Model Number

DK20-9,5/A/79B/110/124

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

Features

- Diffuse mode sensor for recording any print mark
- Static TEACH-IN: automatic switching threshold adaptation
- Optical system exchangeable by 90°
- 30 µs response time, suitable for extremely rapid scanning processes
- 3 emitter colors: green, red and blue

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).

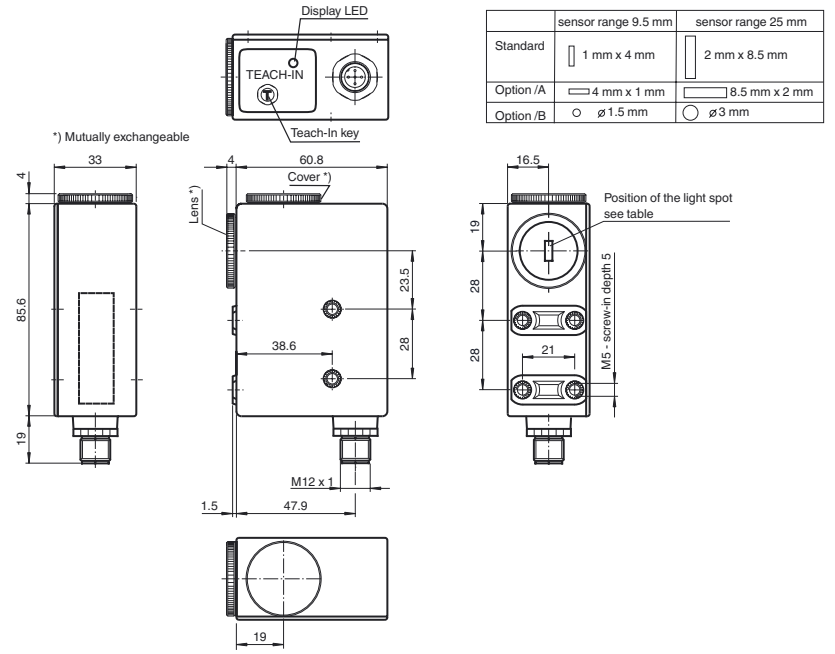
The DK10 sensor series offers laser and LED light sources, a manual sensitivity adjustment and high sensing ranges up to 800 mm.

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.

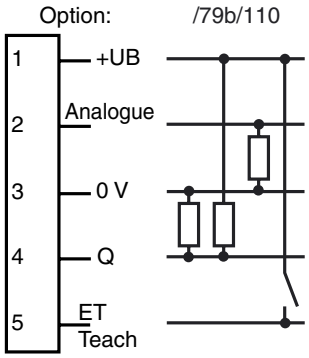
The series DK20/DK34 offer a static Teach-In, the DK21/DKE21/DK31/DK35 series offer a dynamic Teach-In.

Dimensions

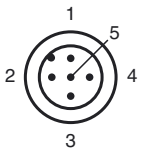


	sensor range 9.5 mm	sensor range 25 mm
Standard	1 mm x 4 mm	2 mm x 8.5 mm
Option /A	4 mm x 1 mm	8.5 mm x 2 mm
Option /B	ø1.5 mm	ø3 mm

Electrical connection



Pinout



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Technical data

General specifications		
Sensor range		9.5 mm +/-3 mm
Light source		LED
Light type		Visible green/red/blue, modulated light
Light spot representation		1 mm x 4 mm , light spot perpendicular to housing
Angle deviation		max. ± 3°
Ambient light limit		
Continuous light		7000 Lux
Teach-In		static Teach-In
Functional safety related parameters		
$MTTF_d$		650 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Function indicator		LED yellow; switching operation: lights up if print mark is detected Teach-In operation: flashing slowly alarm display: flashing quickly, if no safe operation is possible
Control elements		Teach-In key
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	≤ 70 mA
Input		
Function input		Teach-In input
Output		
Switching type		light/dark on switchable, results from the order of the Teach-In
Signal output		Push-pull output, short-circuit protected, reverse polarity protected
Switching voltage		PNP: ≥ (+U_B -2.5 V) , NPN: ≤ 1.5 V
Switching current		max. 200 mA
Measurement output		Analog output 0.3 ... 10 mA, (RL ≤ 600 Ohm)
Switching frequency	f	16.5 kHz
Response time		30 µs
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-20 ... 75 °C (-4 ... 167 °F)
Mechanical specifications		
Protection degree		IP67
Connection		M12 x 1 connector, 5-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	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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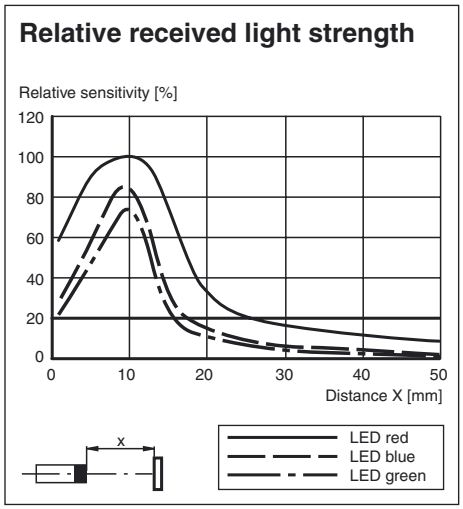

Additional information

Construction

This device is supplied with a changeable Lens. By interchanging Lens and cover the sensor is able to be modified from a side-looker to a top-looker and vice versa.

Adjustment

1. Point the light spot to the print mark. With mirroring or shiny object surface the sensor has to be tilt by 10° ... 15°.
2. Press Teach-In key at the device or apply a positive pulse (UB+) for at least 50 ms to the external Teach-In input.
   After finishing this first step, the indicator LED flashes slowly (approx. 1 Hz).
3. Point light spot to the underground/background.
4. Press Teach-In key or apply Teach-In signal once more.
5. If Teach-In successful: sensor in switching mod, LED off.
   Alarme-Function: insufficient contrast. No reliable switching operation possible. Indicator LED flashes fast (approx. 4 Hz)
6. Return to switching mode when pressing key

The switching signal level is set automatically to the middle between print mark and background.
If there is the same contrast between mark and background for various transmitter colours, the sensor selects a transmitter colour by random.
For exact contrast evaluation the DK... , as an option, can be delivered with an additional analogue output.

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