



## Print mark contrast sensor DK20/35B/79B



- 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
- Red transmission light

Print mark contrast sensor, 50 mm detection range, red light, light/dark on, external Teach-In, analog output, push-pull output, M12 plug



### Function

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).

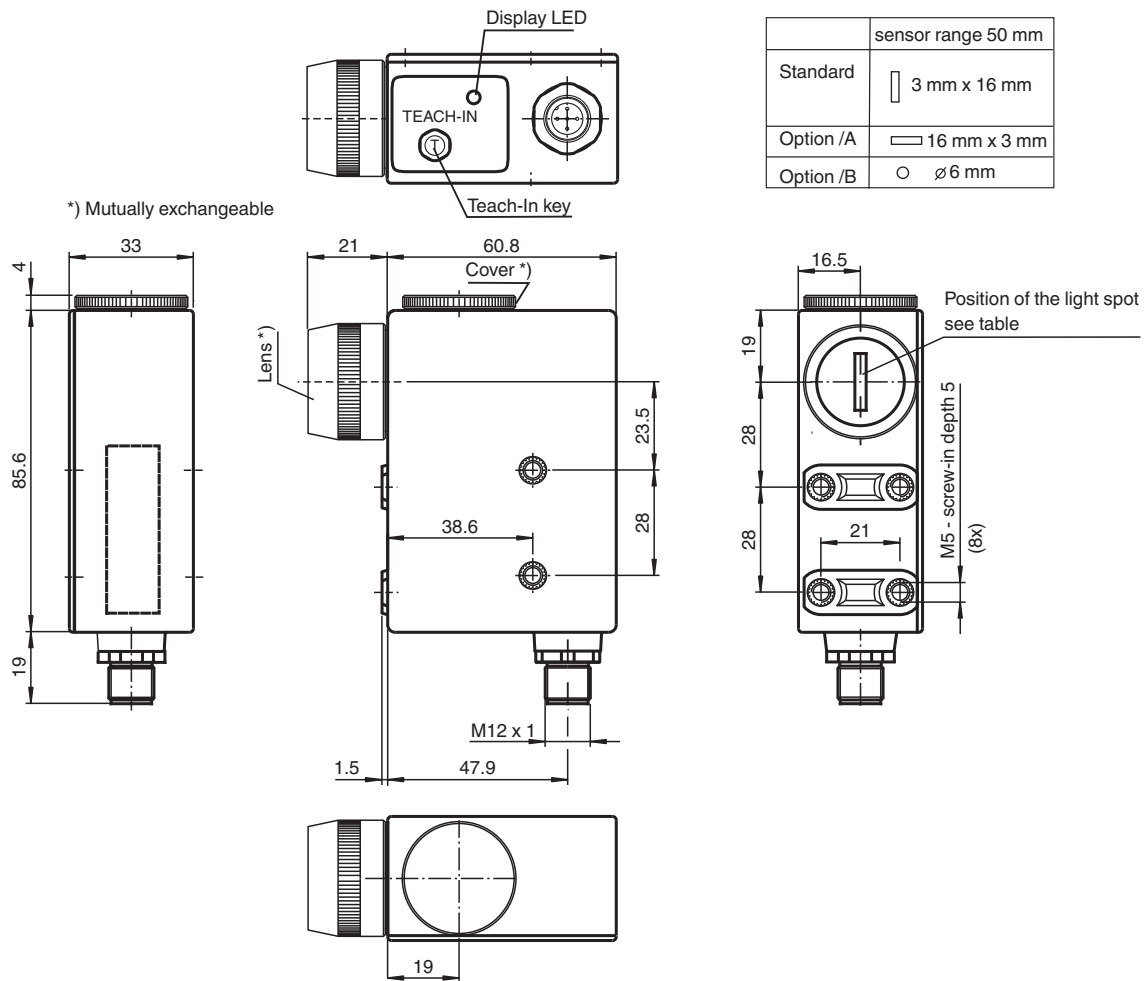
The DK10 sensor series offers laser and LED light sources, a manual sensitivity adjustment and high sensing ranges up to 800 mm.

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



## Technical Data

### General specifications

Sensor range	50 mm
Light source	LED
Light type	modulated visible red light
Light spot representation	3 mm x 16 mm , light spot parallel to housing
Angle deviation	max. $\pm 3^\circ$
Ambient light limit	
Continuous light	7000 Lux
Teach-In	static Teach-In

### Functional safety related parameters

MTTF <sub>d</sub>	650 a
Mission Time (T <sub>M</sub> )	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 <sub>B</sub>	10 ... 30 V DC
Ripple		10 %
No-load supply current	I <sub>0</sub>	≤ 70 mA

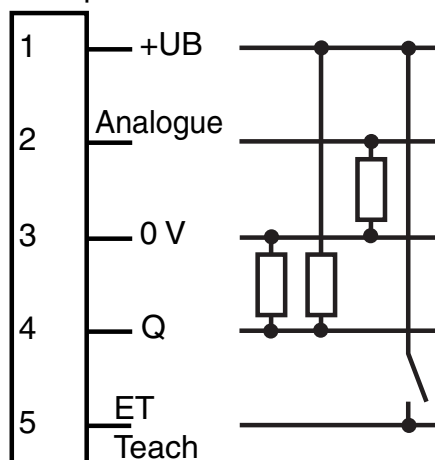
### Input

## Technical Data

Function input		Teach-In input
<b>Output</b>		
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: $\geq (+U_B - 2.5 \text{ V})$ , NPN: $\leq 1.5 \text{ V}$
Switching current		max. 200 mA
Measurement output		Analog output 0.3 ... 10 mA, ( $R_L \leq 600 \text{ Ohm}$ )
Switching frequency	f	16.5 kHz
Response time		30 $\mu\text{s}$
<b>Conformity</b>		
Product standard		EN 60947-5-2
<b>Compliance with standards and directives</b>		
Standard conformity		
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
<b>Approvals and certificates</b>		
EAC conformity		TR CU 020/2011
UL approval		cULus Listed , Class 2 power source
CCC approval		CCC approval / marking not required for products rated $\leq 36 \text{ V}$
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-20 ... 75 °C (-4 ... 167 °F)
<b>Mechanical specifications</b>		
Housing width		33 mm
Housing height		85.6 mm
Housing depth		60.8 mm
Degree of protection		IP67
Connection		5-pin, M12 x 1 connector
Material		
Housing		PC (glass-fiber-reinforced Makrolon)
Optical face		glass
Mass		200 g

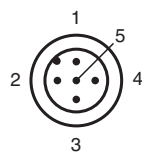
## Connection Assignment

Option: /79b/110







Release date: 2022-03-30 Date of issue: 2022-03-30 Filename: 418088\_eng.pdf

Connection Assignment



Accessories

	V15-G-5M-PVC	Female cordset single-ended M12 straight A-coded, 5-pin, PVC cable grey
	V15-W-5M-PVC	Female cordset single-ended M12 angled A-coded, 5-pin, PVC cable grey
	OMH-DK	Right-Angled Mounting Bracket
	OMH-DK-1	Flat Mounting Bracket

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## Assembly

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.

## Teach-in

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.

For exact contrast evaluation the DK... , as an option, can be delivered with an additional analogue output.