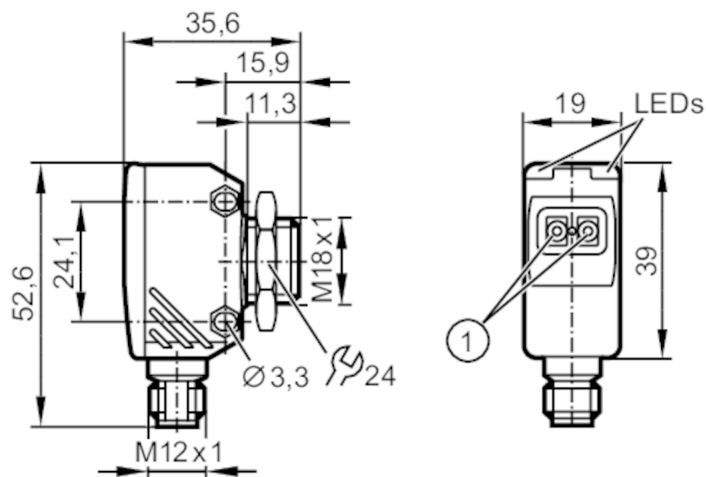


Diffuse reflection sensors with background suppression

OGH-FNKG/US/CUBE



- 1 Programming buttons
transmitter in lower lens
Receiver in upper lens



Product characteristics

Type of light	red light
Housing	rectangular with M18 thread

Application

System	Background suppression
Function principle	Diffuse reflection sensor

Electrical data

Operating voltage	[V]	10...30 DC
Current consumption	[mA]	25
Protection class		III
Reverse polarity protection		yes
Type of light		red light
Wave length	[nm]	645

Outputs

Electrical design		NPN
Output function		light-on/dark-on mode; (programmable)
Max. voltage drop switching output DC	[V]	2.5
Permanent current rating of switching output DC	[mA]	200
Switching frequency DC	[Hz]	1000
Short-circuit protection		yes
Type of short-circuit protection		yes (non-latching)
Overload protection		yes

Monitoring range

Range	[mm]	15...200; (white paper 200 x 200 mm 90 % remission)
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Range on white object (90 % remission) [mm]	15...200
Range on grey object (18 % remission) [mm]	15...200
Range on black object (6 % remission) [mm]	15...200
Range adjustable	yes
Max. light spot diameter [mm]	13
Light spot dimensions refer to	at maximum range
Background suppression available	yes

Interfaces

Communication interface	IO-Link								
Transmission type	COM2 (38,4 kBaud)								
IO-Link revision	1.1								
SDCI standard	IEC 61131-9								
Profiles	Measuring Sensor, Identification and Diagnosis, Switching Signal Channel, Teach Channel								
SIO mode	yes								
Required master port class	A								
Min. process cycle time [ms]	10								
IO-Link process data (cyclical)	<table> <tr> <th>Function</th><th>bit length</th></tr> <tr> <td>process value</td><td>16</td></tr> <tr> <td>device status</td><td>4</td></tr> <tr> <td>binary switching information</td><td>1</td></tr> </table>	Function	bit length	process value	16	device status	4	binary switching information	1
Function	bit length								
process value	16								
device status	4								
binary switching information	1								
IO-Link functions (acyclical)	application specific tag; operating hours counter; switching cycles counter								
Supported DeviceIDs	<table> <tr> <th>Type of operation</th><th>DeviceID</th></tr> <tr> <td>default</td><td>1165</td></tr> </table>	Type of operation	DeviceID	default	1165				
Type of operation	DeviceID								
default	1165								
Note	For further information please see the IODD PDF file at "Downloads"								

Operating conditions

Ambient temperature [°C]	-25...60
Storage temperature [°C]	-40...60
Protection	IP 65; IP 67

Tests / approvals

EMC	EN 60947-5-2								
MTTF [years]	782								
UL approval	<table> <tr> <td>Ta</td><td>-25...60 °C</td></tr> <tr> <td>Enclosure type</td><td>Type 1</td></tr> <tr> <td>voltage supply</td><td>Class 2</td></tr> <tr> <td>File number UL</td><td>E174191</td></tr> </table>	Ta	-25...60 °C	Enclosure type	Type 1	voltage supply	Class 2	File number UL	E174191
Ta	-25...60 °C								
Enclosure type	Type 1								
voltage supply	Class 2								
File number UL	E174191								

Mechanical data

Weight [g]	60
Housing	rectangular with M18 thread
Dimensions [mm]	52.6 x 19 x 35.6
Thread designation	M18 x 1
Material	diecast zinc; PEI
Lens material	PEI



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Lens alignment	Side sensing
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Displays / operating elements

Display	Switching status	1 x LED, yellow
	Power	1 x LED, green

Accessories

Items supplied	lock nut: 1
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Remarks

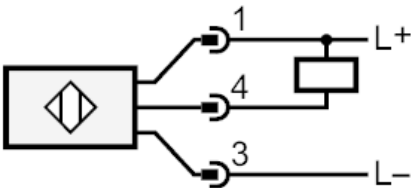
Pack quantity	1 pcs.
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Electrical connection

Connector: 1 x M12; coding: A



Connection



4 OUT / IO-Link



Diffuse reflection sensors with background suppression

OGH-FNKG/US/CUBE

Other data

Repeatability / precision: 6 σ

	Repeatability of the measured values	
Abstand	white (90 % remission)	black (6 %...90 % remission)
20 mm	0.5 mm	1.0 mm
50 mm	0.8 mm	2.0 mm
100 mm	1.5 mm	4.5 mm
150 mm	3.0 mm	9.0 mm
200 mm	6.0 mm	20.0 mm
	Accuracy	
Abstand	white (90 % remission)	black (6 %...90 % remission)
20 mm	± 2.0 mm	± 2.5 mm
50 mm	± 3.5 mm	± 4.5 mm
100 mm	± 6.0 mm	± 7.5 mm
150 mm	± 7.5 mm	± 11.0 mm
200 mm	± 10.0 mm	± 17.0 mm

The values apply at

Extraneous light on the object

< 10 klx

constant ambient conditions

23 °C / 960 hPa

minimum power-on time in minutes

10

Diagrams and graphs

The diagram illustrates the measurement setup for a diffuse reflection sensor. A sensor, labeled 'a', is positioned on the left. A square object, labeled 'b', is positioned in the middle. A vertical background, labeled 'c', is on the right. A double-headed arrow labeled 'x' indicates the distance between the sensor 'a' and the object 'b'. A dashed vertical line extends from the bottom of the object 'b' to the background 'c'. A double-headed arrow labeled 'y' indicates the minimum distance between the object 'b' and the background 'c'.

a: sensor

b: object

c: background

x: distance sensor/object [mm]

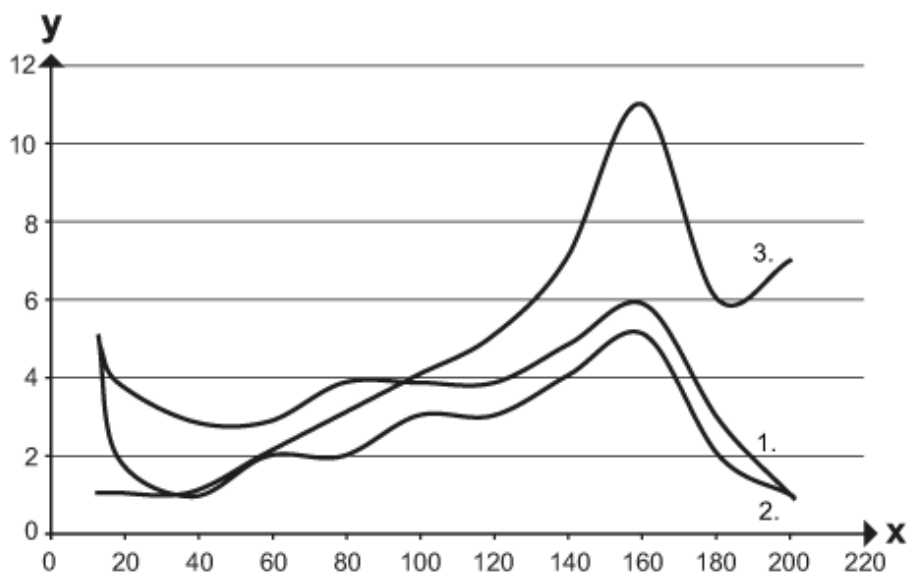
y: min. distance object/background [mm]



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Background suppression chart



x: distance sensor/object [mm]

y: min. distance object/background [mm]

1 = object black (6 % remission) , Background white (90 % remission)

2 = object grey (18 % remission) , Background white (90 % remission)

3 = object white (90 % remission) , Background white (90 % remission)