



## **Model Number**

#### DK10-LAS/35/79b

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

#### **Features**

- Laser print mark contrast sensor for • recording very small print marks
- Laser class 2, eyesafe
- Adjustable sensitivity •
- 30 µs response time, suitable for extremely rapid scanning processes

## **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/pushpull).

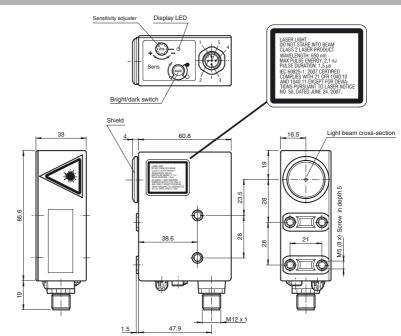
The DK10 sensor series offers laser and LED light sources, a manual sensitivity adjustment and high sensing ranges up to 800 mm.

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

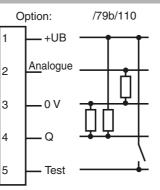
The DK31/DK34/DK35 sensor series is designed for cutting edge contrast recognition at highest sensitivity level.

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





# **Electrical connection**



#### **Pinout**



Pepperl+Fuchs Group

www.pepperl-fuchs.com

Refer to "General Notes Relating to Pepperl+Fuchs Product Information" USA: +1 330 486 0001

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Detection range3 800 mmLight topemodulated visible red lightLaser comminal ratingsNoteLASER LIGHT, DO NOT STARE INTO BEAMLaser class2Wave length650 nmBeam divergence<1.5 µrsPulse length1.5 µrsPulse length1.5 µrsAmbient light nate108.7 kHzmax. pulse energy2.1 n.JLight spot representationapprox. 2 mm at a distance of 800 mmAmbient light nate550 aMTTFg550 aMTTFg550 aMTTFg550 aIbignostic Coverage (DC)60 %diadots/operating meansLED yellow: lights up if receiver is lit (light on), lights up if	echnical data			
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Ambient conditions       -10 50 °C (14 122 °F)         Ambient temperature       -20 75 °C (-4 167 °F)         Mechanical specifications       Protection degree         Protection degree       IP67         Connection       M12 x 1 connector, 5-pin         Material       -00 glass         Housing       PC (glass-fiber-reinforced Makrolon)         Optical face       glass         Mass       200 g         Compliance with standards and directives       Vibration resistance         Product standard       EN 60947-5-2:2007 IEC 60947-5-2:2007         Shock and impact resistance       IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 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 directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 10400 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007			30 us	
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Connection       M12 x 1 connector, 5-pin         Material       PC (glass-fiber-reinforced Makrolon)         Optical face       glass         Mass       200 g         Compliance with standards and directives       EMC Directive 2004/108/EC         Directive conformity       EMC Directive 2004/108/EC         Standard conformity       EN 60947-5-2:2007 IEC 60947-5-2:2007         Shock and impact resistance       IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 g in each X, Y and Z directions         Vibration resistance       IEC ON06825-1:2007 Complies with 21 CFR 1040.10 and 10400 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007	•		1967	
Material       PC (glass-fiber-reinforced Makrolon)         Optical face       glass         Mass       200 g         Compliance with standards and directives       EMC Directive 2004/108/EC         Directive conformity       EMC Directive 2004/108/EC         Standard conformity       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 directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 10400 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007	•			
Housing       PC (glass-fiber-reinforced Makrolon)         Optical face       glass         Mass       200 g         Compliance with standards and directives       EMC Directive 2004/108/EC         Directive conformity       EMC Directive 2004/108/EC         Standard conformity       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 directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 10400 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007			M12 x 1 connector, 5-pin	
Optical face       glass         Mass       200 g         Compliance with standards and directives       Image: Compliance with standards and directives         Directive conformity       EMC Directive 2004/108/EC         Standard conformity       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 directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007				
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Compliance with standards and directives         Directive conformity       EMC Directive 2004/108/EC         Standard conformity       EN 60947-5-2:2007         Product standard       EN 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 directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007	Optical face		glass	
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Directive conformity       EMC Directive 2004/108/EC         Standard conformity       EN 60947-5-2:2007         Product standard       EN 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 directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007	Compliance with standards and	directi-		
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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 directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007	Standard conformity			
Vibration resistance       IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 g in each X, Y and directions         Laser class       IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007	Product standard			
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Laser class IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007			IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 g in each X, Y and Z	
except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007				
Approvals and certificates	Laser class		except for deviations pursuant to Laser Notice No. 50, dated	
	Approvals and certificates			
UL approval cULus Listed , Class 2 power source	UL approval		cULus Listed , Class 2 power source	
CCC approval CCC approval / marking not required for products rated ≤36			CCC approval / marking not required for products rated ≤36 V	

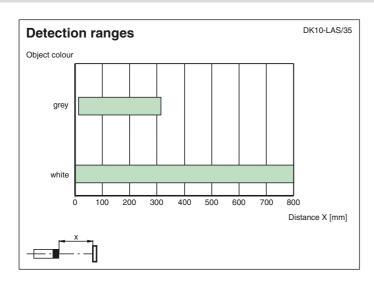
Accessories
V15-G-5M-PVC Female cordset, M12, 5-pin, PVC cable
V15-W-5M-PVC Female cordset, M12, 5-pin, PVC cable
OMH-DK Right-Angled Mounting Bracket
OMH-DK-1 Flat Mounting Bracket
Other suitable accessories can be found at www.pepperl-fuchs.com

Germany: +49 621 776 4411 fa-info@de.pepperl-fuchs.com

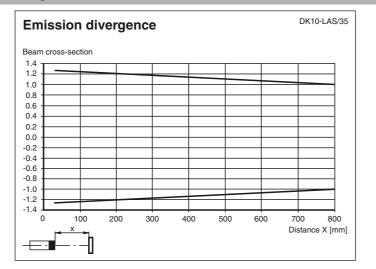
Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com



2



#### **Curves/Diagrams**



## Adjustment instructions

## Switching threshold adjustment

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.
- Point the light spot at the light part of the surface being scanned. 2.
- If the yellow indicator LED lights up, turn the sensitivity control to the left until the indicator LED goes off again. З. If the yellow indicator LED does not light up, miss out this step.
- Turn the sensitivity control to the right until the indicator LED just lights up. 4.
- Point the light spot at the dark part of the surface being scanned. 5.
- The indicator LED must have gone off. 6.
- Turn the sensitivity control to the right again until the indicator LED lights up again. Counting the number of turns. 7.
- 8. Turn the sensitivity control back to the left by half the number of counted turns.

Once the DK10 colour mark scanner has been adjusted in this way, the switching thres-hold is exactly in the middle of the measured light and dark values. The greater the number the number of times the sensitivity control is turned between the light and the dark marks, the greater the contrast.

**Recommendation:** The number of turns should be to > 0.5.

# Switching mode adjustment:

Setting of light/dark switch	Receiver	Output PNP	Output NPN
н	exposed	inactive	active
	unexposed	active	inactive
D	exposed	active	inactive
	unexposed	inactive	active

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## 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.

