

## Photoelectric sensors

### Analog output sensors

Bernstein has extended its M 18 photoelectric range through a diffuse-reflective sensor with an analog output. Suitable for sensing distances between 30 and 200 mm, the required sensing distance can easily be set within this range via a programming wire.

The sensor sets a new amplification, by means of a brief connection to the positive operating voltage (0.1 - 10 s). Parameters such as the steepness of the characteristic curve and direction can be factory programmed.

The following voltage and current signals are available on the output side: 0-10 V, 0-20 mA and 4-20 mA.

The new diffuse-reflective sensor with analog output is available in the following housing variants: Threaded design in plastic, brass, stainless steel and in smooth stainless steel barrels with a 20 mm diameter.

An M 12 x 1 plug was chosen for the connection.

### Overview of analog output sensors

#### Design OT, plastic housing



Output	Part number	Designation
0-20 mA	655.7018.001	OT18RT-DPAP-0200-SE
4-20 mA	655.7018.002	OT18RT-DPAP-0200-SE
0-10 V	655.7018.003	OT18RT-DPAP-0200-SE

#### Design OM, metal housing



Output	Part number	Designation
0-20 mA	655.7016.001	OM18RT-DPAP-0200-SE
4-20 mA	655.7016.002	OM18RT-DPAP-0200-SE
0-10 V	655.7016.003	OM18RT-DPAP-0200-SE

#### Design ON, stainless steel housing



Output	Part number	Designation
0-20 mA	655.7021.001	ON18RT-DPAP-0200-SE
4-20 mA	655.7021.002	ON18RT-DPAP-0200-SE
0-10 V	655.7021.003	ON18RT-DPAP-0200-SE

#### Design OZ, stainless steel housing Ø 20 mm



Output	Part number	Designation
0-20 mA	655.7000.002	OZ20RT-DPAP-0200-SE
4-20 mA	655.7000.003	OZ20RT-DPAP-0200-SE
0-10 V	655.7000.004	OZ20RT-DPAP-0200-SE

# The new M18 product line of photoelectric sensors

## Using the selection matrix

To assist the user in selecting the right photoelectric sensor for their application, Bernstein developed the selection matrix below.

The colour of the individual fields matches those in the product index to allow rapid selection of the most suitable sensor (by part number) starting with the most important criteria switching distance. By not using detailed technical descriptions the selection is considerably simplified, but our engineers are always available to answer any technical questions.

## Variants and Highlights

The new photoelectric sensors of the M18 product line are available in three different housing materials:

Plastic, nickel-plated brass and stainless steel.

The new product line covers all the most popular function types.

*Diffuse reflective sensors* are available with different sensing distances. One variant has a fixed sensing distance of 100 mm, two further diffuse reflective sensors have an adjustable sensing distance of 300 mm and 500 mm.

An integral part of this product line is also a *convergent beam sensor* with 40 mm fixed sensing distance.

The transmission and reception elements of convergent beam sensors are arranged in a defined angle to each other. This results in an active detection zone being defined around this focal point.

In addition to the *retroreflective sensor* with 3 m fixed range, the product line includes a polarized retroreflective sensor with 2.5 m adjustable range.

The *polarized retroreflective sensor* is an autocollimation type. The advantage of this technology is, that the transmission and reception channel have the same light emitting surface, and therefore no dead detection zone.

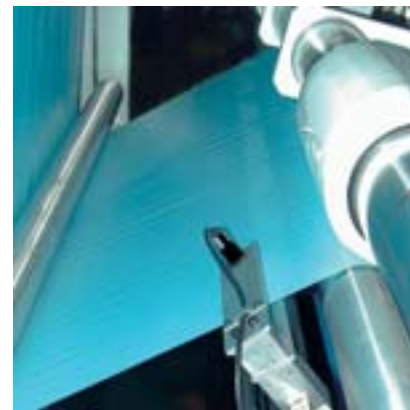
Selection matrix photoelectric sensors product line M18

Function type	Sensing range-/distance	Housing material	Output	Connection
Diffuse reflective (R T)	100 mm fixed 300 mm adjustable 500 mm adjustable	Plastic Nickel plated brass Stainless steel	NPN PNP	plug M12 cable 2 m
Convergent beam (Fix-Focus) (FF)	40 mm fixed	Plastic Nickel plated brass Stainless steel	NPN PNP	plug M12 cable 2 m
Retroreflective (R S)	3 m fixed	Plastic Nickel plated brass Stainless steel	NPN PNP	plug M12 cable 2 m
Polarized retroreflective (PS) Transparent sensor (PS)	2.5 m adjustable 0.8 m adjustable	Plastic Nickel plated brass Stainless steel	NPN PNP	plug M12 cable 2 m
Through-beam Transmitter (SE) Set (ES) Through-beam Receiver (EE)	8 m fixed	Plastic Nickel plated brass Stainless steel	NPN PNP	plug M12 cable 2 m

Specific for the detection of translucent materials, e.g. film, plastic cans, bottles, etc., a transparent sensor was developed. From a technical point of view, a polarized retroreflective sensor is equipped with enhanced optical qualities. By the implementation of this technique into a M18 housing, this variant provides, in conjunction with a MICROTUBE-reflector (Part.-No. 657.2100.011), an ideal solution to detect objects which could hardly have been registered previously. The M18 product line also includes a through-beam sensor with 8 m range. The transmitter and the receiver are available separately or as a set (simple stockkeeping).

The photoelectric sensors have either a 2 m cable or an M12 connector, both versions are available with PNP or NPN output.

To simplify the stockkeeping and the selection of the correct sensor, all sensors have a programmable switching output. The dark activated output (standard for diffuse reflective and convergent beam sensors) and the light activated output (standard for retroreflective and through-beam sensors) can be chosen by means of a programming wire.



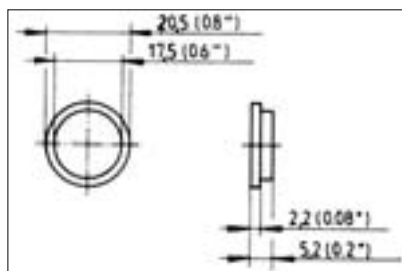
Picture above: Transparent sensor for the detection of film (packaging industry)

## Reflectors

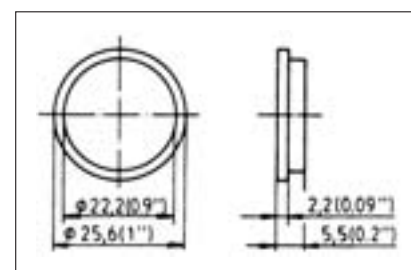
The BERNSTEIN reflectors, which consist of several triple mirrors standing pyramid-shaped, are best suited for retro and polarised retro applications. The pyramid-shaped structure of these triple mirrors allows a variation of the reflector of up to 30° to the optical axis (e.g. caused by vibration or slight movements at the application).

The ranges of the retroreflective sensors refer to the Ø 83 mm type (657.2107.003); use of reflectors with smaller surface area will result in a reduction of the stated sensing distance.

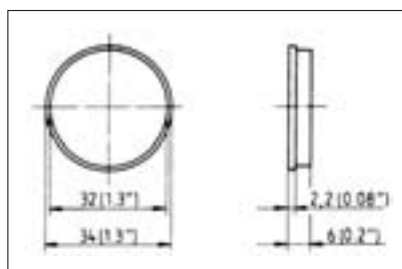
The reflector diameter should be selected in terms of the range and the size of the object to be detected. The ideal case is, the object should be larger than the reflector, which is then "shadowed" completely.



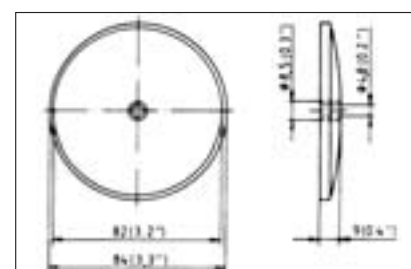
**Part number** 657.2108.008  
**Diameter** 17.5 mm



**Part number** 657.2109.009  
**Diameter** 22 mm



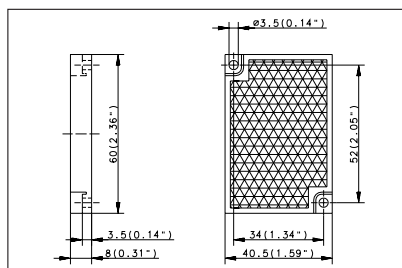
**Part number** 657.2110.010  
**Diameter** 32 mm



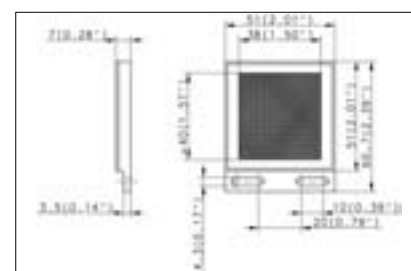
**Part number** 657.2107.003  
**Diameter** 83 mm

## Accessory

You find further accessories on page 274 ff.







**Part number** 657.2100.007  
**Dimensions** 60 x 41 mm





**Part number** 657.2100.011  
**Dimensions** 60 x 51 mm



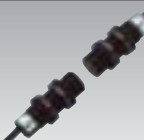

## Overview diffuse reflective/retroreflective sensors M 18





Type OT, Plastic housing								
	PA 12-front cap				glass lens			
	2 m cable, length = 56 mm		plug M12, length = 65 mm		2 m cable, length = 58.5 mm		plug m12, length = 67.5 mm	
Sensing range-/distance	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN
RT 100 mm fixed	655.7819.004	655.7219.004	655.7818.002	655.7218.001				
RT 300 mm adjustable	655.7819.005	655.7219.005	655.7818.003	655.7218.005				
RT 500 mm adjustable	655.7819.006	655.7219.006	655.7818.006	655.7218.006				
FF 40 mm fixed	655.8819.001	655.8219.001	655.8818.002	655.8218.001				
RS 3 m fixed	655.4819.003	655.4219.002	655.4818.001	655.4218.001				
PS 2.5 m adjustable					655.5819.003	655.5219.001	655.5818.001	655.5218.001
PS 0.8 m adjustable					655.5819.004	655.5219.002	655.5818.002	655.5218.002





Type OM, Nickel plated brass housing								
	PA 12-front cap				glass lens			
	2 m cable, length = 56 mm		plug M12, length = 65 mm		2 m cable, length = 58.5 mm		plug M12, length = 67.5 mm	
Sensing range-/distance	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN
RT 100 mm fixed	655.7817.002	655.7217.001	655.7816.001	655.7216.001				
RT 300 mm adjustable	655.7817.003	655.7217.002	655.7816.002	655.7216.003				
RT 500 mm adjustable	655.7817.004	655.7217.003	655.7816.006	655.7216.004				
FF 40 mm fixed	655.8817.001	655.8217.001	655.8816.001	655.8216.001				
RS 3 m fixed	655.4817.001	655.4217.001	655.4816.001	655.4216.001				
PS 2.5 m adjustable					655.5817.001	655.5217.001	655.5816.001	655.5216.001
PS 0.8 m adjustable					655.5817.002	655.5217.002	655.5816.002	655.5216.002

Type ON, Stainless steel housing								
	PA 12-front cap				glass lens			
	2 m cable, length = 56 mm		plug M12, length = 65 mm		2 m cable, length = 58.5 mm		plug m12, length = 67.5 mm	
Sensing range-/distance	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN
RT 100 mm fixed	655.7822.001	655.7222.001	655.7821.001	655.7221.001				
RT 300 mm adjustable	655.7822.002	655.7222.002	655.7821.002	655.7221.002				
RT 500 mm adjustable	655.7822.003	655.7222.003	655.7821.003	655.7221.003				
FF 40 mm fixed	655.8822.001	655.8222.001	655.8821.001	655.8221.001				
RS 3 m fixed	655.4822.001	655.4222.001	655.4821.001	655.4221.001				
PS 2.5 m adjustable					655.5822.001	655.5222.001	655.5821.001	655.5221.001
PS 0.8 m adjustable					655.5822.002	655.5222.002	655.5821.002	655.5221.002

## Overview through-beam sensors M 18

<b>Type OT, Plastic housing</b>								
	Receiver				Set			
Sensing-/distance	2 m cable, length = 56 mm		plug M12, length = 65 mm		2 m cable, length = 56 mm		plug M12, length = 65 mm	
	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN
8 m	<b>655.1819.001</b>	<b>655.1219.002</b>	<b>655.1818.001</b>	<b>655.1218.001</b>	<b>655.1819.101</b>	<b>655.1219.102</b>	<b>655.1818.101</b>	<b>655.1218.101</b>
	Transmitter							
	<b>655.1019.001</b>		<b>655.1018.001</b>					

<b>Type OM, Nickel plated brass housing</b>								
	Receiver				Set			
Sensing range-/distance	2 m cable, length = 56 mm		plug M12, length = 65 mm		2 m cable, length = 56 mm		plug M12, length = 65 mm	
	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN
8 m	<b>655.1817.001</b>	<b>655.1217.001</b>	<b>655.1816.001</b>	<b>655.1216.001</b>	<b>655.1817.101</b>	<b>655.1217.101</b>	<b>655.1816.101</b>	<b>655.1216.101</b>
	Transmitter							
	<b>655.1017.001</b>		<b>655.1016.001</b>					

<b>Type ON, Stainless steel housing</b>								
	Receiver				Set			
Sensing range-/distance	2 m cable, length = 56 mm		plug M12, length = 65 mm		2 m cable, length = 56 mm		plug M12, length = 65 mm	
	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN
8 m	<b>655.1822.001</b>	<b>655.1222.001</b>	<b>655.1821.001</b>	<b>655.1221.001</b>	<b>655.1822.101</b>	<b>655.1222.101</b>	<b>655.1821.101</b>	<b>655.1221.101</b>
	Transmitter							
	<b>655.1022.001</b>		<b>655.1021.001</b>					

### General data

Operating voltage	$U_s$	10–36 V DC	Ambient light resistance	10 kLux
Max. switching current	$I$	200 mA	Operating temperature	-20°C...+70°C
Switch hysteresis	$H$	≤ 15%	Ingress protection	IP67
Repeatability	$R$	≤ 10%	Protection class	II, protective insulation
Switching frequency	$f$	500 Hz	Cable PVC	0.34 mm <sup>2</sup>
Output	Voltage reversal protection, short-circuit protection light-/dark activated programmable		Housing material (Type)	PBT(OT18), Nickel plated brass (OM18), 1.4305 (ON18)

# Photoelectric sensors OM18RH

OM18RH Diffuse reflective sensors  
with background suppression



**M 18 x 63.5 mm**

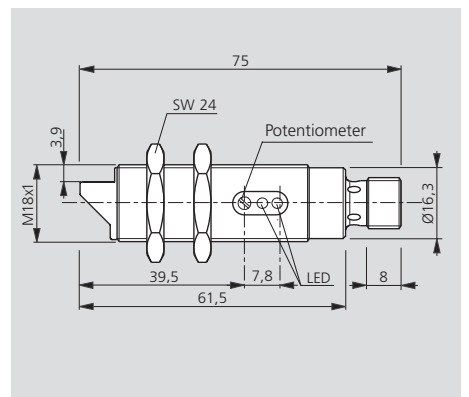
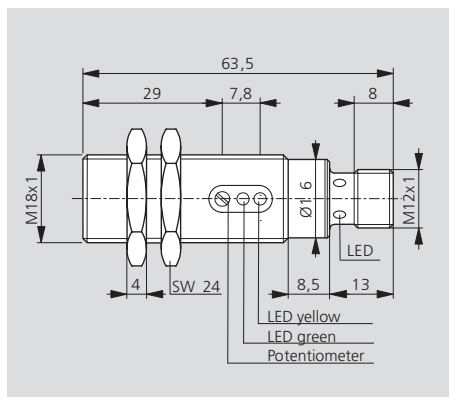


**M 18 x 75 mm**

Sensing type			Diffuse reflective sensors with background suppression		Diffuse reflective sensors with background suppression	
Sensing distance / range			120 mm		120 mm	
	Model description		OM18RH-DHTP-0120-SDE		OM18RH-DHTP-0120-SDEW	
PNP	<b>Part number</b>		<b>655.8916.001</b>		<b>655.8916.002</b>	
LA	Wiring diagram (page/pos.)		271/4		271/4	
Stock status: Ex stock/Built to order			-/●		-/●	
	Model description		-		-	
PNP	<b>Part number</b>					
DA	Wiring diagram (page/pos.)					
Stock status: Ex stock/Built to order						
	Model description		-		-	
NPN	<b>Part number</b>					
DA	Wiring diagram (page/pos.)					
Stock status: Ex stock/Built to order						
	Model description		-		-	
Transmitter	<b>Part number</b>					
	Wiring diagram (page/pos.)					
Stock status: Ex stock/Built to order						
Voltage range			10–36 V DC		10–36 V DC	
Short-circuit protection			●		●	
Output current	max.		200 mA		200 mA	
Switching frequency	max.		500 Hz		500 Hz	
LED for output function/supply voltage/diagnostic			●/-/●		●/-/●	
Adjustable sensitivity			●		●	
Timer function			-		-	
Diagnostic function			-		-	
Temperature range	min./max.		-20 °C/+55 °C -4 °F/+131 °F		-20 °C/+55 °C -4 °F/+131 °F	
Protection type			IP 67/NEMA 4		IP 67/NEMA 4	
Screw-clamp termination	(page/Pos.)					
Cable length (2 m)	Cross section (mm <sup>2</sup> )					
Plug	(page/Pos.)		284/286; 285/3, 4		284/286; 285/3, 4	
Accessories	(page/Pos.)					

## Dimensions

All dimensions in mm



# Photoelectric sensors OR05

- OR05 ES Through-beam sensors
- OR05 PS Polarised retroreflective sensors
- OR05 RT Diffuse reflective sensors
- OR05 LC Fibre optic controls



### 30 x 30 x 15 mm

**Through-beam sensors**  
12 m (39.4 ft)

### 30 x 30 x 15 mm

**Polarised retroreflective sensors**  
4 m (13.1 ft)

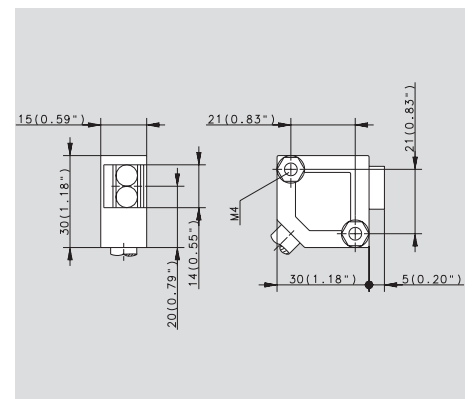
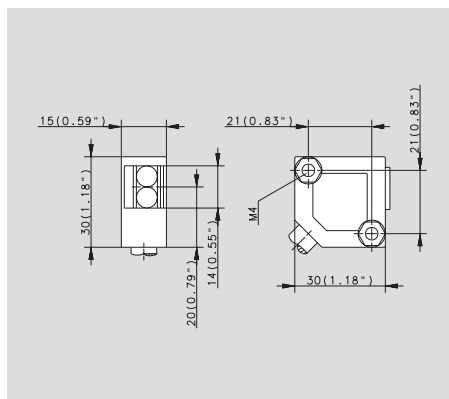
<b>Sensing type</b>	
<b>Sensing distance / range</b>	
Model description	
PNP	
LA	<b>Part number</b>
	Wiring diagram (page/Pos.)
Stock status: Ex stock/Built to order	
Model description	
PNP	
antivalent	<b>Part number</b>
	Wiring diagram (page/Pos.)
Stock status: Ex stock/Built to order	
Model description	
Transmitter	
(Connector)	<b>Part number</b>
	Wiring diagram (page/Pos.)
Stock status: Ex stock/Built to order	
Model description	
Transmitter	
(Cable)	<b>Part number</b>
	Wiring diagram (page/Pos.)
Stock status: Ex stock/Built to order	
Voltage range	
Short-circuit protection	
Output current	max.
Switching frequency	max.
LED for output function/supply voltage/diagnostic	
Adjustable sensitivity	
Timer function	
Diagnostic function	
Temperature range	min./max.
Protection type	
Screw-clamp termination	(page/Pos.)
Cable length (2 m)	Cross section (mm <sup>2</sup> )
Plug	(page/Pos.)
Accessories	(page/Pos.)

-	-	OR05 PS-DHTP-04.0-3LFE <b>655.5975.002</b> 271/6 ●/-
OR05 EE-DATP-12.0-3DE <b>655.1875.003</b> [ 2 ] 271/5 ●/-	OR05 EE-DATP-12.0-SDE <b>655.1875.004</b> [ 1 ] 271/5 ●/-	OR05 PS-DATP-04.0-3DE <b>655.5875.001</b> 271/5 ●/-
-	OR05 SE-DOOS-12.0-SC <b>655.1075.004</b> 271/3 ●/-	-
OR05 SE-DOOS-12.0-3C <b>655.1075.003</b> 271/3 ●/-	-	-
SE: 10-36 V DC	EE: 10-36 V DC	10-36 V DC
-	●	●
-	200 mA	200 mA
-	>1000 Hz	>1000 Hz
-/-/-	●/-/●	●/-/●
-	●	●
-	-	-
●	-	-
-25 °C/+70 °C -13 °F/+158 °F	-25 °C/+70 °C -13 °F/+158 °F	-25 °C/+70 °C -13 °F/+158 °F
IP 67/NEMA 4	IP 67/NEMA 4	IP 67/NEMA 4
-	-	-
3 m/4 x 0.14	-	3 m/4 x 0.14
-	281	-
273/1	273/1	273/1; 274

## Dimensions

All dimensions in mm (inch)

- [ 1 ] Connector
- [ 2 ] Cable



# Photoelectric sensors OR05

- OR05 ES Through-beam sensors
- OR05 PS Polarised retroreflective sensors
- OR05 RT Diffuse reflective sensors
- OR05 LC Fibre optic controls



**30 x 30 x 15 mm**

**30 x 30 x 15 mm**

<b>Sensing type</b>	
<b>Sensing distance / range</b>	
	Model description
PNP	
LA	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	
	Model description
PNP	
avalantent	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	

<b>Polarised retroreflective sensors</b>	
<b>4 m (13.1 ft)</b>	
	OR05 PS-DHTP-04.0-SLFE
	<b>655.5975.001</b>
	271/6
	●/–
	–

<b>Diffuse reflective sensors</b>	
<b>1.2 m (3.94 ft)</b>	
	OR05 RT-DHTP-01.2-3LFE
	<b>655.7975.004</b>
	271/6
	●/–
	OR05 RT-DATP-01.2-3DE
	<b>655.7875.003</b>
	271/5
	●/–

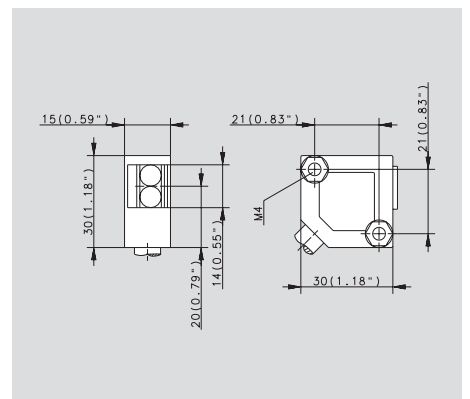
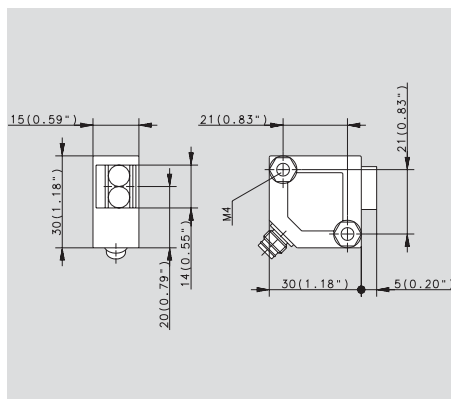
<b>Voltage range</b>	
<b>Short-circuit protection</b>	
Output current	max.
Switching frequency	max.
LED for output function/supply voltage/diagnostic	
Adjustable sensitivity	
Timer function	
Diagnostic function	
Temperature range	min./max.
<b>Protection type</b>	
Screw-clamp termination	(page/Pos.)
Cable length (2 m)	Cross section (mm <sup>2</sup> )
Plug	(page/Pos.)
Accessories (page/Pos.)	

10–36 V DC	
●	
200 mA	
>1000 Hz	
●/–/●	
●	
–	
–	
–25 °C/+70 °C	
–13 °F/+158 °F	
IP 67/NEMA 4	
–	
–	
281	
273/1, 274	

10–36 V DC	
●	
200 mA	
>1000 Hz	
●/–/●	
●	
–	
–	
–25 °C/+70 °C	
–13 °F/+158 °F	
IP 67/NEMA 4	
–	
3 m/4 x 0.14	
–	
273/1	

## Dimensions

All dimensions in mm (inch)





**30 x 30 x 15 mm**

**Diffuse reflective sensors**  
1.2 m (3.94 ft)

OR05 RT-DHTP-  
01.2-SLFE  
**655.7975.003**  
271/6

●/-

-



**30 x 30 x 15 mm**

**Fibre optic controls**  
depending on fibre type

OR05 LC-DHTP-  
0000-3LFE  
**655.2975.004**  
271/6

●/-

OR05 LC-DATP-  
0000-3DE

**655.2875.002**

271/5

●/-



**30 x 30 x 15 mm**

**Fibre optic controls**  
depending on fibre type

OR05 LC-DHTP-  
0000-SLFE  
**655.2975.003**  
271/6

●/-

-

10-36 V DC

●

200 mA

>1000 Hz

●/-●

●

-

-

-25 °C/+70 °C

-13 °F/+158 °F

IP 67/NEMA 4

-

-

281

273/1

10-36 V DC

●

200 mA

>250 Hz

●/-●

●

-

●

-25 °C/+70 °C

-13 °F/+158 °F

IP 67/NEMA 4

-

3 m/4 x 0.14

-

275

10-36 V DC

●

200 mA

>250 Hz

●/-●

●

-

●

-25 °C/+70 °C

-13 °F/+158 °F

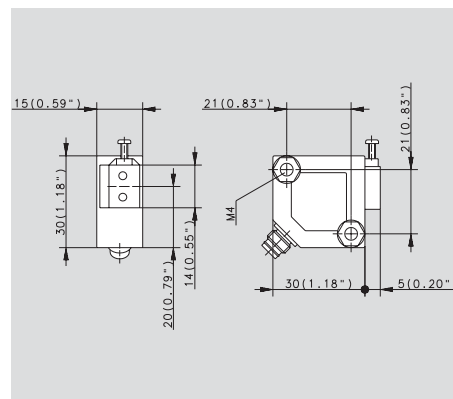
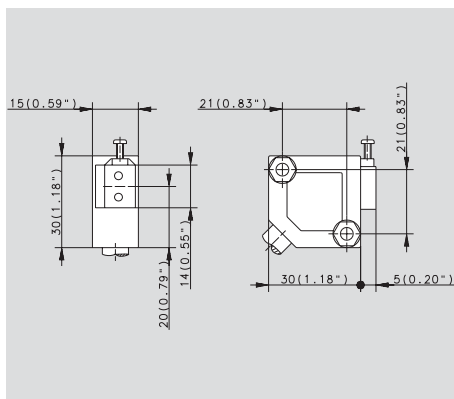
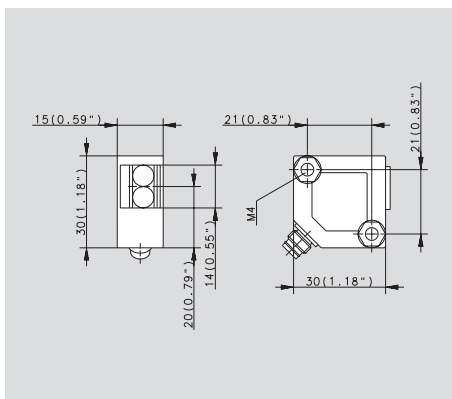
IP 67/NEMA 4

-

-

281

275



# Photoelectric sensors OR12

- OR12 ES Through-beam sensors
- OR12 ES Through-beam sensors with reduced interior beam
- OR12 RS Retroreflective sensors
- OR12 RT Diffuse reflective sensors



12 x 12 x 55 mm

12 x 12 x 55 mm

<b>Sensing type</b>	
<b>Sensing distance / range</b>	
Model description	
PNP	
LA	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	
Model description	
PNP	
DA	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	
Model description	
[1] NPN	
LA	<b>Part number</b>
[2] Transmitter	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	
Model description	
NPN	
DA	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	
Voltage range	
Short-circuit protection	
Output current	max.
Switching frequency	max.
LED for output function/supply voltage/diagnostic	
Adjustable sensitivity	
Timer function	
Diagnostic function	
Temperature range	min./max.
Protection type	
Screw-clamp termination	(page/Pos.)
Cable length (2 m)	Cross section (mm <sup>2</sup> )
Plug	(page/Pos.)
Accessories	(page/Pos.)

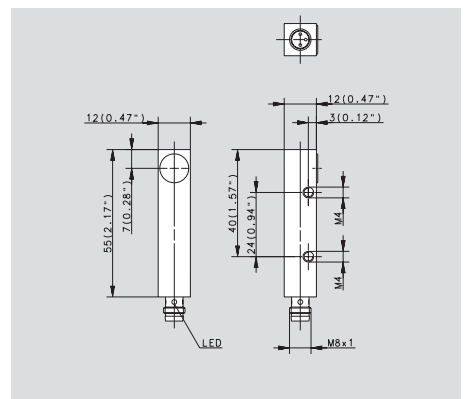
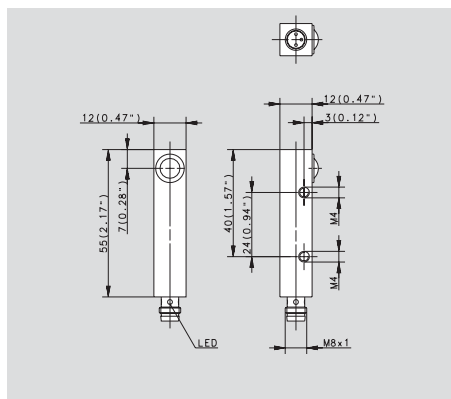
<b>Through-beam sensors</b>		<b>Through-beam sensors</b>	
<b>6 m (19.7 ft)<sup>1)</sup></b>		<b>1 m (3.28 ft)</b>	
–	OR12-EE-DHTP-06.0-SL	–	OR12 EE-DHTP-01.0-SL
	<b>655.1955.001</b>		<b>655.1955.002</b>
	271/4		271/4
	●/–		●/–
OR12 EE-DDTP-06.0-SL	OR12-EE-DDTP-06.0-SLE	OR12 EE-DDTP-01.0-SL	OR12 EE-DDTP-01.0-SLE
<b>655.1755.001</b>	<b>655.1755.003</b>	<b>655.1755.002</b>	<b>655.1755.004<sup>2)</sup></b>
271/4	271/4	271/4	271/4
●/–	–/●	●/–	–/●
OR12 SE-DOOS-06.0-SVC	[2] –	OR12 SE-DOOS-01.0-SVC	[2] –
<b>655.1055.002</b>		<b>655.1055.003</b>	
271/3		271/3	
●/–		●/–	
–	OR12-EE-DDTN-06.0-SL	–	OR12 EE-DDTN-01.0-SL
	<b>655.1155.001</b>		<b>655.1155.002</b>
	271/7		271/7
	–/●		–/●
SE: 10–36 V DC	EE: 10–36 V DC	SE: 10–36 V DC	EE: 10–36 V DC
–	●	–	●
–	200 mA	–	200 mA
–	>100 Hz	–	>100 Hz
–/●/–	●/–/–	–/●/–	●/–/–
–	–	–	–
–	–	–	–
●	–	●	–
–5 °C/+70 °C	–5 °C/+70 °C	–5 °C/+70 °C	–5 °C/+70 °C
+23 °F/+158 °F	+23 °F/+158 °F	+23 °F/+158 °F	+23 °F/+158 °F
IP 65/NEMA 12	IP 65/NEMA 12	IP 65/NEMA 12	IP 65/NEMA 12
–	–	–	–
–	–	–	–
280/1, 2; 282	280/1, 2; 282	280/1, 2; 282	280/1, 2; 282
–	273/5	273/5	273/5

## Dimensions

<sup>1)</sup> Range 10 m and 60 m LASER on request

<sup>2)</sup> Adjustable sensitivity

All dimensions in mm (inch)





**12 x 12 x 65 mm**

**Retroreflective sensors**

**4 m (13.1 ft)**

OR12 RS-DHTP-  
04.0-SL

**655.4955.001**

271/4

-/●

OR12 RS-DDTP-

04.0-SL

**655.4755.001**

271/4

●/-

OR12 RS-DHTN-

04.0-SL

**655.4355.001**

271/7

-/●

OR12 RS-DDTN-

04.0-SL

**655.4155.001**

271/7

-/●

10-36 V DC

●

200 mA

>100 Hz

●/-/-

-

-

-

-5 °C/+70 °C

+23 °F/+158 °F

IP 65/NEMA 12

-

-

280/1, 2; 282

273/5, 274



**12 x 12 x 60 mm**

**Diffuse reflective sensors**

**200 mm (7.87")**

OR12 RT-DHTP-  
0200-SLE

**655.7955.001**

271/4

●/-

OR12 RT-DDTP-

0200-SLE

**655.7755.001**

271/4

-/●

OR12 RT-DHTN-

0200-SLE

**655.7355.001**

271/7

-/●

OR12 RT-DDTN-

0200-SLE

**655.7155.001**

271/7

-/●

10-36 V DC

●

200 mA

>100 Hz

●/-/-

●

-

-

-5 °C/+70 °C

+23 °F/+158 °F

IP 65/NEMA 12

-

-

280/1, 2; 282

273/5



**12 x 12 x 65 mm**

**Diffuse reflective sensors**

**1.2 m (3.94 ft)**

OR12 RT-DHTP-  
01.2-SLE

**655.7955.002**

271/4

●/-

OR12 RT-DDTP-

01.2-SLE

**655.7755.002**

271/4

-/●

OR12 RT-DHTN-

01.2-SLE

**655.7355.002**

271/7

-/●

OR12 RT-DDTN-

01.2-SLE

**655.7155.002**

271/7

-/●

10-36 V DC

●

200 mA

>100 Hz

●/-/-

●

-

-

-5 °C/+70 °C

+23 °F/+158 °F

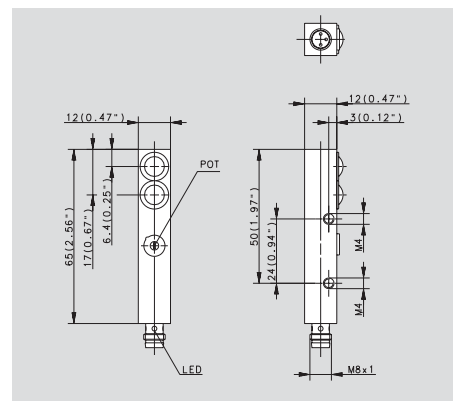
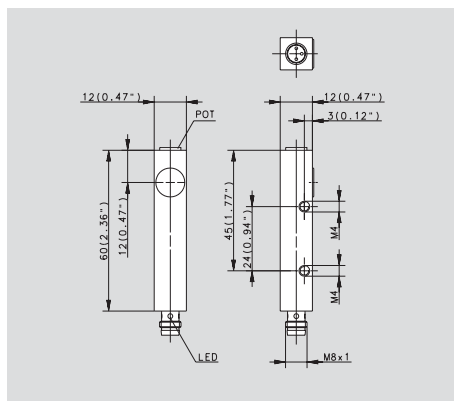
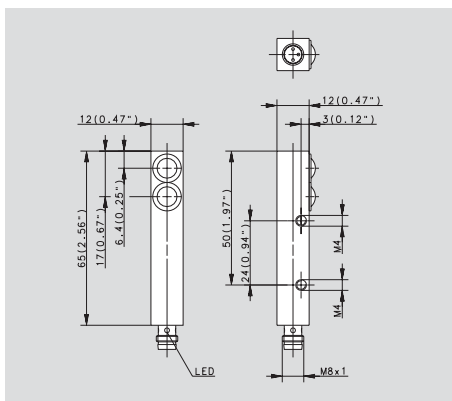
IP 65/NEMA 12

-

-

280/1, 2; 282

273/5









**120 x 41.5 x 41.5 mm**

**Diffuse reflective sensors**

**2 m (6.56 ft)**

OR17 RT-DPTU-  
02.0-AHE  
**655.7060.002**  
272/9

●/-

OR17 RT-DPTP-  
02.0-AGEC  
**655.7860.002**  
272/4  
●/-



**120 x 41.5 x 41.5 mm**

**Polarised retroreflective sensors**

**8 m (26.2 ft)**

OR17 PS-DPTU-  
08.0-AHE  
**655.5060.001**  
272/9

●/-

OR17 PS-DPTP-  
08.0-AGEC  
**655.5860.001**  
272/4  
-/●

10-60 V DC

●  
400 mA

>50 Hz

●/●/-

●

-

-

-5 °C/+70 °C

+23 °F/+158 °F

IP 65/NEMA 12

272/9

-

-

-

10-60 V DC

●  
400 mA/50 mA<sup>2</sup>)

>50 Hz

●/●/●<sup>3</sup>)

●

-

●

-5 °C/+70 °C

+23 °F/+158 °F

IP 65/NEMA 12

272/4

-

-

-

10-60 V DC

●  
400 mA

>50 Hz

●/●/-

●

-

-

-5 °C/+70 °C

+23 °F/+158 °F

IP 65/NEMA 12

272/9

-

-

274

10-60 V DC

●  
400 mA/50 mA<sup>2</sup>)

>50 Hz

●/●/●<sup>3</sup>)

●

-

●

-5 °C/+70 °C

+23 °F/+158 °F

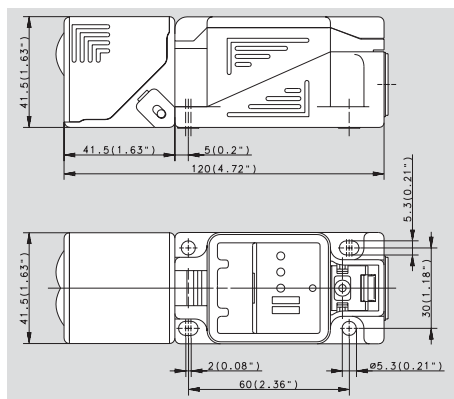
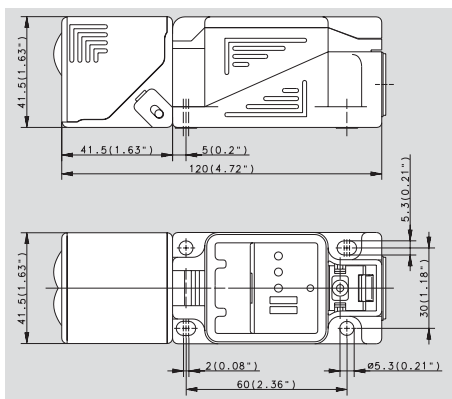
IP 65/NEMA 12

272/4

-

-

274



# Photoelectric sensors OR20

## DC types

- OR20 ES Through-beam sensors
- OR20 RS Retroreflective sensors
- OR20 PS Polarised retroreflective sensors
- OR20 RT Diffuse reflective sensors
- OR20 RH Diffuse reflective sensors with background suppression



**88 x 63 x 24 mm**

**Through-beam sensors**  
20 m (65.6 ft)

**88 x 63 x 24 mm**

**Retroreflective sensors**  
8 m (26.2 ft)

Sensing type	
Sensing distance / range	
Model description	
PNP selectable	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	
Model description	
NPN selectable	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	
Model description	
Transmitter	<b>Part number</b>
	Wiring diagram (page/pos.)
Stock status: Ex stock/Built to order	

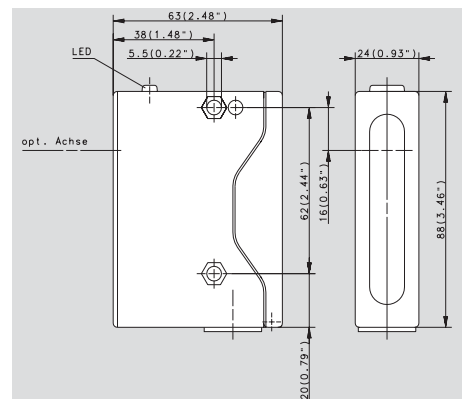
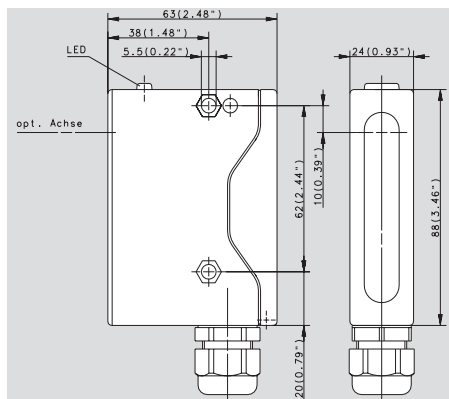
–	OR20 EE-DPTP-20.0-ALET	OR20 RS-DPTP-08.0-ALET
	<b>655.1886.003</b>	<b>655.4886.001</b>
	272/5	272/5
	●/–	●/–
–	–	–
OR20 SE-DOOS-20.0-AV	–	–
<b>655.1086.003</b>		
272/1		
●/–		

Stock status: Ex stock/Built to order		
Voltage range		
Short-circuit protection		
Output current	max.	
Switching frequency	max.	
LED for output function/supply voltage/diagnostic		
Adjustable sensitivity		
Timer function		
Diagnostic function		
Temperature range	min./max.	
Protection type		
Screw-clamp termination	(page/Pos.)	
Cable length (2 m)	Cross section (mm <sup>2</sup> )	
Plug (page/Pos.)		
Accessories (page/Pos.)		

SE: 10–36 V DC	EE: 10–36 V DC	10–36 V DC
–	●	●
–	200 mA	200 mA
–	>100 Hz	>100 Hz
–/●/–	●/–/–	●/–/–
–	●	●
–	●	●
–	–	–
–20 °C/+70 °C	–20 °C/+70 °C	–20 °C/+70 °C
–4 °F/+158 °F	–4 °F/+158 °F	–4 °F/+158 °F
IP 65/NEMA 12	IP 65/NEMA 12	IP 65/NEMA 12
272/1	272/5	272/5
–	–	–
–	–	–
273/2, 3	273/2, 3	273/2, 3; 274

## Dimensions

All dimensions in mm (inch)





**88 x 63 x 24 mm**

**Polarised retroreflective sensors**

**6 m (19.7 ft)**

OR20 PS-DPTP-

06.0-ALET

**655.5886.001**

272/5

●/-

-



**88 x 63 x 24 mm**

**Diffuse reflective sensors**

**600 mm (1.97 ft)**

**1.5 m (4.92 ft)**

OR20 RT-DPTP-

0600-ALET

**655.7886.001**

272/5

-/●

-



**88 x 63 x 24 mm**

**Background suppression**

**400 mm (1.31 ft)**

OR20 RH-DPTP-

0400-ALET

**655.8886.002**

272/5

-/●

-

10–36 V DC

●

200 mA

>100 Hz

●/-/-

●

●

-

-20 °C/+70 °C

-4 °F/+158 °F

IP 65/NEMA 12

272/5

-

-

273/2, 3; 274

10–36 V DC

●

200 mA

>100 Hz

●/-/-

●

●

-

-20 °C/+70 °C

-4 °F/+158 °F

IP 65/NEMA 12

272/5

-

-

273/2, 3

10–36 V DC

●

200 mA

>100 Hz

●/-/-

●

●

-

-20 °C/+70 °C

-4 °F/+158 °F

IP 65/NEMA 12

272/5

-

-

273/2, 3

10–36 V DC

●

200 mA

>100 Hz

●/-/-

●

●

-

-20 °C/+70 °C

-4 °F/+158 °F

IP 65/NEMA 12

272/5

-

-

273/2, 3

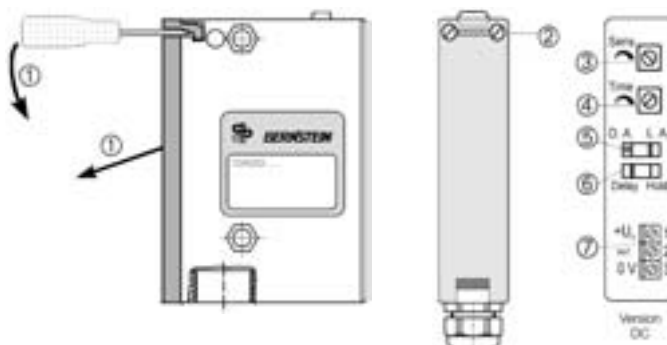
### Notes on operation of OR20 series (DC types)

#### Housing types:

- ① Snap-cover housing  
(to be opened with screwdriver)
- ② Screw-cap housing  
(with M 16-cable gland)

#### Operating elements

- ③ Sensitivity potentiometer
- ④ Time potentiometer
- ⑤ Operation-mode micro switch
- ⑥ Delay-type micro switch
- ⑦ Connection terminals



# Photoelectric sensors OR20

## AC/DC types

- OR20 ES Through-beam sensors
- OR20 RS Retroreflective sensors
- OR20 PS Polarised retroreflective sensors
- OR20 RT Diffuse reflective sensors
- OR20 RH Diffuse reflective sensors with background suppression



**88 x 63 x 24 mm**

**Through-beam sensors**  
20 m (66.2 ft)

**88 x 63 x 24 mm**

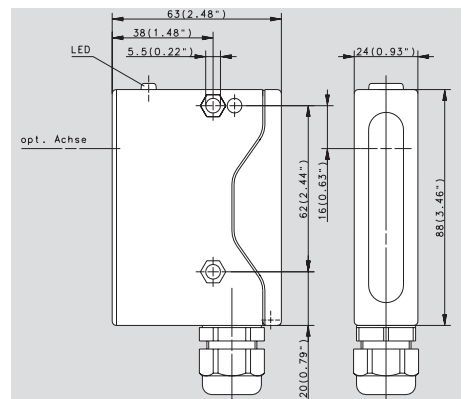
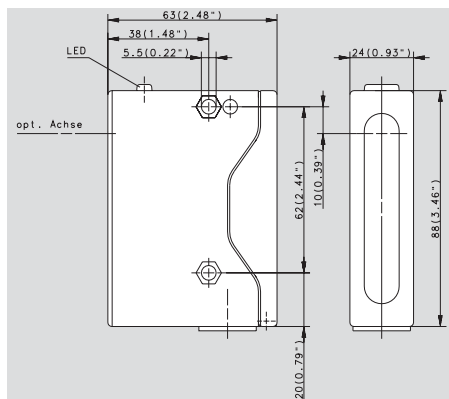
**Retroreflective sensors**  
8 m (26.2 ft)

Sensing type	
Sensing distance / range	
Model description	
<b>Relay output</b>	<b>Part number</b>
– Contacts: change-over (1 x)	Wiring diagram (page/pos.)
– Switching current 3 A	Stor./deliv.: on requ.
– Connection compartment cover with quick snap release	Model description
	<b>Part number</b>
	Wiring diagram (page/pos.)
	Stor./deliv.: on requ.
Model description	
<b>Relay output</b>	<b>Part number</b>
– Contacts: change-over (1 x)	Wiring diagram (page/pos.)
– Switching current 3 A	Stor./deliv.: on requ.
– Connection compartment cover with screws	Model description
– Cable gland	<b>Part number</b>
	Wiring diagram (page/pos.)
	Stor./deliv.: on requ.
Voltage range	
Short-circuit protection	
Output current	max.
Switching frequency	max.
LED for output function/supply voltage/diagnostic	
Adjustable sensitivity	
Timer function	
Diagnostic function	
Temperature range	min./max.
Protection type	
Screw-clamp termination	(page/Pos.)
Cable length (2 m)	Cross section (mm <sup>2</sup> )
Plug	(page/Pos.)
Accessories	(page/Pos.)

OR20 SE-MOOS-20.0-AV	–	–
<b>655.1086.001</b>		
272/1		
●/–		
–	OR20 EE-MAR5-20.0-ALET	OR20 RS-MAR5-08.0-ALET
	<b>655.1686.003</b>	<b>655.4686.001</b>
	272/3	272/3
	●/–	●/–
OR20 SE-MOOS-20.0-AV	–	–
<b>655.1086.002</b>		
272/1		
–/●		
–	OR20 EE-MAR5-20.0-ALET	OR20 RS-MAR5-08.0-ALET
	<b>655.1686.004</b>	<b>655.4686.002</b>
	272/3	272/3
	–/●	–/●
SE: 12–265 V AC/DC	EE: 12–265 V AC/DC	12–265 V AC/DC
–	–	–
–	3 A	3 A
–	>50 Hz	>50 Hz
–/●/–	●/–/–	●/–/–
–	●	●
–	●	●
–	–	–
–20 °C/+70 °C	–20 °C/+70 °C	–20 °C/+70 °C
–4 °F/+158 °F	–4 °F/+158 °F	–4 °F/+158 °F
IP 65/NEMA 12	IP 65/NEMA 12	IP 65/NEMA 12
272/1	272/3	272/3
–	–	–
–	–	–
273/2, 3	273/2, 3	273/2, 3; 274

## Dimensions

All dimensions in mm (inch)





**88 x 63 x 24 mm**

**Polarised retroreflective sensors**

6 m (19.7 ft)



**88 x 63 x 24 mm**

**Diffuse reflective sensors**

600 mm (1.97 ft)

1.5 m (4.92 ft)



**88 x 63 x 24 mm**

**Background suppression**

400 mm (1.31 ft)

OR20 PS-MAR5-

06.0-ALET

**655.5686.001**

272/3

●/-

OR20 RT-MAR5-

0600-ALET

**655.7686.001**

272/3

●/-

OR20 RT-MAR5-

01.5-ALET

**655.7686.003**

272/3

●/-

OR20 RH-MAR5-

0400-ALET

**655.8686.002**

272/3

●/-

OR20 PS-MAR5-

06.0-ALET

**655.5686.002**

272/3

●/-

-

OR20 RT-MAR5-

01.5-ALET

**655.7686.004**

272/3

-/●

-

12-265 V AC/DC

12-265 V AC/DC

12-265 V AC/DC

12-265 V AC/DC

3 A

3 A

3 A

3 A

>50 Hz

>50 Hz

>50 Hz

>50 Hz

●/-/-

●/-/-

●/-/-

●/-/-

●

●

●

●

●

●

●

●

-20 °C/+70 °C

-20 °C/+70 °C

-20 °C/+70 °C

-20 °C/+70 °C

-4 °F/+158 °F

-4 °F/+158 °F

-4 °F/+158 °F

-4 °F/+158 °F

IP 65/NEMA 12

IP 65/NEMA 12

IP 65/NEMA 12

IP 65/NEMA 12

272/3

272/3

272/3

272/3

273/2, 3; 274

273/2, 3

273/2, 3

273/2, 3

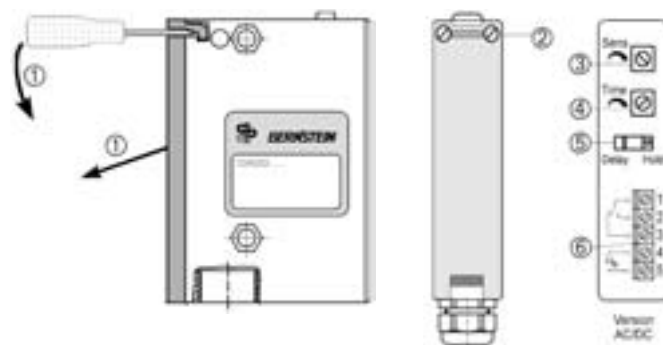
**Notes on operation of OR20 series (AC/DC types)**

**Housing types:**

- ① Snap-cover housing (to be opened with screwdriver)
- ② Screw-cap housing (with M 16-cable gland)

**Operating elements**

- ③ Sensitivity potentiometer
- ④ Time potentiometer
- ⑤ Delay-type micro switch
- ⑥ Connection terminals







### M 12 x 66.5 mm

Diffuse reflective sensors

60 mm (2.36")

200 mm (7.87")

OM12 RT-DHTP-  
0060-CL  
**655.7928.002**

271/4

●/-

-

-

10-36 V DC

●

200 mA

>100 Hz

●/-/-

-

-

0 °C/+70 °C

+32 °F/+158 °F

IP 67/NEMA 4

3 x 0.14

-

-



### M 12 x 74.5 mm

Diffuse reflective sensors

60 mm (2.36")

OM12 RT-DHTP-  
0200-CL  
**655.7927.001**

271/4

-/●

-

-

10-36 V DC

●

200 mA

>100 Hz

-/-/-

-

-

0 °C/+70 °C

+32 °F/+158 °F

IP 67/NEMA 4

3 x 0.14

284/286; 285/3, 4

-



### M 12 x 76 mm

Diffuse reflective sensors

60 mm (2.36")

OM12 RT-DHTP-  
0200-CLE  
**655.7928.003**

271/4

-/●

-

-

10-36 V DC

●

200 mA

>250 Hz

●/-/-

●

-

0 °C/+70 °C

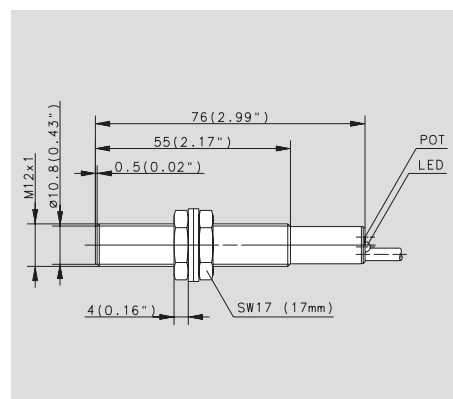
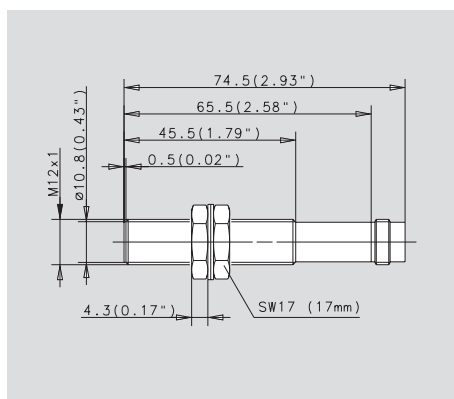
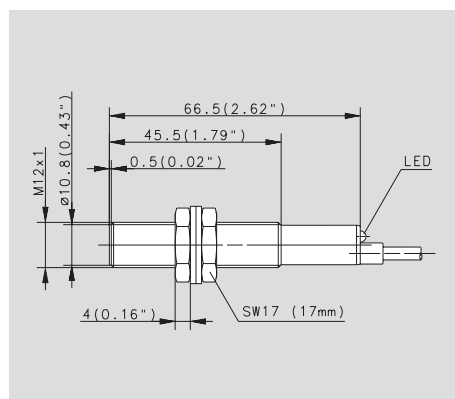
+32 °F/+158 °F

IP 65/NEMA 12

3 x 0.14

-

-



## Photoelectric sensors

### Type OZ20 – stainless steel

The photoelectric range has been further extended by the housing OZ20.

A smooth stainless steel barrel with a 20 mm diameter that has been specially designed for use in hygienic areas. The food industry requires that installations and components are easy to clean. The smooth barrel form offers bacteria no hiding places.

Many different functional types are available.

The sensors are connected via 2 m fixed cable or an M 12 plug.

### Overview design OZ20

#### Design OZ, stainless steel housing Ø 20 mm, 2 m cable



Function type, detection range	Part number	Designation
Sensor, 100 mm fixed	655.7800.001	OZ20RT-DPTP-0100-CL
Sensor, 300 mm adjustable	655.7800.003	OZ20RT-DPTP-0300-CLE
Sensor, 500 mm adjustable	655.7800.005	OZ20RT-DPTP-0500-CLE
Fix-focus, 40 mm fixed	655.8800.001	OZ20FF-DPTP-0040-CL
Retroreflective beam, 3 m fixed	655.4800.001	OZ20RS-DPTP-03.0-CL
Pole filter beam, 2.5 m adjustable	655.5800.001	OZ20PS-DPTP-02.5-CLE
Transparent sensor, 0.8 m adjustable	655.5800.003	OZ20PS-DPTP-0800-CLE
Transmitter, 8 m	655.1000.002	OZ20SE-DOOS-08.0-CC
Receiver, 8 m	655.1800.001	OZ20EE-DPTP-08.0-CL

#### Design OZ, stainless steel housing Ø 20 mm, plug M12



Function type, detection range	Part number	Designation
Sensor, 100 mm fixed	655.7800.002	OZ20RT-DPTP-0100-SL
Sensor, 300 mm adjustable	655.7800.004	OZ20RT-DPTP-0300-SLE
Sensor, 500 mm adjustable	655.7800.006	OZ20RT-DPTP-0500-SLE
Fix-focus, 40 mm fixed	655.8800.002	OZ20FF-DPTP-0040-SL
Retroreflective beam, 3 m fixed	655.4800.002	OZ20RS-DPTP-03.0-SL
Pole filter beam, 2.5 m adjustable	655.5800.002	OZ20PS-DPTP-02.5-SLE
Transparent sensor, 0.8 m adjustable	655.5800.004	OZ20PS-DPTP-0800-SLE
Transmitter, 8 m	655.1000.001	OZ20SE-DOOS-08.0-SC
Receiver, 8 m	655.1800.002	OZ20EE-DPTP-08.0-SL