



Model Number

DK10-9,5/9S20/92/110

Print mark contrast sensor with M12, 4-pin metal connector

Features

- Diffuse mode sensor for recording any print mark
- Adjustable sensitivity
- Optical system exchangeable by 90°
- 30 μs response time, suitable for extremely rapid scanning processes
- Green transmitter light
- Time function

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).

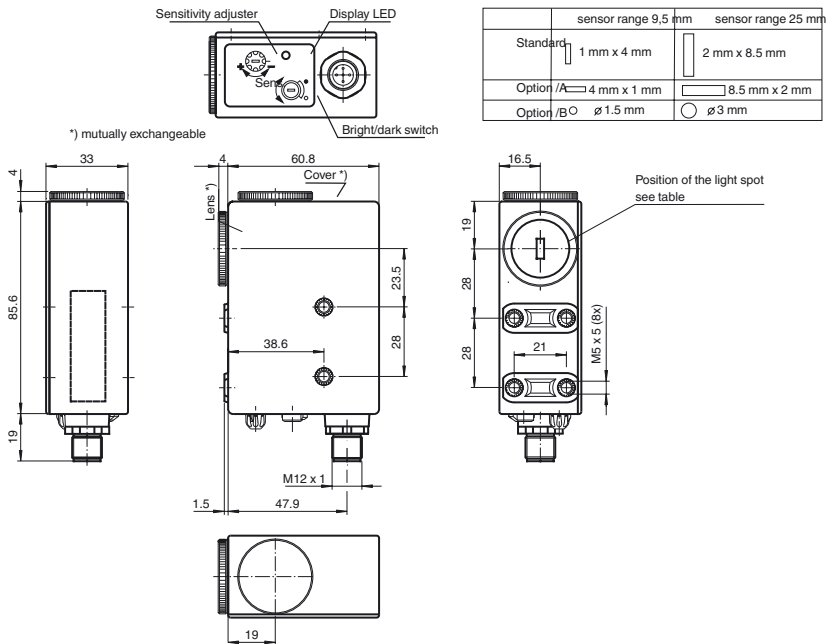
The DK10 sensor series offers laser and LED light sources, a manual sensitivity adjustment and high sensing ranges up to 800 mm.

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

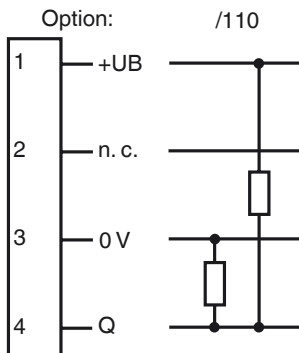
The DK31/DK34/DK35 sensor series is designed for cutting edge contrast recognition at highest sensitivity level.

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

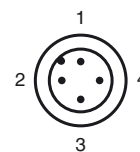
Dimensions



Electrical connection



Pinout



Release date: 2011-08-29 16:33 Date of issue: 2011-08-29 418060_eng.xml

Subject to modifications without notice

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

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

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

Technical data**General specifications**

Sensor range	9.5 mm +/-3 mm
Light source	LED
Light type	modulated green light
Light spot representation	1 mm x 4 mm , light spot parallel to housing
Angle deviation	max. $\pm 3^\circ$
Ambient light limit	
Continuous light	40000 Lux

Functional safety related parameters

MTTF _d	650 a
Mission Time (T _M)	20 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

Function display	LED yellow: lights up if receiver is lit (light on), lights up if receiver is not lit (dark on)
Controls	Sensitivity adjuster, light/dark switch

Electrical specifications

Operating voltage	U _B	10 ... 30 V DC
Ripple		10 %
No-load supply current	I ₀	≤ 55 mA

Output

Switching type	light/dark on, switchable	
Signal output	Push-pull output, short-circuit protected, reverse polarity protected	
Switching voltage	PNP: $\geq (+U_B - 2.5 \text{ V})$, NPN: $\leq 1.5 \text{ V}$	
Switching current	max. 200 mA	
Switching frequency	f	16.5 kHz
Response time	30 μs	
Timer function	rising edge , mono stable	
Pulse length	20 ms	

Ambient conditions

Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Storage temperature	-20 ... 75 °C (-4 ... 167 °F)

Mechanical specifications

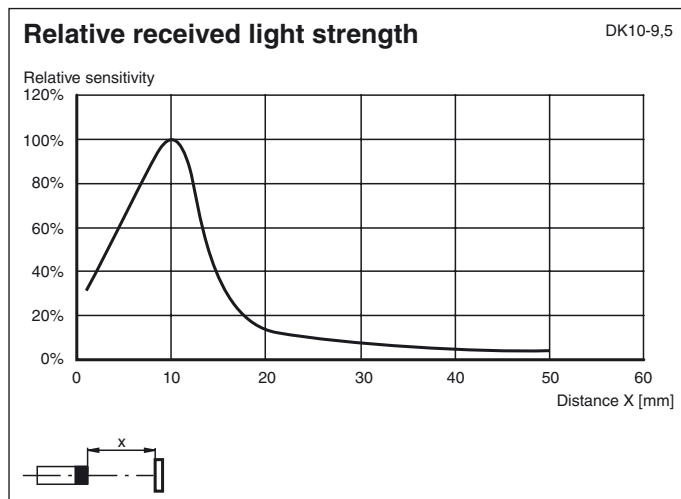
Protection degree	IP67
Connection	connector M12 x 1, 4-pin
Material	
Housing	PC (glass-fiber-reinforced Makrolon)
Optical face	glass
Mass	200 g

Compliance with standards and directives

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

Approvals and certificates

UL approval	cULus Listed , Class 2 power source
CCC approval	Products with a maximum operating voltage of $\leq 36 \text{ V}$ do not bear a CCC marking because they do not require approval.

**Accessories****V1-G-2M-PVC**

Cable socket, M12, 4-pin, PVC cable

V1-W-2M-PVC

Cable socket, M12, 4-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

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.
2. Point the light spot at the light part of the surface being scanned.
3. If the yellow indicator LED lights up, turn the sensitivity control to the left until the indicator LED goes off again.
If the yellow indicator LED does not light up, miss out this step.
4. Turn the sensitivity control to the right until the indicator LED just lights up.
5. Point the light spot at the dark part of the surface being scanned.
6. The indicator LED must have gone off.
7. Turn the sensitivity control to the right again until the indicator LED lights up again. Counting the number of turns.
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 threshold is exactly in the middle of the measured light and dark values. The greater 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
H	exposed	inactive	active
	unexposed	active	inactive
D	exposed	active	inactive
	unexposed	inactive	active