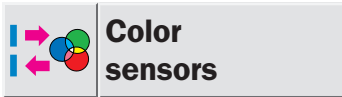


# CS8: detect, check and sort colours



W

When colours are the decisive criterion for detecting, checking and sorting, the CS8 color sensor is the right choice.

Thanks to the two scanning ranges of 12.5 mm with a precise light spot and 60 mm with a larger spot, numerous tasks can be handled. A difference in a single colour can be detected using the CS8-1. If more colour distinctions are required, the CS8-4 is available with 4 channels.


The simple teach-in and the bar graph make the device especially easy to use. At the teach-in, the

light spot is positioned on the colour to be detected, push button – ready. If required, the colour tolerance can easily be adjusted. Using the CS8-4 each channel is selected for a corresponding colour. The high performance color sensors from SICK do not require any complex set-up procedures.

The default setting is selected in such a way that it can handle the majority of applications. However, if especially high speed or high colour resolution is required, you can select from three modes (speed, resolution and combi). The sensor is then set to the different conditions. The CS8 can be installed flexibly with its robust metal housing, selectable light exits and rotatable M12 plug. Thanks to its electrical and mechanical compatibility and a common teach-in procedure, you can switch from the old generation CS1 to CS8-1 and CS3 to CS8-4 without problems.

The reference channel technology guarantees working during the whole life cycle - even in alternating temperatures.

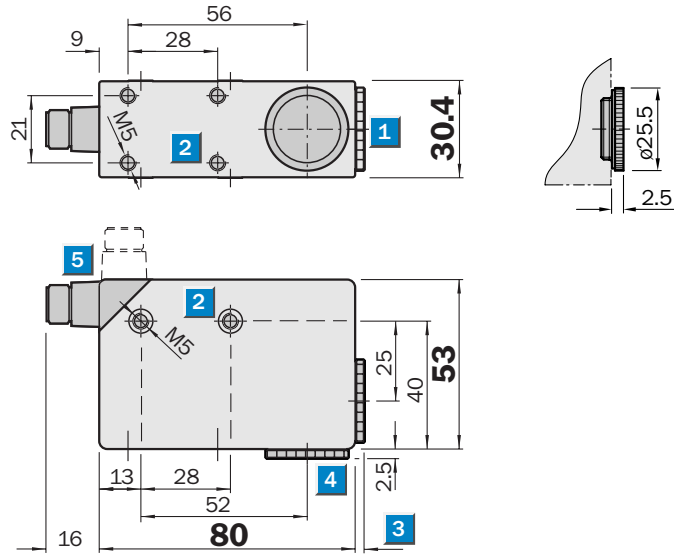


 **Scanning distance**  
12.5 mm/60 mm

**Color sensors**

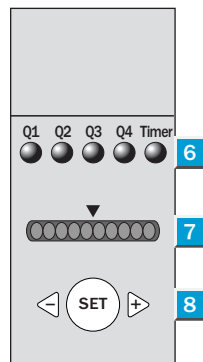
- Response time up to 85  $\mu$ s
- High colour resolution
- Quality of colour indicator via bar display
- High geometrical resolution
- Metal housing with 2 light exits (changeable)
- Reference channel - for constant detection

### Dimensional drawing



### Adjustments possible

All Types

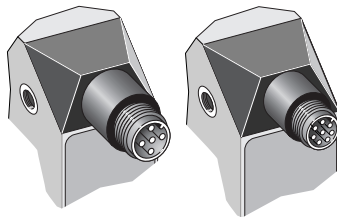


- 1 Lens (light transmission)
- 2 M5 mounting holes, 5.5 mm deep
- 3 See dimensional drawing of lens
- 4 Blind screw can be replaced by lens 1
- 5 5-pin, M12 x 1 plug (rotatable through 90°) or 8-pin, M12 x 1 plug (rotatable through 90°)
- 6 Function signal indicators (yellow)
- 7 Bar graph (green), Power on  $\cong$  left LED
- 8 Teach-in button/“+” and “-” button

### Connection type

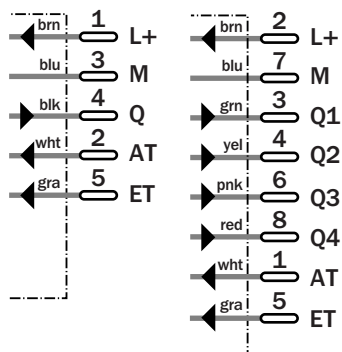
CS8-1

CS8-4



5-pin, M12

8-pin, M12



Technical data		CS8	1-P1112	1-P3612	4-P1112	4-P3612	1-N1112	1-N3612	4-N1112	4-N3612		
<b>Scanning distance,</b> from front edge of housing	12.5 ± 3 mm											
	60 ± 9 mm											
<b>Light spot size</b>	4 x 2 mm <sup>2</sup> (at 12.5 mm)											
	13 x 13 mm <sup>2</sup> (at 60 mm)											
<b>Light source<sup>4)</sup></b>	LED; red, green, blue											
Wave length (nm)	640, 525, 470											
Light spot direction	Longitudinal											
<b>Scanning range with PL80A reflector</b>	100 ... 250 mm											
	250 ... 1000 mm											
<b>Supply voltage V<sub>S</sub></b>	10 ... 30 V DC <sup>2)</sup>											
Residual ripple <sup>3)</sup>	< 5 V											
Current consumption <sup>4)</sup>	< 80 mA											
<b>Switching outputs</b>	PNP: HIGH = V <sub>S</sub> - < 2 V / LOW = 0 V											
	NPN: HIGH = V <sub>S</sub> / LOW = < 2 V											
Output current I <sub>A</sub> max.	< 120 mA											
<b>Switching frequency <sup>5)</sup></b>	Adjustable											
	1 kHz (0.5 ms); 3 kHz (160 μs); 6 kHz (85 μs)											
	0.5 kHz (1 ms); 1 kHz (500 μs); 3.5 kHz (145 μs)											
<b>Timer</b>	Off delay 20 ms adjustable											
<b>Output (Channel)</b>	1 colour											
	4 colours											
<b>Teach-in input ET</b> ET > 2ms	PNP: Teach > 10 V ... < V <sub>S</sub>											
	Run 0 V or unswitched											
	NPN: Teach 0 V Run V <sub>S</sub> or unswitched											
<b>Blanking input AT</b>	AT > 200 μs											
Blanked	PNP: AT > 10 V											
	Free running AT > 2 V or unswitched											
NPN: AT < 2 V												
	AT > 10 V or unswitched											
<b>Retention time</b>	25 ms, non-volatile memory											
<b>Connection type</b>	M12 plug, 5-pin											
	M12 plug, 8-pin											
<b>VDE protection class <sup>6)</sup></b>	□											
<b>Circuit protection <sup>7)</sup></b>	A, B, C, D											
<b>Enclosure rating</b>	IP 67											
<b>Ambient temperature T<sub>A</sub></b>	Operation -10 ... +55 °C											
	Storage -25 ... +75 °C											
<b>Shock load</b>	To IEC 68											
<b>Weight</b>	Approx. 400 g											
<b>Housing material</b>	Cast zinc											

1) Average service life 100,000 h at T<sub>A</sub> = +25 °C  
 2) Limit values  
 3) May not exceed or fall short of V<sub>S</sub> tolerances

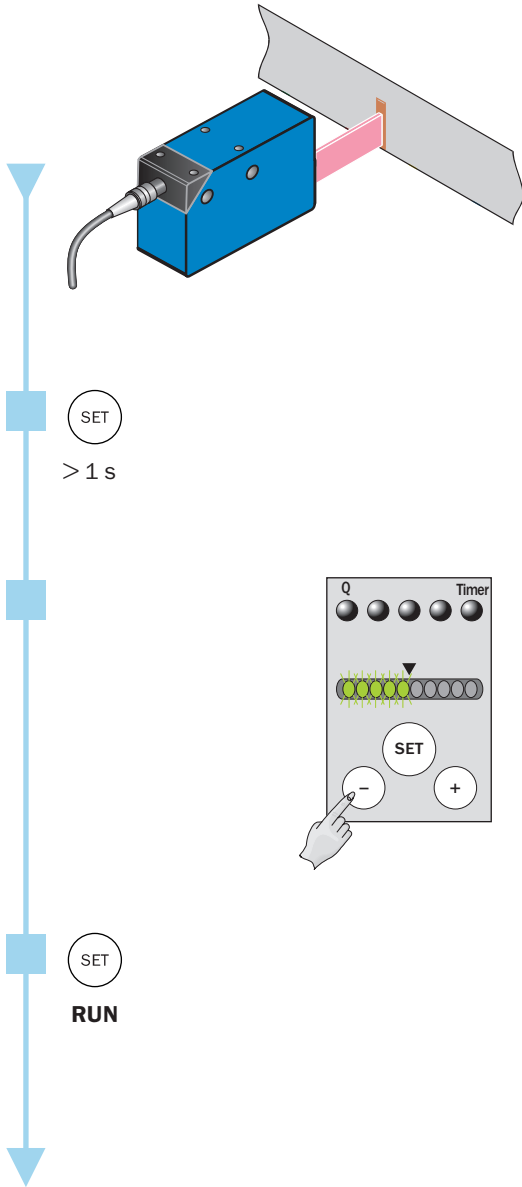
4) Without load  
 5) With light/dark ratio 1:1  
 6) Reference voltage 50 V DC

7) A = V<sub>S</sub> connection reverse-polarity protected  
 B = Output Q or Q<sub>1</sub> to Q<sub>4</sub> short-circuit protected

C = Interference pulse suppression  
 D = Output overcurrent and short-circuit protected

Order information	
Type	Order no.
CS81-P1112	1028224
CS81-P3612	1028225
CS84-P1112	1028226
CS84-P3612	1028227
CS81-N1112	1028228
CS81-N3612	1028229
CS84-N1112	1028230
CS84-N3612	1028231

Teach-in: Setting the switching threshold

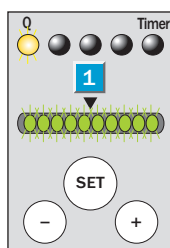


Status

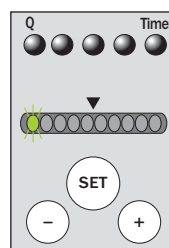
- Position colour, press „SET“ > 1 s and release button.
- Adaption of tolerance with „+“ or „-“ button, confirm with „SET“.

Operation

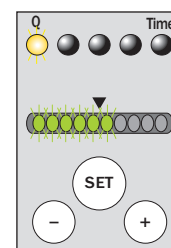
1 Switching threshold



Full correspondence  
Colour detected  
→ Q active



No correspondence  
Colour not detected  
→ Q inactive

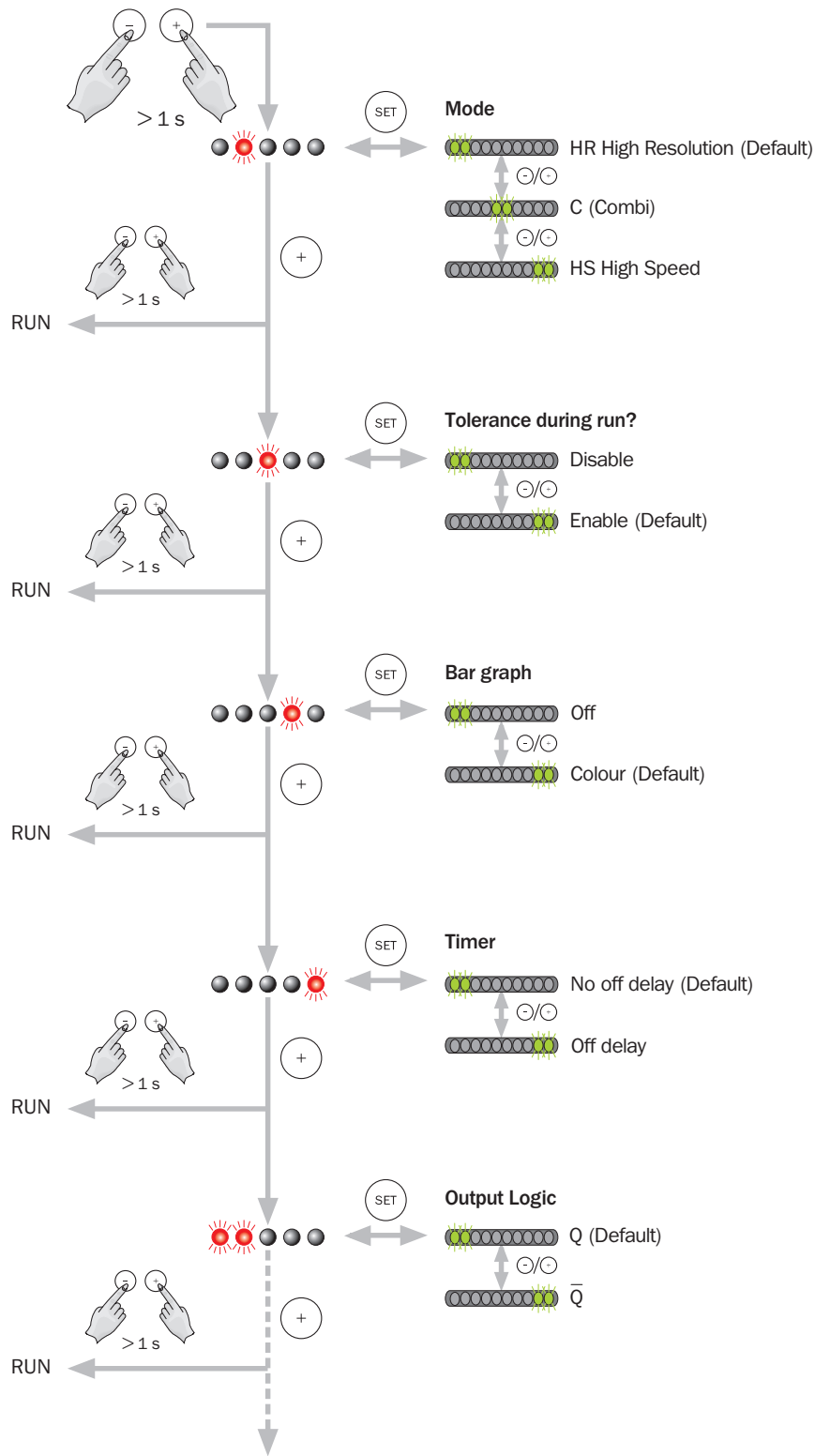


Margin of tolerance  
Colour detected  
→ Q active

Notes

- During operation the bar graph displays the colour quality (correspondence to teached colour). If the arrow is above or below, the switching output is changed.
- During operation the colour tolerance can be reset (if special settings have been set to „Tolerance during run?“).
  - Press „+“ button > 1 s and release.
  - Adaption of tolerance with „+“ or „-“.
  - Confirm with „SET“.

Special settings



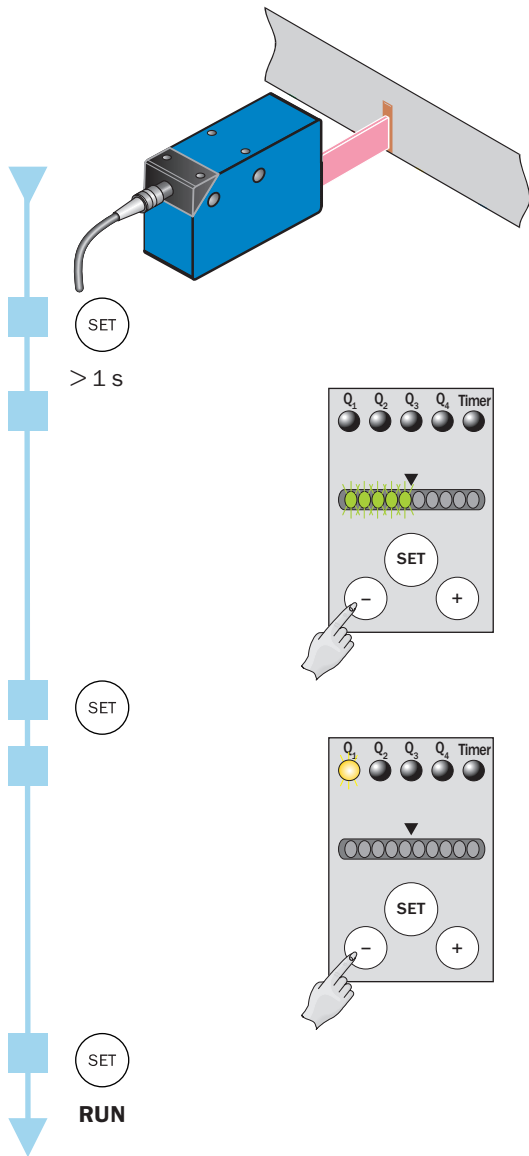
My settings (☑)

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Notes

- Special settings:
  - „-“ and „+“ button > 1 s → Enter/Exit.
  - „-“ or „+“ button → Navigate.
  - „SET“ button → Select/Confirm.
- Restore defaults:
  - „-“ and „+“ button, select both > 1 s and release (Enter special mode).
  - „-“ and „+“ button, select both > 5 s until five status LEDs (Q ... Timer) flash two times.
 Reset does not delete the stored colour (Q).

Teach-in: Setting the switching threshold

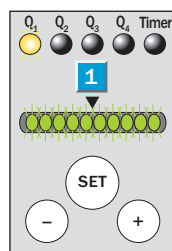


Status

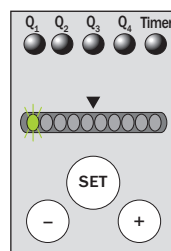
- Position colour, press „SET“ > 1 s and release button.
- Adaption of tolerance with „+“ or „-“ button, confirm with „SET“.
- Select channel with „+“ or „-“, confirm with „SET“.

Operation

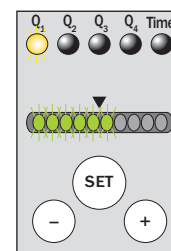
1 Switching threshold



Full correspondence  
Colour detected  
→ Q active



No correspondence  
Colour not detected  
→ Q inactive

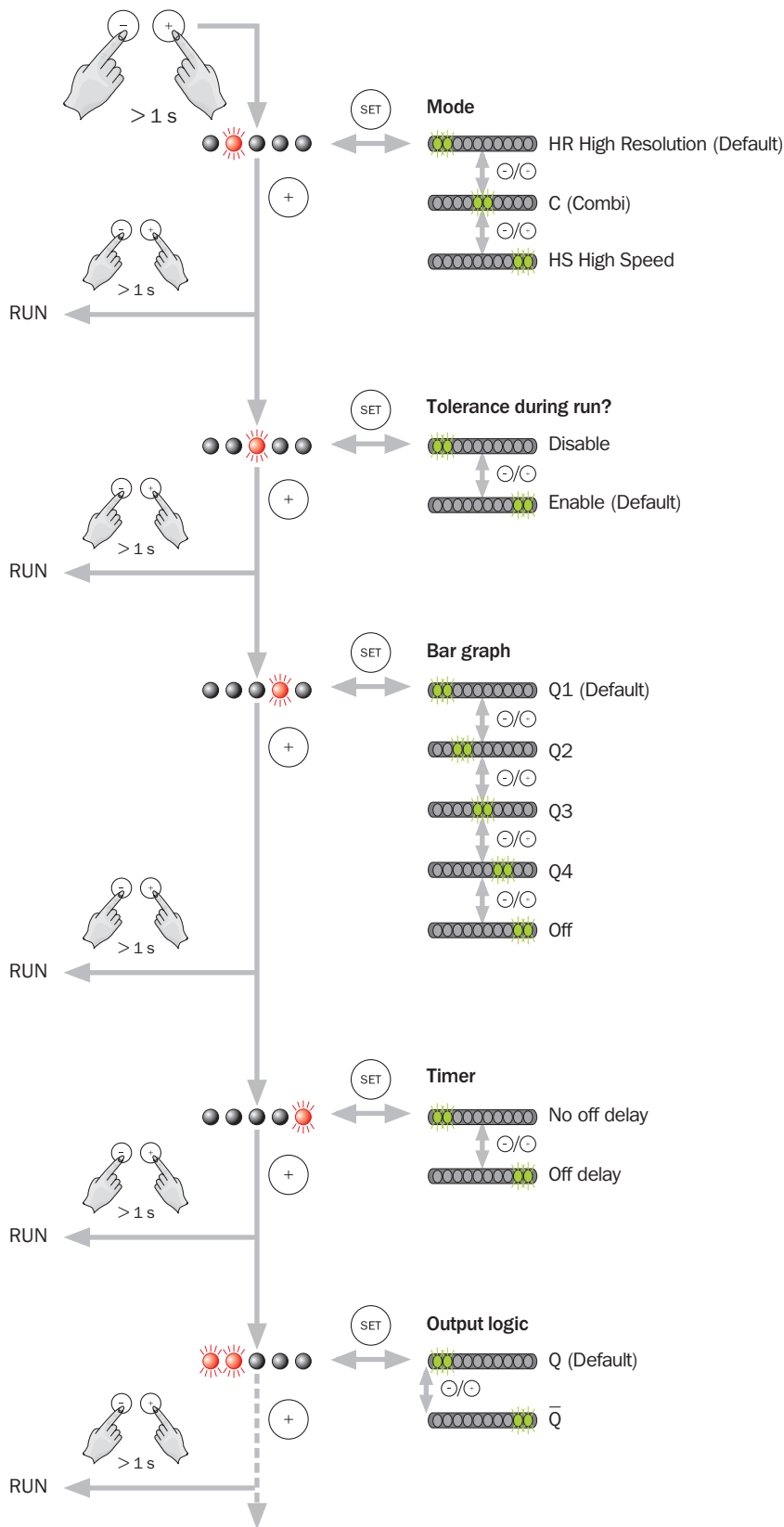


Margin of tolerance  
Colour detected  
→ Q active

Notes

- During operation the bar graph displays the colour quality according to the selected colour channel (refer to special settings „Bar graph“). If the arrow is above or below, the switching output is changed.
- During operation the colour tolerance can be reset.
  - Press „+“ button > 1 s and release.
  - Adaption of tolerance with „+“ or „-“.
  - Confirm with „SET“.
 This function can be set in special settings (refer to „Tolerance during run?“). Tolerance refers to the selected channel (see special settings „Bar graph“).
- External teach-in always refers to channel Q1.

Special settings



My settings (☑)















Notes

- Special settings:
  - „-“ and „+“ button > 1 s → Enter/Exit.
  - „-“ or „+“ button → Navigate.
  - „SET“ button → Select/Confirm.
- Restore defaults:
  - „-“ and „+“ button, select both > 1 s and release (Enter special mode).
  - „-“ and „+“ button, select both > 5 s until five status LEDs (Q ... Timer) flash two times. Reset does not delete the stored colour (Q).

Dimensional drawings and order Informations

SENSICK screw-in system M12, 8-pin, enclosure rating IP 67

Female connector M12, 5-pin, straight

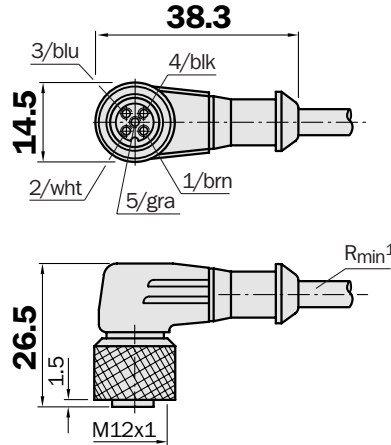
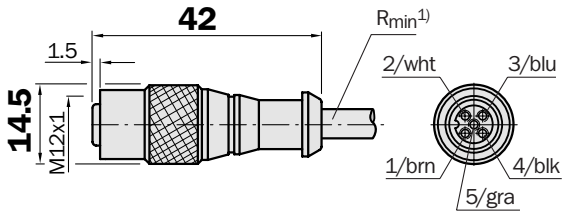
Diameter of cable 6 mm, 5 x 0,25 mm<sup>2</sup>, sheath PVC

Type	Order no.	Contacts	Cable length
DOL-1205-G02M	6008899	5	2 m
DOL-1205-G05M	6009868	5	5 m
DOL-1205-G10M	6010544	5	10 m

Female connector M12, 5-pin, right angle

Diameter of cable 6 mm, 5 x 0,25 mm<sup>2</sup>, sheath PVC

Type	Order no.	Contacts	Cable length
DOL-1205-W02M	6008900	5	2 m
DOL-1205-W05M	6009869	5	5 m
DOL-1205-W10M	6010542	5	10 m



<sup>1)</sup> Minimal bending radius in flexible motion  
R<sub>min</sub> = 20 x diameter of cable

SENSICK screw-in system M12, 8-pin, enclosure rating IP 67

Female connector M12, 8-pin, straight

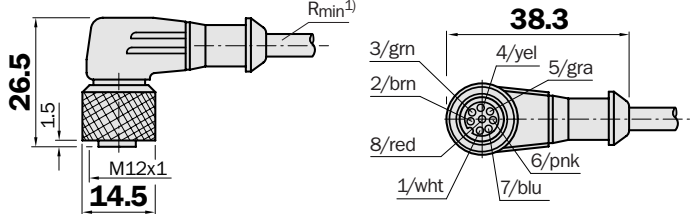
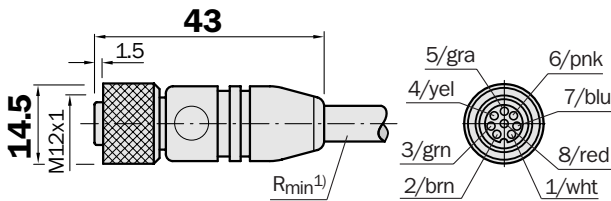
Female connector M12, 8-pin, straight

Type	Order no.	Contacts	Cable length
DOL-1208-G02MA	6020633	8	2 m
DOL-1208-G05MA	6020993	8	5 m
DOL-1208-GA10MA	6022152	8	10 m

Female connector M12, 5-pin, right angle

Diameter of cable 6 mm, 8 x 0,25 mm<sup>2</sup>, PVC

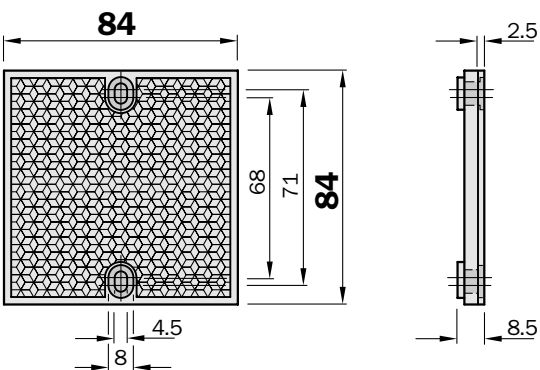
Type	Order no.	Contacts	Cable length
DOL-1208-W02MA	6020992	8	2 m
DOL-1208-W05MA	6021033	8	5 m



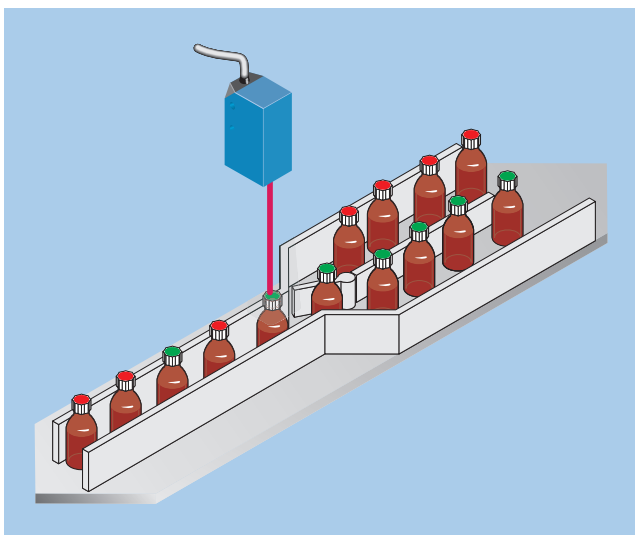
Reflectors, plastic design for temperatures up to 65 °C

Reflector 80 x 80 mm<sup>2</sup>

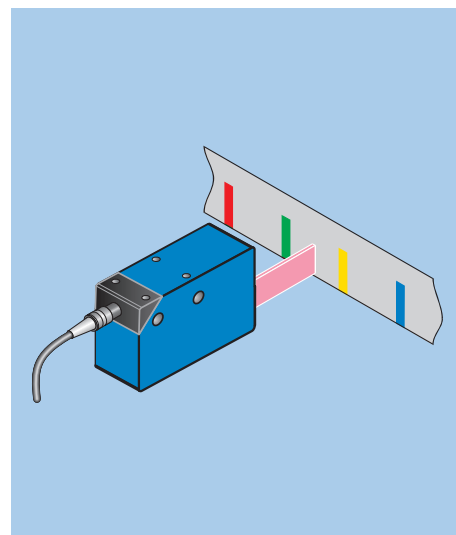
Type	Order no.
PL80A	1003865



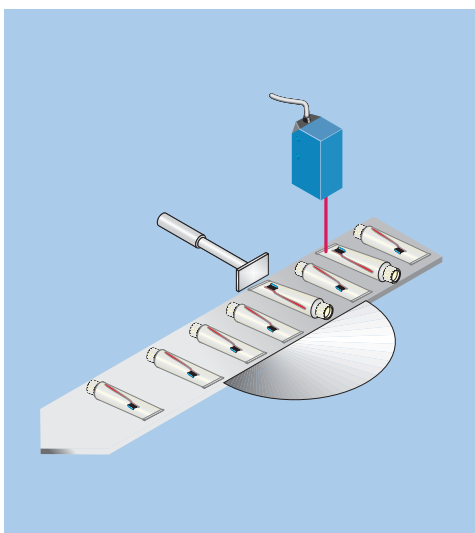




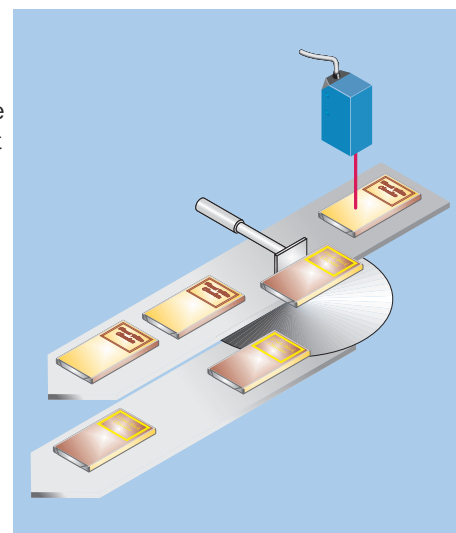
► Print mark control with the CS8: each channel corresponds to one coloured mark.



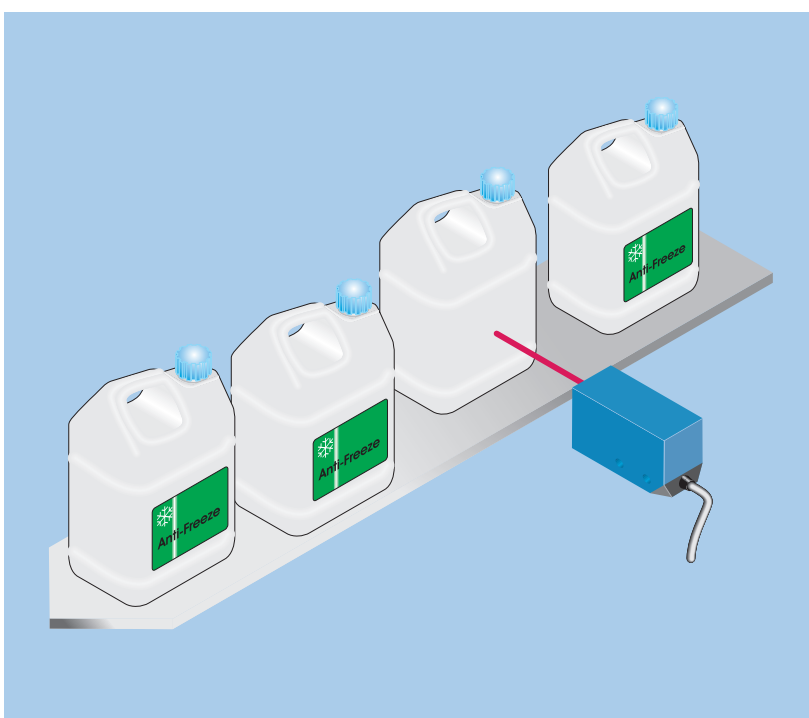
▲ The same shape, different contents: the CS8 assists in sorting if colour remains the only distinguishing feature.



► The chocolate is packed, but is it the right one? The CS8 sorts according to the colour of the different packages.



◀ The CS8 checks prior to packaging, whether the toothpaste tubes have been aligned correctly.



◀ The CS8 detects the presence or absence of the label, using the colour.

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