

Contrast scanners detect the little differences



Nowadays, contrast scanners are indispensable in automated packaging processes. They are used wherever differences in contrast must be detected quickly and accurately. With over 30 distinguishable grey tones, they are able to detect all types of contrast markings, e.g. print marks on film or packaging materials. A large range of device types employing a variety of contrast detection techniques with different user interfaces are available to fulfil a wide range of application requirements.

- Adjustment of the standard version is carried out manually. The contrast scanner has an integrated adjustment aid for setting the switching threshold.
- The KT 5 is also available as a fibre-optic cable version which can be used in locations where space is restricted.
- In the case of versions with teach-in, the switching threshold can be set via the control cable or by means of the teach-in button on the device.
- A further variant offers dynamic teach-in where the switching threshold is adjusted automatically as markings and background pass through the scanning zone.
- The scanner with dynamic contrast detection offers maximum operating convenience. With this version, the switching threshold is automatically adjusted to the contrast currently being scanned.
- The small and extremely cost-effective KT 2 is the ideal solution for less complex applications.

► KT 5 G positioning tubes to allow precise labelling.




▼ Absolute reliability required: KT 5 monitoring the date stamp on the labels of pharmaceutical products.



► The KT 5 contrast scanner being used for calibrating gas meters.



▲ Making sure the champagne doesn't bubble over too soon: KT 5 contrast scanner uses capsule marks to position champagne bottles.

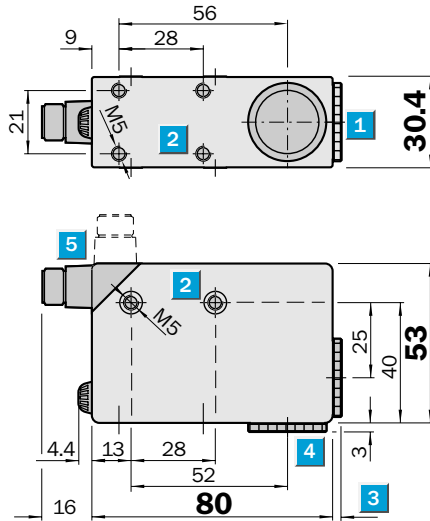

Scanning distance
 10/20/40 mm

Contrast scanners

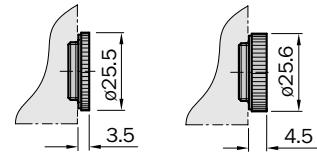
- Green light
- Manual switching threshold adjustment
- Adjustment switch
- Optional time delay
- Switching frequency 10 kHz



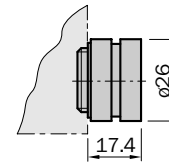
Dimensional drawing



KT 5G-2P 1111	KT 5G-2P 1211
KT 5G-2P 1121	KT 5G-2P 1221
KT 5G-2N 1111	KT 5G-2N 1211

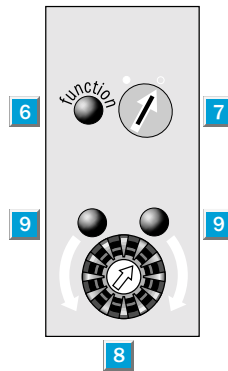


KT 5G-2P 1311
KT 5G-2P 1321
KT 5G-2N 1311



Adjustments possible

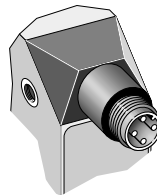
All types



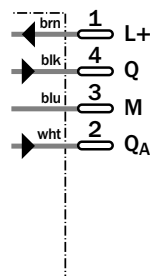
- 1 Lens (light transmission), can be replaced by item 4
- 2 M 5 mounting holes, 5.5 mm deep
- 3 See dimensional drawing of lens
- 4 Blind screw, can be replaced by item 1
- 5 4-pin, M 12 x 1 plug (rotatable through 90°)
- 6 Function signal indicator (yellow)
- 7 Operating mode selector switch
- 8 Light-switching
- 9 Dark-switching
- 8 Switching threshold adjustment
- 9 Adjustment indicators (green)

Connection type

All types



4-pin, M12



Accessories	page
Cable receptacles	496
Lens	556

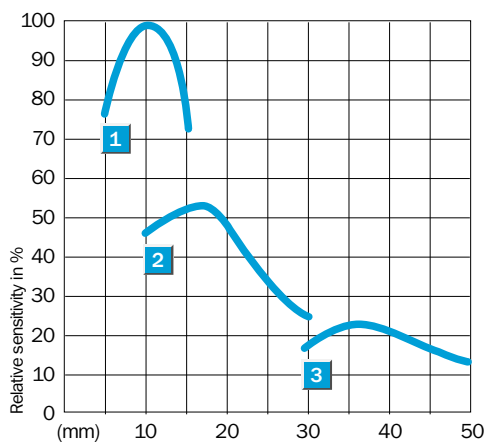
Technical data		KT 5G-2	P1111	P1121	P1211	P1221	P1311	P1321	N1111	N1211	N1311
Scanning distance from front edge of lens/											
Light spot dimensions	10 ± 3 mm / 1.2 x 4.2 mm										
	20 ± 3 mm / 1.5 x 5.5 mm										
	40 ± 3 mm / 1.1 x 4.2 mm										
Light spot direction	Longitudinal										
Light source¹⁾, light type, wavelength	LED, green light, 520 nm										
Supply voltage V_S	10...30 V DC ²⁾										
Ripple ³⁾	< 5 V _{SS}										
Current consumption ⁴⁾	< 80 mA										
Switching outputs	Light-/dark-switching, selectable										
	PNP: HIGH = V _S - < 2 V / LOW = 0 V										
	NPN: HIGH = V _S / LOW = < 2 V										
Output current I _A max.	100 mA										
Response time ⁵⁾	50 μs										
Max. switching frequency ⁶⁾	to 10 kHz										
Time delay	No timing element										
	Deactivation delay, ...20 ms										
Analogue output Q_A, optional	0.3...10 mA										
Switching threshold	Adjustable (standard type)										
Connection type	Plug 4-pin, M12 x 1										
VDE protection class⁷⁾	□										
Enclosure rating	IP 67										
Circuit protection⁸⁾	A, B, C										
Ambient temperature T_A	Operation - 10 °C...+ 55 °C										
	Storage - 25 °C...+ 75 °C										
Shock load	To IEC 68										
Weight	Approx. 400 g										
Housing material	Coated metal										

- 1) Average service life 100,000 h at T_A = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1
- 7) Reference voltage 50 V DC

- 8) A = V_S connections reverse-polarity protected
- B = Output Q and Q_A short-circuit protected
- C = Interference pulse suppression


Scanning distance



- 1 Scanning distance 10 mm
- 2 Scanning distance 20 mm
- 3 Scanning distance 40 mm

Order information

Preferred type	Part no.
KT 5G-2P 1111	1 015 993
KT 5G-2P 1121	1 015 997
KT 5G-2P 1211	1 015 999
KT 5G-2P 1221	1 016 001
KT 5G-2P 1311	1 016 003
KT 5G-2P 1321	1 016 005
KT 5G-2N 1111	1 015 981
KT 5G-2N 1211	1 015 985
KT 5G-2N 1311	1 015 988

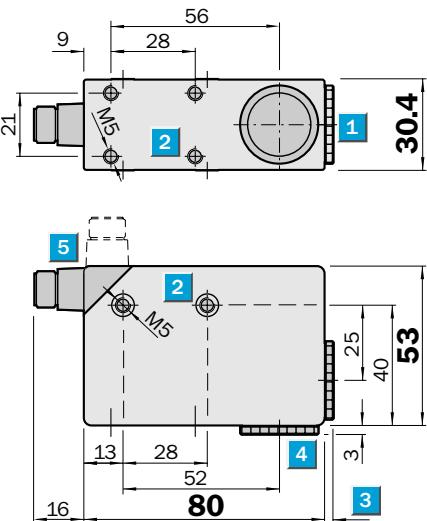

Scanning distance
 10 mm/20 mm

Contrast scanners

- Green light
- Static teach-in via control cable or control panel on unit
- Fine/coarse via control cable or control panel on unit
- No light-/dark-selection
- Switching frequency 10 kHz

Dimensional drawing

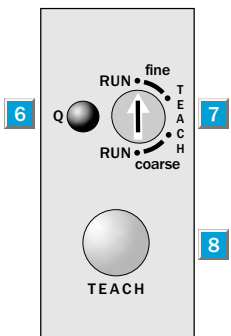
KT 5G-2P1112	KT 5G-2P1212
KT 5G-2N1112	KT 5G-2N1212



1 Lens (light transmission), can be replaced by Item 4
 2 M 5 mounting holes, 5.5 mm deep
 3 See dimensional drawing of lens
 4 Blind screw, can be replaced by Item 1
 5 5-pin, M 12 x 1 plug (rotatable through 90°)
 6 Function signal indicator (yellow)
 7 Pre-selection switch for minimum contrast
 8 Teach-in button

Adjustments possible

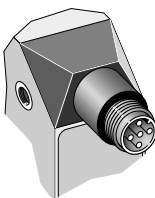
KT 5G-2P1112	KT 5G-2P1212
KT 5G-2N1112	KT 5G-2N1212



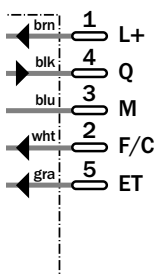
- 1 Lens (light transmission), can be replaced by Item 4
- 2 M 5 mounting holes, 5.5 mm deep
- 3 See dimensional drawing of lens
- 4 Blind screw, can be replaced by Item 1
- 5 5-pin, M 12 x 1 plug (rotatable through 90°)
- 6 Function signal indicator (yellow)
- 7 Pre-selection switch for minimum contrast
- 8 Teach-in button

Connection type

KT 5G-2P1112	KT 5G-2P1212
KT 5G-2N1112	KT 5G-2N1212



5-pin, M 12 x 1



Accessories

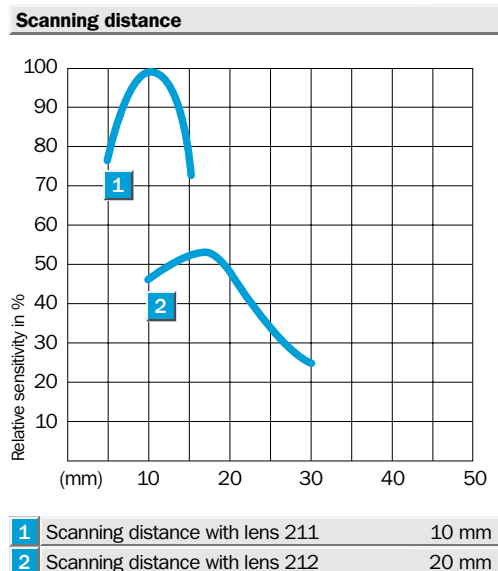
Cable receptacles	page 496
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Technical data		KT 5G-2	P1112	N1112	P1212	N1212						
Scanning distance from front edge of lens												
	10 ± 3 mm											
	20 ± 3 mm											
Light spot dimensions	1.2 x 4.2 mm											
Light source¹⁾, light type	LED, green											
Supply voltage V_S												
	10...30 V DC ²⁾											
Ripple ³⁾	< 5 V _{SS}											
Current consumption ⁴⁾	< 80 mA											
Switching outputs												
	PNP: HIGH = V _S - < 2 V / LOW = 0 V											
	NPN: HIGH = V _S / LOW = < 2 V											
Output current I _A max.	100 mA, short circuit protected											
Response time ⁵⁾	50 μs											
Max. switching frequency ⁶⁾	to 10 kHz											
Teach-in input ET												
	PNP: Teach > 10 V...< V _S											
	Run 0 V or unswitched											
	NPN: Teach 0 V											
	Run V _S or unswitched											
Pulse duration	ET > 10 ms											
Retention time	25 ms non-volatile memory											
Fine/coarse input F/C												
	PNP: Fine 0 V or unswitched											
	Coarse > 10 V...< V _S											
	NPN: Fine V _S or unswitched											
	Coarse 0 V											
Connection type	Plug 5-pin, M 12 x 1											
VDE protection class⁷⁾	□											
Enclosure rating	IP 67											
Circuit protection⁸⁾	A, B, C											
Ambient temperature T_A												
	Operation - 10 °C...+ 55 °C											
	Storage - 25 °C...+ 75 °C											
Shock load	To IEC 68											
Weight	Approx. 400 g											
Housing material	Coated metal											

- 1) Average service life 100,000 h at T_A = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1
- 7) Reference voltage 50 V DC

- 8) A = V_S connections reverse-polarity protected
- B = Output Q short-circuit protected
- C = Interference pulse suppression



Teach-in

Teach-in and fine/coarse (contrast resolution)
The two settings can be triggered simultaneously either via control panel or control cables.

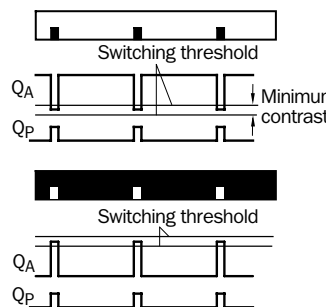
Control panel: The teach-in button can be locked against accidental actuation with "run". In an undefined switching position, no teach-in procedure can be triggered.

Setting via control panel:
1. Select "fine" or "coarse" using rotating switch
2. Position light spot on mark
3. Trigger teach-in via teach-in switch
Light-/dark-switching is not required/acknowledge/signal or Q active = teach-in procedure completed

Setting via control cable:
1. Select "fine" or "coarse" using rotating switch
2. Position light spot on mark
3. Trigger teach-in via ET control cable

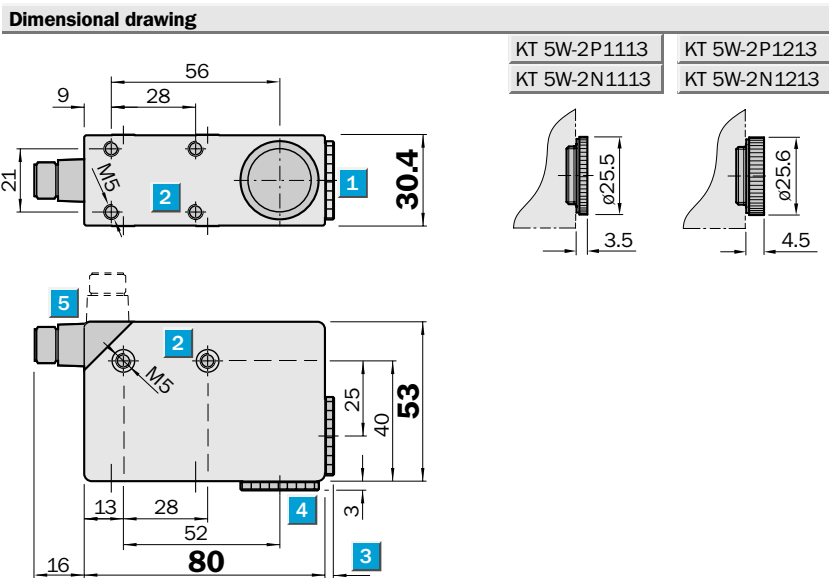
Order information

Type	Part no.
KT 5G-2P1112	1 016 628
KT 5G-2N1112	1 016 717
KT 5G-2P1212	1 016 718
KT 5G-2N1212	1 016 719



	Scanning distance 10 mm/20 mm
Contrast scanners	

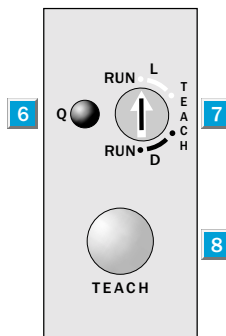
- Dynamic teach-in
- Automatic light transmission selector, red, blue and green
- Teach-in: button on unit or via control cable
- L/D adjustable on unit or via control cable
- No light/dark selection
- Switching frequency 10 kHz



Adjustments possible

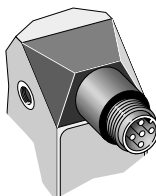
KT 5W-2P1113	KT 5W-2P1213
KT 5W-2N1113	KT 5W-2N1213

- 1 Lens (light transmission), can be replaced by Item 4
- 2 M 5 mounting holes, 5.5 mm deep
- 3 See dimensional drawing of lens
- 4 Blind screw, can be replaced by Item 1
- 5 5-pin, M 12 x 1 plug (rotatable through 90°)
- 6 Function signal indicator (yellow)
- 7 L/D pre-selection switch
- 8 Teach-in button

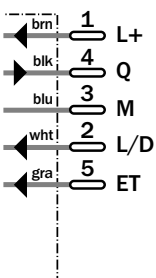


Connection type

KT 5W-2P1113	KT 5W-2P1213
KT 5W-2N1113	KT 5W-2N1213



5-pin, M 12 x 1



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Cable receptacles	496
Lens	556

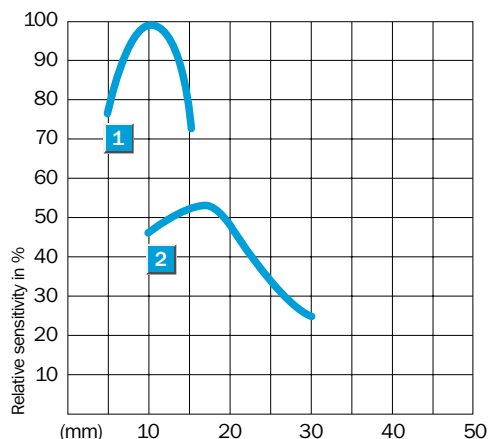
Technical data		KT 5W-2	P1113	N1113	P1213	N1213						
Scanning distance from front edge of lens												
	10 ± 3 mm											
	20 ± 3 mm											
Light spot dimensions												
	1.2 x 4.2 mm											
Light source¹⁾, light type												
	LED, red, blue, green											
Supply voltage V_S												
	10...30 V DC ²⁾											
Ripple ³⁾												
	< 5 V _{SS}											
Current consumption ⁴⁾												
	< 80 mA											
Switching outputs Q												
	PNP: HIGH = V _S - < 2 V / LOW = 0 V											
	NPN: HIGH = V _S / LOW = < 2 V											
Output current I _A max.												
	100 mA, short-circuit protected											
Response time ⁵⁾												
	50 μs											
Max. switching frequency ⁶⁾												
	to 10 kHz											
Teach-in input ET												
	PNP: Teach > 10 V...< V _S											
	Run 0 V or unswitched											
	NPN: Teach 0 V											
	Run V _S or unswitched											
Retention time												
	25 ms non-volatile memory											
L/D input, light-/dark-switching												
	PNP: dark = > 10 V...< V _S											
	light = 0 V or unswitched											
	NPN: dark = 0 V											
	light = V _S or unswitched											
Connection type												
	Plug 5-pin, M 12 x 1											
VDE protection class⁷⁾												
	□											
Enclosure rating												
	IP 67											
Circuit protection⁸⁾												
	A, B, C											
Ambient temperature T_A												
	Operation - 10 °C...+ 55 °C											
	Storage - 25 °C...+ 75 °C											
Shock load												
	To IEC 68											
Weight												
	Approx. 400 g											
Housing material												
	Coated metal											

- 1) Average service life 100,000 h at T_A = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1
- 7) Reference voltage 50 V DC

- 8) A = V_S connections reverse-polarity protected
- B = Output Q short-circuit protected
- C = Interference pulse suppression

Scanning distance	Teach-in	Order information
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1	Scanning distance with lens 211	10 mm
2	Scanning distance with lens 212	20 mm

Teach-in	Order information
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Teach-in and light/dark

The two settings can be triggered simultaneously either via control panel or control cable.

Control panel: The teach-in button can be locked against accidental actuation with "run". In an undefined switching position, no teach-in procedure can be triggered.

Setting through control panel:

1. Select "light (L)" or "dark (D)" using rotating switch
 2. Trigger teach-in via teach-in button
 3. Run the object to be detected at least one register length through the light spot
- Acknowledged via Q or LED control flashes = insufficient contrast.

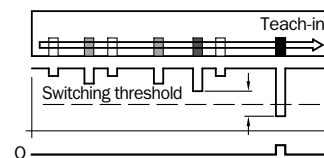
Setting via control cable

1. Select "light" or "dark" using control cable
2. Trigger teach-in via ET control cable
3. Run the object to be detected at least one register length through the light spot
4. End teach-in


Material speed during teach-in: min. 25 mm/s, max. 300 mm/s.

Order information

Type	Part no.
KT 5W-2P1113	1 016 629
KT 5W-2N1113	1 016 630
KT 5W-2P1213	1 016 715
KT 5W-2N1213	1 016 716



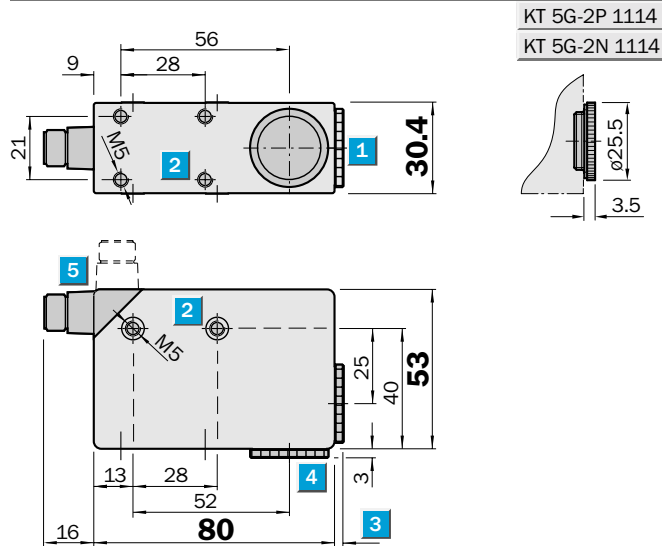
KT 5G-2 Contrast scanners, dynamic


Scanning distance
10 mm

Contrast scanners

- Green light
- Dynamic contrast determination
- Fine/course adjustment
- Light/dark finely adjustable
- Switching frequency 10 kHz

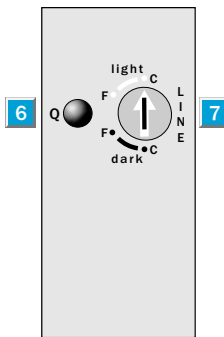
Dimensional drawing



Adjustments possible

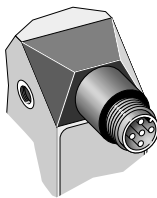
KT 5G-2P 1114
KT 5G-2N 1114

- 1 Lens (light transmission), can be replaced by Item 4
- 2 M 5 mounting holes, 5.5 mm deep
- 3 See dimensional drawing of lens
- 4 Blind screw, can be replaced by Item 1
- 5 5-pin, M 12
- 6 Function signal indicator (yellow)
- 7 Fine/course selection

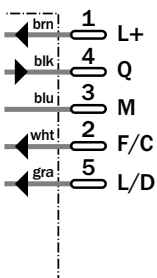


Connection type

KT 5G-2P 1114
KT 5G-2N 1114



5-pin, M 12

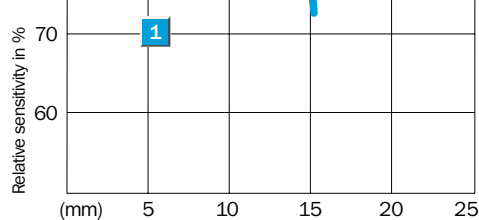


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Lens	556

Technical data		P1114	N1114								
Scanning distance from front edge of lens	10 ± 3 mm										
Light spot dimensions	1.2 x 4.2 mm										
Light source¹⁾, light type	LED, green										
Supply voltage V_S	10...30 V DC ²⁾										
Ripple ³⁾	< 5 V _{SS}										
Current consumption ⁴⁾	< 80 mA										
Switching outputs	PNP: HIGH = V _S - < 2 V / LOW = 0 V NPN: HIGH = V _S / LOW = < 2 V										
Output current I _A max.	100 mA, short-circuit protected										
Response time ⁵⁾	50 μs										
Max. switching frequency ⁶⁾	to 10 kHz										
Fine/coarse input, F/C	PNP: Fine 0 V or unswitched Coarse > 10 V...< V _S NPN: Fine V _S or unswitched Coarse 0 V										
L/D input, light-/dark-switching	PNP: dark = > 10 V...< V _S light = 0 V or unswitched NPN: dark = 0 V light = V _S or unswitched										
Connection type	Plug 5-pin, M 12										
VDE protection class⁷⁾	□										
Enclosure rating	IP 67										
Circuit protection⁸⁾	A, B, C										
Ambient temperature T_A	Operation - 10 °C...+ 55 °C Storage - 25 °C...+ 75 °C										
Shock load	To IEC 68										
Weight	Approx. 400 g										
Housing material	Coated metal										


- 1) Average service life 100,000 h at T_A = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances
- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1
- 7) Do not bend below 0 °C
- 8) Reference voltage 50 V DC
- 9) A = V_S connections reverse-polarity protected
B = Output Q short-circuit protected
C = Interference pulse suppression

Scanning distance	Function	Order information	
	<p>The switching threshold for the KT 5G-2 P/N 1114 contrast scanner is tracked dynamically to the existing contrast. No teach-in procedure is required. The "fine" or "coarse" contrast and the "light" or "dark" selection can be triggered via the switch on the control panel or the control cable.</p> <p>In the LINE switching position, the control panel is blocked, only F/C and L/D settings triggered via the control cable are accepted.</p> <p>The following example shows function in the "coarse" position and the "dark-switching" operating mode:</p>	Type	Part no.
		KT 5G-2P1114	1 016 999
		KT 5G-2N1114	1 017 000



1 Scanning distance 10 mm

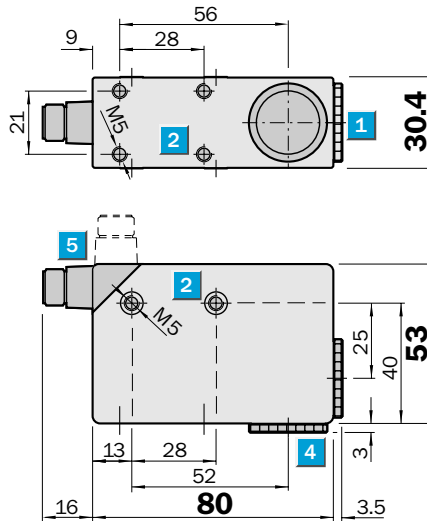



**Scanning distance
10 mm**

Contrast scanners

- Static teach-in to mark and background via control cable or control panel on unit
- Automatic switching threshold adjustment for detection of extremely shiny objects

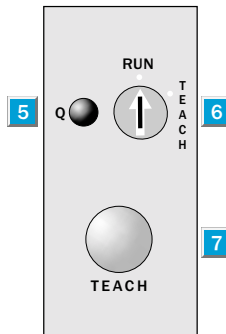
Dimensional drawing



Adjustments possible

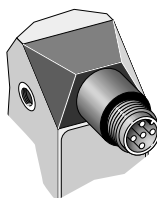
KT 5W-2P 1116
KT 5W-2N 1116

- 1** Lens (light transmission), can be replaced by Item **4**
- 2** M 5 mounting holes, 5.5 mm deep
- 3** Blind screw, can be replaced by Item **1**
- 4** 5-pin, M 12 x 1 plug (rotatable through 90°)
- 5** Function signal indicator (yellow)
- 6** Pre-selection switch
- 7** Teach-in button

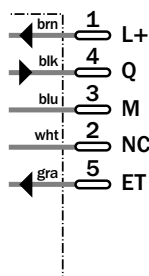


Connection type

KT 5W-2P 1116
KT 5W-2N 1116



5-pin, M 12 x 1



Accessories	page
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Technical data		KT 5W-2	P1116	N1116										
Scanning distance from front edge of lens	10 ± 3 mm													
Light spot dimensions	1.2 x 4.2 mm													
Light source¹⁾, light type	LED, red, blue, green													
Supply voltage V_S	10...30 V DC ²⁾													
Ripple ³⁾	< 5 V _{SS}													
Current consumption ⁴⁾	< 80 mA													
Switching outputs	PNP: HIGH = V _S - < 2 V / LOW = 0 V NPN: HIGH = V _S / LOW = < 2 V													
Output current I _A max.	100 mA, short-circuit protected													
Switching frequency	To 10 kHz													
Response time ⁵⁾	50 μs													
Max. switching frequency ⁶⁾	to 10 kHz													
Teach-in input ET	PNP: Teach > 10 V...< V _S Run 0 V or unswitched NPN: Teach 0 V Run V _S or unswitched													
Retention time	25 ms non-volatile memory													
Connection type	Plug 5-pin, M 12													
VDE protection class⁷⁾	<input type="checkbox"/>													
Enclosure rating	IP 67													
Circuit protection⁸⁾	A, B, C													
Ambient temperature T_A	Operation - 10 °C...+ 55 °C Storage - 25 °C...+ 75 °C													
Shock load	To IEC 68													
Weight	Approx. 400 g													
Housing material	Coated metal													

- 1) Average service life 100,000 h at T_A = + 25 °C
 2) Limit values
 3) May not exceed or fall short of V_S tolerances

- 4) Without load
 5) Signal transit time with resistive load
 6) With light/dark ratio 1:1
 7) Reference voltage 50 V DC

- 8) A = V_S connections reverse-polarity protected
 B = Output Q short-circuit protected
 C = Interference pulse suppression

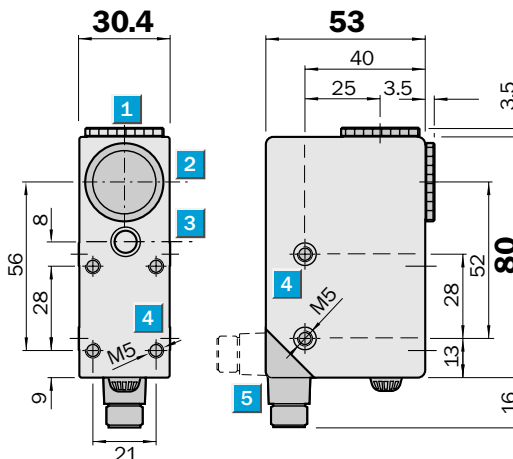
Scanning distance	Static teach-in	Order information						
<p>1 Scanning distance with lens 211 10 mm</p>	<p>Control panel: The teach-in button can be locked against accidental actuation with "run". In an undefined switching position, no teach-in procedure can be triggered.</p> <p>Setting via control panel:</p> <ol style="list-style-type: none"> Select teach-in using rotating switch Position mark or background onto light spot <ul style="list-style-type: none"> – trigger first teach-in procedure via teach-in button Position background or mark onto light spot <ul style="list-style-type: none"> – trigger second teach-in procedure via teach-in button. <p>Setting via control cable:</p> <ol style="list-style-type: none"> Position mark or background onto light spot <ul style="list-style-type: none"> – trigger first teach-in procedure via ET control cable Position background or mark onto light spot <ul style="list-style-type: none"> – trigger second teach-in procedure via ET control cable. <p>Acknowledge: After the first teach-in procedure, the red transmission light flashes and the function signal slowly indicates that a second teach-in procedure must be triggered. LED and Q flash quickly = insufficient contrast LED and Q do not flash = teach-in completed Light-/dark-switching not required, unit switches on the object to be detected, that was under the light spot during the first teach-in procedure (mark or background).</p>	<table border="1"> <thead> <tr> <th>Type</th> <th>Part no.</th> </tr> </thead> <tbody> <tr> <td>KT 5W-2P 1116</td> <td>1 018 044</td> </tr> <tr> <td>KT 5W-2N 1116</td> <td>1 018 045</td> </tr> </tbody> </table>	Type	Part no.	KT 5W-2P 1116	1 018 044	KT 5W-2N 1116	1 018 045
Type	Part no.							
KT 5W-2P 1116	1 018 044							
KT 5W-2N 1116	1 018 045							


Scanning distance
150 mm

Laser contrast scanners

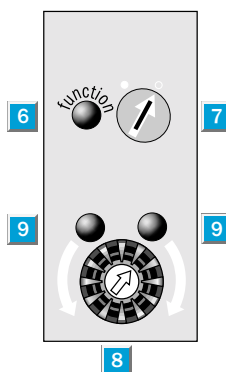
- Laser class 2
- Adjustment switch
- Long scanning distance
- Accurate recording of very small marks
- Switching frequency 10 kHz

Dimensional drawing



Adjustments possible

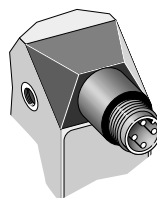
- KT 5L-P3611
- KT 5L-N3611



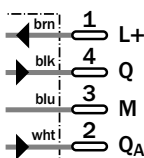
- 1 Blind screw
- 2 Receiver
- 3 Sender
- 4 M 5 mounting holes, 5.5 mm deep
- 5 4-pin, M 12 x 1 plug
- 6 Function signal indicator (red)
- 7 Operating mode selector switch
- Light-switching
- Dark-switching
- 8 Switching threshold adjustment
- 9 Adjustment indicators (green)

Connection type

- KT 5L-P3611
- KT 5L-N3611



4-pin, M12



Accessories	page
Cable receptacles	496

Technical data		KT 5L-	P3611	N3611									
Scanning distance from front edge of lens	150 mm ± 10 mm												
Light spot	< 0.3 mm at 150 mm												
Light source¹⁾, light type	Laser diode, red light												
Supply voltage V_S	10 ... 30 VDC ²⁾												
Ripple ³⁾	< 5 V _{SS}												
Current consumption ⁴⁾	< 80 mA												
Switching outputs	Light-/dark-switching, selectable												
	PNP: HIGH = V _S - < 2 V/LOW = 0 V												
	NPN: HIGH = V _S /LOW = < 2 V												
Output current I _A max.	100 mA, short-circuit protected												
Response time ⁵⁾	50 μs												
Max. switching frequency ⁶⁾	To 10 kHz												
Analogue output Q_A	0.3...10 mA												
Connection type	Plug 4-pin, M 12												
VDE protection class⁷⁾	□												
Laser class	2 (IEC 825/VDE 0837)												
Enclosure rating	IP 67												
Circuit protection⁸⁾	A, B, C												
Ambient temperature T_A	Operation - 10 °C... + 40 °C												
	Storage - 25 °C... + 75 °C												
Shock load	To IEC 68												
Weight	Approx. 400 g												
Housing material	Coated metal												

- 1) Average service life 100,000 h at T_A = + 25 °C
 2) Limit values
 3) May not exceed or fall short of V_S tolerances

- 4) Without load
 5) Signal transit time with resistive load
 6) With light/dark ratio 1:1
 7) Reference voltage 50 V DC

- 8) A = V_S connections reverse-polarity protected
 B = Outputs Q and Q_A short-circuit protected
 C = Interference pulse suppression

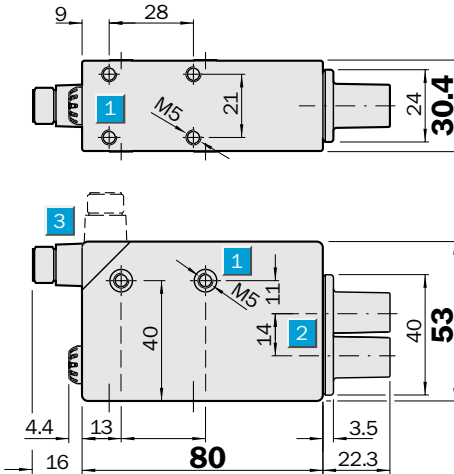
Order information

Type	Part no.
KT 5L-P 3611	1 011 536
KT 5L-N 3611	1 013 266

	Scanning distance up to 15 mm
Proximity mode	
	Scanning range up to 60 mm
Through-beam mode	

- Green light
- Switching threshold adjustable
- Insensitive to ambient light
- Adjustment switch
- Switching frequency 10 kHz
- High contrast resolution
- Fibre-optic cable for high temperatures

Dimensional drawing

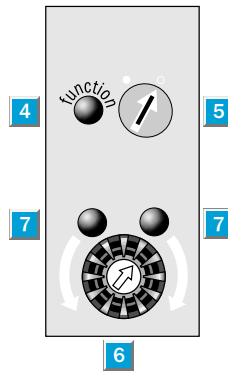


Adjustments possible

KTL 5G-2P11

KTL 5G-2N11

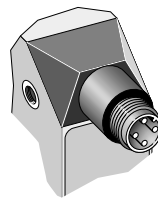
- 1 M 5 mounting holes, 5.5 mm deep
- 2 Fibre-optic adapter (M 12 x 1 internal thread)
- 3 4-pin, M 12 x 1 plug (rotatable through 90°)
- 4 Function signal indicator (yellow)
- 5 Operating mode selector switch
- Light-switching
- Dark-switching
- 6 Switching threshold adjustment
- 7 Adjustment indicators (green)



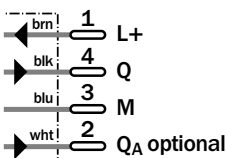
Connection type

KTL 5G-2P11

KTL 5G-2N11



4-pin, M12



Accessories	page
Cable receptacles	496
Fibre-optic cable	528

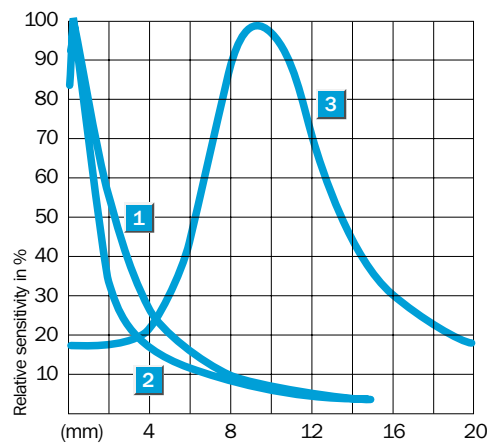
Technical data		KTL 5G-2	P11	N11									
Scanning distance/scanning range	15 mm/60 mm												
Light source¹, light type	LED, green												
Supply voltage V_S	10...30 V DC ²												
Ripple ³	< 5 V _{SS}												
Current consumption ⁴	< 30 mA at 24 V DC												
Switching outputs	Light-/dark-switching, selectable												
	PNP: HIGH = V _S - < 2 V/LOW = 0 V												
	NPN: HIGH = V _S /LOW = < 2 V												
Output current I _A max.	100 mA, short-circuit protected												
Response time ⁵	50 μs												
Max. switching frequency ⁶	To 10 kHz												
Analogue output Q_A, optional	0.3...10 mA												
Connection type	Plug 4-pin, M 12												
VDE protection class⁷	□												
Enclosure rating	IP 67												
Circuit protection⁸	A, B, C												
Ambient temperature T_A	Operation - 10 °C...+ 55 °C Storage - 25 °C...+ 75 °C												
Shock load	To IEC 68												
Weight	Approx. 400 g												
Housing material	Coated metal												

- 1) Average service life 100,000 h at T_A = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1
- 7) Reference voltage 50 V DC

- 8) A = V_S connections reverse-polarity protected
- B = Outputs Q and Q_A short-circuit protected
- C = Interference pulse suppression


Scanning distance



- 1 Fibre-optic cable LBST 32900
- 2 Fibre-optic cable LBSR 32900
- 3 Fibre-optic cable OCSL

Order information

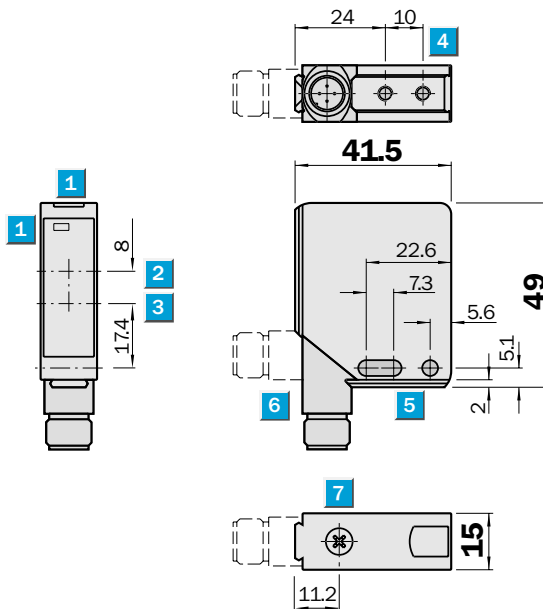
Type	Part no.
KTL 5G-2P11	1 016 294
KTL 5G-2N11	1 016 295


Scanning distance
13.5 mm

Contrast scanners

- Red or green light transmitter
- Sensitivity adjustable
- Light- or dark-switching selectable via control cable
- Switching frequency 10 kHz
- NPN and PNP switching output

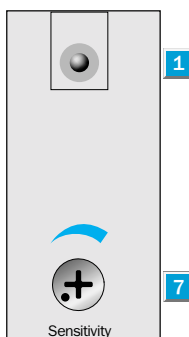
Dimensional drawing



Adjustments possible

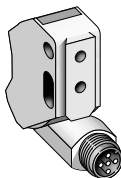
- KT 2R - 2B 3711
- KT 2G - 2B 3711
- KT 2R - 2B 3721

- 1** Reception indicator
- 2** Optical axis – receiver
- 3** Optical axis – sender
- 4** M 4 threaded mounting hole, 4 mm deep
- 5** Through hole \varnothing 4.2 mm
- 6** M 12 plug (rotatable through 90°)
- 7** Sensitivity adjustment

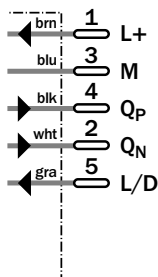


Connection type

- KT 2R - 2B 3711
- KT 2G - 2B 3711
- KT 2R - 2B 3721



5-pin, M12



Accessories	page
Cable receptacles	496
Terminal bracket*	510
Mounting brackets	510

* 2 units included with delivery

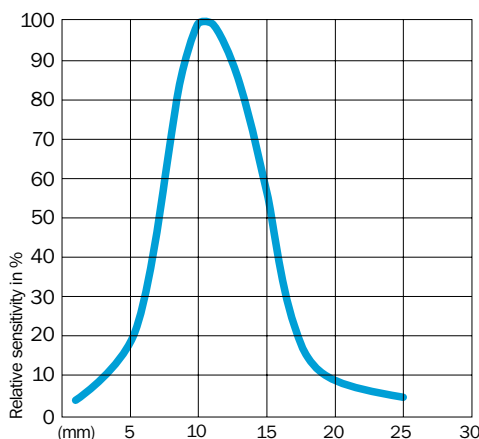
Technical data		KT 2	R-2B 3711	G-2B 3711	R-2B 3721						
Scanning distance from front edge of lens	13.5 mm										
Light spot diameter	2 mm										
Light source ¹⁾ , light type	LED, red										
	LED, green										
Supply voltage V _S	10...30 V DC ²⁾										
Ripple ³⁾	< 5 V _{SS}										
Current consumption ⁴⁾	< 80 mA										
Switching outputs	Light-/dark-switching, selectable										
	PNP: HIGH = V _S - < 2.9V/ LOW = approx. 0 V										
	NPN: HIGH = V _S /LOW = < 1.5 V										
	Output current I _A max.	100 mA									
Response time ⁵⁾	≤ 50 μs										
Max. switching frequency ⁶⁾	10 kHz										
Time delay	Deactivation delay 20 ms										
L/D input, light-/dark-switching	PNP: dark = > 10 V... < V _S light = 0 V or unswitched										
	NPN: dark = 0 V light = V _S or unswitched										
	Connection type	Plug 5-pin, M 12									
	VDE protection class ⁷⁾	□									
Enclosure rating	IP 67										
Circuit protection ⁸⁾	A, B, C										
Ambient temperature T _A	Operation - 10 °C... + 55 °C										
	Storage - 25 °C... + 75 °C										
Shock load	To IEC 68										
Weight	Approx. 400 g										
Housing material	Coated metal										

- 1) Average service life 100,000 h at T_A = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1
- 7) Reference voltage 50 V DC

- 8) A = V_S connections reverse-polarity protected
- B = Output Q short-circuit protected
- C = Interference pulse suppression

Scanning distance



1 Scanning distance TW 13.5 mm

Object shown with 90 % remission (based on standard white acc. to DIN 5033)

Order information

Type	Part no.
KT 2R-2B 3711	1 016 115
KT 2G-2B 3711	1 016 112
KT 2G-2B 3721	1 016 114