

SELECTION GUIDE

Contrast scanners

Operating principle



Contrast scanners detect markings, even those with only slight contrast with respect to the background, at very high processing speeds. Automatic adaptation of the wavelength allows the slightest changes in grey value to be detected, independent of the color combination of the marking and background.

Products and typ. scanning ranges [mm]



KRT... 3B
Scanning ranges: **14.5 / 60**

from **page 424** onwards



KRT... 55
Scanning ranges: **14.5**

from **page 424** onwards



KRT... 20B
Scanning ranges: **12 / 20 / 50**

from **page 424** onwards



KRTM 20
Scanning ranges: **12 / 20 / 50**

from **page 424** onwards

Features

- Multicolor-, white-light- and laser contrast scanners available
- Detection of the slightest differences in contrast by means of highly dynamic transmitter regulation
- Various teach-in variants for optimum process integration
- Special functions can be enabled via a keyboard
- Temperature compensation ensures stable scanning over a long operating period

Color sensors

Operating principle



Color sensors detect the color of an object by comparing with a taught-in reference color. They generate a switching signal when both colors match within a specified tolerance range.

Products and typ. scanning ranges [mm]



CRT 20B
Scanning ranges: **12.5 / 60**

from **page 450** onwards



CRT 442
Scanning ranges: **12.5**

from **page 450** onwards

Features

- Multicolor LED transmitter
- Color detection with incident light and transmitted light
- Detection of different colors via 1/4 digital outputs
- Up to four reference colors can be stored
- Programming via teach-in
- Analogue evaluation with transmitter switchover

Luminescence scanners

Operating principle



A luminescent material which is illuminated with blue light reflects light with a longer wavelength. This effect, combined with appropriate filtering, makes it possible to detect luminescent markings or materials, even on optically critical surfaces.

Products and typ. scanning ranges [mm]



LRT 8
Scanning ranges: 0 ... 100

from **page 456** onwards



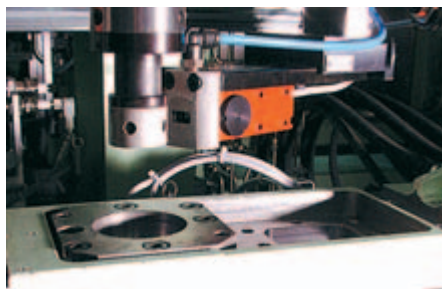
LRT 440
Scanning ranges: 0 ... 150

from **page 456** onwards

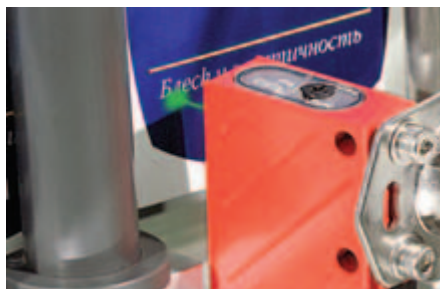
Features

- UV LED transmitter
- Detection of visible and invisible luminescent material
- Luminescence scanners in various housings
- Filtering options
- PNP, NPN and analog outputs

OVERVIEW OF CONTRAST SCANNERS



Slit and hole recognition

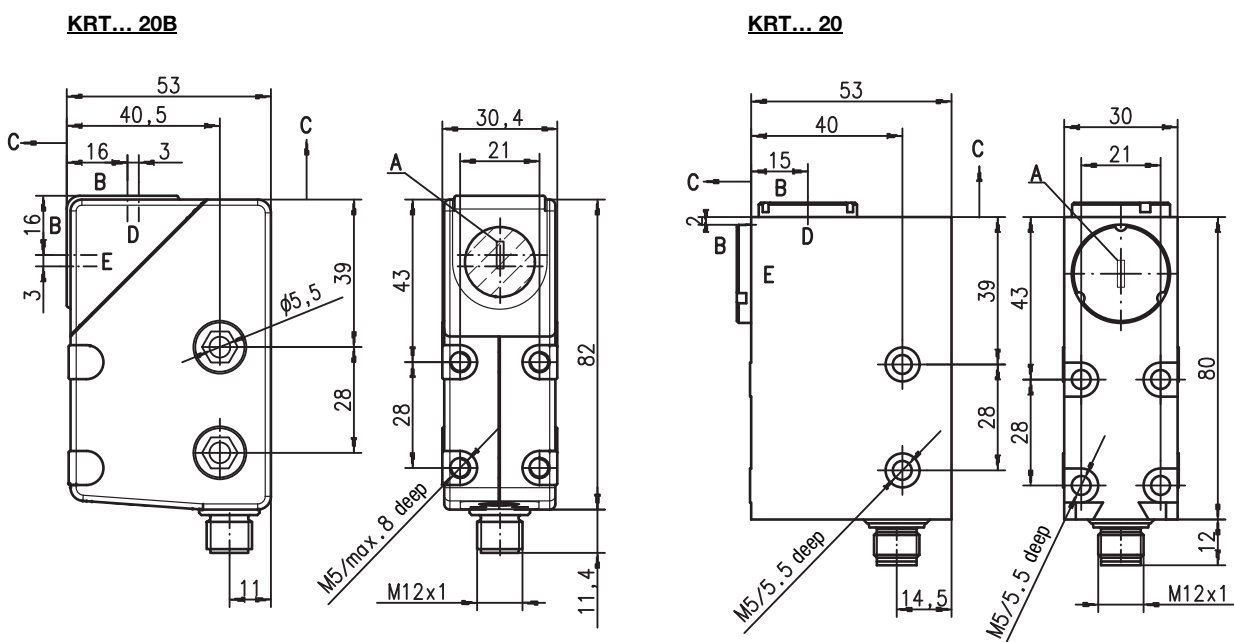


Mark detection



Dimensioned drawing KRT... 3B... see 3B Series standard sensors on page 32.
Dimensioned drawing KRT... 55... see 55 Series standard sensors on page 130.

Dimensioned drawing



- A Vertical light spot orientation
- B Optical axis
- C Scanning range
- D Head
- E Front



Further details can be found in the respective data sheet.

We reserve the right to make changes • KRT_Overview_EN.fm



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KRT 3B / 55 / 20(B)

Contrast scanners	Scanning ranges	Page
 Contrast scanner KRT... 3B	14.5 / 60mm	426
 Contrast scanner KRT... 55	13mm	436
 Contrast scanner KRT... 20(B)	12 ... 50mm	442

Additional products - special sensors:

 Color sensors	CRT 20B, CRT 442	450
 Luminescence scanners	LRT 8, LRT 440	456



Common technical data

Electrical data	Operating voltage U_B	10 ... 30/18 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA}/\leq 60\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2V)/\leq 2V$
Indicators	Green LED	Ready, teach-in
	Yellow LED	Obj. detected, teach-in
Mechanical data	Housing	Metal
	Optics cover	Glass
	Weight (...3B/...55/...20)	10g/50g/300g
Environmental data	Ambient temperature (operation)	..3B: $-30^\circ\text{C} \dots +55^\circ\text{C}$
		Laser 3B: $-10^\circ\text{C} \dots +55^\circ\text{C}$
		..55/20B: $-30^\circ\text{C} \dots +55^\circ\text{C}$
	..20: $-25^\circ\text{C} \dots +60^\circ\text{C}$	
	VDE safety class	II, III for metal connector
	Protection class	IP 67, IP 69K
LED class	1 acc. to EN 60825-1	
Standards applied	IEC 60947-5-2, UL 508	

Mounting systems for this series can be found from page 526 onwards

Features

- Multicolor, white light or laser light
- Variants with interchangeable objectives for scanning ranges of 12mm, 20mm and 50mm
- Models with memory for up to 128 different labels
- Analog and digital $10\mu\text{s}$ high-speed interface
- Automatic amplifier adaptation for shiny and dull cut marks
- IO-Link



Optical Sensor ABC

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CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 3B / 4.1121 - S8 50110584	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.1121, 200 - S8 50113785	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.1121, 200 - S12 50110586	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.1221 - S8 50110588	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.1221, 200 - S12 50110590	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 3B / 4.2121 - S8 50111768	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP

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Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 3B
Contrast scanners



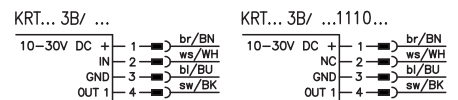
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 5, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 5, 6, 7, 8, 10	e, f
M8 connector	1, 5, 6, 7, 8, 9, 10	a, b, c, d



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- Outputs Page 568

Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 Light spot orientation horizontal
- 10 UL approval (class 2 acc. to NEC)

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- Standard Sensors
- Measuring Sensors
- Ultrasonic Sensors
- Inductive Switches
- Forked Sensors
- Special Sensors
- Fiber Optic Sensors
- Light Curtains
- Protective Sensors
- Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 3B / 2.1121 - S8 50110585	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 3B / 2.1121, 200 - S12 50110587	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 3B / 2.1221 - S8 50110589	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 3B / 2.1221, 200 - S12 50110591	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 3B / 6.1121 - S8 50111312	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xPush-pull/DC
KRTM 3B / 6.1221 - S8 50111313	14.5 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xPush-pull/DC

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Accessories / connection cables

 More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC


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KRT 3B
Contrast scanners



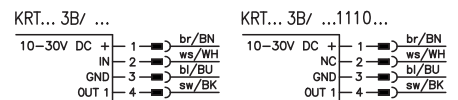
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 5, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 5, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d
M8 connector	1, 5, 6, 7, 8, 9, 10	a, b, c, d



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Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 IO-Link COM2
- 10 UL approval (class 2 acc. to NEC)

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Standard Sensors

Measuring Sensors

Ultrasonic Sensors

Inductive Switches

Forked Sensors

Special Sensors

Fiber Optic Sensors

Light Curtains

Protective Sensors

Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner					
KRTW 3B / 4.1110 - S8 50110572	14.5 ± 2mm	10 ... 30VDC	6kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.1121 - S8 50110576	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.1121, 200 - S12 50110578	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.2121 - S8 50111769	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 4.0 x 1.5mm ²	1 x PNP
KRTW 3B / 4.1321 - S8 50110580	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 3B / 4.1321, 200 - S12 50110582	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP

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Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 3B
Contrast scanners



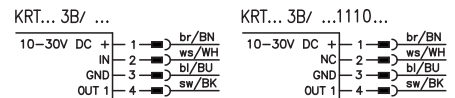
Connection	Option	Accessories
M8 connector	2, 4, 5, 10	a, b, c, d
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d
M8 connector	1, 3, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 3, 6, 7, 8, 10	e, f



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Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Economy housing
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 Light spot orientation horizontal
- 10 UL approval (class 2 acc. to NEC)

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- Special Sensors
- Fiber Optic Sensors
- Light Curtains
- Protective Sensors
- Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner					
KRTW 3B / 2.1110 - S8 50110573	14.5 ± 2mm	10 ... 30VDC	6kHz	White light 1.5 x 4.0mm ²	1 xNPN
KRTW 3B / 2.1121 - S8 50110577	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 xNPN
KRTW 3B / 2.1121, 200 - S12 50110579	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 xNPN
KRTW 3B / 2.1321 - S8 50110581	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 xNPN
KRTW 3B / 2.1321, 200 - S12 50110583	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 xNPN
KRTW 3B / 6.1121 - S8 50111319	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 xPush-pull/DC
KRTW 3B / 6.1321 - S8 50111320	14.5 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 xPush-pull/DC

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Accessories / connection cables

 More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC


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KRT 3B
Contrast scanners



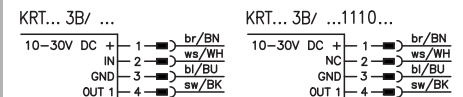
Connection	Option	Accessories
M8 connector	2, 4, 5, 10	a, b, c, d
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 3, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 3, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d
M8 connector	1, 3, 6, 7, 8, 9, 10	a, b, c, d



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Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 IO-Link COM2
- 10 UL approval (class 2 acc. to NEC)

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CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Laser contrast scanner					
KRTL 3B / 4.3111 - S8 50110592	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1 x PNP
KRTL 3B / 4.3111, 200 - S12 50110594	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1 x PNP
KRTL 3B / 2.3111 - S8 50110593	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1 x NPN
KRTL 3B / 2.3111, 200 - S12 50110595	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1 x NPN
KRTL 3B / 6.3111 - S8 50111321	60 ± 20mm	10 ... 30VDC	4kHz	Red light laser class 1 0.5 x 1.0mm ²	1 x Push-pull/DC

Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC



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KRT 3B
Contrast scanners



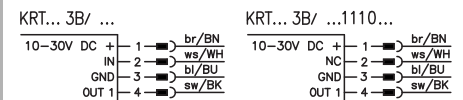
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 9, 10	a, b, c, d



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Electrical connection



Options

- 1 Teach input
- 2 Direct connection to AS-interface I/O coupling modules
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 IO-Link COM2
- 10 UL approval (class 2 acc. to NEC)

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CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 55 / 4.1121 - S8 50111644	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1121, 5000 50114074	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1121, 200 - S12 50110611	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1221 - S8 50110613	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP
KRTM 55 / 4.1221, 200 - S12 50110615	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 x PNP

Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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KRT 55
Contrast scanners



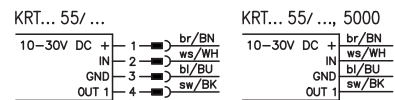
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 9	a, b, c, d
Cable, 5 m	1, 4, 6, 7, 8, 9	
Cable, 0.2 m, with M12 connector	1, 4, 6, 7, 8, 9	e, f
M8 connector	1, 5, 6, 7, 8, 9	a, b, c, d
Cable, 0.2 m, with M12 connector	1, 5, 6, 7, 8, 9	e, f



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Electrical connection



Options

- 1 Teach input
- 2 IO-Link COM2
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 UL approval (class 2 acc. to NEC)

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Measuring Sensors

Ultrasonic Sensors

Inductive Switches

Forked Sensors

Special Sensors

Fiber Optic Sensors

Light Curtains

Protective Sensors

Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Multicolor contrast scanner					
KRTM 55 / 2.1121 - S8 50111610	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 55 / 2.1121, 200 - S12 50110612	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 55 / 2.1221 - S8 50110614	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 55 / 2.1221, 200 - S12 50110616	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xNPN
KRTM 55 / 6.1121 - S8 50111643	13 ± 2mm	10 ... 30VDC	10kHz	RGB 1.5 x 6.5mm ²	1 xPush-pull/DC

Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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KRT 55
Contrast scanners



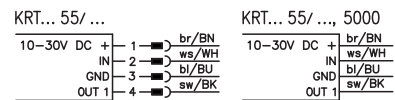
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 9	a, b, c, d
Cable, 0.2m, with M12 connector	1, 4, 6, 7, 8, 9	e, f
M8 connector	1, 5, 6, 7, 8, 9	a, b, c, d
Cable, 0.2m, with M12 connector	1, 5, 6, 7, 8, 9	e, f
M8 connector	1, 2, 4, 6, 7, 8, 9	a, b, c, d



Optical Sensor ABC

- Contrast scanners Page 565
- Connection types Page 568
- Outputs Page 568

Electrical connection



Options

- 1 Teach input
- 2 IO-Link COM2
- 3 Static 1-point teach-in via teach button/line
- 4 Static 2-point teach-in via teach button/line
- 5 Dynamic 2-point teach-in via teach button/line
- 6 Switching threshold adjustment with EasyTune via teach button
- 7 Switchable pulse stretching
- 8 Keyboard lockout
- 9 UL approval (class 2 acc. to NEC)

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- Light Curtains
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- Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner					
KRTW 55 / 4.1121 - S8 50111642	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 55 / 4.1121, 5000 50114075	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 55 / 4.1121, 200 - S12 50110602	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x PNP
KRTW 55 / 2.1121 - S8 50110601	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x NPN
KRTW 55 / 2.1121, 200 - S12 50110603	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x NPN
KRTW 55 / 6.1121 - S8 50111641	13 ± 2mm	10 ... 30VDC	10kHz	White light 1.5 x 4.0mm ²	1 x Push-pull/DC

Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
f 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC

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KRT 55
Contrast scanners



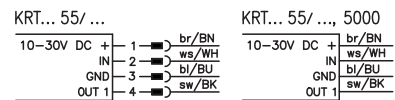
Connection	Option	Accessories
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 5 m	1, 4, 6, 7, 8, 10	
Cable, 0.2 m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 4, 6, 7, 8, 10	a, b, c, d
Cable, 0.2 m, with M12 connector	1, 4, 6, 7, 8, 10	e, f
M8 connector	1, 2, 4, 6, 7, 8, 10	a, b, c, d



Optical Sensor ABC

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- Connection types Page 568
- Outputs Page 568

Electrical connection



Options

- Teach input
- IO-Link COM2
- Static 1-point teach-in via teach button/line
- Static 2-point teach-in via teach button/line
- Dynamic 2-point teach-in via teach button/line
- Switching threshold adjustment with EasyTune via teach button
- Switchable pulse stretching
- Keyboard lockout
- Light spot orientation horizontal
- UL approval (class 2 acc. to NEC)

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- Protective Sensors
- Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
RGB multicolor contrast scanners					
KRTM 20B/4.4110 - S12 50112446	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.5110 - S12 50112447	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.4121 - S12 50111627	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.4221 - S12 50111633	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.5121 - S12 50111628	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.5221 - S12 50111634	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	PNP
KRTM 20B/4.6121 - S12 50111771	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 1.5 x 4mm ²	PNP

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Accessories / connection cables

 More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC


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KRT 20B
Contrast scanners



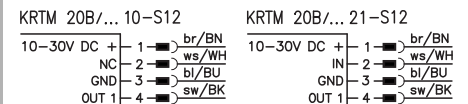
Connection	Option	Accessories	
M12 connector	1, 4, 7	a, b, c, d, e, f	
M12 connector	1, 5, 7	a, b, c, d, e, f	
M12 connector	2, 4, 7	a, b, c, d, e, f	
M12 connector	3, 4, 7	a, b, c, d, e, f	
M12 connector	2, 5, 7	a, b, c, d, e, f	
M12 connector	3, 5, 7	a, b, c, d, e, f	
M12 connector	2, 4, 6, 7	a, b, c, d, e, f	



Optical Sensor ABC

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Electrical connection



Options

- 1 Static 2-point teach-in via teach button
- 2 Static 2-point teach-in via teach button/input
- 3 Dynamic 2-point teach-in via teach button/input
- 4 Light beam gate on face
- 5 Light beam gate on front
- 6 Light spot orientation horizontal
- 7 UL approval (class 2 acc. to NEC)

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- Protective Sensors
- Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
RGB multicolor contrast scanners					
KRTM 20B/2.4110 - S12 50110600	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.5110 - S12 50112445	13.5 ± 3mm	10 ... 30VDC	6kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.4121 - S12 50111629	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.4221 - S12 50111635	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.5121 - S12 50111630	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/2.5221 - S12 50111636	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 4.0 x 1.5mm ²	NPN
KRTM 20B/6.4121 - S12 50111625	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 1.5 x 4mm ²	Push-pull/DC
KRTM 20B/6.5121 - S12 50111626	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	RGB light 1.5 x 4mm ²	Push-pull/DC

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Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



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KRT 20B
Contrast scanners



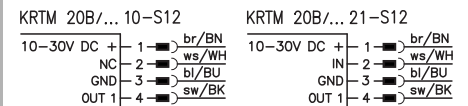
Connection	Option	Accessories
M12 connector	1, 4, 7	a, b, c, d, e, f
M12 connector	1, 5, 7	a, b, c, d, e, f
M12 connector	2, 4, 7	a, b, c, d, e, f
M12 connector	3, 4, 7	a, b, c, d, e, f
M12 connector	2, 5, 7	a, b, c, d, e, f
M12 connector	3, 5, 7	a, b, c, d, e, f
M12 connector	2, 4, 6, 7	a, b, c, d, e, f
M12 connector	2, 5, 6, 7	a, b, c, d, e, f



Optical Sensor ABC

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- Connection types Page 568
- Outputs Page 568

Electrical connection



Options

- 1 Static 2-point teach-in via teach button
- 2 Static 2-point teach-in via teach button/input
- 3 Dynamic 2-point teach-in via teach button/input
- 4 Light beam gate on face
- 5 Light beam gate on front
- 6 IO-Link COM2
- 7 UL approval (class 2 acc. to NEC)

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- Fiber Optic Sensors
- Light Curtains
- Protective Sensors
- Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
White light contrast scanner RGB					
KRTW 20B/4.4121 - S12 50111621	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	PNP
KRTW 20B/4.5121 - S12 50111622	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	PNP
KRTW 20B/4.6121 - S12 50111770	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 1.5 x 4mm ²	PNP
KRTW 20B/2.4121 - S12 50111623	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	NPN
KRTW 20B/2.5121 - S12 50111624	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	NPN
KRTW 20B/6.4121 - S12 50111619	13.5 ± 3mm	10 ... 30VDC	10kHz (internally)	White light 4.0 x 1.5mm ²	Push-pull/DC

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Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC



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KRT 20B
Contrast scanners



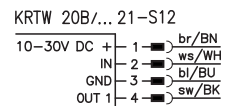
Connection	Option	Accessories	
M12 connector	1, 2, 6	a, b, c, d, e, f	
M12 connector	1, 3, 6	a, b, c, d, e, f	
M12 connector	1, 2, 4, 6	a, b, c, d, e, f	
M12 connector	1, 2, 6	a, b, c, d, e, f	
M12 connector	1, 3, 6	a, b, c, d, e, f	
M12 connector	1, 2, 5, 6	a, b, c, d, e, f	



Optical Sensor ABC

- Contrast scanners Page 565
- Connection types Page 568
- Outputs Page 568

Electrical connection



Options

- 1 Static 2-point teach-in via teach button/input
- 2 Light beam gate on face
- 3 Light beam gate on front
- 4 Light spot orientation horizontal
- 5 IO-Link COM2
- 6 UL approval (class 2 acc. to NEC)

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- Fiber Optic Sensors
- Light Curtains
- Protective Sensors
- Ex Sensors

CONTRAST SCANNERS

Part description Part No.:	Scanning range ¹⁾	Operating voltage	Switching frequency	Light source Light spot	Output
RGB multicolor contrast scanners					
KRTM 20 M/P - 20 - 6320 - S12 50113435	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	PNP
KRTM 20 M/P - 20 - 3320 - S12 50114202	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light Ø 0.6mm	PNP
KRTM 20 M/N - 20 - 6320 - S12 50113436	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	NPN
KRTM 20 M/N - 20 - 3320 - S12 50114201	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light Ø 0.6mm	NPN
KRTM 20 M/V - 20 - 0004 - S12 50041007	20 ± 2mm	12 ... 30VDC	16kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA PNP
KRTM 20 M/V - 20 - 0001 - S12 50035674	20 ± 2mm	12 ... 30VDC	16kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA PNP
KRTM 20 M/C - 20 - 6526 - S12 50113438	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA PNP
KRTM 20 M/C - 20 - 6626 - S12 50113437	20 ± 2mm	12 ... 30VDC	25/50kHz (digital)	RGB light 4.0 x 1.2mm ²	Analog/mA NPN

1) Other scanning ranges of 12 ± 1 mm or 50 ± 5 mm are possible by changing the objective.

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Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
b 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
c 50034051	OB 12 - KRT 20	Objective for 12mm scanning range
d 50034050	OB 20 - KRT 20	Objective for 20mm scanning range
e 50034049	OB 50 - KRT 20	Objective for 50mm scanning range
f 50034118	WZ - OB - KRT 20	Tool for changing objectives



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KRTM 20
Contrast scanners



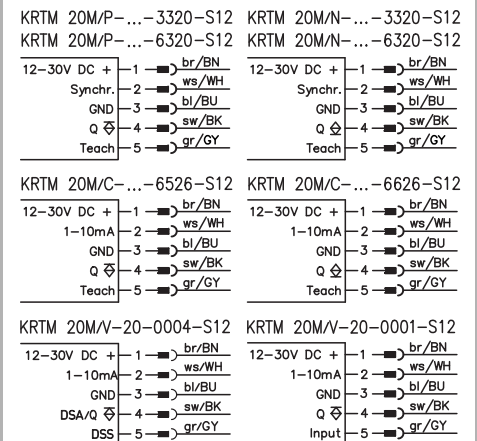
Connection	Option	Accessories
M12 connector	1, 2, 3, 6, 7, 8	a, b, c, d, e, f
M12 connector	1, 2, 3, 6, 7, 8	a, b, c, d, e, f
M12 connector	1, 2, 3, 6, 7, 8	a, b, c, d, e, f
M12 connector	1, 2, 3, 6, 7, 8	a, b, c, d, e, f
M12 connector	1, 4, 6, 7, 8	a, b, c, d, e, f
M12 connector	5, 8	a, b, c, d, e, f
M12 connector	1, 3, 6, 7, 8	a, b, c, d, e, f
M12 connector	1, 3, 6, 7, 8	a, b, c, d, e, f



Optical Sensor ABC

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Electrical connection



Options

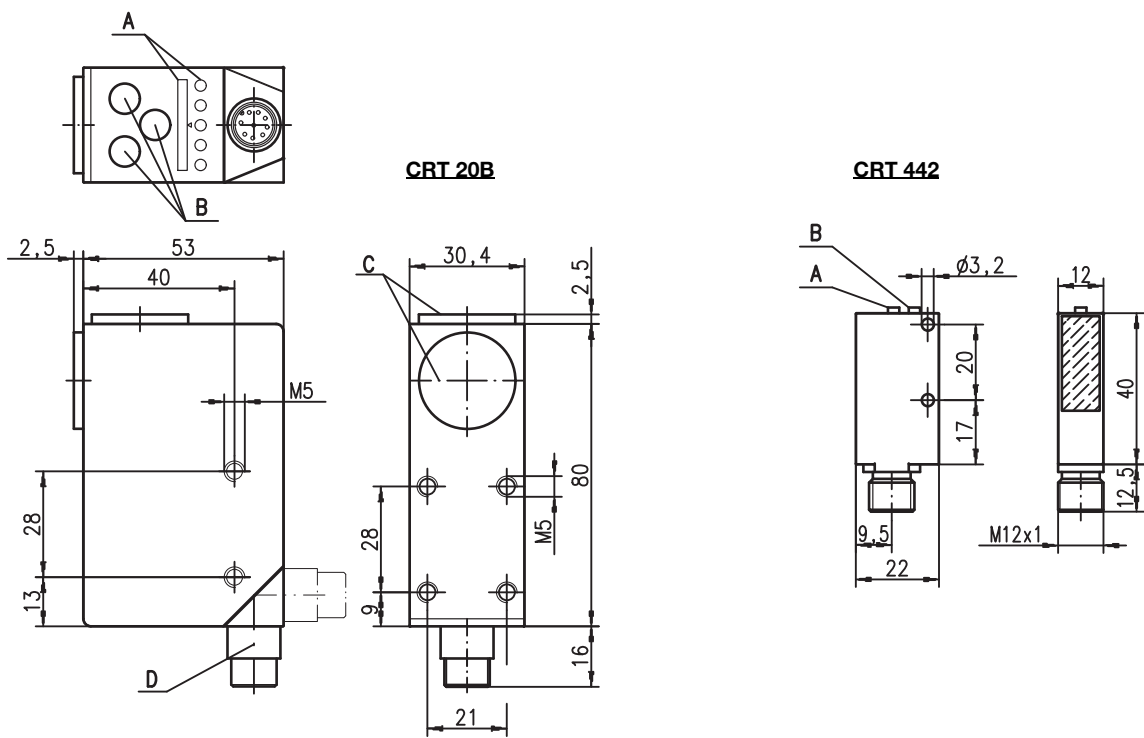
- 1 Static teach-in via teach button/line
- 2 Synchronous input
- 3 High resolution design: 70 gray levels for digital/ 400 gray levels for analog
- 4 Cut-marking system with memory for 128 data sets
- 5 Freely programmable via protocol interface (buttons disabled)
- 6 Switchable pulse stretching
- 7 Light/dark switching
- 8 UL approval

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OVERVIEW OF COLOR SENSORS

Dimensioned drawing



- A** Display elements
- B** Control buttons
- C** Objective
- D** 90° turning connector

 Further details can be found in the respective data sheet.

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CRT 20B / 442

Color sensors	Scanning ranges	Page
 Color sensors - digital output CRT 20B	12.5 / 60mm	452
 Color sensors - digital output CRT 442	12.5mm	454

Additional products - special sensors:

 Contrast scanners	KRT... 3B, KRTG 8, KRT... 20	424
 Luminescence scanners	LRT 8, LRT 440	456



Common technical data

Electrical data	Operating voltage U_B	10 ... 30 / 24VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 80\text{mA} / \leq 60\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready to operate
	Yellow LED	Switching state/error
	Orange LED (CRT 448...)	Teach-in
Mechanical data	Housing	ABS / metal
	Optics cover	Glass
	Weight (...448/...20)	11g/125g/300g
Environmental data	Ambient temperature (operation)	-10°C ... +55°C ...20: -25°C ... +55°C
	Protection class	IP 67
	LED class	1 acc. to EN 60825-1
	Standards applied	IEC 60947-5-2, UL 508
	Mounting systems for this series can be found from page 526 onwards	

Features

- Scanning ranges of 12.5mm and 60mm
- Simple assignment of colors with teach function
- Reversible transmitter colors for sensitive measurement tasks
- High switching frequencies
- Up to 4 digital switching outputs



Optical Sensor ABC

- Color sensors Page 565

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COLOR SENSORS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Color sensors with digital output					
CRT 20B M/P - 60 - 001 - S12 50109597	60mm	10 ... 30VDC	6kHz	RGB light 13.0 x 13.0mm ²	1 x PNP
CRT 20B M/P - 60 - 004 - S12 50109601	60mm	10 ... 30VDC	3.5kHz	RGB light 13.0 x 13.0mm ²	4x PNP
CRT 20B M/N - 60 - 001 - S12 50109595	60mm	10 ... 30VDC	6kHz	RGB light 13.0 x 13.0mm ²	1xNPN
CRT 20B M/N - 60 - 004 - S12 50109599	60mm	10 ... 30VDC	3.5kHz	RGB light 13.0 x 13.0mm ²	4xNPN
CRT 20B M/P - 12 - 001 - S12 50109596	12.5mm	10 ... 30VDC	6kHz	RGB light 4.0 x 2.0mm ²	1 x PNP
CRT 20B M/P - 12 - 004 - S12 50109600	12.5mm	10 ... 30VDC	3.5kHz	RGB light 4.0 x 2.0mm ²	4x PNP
CRT 20B M/N - 12 - 001 - S12 50109594	12.5mm	10 ... 30VDC	6kHz	RGB light 4.0 x 2.0mm ²	1xNPN
CRT 20B M/N - 12 - 004 - S12 50109598	12.5mm	10 ... 30VDC	3.5kHz	RGB light 4.0 x 2.0mm ²	4xNPN

We reserve the right to make changes • CRT_1_EN.fm

Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
b 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC
c 50104591	K - D M12A - 8P - 2m - PUR	Connection cable 2000mm, M12 axial, 8-pin, PUR
d 50104590	K - D M12A - 8P - 5m - PUR	Connection cable 5000mm, M12 axial, 8-pin, PUR



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CRT 20B
Color sensors



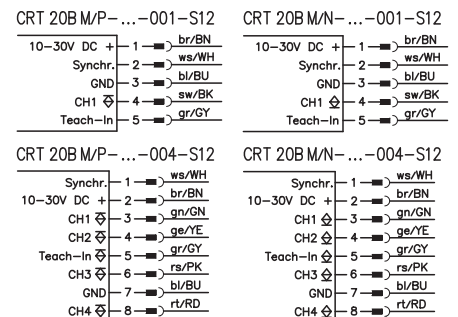
Connection	Option	Accessories
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d
M12 connector	1, 3	a, b
M12 connector	2, 3	c, d



Optical Sensor ABC

- Color sensors Page 565
- Connection types Page 568
- Outputs Page 568

Electrical connection



Options

- 1 Color sensor with 1 channel, teach-in of reference color
- 2 Color sensor with 4 channels, teach-in of reference color
- 3 UL approval

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- Standard Sensors
- Measuring Sensors
- Ultrasonic Sensors
- Inductive Switches
- Forked Sensors
- Special Sensors
- Fiber Optic Sensors
- Light Curtains
- Protective Sensors
- Ex Sensors

COLOR SENSORS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source Light spot	Output
Color sensors with digital output					
CRT 442 K/P - 12 - 001 - S12 50109603	12.5 ± 2mm	24VDC ± 20%	1.5kHz	RGB light 1.5 x 6.5mm ²	1 x PNP
CRT 442 K/N - 12 - 001 - S12 50109602	12.5 ± 2mm	24VDC ± 20%	1.5kHz	RGB light 1.5 x 6.5mm ²	1 x NPN

Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104547	K - D M12W - 4P - 10m - PVC	Connection cable 10000mm, M12 angular, 4-pin, PVC
f 50104546	K - D M12A - 4P - 10m - PVC	Connection cable 10000mm, M12 axial, 4-pin, PVC

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CRT 442
Color sensors



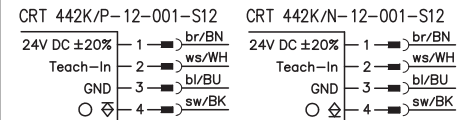
Connection	Option	Accessories
M12 connector	1, 2	a, b, c, d, e, f
M12 connector	1, 2	a, b, c, d, e, f



Optical Sensor ABC

- Color sensors Page 565
- Connection types Page 568
- Outputs Page 568

Electrical connection



Options

- 1 Teach-in of reference color
- 2 UL approval

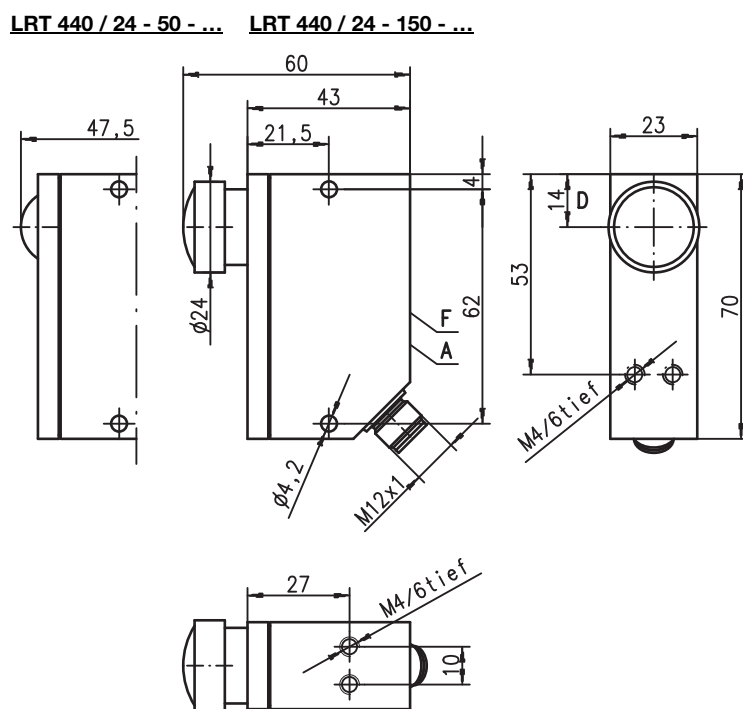
www.leuze.com/special_sensors/

OVERVIEW OF LUMINESCENCE SCANNERS



Dimensioned drawing LRT 8... see 8 Series standard sensors on page 60.

Dimensioned drawing



- A Indicator diode
- B Transmitter
- C Receiver
- D Optical axis
- E Sensitivity adjustment
- F Control button panel



Further details can be found in the respective data sheet.



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LRT 8 / 440

Luminescence scanners	Scanning ranges	Page
 Luminescence scanner LRT 8	0 ... 50mm / 0 ... 100mm	458
 Luminescence scanner LRT 440	0 ... 150mm	458

Additional products - special sensors:

 Contrast scanners	KRT... 3B, KRT... 55, KRT... 20	424
 Color sensors	CRTM 20, CRT 20B, CRT 442	450



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 15\%$ of U_B
	Open-circuit current	$\leq 35\text{mA} / \leq 40\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Yellow LED	Obj. detected/Reflection
Mechanical data	Housing	Metal
	Optics cover	Glass
	Weight (...8/...440)	70g/250g
Environmental data	Ambient temperature (operation)	$-20^\circ\text{C} \dots +60^\circ\text{C}$
	Protection class	IP 67
	Standards applied	IEC 60947-5-2, UL 508 ¹⁾

1) LRT 8 only

Mounting systems for this series can be found from page 527 onwards

Features

- Scanning ranges up to 150mm
- Among others, luminescence scanners in compact housings
- Filter possibility for distinguishing between different-colored luminescences
- Analog sensitivity adjustment via connector interface



Optical Sensor ABC

- Luminescence scanners Page 565

LUMINESCENCE SCANNERS

Part description Part No.:	Scanning range	Operating voltage	Switching frequency	Light source	Output
Luminescence scanners					
LRT 8 / 24.00 - 50 - S12 50041839	0 ... 50mm	10 ... 30VDC	1500Hz	UV light, LED class 1M	1 x PNP 1 x NPN
LRT 8 / 24.04 - 50 - S12 50041840	0 ... 50mm	10 ... 30VDC	1500Hz	UV light, LED class 1M	1 x PNP 1 x NPN
LRT 8 / 24.04 - 100 - S12 50109343	0 ... 100mm	10 ... 30VDC	1500Hz	UV light, LED class 1M	1 x PNP 1 x NPN
LRT 440 / 24 - 150 - 004 - S12 50037909	0 ... 150mm	10 ... 30VDC	600Hz	UV light, laser class 3R	1 x PNP 1 x NPN
LRT 440 / 24 - 50 - 104 - S12 50037910	0 ... 50mm	10 ... 30VDC	600Hz	UV light, laser class 1	Analog/mA 1xPNP 1xNPN

Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104543	K - D M12W - 4P - 2m - PVC	Connection cable 2000mm, M12 angular, 4-pin, PVC
b 50104542	K - D M12A - 4P - 2m - PVC	Connection cable 2000mm, M12 axial, 4-pin, PVC
c 50104545	K - D M12W - 4P - 5m - PVC	Connection cable 5000mm, M12 angular, 4-pin, PVC
d 50104544	K - D M12A - 4P - 5m - PVC	Connection cable 5000mm, M12 axial, 4-pin, PVC
e 50104558	K - D M12W - 5P - 5m - PVC	Connection cable 5000mm, M12 angular, 5-pin, PVC
f 50104557	K - D M12A - 5P - 5m - PVC	Connection cable 5000mm, M12 axial, 5-pin, PVC

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LRT 8 / 440
Luminescence scanners



Connection	Option	Accessories
M12 connector	1, 3, 6, 7	e, f
M12 connector	1, 3, 4, 5, 6, 7	e, f
M12 connector	1, 3, 4, 5, 6, 7	e, f
M12 connector	2, 4, 5	a, b, c, d
M12 connector	2, 4, 5	e, f

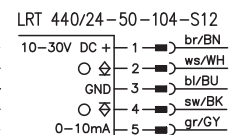
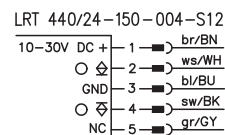
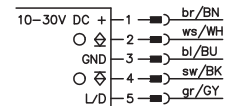


Optical Sensor ABC

- Luminescence scanners Page 565
- Connection types Page 568
- Outputs Page 568

Electrical connection

LRT 8/24.00-50-S12
LRT 8/24.04-50-S12
LRT 8/24.04-100-S12



Options

- 1 Sensitivity adjustment via potentiometer
- 2 Sensitivity adjustment in 256 levels via buttons
- 3 For detecting red luminescence
- 4 For detecting blue/colorless luminescence
- 5 For detecting yellow/yellow-green luminescence
- 6 Light/dark switching
- 7 UL approval

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Standard Sensors

Measuring Sensors

Ultrasonic Sensors

Inductive Switches

Forked Sensors

Special Sensors

Fiber Optic Sensors

Light Curtains

Protective Sensors

Ex Sensors

OVERVIEW OF FIBER OPTIC AMPLIFIERS

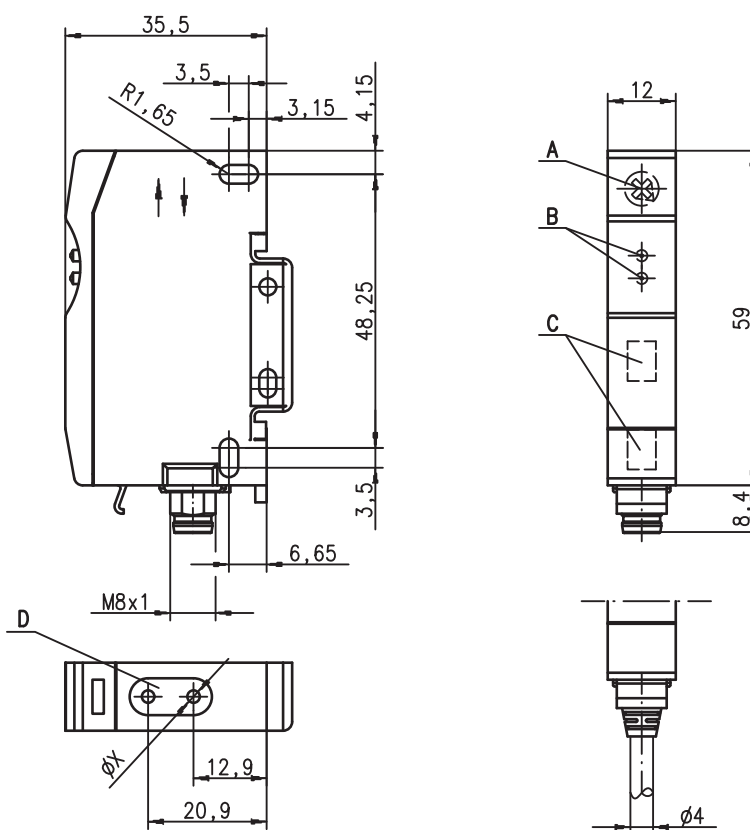
Dimensioned drawing

	X
LVSR 325K/P-201	∅ 2.2
LVSR 325K/P-202-S8	∅ 2.2
LVSR 325K/N-201	∅ 2.2
LVSR 325K/N-202-S8	∅ 2.2
LVSR 325K/P-401	∅ 4
LVSR 325K/P-402-S8	∅ 4



Further details can be found in the respective data sheet.

- A** Fiber optics fixing screw
- B** Indicator diodes
- C** Sensitivity adjustment
- D** Fiber optics input



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LVSR 325
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LVSR 424
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GF
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KF
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LVSR 325

Fiber optic amplifiers	Fiber optics	Page
 Fiber optic amplifier LVSR 325	Plastic / glass fiber	462

Additional products:

 Fiber optic amplifier	LVSR 424	464
 Glass fiber optics	GF	468
 Plastic fiber optics	KF	474



Common technical data

Electrical data	Operating voltage U_B	10 ... 30VDC
	Residual ripple	$\leq 10\%$ of U_B
	Open-circuit current	$\leq 25\text{mA}$
	Signal voltage high/low	$\geq (U_B - 2\text{V}) / \leq 2\text{V}$
Indicators	Green LED	Ready/Teach-in
	Yellow LED	Switching output
	Red LED	Performance res./Teach-in
Mechanical data	Housing	Plastic
	Fiber optic connection	Screw connection
	Weight (without cable)	30g
Environmental data	Ambient temperature (operation)	$-20^\circ\text{C} \dots +70^\circ\text{C}$
	Protection class	IP 65

Features

- For plastic or glass fiber optics
- Teach-in for optimum sensitivity adjustment
- Activation or teach input
- Warning output



Optical Sensor ABC

- Fiber optic sensors Page 566

FIBER OPTIC AMPLIFIERS

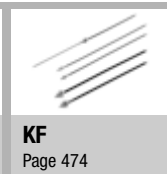
Part description Part No.:	Fiber optics	Light source	Output	Switching
Fiber optic amplifiers for glass and plastic fiber optic cables				
LVSr 325 K / P - 402 - S8 50081301	Glass fiber GF, Ø 4 mm	Red light	PNP	Light/dark configurable
LVSr 325 K / P - 401 50081300	Glass fiber GF, Ø 4 mm	Red light	PNP	Light/dark configurable
LVSr 325 K / P - 202 - S8 50081298	Plastic KF, Ø 2.2 mm	Red light	PNP	Light/dark configurable
LVSr 325 K / P - 201 50081297	Plastic KF, Ø 2.2 mm	Red light	PNP	Light/dark configurable
LVSr 325 K / N - 202 - S8 50033579	Plastic KF, Ø 2.2 mm	Red light	NPN	Light/dark configurable
LVSr 325 K / N - 201 50033581	Plastic KF, Ø 2.2 mm	Red light	NPN	Light/dark configurable

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Accessories / connection cables

More accessories can be found from **page 514** onwards

Part No.	Designation	Features
a 50104525	K - D M8W - 4P - 2m - PVC	Connection cable 2000mm, M8 angular, 4-pin, PVC
b 50104524	K - D M8A - 4P - 2m - PVC	Connection cable 2000mm, M8 axial, 4-pin, PVC
c 50104527	K - D M8W - 4P - 5m - PVC	Connection cable 5000mm, M8 angular, 4-pin, PVC
d 50104526	K - D M8A - 4P - 5m - PVC	Connection cable 5000mm, M8 axial, 4-pin, PVC
e 50104529	K - D M8W - 4P - 10m - PVC	Connection cable 10000mm, M8 angular, 4-pin, PVC
f 50104528	K - D M8A - 4P - 10m - PVC	Connection cable 10000mm, M8 axial, 4-pin, PVC



LVSr 325
Fiber optic amplifiers

Connection	Option	Accessories
M8 connector	1	a, b, c, d, e, f
Cable, 2m	1	
M8 connector	1	a, b, c, d, e, f
Cable, 2m	1	
M8 connector	1	a, b, c, d, e, f
Cable, 2m	1	

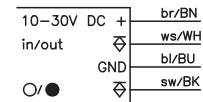


Optical Sensor ABC

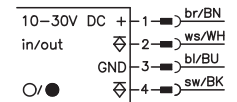
- Fiber optic sensors Page 566
- Connection types Page 568
- Outputs Page 568

Electrical connection

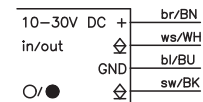
LVSr 325K/P-201
LVSr 325K/P-401



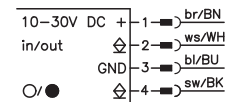
LVSr 325K/P-202-S8
LVSr 325K/P-402-S8



LVSr 325K/N-201



LVSr 325K/N-202-S8



Options

- 1 Teach-in via buttons