

# 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.

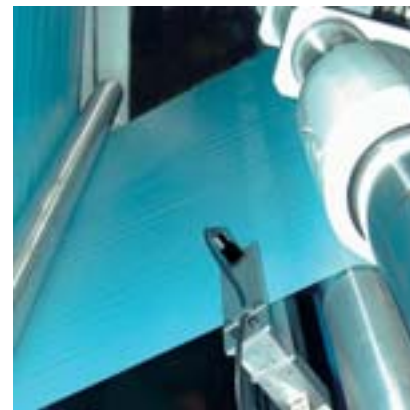
Selection matrix photoelectric sensors product line M18

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.



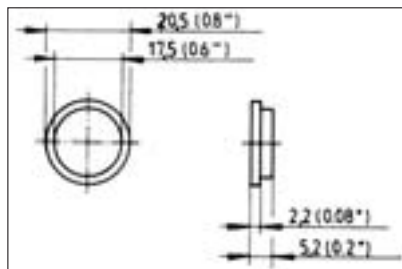
Picture above: Transparent sensor for the detection of film (packaging industry)

## Reflectors

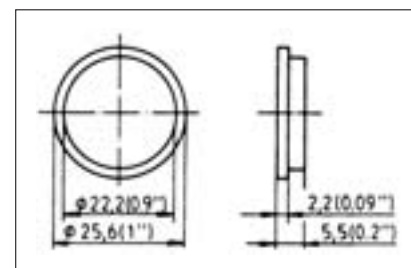
The BERNSTEIN reflectors, which consist of several triple mirrors standing pyramid-shaped, are best suited for retro and polarised retro applications. The pyramid-shaped structure of these triple mirrors allows a variation of the reflector of up to 30° to the optical axis (e.g. caused by vibration or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

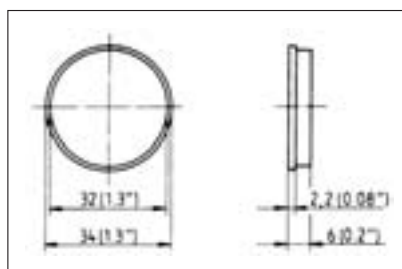
The reflector diameter should be selected in terms of the range and the size of the object to be detected. The ideal case is, the object should be larger than the reflector, which is then "shadowed" completely.



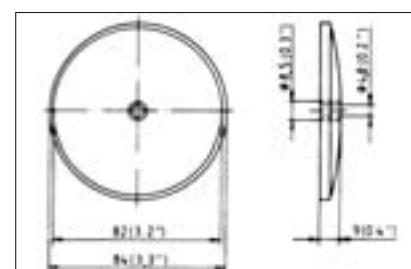
**Part number** 657.2108.008  
Diameter 17.5 mm



**Part number** 657.2109.009  
Diameter 22 mm



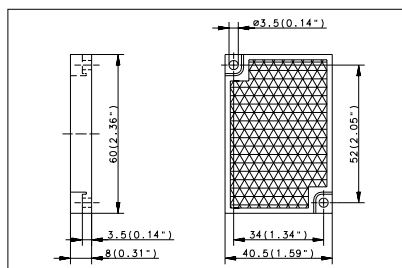
**Part number** 657.2110.010  
Diameter 32 mm



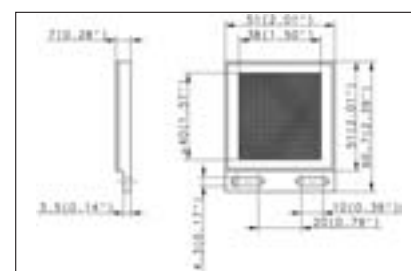
**Part number** 657.2107.003  
Diameter 83 mm

## 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



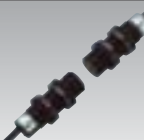

## Overview diffuse reflective/retroreflective sensors M 18





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

