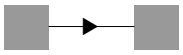
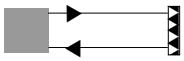
Series OP

Balanced – subtle – compact sensors for economical solutions



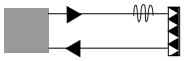
12 m

Through-beam sensors OPS/OPE



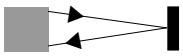
up to 8 m

Retro-reflective sensors OPR



up to 7,5 m

Retro-reflective sensors
with polarizing filters OPP



up to 65 cm

Diffuse-reflective sensors OPT

High functionality

Diverse optical principles
ELESTA's OP sensors are available as through-beam sensors, retro-reflective sensors with and without polarizing filters, as well as diffuse-reflective sensors. Additionally, diffuse-reflective sensors with *background suppression* are available. Within the series OP also sensors for glas or plastic fiber optics exist (see page 118).

Light reserve warning indicator
All of the sensors in the OP series contain a *light-reserve warning indicator* (blinking function indicator) for controlling dirt build-up on the lenses and as an *alignment aid*.

High switching frequency
All OP sensors have a 1000 Hz switching frequency, allowing for the reliable detection of even fast moving objects.

Low power consumption
The OP sensors distinguish themselves with an extremely small power con–sumption of less than 15 mA.

***Test input* as option**
As an option, the OP sensors are available with *test input*, for confirming that the sensor is operating properly. A sensor with *test input* has only one output, either *light-on* or *dark-on*.

Simple installation and operation

Adjustable *range*
The optical *range* of each OP sensor can be adjusted to meet the specific appli-cation.

Various connection versions
All OP sensors are available standard with a 2m cable or an M12 connector. As an option, the OP sensors are available with an M8 connector, or a Torson connector.

User friendly, even in tight spaces
The range adjustment potentiometer is conveniently located at the back of the sensor. This is especially advantageous in tight spaces. A luminous *function indicator* is easily seen from the back and side of the sensor even in bright daylight conditions.

Reliable for the highest demands

Robust construction with IP 65 *sealing*
The OP photoelectric sensors are built with a glass-sphere reinforced polyamide housing, and are protected against water and dust. The sensors meet the *sealing* requirements of IP 65.

EMC-tested
The OP sensors are tested according to IEC 801, EN50081-1 and EN50082-2. This assures trouble free use even in high electromagnetically contaminated environments.

High ambient light rejection
Thanks to pulse modulation and a multilevel disturbance rejection, the OP sensors are extremely insensitive to foreign light sources.

Reverse polarity protection
All of the OP sensor's electrical connec-tions are protected against reverse wiring.

Short-circuit protection
The OP sensor's transistor outputs are electronically protected against short circuit.

Power-up output suppression
During power-up the outputs of the OP sensors are blocked for typically 30 msec.

Designation code

OP x xxx xxx xx

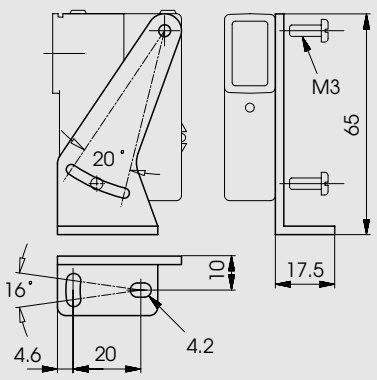
Principle	Supply	Outputs	Connection	Electr. option	Light	Range
E: Through-beam receiver P: Retro-reflective with polarizing filters R: Retro-reflective S: Through-beam emitter T: Diffuse-reflective Z: Accessory	1: 10-30 VDC	KA: No output NA: NPN light- and dark-on ND: NPN dark-on NH: NPN light-on PA: PNP light- and dark-on PD: PNP dark-on PH: PNP light-on	0: Cable special length 1: Cable 2 m 4: Connector M12 5: Connector M8 6: Connector Torson	00: Range adjustable 01: Range adjustable, test input 40: Range not adjustable 41: Range not adjustable, test input	I: Infrared R: Red	OPS/OPE: 1: 12 m OPP/OPR: 1: 3,5 m 2: 4 m OPT: 1: 40 cm 2: 5 cm 3: 10 cm 4: 20 cm 5: 65 cm

Accessories

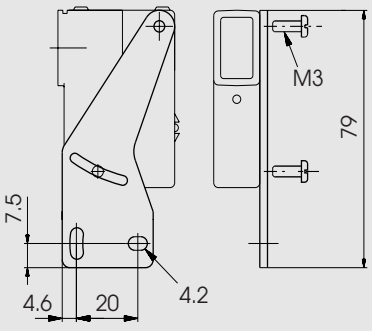
Retroreflectors: see page 130

Connector cables: see page 128

Mounting:



Mounting bracket OPZ 001



Mounting bracket OPZ 002

Retro-reflective sensors, in a small plastic housing

- Light reserve warning indicator
- Dual transistor outputs, **NPN or PNP**
- **1000 Hz switching frequency**
- Short-circuit protection, reverse polarity protection **and** power-up output suppression
- Test input **(option)**
- **Connections: Cable, 2 meter**
  Connector, M12
  Connector, M8 (option)
  Connector, Torson (option)
- **EMC tested according to IEC 801 and EN50081-1/EN 50082-2**

CE

Product designation [1]	**OPR 1NA 100 I2**	**OPR 1NA 400 I2**	**OPR 1PA 100 I2**	**OPR 1PA 400 I2**
Output	NPN (light- and dark-on)		PNP (light- and dark-on)	
Connection	Cable 2 m	Connector M12	Cable 2 m	Connector M12
Range adjustment	Yes			
Optical data [2]				
Range	0,05…4 m (retroreflector OZR 001)			
Emitter	Infrared-LED, 950 nm, pulsed			
Electrical data [2]				
Supply voltage U_S	10...30 VDC			
Allowable ripple	+/- 10% of U_S			
Current consumption (without load)	< 15 mA			
Max. load current I_L	200 mA			
Residual voltage	< 1,6 V			
Max. switching frequency	1000 Hz			
Environmental data				
Sealing	IP 65			
Temperature T_A (operating and storage)	-25...+65 °C			
Weight	ca. 100 g	ca. 35 g	ca. 100 g	ca. 35 g
Option [1]				
Test input: emitter on	+ U_S or open			
emitter off	< 1,5 V		< U_S - 8 V	

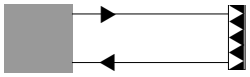
1) For product designation of sensors with options see designation code on page 81.
2) When not otherwise noted, all technical data at T_A = 25 °C and U_S = 24 V.

Retro-reflector ●	Range	Retro-reflector ▬	Range	Retro-reflective tape	Range
OZR 001	0.05 – 4.0 m	OZR 101	0.05 – 6.0 m	OZR 201*	0.15 – 1.4 m
OZR 002	0.03 – 3.5 m	OZR 102	0.05 – 2.2 m	OZR 202	0.15 – 3.0 m
OZR 003	0.03 – 1.6 m	OZR 103	0.03 – 4.8 m	OZR 203	0.15 – 2.3 m
		OZR 104	0.03 – 8.0 m	OZR 204*	0.15 – 2.0 m
				OZR 205*	0.15 – 2.9 m

* 30 cm long

10...30 VDC

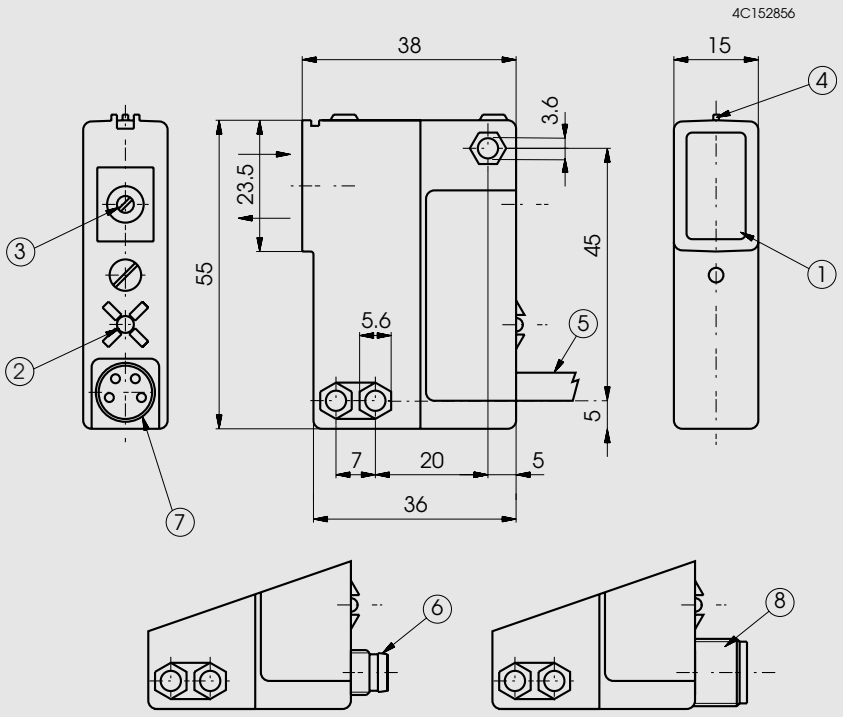
NPN / PNP
light-on and
dark-on output



up to 8 m

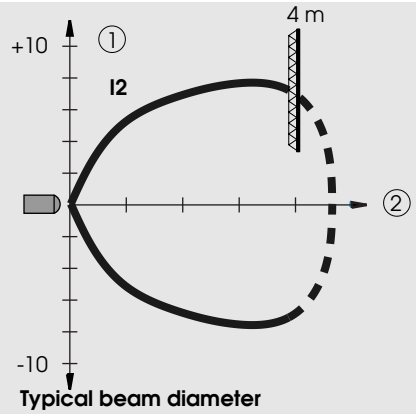
OPR

Dimensions (55 mm x 38 mm x 15 mm)



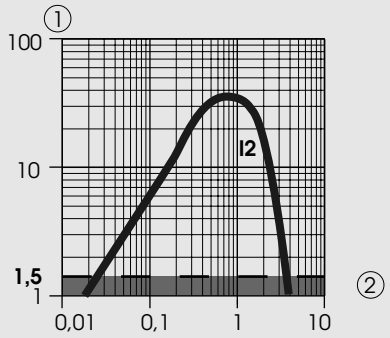
① Optics
② Function indicator
③ Range adjustment
④ Alignment aid
⑤ Cable connection
⑥ Connector M8
⑦ Connector Torson
⑧ Connector M12

Optical diagrams



Typical beam diameter
(with retroreflector OZR 001)

① Diameter in (cm)
② Range in (m)

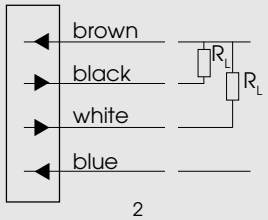


Typical excess gain curve
(with retroreflector OZR 001)

① Gain factor
② Range in (m)

Wiring diagram

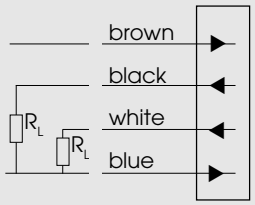
NPN-output



⊕ Supply voltage 10...30 V
Light-on output
Dark-on output
⊖ Supply voltage

Connection for M8/M12/Torson	Wire color	Connection for test input
1	brown	Supply+
2	white	Test input
3	blue	Supply-
4	black	Output

PNP-output



Light-on output:
Output energized when no object is present.

Dark-on output:
Output energized when object is present.