



Print mark contrast sensor DK20-2497(/49)

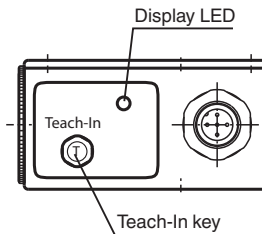


- Diffuse mode sensor for recording any print mark
- Static TEACH-IN: automatic switching threshold adaptation
- 30 μ s response time, suitable for extremely rapid scanning processes
- 3 emitter colors: green, red and blue

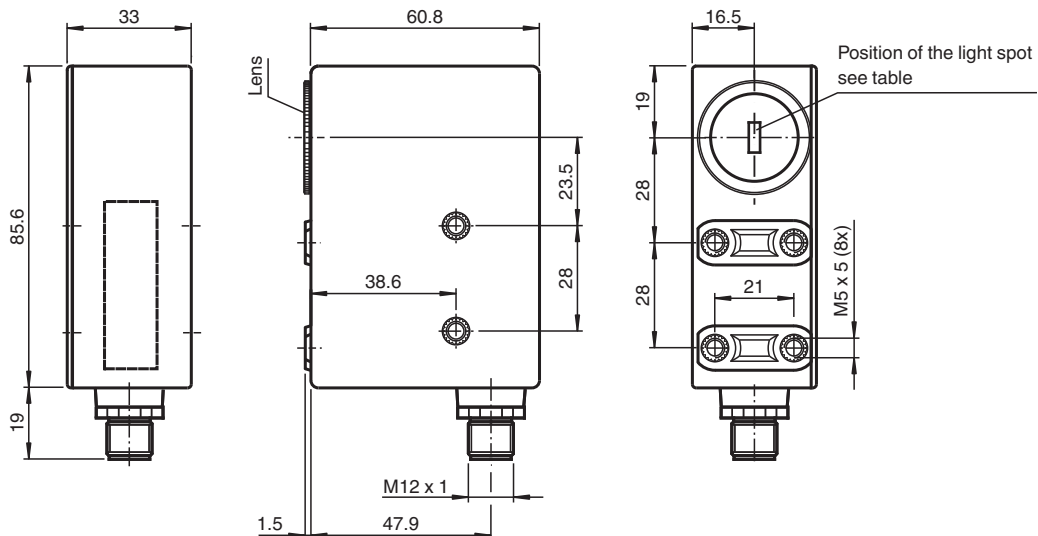
Print mark contrast sensor with plastic lens, 9.5 mm detection range, RGB light, light/dark on, external Teach-in, NPN output, PNP output, M12 plug



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	Ø 1.5 mm	Ø 3 mm



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	rectangular 1 mm x 4 mm ,
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
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Output

Switching type	light/dark on switchable, results from the order of the Teach-In	
Signal output		1 PNP and 1 NPN short-circuit protected, open collector, synchronized-switching
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

Conformity

Product standard	EN 60947-5-2
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Compliance with standards and directives

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

Approvals and certificates

EAC conformity	TR CU 020/2011
UL approval	cULus Listed , Class 2 power source
CCC approval	CCC approval / marking not required for products rated ≤36 V

Ambient conditions

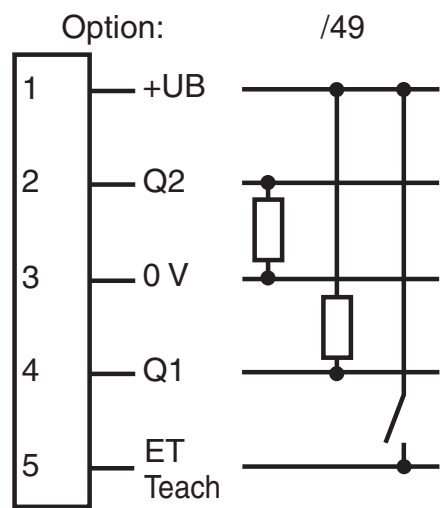
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Storage temperature	-20 ... 75 °C (-4 ... 167 °F)

Mechanical specifications

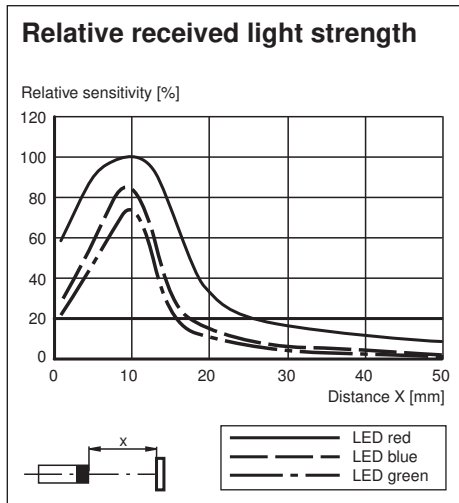
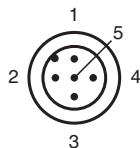
Housing width	33 mm
Housing height	85.6 mm
Housing depth	60.8 mm
Degree of protection	IP67
Connection	5-pin, M12 x 1 connector
Material	
Housing	PC (glass-fiber-reinforced Makrolon)
Optical face	plastic
Mass	200 g

Release date: 2022-03-30 Date of issue: 2022-03-30 Filename: 418086_eng.pdf

Connection Assignment



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

Teach-In

Adjustment

1. Adjust light spot to print mark. In case of mirroring or shiny object surface tilt Sensor by 10° ... 15°.
2. Press Teach-In key, or apply a positive pulse (+UB) for at least 50 ms to the external Teach-In input. Now the indication LED flashes slowly (approx. 1 Hz).
3. Adjust light spot to the background
4. Press Teach-In key, or apply a positive pulse (+UB) for at least 50 ms to the external Teach-In input once more.
5. Teach-In successful: sensor in switching mode, LED is off

Alarme-function: contrast for all emitter colours too weak; a reliable sensor operation cannot be guaranteed. Indicator LED flashes quickly (approx. 4 Hz). Return to switch mode by keystroke.

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.

Switching type:

The output switches at the receiver signal that has been first taught-in after +U_B. The light-on/dark-on switching results from the changed sequence of the Teach-In procedure and is therefore reversible.

Emitter-test function:

1. Connection of +U_B at active Teach-In signal (keystroke or ext. Teach-In).
2. After teach-in is finished (keystroke or ext. Teach-In signal) 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: switching operation

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

