

# Light barriers and light sensors

## Subminiature and miniature sensors

Unique reliable object detection and positioning with optical sensors

- Smart & Small – ultimate performance in smallest designs
- Find the optimum solution quickly through large portfolio
- Easy to set up with clever teach-in function
- Laser sensors for detection tasks in the 0.01 mm range



	FHDK 04	FxDK 07 FxCCK 07	FxDM 08	FxAM 08
x = function principle y = light source				
features	<ul style="list-style-type: none"> <li>■ Mounting in rails</li> <li>■ Fix sensing distance</li> </ul>	<ul style="list-style-type: none"> <li>■ World's smallest adjustable sensor family</li> </ul>	<ul style="list-style-type: none"> <li>■ Fix sensing distance</li> <li>■ Robust metal housing</li> </ul>	<ul style="list-style-type: none"> <li>■ Fix sensing distance</li> </ul>
dimensions (B × H × T)	4 × 44,8 × 6,2 mm	8 × 16,2 × 10,8 mm	8 × 58 × 12 mm	M8 × 56 mm
function principle (x) / ranges				
diffuse sensors with background suppression	30 mm / 50 mm (FHDK 04)	10 ... 60 mm (FHDK 07 / FHCK 07)		
diffuse sensor with background suppression		20 ... 150 mm (FZDK 07 / FZCK 07)	40 mm / 80 mm (FZDM 08)	40 mm / 80 mm (FZAM 08)
SmartReflect® light barriers without reflector		17 ... 45 mm (FNCK 07)		
SmartReflect® transparent				
retro-reflective sensors		800 mm (FPDK 07 / FPCK 07)		
transparent detection without reflector				
through beam sensors		2,5 m (FSDK 07 / FSCK 07) (FEDK 07 / FECK 07)	1 m / 3 m (FSDM 08 / FEDM 08)	3 m (FSAM 08 / FEAM 08)
light source (y)				
standard LED (R)	■	■		
pinPoint LED (P)				
infrarot (I)			■	■
laser (L)				
response time	< 0,5 ms	< 0,5 ms	< 1 ms	< 2,5 ms
output	push-pull	PNP NPN	PNP	PNP
connection types	cable 2 m flylead connector M8	cable 2 m flylead connector M8	cable 2 m connector M8	cable 2 m connector M8
housing material	plastic	plastic	aluminium	brass nickel plated
operating temperature	-10 ... +50 °C	-20 ... +50 °C	-25 ... +65 °C	-25 ... +65 °C
protection class	IP 65	IP 65	IP 65	IP 65

# Light barriers and light sensors



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	O200.xy	FxDM 12 OxDM 12 (laser)	FxAM 12
	<ul style="list-style-type: none"> <li>■ Sensors with single-lens or V-optics</li> <li>■ Variations with line beam</li> </ul>	<ul style="list-style-type: none"> <li>■ Sensing distance adjustable</li> <li>■ Sensors with single lens optics</li> </ul>	<ul style="list-style-type: none"> <li>■ Sensitivity adjustable with potentiometer</li> </ul>
	8 × 21 × 14,1 mm	12,4 × 35 × 35 mm	M12 × 70,5 mm
	10 ... 175 mm (O200.Gy)	15 ... 300 mm (FHDM 12 / OHDM 12)	
	20 ... 200 mm (O200.ZR)		30 ... 200 mm (FZAM 12)
	25 ... 180 mm (O200.Sy)		
	15 ... 180 mm (O200.Sy.T)		
	4 m (O200.Ry)	8 m (FPDM 12 / OPDM 12)	
	1,2 m (O200.Ry.T)		
	6 m (O200.Ty / O200.Ey)	7,5 m (FSDM 12 / FEDM 12)	
	<ul style="list-style-type: none"> <li>■</li> <li>■</li> <li>■</li> </ul>	<ul style="list-style-type: none"> <li>■</li> <li>■</li> </ul>	<ul style="list-style-type: none"> <li>■</li> </ul>
	< 0,25 ms < 0,05 ms (laser)	< 1 ms < 0,05 ms (laser)	< 1 ms
	push-pull PNP NPN	PNP NPN	PNP
	cable 2 m connector M8	cable 2 m connector M8	cable 2 m connector M12
	plastic	die-cast zinc	brass nickel plated
	-25 ... +50 °C -20 ... +50 °C (laser)	-25 ... +65 °C -20 ... +50 °C (laser)	-25 ... +65 °C
	IP 67	IP 67	IP 65

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	O300.xy	O300.xy Line	OHDM 13 (laser)
<i>x</i> = function principle <i>y</i> = light source			
features	<ul style="list-style-type: none"> <li>■ Setting via wear-free <i>qTeach</i>® or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>■ Up to 100 mm long time</li> </ul>	<ul style="list-style-type: none"> <li>■ Sensing distance adjustable</li> </ul>
dimensions (B × H × T)	12,9 × 32,3 × 23 mm	12,9 × 32,3 × 23 mm	13,4 × 48,2 × 40 mm
function principle ( <i>x</i> ) / ranges			
diffuse sensors with background suppression	30 ... 300 mm (O300.Gy)	30 ... 180 mm (O300.Gy)	50 ... 550 mm (OHDM 13)
diffuse sensor with background suppression	10 ... 400 mm (O300.Zy)		
<i>SmartReflect</i> ® light barriers without reflector	30 ... 300 mm (O300.Sy)	30 ... 120 mm (O300.Sy)	
<i>SmartReflect</i> ® transparent	30 ... 300 mm (O300.SP.T)		
retro-reflective sensors	6 m (O300.Ry)		
transparent detection without reflector	4 m (O300.RP.T)		
through beam sensors	15 m (O300.Ty / O300.Ey)		
light source ( <i>y</i> )			
standard LED (R)	■	■	
pinPoint LED (P)	■	■	
infrarot (I)	■		
laser (L)	■	■	■
response time	< 0,25 ms < 0,1 ms (laser)	< 1,5 ms	< 5 ms
output	push-pull PNP NPN	push-pull	PNP NPN
connection types	cable 2 m connector M8 flylead connector	cable 2 m connector M8	connector M8
housing material	plastic	plastic	aluminum
operating temperature	-25 ... +60 °C -10 ... +60 °C (laser)	-25 ... +60 °C -10 ... +60 °C (laser)	0 ... +50 °C
protection class	IP 67	IP 67	IP 67



# Light barriers and light sensors

## Standard sensors – rectangular and cylindrical

Unique reliable object detection and positioning with optical sensors

- Find the optimum solution quickly through large portfolio
- Easy to set up with clever teach-in function
- Extremely accurate object positioning with 0.01 mm precision



	OxDK 14 (laser)	FxDM 16 OxDM 16 (laser)	OR18.xy	OR18.GR.F
<i>x</i> = function principle <i>y</i> = light source				
features	■ Sensors for transparent objects	■ Laser sensors for wafer detection	■ Setting via potentiometer, teach-in or <i>qTeach</i>	■ Fixed Focus
dimensions (B × H × T)	14,8 × 43 × 31 mm	15,4 × 50 × 50 mm	M18	M18 × 48,3 mm
function principle ( <i>x</i> ) / ranges				
diffuse sensors with background suppression	20 ... 350 mm (OHDK 14)	20 ... 600 mm (FHDM 16 / OHDM 16)	40 ... 200 mm (OR18.Gy)	50 mm (OR18.GR.F)
diffuse sensors with intensity difference	20 ... 350 mm (OZDK 14)	0 ... 400 mm (FZDM 16 / OZDM 16)	0 ... 800 mm (OR18.ZI)	
<i>SmartReflect</i> ® light barriers without reflector			55 ... 300 mm (OR18.SP)	
<i>SmartReflect</i> ® transparent				
retro-reflective sensors	5,2 m (OPDK 14)	12 m (FPDM 16 / OPDM 16)	16 m (OR18.RR)	
transparent detection without reflector			800 mm (OR18.RR.T)	
through beam sensors	10 m (OSDK 14 / OEDK 14)		60 m (OR18.TI / OR18.EI)	
light source ( <i>y</i> )				
standard LED (R)		■	■	■
pinPoint LED (P)			■	
infrarot (I)			■	
laser (L)	■	■	■	
response time	< 0,25 ms	< 1 ms < 0,05 ms (laser)	< 0,5 ms < 0,1 ms (laser)	< 0,5 ms
output	push-pull PNP NPN	PNP NPN 4 ... 20 mA	PNP NPN	PNP NPN
connection types	cable 2 m connector M8 flylead connector M12	cable 2 m connector M12	cable 2 m connector M12 flylead connector M12	cable 2 m connector M12
housing material	plastic	die-cast zinc	plastic brass nickel plated	plastic
operating temperature	-25 ... +65 °C -10 ... +50 °C (laser)	-25 ... +65 °C -10 ... +50 °C (laser)	-25 ... +55 °C -10 ... +55 °C (laser)	-25 ... +55 °C
protection class	IP 67	IP 67	IP 67	IP 65 / IP 67

# Light barriers and light sensors



	FxAM 18	O500.xy	OHDM 20 (Laser)	OxDK 25 (Laser)
	<ul style="list-style-type: none"> <li>Compatible with glass fibre optics</li> </ul>	<ul style="list-style-type: none"> <li>Setting via wear-free <i>qTeach</i>® or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Light / dark operate switchable</li> </ul>	<ul style="list-style-type: none"> <li>Sensors with 2 output</li> <li><i>qTeach</i>®</li> </ul>
	M18	18 × 45 × 32 mm	20,6 × 65 × 50 mm	23,4 × 63 × 45 mm
		60 ... 550 mm (O500.Gy)	210 ... 1500 mm (OHDM 20)	100 ... 1750 mm (OHDK 25)
	60 ... 430 mm (FZAM 18)	20 ... 600 mm (O500.Zy)		
		60 ... 600 mm (O500.SP)		1900 mm (ONDK 25)
		60 ... 1000 mm (O500.Sy.T)		
		8 m (O500.Ry)		
		6 m (O500.RP.T)		
		40 m (O500.TR / O500.ER)		
	<ul style="list-style-type: none"> <li></li> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> <li></li> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
	< 1 ms	< 0,25 ms	< 6 ms	10 ms
	PNP NPN	push-pull PNP NPN	PNP	push-pull
	cable 2 m connector M12	cable 2 m connector M12	connector M12	cable 2 m connector M12
	brass nickel plated	plastic	die-cast zinc	plastic
	-25 ... +55 °C	-25 ... +60 °C	0 ... +50 °C	0 ... +50 °C
	IP 67	IP 67	IP 67	IP 67

# Light barriers and light sensors

## Standard with extra power – O300/O500

Unique portfolio with extra performance for your application

- Beam shape as line or point allows for the optimum application-specific solution
- Enhanced processor performance for maximum detection reliability
- Easy implementation and operation, IoT-ready



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O300.xy x = function principle y = light source	O300.xy	O300W.xy	O300H.xy
features	<ul style="list-style-type: none"> <li>■ Setting via wear-free <i>qTeach</i><sup>®</sup> or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>■ Stainless steel housing in washdown design</li> <li>■ Safe setting via wear-free <i>qTeach</i><sup>®</sup> or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>■ Stainless steel housing in hygienic design</li> <li>■ Safe setting via wear-free magnetic <i>qTeach</i><sup>®</sup> or IO-Link</li> </ul>
dimensions (B × H × T)	12,9 × 32,3 × 23 mm	16,5 × 34,7 × 28,2 mm	16,5 × 34,6 × 28,7 mm
function principle (x) / ranges			
diffuse sensors	30 ... 300 mm (O300.Gy)	30 ... 250 mm (O300W.Gy)	30 ... 250 mm (O300H.Gy)
background suppression (G)			
diffuse sensors with intensity difference (Z)	10 ... 400 mm (O300.Zy)		
<i>SmartReflect</i> <sup>®</sup> light barriers without a reflector (S)	30 ... 300 mm (O300.Sy)	30 ... 300 mm (O300W.Sy)	30 ... 300 mm (O300H.Sy)
<i>SmartReflect</i> <sup>®</sup> transparent (Sy.T)	30 ... 300 mm (O300.SP.T)	30 ... 300 mm (O300W.SP.T)	30 ... 300 mm (O300H.SP.T)
diffuse sensors (R)	6 m (O300.Ry)	6 m (O300W.Ry)	6 m (O300H.Ry)
retro-reflective sensors (Ry. T)	4 m (O300.RP.T)	4 m (O300W.RP.T)	4 m (O300H.Ry.T)
through beam sensors (T / E)	15 ... 75 m (O300.Ty / O300.Ey)	15 ... 75 m (O300W.Ty / O300W.Ey)	15 ... 75 m (O300H.Ty / O300H.Ey)
light source (y)			
standard LED (R)	■	■	■
pinPoint LED (P)	■	■	■
infrarot (I)	■		
laser (L)	■	■	■
response time	< 0,25 ms < 0,1 ms (laser)	< 0,25 ms < 0,1 ms (laser)	< 0,25 ms < 0,1 ms (laser)
output	push-pull PNP NPN	push-pull	push-pull
connection types	cable 2 m connector M8 flylead connector M8	connector M8	connector 2 m flylead connector M8
housing material	plastic	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	-25 ... +60 °C -10 ... +60 °C (laser)	-25 ... +60 °C -10 ... +60 °C (laser)	-25 ... +60 °C -10 ... +60 °C (laser)
protection class	IP 67	IP 68 / IP 69K <i>proTect</i> <sup>+</sup>	IP 68 / IP 69K <i>proTect</i> <sup>+</sup>

# Light barriers and light sensors



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O500.xy x = function principle y = light source	O500.xy	O500W.xy	O500H.xy
features	<ul style="list-style-type: none"> <li>Setting via wear-free <i>qTeach</i><sup>®</sup> or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Stainless steel housing in washdown design</li> <li>Safe setting via wear-free <i>qTeach</i><sup>®</sup> or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Stainless steel housing in hygienic design</li> <li>Safe setting via wear-free magnetic <i>qTeach</i><sup>®</sup> or IO-Link</li> </ul>
dimensions (B × H × T)	18 × 45 × 32 mm	20,2 × 47,2 × 37,2 mm	20,2 × 47,7 × 36,4 mm
function principle (x) / ranges			
diffuse sensors	60 ... 550 mm	60 ... 400 mm	60 ... 400 mm
background suppression (G)	(O500.Gy)	(O500W.Gy)	(O500H.Gy)
diffuse sensors with intensity difference (Z)	20 ... 600 mm		
	(O500.Zy)		
<i>SmartReflect</i> <sup>®</sup> light barriers without a reflector (S)	60 ... 600 mm	60 ... 600 mm	60 ... 600 mm
	(O500.SP)	(O500W.SP)	(O500H.SP)
<i>SmartReflect</i> <sup>®</sup> transparent (Sy.T)	60 ... 1000 mm	60 ... 1000 mm	60 ... 1000 mm
	(O500.SPT)	(O500W.SPT)	(O500H.SPT)
diffuse sensors (R)	8 m	8 m	8 m
	(O500.Ry)	(O500W.Ry)	(O500H.Ry)
retro-reflective sensors (Ry. T)	6 m	6 m	6 m
	(O500.RPT)	(O500W.RPT)	(O500H.RPT)
through beam sensors (T / E)	40 m	40 m	40 m
	(O500.TR / O500.ER)	(O500W.TR / O500W.ER)	(O500H.TR / O500H.ER)
light source (y)			
standard LED (R)	■	■	■
pinPoint LED (P)	■	■	■
infrarot (I)	■		
laser (L)			
response time	< 0,25 ms	< 0,25 ms	< 0,25 ms
output	push-pull PNP NPN	push-pull	push-pull
connection types	cable 2 m connector M12	connector M12	cable 2 m connector M12
housing material	plastic	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C
protection class	IP 67	IP 68 / IP 69K <i>proTect</i> <sup>+</sup>	IP 68 / IP 69K <i>proTect</i> <sup>+</sup>



# Light barriers and light sensors

## Laser sensors

Precise control of fast processes and detection of very small objects

- Very precise object positioning to within 0.01 mm
- Detection of very small objects thanks to focused 0.1 mm laser spot
- Detection of fast objects thanks to short response times of < 0.1 ms



x = function principle	O200.xy	OxDM 12	OBDM 12 Difference sensors	OHDM 13
features	<ul style="list-style-type: none"> <li>■ Sensors with single-lens optics</li> <li>■ Variations with line beam</li> </ul>	<ul style="list-style-type: none"> <li>■ Adjustable ranges</li> <li>■ Sensors with single lens optics</li> </ul>	<ul style="list-style-type: none"> <li>■ 5 functions (e.g. window teach)</li> </ul>	<ul style="list-style-type: none"> <li>■ Adjustable ranges</li> </ul>
dimensions (B × H × T)	8 × 21 × 15,8 mm	12,4 × 35 × 35 mm	12,4 × 37 × 34,5 mm	13,4 × 48,2 × 40 mm
function principle (x) / ranges				
diffuse sensors	20 .. 175 mm	17 ... 120 mm		50 ... 550 mm
background suppression	(O200.GL)	(OHDM 12)		(OHDM 13)
diffuse sensors with intensity difference				
SmartReflect® light barriers without a reflector	25 .. 180 mm			
retro-reflective sensors	(O200.SL / O200.SL.T)			
retro-reflective sensors for transparent detection	1,2 m	8 m		
through beam sensors	(O200.RL.C)	(OPDM 12)		
differential sensors	1,2 m		16 ... 120 mm	
laser class	1	2	2	2
response time up	6 m			
output	< 0,05 ms	< 0,05 ms	< 1 ms	< 5 ms
housing material	PNP NPN	PNP NPN	PNP NPN	PNP NPN
operating temperature	plastic	die-cast zinc	die-cast zinc	aluminum
protection class	-20 ... +50 °C	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
	IP 67	IP 67	IP 67	IP 67

# Light barriers and light sensors



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OxDK 14	O300.xL	O300W.xL	O300H.xL
<ul style="list-style-type: none"> <li>Mechanical sensing distance adjustment</li> </ul>	<ul style="list-style-type: none"> <li>Setting via wear-free magnetic <i>qTeach</i>® or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Setting via wear-free <i>qTeach</i>® or IO-Link</li> </ul>	<ul style="list-style-type: none"> <li>Setting via wear-free magnetic <i>qTeach</i>® or IO-Link</li> </ul>
14,8 × 43 × 31 mm	12,9 × 32,3 × 23 mm	16,5 × 34,7 × 28,2 mm	16,5 × 34,6 × 28,7 mm
20 ... 350 mm (OHDK 14)	30 ... 300 mm (O300.GL) 10 ... 400 mm (O300.ZL)	30 ... 250 mm (O300W.GL)	30 ... 250 mm (O300H.GL)
	30 ... 300 mm (O300.SL)	30 ... 300 mm (O300W.SL)	30 ... 300 mm (O300H.SL)
11 m (OPDK 14) 5,2 m (OPDK 14)	6 m (O300.RL)	6 m (O300W.RL)	6 m (O300H.RL)
	75 m (O300.TL / O300.EL)	75 m (O300W.TL / O300W.EL)	75 m (O300H.TL / O300H.EL)
2	1	1	1
< 0,15 ms	< 0,1 ms	< 0,1 ms	< 0,1 ms
PNP NPN	PNP NPN push-pull	push-pull	push-pull
plastic	plastic	stainless steel	stainless steel
-10 ... +50 °C	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C
IP 67	IP 67 IP 68 / IP 69K <i>proTect+</i>	IP 67 IP 68 / IP 69K <i>proTect+</i>	IP 67 IP 68 / IP 69K <i>proTect+</i>

# Light barriers and light sensors

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x = function principle	OxDM 16	OHDM 20	OxDK 25	OR18.EL/TL
features	■ Sensors for wafer detection	■ Large range	■ Sensors with two outputs	■ Short response time ■ Large range
dimensions (B × H × T)	15,4 × 50 × 50 mm	20,6 × 65 × 50 mm	23,4 × 63 × 45 mm	M18
function principle (x) / ranges				
diffuse sensors background suppression	25 ... 300 mm (OHDM 16)	210 ... 1500 mm	100 ... 1750 mm (OHDK 25)	
diffuse sensors with intensity difference	0 ... 250 mm (OZDM 16)			10 ... 300 mm (OR18.ZL)
SmartReflect® light barriers without a reflector			100 ... 1900 mm (ONDK 25)	
retro-reflective sensors	12 m (OPDM 16)			16 m (OR18.RL)
retro-reflective sensors for transparent detection through beam sensors				60 m (OR18.EL/TL)
differential sensors				
laser class	2	2	1	1
response time up	< 0,1 ms	< 6 ms	< 10 ms	< 0,34 ms
output	PNP NPN	PNP	push-pull	PNP NPN
housing material	die-cast zinc	die-cast zinc	plastic	brass nickel plated
operating temperature	-10 ... +50 °C	-10 ... +50 °C	-10 ... +50 °C	-10 ... +55 °C
protection class	IP 67	IP 67	IP 67	IP 67



# Light barriers and light sensors

## Light barriers without reflector – *SmartReflect*®

Less is more – reduced operating costs with increased functional reliability

- Reliable barrier principle between the sensor and the machine part
- Suitable for objects of different color, surface or transparency
- Robust with dirt deposit in plastic, stainless steel or hygiene design



	FNDK 07 FNCK 07	O200.Sy O200.Sy.T	O300.Sy O300.Sy.T	O500.Sy O500.Sy.T
y = light source				
features	<ul style="list-style-type: none"> <li>■ Miniature sensor</li> <li>■ Sensing distance adjustable</li> </ul>	<ul style="list-style-type: none"> <li>■ Miniature sensor</li> <li>■ Sensing distance adjustable</li> <li>■ Transparent detection versions</li> </ul>	<ul style="list-style-type: none"> <li>■ Miniature sensor</li> <li>■ Transparent detection versions</li> </ul>	<ul style="list-style-type: none"> <li>■ Transparent detection versions</li> </ul>
dimensions (B × H × T)	8 × 16,2 × 10,8 mm	8 × 21 × 15,8 mm	12,9 × 32,2 × 23 mm	18 × 45 × 32 mm
light source (y)				
standard LED (R)	17 ... 45 mm			
pinPoint LED (P)		25 ... 180 mm (O200.SP / O200.SPT)	30 ... 300 mm (O300.SP / O300.SPT)	60 ... 600 mm (O500.SP) 30 ... 1000 mm (O500.SPT)
infrarot (I)				
laser (L)		25 ... 180 mm (O200.SL / O200.SL.T)	30 ... 250 mm (O300.SL)	
response time	< 0,5 ms	< 0,25 ms	< 0,25 ms	< 0,25 ms
output	PNP NPN	push-pull PNP NPN	push-pull PNP NPN	push-pull PNP NPN
connection types	cable 2 m flylead connector M8	cable 2 m flylead connector M8	cable 2 m connector M8 flylead connector M8	cable 2 m connector M12
housing material	plastic	plastic	plastic	plastic
operating temperature	-20 ... +50 °C	-25 ... +50 °C -25 ... +50 °C (Laser)	-25 ... +60 °C	-25 ... +60 °C
protection class	IP 65	IP 67	IP 67	IP 67

# Light barriers and light sensors



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	ONDK 25	OR18.SP	O300W.Sy O300W.Sy.T	O500W.Sy O500W.Sy.T
	<ul style="list-style-type: none"> <li>Standard</li> </ul>	<ul style="list-style-type: none"> <li>Standard sensor M18</li> </ul>	<ul style="list-style-type: none"> <li>Washdown design</li> <li>Transparent detection versions</li> </ul>	<ul style="list-style-type: none"> <li>Washdown design</li> <li>Transparent detection versions</li> </ul>
	23,4 × 63 × 45 mm	M18 × 65 mm	16,5 × 34,7 × 28,2 mm	20,2 × 47,2 × 37,7 mm
		55 ... 300 mm	30 ... 300 mm (O300W.SP / O300W.SP.T)	60 ... 600 mm (O500W.SP) 30 ... 1000 mm (O500W.SP.T)
	1900 mm		30 ... 250 mm (O300W.SL)	
	< 10 ms	< 0,49 ms	< 0,25 ms	< 0,25 ms
	push-pull	push-pull PNP NPN	push-pull	push-pull
	cable 2 m connector M12	connector M12	connector M8	connector M12
	plastic	brass nickel plated	stainless steel, Ecolab- certified, FDA-compliant	stainless steel, Ecolab- certified, FDA-compliant
	0 ... +50 °C	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C
	IP 67	IP 67	IP 68 / IP 69K <i>proTect+</i>	IP 68 / IP 69K <i>proTect+</i>

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- Suitable for objects of different color, surface or transparency
- Robust with dirt deposit in plastic, stainless steel or hygiene design



	IO-Link O300H.Sy O300H.Sy.T	IO-Link O500H.Sy O500H.Sy.T
y = light source		
features	<ul style="list-style-type: none"> <li>■ Hygienic design</li> <li>■ Version for transparency object detection</li> </ul>	<ul style="list-style-type: none"> <li>■ Hygienic design</li> <li>■ Version for transparency object detection</li> </ul>
dimensions (B × H × T)	16,5 × 34,6 × 28,7 mm	20,2 × 47,7 × 36,4 mm
light source (y)		
standard LED (R)		
pinPoint LED (P)	30 ... 300 mm (O300H.SP / O300H.SPT)	60 ... 600 mm (O500H.SP) 60 ... 1000 mm (O500H.SPT)
laser (L)	30 ... 250 mm (O300H.SL)	
response time	< 0,25 ms	< 0,25 ms
output	push-pull	push-pull
connection types	cable 2 m flylead connector M8	cable 2 m flylead connector M12
housing material	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	–25 ... +60 °C	–25 ... +60 °C
protection class	IP 68 / IP 69K <i>proTect+</i>	IP 68 / IP 69K <i>proTect+</i>



## *SmartReflect*<sup>®</sup> – the light barrier without reflector

With *SmartReflect*<sup>®</sup> Baumer has reinvented the optical light barrier: The reflector as the weak point is eliminated and highly reliable object detection is still guaranteed even for transparent objects. That reduces your costs tremendously.

### Your benefits

- Maximum system uptime and process safety
  - Very reliable object detection thanks to barrier principle
  - Elimination of the reflector as a potential source of error
  - No function impairment through dirt accumulation
  - Available in robust washdown or hygiene design
- Reduction of operating costs
  - No reflector means time saving installation
  - No need for a reflector eliminates exchange and wear
  - No need for a reflector eliminates cleaning effort
- Raising productivity
  - Sensing range up to 1.9 m or 1 m for transparent objects
  - High machine performance thanks to short response times of < 0.25 ms
  - Fast format changes, easy sensor exchange and additional usage data via IO-Link





# Light barriers and light sensors

## Transparent detection

The sensor solutions for the detection of bowls, bottles and foils

- Extremely safe and fast with a response time < 0.25 ms
- Unique range without reflector up to 1 m
- Up to 7 m range with retro-reflective light barriers



IO-Link



IO-Link



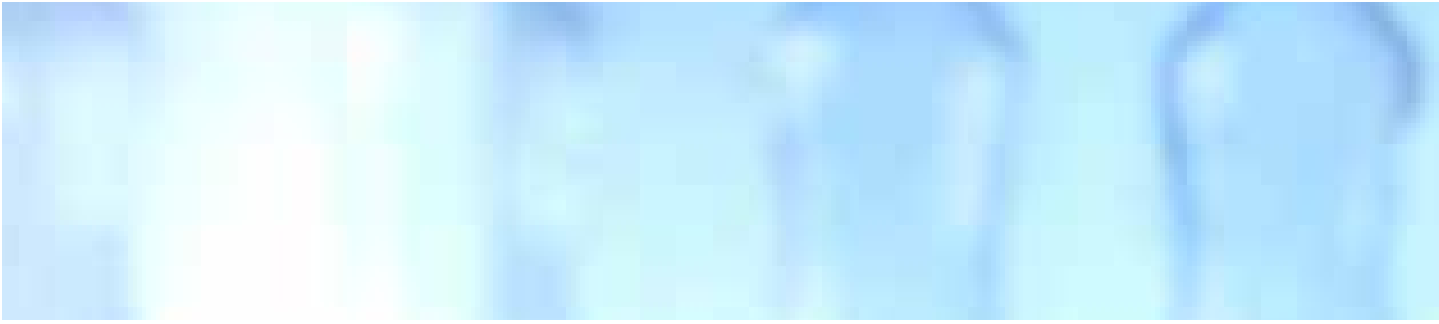
IO-Link



IO-Link

	O200.Sy.T	O200.Ry.T	O300.SP.T	O300.RP.T
y = light source				
features	■ SmartReflect®	■ Retro-reflective sensors with single-lens optics	■ SmartReflect®	■ Retro-reflective sensors
dimensions (B × H × T)	8 × 21 × 15,8 mm	8 × 21 × 15,8 mm	12,9 × 32,3 × 23 mm	12,9 × 32,3 × 23 mm
light source (y)				
standard LED (R)				
pinPoint LED (P)			30 ... 300 mm	4 m
infrarot (I)	15 ... 180 mm	1,2 m		
laser (L)	25 ... 180 mm	1,2 m		
response time	< 0,25 ms	< 0,25 ms	< 0,25 ms	< 0,25 ms
output	push-pull	push-pull	push-pull	push-pull
connection types	cable 2 m flylead connector M8	cable 2 m flylead connector M8	cable 2 m connector M8	cable 2 m connector M8
housing material	plastic	plastic	plastic	plastic
operating temperature	-25 ... +50 °C -20 ... +50 °C (Laser)	-25 ... +50 °C -20 ... +50 °C (Laser)	-25 ... +60 °C	-25 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67

# Light barriers and light sensors



IO-Link

IO-Link

	OPDK 14	FPDM 16	O500.SPT	O500.RPT
	■ Retro-reflective laser sensor	■ Retro-reflective sensors	■ <i>SmartReflect</i> ®	■ Retro-reflective sensors
	14,8 × 43 × 31 mm	15,4 × 50 × 50 mm	18 × 45 × 32 mm	18 × 45 × 32 mm
		7,2 m	60 ... 1000 mm	6 m
	5,2 m			
	< 0,25 ms	< 2,5 ms	< 0,25 ms	< 0,25 ms
	PNP NPN	PNP	push-pull	push-pull
	cable 2 m connector M8 connector M12	connector M12	cable 2 m connector M12	cable 2 m connector M12
	plastic	die-cast zinc	plastic	plastic
	-10 ... +50 °C	-25 ... +65 °C	-25 ... +60 °C	-25 ... +60 °C
	IP 67	IP 67	IP 67	IP 67

# Light barriers and light sensors

## Transparent detection in demanding environments

Robust stainless steel sensors for the detection of bowls, bottles and foils

- Extremely safe and fast with a response time < 0.25 ms
- Unique range without reflector up to 1 m
- Up to 7 m range with retro-reflective light barriers



IO-Link



IO-Link



IO-Link



IO-Link

	O300W.SPT O300H.SPT	O300W.R.P.T O300H.R.P.T	O500W.S.P.T O500H.S.P.T	O500W.R.P.T O500H.R.P.T
y = light source				
features	<ul style="list-style-type: none"> <li>■ SmartReflect®</li> <li>■ Stainless steel housing in washdown- (W) or hygienic design (H)</li> </ul>	<ul style="list-style-type: none"> <li>■ Retro-reflective sensors</li> <li>■ Stainless steel housing in washdown- (W) or hygienic design (H)</li> </ul>	<ul style="list-style-type: none"> <li>■ SmartReflect®</li> <li>■ Stainless steel housing in washdown- (W) or hygienic design (H)</li> </ul>	<ul style="list-style-type: none"> <li>■ Retro-reflective sensors</li> <li>■ Stainless steel housing in washdown- (W) or hygienic design (H)</li> </ul>
dimensions (B × H × T)	16,5 × 34,7 × 28,2 mm	16,5 × 34,7 × 28,2 mm	20,2 × 124 × 36,4 mm	20,2 × 124 × 36,4 mm
light source (y)				
standard LED (R)				
pinPoint LED (P)	30 ... 300 mm	4 m	60 ... 1000 mm	6 m
infrarot (I)				
laser (L)				
response time	< 0,25 ms	< 0,25 ms	< 0,25 ms	< 0,25 ms
output	push-pull	push-pull	push-pull	push-pull
connection types	cable 2 m connector M8	cable 2 m connector M8	cable 2 m connector M12	cable 2 m connector M12
housing material	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant
operating temperature	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C
protection class	IP 68 / IP 69K proTect+	IP 68 / IP 69K proTect+	IP 68 / IP 69K proTect+	IP 68 / IP 69K proTect+

# Light barriers and light sensors



	OR18.W.RR.T
	<ul style="list-style-type: none"> <li>■ Retro-reflective sensors</li> <li>■ Stainless steel housing in washdown- (W)</li> </ul>
	M18 × 67,2 mm
	800 mm
	< 1 ms
	PNP NPN
	connector M12
	stainless steel
	-25 ... +55 °C
	IP 67/69K



The *proTect+* impermeability concept by Baumer ensures absolute dependability even under most adverse conditions. Thanks to the specifically conceived construction and the use of high-quality materials, sensors with *proTect+* provide IP 69K protection and ensure absolute stability even after countless temperature cycles. In order to achieve this, the sensors have been shock-tested over the entire temperature range. The *proTect+* concept ensures enhanced reliability and extended sensor service life.

More information at [www.baumer.com/protect+](http://www.baumer.com/protect+)

# Light barriers and light sensors

## Washdown design

- Robust stainless steel housing
- Long-term sealing thanks to *proTect+*
- IP 69K and Ecolab tested
- Different sizes and sensor principles



x = function principle y = light source	FKDR 14	O300W.xy IO-Link	O500W.xy IO-Link	OR18W.xy IO-Link
dimensions (B × H × T)	19,6 × 62,4 × 34,3 mm	16,5 × 34,7 × 28,2 mm	20,2 × 47,2 × 37,7 mm	M18
function principle (x) / ranges				
diffuse sensors with background suppression		30 ... 250 mm (O300W.GP / O300W.GL)	60 ... 400 mm (O500W.GP)	40 ... 120 mm (OR18W.GR)
diffuse sensors with intensity difference				0 ... 800 mm (OR18W.ZI)
<i>SmartReflect</i> ® light barriers without reflector		30 ... 300 mm (O300W.SP / O300W.SL)	60 ... 600 mm (O500W.SP)	
<i>SmartReflect</i> ® transparent		30 ... 300 mm (O300W.SPT)	60 ... 1000 mm (O500W.SPT)	
retro-reflective sensors		6 m (O300W.RP / O300W.RL)	8 m (O500W.RP)	4,5 m (OR18W.RR)
transparent detection without reflector		4 m (O300W.RPT)	6 m (O500W.RPT)	800 mm (OR18W.RR.T)
through beam sensors		15 m (O300W.TR / .TL) (O300W.ER / .EL)	40 m (O500W.TR / .TL) (O500W.ER / .EL)	20 m (OR18W.TI) (OR18W.EI)
contrast sensor	12,5 mm ±2 mm (FKDR 14)			
light source (y)				
standard LED (R)	■	■	■	■
pinPoint LED (P)		■	■	
infrarot (I)				■
laser (L)		■		
response time	<0,05 ms	< 0,25 ms < 0,1 ms (laser)	< 0,25 ms	< 1 ms
output	push-pull	push-pull	push-pull	PNP NPN
connection types	connector M12	connector M8	connector M12	connector M12
housing material	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, FDA-compliant
operating temperature	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C	-25 ... +55 °C
protection class	IP 68 / IP 69K <i>proTect+</i>	IP 68 / IP 69K <i>proTect+</i>	IP 68 / IP 69K <i>proTect+</i>	IP 67 / IP 69K

## Hygienic design

- EHEDG certified, FDA-compliant, Ecolab tested
- Long-term sealing thanks to *proTect+*
- Different sizes and sensor principles
- Benefits through *SmartReflect®* light barrier without reflector



IO-Link



IO-Link



IO-Link

x = function principle y = light source	FKDH 14	O300H.xy	O500H.xy
dimensions (B × H × T)	19,6 × 52,2 × 34,3 mm	16,5 × 34,6 × 28,7 mm	20,2 × 47,7 × 36,4 mm
function principle (x) / ranges			
diffuse sensors with background suppression		30 ... 250 mm (O300H.Gy)	60 ... 400 mm (O500H.Gy)
diffuse sensors with intensity difference			
<i>SmartReflect®</i> light barriers without reflector		30 ... 300 mm (O300H.Sy)	60 ... 600 mm (O500H.Sy)
<i>SmartReflect®</i> transparent		30 ... 300 mm (O300H.SPT)	60 ... 1000 mm (O500H.SPT)
retro-reflective sensors		6 m (O300H.Ry)	8 m (O500H.Ry)
transparent detection without reflector		4 m (O300H.RPT)	6 m (O500H.RPT)
through beam sensors		15 m (O300H.Ty) (O300H.Ey)	40 m (O500H.Ty) (O500H.Ey)
contrast sensor	12,5 m ±2 mm (FKDH 14)		
light source (y)			
standard LED (R)	■	■	■
pinPoint LED (P)		■	■
infrarot (I)			
laser (L)		■	
response time	<0,05 ms	< 0,25 ms <0,1 ms (laser)	< 0,25 ms
output	push-pull	push-pull	push-pull
connection types	connector 2 m flylead connector M12	connector 2 m flylead connector M8	connector 2 m flylead connector M12
housing material	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	-30 ... +60 °C	-25 ... +60 °C -10 ... +60 °C (Laser)	-25 ... +60 °C
protection class	IP 68 / IP 69K <i>proTect+</i>	IP 68 / IP 69K <i>proTect+</i>	IP 68 / IP 69K <i>proTect+</i>

# Light barriers and light sensors

## Fork and angle sensors

- Through-beam photoelectric sensor integrated in a single device
- No alignment of transmitter and receiver
- No misalignment caused by vibration
- Laser variants for miniature parts and positioning within 1/100 mm range



IO-Link



IO-Link



IO-Link



IO-Link

	OGxxxU.R	OGxxxL.R	OGxxxU.R...VL	OGxxxU.L
category	Pulsed red LED Fork sensors	Pulsed red LED Fork sensors	Pulsed red LED Fork sensors Stainless steel	Pulsed red LED Fork sensors
features	<ul style="list-style-type: none"> <li>■ Potentiometer / IO-Link</li> <li>■ Narrow, almost parallel light beam</li> <li>■ Sensors are stackable</li> </ul>	<ul style="list-style-type: none"> <li>■ Special L design</li> <li>■ Potentiometer / IO-Link</li> <li>■ Narrow, almost parallel light beam</li> <li>■ Sensors are stackable</li> </ul>	<ul style="list-style-type: none"> <li>■ Potentiometer / IO-Link</li> <li>■ Narrow, almost parallel light beam</li> <li>■ Sensors are stackable</li> <li>■ Extra robust</li> </ul>	<ul style="list-style-type: none"> <li>■ Very high resolution</li> <li>■ Extremely narrow laser light beam</li> <li>■ High repeat accuracy</li> <li>■ Potentiometer / IO-Link</li> <li>■ Sensors are stackable</li> </ul>
type	U profile	L profile	U profile	U profile
fork widths	10 mm 20 mm 30 mm 50 mm 80 mm 120 mm 170 mm	60 mm 100 mm 158 mm	30 mm 50 mm 80 mm 120 mm	30 mm 50 mm 80 mm 120 mm
object size	0,2 mm	0,2 mm	0,2 mm	0,03 mm
repeat accuracy	0,02 mm	0,02 mm	0,02 mm	0,01 mm
response / release time	0,06 ms	0,06 ms	0,06 ms	0,05 ms
connection types	connector M8	connector M8	connector M8	connector M8
housing material	die-cast zinc	die-cast zinc	stainless steel	die-cast zinc
operating temperature	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67
specific features				■ Laser class 1





# Light barriers and light sensors

## Differential, contrast and color sensors

- Differential sensors to monitor position tolerances
- Rapid print mark recognition
- Capturing even slightest contrast or shades of color
- Small dimensions, starting at 12 mm



	OBDM 12	OZDM 16	FKDK 14
features	<ul style="list-style-type: none"> <li>■ Difference sensors</li> </ul>	<ul style="list-style-type: none"> <li>■ Diffuse sensors with intensity difference with analog output - standard</li> </ul>	<ul style="list-style-type: none"> <li>■ White LED diffuse contrast sensors</li> </ul>
dimensions (B × H × T)	12,4 × 37 × 34,5 mm	15,4 × 50 × 50 mm	14,8 × 43 × 31 mm
light source	laser	laser	white LED
sensing distance Tw	16 ... 120 mm	0 ... 250 mm	12,5 mm ±2 mm
response time	< 1 ms	< 0,1 ms	< 0,05 ms
output	PNP NPN	PNP 4 ... 20 mA	push-pull
connection types	connector M8	cable 2 m connector M8	cable 2 m connector M8 connector M12
housing material	die-cast zinc	die-cast zinc	plastic
operating temperature	0 ... +50 °C	-10 ... +50 °C	-25 ... +65 °C
protection class	IP 67	IP 67	IP 67
function	<ul style="list-style-type: none"> <li>■ monitoring of position tolerances</li> <li>■ object detection on fluctuating conveyor belts</li> <li>■ detection of minimum and maximum deviations in the process</li> <li>■ variant for step / edge detection</li> </ul>	<ul style="list-style-type: none"> <li>■ detection of gradual changes, e. g. when polishing surfaces</li> <li>■ fast and economical print mark recognition</li> </ul>	<ul style="list-style-type: none"> <li>■ detection of gradual changes, e. g. when polishing surfaces</li> <li>■ fast and economical print mark recognition</li> </ul>

# Light barriers and light sensors



	FKDR 14	FKDH 14	OC50	OC60
	<ul style="list-style-type: none"> <li>White LED diffuse contrast sensors</li> <li>Washdown design</li> </ul>	<ul style="list-style-type: none"> <li>White LED diffuse contrast sensors</li> <li>Hygienic design</li> </ul>	<ul style="list-style-type: none"> <li>RGB contrast sensor</li> <li>Intuitive adjustment</li> <li>Optional lenses for distances up to 18 mm</li> </ul>	<ul style="list-style-type: none"> <li>RGB and UV contrast sensors</li> <li>Variation with color mode</li> <li>Intuitive adjustment</li> <li>Optional lenses for distances up to 40 mm</li> </ul>
	19,6 × 51 × 34,3 mm	19,6 × 52,2 × 34,3 mm	31 × 53 × 80,1 mm	31,9 × 60,2 × 79mm
	white LED	white LED	RGB	RGB UV
	12,5 mm ±2 mm	12,5 mm ±2 mm	9 mm ±3 mm	9 mm ±3 mm 10 ... 50 mm (UV)
	< 0,05 ms	< 0,05 ms	< 0,033 ms	< 0,01 ms
	push-pull	push-pull	PNP NPN	PNP NPN 0 ... 5 VDC
	connector M12	cable 2 m flylead connector M12	connector M12	connector M12
	stainless steel	stainless steel	plastic	aluminum
	-25 ... +65 °C	-25 ... +60 °C	-10 ... +55 °C	-10 ... +55 °C
	IP 68 / IP 69K <i>proTect+</i>	IP 68 / IP 69K <i>proTect+</i>	IP 67	IP 67
	<ul style="list-style-type: none"> <li>detection of gradual changes, e. g. when polishing surfaces</li> <li>fast and economical print mark recognition</li> </ul>	<ul style="list-style-type: none"> <li>detection of gradual changes, e. g. when polishing surfaces</li> <li>fast and economical print mark recognition</li> </ul>	<ul style="list-style-type: none"> <li>detection of gradual changes, e. g. when polishing surfaces</li> <li>fast and economical print mark recognition</li> </ul>	<ul style="list-style-type: none"> <li>detection of gradual changes, e. g. when polishing surfaces</li> <li>fast and economical print mark recognition</li> </ul>