Model Number

DK10-LAS-54/76/110/124

Print mark contrast sensor
with 5-pin, M12 x 1 connector

Features

- Coaxial optical system - no unusable area
- Laser class 2, eyesafe
- Adjustable sensitivity
- 30 µs response time, suitable for extremely rapid scanning processes
- Sensing range up to 10 m
- Laser-retroreflective sensor

Product information

The contrast sensor series DK10, DK2X, DKE2X and DK3X have an extreme robust and IP67 tight industrial standard housing with eight M5 metal reinforced inserts for sensor mounting. The lenses are made of high grade glass. All sensors offer different light spot shapes and orientations and have powerful push-pull outputs (NPN/PNP/push-pull).

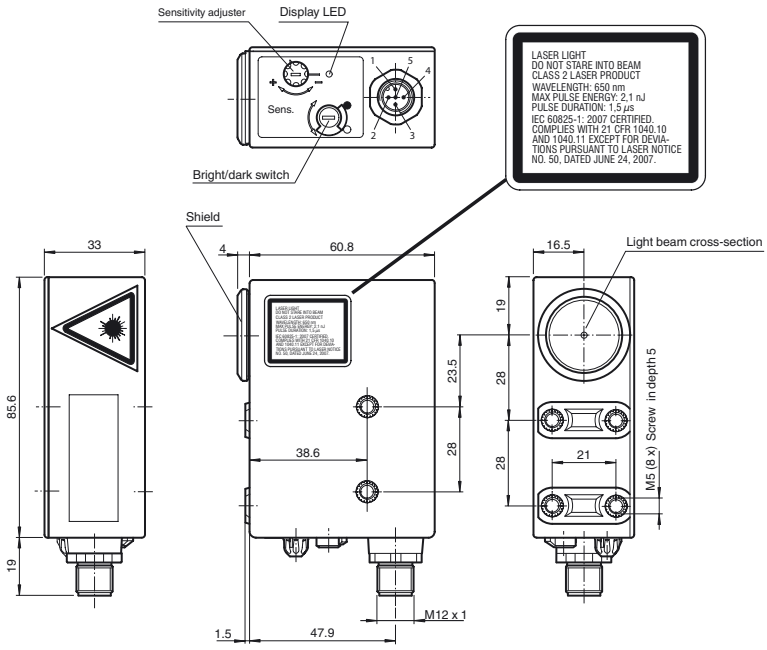
The DK10 sensor series offers laser and LED light sources, a manual sensitivity adjustment and high sensing ranges up to 800 mm.

The DK20/DK21/DKE2X standard contrast sensor series offers a very good contrast recognition and are available in extreme robust stainless-steel housings (DKE).

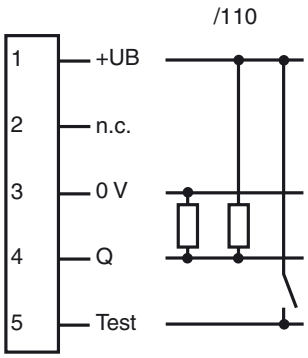
The DK31/DK34/DK35 sensor series is designed for cutting edge contrast recognition at highest sensitivity level.

The series DK20/DK34 offer a static Teach-In, the DK21/DKE21/DK31/DK35 series offer a dynamic Teach-In.

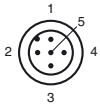
Dimensions



Electrical connection



Pinout



Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)
5	GY	(gray)

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Technical data

General specifications		
Effective detection range		0 ... 10 m
Reflector distance		0 ... 10 m
Threshold detection range		12 m
Reference target		reflector C110-2
Light source		laser diode
Light type		modulated visible red light
Laser nominal ratings		
Note		LASER LIGHT , DO NOT STARE INTO BEAM
Laser class		2
Wave length		650 nm
Beam divergence		< 1.5 mrad
Pulse length		1.5 µs
Repetition rate		108.7 kHz
max. pulse energy		2.1 nJ
Light spot representation		approx. 10 mm at a distance of 10 m
Ambient light limit		
Continuous light		40000 Lux
Functional safety related parameters		
$MTTF_d$		550 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		60 %
Indicators/operating means		
Function indicator		LED yellow: lights up if receiver is lit (light on), lights up if receiver is not lit (dark on)
Control elements		Light-on/dark-on changeover switch, sensitivity adjuster
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	≤ 55 mA
Input		
Test input		emitter deactivation with +Ub
Output		
Switching type		light/dark on switchable
Signal output		Push-pull output, short-circuit protected, reverse polarity protected
Switching voltage		PNP: U_B - 2.5 V / NPN: U_{Rest} 1.5 V
Switching current		max. 200 mA
Switching frequency	f	16.5 kHz
Response time		30 µs
Ambient conditions		
Ambient temperature		-10 ... 50 °C (14 ... 122 °F)
Storage temperature		-20 ... 75 °C (-4 ... 167 °F)
Mechanical specifications		
Degree of protection		IP67
Connection		5-pin, M12 x 1 connector
Material		
Housing		PC (glass-fiber-reinforced Makrolon)
Optical face		glass
Mass		200 g
Compliance with standards and directives		
Directive conformity		EMC Directive 2004/108/EC
Standard conformity		
Product standard		EN 60947-5-2:2007 IEC 60947-5-2:2007
Shock and impact resistance		IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions
Vibration resistance		IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 g in each X, Y and Z directions
Laser class		IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
Approvals and certificates		
UL approval		cULus Listed , Class 2 power source
CCC approval		CCC approval / marking not required for products rated ≤36 V

Accessories

V15-G-5M-PVC
Female cordset, M12, 5-pin, PVC cable

V15-W-5M-PVC
Female cordset, M12, 5-pin, PVC cable

OMH-DK
Right-Angled Mounting Bracket

OMH-DK-1
Flat Mounting Bracket

Other suitable accessories can be found at www.pepperl-fuchs.com

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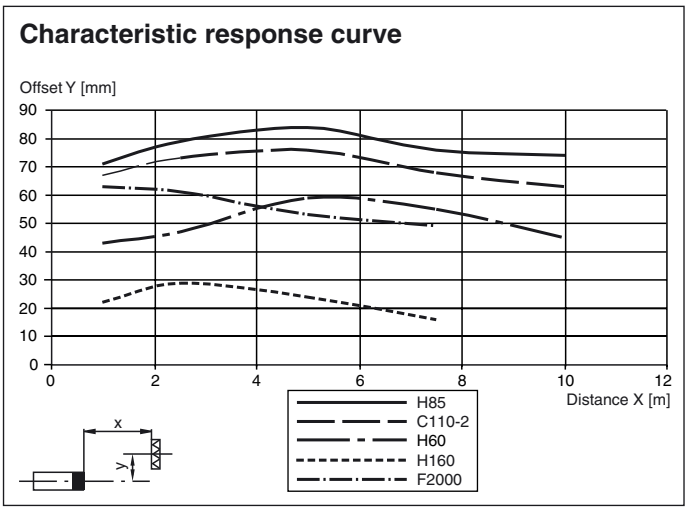
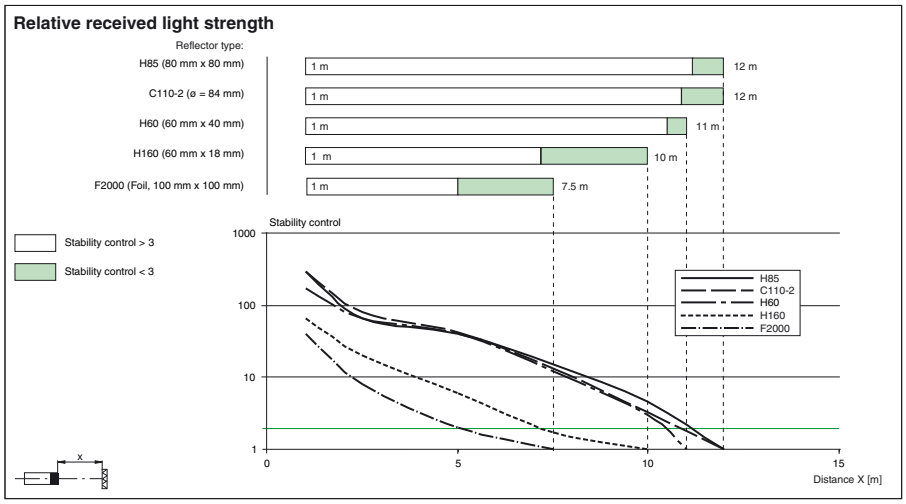
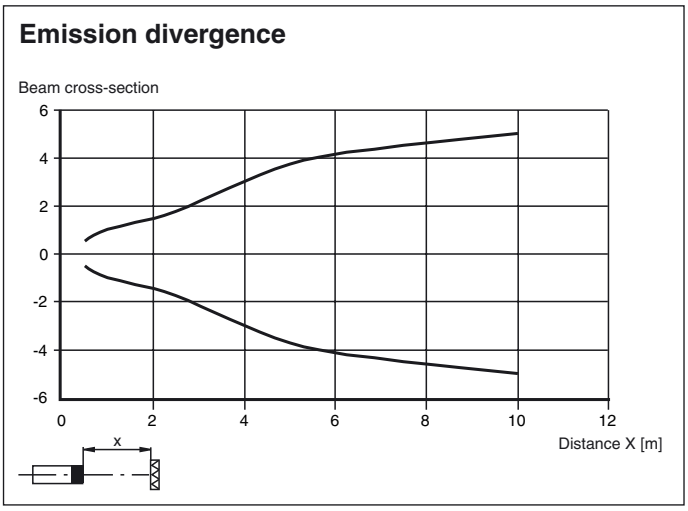
Curves/Diagrams





Curves/Diagrams



Adjustment instructions

The required switching threshold is adjusted with the sensitivity control. Please proceed as follows:

1. Switch the light/dark change-over switch to the light setting.
2. Point the light spot exactly to the reflector.
3. If the yellow indicator LED lights up, turn the sensitivity control to the left until the indicator LED goes off again.
4. If the yellow indicator LED does not light up, miss out this step.
5. Turn the sensitivity control to the right until the indicator LED just lights up.

This adjustment maximizes the sensitivity for detection of small objects ar weak cantrast.

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With this setting there is no sensitivity reserve to compensate reflector or optics soiling. To increase operation reliability in your application, turn the sensitivity adjuster another 2 ... 3 turns to the right, when indicator LED lights up, as far as the object ist well detected.

Laser notice laser class 2

- The irradiation can lead to irritation especially in a dark environment. Do not point at people!
- Caution: Do not look into the beam!
- Maintenance and repairs should only be carried out by authorized service personnel!
- Attach the device so that the warning is clearly visible and readable.
- Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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