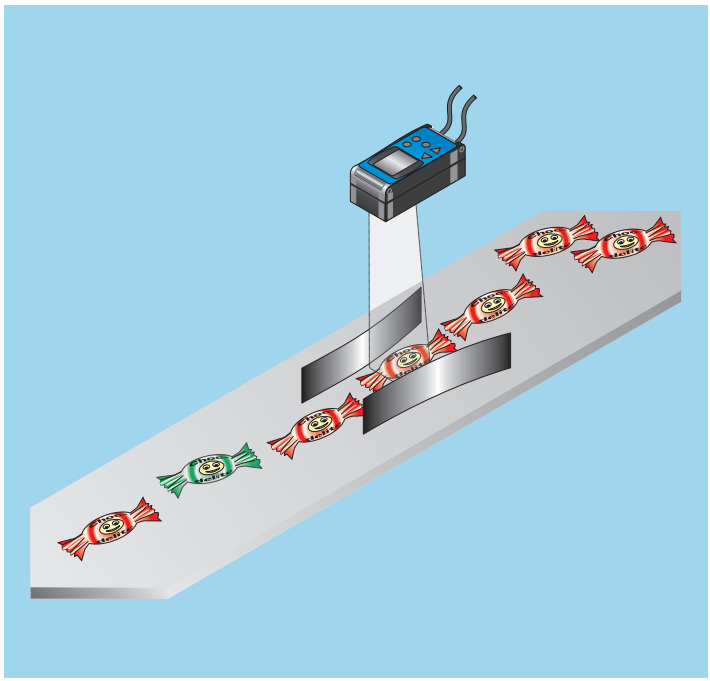
Colour Vision Sensors: Detects colours, distinguishes colours.

If colour plays an important role in your process and a simple colour sensor does not have the capability for more complex checks, the Colour Vision Sensors is the economic solution. They count the pixels of all colours or specifically selected colours in a monitored area and compares the result with a taught-in number.

A built-in colour display helps to optimally align the sensor for set up and teaching. The continually updated measurement values are shown so that all parameters which are needed for reliable operation are displayed. If the CVS is mounted in a way where the built-in display can't be seen, such as when embedded into a packaging machine, a separate keypad with its own colour display can be connected. This solves the problem and helps prevent any dislocating twists or sprains to the set up person.

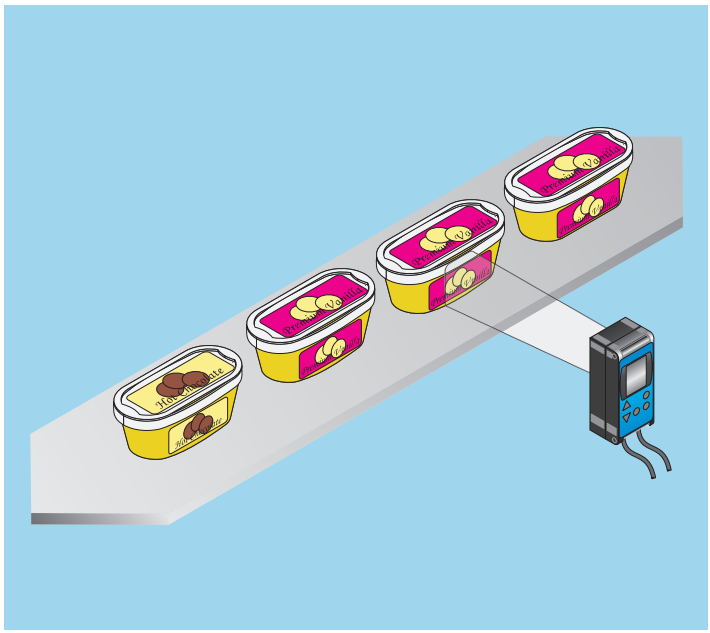
Each parameter can of course be easily edited subsequently if adjustments are required. The CVS2 has memory space for 16 complete parameter sets, which can be selected via external signals. Consequently, it can be optimally set up for fast product changes.

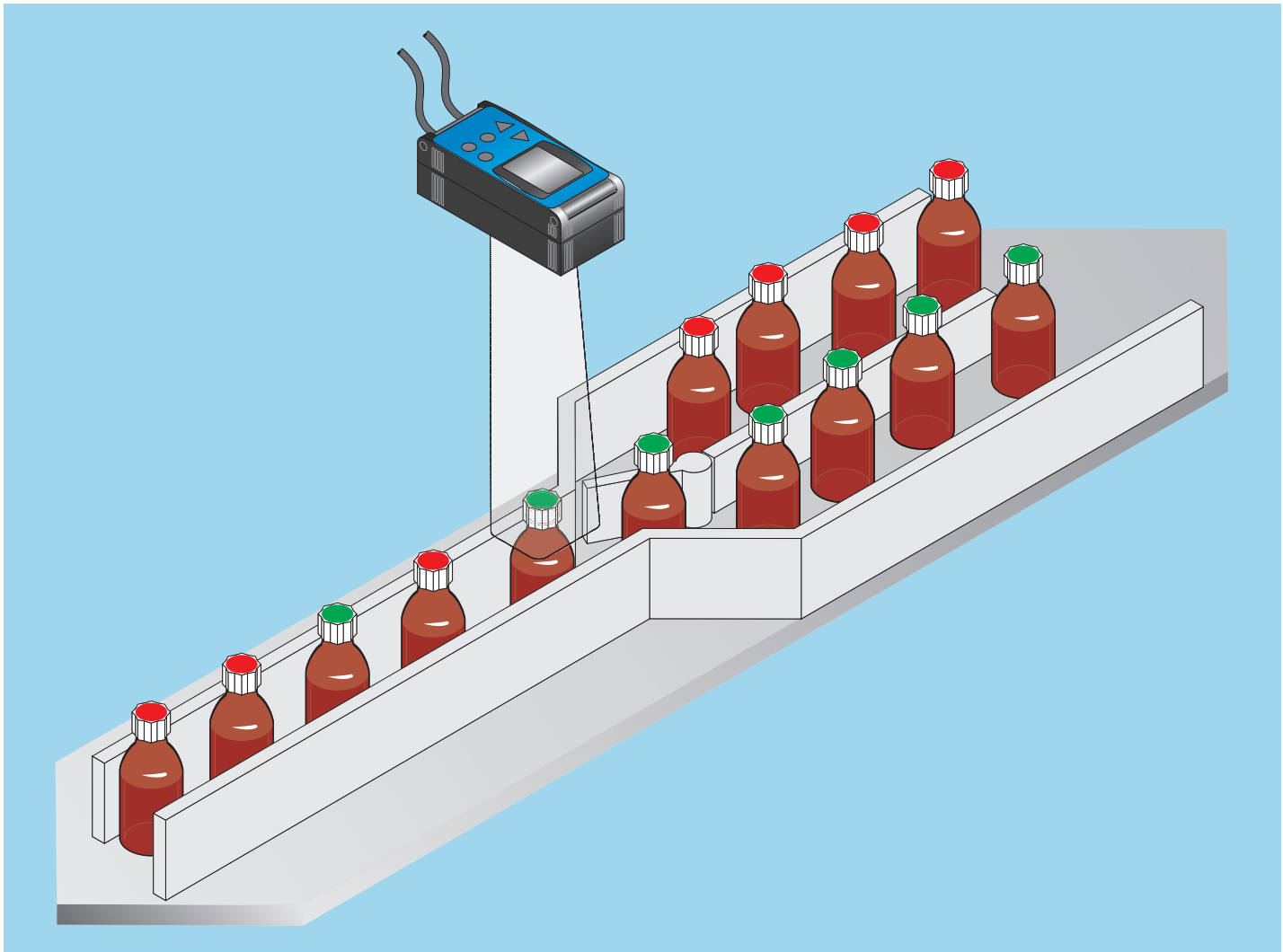
The CVS family has no problem in environments where broken glass must be avoided thanks to its sturdy plastic housing and front window. With its IP 67 enclosure rating it is particularly suitable for harsh industrial environment.



▲ Even parts with greatly varying appearance and position can be sorted by the CVS2, using their colour.

▼ The label is on – but is it the right one? The CVS1 Easy recognises incorrect labels by colour.





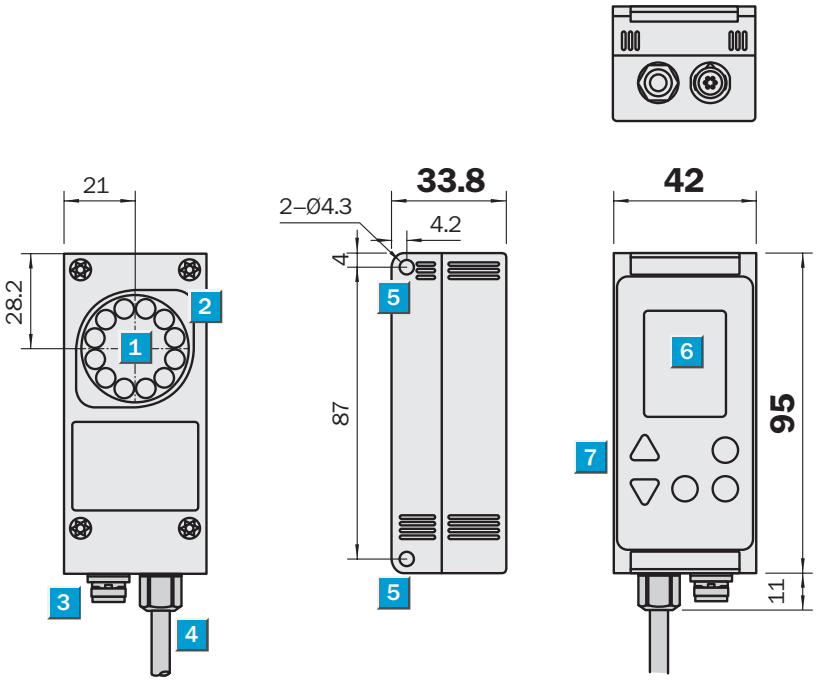
▲ The same shape, different contents: a camera sensor assists in sorting if colour remains the only distinguishing feature.

Nominal scanning dist.
210 ... 270/90 ... 150/
50 ... 100 mm

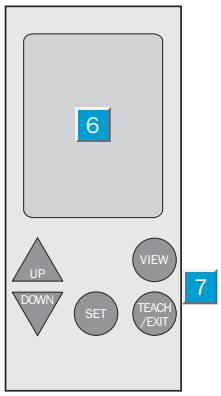
Colour Vision Sensors

- Detecting colour
- Plug and play teach
- Memory capacity for 8 colours

Dimensional drawing



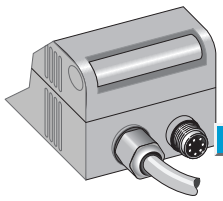
Adjustments possible



1 Front screen
2 Lighting
3 Connection: external lighting/monitor
4 Connecting cable
5 Fixing hole
6 Colour display
7 Input keypad

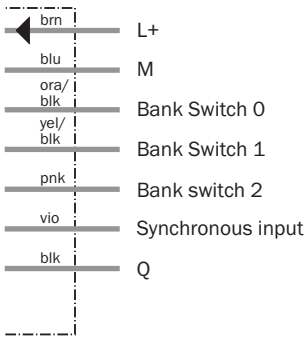
Connection type

All types



3 Connection: external lighting/monitor

Cable, 7-wire



Technical data	CVS1-	P112	P122	P142	N112	N122	N142	Easy
Nominal scanning distance/Field of view	210 ... 270 mm/40 x 50 ... 55 x 65 mm²	■			■			
	90 ... 150 mm/40 x 50 ... 65 x 75 mm²		■			■		
	50 ... 100 mm/50 x 65 ... 100 x 115 mm²			■			■	
Light source [1]	12 x LED, white	■	■	■	■	■	■	
Resolution	Max. 200 x 240 x 3 (RGB)	■	■	■	■	■	■	
Teach procedure	1-point	■	■	■	■	■	■	
	Lower limit	■	■	■	■	■	■	
Supply voltage V_s [2]	12 ... 24 V DC	■	■	■	■	■	■	
Residual ripple [3]	< 5 V_{pp}	■	■	■	■	■	■	
Current consumption [4]	< 220 mA (at 24 V),	■	■	■	■	■	■	
	< 120 mA (at 12 V)	■	■	■	■	■	■	
Switching outputs	PNP	■	■	■				
	NPN				■	■	■	
Output current I_A max.	< 100 mA	■	■	■	■	■	■	
Response time [5]	0.6 ... 22 ms	■	■	■	■	■	■	
Trigger input	HIGH corresp. 8 V	■	■	■	■	■	■	
I/O + V_S connection	Cable 7-pin, L = 2 m	■	■	■	■	■	■	
Connection of additional device	HRS, 6-pin	■	■	■	■	■	■	
Ambient temperature T_A [6]	Operation: 0 °C ... +40 °C	■	■	■	■	■	■	
	Storage: -20 °C ... +70 °C	■	■	■	■	■	■	
Shock load	5 g, 6 directions	■	■	■	■	■	■	
Housing material	ABS, acrylic, polycarbonate	■	■	■	■	■	■	
Enclosure rating	IP 67	■	■	■	■	■	■	
Weight	180 g	■	■	■	■	■	■	

1) Average service life 50,000 h at T_A = +25 °C; 50 % intensity fall
2) Limit values ± 10%
3) May not exceed or fall short of V_S tolerances
4) Without load
5) Dependent on settings; see display on device
6) Rel. humidity: 35 ... 85 % at operation, 95% at storage

Teach procedure	Explanation
1-point	Colour parts of the object are taught in. Switching limit = 50% of the taught-in colour pixel sum (manually adjustable).
Lower limit	Lower switching limit of the object colour is taught in.

Order information

Colour Vision Sensor

Type	Order no.
CVS1-P112 Easy	1028668
CVS1-P122 Easy	1028669
CVS1-P142 Easy	1028670
CVS1-N112 Easy	1028665
CVS1-N122 Easy	1028666
CVS1-N142 Easy	1028667

Accessories

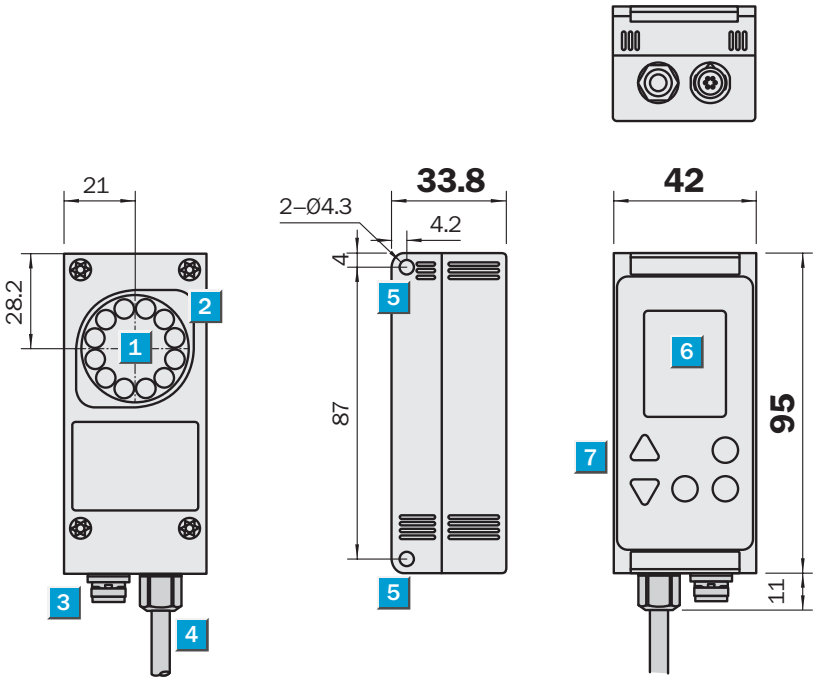
Type	Order no.
CVSM-1, external operating unit incl. monitor and keypad	1026355
CVSL-S5, external lighting, 12 x LED, white	1026356
Cable DSL-SH06-G03M, 3 m	6028659

Nominal scanning dist.
210 ... 270/90 ... 150/
50 ... 100 mm

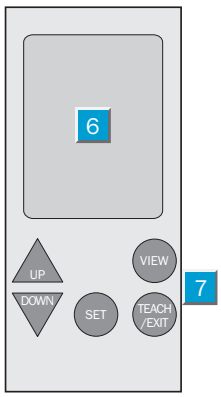
Colour Vision Sensors

- Detecting colour
- Sorting colours
- Detecting objects using two colours
- Memory capacity for 15 colours

Dimensional drawing



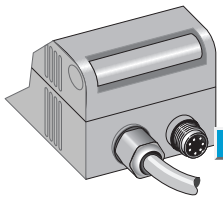
Adjustments possible



1 Front screen
2 Lighting
3 Connection: external lighting/ monitor/ PC
4 Connecting cable
5 Fixing hole
6 Colour display
7 Input keypad

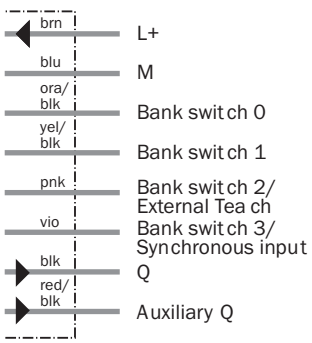
Connection type

All types



3 Connection: external lighting/ monitor/ PC

Cable, 8-wire



Technical data	CVS2-	P112	P122	P142	N112	N122	N142
Nominal scanning distance/Field of view	210 ... 270 mm/40 x 50 ... 55 x 65 mm²	■			■		
	90 ... 150 mm/40 x 50 ... 65 x 75 mm²		■			■	
	50 ... 100 mm/50 x 65 ... 100 x 115 mm²			■			■
Light source [1]	12 x LED, white	■	■	■	■	■	■
Resolution	Max. 208 x 236 x 3 (RGB)	■	■	■	■	■	■
Teach procedure	1-point	■	■	■	■	■	■
	2-point	■	■	■	■	■	■
	Upper/lower limit	■	■	■	■	■	■
Supply voltage V_S [2]	12 ... 24 V DC	■	■	■	■	■	■
Residual ripple [3]	< 5 V_{pp}	■	■	■	■	■	■
Current consumption [4]	< 240 mA (at 24 V),	■	■	■	■	■	■
	< 140 mA (at 12 V)	■	■	■	■	■	■
Interface	RS 232 TTL	■	■	■	■	■	■
Switching outputs	PNP	■	■	■			
	NPN				■	■	■
Output current I_A max.	< 100 mA	■	■	■	■	■	■
Response time [5]	5 ... 26.6 ms	■	■	■	■	■	■
Trigger input	HIGH corresp. 8 V	■	■	■	■	■	■
I/O + V_S connection	Cable 8-pin, L = 2 m	■	■	■	■	■	■
Connection of additional device	HRS, 6-pin	■	■	■	■	■	■
Ambient temperature T_A [6]	Operation: 0 °C ... +40 °C	■	■	■	■	■	■
	Storage: -20 °C ... +70 °C	■	■	■	■	■	■
Shock load	5 g, 6 directions	■	■	■	■	■	■
Housing material	ABS, acrylic, polycarbonate	■	■	■	■	■	■
Enclosure rating	IP 67	■	■	■	■	■	■
Weight	180 g	■	■	■	■	■	■

1) Average service life 50,000 h at T_A = +25 °C; 50 % intensity fall
2) Limit values ± 10%
3) May not exceed or fall short of V_S tolerances
4) Without load
5) Dependent on settings; see display on device
6) Rel. humidity: 35 ... 85 % at operation, 95% at storage

Teach procedure	Explanation
1-point	Colour parts of the object are taught in. Switching limit = 50% of the taught-in colour pixel sum (manually adjustable). Teach with automatic colour selection.
2-point	Colour parts of the object and the background are taught in. Switching limit = average between object and background.
Upper/lower limit	Upper and lower switching limit of the object colour are taught in.

Order information

Colour Vision Sensor

Type	Order no.
CVS2-P112	1027332
CVS2-P122	1027333
CVS2-P142	1027334
CVS2-N112	1027329
CVS2-N122	1027330
CVS2-N142	1027331

Accessories

Type	Order no.
CVSM-1, external operating unit incl. monitor and keypad	1026355
CVSL-S5, external lighting, 12 x LED, white	1026356
Cable DSL-SH06-G03M, 3 m	6028659
Connection cable DSL-DH06-G02M, 2 m for CVS data transfer and save/load configuration files to/from PC	6029801

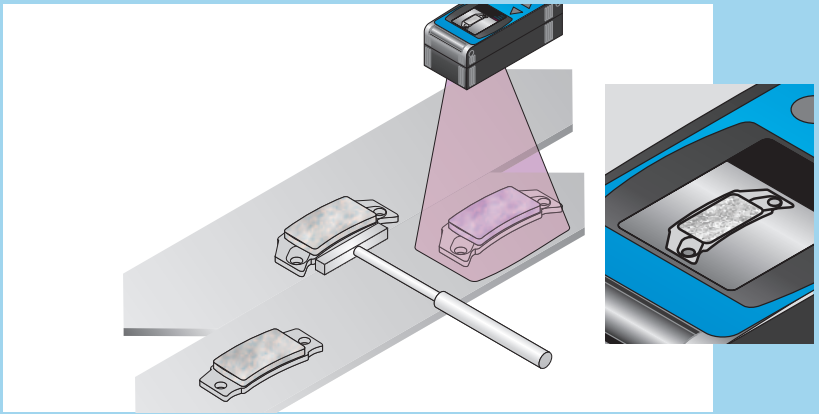
Contour Vision Sensor: Detection of Shapes, Profiles and Reliefs in any Position.

Using contour detection, processes are controlled more efficiently and with less interference.

Detecting and evaluating characteristic profiles — easily and flexibly. Contours, shapes and sizes are captured irrespective of position — for scanning distances up to 150 mm and fields of view up to 65 x 75 mm^2.

The intelligent Contour Vision Sensor CVS3 with integrated evaluation software differentiates between objects using shape or size; it detects the presence of, or damage to, printed labels and checks surfaces for contamination.

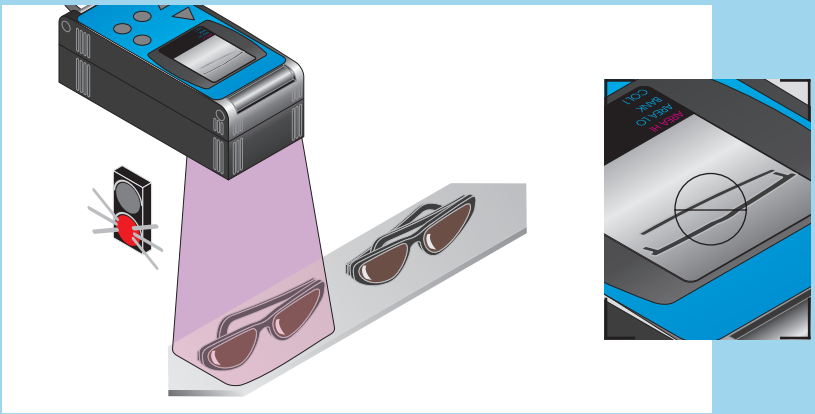
▼ The CVS3 distinguishes objects using the taught-in contour.



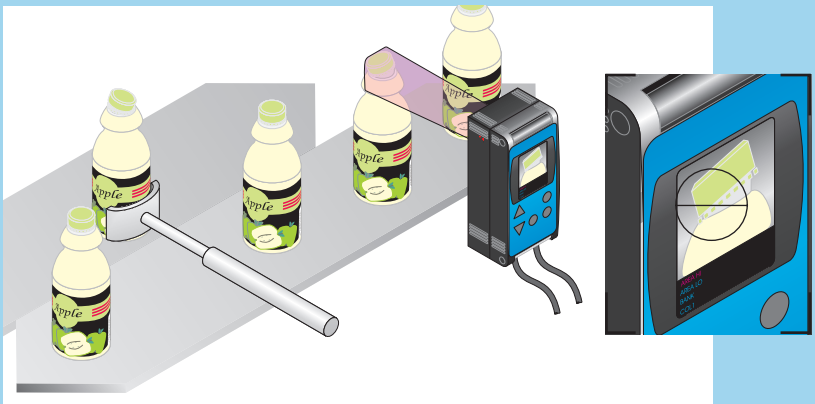
◀ The integrated memory can take teach-in data for up to 15 different objects; digital switching inputs permit external selection and, thus, fast and flexible product change-overs. During operation, all operational data required remains in view on the LCD display. Thus, the CVS3 combines all components of an image processing system in the smallest space.

▶ During setting and Teach-in, the LCD display supports the CVS3's optimum alignment. The parametrisation is done directly via the device's keypad. Automatic calculation of complex parameters and the serial interface also facilitate parametrisation; once settings are made, they can be stored on a PC and made available to other CVS3 units.

▼ Final checking of sunglasses. The CVS3 checks whether frames, lenses and ear pieces are where they belong.



▼ Does the cap fit properly? The CVS3 ensures that only correctly assembled products are packaged.



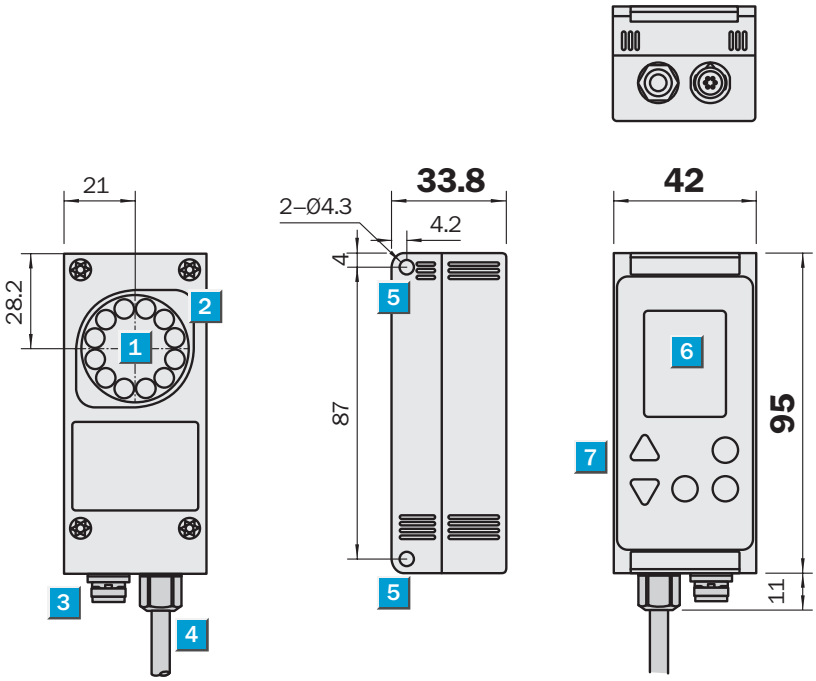
◀ With its robust and compact plastic housing and plastic front screen, the CVS3 is also particularly suitable for use in the food and beverage or pharmaceutical industries. And, thanks to IP 67 enclosure rating, it is particularly suitable for harsh industrial environments.

Nominal scanning dist.
90 ... 150/
31 ... 39 mm

Contour Vision Sensors

- Object detection using shape or size
- Check for surface contamination
- Memory capacity for 15 images

Dimensional drawing

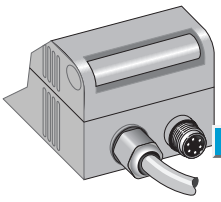


Adjustments possible

1 Front screen
2 Lighting
3 Connection: external lighting/ monitor/ PC
4 Connecting cable
5 Fixing hole
6 Colour display
7 Input keypad

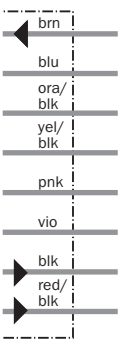
Connection type

All types



3 Connection: external lighting/ monitor/ PC

Cable, 8-wire



L+
M
Bank switch 0
Bank switch 1
Bank switch 2/ External Tea ch
Bank switch 3/ Synchronous input
Q
Auxiliary Q/ Lighting control output

Technical data	CVS3-	P122	P132	N122	N132
Nominal scanning distance/Field of view	90 ... 150 mm/40 x 50 ... 65 x 75 mm²	■		■	
	31 ... 39 mm/15 x 18 ... 19 x 22 mm²		■		■
Light source [1]	12 x LED, white	■	■	■	■
Resolution	Max. 208 x 236 x 3 (RGB)	■	■	■	■
Supply voltage V_S [2]	12 ... 24 V DC	■	■	■	■
Current consumption [3]	< 140 mA (at 24 V)	■	■	■	■
Interface	RS 232 TTL (4800 ... 57600 Baud)	■	■	■	■
Switching outputs	PNP	■	■		
	NPN			■	■
Output current I_A max.	< 100 mA	■	■	■	■
Response time (min./typ./max.) [4]	7/48/398 ms	■	■	■	■
Switching inputs	External trigger, Teach and	■	■	■	■
	memory selection	■	■	■	■
I/O + V_S connection	Cable 8-pin cable, L = 2 m	■	■	■	■
Ambient temperature T_A [5]	Operation: 0 °C ... +40 °C	■	■	■	■
	Storage: –20 °C ... +70 °C	■	■	■	■
Shock load	5 g, 6 directions	■	■	■	■
Housing material	ABS, acrylic, polycarbonate	■	■	■	■
Enclosure rating	IP 67	■	■	■	■
Weight	180 g	■	■	■	■

1) Average service life 50,000 h at TA = +25 °C; 50 % drop-in intensity
2) Limit values ± 10%
3) Without load
4) Dependent on settings; as displayed
5) Rel. humidity: 35 ... 85 % at operation, 95% at storage

Order information

Contour Vision Sensor CVS3

Type	Order no.
CVS3-P122	1028673
CVS3-P132	1028674
CVS3-N122	1028671
CVS3-N132	1028672

Accessories

Type	Order no.
CVSM-1, external operating device incl. monitor and keypad	1026355
CVSL-S5, external lighting, 12 x LED, white	1026356
Connecting Cable DSL-SH06-G03M, 3 m	6028659
Connection cable DSL-DH06-G02M, 2 m for save/load configuration files to/from PC	6029801

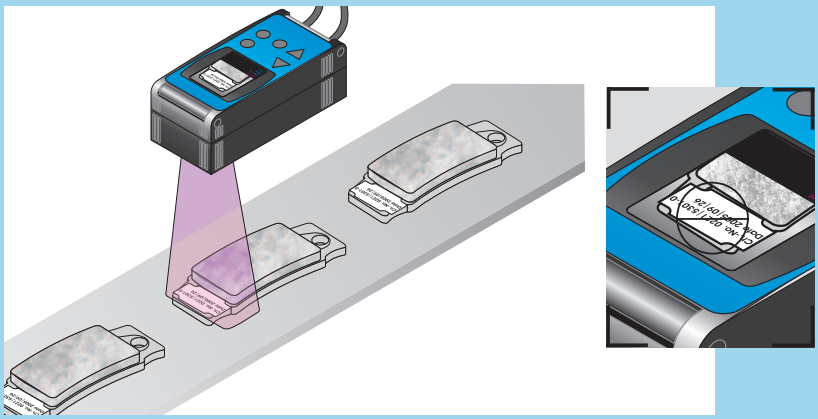
OCR Vision Sensor: Detection and Readout of Dates, Times, Strings and Batch Numbers.

Flexible image processing in the smallest space.

For scanning distances up to 150 mm and fields of view up to 79 x 76 mm^2, the CVS4 detects, recognises and, if required, counts characters. The CVS4's integrated OCR evaluation software reads 60 characters on up to six lines, securely capturing up to four different formats such as two dates and times each.

Further more the CVS4 can with advantage be used for batch code checking with its support for count-up at trigger input.

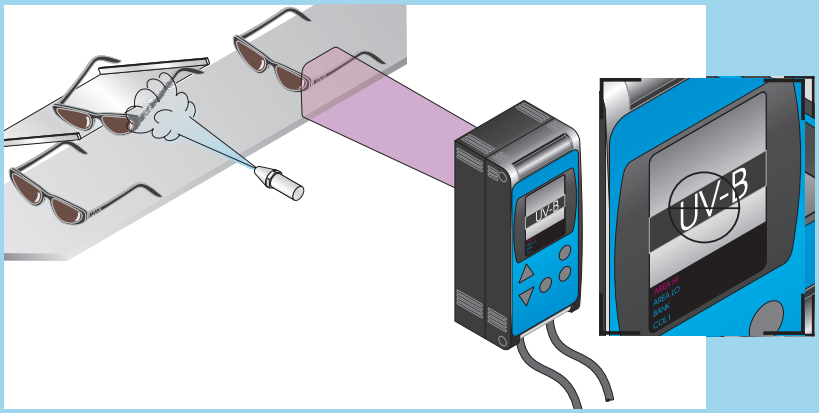
▼ Some products must be uniquely identifiable via a serial number. The CVS4 also counts the characters.



◀ Integrated character set database and clock as well as 18 predefined date and time formats allow fast setup. The character set can be extended by up to 57 user-defined characters; the internal clock ensures automatic date change at midnight. Even the recognition of consecutive or sequenced serial numbers presents the CVS4 with no challenge, thanks to the pulse counting input. The memory has a maximum capacity for 16 date/time formats, which can be selected via external signals. And up to 30 error images can be stored, for complete process control.

▶ During setting and Teach-in, the display supports the sensor's optimum alignment. The parameterisation is done directly via the device's keypad. Automatic calculation of complex parameters also simplifies commissioning. During operation, all operational data required remains on view via the LCD display. Thus, the CVS4 combines all components of an image processing system in the smallest space.

▼ Attention to detail is essential for similar-looking but different products: The CVS4 ensures that the label shows what is inside.



▼ The unique identification of a product is key in the food industry. The CVS4 checks if the batch number is correct and, by controlling the use-by date, ensures transparency for the customer.

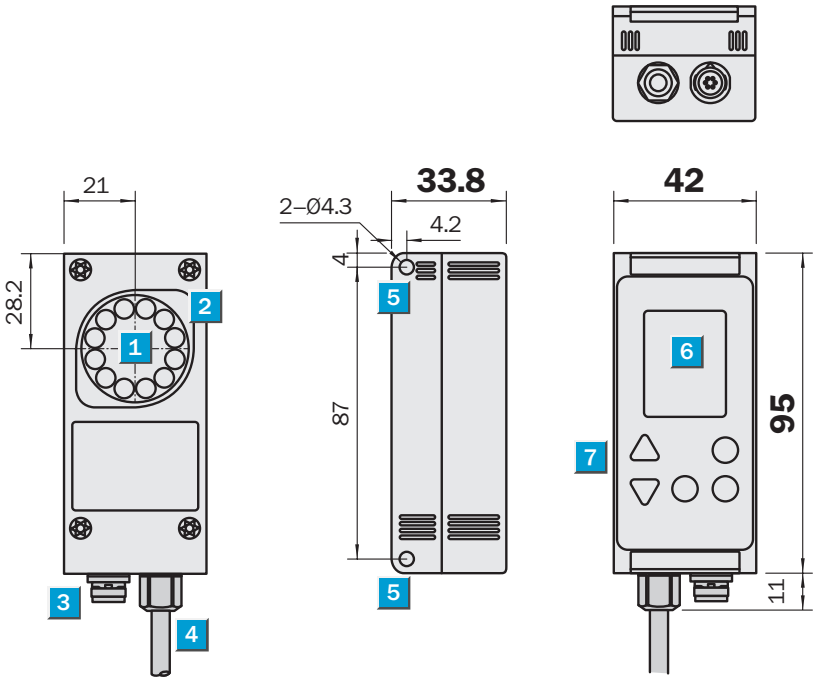
◀ With its robust and compact plastic housing and plastic front screen, the CVS4 is also particularly suitable for use in the food and beverage or pharmaceutical industries. And, thanks to IP 67 enclosure rating, it is particularly suitable for harsh industrial environments.

Nominal scanning dist.
90 ... 150/40 ... 100/
44 ... 56/31 ... 39 mm

OCR Vision Sensors

- Detecting date, time, string or batch number
- Memory capacity of 16 teach configurations

Dimensional drawing

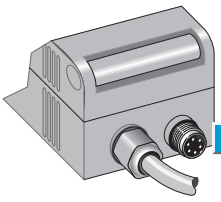


Adjustments possible

1 Front screen
2 Lighting
3 Connection: external lighting/ monitor/ PC
4 Connecting cable
5 Fixing hole
6 Colour display
7 Input keypad

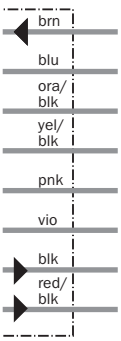
Connection type

All types



3 Connection: external lighting/ monitor/ PC

Cable, 8-wire



L+
M
Bank switch 0/Encode input
Bank switch 1/String+ input
Bank switch 2/ External Tea ch
Bank switch 3/ Synchronous input
Q
Auxiliary Q/ Lighting control output

Technical Data	CVS4-	N122	N132	N152	N150	N142	P122	P132	P152	P150	P142
Nominal scanning distance/Field of view	90 ... 150 mm/ 53 x 25 ... 79 x 38 mm²	■					■				
	53 x 50 ... 79 x 76 mm²	■					■				
	40 ... 100 mm/ 53 x 25 ... 115 x 53 mm²					■					■
	44 ... 56 mm/ 30 x 15; 30 x 30 mm²			■					■		
	44 ... 56 mm/ 15 x 30; 30 x 30 mm²				■					■	
	31 ... 39 mm/ 21 x 10; 21 x 20 mm²		■					■			
Character width/ height (min ... max.)	2.8 ... 30 mm/2.8 ... 62 mm	■					■				
	1.0 ... 11 mm/1.1 ... 24 mm			■	■				■	■	
	0.75 ... 8,2 mm/0.75 ... 16 mm		■					■			
	2.8 ... 44 mm/ 2.8 ... 43 mm					■					■
Light source [1]	12 x LED, white	■	■	■	■	■	■	■	■	■	■
Resolution	Max. 512 x 244 pixels (b/w)	■	■	■	■	■	■	■	■	■	■
Supply voltage V_S [2]	12 ... 24 V DC	■	■	■	■	■	■	■	■	■	■
Current consumption [3]	< 140 mA (at 24 V)	■	■	■	■	■	■	■	■	■	■
Interface	RS 232 TTL (4800 ... 15200 Baud)	■	■	■	■	■	■	■	■	■	■
Switching outputs	NPN	■	■	■	■	■					
	PNP						■	■	■	■	■
Output currents I_A max.	< 100 mA	■	■	■	■	■	■	■	■	■	■
Response time [4]	23 ... 48 ms [5]	■	■	■	■	■	■	■	■	■	■
Switching inputs	External trigger, Teach, pulse counter,	■	■	■	■	■	■	■	■	■	■
	string+ and memory selection	■	■	■	■	■	■	■	■	■	■
Filter switching inputs	< 12 ms [6]	■	■	■	■	■	■	■	■	■	■
	< 48 µs (on)/< 450 µs (off) [7]	■	■	■	■	■	■	■	■	■	■
Accuracy of integrated clock	Approx. -45 s ... +75 s per month	■	■	■	■	■	■	■	■	■	■
Power reserve of integrated clock	Stage 1: 3 days approx. [8]	■	■	■	■	■	■	■	■	■	■
	Stage 2: 5 years approx. [9]	■	■	■	■	■	■	■	■	■	■
I/O + U_S connection	8-pin cable, L = 2 m	■	■	■	■	■	■	■	■	■	■
Ambient temperature T_A [10]	Operation: 0 °C ... +40 °C	■	■	■	■	■	■	■	■	■	■
	Storage: –20 °C ... +70 °C	■	■	■	■	■	■	■	■	■	■
Shock load	5 g, 6 directions	■	■	■	■	■	■	■	■	■	■
Housing material	ABS, acrylic, polycarbonate	■	■	■	■	■	■	■	■	■	■
Enclosure rating	IP 67	■	■	■	■	■	■	■	■	■	■
Weight	200 g	■	■	■	■	■	■	■	■	■	■
Number of recognisable characters	60 characters max. (across all lines)	■	■	■	■	■	■	■	■	■	■
	6 lines max.	■	■	■	■	■	■	■	■	■	■
	30 characters max. per line	■	■	■	■	■	■	■	■	■	■
Recognisable date formats	Date, time, continuous serial/batch no.	■	■	■	■	■	■	■	■	■	■
	Max. of 4 different formats simultaneously [11]	■	■	■	■	■	■	■	■	■	■
Inbuilt dictionary	. / 0 to 9 : A to Z	■	■	■	■	■	■	■	■	■	■
User defined characters	56 characters [12]	■	■	■	■	■	■	■	■	■	■

1) Average service life 50,000 h at T_A = +25 °C; 50% drop-in intensity
2) Limit values ± 10%
3) Without load
4) Dependent on settings; as displayed
5) 20-character date code in 2 lines
6) For string + , teach and memory selection
7) For external trigger and pulse counters
8) With capacitor without V_S
9) With battery, without V_S
10) Rel. humidity: 35 ... 85 % at operation, 95% at storage
11) Max. 2 date and/or time formats each, plus serial/batch number can be combined
12) Can be created and transmitted by PC

Order information

OCR Vision Sensor CVS4

Type	Order no.	Type	Order no.
CVS4-P122	1028679	CVS4-N122	1028675
CVS4-P132	1028680	CVS4-N132	1028676
CVS4-P142	1028965	CVS4-N142	1028966
CVS4-P150	1028682	CVS4-N150	1028678
CVS4-P152	1028681	CVS4-N152	1028677

Accessories

Type	Order no.
CVSM-1, external operating device incl. monitor and keypad	1026355
CVSL-S5, external lighting, 12 x LED, white	1026356
Connection cable DSL-SH06-G03M, 3 m	6028659
Connection cable DSL-DH06-G02M, 2 m for CVS data transfer and save/load configuration files to/from PC	6029801