7 Sensitivity selector
8 Mounting hole, ø 4.5 mm
9 Connecting cable 2 m (optional 5 m) or M12 plug; 90° rotatable

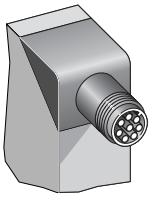
**Connection type**

| | | | |
|---|---|---|---|
| OD130-50P142 | OD250-150P142 | OD100-35P840 | OD130-50N840 |
| OD130-50N142 | OD250-150N142 | OD100-35N840 | OD250-150P840 |
| | | OD130-50P840 | OD250-150N840 |

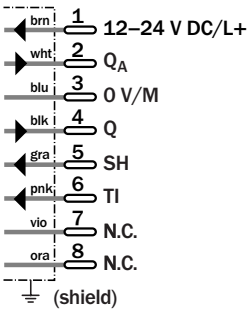


6 x 0.2 mm²



8-pin, M12



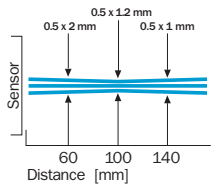

**Accessories**

Cables and connectors

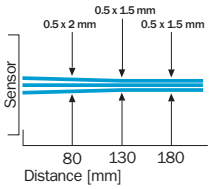
| Technical data | | OD- | 100-35 P840 | 100-35 N840 | 130-50 P142 | 130-50 N142 | 130-50 P840 | 130-50 N840 | 250-150 P142 | 250-150 N142 | 250-150 P840 | 250-150 N840 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Light source** | Red laser diode 2 (II) [1] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring range** | 100 ± 35 mm | | ■ | ■ | | | | | | | | |
| | 130 ± 50 mm | | | | ■ | ■ | ■ | ■ | | | | |
| | 250 ± 150 mm | | | | | | | | ■ | ■ | ■ | ■ |
| **Resolution [2]** | 15 µm | | ■ | ■ | | | | | | | | |
| | 20 µm | | | | ■ | ■ | ■ | ■ | | | | |
| | 150 µm | | | | | | | | ■ | ■ | ■ | ■ |
| **Reproducibility [3]** | 45 µm | | ■ | ■ | | | | | | | | |
| | 60 µm | | | | ■ | ■ | ■ | ■ | | | | |
| | 450 µm | | | | | | | | ■ | ■ | ■ | ■ |
| **Accuracy [4]** | ± 1.4 mm | | ■ | ■ | | | | | | | | |
| | ± 2 mm | | | | ■ | ■ | ■ | ■ | | | | |
| | ± 9 mm | | | | | | | | ■ | ■ | ■ | ■ |
| **Effect of air temperature** | ± 0.01 % FS [5]/ °C | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Response time [6]** | 100/10/1 ms | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring frequency / Output rate** | 5 kHz | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **In- and outputs** | PNP | | ■ | | ■ | | ■ | | ■ | | ■ | |
| | NPN | | | ■ | | ■ | | ■ | | ■ | | ■ |
| **Output** | | | | | | | | | | | | |
| 1 Analogue current output | 4 ... 20 mA [7] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Control output | max. 100 mA/DC 30 V | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Inputs** | | | | | | | | | | | | |
| 1 Sample and Hold input | Synchronisation of the sensor | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Teach input | To reference the measurement | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Supply voltage $V_S$** | 12 ... 24 V DC, –5 %, +10 % | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Power consumption [8]** | ≤ 1.8 W | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Enclosure rating** | IP 67 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **VDE protection class** | III | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Ambient temperature** | Operation –10 °C ... +40 °C [9] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Storage –20 °C ... +60 °C | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Sensitivity to ambient light** | Max. 3.000 lx (artificial light) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Max. 10.000 lx (sun) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Vibration resistance** | 10/s ... 55/s [10] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Shock resistance** | 50 G (500 m/s²) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Weight** | 200 g (plug), 300 g (cable) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Material** | Housing: Zinc | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Connection type** | 2 m connecting cable (optional 5 m) | | | | ■ | ■ | | | ■ | ■ | | |
| | Plug M12, 8-pin [11] | | ■ | ■ | | | ■ | ■ | | | ■ | ■ |

1) Wavelength 650 nm, max. output 1 mW
2) At a selected response time of 100 ms with 90 % remission
3) At a selected response time of 100 ms with 90 % remission and constant conditions
4) For 6 ... 90 % (OD250-150, 16 ... 90 %) Remission; equivalent ± 2 % of Full Scale (bei OD250-150 ± 3 %)
5) Full Scale = Measuring range:
OD100-35 ... = 70 mm
OD130-50 ... = 100 mm
OD250-150 ... = 300 mm
6) Dependent on the selected response time
7) Load impedance max. 300 Ω
8) Including analogue current output
9) Non-condensing; do not bend below 0 °C
10) Amplitude 1.5 mm; 2 h for axes XYZ
11) 2 m cable: 6020663
5 m cable: 6020664

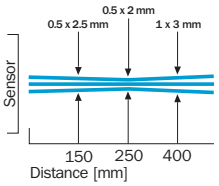
**OD100-35: Light spot diameter**




**OD130-50: Light spot diameter**



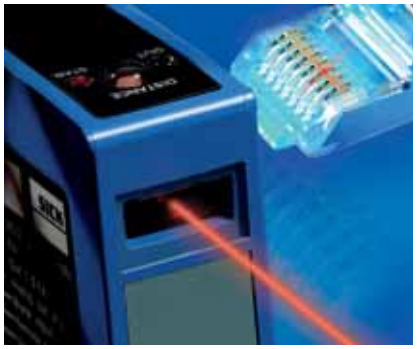

**OD250-150: Light spot diameter**




**Order information**

| Type | Order no. |
|---|---|
| OD100-35N840 | 6022479 |
| OD100-35P840 | 6022478 |
| OD130-50N142 | 6021848 |
| OD130-50P142 | 6021847 |
| OD130-50N840 | 6021850 |
| OD130-50P840 | 6021849 |
| OD250-150N142 | 6021852 |
| OD250-150P142 | 6021851 |
| OD250-150N840 | 6021854 |
| OD250-150P840 | 6021853 |

# OD Hi displacement sensor – non-surface dependent, accurate distance measurement



OD HI SERIES

## Non-surface dependent, accurate distance measurement

- Safe measurements on all surfaces: matt ... shiny, as well as light ... dark
- High measuring accuracy
- Very compact stand-alone device
- Display: quick and easy set-up directly on the sensor

# OD Hi series →

AUDIN - 8, avenue de la malle - 51370 Saint Brice Courcelles - Tel : 03.26.04.20.21 - Fax : 03.26.04.28.20 - Web : http: www.audin.fr - Email : info@audin.fr

**Measurement ranges**
**30 ± 4/50 ± 10/80 ± 15/ 100 ± 40/250 ± 150 mm**

**Displacement sensor**

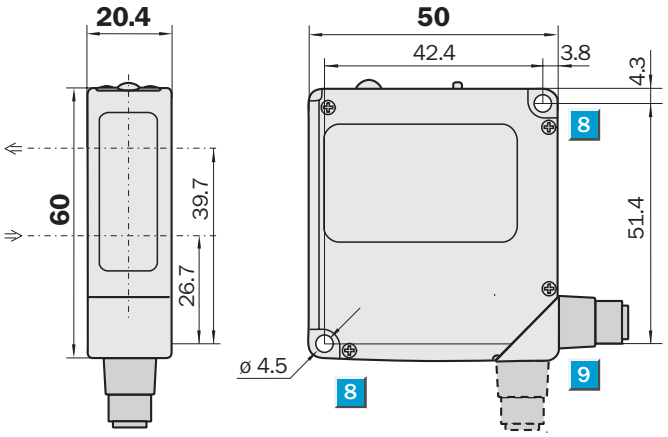
- Laser Technology
- CMOS Technology:
  – object independent measuring: light ... dark
- Stand-alone device:
  – no additional outlay caused by external controller necessary
- Setting and display on the device
  – quick, fast and easy set up

CE

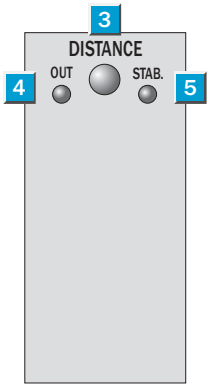
**Accessories**
Cables and connectors

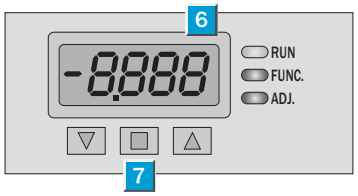
**Dimensional drawing**

| OD30 | OD50 | OD80 | OD100 | OD250 |
|---|---|---|---|---|




**Adjustments possible**
All types

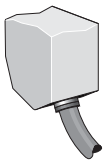


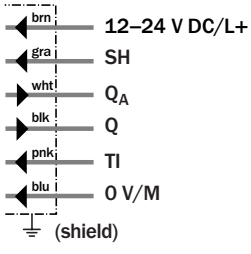

1 Mounting hole, ø 4.5 mm
2 2 m cable (5 m optional) or M12 plug; 90° rotatable
3 Distance indicator
4 Output indicator (OUT)
5 Stability indicator
6 Display
7 Mode buttons

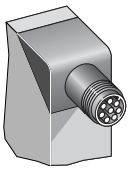
**Connection type**

| | | | |
|---|---|---|---|
| OD30-04P152 | OD30-04N152 | OD30-04P850 | OD30-04N850 |
| OD50-10P152 | OD50-10N152 | OD50-10P850 | OD50-10N850 |
| OD80-15P152 | OD80-15N152 | | |

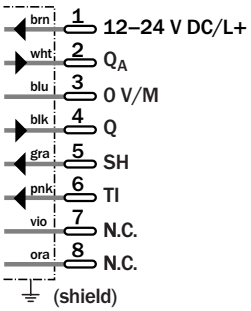


6 x 0.2 mm²



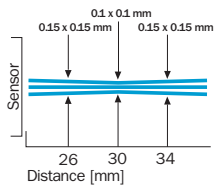
8-pin, M12



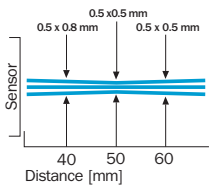
| Technical data | OD- | 30-04 P152 | 30-04 N152 | 30-04 P850 | 30-04 N850 | 50-10 P152 | 50-10 N152 | 50-10 P850 | 50-10 N850 | 80-15 P152 | 80-15 N152 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Light source** | Red laser diode 2 (II) [1] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring range** | 30 ± 4 mm | ■ | ■ | ■ | ■ | | | | | | |
| | 50 ± 10 mm | | | | | ■ | ■ | ■ | ■ | | |
| | 80 ± 15 mm | | | | | | | | | ■ | ■ |
| **Resolution [2]** | 4 µm | ■ | ■ | ■ | ■ | | | | | | |
| | 10 µm | | | | | ■ | ■ | ■ | ■ | | |
| | 15 µm | | | | | | | | | ■ | ■ |
| **Reproducibility [3]** | 12 µm | ■ | ■ | ■ | ■ | | | | | | |
| | 30 µm | | | | | ■ | ■ | ■ | ■ | | |
| | 45 µm | | | | | | | | | ■ | ■ |
| **Accuracy [4]** | ± 80 µm | ■ | ■ | ■ | ■ | | | | | | |
| | ± 200 µm | | | | | ■ | ■ | ■ | ■ | | |
| | ± 300 µm | | | | | | | | | ■ | ■ |
| **Effect of air temperature** | ± 0.08 % FS [5]/ °C | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Response time [6]** | 2 ms | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring frequency / Output rate** | 1 kHz | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **In- and outputs** | PNP | ■ | | ■ | | ■ | | ■ | | ■ | |
| | NPN | | ■ | | ■ | | ■ | | ■ | | ■ |
| **Output** | | | | | | | | | | | |
| 1 Analogue current output | 4 ... 20 mA [7] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Control output | max. 100 mA/30 V DC | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Inputs** | | | | | | | | | | | |
| 1 Sample and Hold input | Synchronisation of the sensor | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Teach input | To reference the measurement | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Display type** | Alphanumeric display, 4-digit | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Additional features** | Averaging functions | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Autom./manual sensitivity setting | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Timer functions | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | 3 Memory banks | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Supply voltage $V_S$** | 12 ... 24 V DC, –5 %, +10 % | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Power consumption [8]** | ≤ 2.88 W | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Enclosure rating** | IP 67 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **VDE protection class** | III | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Ambient temperature** | Operation –10 °C ... +40 °C [9] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Storage –20 °C ... +60 °C | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Sensitivity to ambient light** | Max. 3.000 lx (artificial light) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Max. 10.000 lx (sun) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Vibration resistance** | 10/s ... 55/s [10] | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Shock resistance** | 50 G (500 m/s²) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Weight** | 200 g (plug), 300 g (cable) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Material** | Housing: Zinc | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Connection type** | 2 m connecting cable (optional 5 m) | ■ | ■ | | | ■ | ■ | | | ■ | ■ |
| | Plug M12, 8-pin [11] | | | ■ | ■ | | | ■ | ■ | | |

1) Wavelength 650 nm, max. output 1 mW
2) Averaging: 64 measurements
Object: 6 ... 90 % remission
3) With constant environmental conditions;
Averaging: 64 measurements
4) For 18 ... 90 % remission; equivalent ± 1 % of Full Scale
5) Full Scale = Measuring range:
OD30-04 ... = 8 mm
OD50-10 ... = 20 mm
OD80-15 ... = 30 mm
6) Without averaging and manually selected sensitivity
7) Load impedance max. 300 Ω
8) Including analogue current output
9) Non-condensing; do not bend below 0 °C
10) Amplitude 1.5 mm;
2 h for axes XYZ
11) 2 m cable: 6020663
5 m cable: 6020664

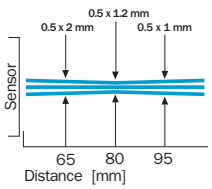
**OD30-04: Light spot diameter**




**OD50-10: Light spot diameter**




**OD80-15: Light spot diameter**




**Order information**

| Type | Order no. |
|---|---|
| OD30-04N152 | 6025033 |
| OD30-04P152 | 6025031 |
| OD30-04N850 | 6025034 |
| OD30-04P850 | 6025032 |
| OD50-10N152 | 6025037 |
| OD50-10P152 | 6025035 |
| OD50-10N850 | 6025038 |
| OD50-10P850 | 6025036 |
| OD80-15N152 | 6025041 |
| OD80-15P152 | 6025039 |

More types see p. 21

**Measurement ranges**
**30 ± 4/50 ± 10/80 ± 15/ 100 ± 40/250 ± 150 mm**

**Displacement sensor**

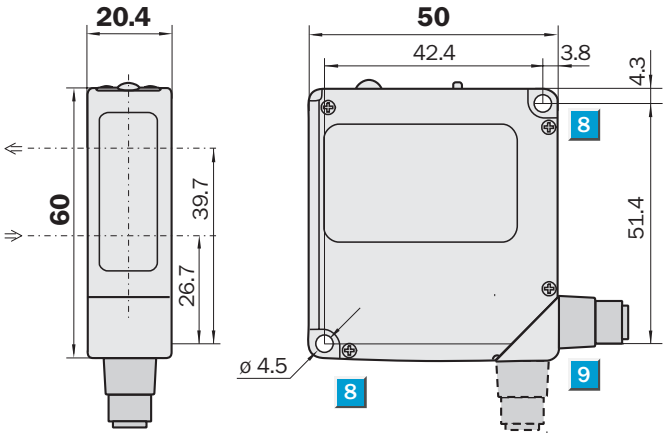
- Laser Technology
- CMOS Technology:
  – object independent measuring: light ... dark
- Stand-alone device:
  – no additional outlay caused by external controller necessary
- Setting and display on the device
  – quick, fast and easy set up

CE

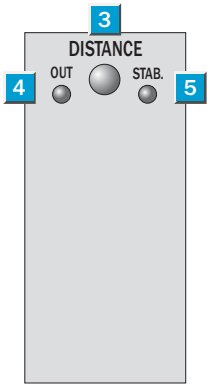
**Accessories**
Cables and connectors

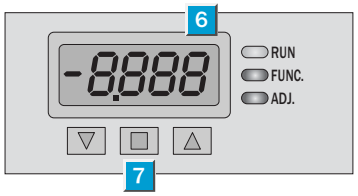
**Dimensional drawing**

| OD30 | OD50 | OD80 | OD100 | OD250 |
|---|---|---|---|---|




**Adjustments possible**
All types

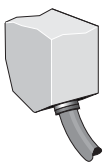


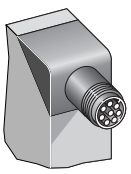

1 Mounting hole, ø 4.5 mm
2 2 m cable (5 m optional) or M12 plug; 90° rotatable
3 Distance indicator
4 Output indicator (OUT)
5 Stability indicator
6 Display
7 Mode buttons

**Connection type**

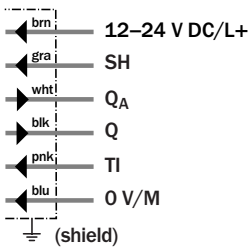
| | | | |
|---|---|---|---|
| OD100-40P152 | OD100-40N152 | OD80-15P850 | OD80-15N850 |
| OD250-150P152 | OD250-150N152 | OD100-40P850 | OD100-40N850 |
| | | OD250-150P850 | OD250-150N850 |

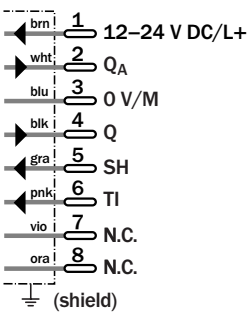


6 x 0.2 mm²



8-pin, M12

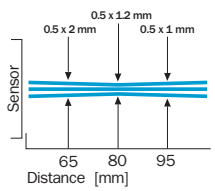


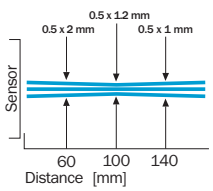
| Technical data | | OD- | 80-15 P850 | 80-15 N850 | 100-40 P152 | 100-40 N152 | 100-40 P850 | 100-40 N850 | 250-150 P152 | 250-150 N152 | 250-150 P850 | 250-150 N850 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Light source** | Red laser diode 2 (II) [1] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring range** | 80 ± 15 mm | | ■ | ■ | | | | | | | | |
| | 100 ± 40 mm | | | | ■ | ■ | ■ | ■ | | | | |
| | 250 ± 150 mm | | | | | | | | ■ | ■ | ■ | ■ |
| **Resolution [2]** | 15 µm | | ■ | ■ | | | | | | | | |
| | 35 µm | | | | ■ | ■ | ■ | ■ | | | | |
| | 75 µm | | | | | | | | ■ | ■ | ■ | ■ |
| **Reproducibility [3]** | 45 µm | | ■ | ■ | | | | | | | | |
| | 105 µm | | | | ■ | ■ | ■ | ■ | | | | |
| | 225 µm | | | | | | | | ■ | ■ | ■ | ■ |
| **Accuracy [4]** | ± 300 µm | | ■ | ■ | | | | | | | | |
| | ± 800 µm | | | | ■ | ■ | ■ | ■ | | | | |
| | ± 6 mm | | | | | | | | ■ | ■ | ■ | ■ |
| **Effect of air temperature** | ± 0.08 % FS [5]/ °C | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Response time [6]** | 2 ms | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Measuring frequency / Output rate** | 1 kHz | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **In- and outputs** | PNP | | ■ | | ■ | | ■ | | ■ | | ■ | |
| | NPN | | | ■ | | ■ | | ■ | | ■ | | ■ |
| **Output** | | | | | | | | | | | | |
| 1 Analogue current output | 4 ... 20 mA [7] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Control output | max. 100 mA/DC 30 V | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Inputs** | | | | | | | | | | | | |
| 1 Sample and Hold input | Synchronisation of the sensor | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 Teach input | To reference the measurement | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Display type** | Alphanumeric display, 4-digit | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Additional features** | Averaging functions | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Autom./manual sensitivity setting | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Timer functions | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | 3 Memory banks | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Supply voltage $V_S$** | 12 ... 24 V DC, –5 %, +10 % | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Power consumption [8]** | ≤ 2.88 W | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Enclosure rating** | IP 67 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **VDE protection class** | III | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Ambient temperature** | Operation –10 °C ... +40 °C [9] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Storage –20 °C ... +60 °C | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Sensitivity to ambient light** | max. 3.000 lx (artificial light) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | max. 10.000 lx (sun) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Vibration resistance** | 10/s ... 55/s [10] | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Shock resistance** | 50 G (500 m/s²) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Weight** | 200 g (plug), 300 g (cable) | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Material** | Housing: Zinc | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **Connection type** | 2 m connecting cable (optional 5 m) | | | | ■ | ■ | | | ■ | ■ | | |
| | Plug M12, 8-pin [11] | | ■ | ■ | | | ■ | ■ | | | ■ | ■ |

1) Wavelength 650 nm, max. output 1 mW
2) Averaging: 64 measurements
Object: 6 ... 90 % remission
3) With constant environmental conditions;
Averaging: 64 measurements
4) For 18 ... 90 % remission; equivalent ± 1 % of Full Scale (for OD250-150 ± 2 %)
5) Full Scale = Measuring range:
OD80-15 ... = 30 mm
OD100-40 ... = 80 mm
OD250-150 ... = 300 mm
6) Without averaging and manually selected sensitivity
7) Load impedance max. 300 Ω
8) Including analogue current output
9) Non-condensing; do not bend below 0 °C
10) Amplitude 1.5 mm;
2 h for axes XYZ
11) 2 m cable: 6020663
5 m cable: 6020664

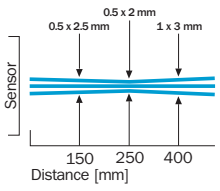
**OD80-15: Light spot diameter**




**OD100-40: Light spot diameter**



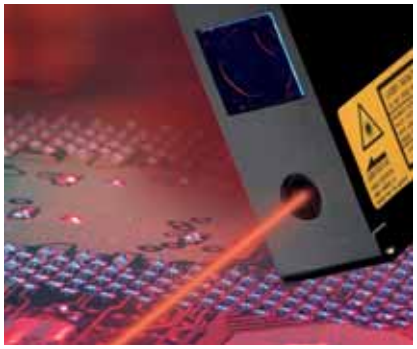

**OD250-150: Light spot diameter**




**Order information**

| Type | Order no. |
|---|---|
| OD80-15N850 | 6025042 |
| OD80-15P850 | 6025040 |
| OD100-40N152 | 6025045 |
| OD100-40P152 | 6025043 |
| OD100-40N850 | 6025046 |
| OD100-40P850 | 6025044 |
| OD250-150N152 | 6028095 |
| OD250-150P152 | 6028094 |
| OD250-150N850 | 6028097 |
| OD250-150P850 | 6028096 |

# OD Max and OD Max Transparent displacement sensors – highly accurate, non-surface dependent distance measurement



- Highest measuring accuracy
- Non-surface dependent measurements: matt ... shiny, as well as light ... dark
- Easiest solution for customer-specific applications, thanks to integrated calculations based on values from 2 sensors
- Diverse interfaces

OD MAX AND OD MAX TRANSPARENT SERIES

**Highly accurate, non-surface dependent distance measurement**

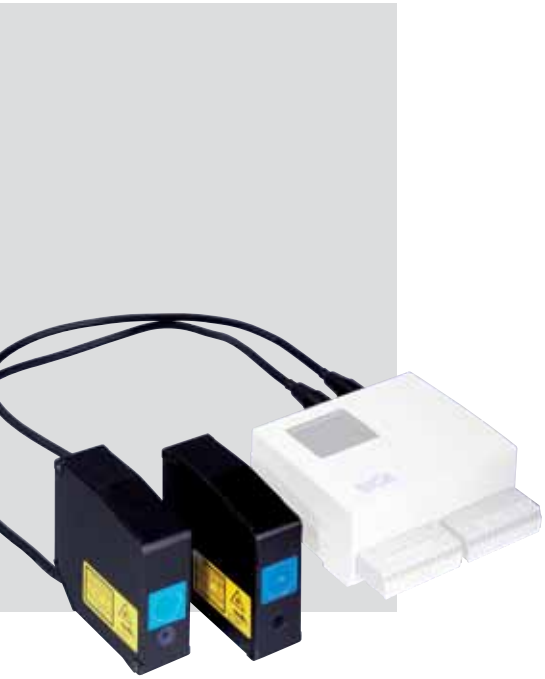
# OD MAX series →

AUDIN - 8, avenue de la malle - 51370 Saint Brice Courcelles - Tel : 03.26.04.20.21 - Fax : 03.26.04.28.20 - Web : http: www.audin.fr - Email : info@audin.fr

**Measurement ranges**
**25±1/30±5/85±20/**
**350±100 mm**

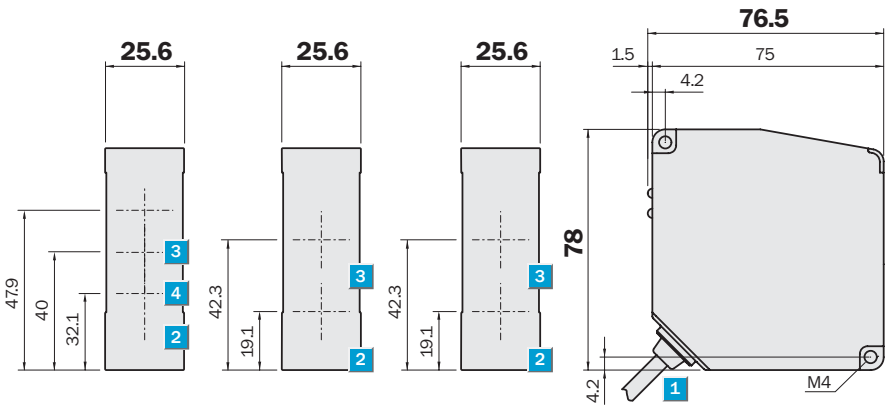
**Displacement Sensor**

- Highest measuring accuracy
- Non-surface dependent measurements: Standard: matt ... shiny, as well as light ... dark
- Transparent: Transparent materials
- Calculation using 2 sensors values
- Diverse interfaces

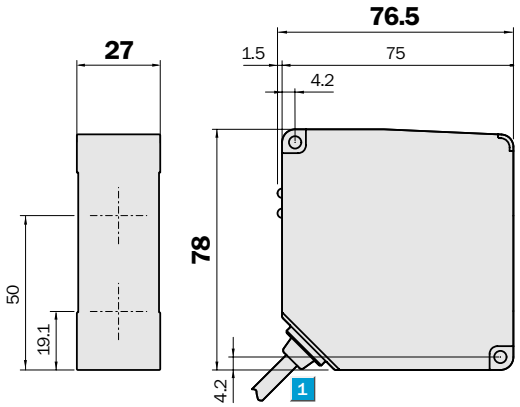


**Dimensional drawing**

0D25-01T1 | 0D30-05T1 | 0D85-20T1



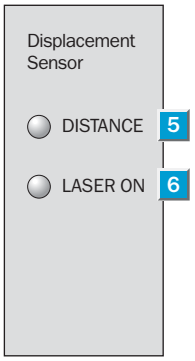

0D350-100T1




1 Cable ø 5 mm/0.5 m with 10-pin connector
2 Optical axis – sender
3 Optical axis – receiver
4 Optical axis – light spot (at 25 mm due to V-Optics with 17.5°)
5 Distance indicator LED
6 Laser on LED

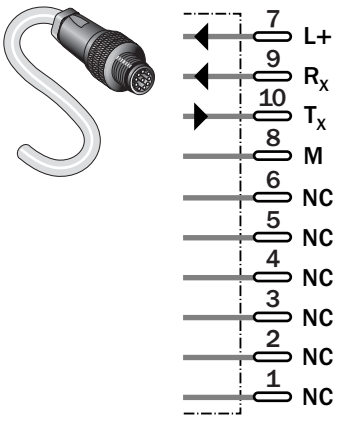
**Adjustments possible**

All types




**Connection types**

All types | 10-pin



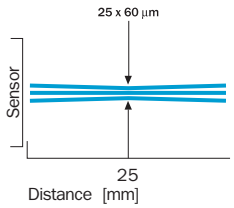

**Accessories**

Cables and connectors

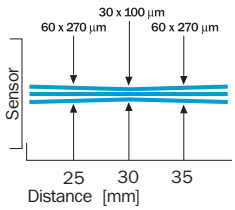
| Technical Data | | 0D- | 25-01T1 | 30-05T1 | 85-20T1 | 350-100T1 |
|---|---|---|---|---|---|---|
| **Light source** | Red laser diode 1 (II) [1] | | ■ | | | |
| | Red laser diode 2 (II) [2] | | | ■ | ■ | ■ |
| **Measuring range** | 25 ± 1 mm | | ■ | | | |
| | 30 ± 5 mm | | | ■ | | |
| | 85 ± 20 mm | | | | ■ | |
| | 350 ± 100 mm | | | | | ■ |
| **Resolution** [3] | 0.1 µm | | ■ | | | |
| | 1 µm | | | ■ | | |
| | 5 µm | | | | ■ | |
| | 50 µm | | | | | ■ |
| **Reproducibility** [4] | 0.3 µm | | ■ | | | |
| | 3 µm | | | ■ | | |
| | 15 µm | | | | ■ | |
| | 150 µm | | | | | ■ |
| **Accuracy** | ± 2 µm [5] | | ■ | | | |
| | ± 10 µm [6] | | | ■ | | |
| | ± 40 µm [6] | | | | ■ | |
| | ± 200 µm [6] | | | | | ■ |
| **Temperature drift** | ± 0.05 % FS [7]/ °C | | ■ | ■ | ■ | ■ |
| **Measuring frequency** | 10 kHz | | ■ | ■ | ■ | ■ |
| **Supply voltage $V_S$** | Supplied from the amplifier unit | | ■ | ■ | ■ | ■ |
| **Enclosure rating** | IP 67 | | ■ | ■ | ■ | ■ |
| **VDE protection class** | III | | ■ | ■ | ■ | ■ |
| **Ambient temperature $T_A$** | Operation –10 °C ... +45 °C [8] | | ■ | ■ | ■ | ■ |
| | Storage –20 °C ... +60 °C | | ■ | ■ | ■ | ■ |
| **Ambient light limit** | max. 3.000 lx (fluorescent light) | | ■ | ■ | ■ | ■ |
| | max. 10.000 lx (sun light) | | ■ | ■ | ■ | ■ |
| **Vibration resistance** | 10/s ... 55/s [9] | | ■ | ■ | ■ | ■ |
| **Shock resistance** | 50 G (500 m/s²) | | ■ | ■ | ■ | ■ |
| **Weight** | 250 g (including 50 cm cable) | | ■ | ■ | ■ | ■ |
| **Material** Sensor head housing | Diecast aluminium | | ■ | ■ | ■ | ■ |
| **Cable extension** | 0.5 m pig tail with connector [10] | | ■ | ■ | ■ | ■ |
| **On AOD-P / N1** | Standard, materials such as metal | | | ■ | ■ | ■ |
| **On AODG-P / N1** | Transparent/mirror | | ■ | | | |

1) Wavelength 650 nm, max. output 390 µW
2) Wavelength 650 nm, max. output 1 µW
3) Averaging: 256/4096 (0D25) measurement; Object: 90% remission; Distance: middle distance
4) With constant environmental conditions; Averaging: 256/1096 (0D25) measurements; Object: 90% remission
5) On Glass; Parallel alignment of the active sensor surface to the object surface; Equivalent ± 0.1 % of Full Scale
6) Equivalent ± 0.1 % of Full Scale for 6 ... 90 % remission
7) Full Scale:
0D25-01T1 = 2 mm
0D30-05T1 = 10 mm
0D85-20T1 = 40 mm
0D350-100T1 = 200 mm
8) Non-condensing
9) Double amplitude 1.5 mm, 2 h for XYZ-axes
10) Extendable by cable to max. 10 m

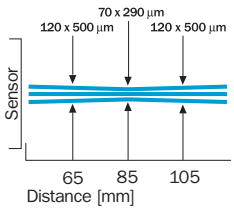
**OD25-01T1: Light spot diameter**




**OD30-05T1: Lightspot diameter**



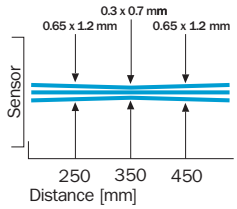

**OD85-20T1: Lightspot diameter**




**Order information**

| Type | Order no. |
|---|---|
| 0D25-01T1 | 6030977 |
| 0D30-05T1 | 6028959 |
| 0D85-20T1 | 6028958 |
| 0D350-100T1 | 6028957 |

**OD350-100T1: Lightspot diameter**



**Measurement ranges**
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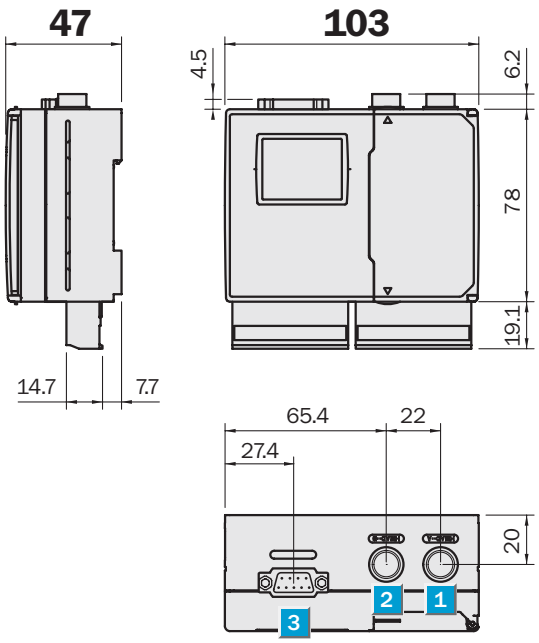
**350±100 mm**

**Displacement Sensor**

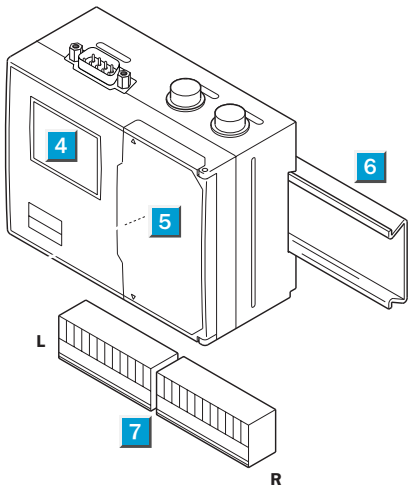
- Highest measuring accuracy
- Non-surface dependent measurements: Standard: matt ... shiny, as well as light ... dark
- Transparent: Transparent materials
- Calculation using 2 sensors values
- Diverse interfaces

## Dimensional drawing




## Adjustments possible

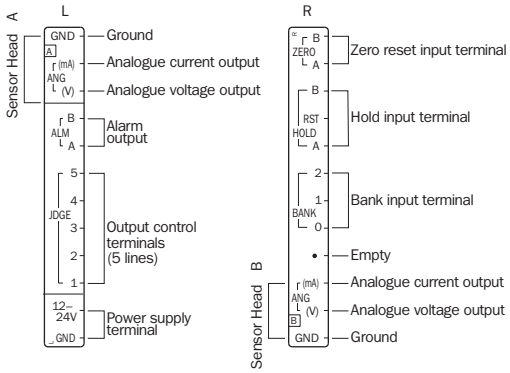
All types



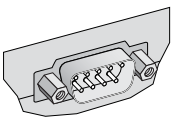

1 Sensor head A connection port
2 Sensor head B connection port
3 RS 232C interface
4 LCD display
5 Operation panel
6 DIN rail
7 Terminal board (detachable)

## Connection terminal board

All types




## Connector pinning RS 232C



**Male connector, 9-pin**

1 DCD – Data Carrier Detect
2 RXD – Receive Data
3 TXD – Transmit Data
4 DTR – Data Terminal Ready
5 SG – Signal Ground
6 DSR – Data Set Ready
7 RTS – Request to Send
8 CTS – Clear to Send
9 RI – (Ring Indicator)

**Accessories**

Cables and connectors

| Technical Data | | AOD- | P1 | N1 | G-P1 | G-N1 |
|---|---|---|---|---|---|---|
| **Response time** [1] | | 0.5 ms | ■ | ■ | ■ | ■ |
| Output rate | | 10 kHz | ■ | ■ | ■ | ■ |
| **In- and outputs** | | PNP | ■ | | ■ | |
| | | NPN | | ■ | | ■ |
| **Outputs** | | | | | | |
| 2 Analogue voltage outputs [3] | | –5 ... + 5 V [4] | ■ | ■ | ■ | ■ |
| 2 Analogue current outputs [3] | | 4 ... 20 mA [5] | ■ | ■ | ■ | ■ |
| 5 Switching outputs [6] | | Max. 100 mA/24 V DC [7] | ■ | ■ | ■ | ■ |
| 2 Alarm outputs | | To indicate failed measurements | ■ | ■ | ■ | ■ |
| **Data interface** | | RS 232C (male) | ■ | ■ | ■ | ■ |
| **Inputs** | | | | | | |
| 3 Bank inputs | | External memory bank selection | ■ | ■ | ■ | ■ |
| 3 Hold inputs | | Holding the measurement/Laser off | ■ | ■ | ■ | ■ |
| 2 Zero reset inputs | | To reference the measurement | ■ | ■ | ■ | ■ |
| **Display type** | | LCD colour display | ■ | ■ | ■ | ■ |
| **Additional features** | | Arithmetical calculations | ■ | ■ | ■ | ■ |
| | | Averaging functions | ■ | ■ | ■ | ■ |
| | | Frequency filters | ■ | ■ | ■ | ■ |
| | | Autom./manual sensitivity setting | ■ | ■ | ■ | ■ |
| | | Timer functions | ■ | ■ | ■ | ■ |
| | | 8 Memory banks | ■ | ■ | ■ | ■ |
| | | Hold functions | ■ | ■ | ■ | ■ |
| **Supply voltage $V_S$** | | 12 ... 24 V DC ± 10 % | ■ | ■ | ■ | ■ |
| Power consumption [2] | | 6 W | ■ | ■ | ■ | ■ |
| **Enclosure rating** | | IP 20 | ■ | ■ | ■ | ■ |
| **VDE protection class** | | III | ■ | ■ | ■ | ■ |
| **Ambient temperature $T_A$** | | Operation –10 °C ... +45 °C [8] | ■ | ■ | ■ | ■ |
| | | Storage –20 °C ... +60 °C | ■ | ■ | ■ | ■ |
| **Vibration resistance** | | 10/s ... 55/s [9] | ■ | ■ | ■ | ■ |
| **Shock resistance** | | 20 G (196 m/s²) | ■ | ■ | ■ | ■ |
| **Weight** | | 240 g (including terminal board) | ■ | ■ | ■ | ■ |
| **Material** | Housing | Polycarbonate | ■ | ■ | ■ | ■ |
| | Terminal board | Nylon 66 | ■ | ■ | ■ | ■ |
| **Connection type** | | Terminal board | ■ | ■ | ■ | ■ |
| **With OD30, 85, 350** | | Standard, materials such as metal | ■ | ■ | | |
| **With OD25** | | Transparent/mirror | | | ■ | ■ |

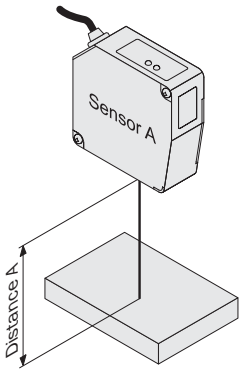
1) Without averaging and manually selected sensitivity
2) 1 for each sensor head, or 1 for the caculation result.
3) Output impendance max. 1 kΩ, Resolution 1 mV
4) Output impendance max. 300, Resolution 1.5 µA
5) For the calculation result
6) Residual voltage max. 1.8 V
7) When connected with 2 sensor heads. Including analogue current output.
8) Non condensing
9) Double amplitude 1.5 mm, 2 h for XYZ axes

| Order information | |
|---|---|
| **OD Max™ Amplifier unit** | |
| **Type** | **Order no.** |
| AOD-P1 | 6028960 |
| AOD-N1 | 6028961 |
| AODG-P1 | 6030978 |
| AODG-N1 | 6030979 |

| Accessories, extension cable | | |
|---|---|---|
| **Type** | **Order no.** | **Cable length** |
| DSL-1210-G02M | 6028943 | 2 m |
| DSL-1210-G05M | 6028944 | 5 m |

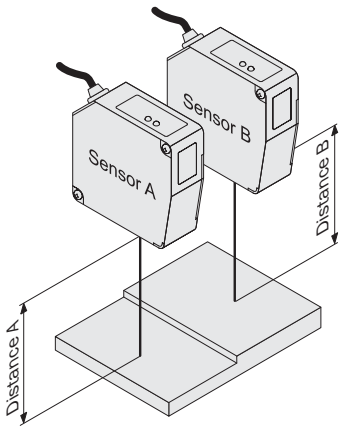
## Calculation functions

Distance measurement



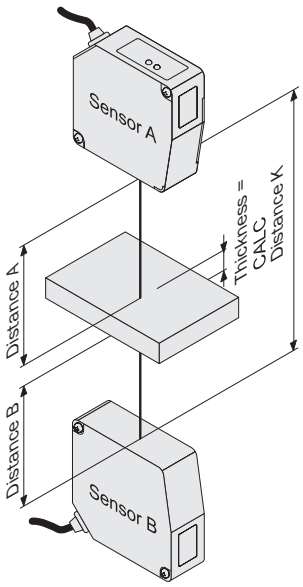

CALC = A

Evenness measurement



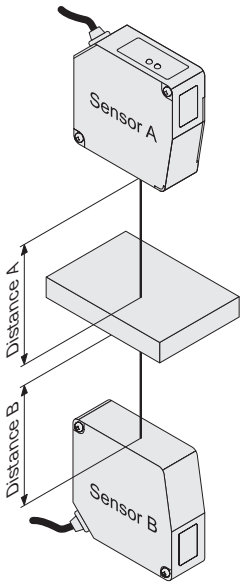

CALC = A - B

Thickness measurement



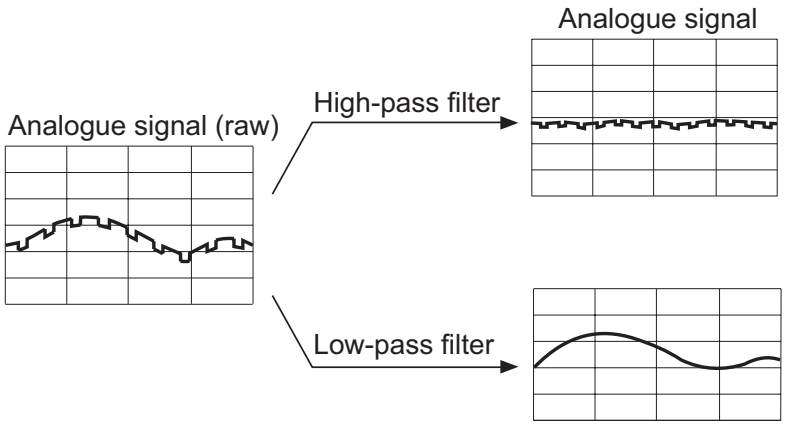

CALC = K - A - B

Centricity measurement




CALC = A - B

## Frequency filter

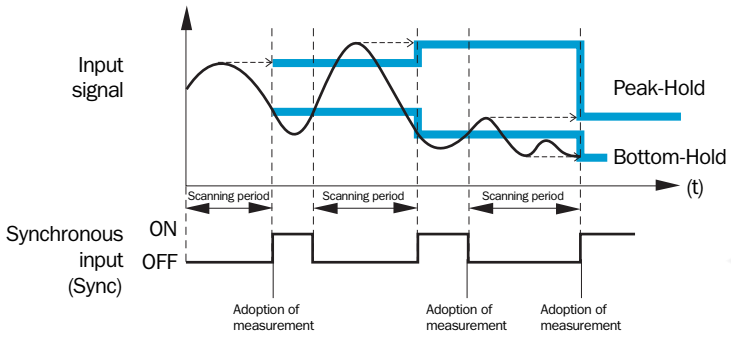


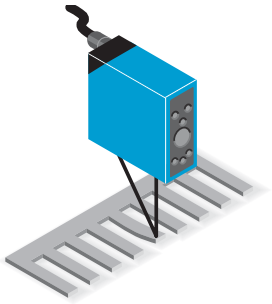
## Time behavior graphs

### Measuring / Hold function (ODC / OD Max)

#### Peak-Bottom-Hold

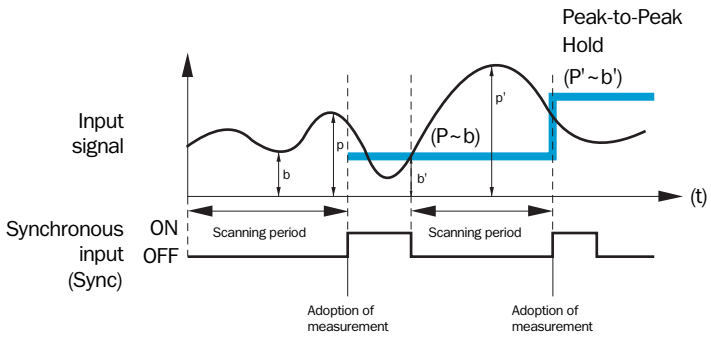
The “Peak-(Bottom-)Hold” function is used for measuring the highest (lowest) value during a specific time period.

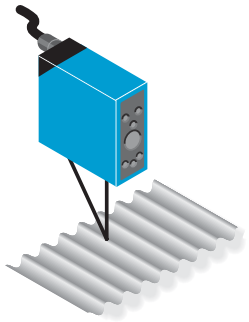


#### Peak-to-Peak-Hold

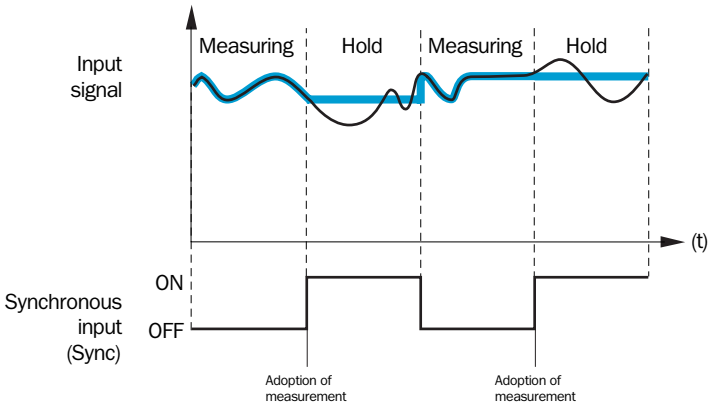
The “Peak-to-Peak” function is used for measuring the difference between the highest and lowest values during the preset time period.

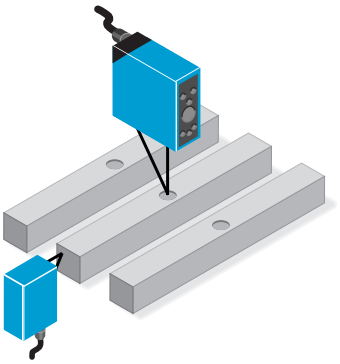


#### Sample/Hold

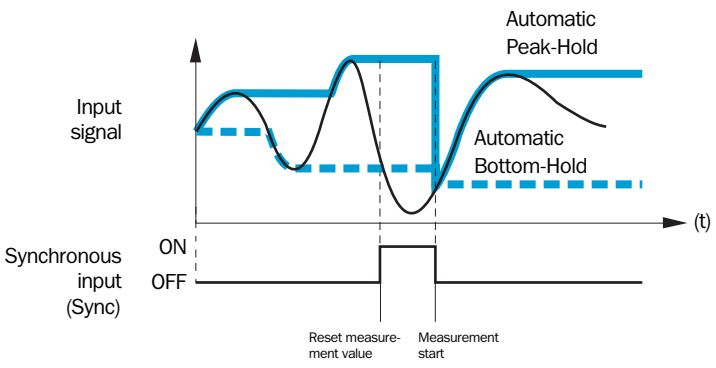
The “Sample-and-Hold” function is used for measuring the value during a specific time period.

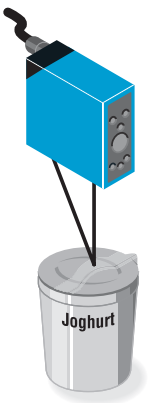


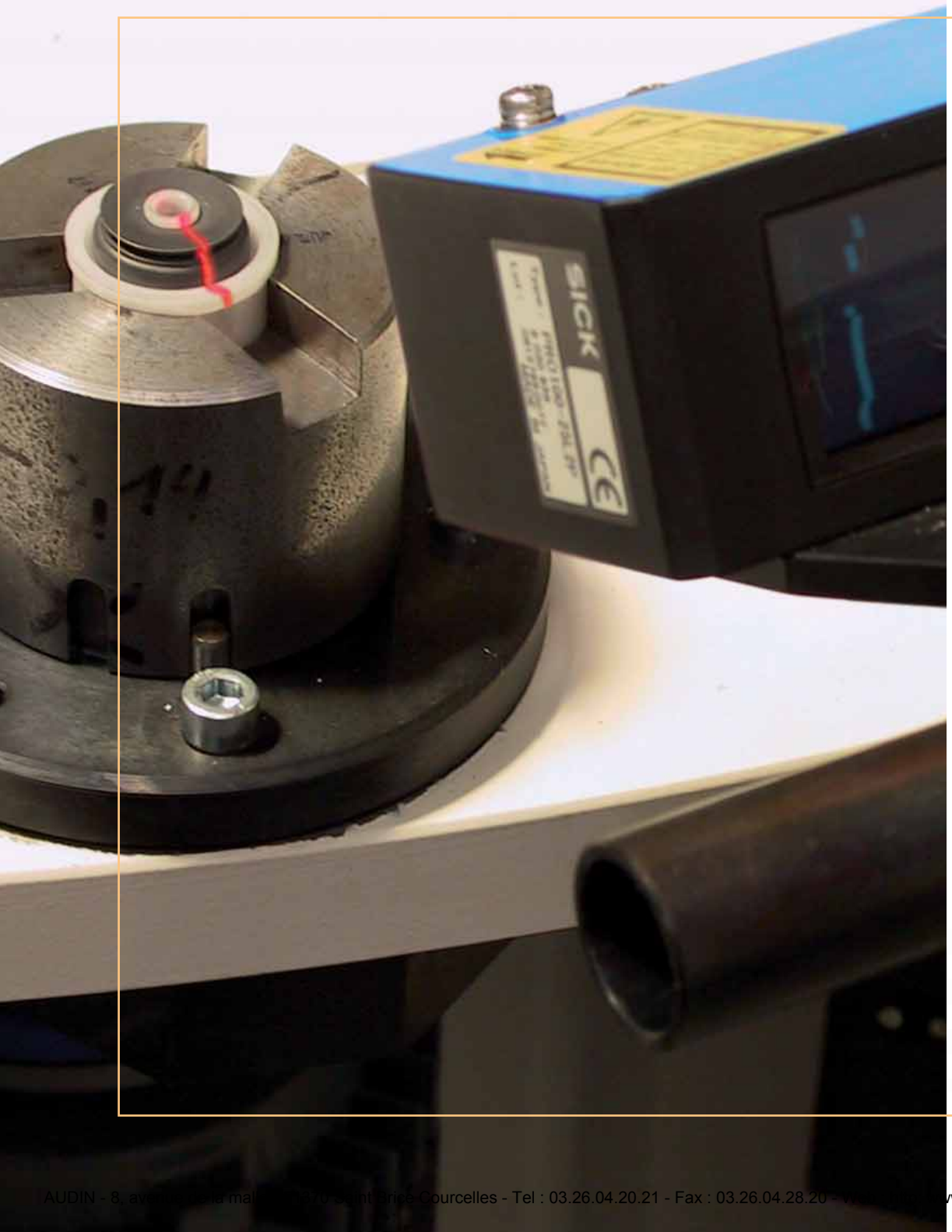
#### Automatic Peak-Bottom-Hold

The “Automatic Peak- and Bottom-Hold” function is used for measuring the highest (lowest) value from the beginning of the measurement.



# Displacement Sensor Profiler™ – line sensor for profile measurement




- Compact split-beam sensor with 32 mm laser line
- Thanks to its 4 measuring modes, the solution for very different applications:
  - Measurement of the distance to the highest point of the measurement object: PEAK mode
  - Measurement of the distance to the lowest point of the measurement object: BOTTOM mode
  - Measurement of the height difference between the highest and the lowest point of the measurement object: PEAK-PEAK mode
  - Measurement of the matching of the measurement object with a nominal shape: SHAPE mode

PROFILER™ SERIES

Line sensor for profile measurement

# Profiler™ series →

AUDIN - 8, avenue de la malle - 51370 Saint Brice Courcelles - Tel : 03.26.04.20.21 - Fax : 03.26.04.28.20 - Web : http: www.audin.fr - Email : info@audin.fr

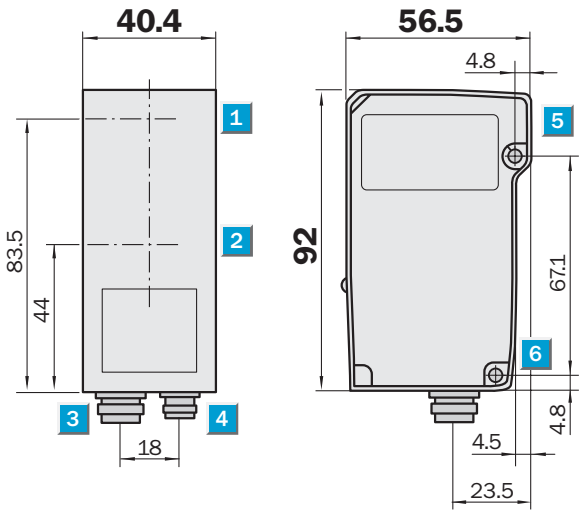
**Scanning distance**
**100 ± 25 mm**

**Displacement sensor**

- Profile measurement with line sensor
- 32 mm laser line
- Stand-alone device
- Easy and fast setup through:
  - Integrated display
  - Teach-in function
- 3 switching outputs and 1 analogue output

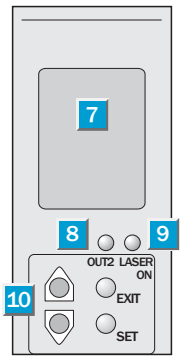
**Accessories**
Cables and connectors
Mounting systems

## Dimensional drawing




## Adjustments possible

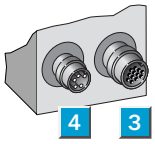
All types



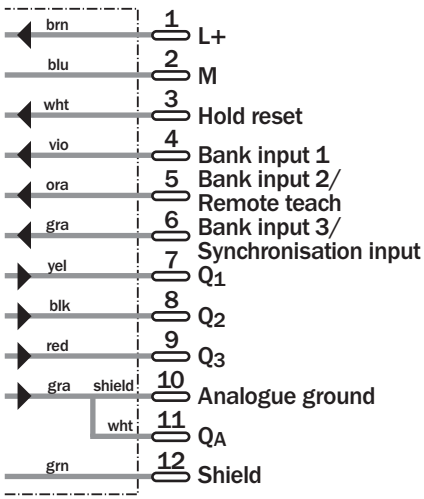

1 Optical axis, sender
2 Optical axis, receiver
3 Main connector, 12-pin (HRS HR30)
4 Display connector 6-pin (HRS HR30) (see Accessories)
5 Reference surface for measurements
6 Mounting holes, ø 4.2 mm
7 LCD-Display
8 Indicator switching output 2 (orange)
9 LED “Laser on” (green)
10 Operating keys

## Connection types

All types




Connection via cable 12-pin



| Technical data | | PR0100- | 25L2P | 25L2N |
|---|---|---|---|---|
| **Scanning distance** | | 100 ± 25 mm | ■ | ■ |
| **Light source, Light spot size** | | Laser diode [1], red light, 0.3 x 32 mm² [2] | ■ | ■ |
| **Laser Class** | | 2M (EN 60825:2001) | ■ | ■ |
| **Supply voltage $V_S$** [3] | | DC 12 ... 24 V | ■ | ■ |
| Current consumption max. [4] | | 120 mA/24 V; 180 mA/12 V | ■ | ■ |
| **Linearity** [5] | **in z direction** | **± 0.25 mm** [2] | ■ | ■ |
| | in x direction | ± 0.8 % of FS in x [6] | ■ | ■ |
| **Accuracy** [5] | **in z direction** | **± 0.5 mm** [2] | ■ | ■ |
| | in x direction | ± 1.5 % of FS in x [6] | ■ | ■ |
| **Resolution** [7] | **in z direction** | **50 µm** | ■ | ■ |
| | in x direction | 80 µm | ■ | ■ |
| Max. response time | | 10 ... 99 ms [8] | ■ | ■ |
| **3 switching outputs** [9] | | PNP Open collector | ■ | |
| | | NPN Open collector | | ■ |
| **Analogue output** | | 4 ... 20 mA [10] | ■ | ■ |
| Load dependant | | ± 0.05 % FS | ■ | ■ |
| Temperature drift | | ± 0.05 % FS/ °C | ■ | ■ |
| Warm-up time max. | | 5 min. | ■ | ■ |
| Indicator | Switching output 2 | LED, orange | ■ | ■ |
| | Laser active | LED, green | ■ | ■ |
| Ambient light | Sunlight | 10.000 lx | ■ | ■ |
| | HF lamp | 3.000 lx | ■ | ■ |
| Ambient temperature $T_A$ | | Operation –10 °C ... +40 °C [11] | ■ | ■ |
| | | Storage –20 °C ... +60 °C | ■ | ■ |
| 8 memory banks | | switchable | ■ | ■ |
| Vibration resistance | | 10/s ... 55/s | ■ | ■ |
| Shock resistance | | 50 G (500 m/s²) | ■ | ■ |
| VDE protection class | | ⧈ | ■ | ■ |
| Enclosure rating | | IP 66 | ■ | ■ |
| Material | Housing | Zinc die-casting/PC | ■ | ■ |
| | Window | Glas | ■ | ■ |
| Weight [12] | | Approx. 250 g | ■ | ■ |

1) Wavelength = 650 nm; Max. output 1 mW (into an aperture of 7 mm)
2) For Full scale in z direction = 100 mm ± 25 mm
3) –5 %, +10 %
4) Incl. analogue output current
5) Measured object: white ceramic, with factory settings
6) FS in x = full scale in x direction: depends on the distance, according to the field of vision. Eg.: at 100 mm = 22 mm
7) Measured object: white ceramics at medium scanning distance, with factory settings
8) Dependent on the chosen settings; synchronised: 6 ... 50.5 ms
9) 30 V/100 mA max. (residual voltage: max. 1.8 V)
10) 24 mA for out of range
11) Non-condensing
12) Excluding connection cable

**Order information**

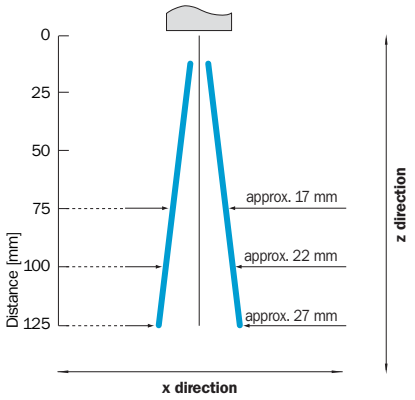
**Profiler™**

| Type | Order no. |
|---|---|
| PR0100-25L2P, Profiler PNP-Version | 6030859 |
| PR0100-25L2N, Profiler NPN-Version | 6030860 |

**Accessories**

| Type | Order no. |
|---|---|
| PROM-1, external control unit, incl. LCD, 3 m pigtail, 6-pin (HRS HR30) | 6029185 |
| DOL-SH12-G02M, 2 m main connection cable (included in supply) | 6029083 |
| DOL-SH12-G05M, 5 m main connection cable | 6029084 |
| DOL-DH06-G02M, 2 m data transfer cable 6-pin (HRS HR30 + RS232) | 6029801 |

**Field of vision**



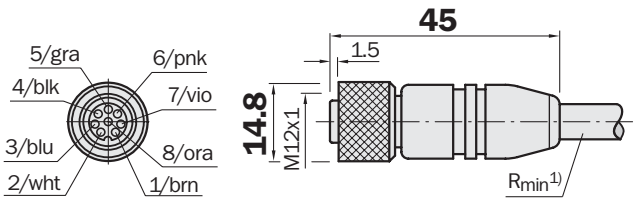
**M12, 8-pin, shielded**

**Round connectors**

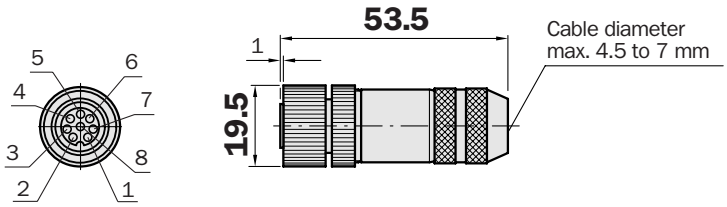
- Gold plated pins
- Especially suitable for use in shielded applications
- 360° shield on locking nut
- Shield on PIN 8
- Enclosure rating IP 67 (only in fully locked position with its plugs)

## Dimensional drawings

DOL-1208-...MF




DOS-1208-G.




1) Minimum bend radius in dynamic use
$R_{min}$ = 20 x cable diameter

## Technical data

| | | | |
|---|---|---|---|
| **Nominal voltage $U_b$** | | 30 V AC/36 V DC | |
| **Contact resistance** | | ≤ 5 mΩ | |
| **Nominal power** | | 1.5 A | |
| **Insulation group** | | C acc. VDE0110 | |
| **Insulation resistance** | | > $10^9$ Ω | |
| **Temperature range** | | In fixed position | –25 °C ... +105 °C |
| **Temperature range** | DOL-1208-...MF | In fixed position | –25 °C ... +80 °C |
| **Molded cable** | | | |
| **Bending radius** | | > 20 x diameter of cable | |
| **Contact** | | CuZn, 0.3 µm gold plated | |
| **Connector diameter** | DOS-1208-GA, STE-1208-GA | Max. 0.75 mm² | |
| **Cable** | | PVC, colour black (8 x 0.25 mm²) | |
| | | PUR, colour black (7 x 0.25 mm² and shield) | |
| **Connector** | | TPU, colour black | |
| **Terminal screwed connector** | | | |
| **Contact** | | CuZn, pre-nickeled, 2 ... 4 µm CuSnZn | |
| **Connection type** | | Connector | |
| **Housing** | | CuZn, brass nickeled | |

## Order information

**Round connectors M12, 8-pin shielded**

| Type | Order no. | Description | | Shield | Cable length [m] | Cable |
|---|---|---|---|---|---|---|
| DOS-1208-G | 6028422 | Female connector | straight | | terminal screwed | 4 ... 8 mm |
| DOS-1208-GA | 6028369 | Female connector | straight | 360° on locking nut | terminal screwed | 4 ... 8 mm |
| DOL-1208-G02MF | 6020663 | Female connector | straight | 360° on locking nut | 2 | PVC spec. core colour |
| DOL-1208-G05MF | 6020664 | Female connector | straight | 360° on locking nut | 5 | PVC spec. core colour |

# Displacement sensors – explanation of the relevant terms

## A

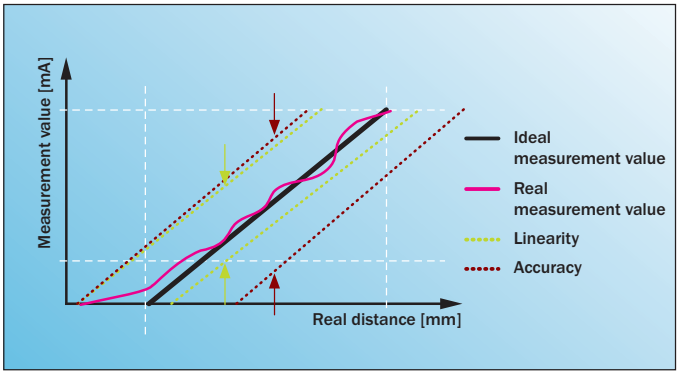
### Accuracy

Measuring accuracy is the maximum expected measuring error between determined and real distance for constant temperature conditions. It includes all deviations from the real value, such as linearity as well as offset and gradient errors of linearity.

In optical systems, the reflective properties of the object can affect the measurement. To achieve best accuracy in every application, the SICK displacement sensors are calibrated and specified on materials with 6 ... 90% reflectance. A reference measurement may be useful to completely eliminate the influence of the real ambient conditions (e.g. material offset).

Relevance to application: measurement of objects with different properties such as material. Typical values are up to a few millimetres.

▼ Accuracy




## L

### Linearity

The maximum deviation between the output signal and an ideal, straight characteristic is called linearity. Even with absolutely linear behaviour of the output signal, there can still be offset and gradient errors compared with the real distance. In most cases, scaling the output signal using reference measurement is recommended.

## M

### Measuring range

The measuring range describes the distance range from the device, in which the sensor works or measures according to the specification.

The measuring range of a sensor can be defined either by the start of the measuring range and the end of the measuring range (e.g. 250 ... 450 mm) or the middle of the measuring range and the distance range from the middle (350 ± 100 mm).

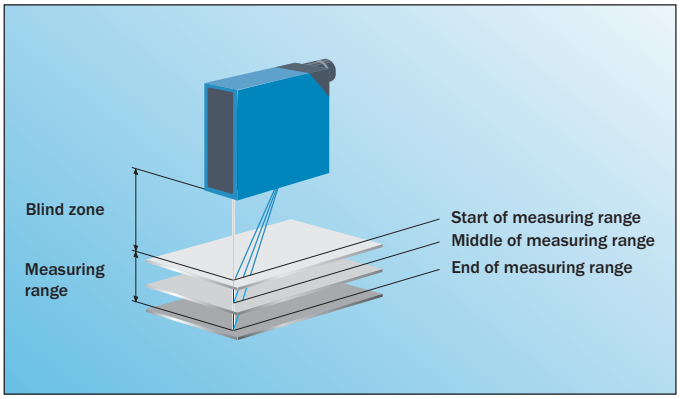
Relevance to application: Both the smallest and the largest expected measurement object need to be captured.

### Measuring frequency

The scanning rate resp. measuring frequency gives the number of implemented measurements in a defined time interval; typically in measurements per second (e.g. 10,000/sec. or 10 kHz).

Relevance to application: Detection and consideration of fast changes in distance.

▼ Measuring range




## O

### Output rate

The output rate describes the frequency with which the output signal is updated.

The output rate remains unaffected by the settings of the response time, as a floating average calculation is implemented. Thus, the output signal is updated for each output cycle.

Relevance to application: distance measurement of an object within the measuring range with continuous change in distance.

# R

## Reproducibility

Reproducibility or accuracy of repetition means the deviation of several measurements performed under the same conditions.

Relevance to application:
For applications with repeated measuring or positioning of identical parts. In most of these cases, reproducibility is more important than accuracy.

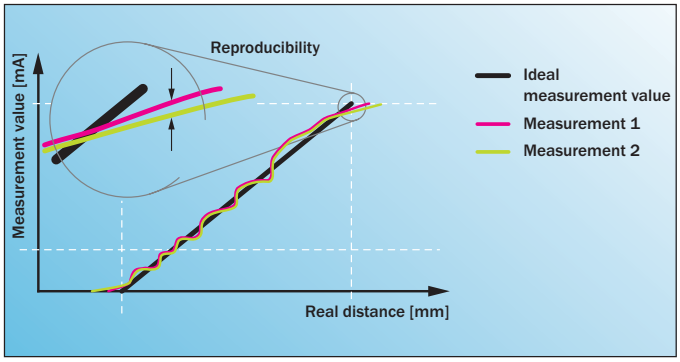
## Resolution

The resolution is the smallest reliably detectable change in distance of an object.

The term “resolution” distinguishes between the digital and the real resolution. The digital resolution (bit) determines the minimum possible step width of the output signal. The real resolution (specified for the displacement sensors) is determined by the noise of the output signal, which occurs even when measuring static objects. In order to detect a change in distance, the signal change must be distinguishable from the noise.
Typical values are in the micrometer range.

Relevance to application:
detection of vibrations; Step width of the measurement value output.

▼ Reproducibility




## Response time

The maximum time between the occurrence of a sudden change in distance and the response of the switching output or a corresponding, full update of the analogue output.

The response time is directly proportionally to the adjustable averaging. An increase in averaging causes an increase in response time and a positive effect on the resolution and reproducibility. Typical values are 0.5 to 1000 ms.

Relevance to application:
Measurement of objects with sudden change in distance.

# T

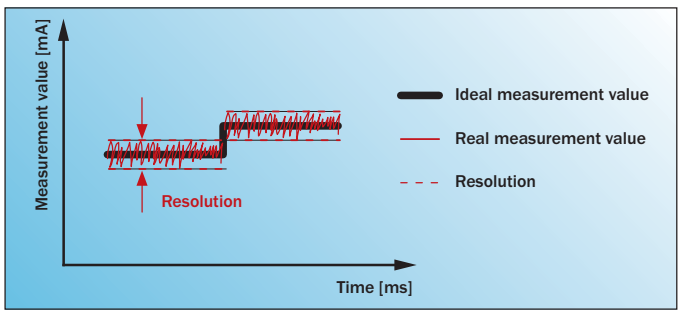
## Temperature drift

Temperature drift describes the effect of the change in ambient temperature on the measuring accuracy of the sensor.

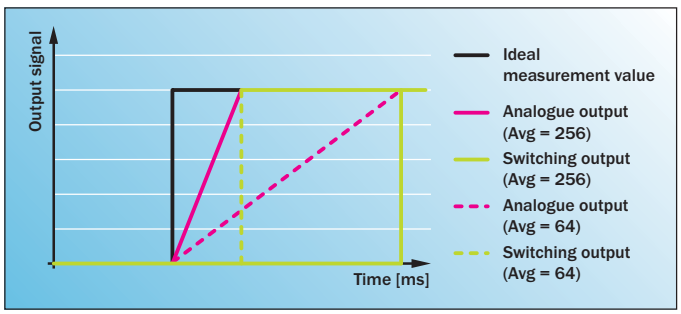
In addition to the physical effects on object and assembly jig, measuring errors because of temperature fluctuations are also due to the expansion of the components in the sensor. For large temperature fluctuations, reference measurements are recommended in order to compensate the drift. For constant temperatures, the behaviour of the system remains consistent and has little effect on specified characteristic values.

Relevance to application:
Used in locations with widely fluctuating ambient temperatures.

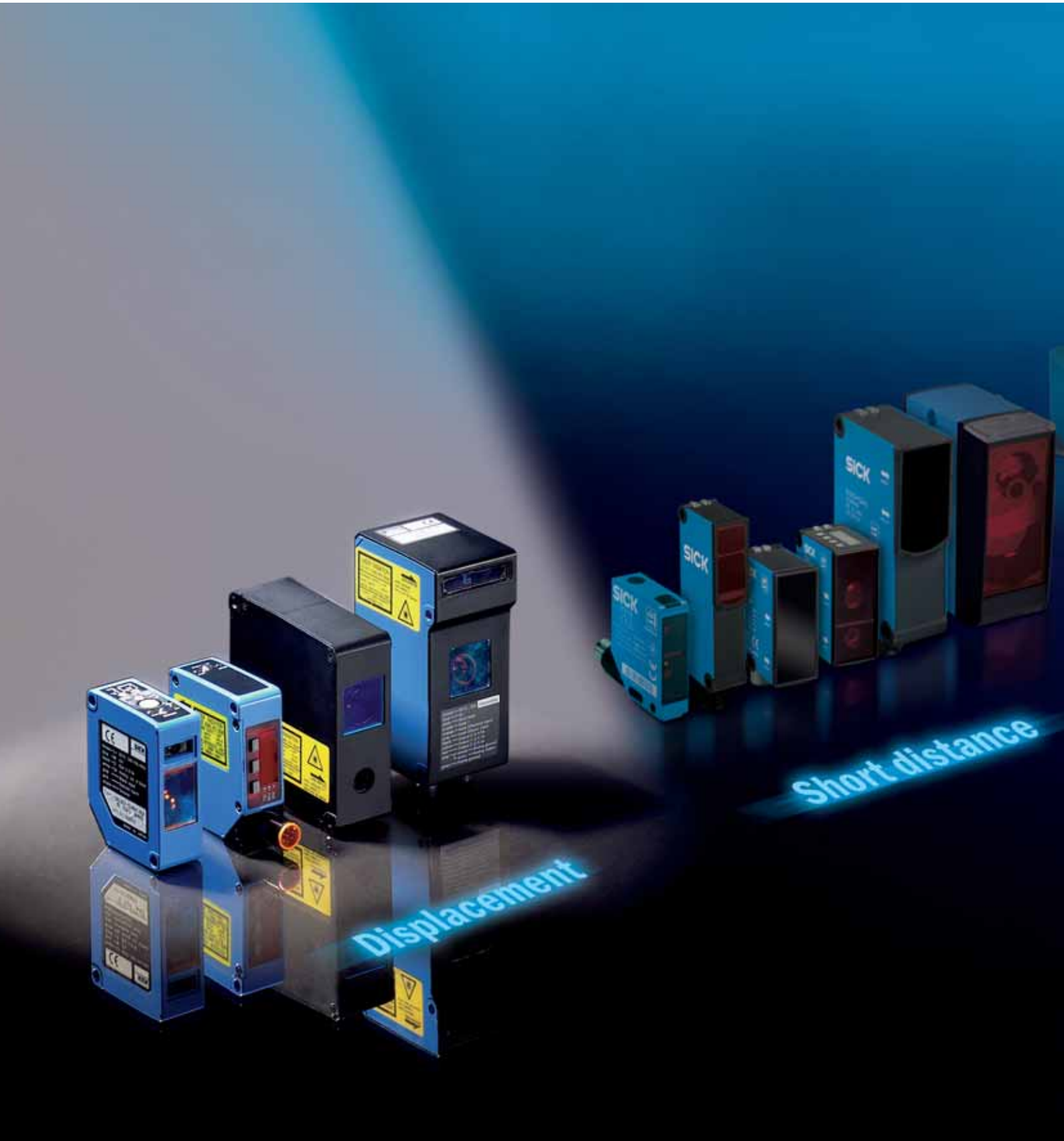
▼ Resolution




▼ Response time



# Our distance and data transmission sensors

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