









# 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



## Product designation<sup>1)</sup>

Output

Connection

Range adjustment

## Optical data<sup>2)</sup>

Range

Emitter

## Electrical data<sup>2)</sup>

Supply voltage  $U_s$

Allowable ripple

Current consumption (without load)

Max. load current  $I_L$

Residual voltage

Max. switching frequency

## Environmental data

Sealing

Temperature  $T_A$   
(operating and storage)

Weight

## Option<sup>1)</sup>

Test input: emitter on

emitter off

OPR 1NA 100 I2	OPR 1NA 400 I2	OPR 1PA 100 I2	OPR 1PA 400 I2
NPN (light- and dark-on)		PNP (light- and dark-on)	
Cable 2 m	Connector M12	Cable 2 m	Connector M12
Yes			
0,05...4 m (retroreflector OZR 001)			
Infrared-LED, 950 nm, pulsed			
10...30 VDC			
+/- 10% of $U_s$			
< 15 mA			
200 mA			
< 1,6 V			
1000 Hz			
IP 65			
-25...+65 °C			
ca. 100 g	ca. 35 g	ca. 100 g	ca. 35 g

+ $U_s$ or open	
< 1,5 V	< $U_s$ - 8 V

1) For product designation of sensors with options see designation code on page 81.

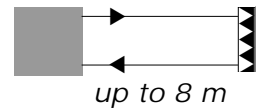
2) When not otherwise noted, all technical data at  $T_A = 25\text{ °C}$  and  $U_s = 24\text{ V}$ .

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

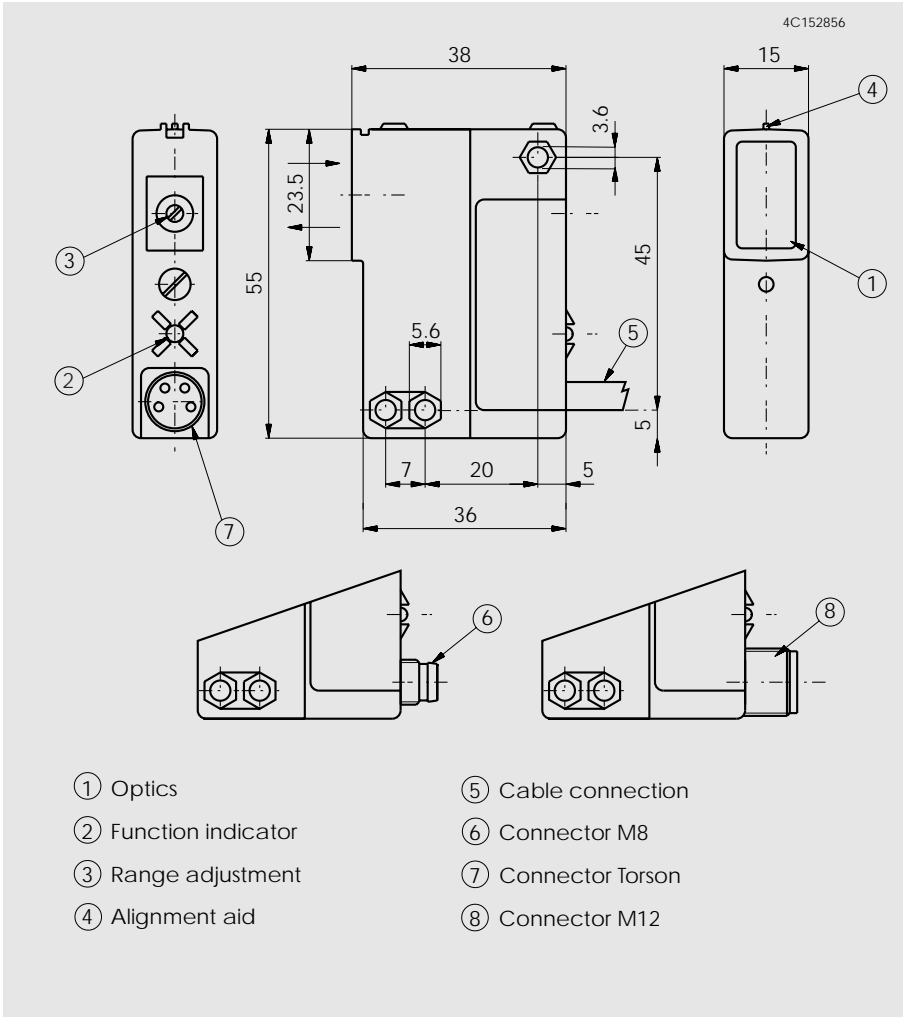
10...30 VDC

NPN / PNP  
light-on and  
dark-on output

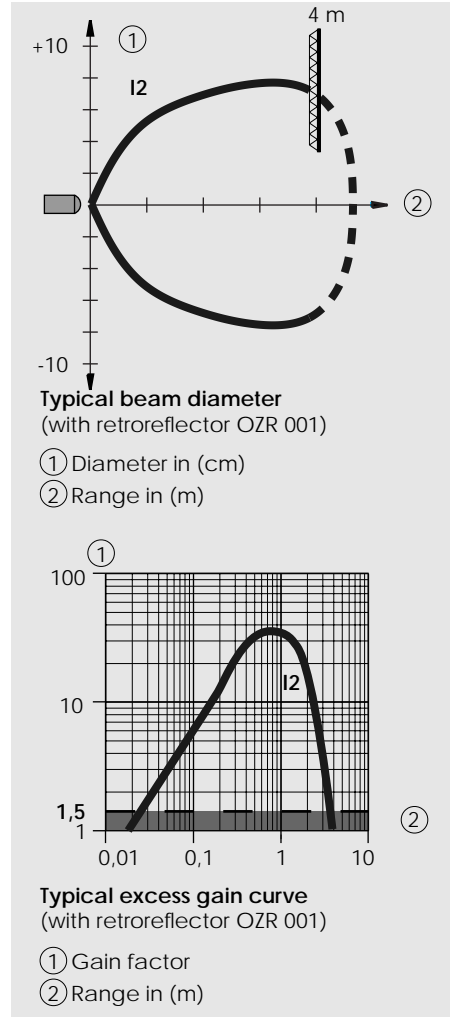


OPR

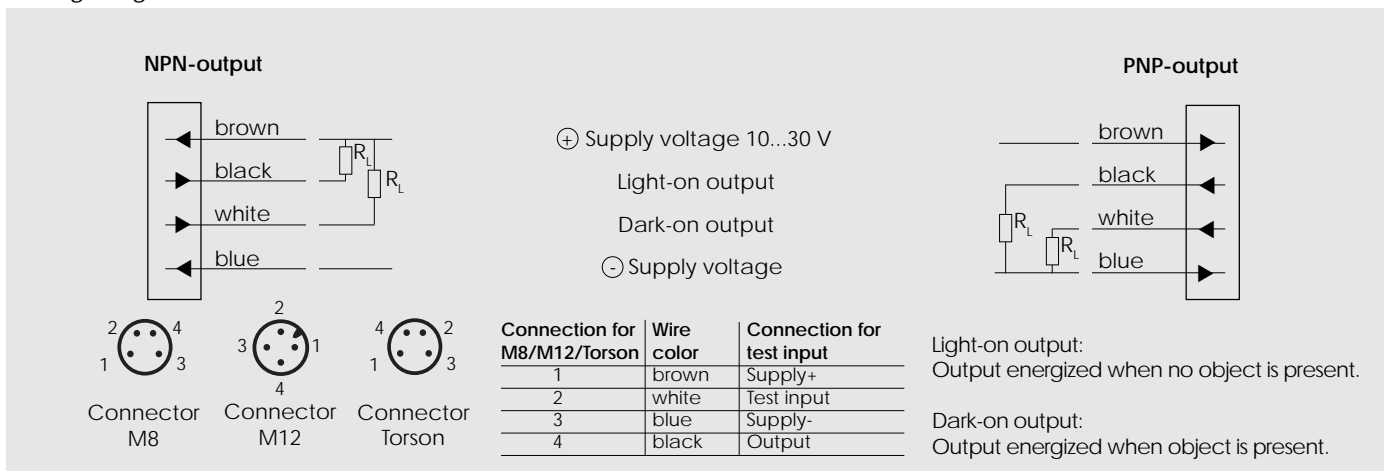
Dimensions (55 mm x 38 mm x 15 mm)



Optical diagrams



Wiring diagram



# Retro-reflective sensors with polarizing filters, in a small plastic housing



- Glass protected optics
- 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



## Product designation<sup>1)</sup>

Output

Connection

Range adjustment

## Optical data<sup>2)</sup>

Range

Emitter

## Electrical data<sup>2)</sup>

Supply voltage  $U_s$

Allowable ripple

Current consumption (without load)

Max. load current  $I_L$

Residual voltage

Max. switching frequency

## Environmental data

Sealing

Temperature  $T_A$   
(operating and storage)

Weight

## Option<sup>1)</sup>

Test input: emitter on

emitter off

OPP 1NA 100 R1	OPP 1NA 400 R1	OPP 1PA 100 R1	OPP 1PA 400 R1
NPN (light- and dark-on)		PNP (light- and dark-on)	
Cable 2 m	Connector M12	Cable 2 m	Connector M12
Yes			
0,1...3,5 m (retroreflector OZR 001)			
Visible-red LED, 660 nm, pulsed, with polarizing filter			
10...30 VDC			
+/- 10% of $U_s$			
< 15 mA			
200 mA			
< 1,6 V			
1000 Hz			
IP 65			
-25...+65°C			
ca. 100 g	ca. 35 g	ca. 100 g	ca. 35 g

+ $U_s$ or open	
< 1,5 V	< $U_s - 8 V$

1) For product designation of sensors with options see designation code on page 81.

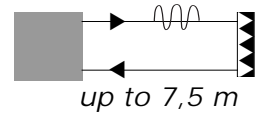
2) When not otherwise noted, all technical data at  $T_A = 25^\circ C$  and  $U_s = 24 V$ .

Retro-reflector ●	Range	Retro-reflector ■	Range	Retro-reflective tape	Range
OZR 001	0.10 – 3.5 m	OZR 101	0.10 – 5.8 m	OZR 201*	0 m
OZR 002	0.08 – 3.3 m	OZR 102	0.10 – 1.9 m	OZR 202	0 m
OZR 003	0.15 – 1.3 m	OZR 103	0.08 – 4.6 m	OZR 203	0.25 – 1.8 m
		OZR 104	0.08 – 7.5 m	OZR 204*	0.25 – 1.3 m
				OZR 205*	0.25 – 1.8 m

\* 30 cm long

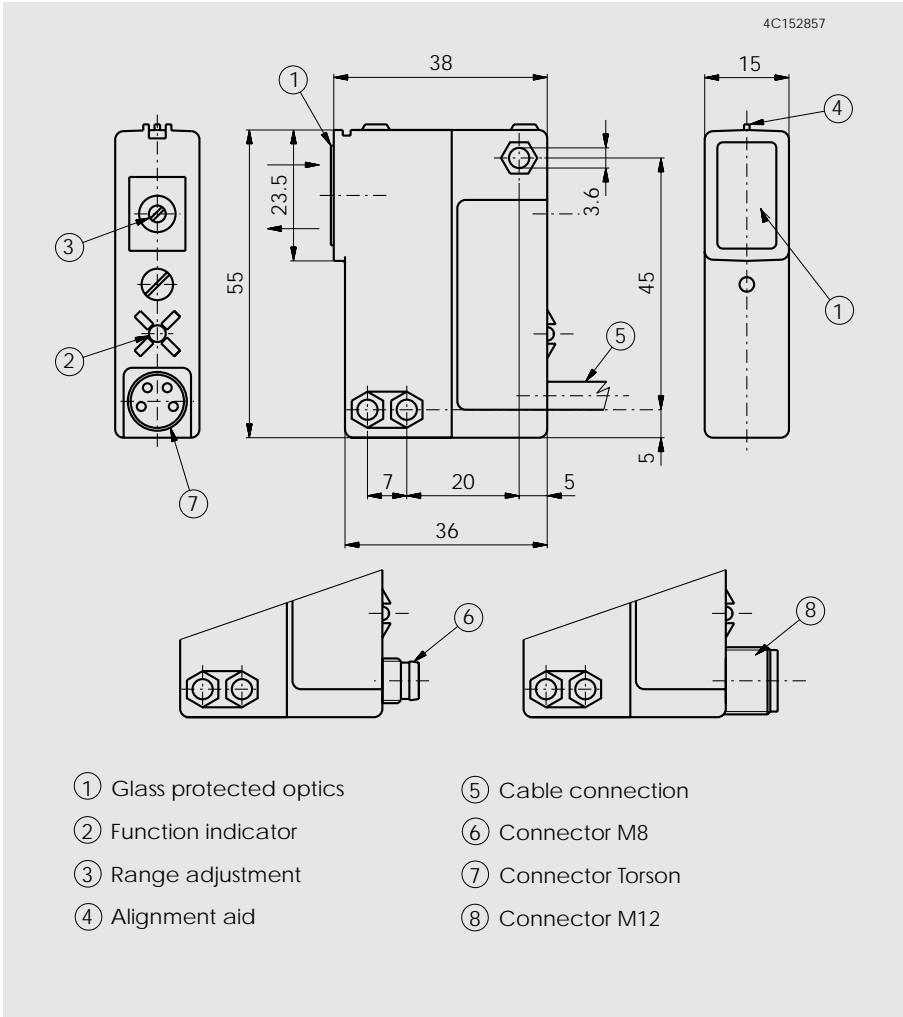
10...30 VDC

NPN / PNP  
light-on and  
dark-on output

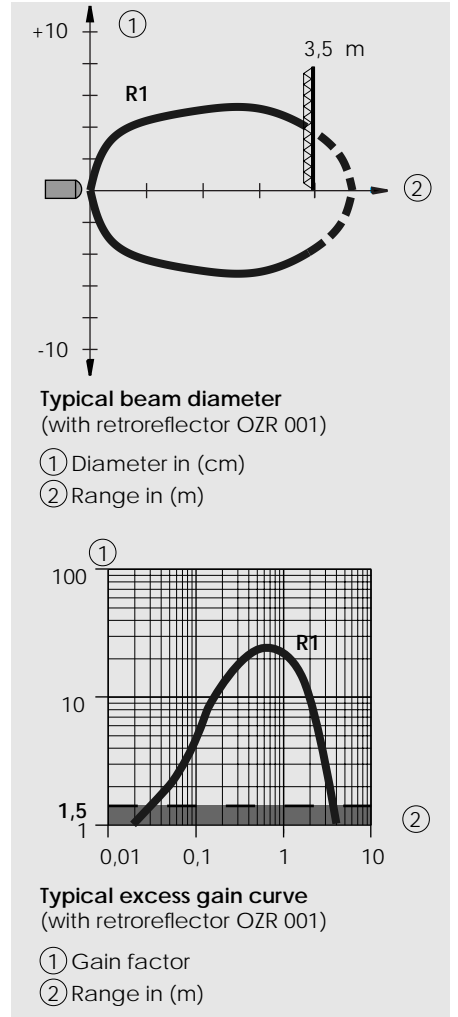


OPP

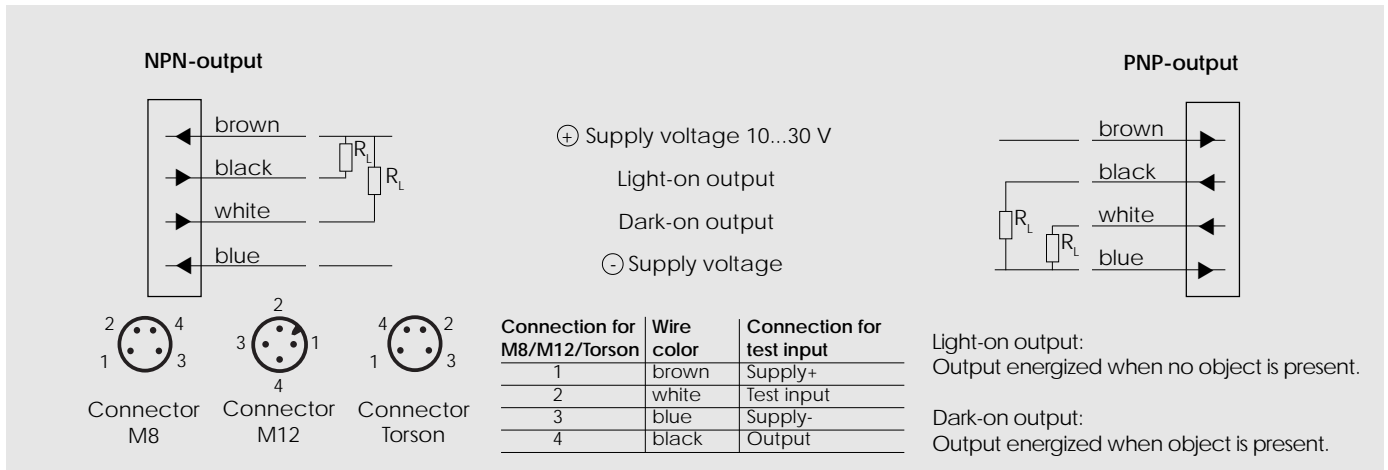
Dimensions (55 mm x 38 mm x 15 mm)



Optical diagrams



Wiring diagram





# Diffuse-reflective sensors, range 5/10 cm, with background suppression, in a small plastic housing



- Background suppression
- 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
- Connections: Cable, 2 meter  
Connector, M12  
Connector, M8 (option)  
Connector, Torson (option)
- EMC tested according to IEC 801 and EN 50081-1/EN 50082-2



## Product designation<sup>1)</sup>

Output

Connection

Range adjustment

## Optical data<sup>2)</sup>

Max. range

Emitter

## Electrical data<sup>2)</sup>

Supply voltage  $U_s$

Allowable ripple

Current consumption (without load)

Max. load current  $I_L$

Residual voltage

Max. switching frequency

## Environmental data

Sealing

Temperature  $T_A$   
(operating and storage)

Weight

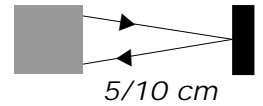
OPT 1NA 100 I2	OPT 1NA 400 I2	OPT 1PA 100 I2	OPT 1PA 400 I2	OPT 1NA 100 I3	OPT 1NA 400 I3	OPT 1PA 100 I3	OPT 1PA 400 I3
NPN (light-/dark-on)		PNP (light-/dark-on)		NPN (light-/dark-on)		PNP (light-/dark-on)	
Cable 2 m	Connector M12	Cable 2 m	Connector M12	Cable 2 m	Connector M12	Cable 2 m	Connector M12
Yes							
5 cm (Kodak card white, 10 x 10 cm)				10 cm (Kodak card white, 10 x 10 cm)			
Infrared-LED, 880 nm, pulsed							
10...30 VDC							
+/- 10% of $U_s$							
< 15 mA							
200 mA							
< 1,6 V							
1000 Hz							
IP 65							
-25...+65 °C							
ca. 100 g	ca. 35 g	ca. 100 g	ca. 35 g	ca. 100 g	ca. 35 g	ca. 100 g	ca. 35 g

1) For product designation of sensors with options see designation code on page 81.

2) When not otherwise noted, all technical data at  $T_A = 25\text{ °C}$  and  $U_s = 24\text{ V}$ .

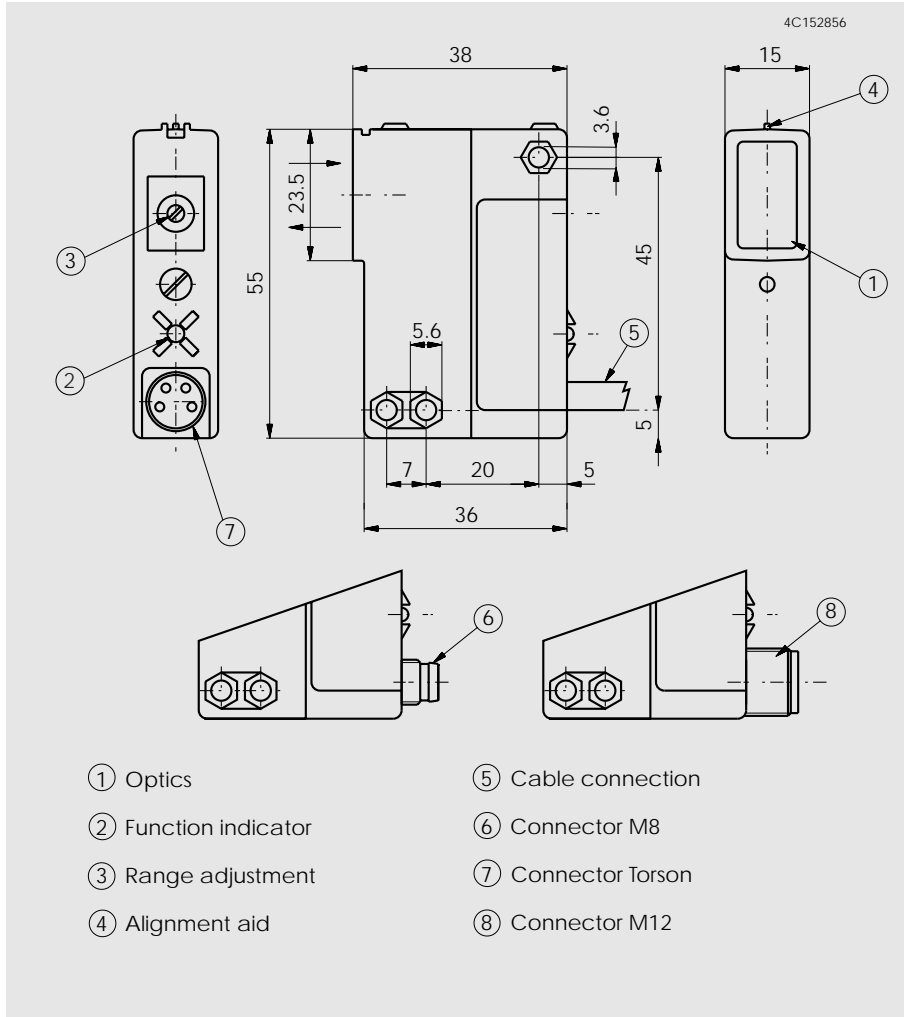
10...30 VDC

NPN / PNP  
light-on and  
dark-on output

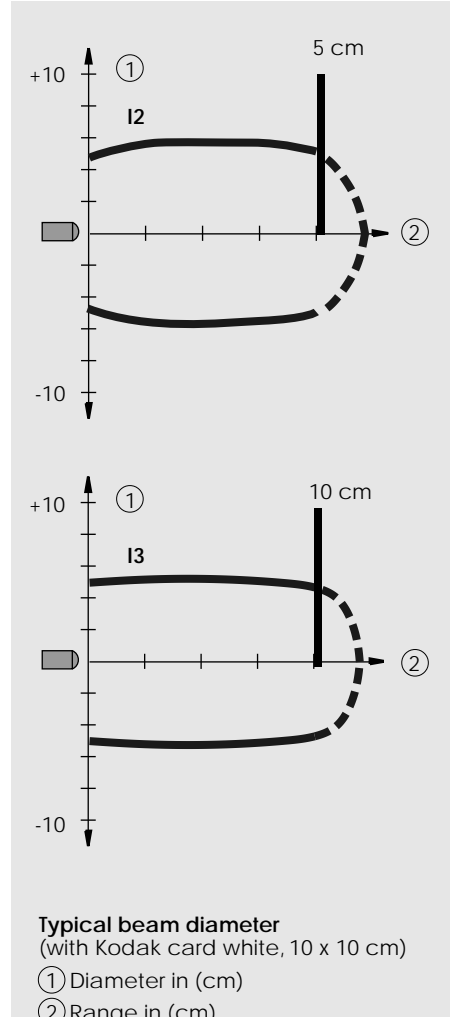


OPT

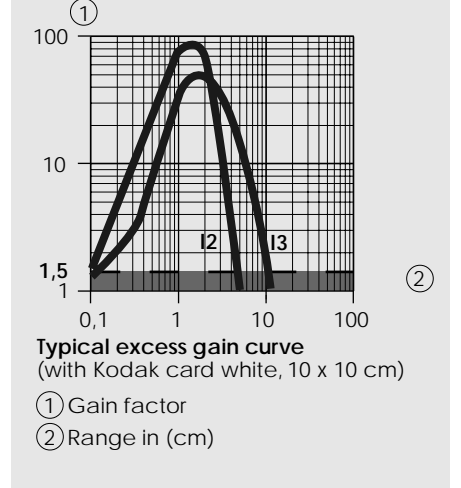
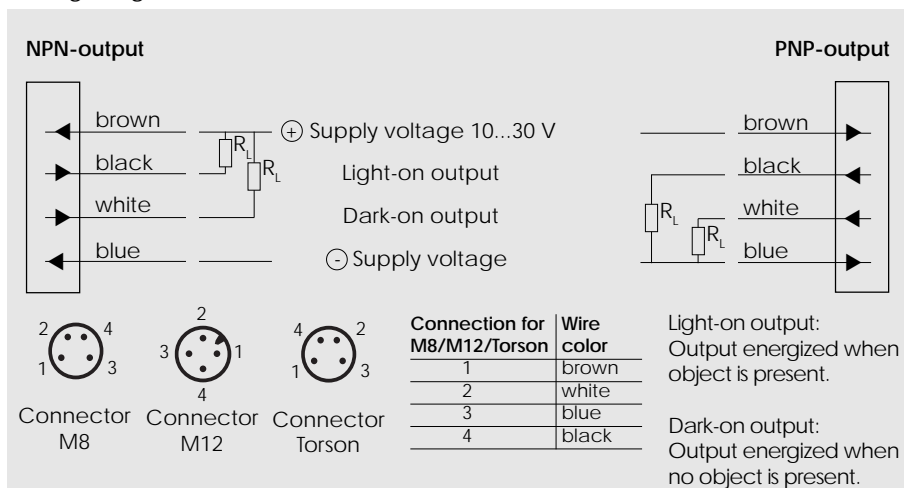
Dimensions (55 mm x 38 mm x 15 mm)



Optical diagrams



Wiring diagram



# Diffuse-reflective sensors, range 20/40/65 cm, 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
- Connections: Cable, 2 meter  
Connector, M12  
Connector, M8 (option)  
Connector, Torson (option)
- EMC tested according to IEC 801 and EN 50081-1/EN 50082-2



Product designation <sup>1)</sup> 20 cm Sensor

Product designation <sup>1)</sup> 40 cm Sensor

Product designation <sup>1)</sup> 65 cm Sensor

Output

Connection

Range adjustment

**Optical data** <sup>2)</sup>

Max. range

Emitter

**Electrical data** <sup>2)</sup>

Supply voltage  $U_s$

Allowable ripple

Current consumption (without load)

Max. load current  $I_L$

Residual voltage

Max. switching frequency

**Environmental data**

Sealing

Temperature  $T_A$   
(operating and storage)

Weight

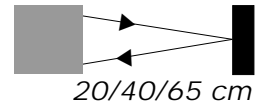
OPT 1NA 100 I4	OPT 1NA 400 I4	OPT 1PA 100 I4	OPT 1PA 400 I4
OPT 1NA 100 I1	OPT 1NA 400 I1	OPT 1PA 100 I1	OPT 1PA 400 I1
OPT 1NA 100 I5	OPT 1NA 400 I5	OPT 1PA 100 I5	OPT 1PA 400 I5
NPN (light- and dark-on)		PNP (light- and dark-on)	
Cable 2 m	Connector M12	Cable 2 m	Connector M12
Yes			
I4: 20 cm / I1: 40 cm / I5: 65 cm (Kodak card withe, 10 x 10 cm)			
Infrared-LED, 880 nm, pulsed			
10...30 VDC			
+/- 10% of $U_{sp}$			
< 15 mA			
200 mA			
< 1,6 V			
1000 Hz			
IP 65			
-25...+65 °C			
ca. 100 g	ca. 35 g	ca. 100 g	ca. 35 g

1) For product designation of sensors with options see designation code on page 81.

2) When not otherwise noted, all technical data at  $T_A = 25\text{ °C}$  and  $U_s = 24\text{ V}$ .

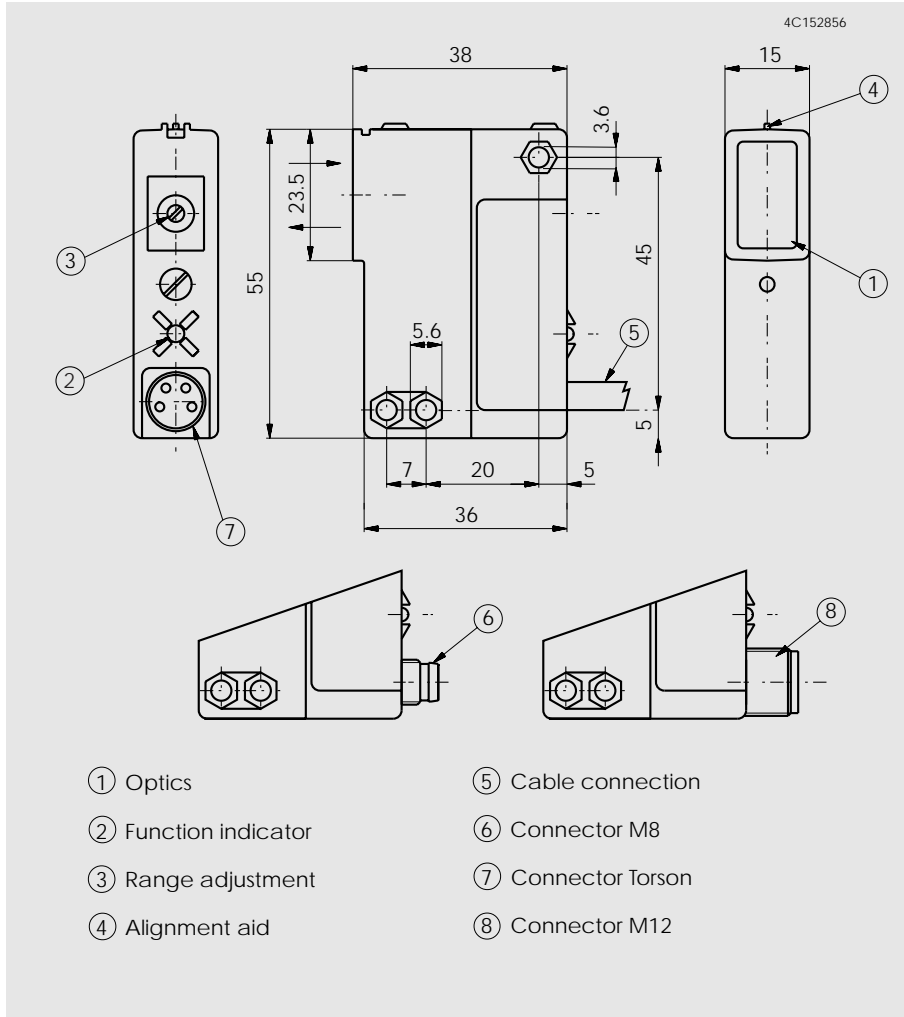
10...30 VDC

NPN / PNP  
light-on and  
dark-on output

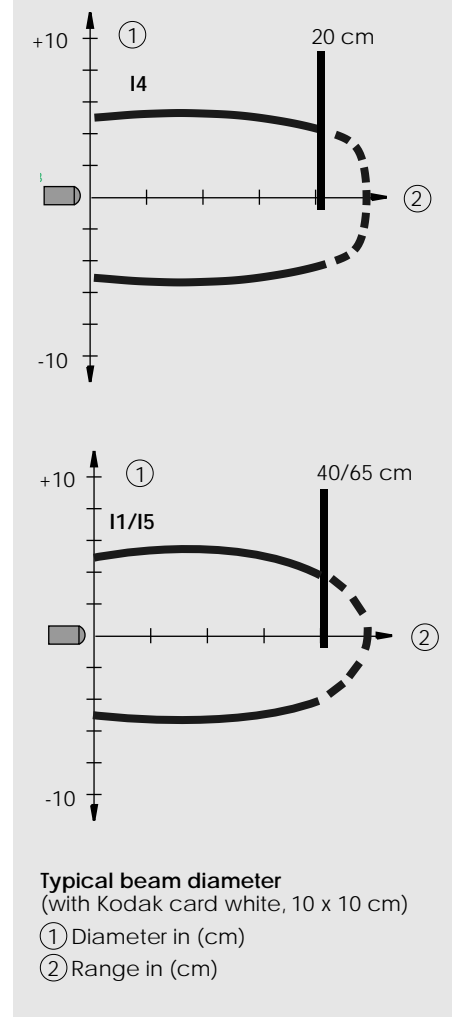


OPT

Dimensions (55 mm x 38 mm x 15 mm)

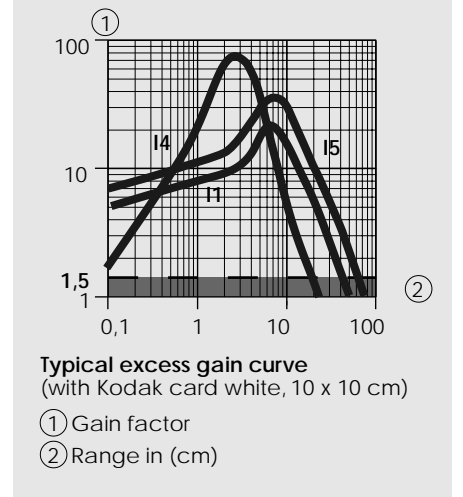
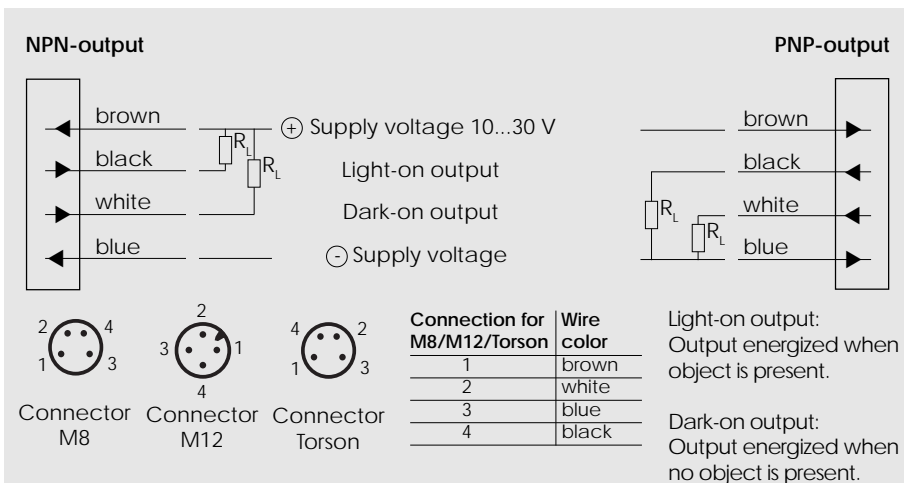


Optical diagrams



**Typical beam diameter**  
(with Kodak card white, 10 x 10 cm)  
① Diameter in (cm)  
② Range in (cm)

Wiring diagram



**Typical excess gain curve**  
(with Kodak card white, 10 x 10 cm)  
① Gain factor  
② Range in (cm)