### VISOR® Color

Vision sensor for the most precise object detection





The same or not the same?

The VISOR® Color detects even the smallest of colour nuances more reliably than the human eye. This allows, for example, the detection of colour deviations or the sorting of parts by colour.



Incorrect occupancy ruled out:

The VISOR® Color combines colour and object detection in a single device and can therefore simultaneously inspect occupancy of the blister for completeness and for occupancy with the correct colour.

#### HIGHLIGHTS OF THE VISOR® COLOR

- Improved object detection through additional colour information
- Powerful colour detection, even with the smallest of colour nuances or self-illuminating components
- · Powerful part finding and tracking
- Highly accurate evaluation via 1.3 megapixel colour chip
- Up to 6 digital switching outputs (another 32 with IO box)
- User-friendly configuration and viewer software with graded user rights and online help



#### All LEDs in the right place?

A unique performance feature of vision colour sensors is the detection of active (self-illuminating) colours. For example, displays in the automotive industry or electronic components can be inspected for correct placement with the VISOR®





Colour is an important feature for detecting and differentiating between objects during the production process. Whether coloured marks in quality assurance, coloured printing or labels, LEDs or display elements, the occupancy of cable harnesses, or the browning level of baked goods – industry is much more colourful than is generally assumed.

Classic colour sensors are limited to the detection of passive colours, i.e. of object colours or coloured marks – they have to give up when confronted with self-illuminating objects. The VISOR® Color vision colour sensor from SensoPart knows no such restrictions – it not only "sees" objects of any shape and colour, but also provides additional information on colour intensity and the position of the particular object. It can also represent an alternative to conventional contrast sensors for

determining grey values and contrast differences when other object features are to be evaluated simultaneously.

#### The upgrade to colour is easy

The new generation of VISOR® Color vision colour sensors not only supports colour detection but also all the performance features of the VISOR® object sensor. The operating concept of the two vision sensors is identical – there are just three additional detectors for colour detection with corresponding configuration possibilities. The introductory effort for those switching from the VISOR® object sensor is thus minimal – when will you put more colours into your applications?

VISOR® Color – product overview					
	Product variant	Resolution	Focal length	Integrated illumination	Page
V20C-CO-A2-xx	Advanced	1280 x 1024 pixels	12 mm	White	112
V20C-CO-A2-xx	Advanced	1280 x 1024 pixels	C-mount	None	114
V10C-CO-S2-xx	Standard	736 × 480 pixels	6 mm	White	116
V10C-CO-S2-xx	Standard	736 × 480 pixels	12 mm	White	118
V10C-CO-A2-xx	Advanced	736 x 480 pixels	6 mm	White	120
V10C-CO-A2-xx	Advanced	736 × 480 pixels	12 mm	White	122
V10C-CO-A2-xx	Advanced	736 x 480 pixels	25 mm	White	124
V10C-CO-A2-xx	Advanced	736 x 480 pixels	C-mount	None	126

### Advanced vision sensor for object detection, colour, 12 mm











- Object detection in colour with 1.3 mega pixel resolution
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max, 255 / max, 255
CMOS	1/1.8", colour	Detectors	Contour, pattern comparison, callipe
Integrated lens, focal length	12 mm, adjustable focal position		BLOB, contrast, brightness, grey level
Adjustment range	30 mm to infinity		colour value, colour area, colour list
Integrated illumination	White LEDs	Properties	Position tracking: X/Y and orientation
Minimum field of view, X x Y	16 x 13 mm <sup>2</sup>		pattern comparison / contour: teach and detection of patterns and contours; calliper: distance between edg BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; colour area: two-dimensional colour inspection vadustable tolerance; colour list: finding the most similar colours
		Typical cycle times <sup>2</sup>	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms ctrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ ms colour list
Electrical data		Mechanical data	
Operating voltage, +U <sub>B</sub>	18 26.4V DC¹	Dimensions	65 x 45 x 45 mm³ (without plug)
Current consumption	≤ 120 mA	Enclosure rating	IP 67
(without illumination and I/O)		Material, housing	Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, U <sub>B</sub> /	Ambient temperature: operation	0 +50° C³
	short-circuit protection of all outputs	Ambient temperature: storage	-20 +60° C³
Power On Delay	Approx. 13 s after Power on	Weight	Approx, 160 g
Outputs	PNP / NPN (switchable)	Plug connections	Supply and I/O M12, 12-pin
Max. output current (per output)	50 mA, 100 mA (pin 12) PNP/NPN High > U <sub>R</sub> -1 V, Low < 3 V		Ethernet M12, 4-pin
Inputs resistance	> 20  kOhm	Vibration and impact resistance	Data M12, 5-pin FN 60947-5-2
Input resistance Encoder input	> 20 KONM High > 4V	Vibration and impact resistance	EIN 0U747-3-2
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

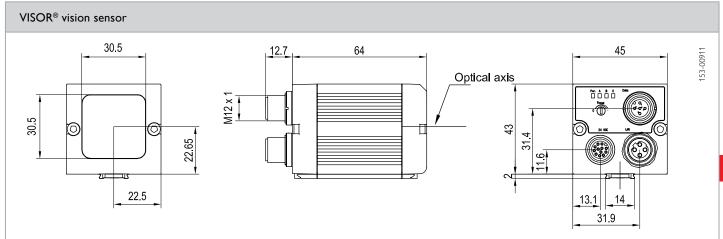
 $<sup>^{1}</sup>$  Max. ripple  $< 5 \, V_{SS}$ 

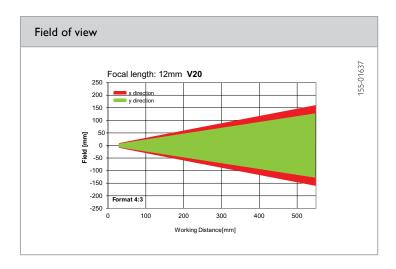
<sup>&</sup>lt;sup>3</sup> 80 % air humidity, non-condensing

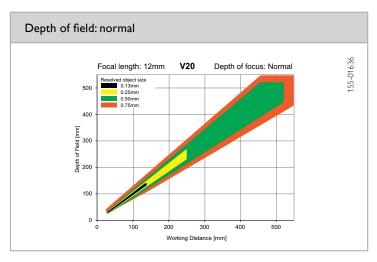
Illumination	Part number	Article number
White	V20C-CO-A2-W12	536-91020

 $<sup>^{2}</sup>$  with VGA-resolution (640 x 480 pixels)









Accessories			
Connection cables	From Page A-34		
Illumination	From Page A-27		
Brackets	From Page A-4		
Interface accessories	From Page A-38		

### Advanced vision sensor for object detection, colour, C-mount











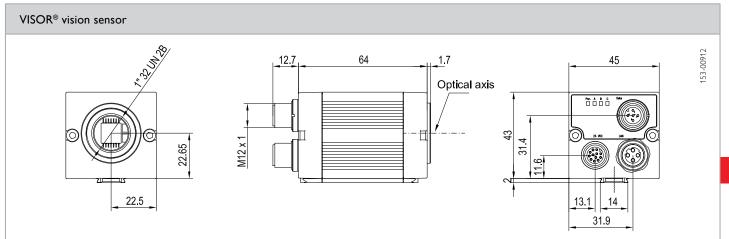
- Object detection in colour with 1.3 megapixel resolution
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

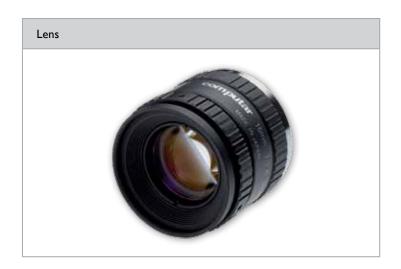
Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", colour	Detectors	Contour, pattern comparison, calliper,
Integrated lens, focal length	C-Mount		BLOB, contrast, brightness, grey level,
Adjustment range	Dependent on lens		colour value, colour area, colour list
Integrated illumination	None	Properties	Position tracking: X/Y and orientation;
Minimum field of view, X x Y	Dependent on lens		pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightnes evaluation of brightness; contrast: evaluation of contrast; colour area: two-dimensional colour inspection wi adustable tolerance; colour list: finding the most similar colours
		Typical cycle times <sup>2</sup>	Typ. 20 ms pattern comparison; typ. 30 m contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms colur trast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. ms colour list
Electrical data		Mechanical data	
Operating voltage, +U <sub>B</sub>	18 26.4V DC¹	Dimensions	65 x 45 x 45 mm³ (without plug)
Current consumption	≤ 120 mA	Enclosure rating	IP 65 <sup>3</sup>
(without illumination and I/O)		Material, housing	Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, U <sub>B</sub> /	Ambient temperature: operation	0 +50 °C <sup>4</sup>
	short-circuit protection of all outputs	Ambient temperature: storage	-20 +60 °C <sup>4</sup>
Power On Delay	Approx. 13 s after Power on	Weight	Арргох. 160 g
Outputs	PNP / NPN (switchable)	Plug connections	Supply and I/O M12, 12-pin
Max. output current (per output)	50 mA, 100 mA (pin 12) PNP/NPN High > U <sub>p</sub> -1 V, Low < 3 V		Ethernet M12, 4-pin
Inputs	> 20  kOhm	Vilentia, and income national	Data M12, 5-pin FN 60947-5-2
Input resistance		Vibration and impact resistance	EIN 60947-3-2
Encoder input Interfaces	High > 4V  Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

<sup>&</sup>lt;sup>1</sup> Max, ripple < 5 V<sub>sc</sub> <sup>2</sup> With VGA-resolution (640 x 480 Pixel) <sup>3</sup> With LPT45 C-mount protective casing <sup>4</sup> 80 % air humidity, non-condensing

Part number	Article number
V20C-CO-A2-C	536-91021







	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories		
Connection cables	From Page A-34	
Illumination	From Page A-27	
Lenses	From Page A-25	
Brackets	From Page A-4	
Interface accessories	From Page A-38	

Standard vision sensor for object detection, colour, 6 mm











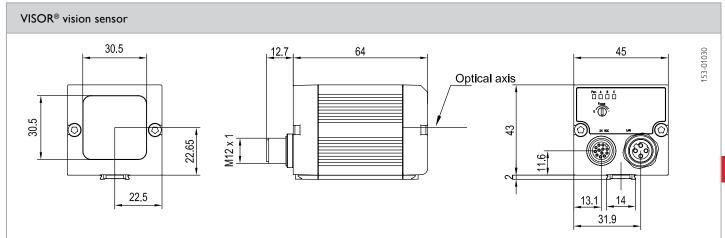
- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights

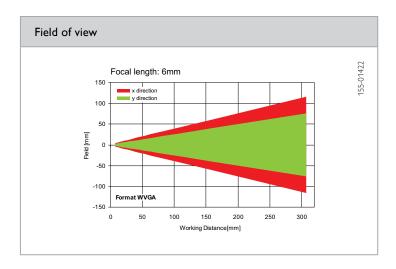
Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 32
CMOS	1/3", colour	Detectors	Position tracking X/Y and orientation
Integrated lens, focal length	6 mm, adjustable focal position		via contour inspection; colour area
Adjustment range	6 mm to infinity	Properties	Position tracking X/Y and orientation
Integrated illumination	White LEDs		contour: teach-in and detection of contours: colour area; two-dimensio
Minimum field of view, X xY	5 x 4 mm <sup>2</sup>		colour inspection with adustable tole rance
		Typical cycle times	Typ. 30 ms position tracking Typ. 30 ms colour area
Electrical data		Mechanical data	
Operating voltage, +U <sub>B</sub>	18 26.4 V DC <sup>1</sup>	Dimensions	65 × 45 × 45 mm³ (without plug)
Current consumption	≤ 120 mA	Enclosure rating	IP 67
(without illumination and I/O)		Material, housing	Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, U <sub>B</sub> /	Ambient temperature: operation	0 +50 °C <sup>2</sup>
Protective circuits	short-circuit protection of all outputs		0 +50 °C² -20 +60 °C²
Protective circuits  Power On Delay	short-circuit protection of all outputs Approx. 13 s after Power on	Ambient temperature: operation	-20 +60 °C² Approx. 160 g
Protective circuits  Power On Delay  Outputs	short-circuit protection of all outputs Approx. 13 s after Power on PNP / NPN (switchable)	Ambient temperature: operation  Ambient temperature: storage	-20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin
Protective circuits  Power On Delay  Outputs  Max. output current (per output)	short-circuit protection of all outputs Approx. 13 s after Power on PNP / NPN (switchable) 50 mA, 100 mA (pin 12)	Ambient temperature: operation Ambient temperature: storage Weight Plug connections	-20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Protective circuits  Power On Delay  Outputs  Max. output current (per output)  Inputs	short-circuit protection of all outputs  Approx. 13 s after Power on  PNP / NPN (switchable)  50 mA, 100 mA (pin 12)  PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V	Ambient temperature: operation  Ambient temperature: storage  Weight	-20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin
Protective circuits  Power On Delay  Outputs  Max. output current (per output)  Inputs  Input resistance	short-circuit protection of all outputs  Approx. 13 s after Power on  PNP / NPN (switchable)  50 mA, 100 mA (pin 12)  PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V  > 20 kOhm	Ambient temperature: operation Ambient temperature: storage Weight Plug connections	-20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Protective circuits  Power On Delay  Outputs  Max. output current (per output)  Inputs	short-circuit protection of all outputs  Approx. 13 s after Power on  PNP / NPN (switchable)  50 mA, 100 mA (pin 12)  PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V	Ambient temperature: operation Ambient temperature: storage Weight Plug connections	-20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin

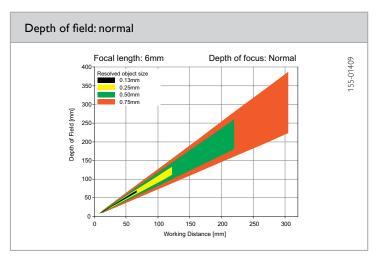
 $<sup>^{1}</sup>$  Max. ripple  $< 5 \, V_{ss}$   $^{2}$  80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-S2-W6	535-91071









Accessories		
Connection cables	From Page A-34	
Illumination	From Page A-27	
Brackets	From Page A-4	
Interface accessories	From Page A-38	

Standard vision sensor for object detection, colour, 12 mm











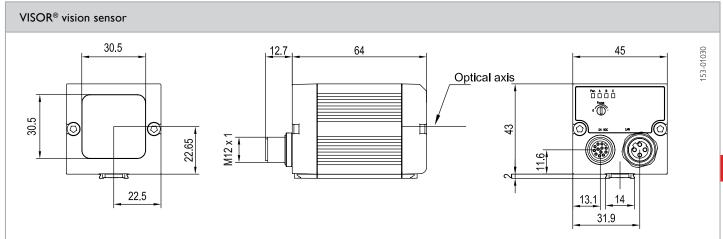
- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights

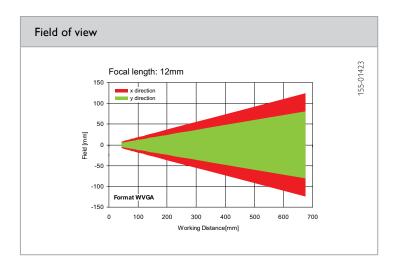
Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 32
CMOS Integrated lens, focal length	1/3", colour  12 mm, adjustable focal position	Detectors	Position tracking X/Y and orientation via contour inspection; colour area
Adjustment range Integrated illumination Minimum field of view, X x Y	30 mm to infinity White LEDs 8 x 6 mm <sup>2</sup>	Properties	Position tracking X/Y and orientation contour: teach-in and detection of contours; colour area: two-dimensior colour inspection with adustable tolerance
		Typical cycle times	Typ. 30 ms position tracking Typ. 30 ms colour area
Electrical data	40. 27.0005	Mechanical data	45 45 45 3/ H
Operating voltage, +U <sub>B</sub> Current consumption	18 26.4 V DC¹ ≤ 120 mA	Dimensions Enclosure rating	65 x 45 x 45 mm <sup>3</sup> (without plug) IP 67
	2 120 117 (		
(without illumination and I/O)		Material, housing	Aluminium, plastic
(without illumination and I/O) Current consumption (without I/O)	≤ 200 mA	Material, housing Material, front screen	Aluminium, plastic Plastic
·	Reverse-polarity protection, U <sub>B</sub> /	Material, front screen	Aluminium, plastic  Plastic  0 +50 °C²
Current consumption (without I/O)	= = • • • • • •	Material, front screen Ambient temperature: operation	Plastic
Current consumption (without I/O)	Reverse-polarity protection, U <sub>B</sub> /	Material, front screen	Plastic 0 +50 °C²
Current consumption (without I/O) Protective circuits	Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs Approx. 13 s after Power on PNP / NPN (switchable)	Material, front screen  Ambient temperature: operation  Ambient temperature: storage  Weight	Plastic 0 +50 °C² -20 +60 °C²
Current consumption (without I/O) Protective circuits  Power On Delay	Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs Approx. 13 s after Power on PNP / NPN (switchable) 50 mA, 100 mA (pin 12)	Material, front screen  Ambient temperature: operation  Ambient temperature: storage	Plastic 0 +50 °C² -20 +60 °C² Approx. 160 g
Current consumption (without I/O) Protective circuits  Power On Delay Outputs	Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs Approx. 13 s after Power on PNP / NPN (switchable)	Material, front screen  Ambient temperature: operation  Ambient temperature: storage  Weight	Plastic 0 +50 °C² -20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin
Current consumption (without I/O) Protective circuits  Power On Delay Outputs Max. output current (per output)	Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs Approx. 13 s after Power on PNP / NPN (switchable) 50 mA, 100 mA (pin 12)	Material, front screen  Ambient temperature: operation  Ambient temperature: storage  Weight  Plug connections	Plastic  0 +50 °C²  -20 +60 °C²  Approx. 160 g  Supply and I/O M12, 12-pin  Ethernet M12, 4-pin
Current consumption (without I/O) Protective circuits  Power On Delay Outputs Max. output current (per output) Inputs	Reverse-polarity protection, $U_{\rm g}$ / short-circuit protection of all outputs Approx. 13 s after Power on PNP / NPN (switchable) 50 mA, 100 mA (pin 12) PNP/NPN High > $U_{\rm g}$ -1 V, Low < 3 V	Material, front screen  Ambient temperature: operation  Ambient temperature: storage  Weight  Plug connections	Plastic  0 +50 °C²  -20 +60 °C²  Approx. 160 g  Supply and I/O M12, 12-pin  Ethernet M12, 4-pin

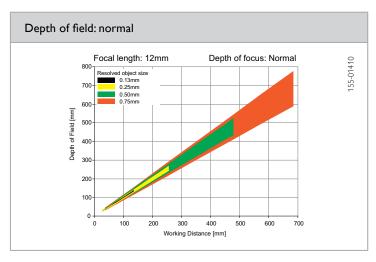
 $<sup>^{1}</sup>$  Max. ripple  $\leq$  5  $V_{ss}$   $\,$   $^{2}$  80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-S2-W12	535-91072









Accessories		
Connection cables	From Page A-34	
Illumination	From Page A-27	
Brackets	From Page A-4	
Interface accessories	From Page A-38	

### Advanced vision sensor for object detection, colour, 6 mm











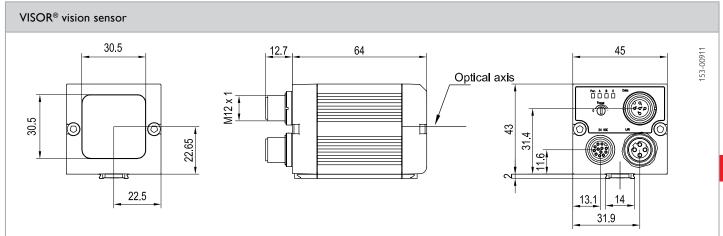
- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

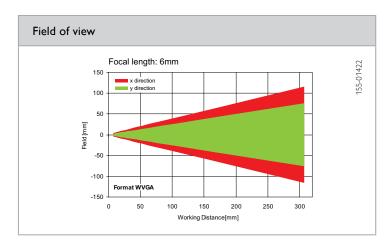
Optical data		Functions	
Resolution	736 × 480 pixels	Number of jobs / detectors	max, 255 / max, 255
CMOS	1/3", colour	Detectors	Contour, pattern comparison, calliper,
Integrated lens, focal length	6 mm, adjustable focal position		BLOB, contrast, brightness, grey level,
Adjustment range	6 mm to infinity		colour value, colour area, colour list
Integrated illumination	White LEDs	Properties	Position tracking: X/Y and orientation;
Minimum field of view, X xY	5 × 4 mm <sup>2</sup>		pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness evaluation of brightness; contrast: evaluation of contrast; colour area: two-dimer sional colour inspection with adustabl tolerance; colour list: finding the most similar colours
		Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. 2 ms colour list
Electrical data		Mechanical data	
Operating voltage, +U <sub>R</sub>	18 26.4 V DC <sup>1</sup>	Dimensions	$65 \times 45 \times 45 \text{ mm}^3$ (without plug)
Operating voltage, +U <sub>B</sub> Current consumption	18 26,4 V DC¹ ≤ 120 mA	Dimensions Enclosure rating	$\frac{65 \times 45 \times 45 \text{ mm}^3 \text{ (without plug)}}{\text{IP 67}}$
1 0 0 6			
Current consumption		Enclosure rating	IP 67
Current consumption (without illumination and I/O)	≤ 120 mA ≤ 200 mA Reverse-polarity protection, U <sub>B</sub> /	Enclosure rating Material, housing	IP 67 Aluminium, plastic
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits	≤ 120 mA  ≤ 200 mA  Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs	Enclosure rating  Material, housing  Material, front screen	IP 67 Aluminium, plastic Plastic
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits  Power On Delay	≤ 120 mA  ≤ 200 mA  Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs  Approx. 13 s after Power on	Enclosure rating  Material, housing  Material, front screen  Ambient temperature: operation	IP 67 Aluminium, plastic Plastic 0 +50 °C²
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits  Power On Delay Outputs	≤ 120 mA  ≤ 200 mA  Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs  Approx. 13 s after Power on  PNP / NPN (switchable)	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +60 °C²
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits  Power On Delay	≤ 120 mA  ≤ 200 mA  Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs  Approx. 13 s after Power on  PNP / NPN (switchable)  50 mA, 100 mA (pin 12)	Enclosure rating  Material, housing  Material, front screen  Ambient temperature: operation  Ambient temperature: storage  Weight	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +60 °C² Approx.160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits  Power On Delay Outputs Max. output current (per output) Inputs	≤ 120 mA  ≤ 200 mA  Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs  Approx. 13 s after Power on  PNP / NPN (switchable)  50 mA, 100 mA (pin 12)  PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight Plug connections	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits  Power On Delay Outputs Max. output current (per output) Inputs Input resistance	≤ 120 mA  Severse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs  Approx. 13 s after Power on PNP / NPN (switchable)  50 mA, 100 mA (pin 12)  PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V > 20 kOhm	Enclosure rating  Material, housing  Material, front screen  Ambient temperature: operation  Ambient temperature: storage  Weight	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +60 °C² Approx.160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits  Power On Delay Outputs Max. output current (per output) Inputs Input resistance Encoder input	≤ 120 mA  ≤ 200 mA  Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs  Approx. 13 s after Power on  PNP / NPN (switchable)  50 mA, 100 mA (pin 12)  PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight Plug connections	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Current consumption (without illumination and I/O) Current consumption (without I/O) Protective circuits  Power On Delay Outputs Max. output current (per output) Inputs Input resistance	≤ 120 mA  Severse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs  Approx. 13 s after Power on PNP / NPN (switchable)  50 mA, 100 mA (pin 12)  PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V > 20 kOhm	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight Plug connections	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +60 °C² Approx. 160 g Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin

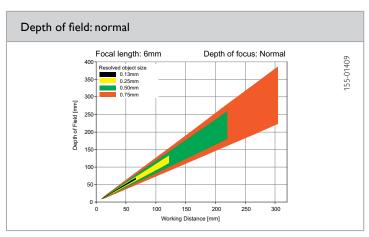
 $<sup>^{1}</sup>$  Max, ripple  $\leq$  5  $V_{ss}$   $\,$   $^{2}$  80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W6	535-91073









Accessories		
Connection cables	From Page A-34	
Illumination	From Page A-27	
Brackets	From Page A-4	
Interface accessories	From Page A-38	

### Advanced vision sensor for object detection, colour, 12 mm











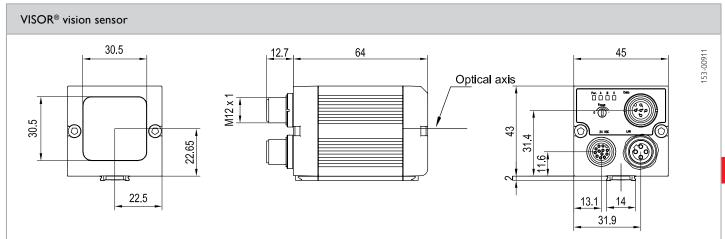
- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

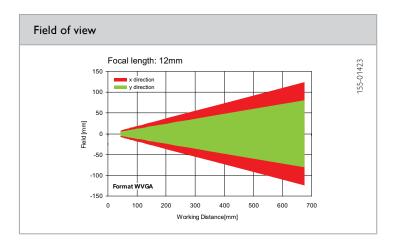
Optical data		Functions	
Resolution	736 × 480 pixels	Number of jobs / detectors	max, 255 / max, 255
CMOS	1/3", colour	Detectors	Contour, pattern comparison, callipe
Integrated lens, focal length	12 mm, adjustable focal position		BLOB, contrast, brightness, grey leve
Adjustment range	30 mm to infinity		colour value, colour area, colour list
Integrated illumination	White LEDs	Properties	Position tracking: X/Y and orientatio
Minimum field of view, X xY	8 x 6 mm <sup>2</sup>		pattern comparison / contour: teach-in and detection of patterns at contours; calliper: distance between edges; BLOB; grey threshold, brightn evaluation of brightness; contrast: evaluation of contrast; colour area: two-dimensional colour inspection vadustable tolerance; colour list: finding the most similar colours
		Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 3 ms colour value; typ. 30 ms colour area typ. 2 ms colour list
Electrical data		Mechanical data	
Operating voltage, +U <sub>B</sub>	18 26.4V DC <sup>1</sup>	Dimensions	65 × 45 × 45 mm³ (without plug)
Current consumption	≤ 120 mA	Enclosure rating	IP 67
(without illumination and I/O)		Material, housing	Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, U <sub>B</sub> /	Ambient temperature: operation	0 +50° C²
	short-circuit protection of all outputs	Ambient temperature: storage	-20 +60° C²
Power On Delay	Approx. 13 s after Power on	Weight	Approx, 160 g
Outputs	PNP / NPN (switchable)	Plug connections	Supply and I/O M12, 12-pin
Max. output current (per output)	50 mA, 100 mA (pin 12)		Ethernet M12, 4-pin
Inputs	$\frac{\text{PNP/NPN High} > \text{U}_{\text{B}}-1\text{ V, Low} < 3\text{ V}}{2000 \text{ Polymer}}$	Vol. di la	Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

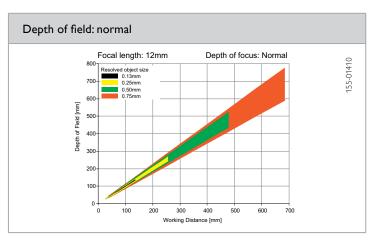
 $<sup>^{1}</sup>$  Max. ripple < 5  $V_{ss}$   $^{2}$  80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W12	535-91074









Accessories		
Connection cables	From Page A-34	
Illumination	From Page A-27	
Brackets	From Page A-4	
Interface accessories	From Page A-38	

### Advanced vision sensor for object detection, colour, 25 mm











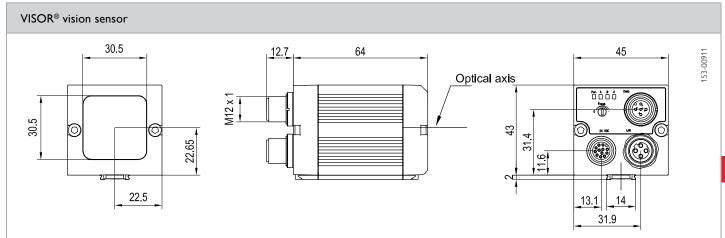
- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

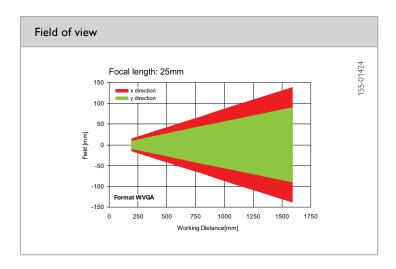
Optical data		Functions	
Resolution	736 × 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", colour	Detectors	Contour, pattern comparison, callipe
Integrated lens, focal length	25 mm, adjustable focal position		BLOB, contrast, brightness, grey level
Adjustment range	140 mm to infinity		colour value, colour area, colour list
Integrated illumination	White LEDs	Properties	Position tracking: X/Y and orientatio pattern comparison / contour:
Minimum field of view, X xY	18 x 14 mm <sup>2</sup>	Typical cycle times	teach-in and detection of patterns are contours; calliper: distance between edges; BLOB; grey threshold, brightness; contrast: evaluation of brightness; contrast: evaluation of contrast; colour area: two-dimensional colour inspection vadustable tolerance; colour list: finding the most similar colours  Typ. 20 ms pattern comparison; typ. 30 ms pattern comparison; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms ctrast; typ. 2 ms grey threshold; typ. 2 ms
Electrical data		Mechanical data	colour value; typ. 30 ms colour area; ty ms colour list
Operating voltage, +U <sub>B</sub>	18 26.4V DC <sup>1</sup>	Dimensions	$65 \times 45 \times 45 \text{ mm}^3$ (without plug)
Current consumption	≤ 120 mA	Enclosure rating	IP 67
(without illumination and I/O)	1200	Material, housing	Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs	Ambient temperature: operation	0 +50 °C²
Power On Delay	Approx. 13 s after Power on	Ambient temperature: storage	-20 +60 °C²
Outputs	PNP / NPN (switchable)	Weight	Approx. 160 g
Max. output current (per output)	50 mA, 100 mA (pin 12)	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Inputs	PNP/NPN High $> U_p$ -1 V, Low $< 3$ V		Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

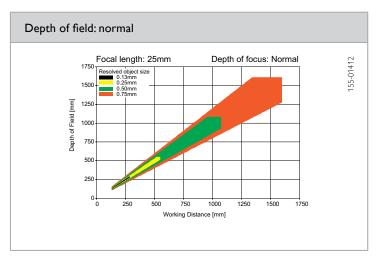
 $<sup>^{1}</sup>$  Max. ripple < 5  $V_{ss}$   $^{2}$  80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W25	535-91075









Accessories		
Connection cables	From Page A-34	
Illumination	From Page A-27	
Brackets	From Page A-4	
Interface accessories	From Page A-38	

### Advanced vision sensor for object detection, colour, C-mount











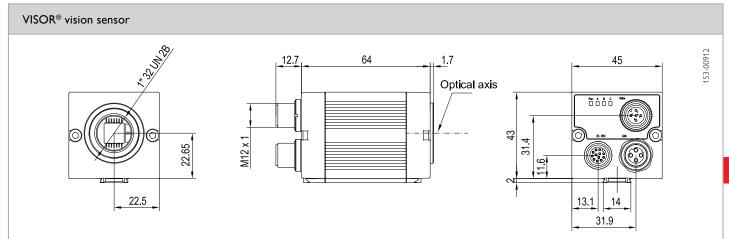
- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- · Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

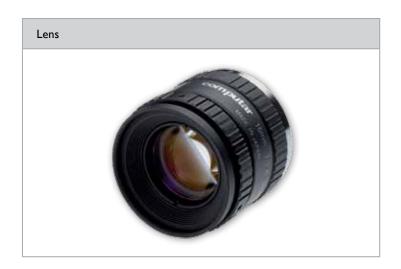
Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", colour	Detectors	Contour, pattern comparison, calliper
Integrated lens, focal length	C-Mount		BLOB, contrast, brightness, grey level
Adjustment range	Dependent on lens		colour value, colour area, colour list
Integrated illumination	None	Properties	Position tracking: X/Y and orientation
Minimum field of view, X x Y	Dependent on lens	Typical cycle times	pattern comparison / contour: teach-in and detection of patterns ar contours; calliper: distance between edges; BLOB; grey threshold, brightne evaluation of brightness; contrast: evaluation of contrast; colour area: two-dimensional colour inspection w adustable tolerance; colour list: finding the most similar colours  Typ. 20 ms pattern comparison; typ. 30 ms BLOB; typ. 2 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms c trast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ ms colour list
Electrical data		Mechanical data	
Operating voltage, +U <sub>R</sub>	18 26.4 V DC <sup>1</sup>	Dimensions	65 x 45 x 45 mm³ (without plug)
Current consumption	≤ 120 mA	Enclosure rating	IP 65 <sup>2</sup>
(without illumination and I/O)		Material, housing	Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, U <sub>B</sub> /	Ambient temperature: operation	0 +50 °C³
	short-circuit protection of all outputs	Ambient temperature: storage	-20 +60 °C³
Power On Delay	Approx, 13 s after Power on	Weight	Approx. 160 g
Outputs	PNP / NPN (switchable)	Plug connections	Supply and I/O M12, 12-pin
Max. output current (per output)	50 mA, 100 mA (pin 12)		Ethernet M12, 4-pin
Inputs	PNP/NPN High > U <sub>B</sub> -1 V, Low < 3 V		Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET		
Inputs/outputs	2 inputs, 4 outputs,		

 $<sup>^{1}</sup>$  Max, ripple < 5  $\rm V_{ss}$   $^{2}$  With LPT45 C-mount protective casing  $^{3}$  80 % air humidity, non-condensing

Part number	Article number		
V10C-CO-A2-C	535-91076		







	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length Article number	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories				
Connection cables	From Page A-34			
Illumination	From Page A-27			
Lenses	From Page A-25			
Brackets	From Page A-4			
Interface accessories	From Page A-38			