

description

The devices of the design Q3 and Q4 are counted among the smallest optical sensors worldwide. Their extremely compact dimensions make them suitable for applications, which in the past had been reserved to fiber optics. The sensors have such a high repeat accuracy that they may be compared to laser sensors. The devices operate with a visible red light, which simplifies the adjustment.

The OTQ30100 difffuse reflection sensor is a so-called fix focus diffuse reflection sensor. Its light beam excels due to its very low diffusion, with the result that small, even transparent objects may be detected. The smallest light spot diameter is found exactly in the centre of the nominal sensing range.

The mode of operation is based on the energetic principle.

Consequently a considerably higher sensing range is achieved on bright or reflecting surfaces.

The through-beam sensors can be supplied in different versions. Despite their small dimensions the maximum operating distance is up to 1m.

application examples

- presence check of different objects
- collision avoidance in feeding motions
- control of object and stack heights
- ▶ limit switches, position switches and pulse generators
- inquiry of grippers

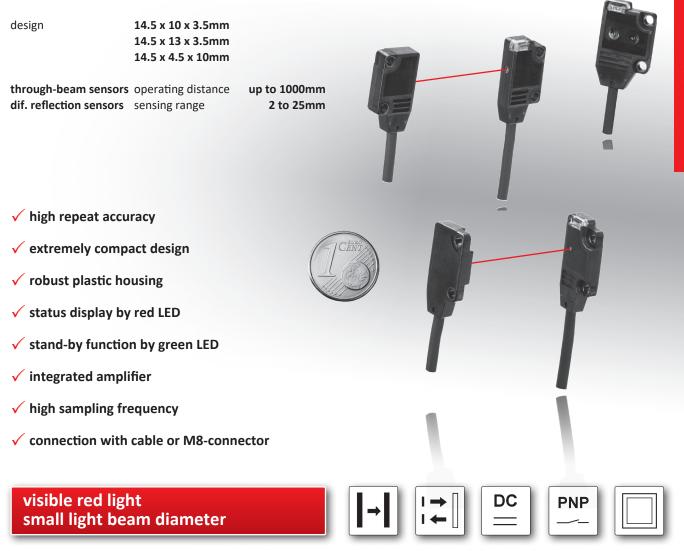


	OYQ30100	OYQ30103
version	through-beam sensor	through-beam sensor
connection	cable	cable
operating distance	150mm	1000mm
	transmitter 1.4 3.5 1.75 6.5 receiver	transmitter 1.75 8.5 Sender receiver
	Empfänger 5.5 Stabilitäts- Betriebsanzeige	Empfänger Stabilitäts- Betriebsanzelge
TECHNICAL DATA		
operating distance	150mm	1000mm
minimum object size	non-transparent, Ø 1mm pnp, dark-on mode **	non-transparent, Ø 2mm pnp, dark-on mode **
output signal		
operating voltage current consumption (w/o load)	12 24V DC ± 10%	12 24V DC ± 10%
	≤ 15mA *, ≤ 10mA **	≤ 15mA *,≤ 10mA **
	FO: A **	FO 4 **
output current (max. load)	50mA **	50mA **
output current (max. load) voltage drop (max. load)	1.0V DC **	1.0V DC **
output current (max. load) voltage drop (max. load) transmitting element (pulsed)	1.0V DC ** LED, red light *	1.0V DC ** LED, red light *
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength	1.0V DC ** LED, red light * 680nm *	1.0V DC ** LED, red light * 680nm *
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time	1.0V DC ** LED, red light * 680nm * max. 0.5ms	1.0V DC ** LED, red light * 680nm * max. 0.5ms
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time nysteresis	1.0V DC ** LED, red light * 680nm * max. 0.5ms -	1.0V DC ** LED, red light * 680nm * max. 0.5ms -
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal)	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by)	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material operating temperature	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material operating temperature system of protection (EN 60529)	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material operating temperature system of protection (EN 60529) connection	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **
coutput current (max. load) coltage drop (max. load) cransmitting element (pulsed) consecution creponse time consecution consecution consecution connection connection connection contestion contestion connection connection contestion contestion connection connection connection contestion contestion contestion contestion connection connection contestion contestion connection connectio	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67
coutput current (max. load) cycltage drop (m	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **



	OTQ30100	OTQ30170
version 	diffuse reflection sensor	diffuse reflection sensor
connection	cable 2 25mm	M8-cable connector 2 25mm
ensing range	2 25mm	Z Z5mm
	Empfanger 2.75 Sender 1.75 Stabilitäts-Betriebsanzeige	Empfänger Stabilitäts- Betriebsenzeige
TECHNICAL DATA		
ensing range	2 25mm	2 25mm
ninimum object size	Ø 1mm	Ø 1mm
output signal	pnp, light-on mode	pnp, light-on mode
pperating voltage	12 24V DC ± 10%	12 24V DC ± 10%
current consumption (w/o load)	≤ 20mA	≤ 20mA
output current (max. load)	50mA	50mA
voltage drop (max. load)	1.0V DC	1.0V DC
transmitting element	LED, red light	LED, red light
wavelength	680nm	680nm
response time	< 0.5ms	< 0.5ms
hysteresis	15% of the sensing range	15% of the sensing range
repeat accuracy	0.1mm	0.1mm
display (signal)	red LED	red LED
display (stand-by)	green LED	green LED
short-circuit protection	+	+
reverse polarity protection	+	+
design	14.5x13x3.5mm	14.5x13x3.5mm
housing material	PET	PET
lens material	polyalylate	polyalylate
operating temperature	-25 +55°C	-25 +55°C
system of protection (EN 60529)	IP67	IP67
	2m PVC-cable, 3-wire	M8-cable connector 300mm, 3-wire e.g. VK200075
connection connection accessories	_	6 G VK200075





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The mode of operation is based on the energetic principle.

Consequently a considerably higher sensing range is achieved on bright or reflecting surfaces.

The through-beam sensors can be supplied in different versions. Despite their small dimensions the maximum operating distance is up to 1m.

application examples

- presence check of different objects
- collision avoidance in feeding motions
- control of object and stack heights
- ▶ limit switches, position switches and pulse generators
- inquiry of grippers



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version	through-beam sensor	through-beam sensor
connection	cable	cable
operating distance	150mm	1000mm
	transmitter 1.4 3.5 1.75 6.5 receiver	transmitter 1.75 8.5 Sender receiver
	Empfänger 5.5 Stabilitäts- Betriebsanzeige	Empfänger Stabilitäts- Betriebsanzelge
TECHNICAL DATA		
operating distance	150mm	1000mm
minimum object size	non-transparent, Ø 1mm pnp, dark-on mode **	non-transparent, Ø 2mm pnp, dark-on mode **
output signal		
operating voltage current consumption (w/o load)	12 24V DC ± 10%	12 24V DC ± 10%
	≤ 15mA *, ≤ 10mA **	≤ 15mA *,≤ 10mA **
	FO: A **	FO 4 **
output current (max. load)	50mA **	50mA **
output current (max. load) voltage drop (max. load)	1.0V DC **	1.0V DC **
output current (max. load) voltage drop (max. load) transmitting element (pulsed)	1.0V DC ** LED, red light *	1.0V DC ** LED, red light *
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength	1.0V DC ** LED, red light * 680nm *	1.0V DC ** LED, red light * 680nm *
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time	1.0V DC ** LED, red light * 680nm * max. 0.5ms	1.0V DC ** LED, red light * 680nm * max. 0.5ms
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time nysteresis	1.0V DC ** LED, red light * 680nm * max. 0.5ms -	1.0V DC ** LED, red light * 680nm * max. 0.5ms -
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal)	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by)	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + **
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material operating temperature	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material operating temperature system of protection (EN 60529)	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67
output current (max. load) voltage drop (max. load) transmitting element (pulsed) wavelength response time hysteresis repeat accuracy display (signal) display (stand-by) short-circuit protection reverse polarity protection design housing material lens material operating temperature system of protection (EN 60529) connection	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **
coutput current (max. load) coltage drop (max. load) cransmitting element (pulsed) consecution creponse time consecution consecution consecution connection connection connection contestion contestion connection connection contestion contestion connection connection connection contestion contestion contestion contestion connection connection contestion contestion connection connectio	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67
coutput current (max. load) cycltage drop (m	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **	1.0V DC ** LED, red light * 680nm * max. 0.5ms - 0.05mm red LED ** green LED ** + ** + 14.5x10x3.5mm PET polyalylate -25 +55°C IP67 2m PVC-cable, 3-wire **



	OTQ30100	OTQ30170
version 	diffuse reflection sensor	diffuse reflection sensor
connection	cable 2 25mm	M8-cable connector 2 25mm
ensing range	2 25mm	Z Z5mm
	Empfanger 2.75 Sender 1.75 Stabilitäts-Betriebsanzeige	Empfänger Stabilitäts- Betriebsenzeige
TECHNICAL DATA		
ensing range	2 25mm	2 25mm
ninimum object size	Ø 1mm	Ø 1mm
output signal	pnp, light-on mode	pnp, light-on mode
pperating voltage	12 24V DC ± 10%	12 24V DC ± 10%
current consumption (w/o load)	≤ 20mA	≤ 20mA
output current (max. load)	50mA	50mA
voltage drop (max. load)	1.0V DC	1.0V DC
transmitting element	LED, red light	LED, red light
wavelength	680nm	680nm
response time	< 0.5ms	< 0.5ms
hysteresis	15% of the sensing range	15% of the sensing range
repeat accuracy	0.1mm	0.1mm
display (signal)	red LED	red LED
display (stand-by)	green LED	green LED
short-circuit protection	+	+
reverse polarity protection	+	+
design	14.5x13x3.5mm	14.5x13x3.5mm
housing material	PET	PET
lens material	polyalylate	polyalylate
operating temperature	-25 +55°C	-25 +55°C
system of protection (EN 60529)	IP67	IP67
	2m PVC-cable, 3-wire	M8-cable connector 300mm, 3-wire e.g. VK200075
connection connection accessories	_	6 G VK200075



article-no. version	OYQ40100 through-beam sensor	OYQ40103 through-beam sensor	
connection	cable	cable	
operating distance	150mm	500mm	
	transmitter 10 4.5 Sender	transmitter 10 4.5 Sender	
	receiver 10 6.45 Empfänger 2xe2.2 Stabilitäts- Betriebsanzeige	receiver 10 6.45 10 10 10 10 10 10 10 10 10 10 10 10 10	
TECHNICAL DATA	150mm	500mm	
operating distance minimum object size	non-transparent, Ø 1mm	non-transparent, Ø 2mm	
output signal	pnp, dark-on mode **	pnp, dark-on mode **	
	12 24V DC ± 10%	12 24V DC ± 10%	
operating voltage current consumption (w/o load)	≤ 15mA **, <=10mA *	12 24V DC ± 10% ≤ 15mA **, <=10mA *	
output current (max. load)	50mA **	50mA **	
voltage drop (max. load)	1.0V DC **	1.0V DC **	
ransmitting element (pulsed)	LED, red light *	LED, red light *	
vavelength	680nm *	680nm *	
response time	< 0.5ms	< 0.5ms	
nysteresis	-	-	
repeat accuracy	0.05mm	0.05mm	
display (signal)	red LED **	red LED **	
display (stand-by)	green LED **	green LED **	
short-circuit protection	+**	+**	
reverse polarity protection	+	+	
	14.5x4.5x10mm	14.5x4.5x10mm	
lesign	PET	14.5x4.5x10iiiii	
nousing material ens material	polyalylate		
operating temperature	-25 +55°C	polyalylate	
system of protection (EN 60529)	-23 +33 C IP67	-25 +55°C IP67	
connection	2m PVC-cable, 3-wire **	2m PVC-cable, 3-wire **	
connection	2m PVC-cable, 2-wire *	2m PVC-cable, 2-wire *	
connection accessories	- - AV000070	AV000070	
mounting accessories (bracket)	e.g. AV000079	e.g. AV000079	

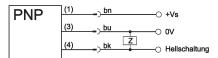


connection

transmitter

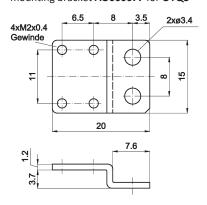


diffuse reflection sensors

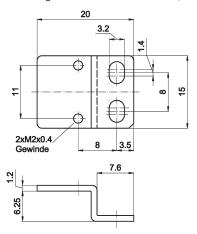


wire colors: bn = brown (1), bu = blue (3), bk = black (4)

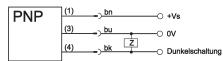
mounting bracket AO000077 for OYQ3



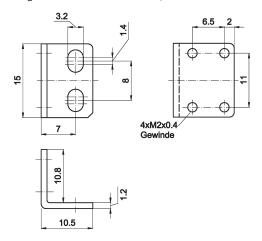
mounting bracket AO000079 for OYQ4



receiver



mounting bracket AO000078 for OYQ3



ACCESSORIES

Accessories		
article-no.	description	material
AO000077	mounting bracket OYQ3	galvanized sheet steel
AO000078	mounting bracket OYQ3	galvanized sheet steel
AO000079	mounting bracket OYQ4	galvanized sheet steel

This data sheet contains the standard versions only. Kindly request the availability of other output- and connection functions.

We will be pleased to supply the matching cable socket for your devices with connector. Please refer to the list in catalog chapter "accessories" under "cable sockets ipf-sensorflex®" or search our website for "VK".

Warning: Never use these devices in applications where the safety of a person depends on their functionality.

This data sheet as well as your personal contact can be found at www.ipf.de

OPTICAL SENSORS





NOTES

