






product family	OBDM 12	OBDM 12	OBDM 12	OBDM 12	OBDM 12
					
type	step analysis	min./max. analysis	tolerance analysis	window analysis	2-point comparison
width / diameter	12,4 mm	12,4 mm	12,4 mm	12,4 mm	12,4 mm
sensing distance T_w	16 ... 120 mm	16 ... 120 mm	16 ... 120 mm	16 ... 120 mm	16 ... 120 mm
response time	< 5 ms	< 1 ms	< 1 ms	< 1 ms	< 1 ms
light source	pulsed red laser diode	pulsed red laser diode	pulsed red laser diode	pulsed red laser diode	pulsed red laser diode
output circuit	NPN PNP	NPN PNP	NPN PNP	NPN PNP	NPN PNP
connection types	connector	connector	connector	connector	connector
housing material	metal	metal	metal	metal	metal
page	448	449	450	451	452



General information

The range of difference sensors opens new perspectives in the field of sensing. The patented functions provide the user with new, innovative solutions in the detection of objects, monitoring of tolerances or the comparison of object sizes and object positions. With the fine laser beam and the high insensitivity of the sensor to colors, objects are accurately detected. Five different sensors with different functions are available according to the application.

Difference sensors with:

- Step analysis
- Window analysis
- Tolerance analysis
- Min./max. analysis
- 2-point comparisons

Characteristics and advantages

Difference evaluation

Distance measuring sensors with integrated logic for distance difference evaluation. Complex evaluation by the connected controller is no longer necessary, saving time and costs.

Nominal difference teachable

With the standardized Teach-in process of Baumer, the nominal difference can be quickly and easily programmed.

Switching output

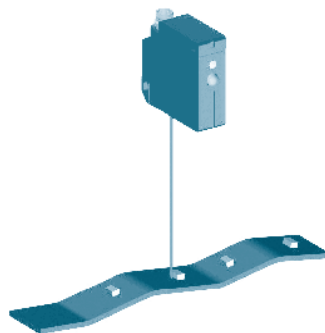
The comparison of the actual and nominal difference is made internally by the sensors and is issued at the switching output as a simply assessed pass/fail signal.

Applications and functions

Difference sensors with step analysis

In step analysis, objects are detected by their height difference (stage) and reported in the form of a digital output signal.

The sensor evaluates the positive or negative height difference within a specified time window of max. 5 ms. If the height difference is greater than 50 % of the taught-in value, an impulse of at least 10 ms is issued at the output. When the value is less than 50 %, the sensor switches back to the OFF state. If height differences are smaller than 50 % of the taught value within the time window (e.g. fluctuation of the conveyor belt), the sensor remains in the OFF state.



- The stage / edge from which the objects are detected can be adjusted (minimum object height 0,2 mm)
- Defined output impulse of 10 ms (can also be read by a normal PLC)
- Detection of objects on a fluctuating conveyor belt
- Detection of stages or edges
- Positioning of objects by an edge, regardless of the distance



Applications and functions

Difference sensors with min./max. analysis

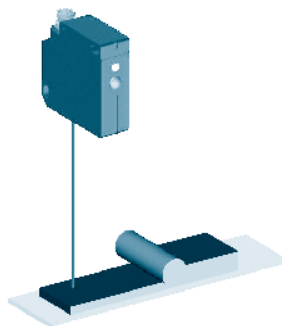
With min./max. analysis, objects can be inspected and monitored according to their scanned contour or shape. The scanning of the objects is activated by an external control signal. At the end of a detection sequence, the measured values are evaluated and the difference between the minimum and maximum values is determined. If the difference exceeds a nominal difference previously taught into the sensor, this is reported in the form of an ON signal. This signal remains active until a new detection sequence is started. When this starts, the output returns to the OFF state. If the difference is smaller than the nominal difference, the output remains in the OFF state.



- Difference is detected regardless of the distance
- Start and stop of the measuring cycle can be determined independently
- Easily evaluated pass/fail signal
- Round true running or knock of wheels / discs can be checked regardless of the distance
- Deformation of plastic parts after cooling can be checked

Difference sensors with tolerance analysis

The dimensional tolerance of objects can be determined by tolerance analysis. In the continuous detection of object distances, all measured values are checked to determine if it is between the specified maximum and minimum tolerances. In the case of if being between, an ON signal is issued at the output. If the distance remains within the tolerance range, the sensor remains in the OFF state.



- Sensor form of a caliper gauge
- Simple monitoring of a distance with a tolerance range (pass/fail information)
- Tolerance range and nominal distance can be taught in separately
- Material thickness checking after a roller mill
- Material thickness checking for extruders

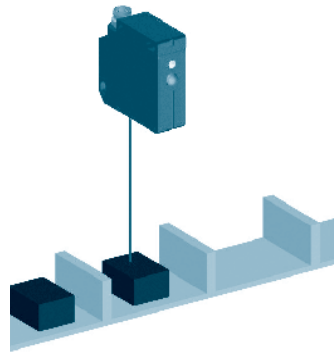


Applications and functions

Difference sensors with window analysis

With window analysis, objects can be classified by a specified switching window.

For this purpose, the switching window is specified in a simple Teach-in procedure with upper and lower limits. If an object is outside the defined limits, this is reported at the switching output.

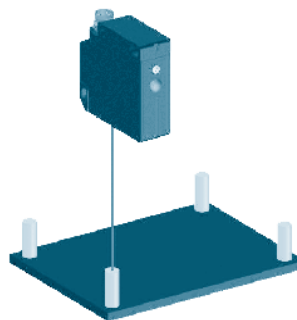


- Foreground and background suppression in a single sensor
- Positions can be taught in separately
- Smallest window 0,45 mm
- Interfering objects in the foreground and background can be suppressed
- Objects can be detected on a segmented conveyor belt

Difference sensors with 2-point comparison

In a 2-point comparison, two distances detected at two specifically chosen times are measured and compared.

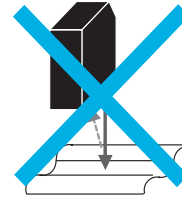
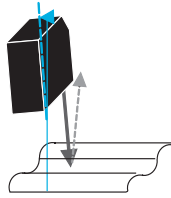
The choice of the time is made using a sync signal. The first distance is measured at the rising flank of the signal and the second distance at the falling flank of the signal. After the second distance was measured, the sensor evaluates the difference between the two distances and compares this with a previously taught-in maximum permissible deviation. If this difference is exceeded, the output switches to the ON state.



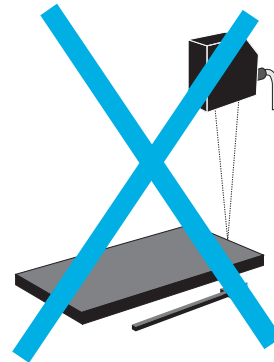
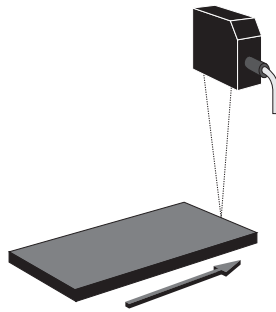
- Object heights can be compared regardless of the distance
- Deviation can be taught in (min. 0,3 mm)
- Measuring time can be determined separately by an external signal
- Checking the pressing depth of pins
- Comparison of the distances/heights of objects with a reference value



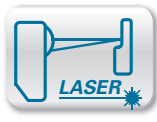
Mounting and adjustment



The direct reflection from glossy or reflective objects must not impinge on the receiver. This can be avoided by slightly tilting the sensor.



For optimum measurement results, the sensor must be installed at right angles to the movement of the object.



Tw = 16 ... 120 mm



- detection of edges
- reference steps adjustable
- min. output pulse 10 ms

general data

type	step analysis
sensing distance Tw	16 ... 120 mm
Teach-in range min.	> 0,2 mm
adjustment	Teach-in
power on indication	LED green
output indicator	LED red
light source	pulsed red laser diode
laser class	2
wave length	650 nm
beam diameter	0,5 ... 0,2 mm

electrical data

response time	< 5 ms
voltage supply range +Vs	12 ... 28 VDC
current consumption max. (no load)	80 mA
current consumption typ.	40 mA
output current	< 100 mA
output pulse length	10 ms
voltage drop Vd	< 2,8 VDC
reverse polarity protection	yes, Vs to GND
short circuit protection	yes

mechanical data

width / diameter	12,4 mm
height / length	37 mm
depth	34,5 mm
type	rectangular
front (optics)	glass
housing material	die-cast zinc
connection types	connector M8 4 pin

ambient conditions

operating temperature	0 ... +50 °C
protection class	IP 67

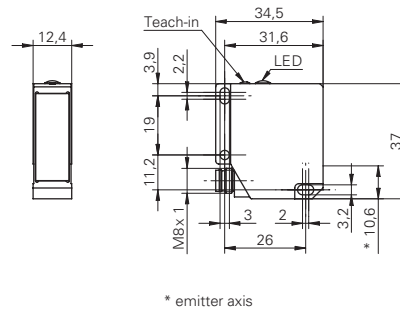
connectors and mating connectors

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	

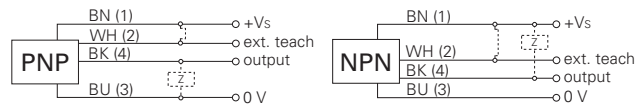
Accessories

10150328	Sensofix series 12
10113873	Mounting bracket series 12 (L design)
for details: see accessories section	

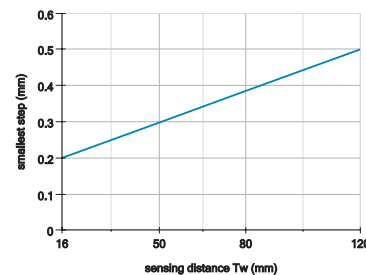
dimension drawing



connection diagrams



min. detectable difference



laser warning

LASER RADIATION
DO NOT STARE INTO BEAM
Wavelength: 640...670nm
IEC 60825-1, Ed. 3, 2014
CLASS 2 LASER PRODUCT

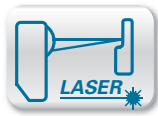
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice No. 50, dated June 24, 2007

order reference

OBDM 12N6910/S35A	NPN
OBDM 12P6910/S35A	PNP

OBDM 12 Tw = 16 ... 120 mm

Difference sensors



Tw = 16 ... 120 mm



- analysis of distance differences (min./max.)
- max. difference tolerance adjustable
- measuring time selectable

general data

type	min./max. analysis
sensing distance Tw	16 ... 120 mm
Teach-in range min.	> 0,3 mm
adjustment	Teach-in
power on indication	LED green
output indicator	LED red
light source	pulsed red laser diode
laser class	2
wave length	650 nm
beam diameter	0,5 ... 0,2 mm

electrical data

response time	< 1 ms
voltage supply range +Vs	12 ... 28 VDC
current consumption max. (no load)	80 mA
current consumption typ.	40 mA
output current	< 100 mA
voltage drop Vd	< 2,8 VDC
reverse polarity protection	yes, Vs to GND
short circuit protection	yes

mechanical data

width / diameter	12,4 mm
height / length	37 mm
depth	34,5 mm
type	rectangular
front (optics)	glass
housing material	die-cast zinc
connection types	connector M8 4 pin

ambient conditions

operating temperature	0 ... +50 °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

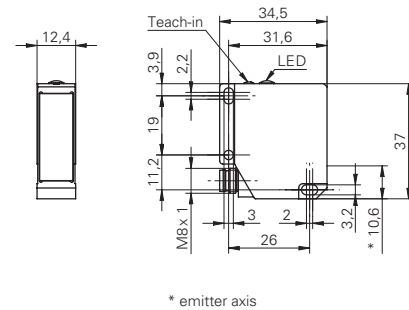
10150328	Sensofix series 12
10113873	Mounting bracket series 12 (L design)

for details: see accessories section

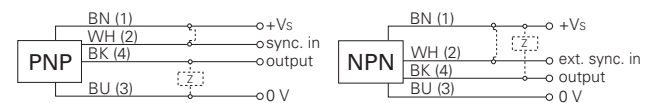
order reference output circuit

OBDM 12N6920/S35A	NPN
OBDM 12P6920/S35A	PNP

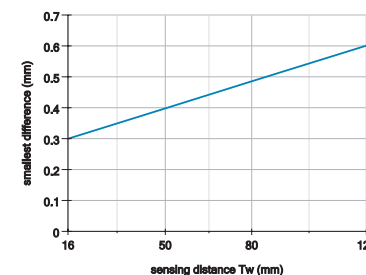
dimension drawing



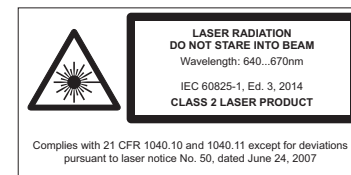
connection diagrams

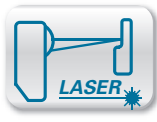


min. detectable difference



laser warning





Tw = 16 ... 120 mm



- distance monitoring within a tolerance band
- nominal distance
- adjustable tolerance band

general data

type	tolerance analysis
sensing distance Tw	16 ... 120 mm
Teach-in range min.	> 0,4 mm
adjustment	Teach-in
power on indication	LED green
output indicator	LED red
light source	pulsed red laser diode
laser class	2
wave length	650 nm
beam diameter	0,5 ... 0,2 mm

electrical data

response time	< 1 ms
voltage supply range +Vs	12 ... 28 VDC
current consumption max. (no load)	80 mA
current consumption typ.	40 mA
output current	< 100 mA
voltage drop Vd	< 2,8 VDC
reverse polarity protection	yes, Vs to GND
short circuit protection	yes

mechanical data

width / diameter	12,4 mm
height / length	37 mm
depth	34,5 mm
type	rectangular
front (optics)	glass
housing material	die-cast zinc
connection types	connector M8 4 pin

ambient conditions

operating temperature	0 ... +50 °C
protection class	IP 67

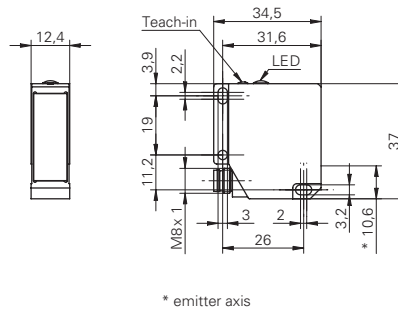
connectors and mating connectors

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	

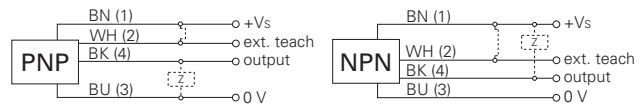
Accessories

10150328	Sensofix series 12
10113873	Mounting bracket series 12 (L design)
for details: see accessories section	

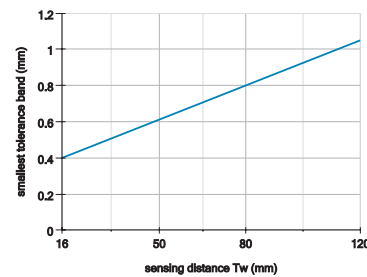
dimension drawing



connection diagrams



min. detectable difference



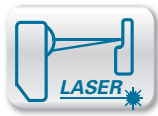
laser warning

LASER RADIATION
DO NOT STARE INTO BEAM
Wavelength: 640...670nm
IEC 60825-1, Ed. 3, 2014
CLASS 2 LASER PRODUCT

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice No. 50, dated June 24, 2007

order reference output circuit

OBDM 12N6930/S35A	NPN
OBDM 12P6930/S35A	PNP



Tw = 16 ... 120 mm



- range switch (foreground / background suppression)
- adjustable window

general data

type	window analysis
sensing distance Tw	16 ... 120 mm
Teach-in range min.	> 0,4 mm
adjustment	Teach-in
power on indication	LED green
output indicator	LED red
light source	pulsed red laser diode
laser class	2
wave length	650 nm
beam diameter	0,5 ... 0,2 mm

electrical data

response time	< 1 ms
voltage supply range +Vs	12 ... 28 VDC
current consumption max. (no load)	80 mA
current consumption typ.	40 mA
output current	< 100 mA
voltage drop Vd	< 2,8 VDC
reverse polarity protection	yes, Vs to GND
short circuit protection	yes

mechanical data

width / diameter	12,4 mm
height / length	37 mm
depth	34,5 mm
type	rectangular
front (optics)	glass
housing material	die-cast zinc
connection types	connector M8 4 pin

ambient conditions

operating temperature	0 ... +50 °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

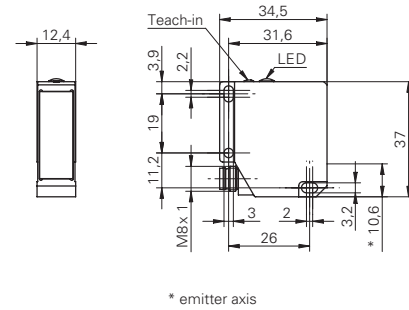
10150328	Sensofix series 12
10113873	Mounting bracket series 12 (L design)

for details: see accessories section

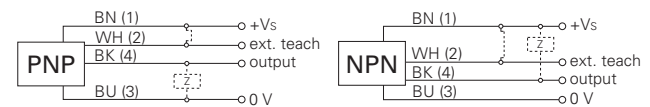
order reference output circuit

OBDM 12N6940/S35A	NPN
OBDM 12P6940/S35A	PNP

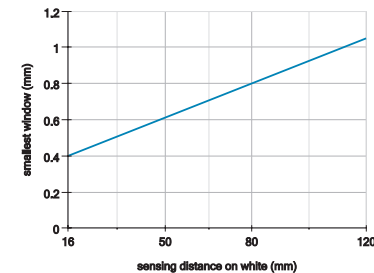
dimension drawing



connection diagrams



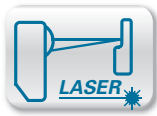
min. detectable difference



laser warning

LASER RADIATION
DO NOT STARE INTO BEAM
 Wavelength: 640...670nm
 IEC 60825-1, Ed. 3, 2014
CLASS 2 LASER PRODUCT

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice No. 50, dated June 24, 2007



Tw = 16 ... 120 mm



- comparison of two distances
- max. tolerance adjustable
- specific measuring moment selectable

general data

type	2-point comparison
sensing distance Tw	16 ... 120 mm
Teach-in range min.	> 0,3 mm
adjustment	Teach-in
power on indication	LED green
output indicator	LED red
light source	pulsed red laser diode
laser class	2
wave length	650 nm
beam diameter	0,5 ... 0,2 mm

electrical data

response time	< 1 ms
voltage supply range +Vs	12 ... 28 VDC
current consumption max. (no load)	80 mA
current consumption typ.	40 mA
output current	< 100 mA
voltage drop Vd	< 2,8 VDC
reverse polarity protection	yes, Vs to GND
short circuit protection	yes

mechanical data

width / diameter	12,4 mm
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type	rectangular
front (optics)	glass
housing material	die-cast zinc
connection types	connector M8 4 pin

ambient conditions

operating temperature	0 ... +50 °C
protection class	IP 67

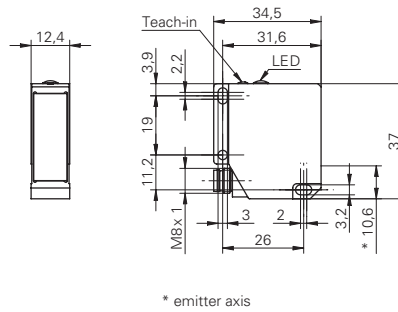
connectors and mating connectors

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	

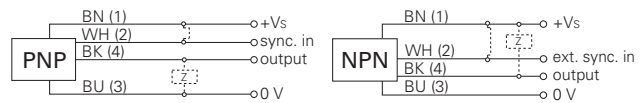
Accessories

10150328	Sensofix series 12
10113873	Mounting bracket series 12 (L design)
for details: see accessories section	

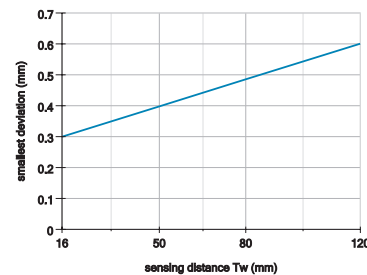
dimension drawing



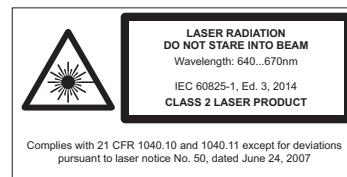
connection diagrams



min. detectable difference



laser warning



order reference

output circuit

OBDM 12N6950/S35A	NPN
OBDM 12P6950/S35A	PNP

