isor range 25 mm

18.5 mm x 2 mm

2 mm x 8.5 mm



# CE

## **Model Number**

## DK21-9,5/A/110/124

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

### **Features**

- Diffuse mode sensor for recording any • print mark
- Dynamic TEACH-IN: automatic swit-٠ ching threshold adaptation with one key pressure
- Optical system exchangeable by 90°
- 30 µs response time, suitable for ex-• tremely rapid scanning processes
- 3 emitter colors: green, red and blue

# **Product information**

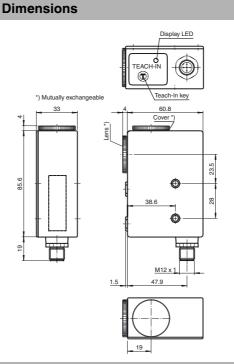
The contrast sensor series DK10, DK2X, DKE2X and DK3X have an extreme robust and IP67 tight industrial standard housing with eight M5 metal reinforced inserts for sensor mounting. The lenses are made of high grade glass. All sensors offer different light spot shapes and orientations and have powerful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

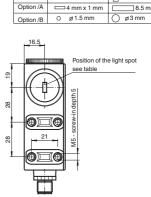
The DK10 sensor series offers laser and LED light sources, a manual sensitivity adjustment and high sensing ranges up to 800 mm.

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.





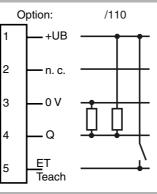
sor range 9.5 m

1 mm x 4 mm

□ 4 mm x 1 mm

Standard

# **Electrical connection**



## **Pinout**





2	WH
3	BU
4	BK
5	GY

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Technical data			Accessories
General specifications			V15-G-5M-PVC
Sensor range		9.5 mm ± 3 mm	Female cordset, M12, 5-pin, PVC cable
Light source		LED	
Light type		Visible green/red/blue, modulated light	V15-W-5M-PVC
Light spot representation		1 mm x 4 mm , light spot perpendicular to housing	Female cordset, M12, 5-pin, PVC cable
Angle deviation		max. ± 3°	
Ambient light limit			OMH-DK
Continuous light		7000 Lux	Right-Angled Mounting Bracket
Teach-In		Dynamic Teach-In	OMH-DK-1
Functional safety related para	ameters		-
MTTF <sub>d</sub>		650 a	Flat Mounting Bracket
Mission Time (T <sub>M</sub> )		20 a	Other suitable accessories can be found at
Diagnostic Coverage (DC)		0 %	www.pepperl-fuchs.com
Indicators/operating means			h the second
Function indicator		LED yellow; switching operation: lights up if print mark is detec-	
		ted Alarm diaplay flaching quickly if no only an evotion is nearible	
Control clomente		Alarm display: flashing quickly, if no safe operation is possible	
Control elements		Teach-In key	
Electrical specifications		10 001/00	
Operating voltage	UB	1030 V DC	
Ripple		10 %	
No-load supply current	I <sub>0</sub>	≤ 60 mA	
Input			
Function input		Teach-In input	
Output			
Signal output		Push-pull output, short-circuit protected, reverse polarity protec- ted	
Switching voltage		$PNP: \geq (+U_B - 2.5  V) \text{ , } NPN: \leq 1.5  V$	
Switching current		max. 200 mA	
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			
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 a ves	nd directi	i-	
Standard conformity			
Product standard		EN 60947-5-2:2007 IEC 60947-5-2:2007	
Shock and impact resistance	3	IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions	
Viburting and interest			

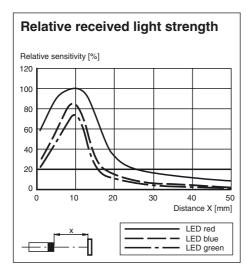
Approvals and certificates

Vibration resistance

CCC approval

CCC approval / marking not required for products rated  $\leq$ 36 V

IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 g in each X, Y and Z



directions

### **Additional information**

2

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Date of issue: 2017-02-15 418096\_eng.xml

Release date: 2017-02-15 17:52

## Adjustment

- 1. Adjust light spot to background. The sensor must be bend 10° to 15° towards the material surface if the object surface is reflective or glossy.
- 2. Keep Teach-In key at the device pressed or connect +UB to external input ET continuously. The Teach-In process starts 50 ms after the Teach-In signal is connected.
- 3. The print mark must cover the light spot for at least 1 ms completely. Move the print mark through the light spot.
- 4. The Teach-In process finishes 50 ms after the Teach-In-signal (keystroke or ET) with the following possible conditions: Teach-In successful: the non-volatile saving of the taught-in values in EEPROM follows. Indicator-LED illuminates when print mark is detected. Push-pull output switches when print mark is detected to  $+U_B$ , with background to 0 V.

ALARM-function: Recorded contrast for all emitter light colours too faint. Indicator-LED flashes with approx. 4 Hz, optional analog-output shows minimal signal. Return to the operation mode with the latest accepted values after keystroke or +U<sub>B</sub> at ET (at least 50 ms).

The switching level is centered between the evaluated print mark/background-contrast values.

The sensor automatically selects and stores the most suitable emitter colour for the best print mark/background-contrast.

For exact contrast evaluation, the DK... can optionally be equipped with an additional analogue output.

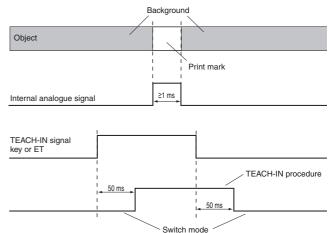
### **Emitter-test function:**

- 1. Switch on sensor supply while active Teach-In signal (keystroke or ET).
- 2. After Teach-In is released, the green emitter is switched.
- 3. The red emitter is switched after the second Teach-In.
- 4. The blue emitter is switched after the third Teach-In.
- 5. After the forth Teach-In: normal switching operation.

The switching of the output is suppressed during the test operation.



DK21-9.5/A/110/124



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