KT 5: Contrast scanner with intelligent display

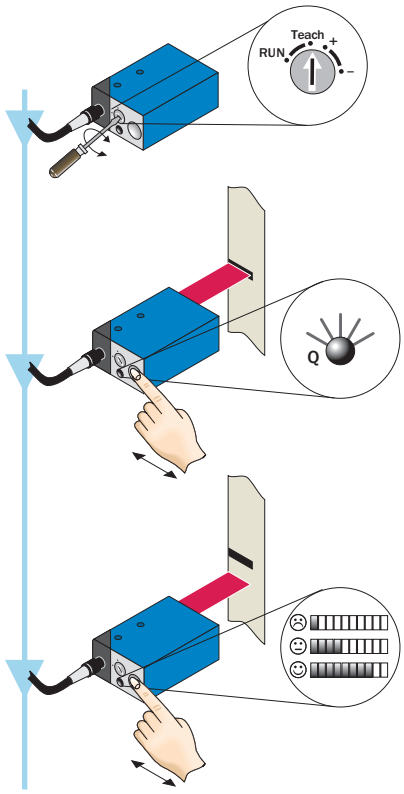
Contrast scanners are used mainly for reading print and registration marks. Here the KT 5 sets new standards in performance and friendlyness. The light bar display provides information about the security of detection. In addition, the user can see the current signal strength and switching threshold. Also, if required the switching threshold may be adjusted manually using the +/– keys. For example, if printing quality changes, the sensor can be adjusted simply “in process”.

Thanks to the three-colour-LED-technology, the optimum emission colour is automatically selected depending on the existing contrast. Futhermore, the precise 2-point-Teach-in procedure is provided, where the gray values of the mark and the background are taught-in. The sensor sets the optimum switching threshold automatically.

A high degree of repeatability is ensured due to the homogenous light spot and the automatic gloss adaptation for shiny materials. The switching frequency of 10,000/s enables an economic operation of the machine. A wide range of sensors with different scanning distances and individual alignment and attachment options cover a wide range of different applications.

Teach-in

Teach-in: setting switching threshold



- After the first Teach-in procedure, the red transmitter light and the status indicator blink and signal that a second Teach-in procedure must be triggered.

- The LED status indicator switches off after the second teach process.
- **Detection reliability:**

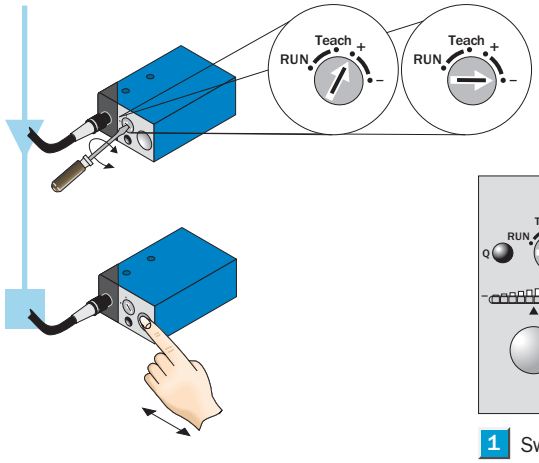
  1 LED on: No reliable operation – minimum contrast difference
  ≤ 4 LEDs on: Capable operation – sufficient contrast difference
  > 4 LEDs on: Reliable operation – high contrast difference

Status

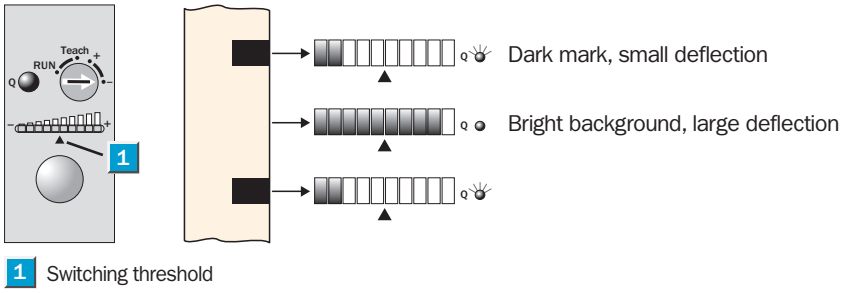
- **Detection reliability:** The bar display signals the quality of the taught-in contrast. The more LEDs light, the more reliable is the detection of the mark.

Manual precise setting

Teach-in: setting switching threshold



- Adjustment of the switching threshold via position +/– and pressing of keys.



1 Switching threshold

Status

- **Switching threshold adjustment:** The bar display visualizes the current level of the material to be scanned, which is on hand.
- The switching threshold is in the middle of the bar display.
- As soon as the switching threshold is exceeded or fallen short of, the switching output changes its state.
- The switching threshold is correspondingly raised or lowered a half LED segment per pressing of the keys.

Notes

- Light-/dark-switching not required: equipment switches for the material to be scanned, which was under the light spot at the first Teach-in procedure (mark or background).
- The material speed must be zero during Teach-in (machine is idle).
- The Teach-in button can be locked against unintentional activation with “Run”.
- A Teach-in procedure can be triggered when the switch setting is not defined.
- The optimum transmission light was selected automatically.
- Teach-in is also possible via control wire.

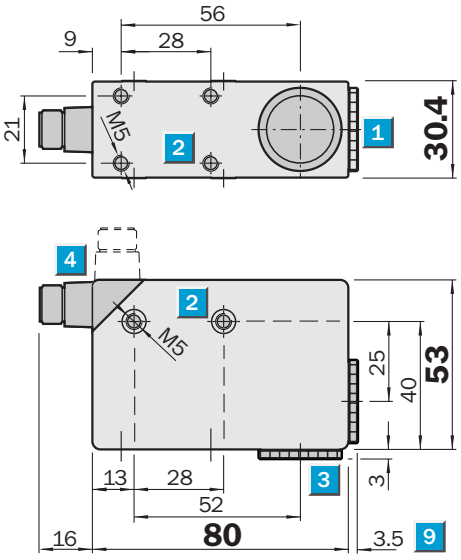
Scanning distance 10/20/40 mm

Contrast scanners

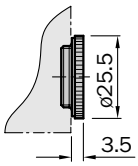
- 10-segment bar display
- Static 2-point Teach-in to mark and background via control cable or control panel on unit
- Detection reliability display
- Subsequent manual adjustment of the switching threshold
- Switching frequency 10,000/s
- Automatic gloss adaptation

Dimensional drawing

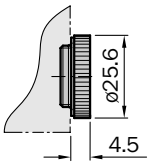
All types



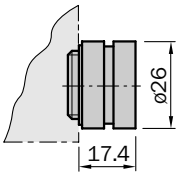
KT 5W-2P 1116D
KT 5W-2P 1126D
KT 5W-2P 2116D
KT 5W-2N 1116D
KT 5W-2N 1126D
KT 5W-2N 2116D



KT 5W-2P 1216D
KT 5W-2N 1216D

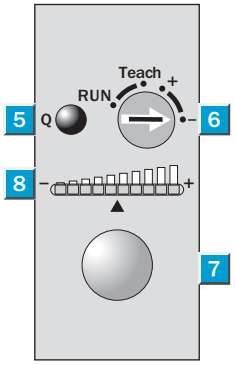


KT 5W-2P 1316D
KT 5W-2N 1316D



Adjustments possible

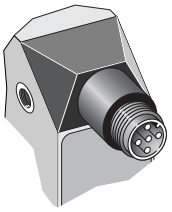
All types



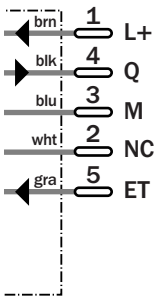
1 Lens (light transmission), can be replaced by item 3
2 M5 mounting holes, 5.5 mm deep
3 Blind screw, can be replaced by item 1
4 5-pin, M12 x 1 plug (rotatable through 90°)
5 Function signal indicator (yellow)
6 Pre-selection switch
7 Teach-in button
8 Bar display
9 See dimensional drawings of the lens

Connection type

All types



5-pin, M12 x 1



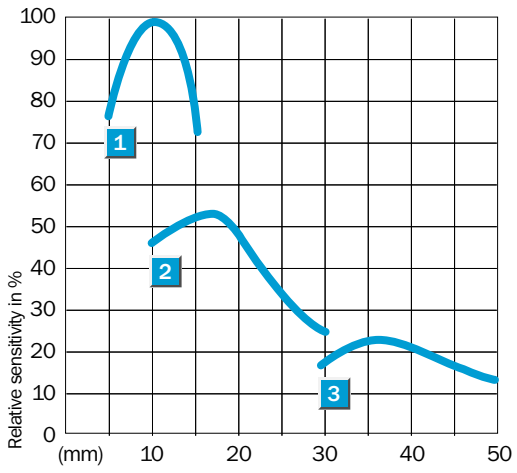
See chapter Accessories

Cables and connectors
Mounting systems
Lens

Technical data	KT 5W-2	P1116D	P1216D	P1316D	P1126D	P2116D	N1116D	N1216D	N1316D	N1126D	N2116D
Scanning distance	10 ± 3 mm	■			■	■	■			■	■
from front edge of lens	20 ± 3 mm		■					■			
	40 ± 3 mm			■					■		
Light spot dimensions	1.2 x 4.2 mm	■			■	■	■			■	■
	1.5 x 5.5 mm		■					■			
	1.1 x 4.2 mm			■					■		
Light source[1]; light type;	LED; red, blue, green;	■	■	■	■	■	■	■	■	■	■
Supply voltage V_S	10... 30 V DC[2]	■	■	■	■	■	■	■	■	■	■
Residual ripple[3]	< 5 V_{PP}	■	■	■	■	■	■	■	■	■	■
Current consumption[4]	< 130 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	■	■	■	■	■	■	■	■	■	■
Switching frequency[6]	To 10 000/s	■	■	■	■	■	■	■	■	■	■
Time delay	20 ms				■					■	
Light spot position	Longitudinal	■	■	■	■		■	■	■	■	
	Transverse					■					■
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, M12	■	■	■	■	■	■	■	■	■	■
VDE protection class[7]	⧈	■	■	■	■	■	■	■	■	■	■
Enclosure rating	IP 67	■	■	■	■	■	■	■	■	■	■
Circuit protection[8]	A, B, C	■	■	■	■	■	■	■	■	■	■
Ambient temperature T_A	Operation –10 ... +55 °C	■	■	■	■	■	■	■	■	■	■
	Storage –25 ... +75 °C	■	■	■	■	■	■	■	■	■	■
Shock load	To IEC 68	■	■	■	■	■	■	■	■	■	■
Weight	Approx. 400 g	■	■	■	■	■	■	■	■	■	■
Housing	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 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	Order no.
KT 5W-2P 1116D	1 026 538
KT 5W-2P 1216D	1 026 577
KT 5W-2P 1316D	1 026 578
KT 5W-2P 1126D	1 026 579
KT 5W-2P 2116D	1 026 584
KT 5W-2N 1116D	1 026 540
KT 5W-2N 1216D	1 026 580
KT 5W-2N 1316D	1 026 581
KT 5W-2N 1126D	1 026 582
KT 5W-2N 2116D	1 026 583