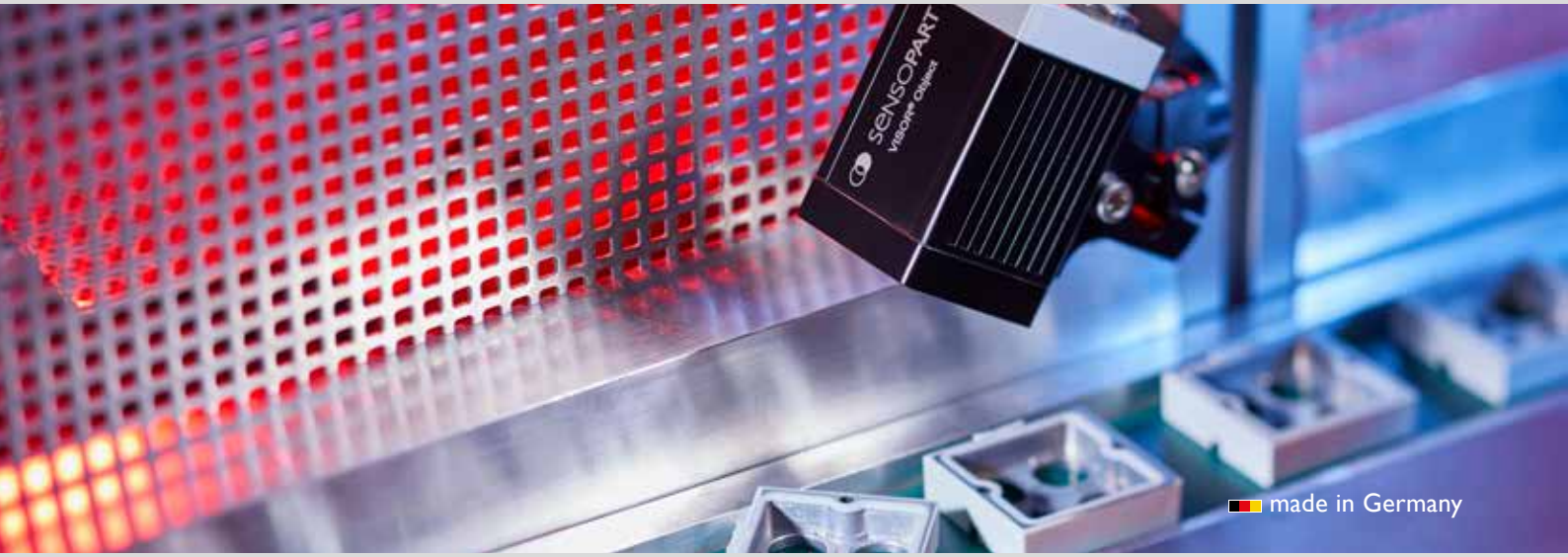
VISOR® Object

Detects the right part in the wrong place and vice versa.



The one with a BLOB: *With the BLOB detector (Binary Large Object), the VISOR® detects even small differences between objects, counts parts or detects whether a part is face up or face down.*

The same or not the same?
The VISOR® detects even the smallest of color nuances more reliably than the human eye. This allows, for example, the detection of color deviations or the sorting of parts by color.

HIGHLIGHTS OF VISOR® OBJECT

- Detectors for presence and completeness checks as well as for simple measurement tasks
- Precise position determination: x/y-position and orientation
- Improved object detection through additional color information
- Comprehensive logic functions for the digital switching outputs
- Flexible definition of output data
- EtherNet/IP PROFINET (conformance class B), EtherNet (TCP/IP) supported
- Comprehensive for archiving images and data
- Simple calibration for measurement tasks. Conversion into mm as well as correction of errors and distortions

Objects that sometimes appear in unexpected positions and have complex shapes and details – classic switching sensors would be completely overwhelmed by such detection tasks. Not the VISOR® Object from SensoPart: it always maintains its overview, detecting defective parts, parts in the wrong position, wrong orientation, wrong sequence or a combination of them all – in an instant. The comprehensive calibration functions range from a simple scaling factor to the correction of image and lens distortions at a mouse click. With its highly precise position and orientation detection, our VISOR® Object is one of the best in its class.

Seven detectors plus position detection

An expansive range of detectors is available for inspection tasks and evaluations: pattern matching, contour detection, calliper, BLOB, brightness, grey threshold and contrast detection. Position tracking offers reliable detection of those features that do not repeatedly appear in the original position taught. All evaluations take place relative to the current part position and orientation, without them having to be defined for every possible position of an individual feature. The color version features detectors for color detection, enabling VISOR® to also distinguish between the finest nuances in shade. This powerful tool allows you to solve even demanding applications confidently!

VISOR® Object – Product overview

	Product variant	Resolution	Focal Length	Integrated illumination	Page
V20x-OB-A3-xxx	Advanced	1440 x 1080 mono/color	Wide	White, red[1] or infrared[1] LEDs	70
V20x-OB-A3-xxx			Medium	White, red[1] or infrared[1] LEDs	72
V20x-OB-A3-xxx			Narrow	White, red[1] or infrared[1] LEDs	74
V20x-OB-A3-C-2			C-Mount	None	76
V10x-OB-S3-xxx	Standard	800 x 600 mono/color	Wide	White, red[1] or infrared[1] LEDs	78
V10x-OB-S3-xxx			Medium	White, red[1] or infrared[1] LEDs	80
V10x-OB-S3-xxx			Narrow	White, red[1] or infrared[1] LEDs	82
V10x-OB-A3-xxx	Advanced	800 x 600 mono/color	Wide	White, red[1] or infrared[1] LEDs	84
V10x-OB-A3-xxx			Medium	White, red[1] or infrared[1] LEDs	86
V10x-OB-A3-xxx			Narrow	White, red[1] or infrared[1] LEDs	88
V10x-OB-A3-C-2			C-Mount	None	90

[1] Only with monochrome version

VISOR® V20 Object Advanced, wide field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	1440 x 1080 pixels
Imaging chip CMOS	1/2.9‘‘‘, monochrome / color
Integrated lens, focal length [mm]	6.5 (wide)
Pixel size	3.45 µm x 3.45 µm
Focus	Motorized
Adjustment range	10 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	6 x 4 mm
Target laser	Laser: red (635 nm) class 1 (IEC 60825-1)

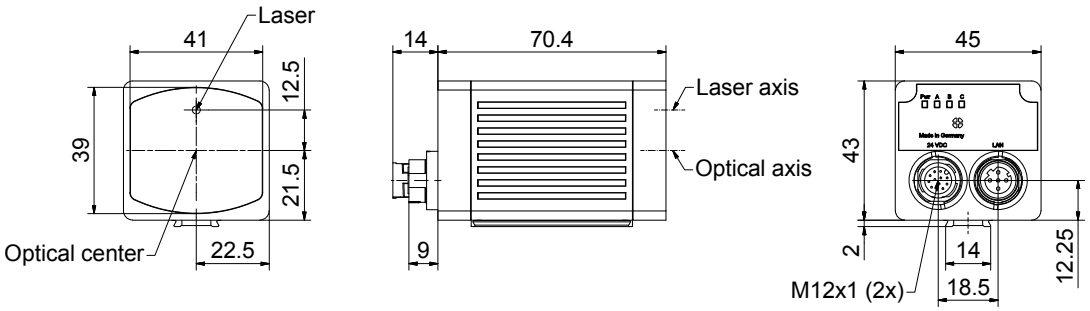
Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[2]: output of color values; **Color area**[2]**:** area inspection of colors, with selectable tolerance; **Color list**[2]: finding the most similar colors

Electrical data	
Operating voltage, $+U_B$	18 … 30 V DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

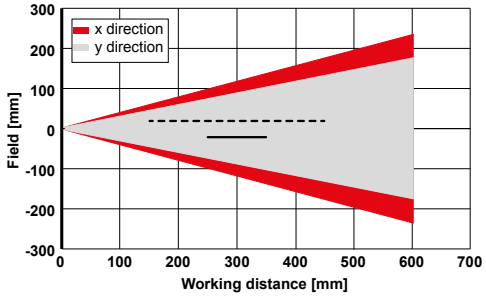
[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

VISOR® vision sensor



153-13554

Field of view V20, wide



155-03279

- - - - - Increased depth of field
——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-OB-A3-W-W-M2-L	632-91031	Connection cables	From Page A-46
Red	V20-OB-A3-R-W-M2-L	632-91034	Illumination	From Page A-33
Infrared	V20-OB-A3-I-W-M2-L	632-91037	Brackets	From Page A-4
White	V20C-OB-A3-W-W-M2-L	632-91041	Interface accessories	From Page A-53

VISOR® V20 Object Advanced, medium field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	1440 x 1080 Pixel
Imaging chip CMOS	1/2.9", monochrome / color
Integrated lens, focal length [mm]	12 (medium)
Pixel size	3.45 µm x 3.45 µm
Focus	Motorized
Adjustment range	25 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	10 x 8 mm
Target laser	Laser: red (635 nm) class 1 (IEC 60825-1)

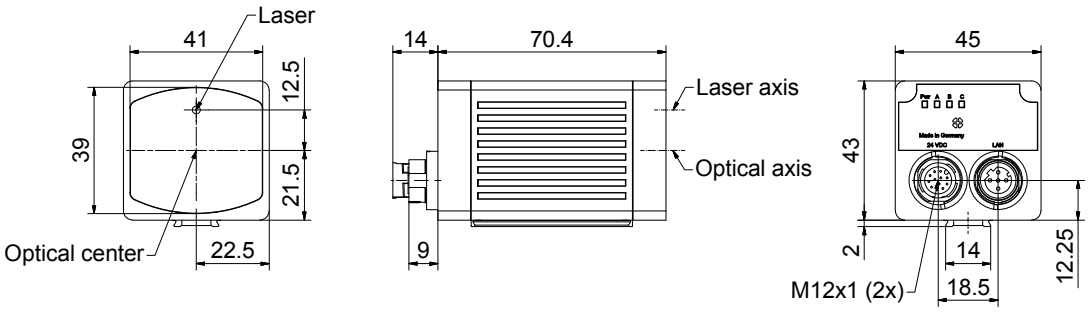
Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[2]: output of color values; **Color area**[2]**:** area inspection of colors, with selectable tolerance; **Color list**[2]: finding the most similar colors

Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

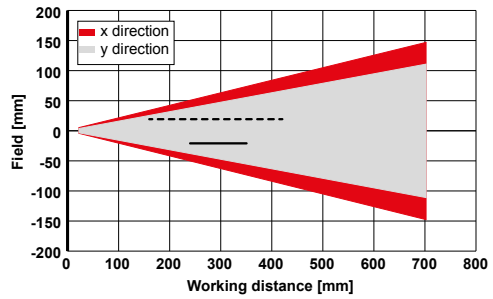
[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

VISOR® vision sensor



153-13554

Field of view V20, medium



155-03099

- - - - - Increased depth of field
——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-OB-A3-W-M-M2-L	632-91032	Connection cables	From Page A-46
Red	V20-OB-A3-R-M-M2-L	632-91035	Illumination	From Page A-33
Infrared	V20-OB-A3-I-M-M2-L	632-91038	Brackets	From Page A-4
White	V20C-OB-A3-W-M-M2-L	632-91042	Interface accessories	From Page A-53

VISOR® V20 Object Advanced, narrow field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	1440 x 1080 Pixel
Imaging chip CMOS	1/2.9", monochrome / color
Integrated lens, focal length [mm]	20 (narrow)
Pixel size	3.45 µm x 3.45 µm
Focus	Motorized
Adjustment range	100 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	18 x 14 mm
Target laser	Laser: red (635 nm) class 1 (IEC 60825-1)

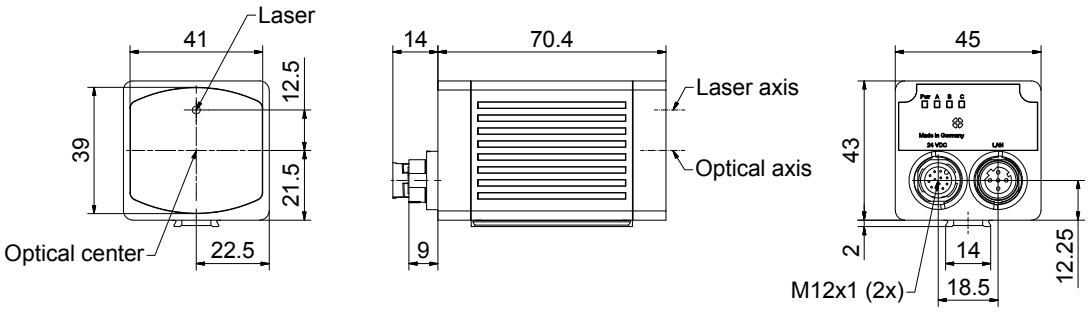
Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[2]: output of color values; **Color area**[2]**:** area inspection of colors, with selectable tolerance; **Color list**[2]: finding the most similar colors

Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

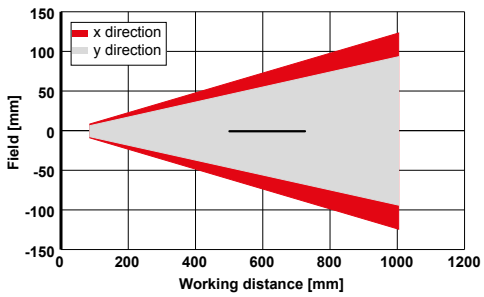
[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

VISOR® vision sensor



153-13554

Field of view V20, narrow



155-03098

——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-OB-A3-W-N-M2-L	632-91033	Connection cables	From Page A-46
Red	V20-OB-A3-R-N-M2-L	632-91036	Illumination	From Page A-33
Infrared	V20-OB-A3-I-N-M2-L	632-91039	Brackets	From Page A-4
White	V20C-OB-A3-W-N-M2-L	632-91043	Interface accessories	From Page A-53

VISOR® V20 Object Advanced, C-Mount

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	1440 x 1080 pixels
Imaging chip CMOS	1/2.9", monochrome / color
Integrated lens, focal length [mm]	C-mount
Pixel size	3.45 µm x 3.45 µm
Focus	Manual
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X x Y	Dependent on lens
Target laser	No

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[1]: output of color values; **Color area**[1]**:** area inspection of colors, with selectable tolerance; **Color list**[1]: finding the most similar colors

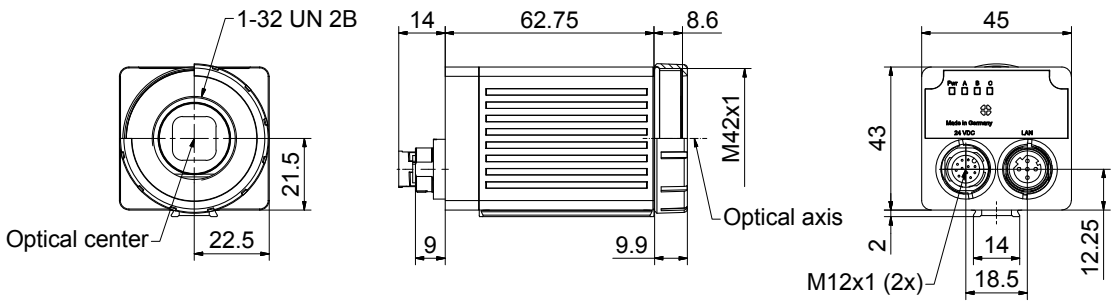
Electrical data	
Operating voltage, $+U_B$	18 … 30 V DC[2]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data	
Dimensions	70,4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65[3]
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Vibrationsfestigkeit	EN 60068-2-6
Schockfestigkeit	EN 60068-2-27

[1] Color hardware [2] Max. ripple < 5 V_{SS} [3] only with protective casing [4] 80 % air humidity, noncondensing

Version: 02/2019. Subject to changes; diagrams similar

Vision-Sensor VISOR® C-mount



153-13555

Lens	C-mount protective casing for VISOR® new generation
	

Part number	Article number
LPT Vxx-G37.5	651-01006
LPT Vxx-25.0	651-01007

	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

Part number	Article number	Accessories	
V20-OB-A3-C-2	632-91040	Connection cables	From Page A-46
V20C-OB-A3-C-2	632-91044	Illumination	From Page A-33
		Lenses	From Page A-28
		Brackets	From Page A-4
		Interface accessories	From Page A-53

VISOR® V10 Object Standard, wide field of view

Vision sensor for object detection, simple presence and completeness checks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Efficient part detection and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data	
Resolution	800 x 600 Pixel
Imaging chip CMOS	1/3.6", monochrome / color
Integrated lens, focal length [mm]	5.2 (wide)
Pixel size	4.8 µm x 4.8 µm
Focus	Motorized
Adjustment range	0 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	2 x 1 mm

Functions	
Number of jobs / detectors	8 / 32
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color area[2]:** area inspection of colors, with selectable tolerance;

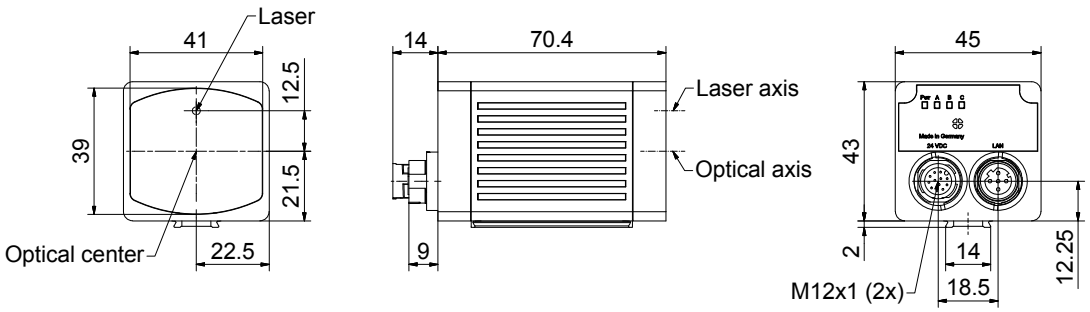
Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs
Encoder	No

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

[1] Not Color hardware [2] Color hardware [2] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

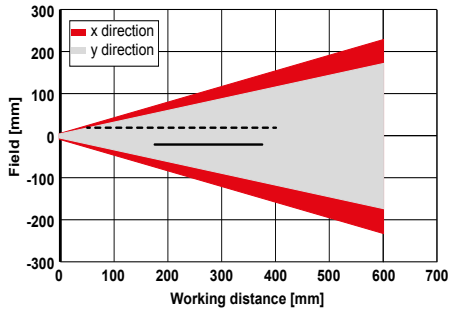
Version: 02/2019. Subject to changes; diagrams similar

VISOR® vision sensor



153-13554

Field of view V10, wide



155-03101

- - - - - Increased depth of field
——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-S3-W-W-M2	631-91043	Connection cables	From Page A-46
Red	V10-OB-S3-R-W-M2	631-91045	Illumination	From Page A-33
Infrared	V10-OB-S3-I-W-M2	631-91047	Brackets	From Page A-4
White	V10C-OB-S3-W-W-M2	631-91049	Interface accessories	From Page A-53

VISOR® V10 Object Standard, medium field of view

Vision sensor for object detection, simple presence and completeness checks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Efficient part detection and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data	
Resolution	800 x 600 Pixel
Imaging chip CMOS	1/3.6“, monochrome / color
Integrated lens, focal length [mm]	9.6 (medium)
Pixel size	4.8 µm x 4.8 µm
Focus	Motorized
Adjustment range	12 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	7 x 3 mm

Functions	
Number of jobs / detectors	8 / 32
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color area[2]:** area inspection of colors, with selectable tolerance;

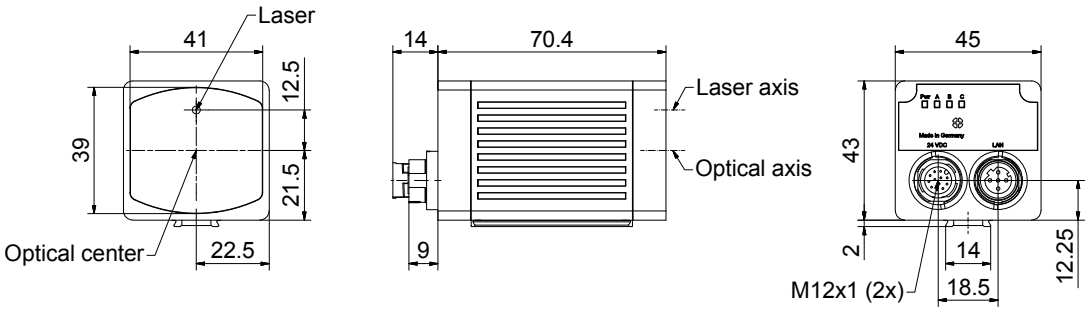
Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs
Encoder	No

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

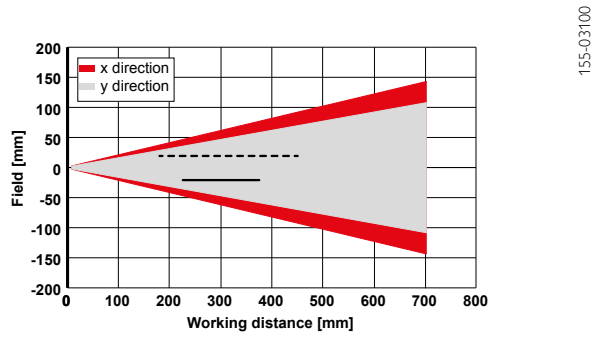
[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

Version: 02/2019. Subject to changes; diagrams similar

VISOR® vision sensor



Field of view V10, medium



- - - - - Increased depth of field
——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-S3-W-M-M2	631-91044	Connection cables	From Page A-46
Red	V10-OB-S3-R-M-M2	631-91046	Illumination	From Page A-33
Infrared	V10-OB-S3-I-M-M2	631-91048	Brackets	From Page A-4
White	V10C-OB-S3-W-M-M2	631-91050	Interface accessories	From Page A-53

VISOR® V10 Object Standard, narrow field of view

Vision sensor for object detection, simple presence and completeness checks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Efficient part detection and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data	
Resolution	800 x 600 Pixel
Imaging chip CMOS	1/3.6“, monochrome / color
Integrated lens, focal length [mm]	20 (narrow)
Pixel size	4.8 µm x 4.8 µm
Focus	Motorized
Adjustment range	100 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	14 x 10 mm

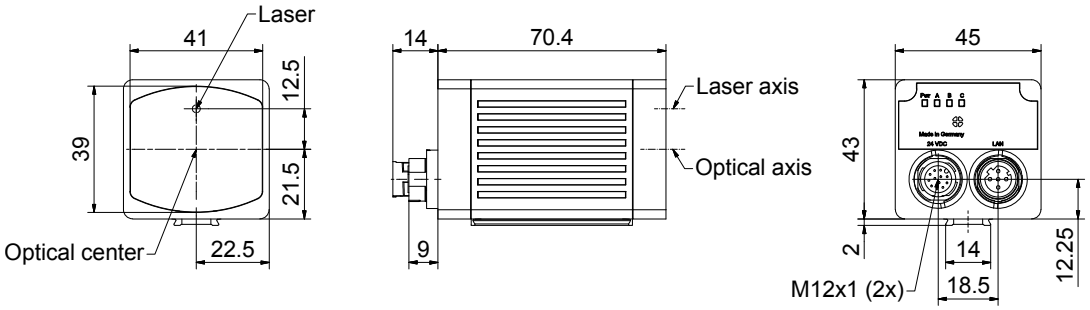
Functions	
Number of jobs / detectors	8 / 32
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color area[2]:** area inspection of colors, with selectable tolerance;

Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs
Encoder	No

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

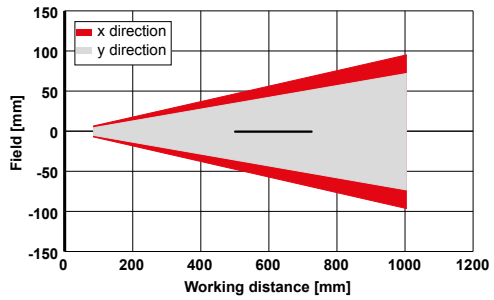
[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

VISOR® vision sensor



153-13554

Field of view V10, narrow



155-03097

——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-S3-W-N-M2	631-91116	Connection cables	From Page A-46
Red	V10-OB-S3-R-N-M2	631-91115	Illumination	From Page A-33
Infrared	V10-OB-S3-I-N-M2	631-91114	Brackets	From Page A-4
White	V10C-OB-S3-W-N-M2	631-91113	Interface accessories	From Page A-53

VISOR® V10 Object Advanced, wide field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	800 x 600 Pixel
Imaging chip CMOS	1/3.6", monochrome / color
Integrated lens, focal length [mm]	5.2 (wide)
Pixel size	4.8 µm x 4.8 µm
Focus	Motorized
Adjustment range	0 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	2 x 1 mm
Target laser	Laser: red (635 nm) class 1 (IEC 60825-1)

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[2]: output of color values; **Color area**[2]**:** area inspection of colors, with selectable tolerance; **Color list**[2]: finding the most similar colors

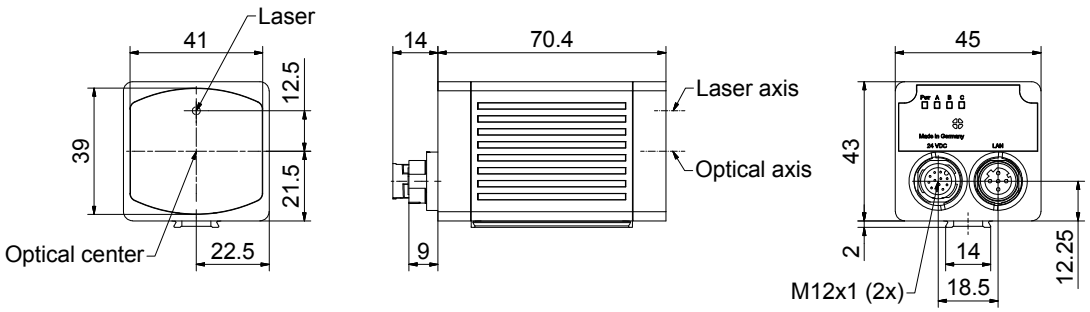
Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

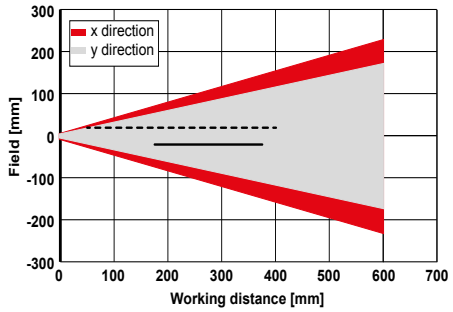
Version: 02/2019. Subject to changes; diagrams similar

VISOR® vision sensor



153-13554

Field of view V10, wide



155-03101

- - - - - Increased depth of field
——— Normal depth of field

Illumination	Part number	Article number
White	V10-OB-A3-W-W-M2-L	631-91014
White	V10-OB-A3-W-WD-M2-L	631-91017
Red	V10-OB-A3-R-W-M2-L	631-91019
Red	V10-OB-A3-R-WD-M2-L	631-91022
Infrared	V10-OB-A3-I-W-M2-L	631-91024
Infrared	V10-OB-A3-I-WD-M2-L	631-91027
White	V10C-OB-A3-W-W-M2-L	631-91013

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Object Advanced, medium field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	800 x 600 Pixel
Imaging chip CMOS	1/3.6", monochrome / color
Integrated lens, focal length [mm]	9.6 (medium)
Pixel size	4.8 µm x 4.8 µm
Focus	Motorized
Adjustment range	12 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	7 x 3 mm
Target laser	Laser: red (635 nm) class 1 (IEC 60825-1)

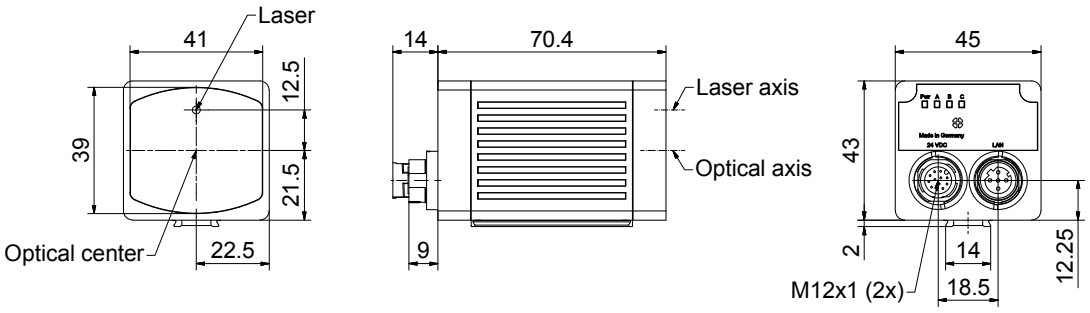
Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[2]: output of color values; **Color area**[2]**:** area inspection of colors, with selectable tolerance; **Color list**[2]: finding the most similar colors

Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

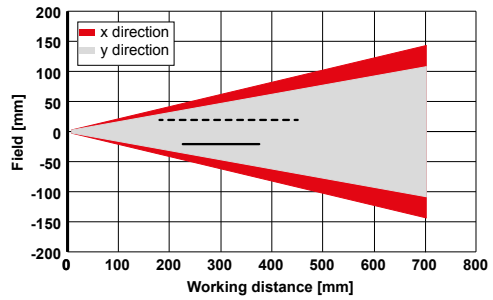
[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

VISOR® vision sensor



153-13554

Field of view V10, medium



155-03100

- - - - - Increased depth of field
——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-A3-W-M-M2-L	631-91015	Connection cables	From Page A-46
White	V10-OB-A3-W-MD-M2-L	631-91018	Illumination	From Page A-33
Red	V10-OB-A3-R-M-M2-L	631-91020	Brackets	From Page A-4
Red	V10-OB-A3-R-MD-M2-L	631-91023	Interface accessories	From Page A-53
Infrared	V10-OB-A3-I-M-M2-L	631-91025		
Infrared	V10-OB-A3-I-MD-M2-L	631-91012		
White	V10C-OB-A3-W-M-M2-L	631-91011		

VISOR® V10 Object Advanced, narrow field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data

Resolution	800 x 600 Pixel
Imaging chip CMOS	1/3.6", monochrome / color
Integrated lens, focal length [mm]	20 (narrow)
Pixel size	4.8 µm x 4.8 µm
Focus	Motorized
Adjustment range	100 mm to infinity
Integrated illumination	White (5000 K), red (635 nm)[1], infrared (850 nm)[1] LEDs
Minimum field of view, X x Y	14 x 10 mm
Target laser	Laser: red (635 nm) class 1 (IEC 60825-1)

Functions

Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[2]: output of color values; **Color area**[2]**:** area inspection of colors, with selectable tolerance; **Color list**[2]: finding the most similar colors

Electrical data

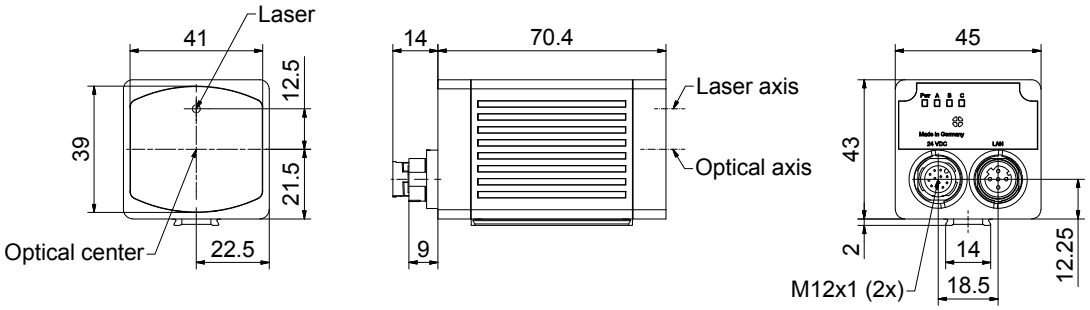
Operating voltage, $+U_B$	18 … 30 DC[3]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data

Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

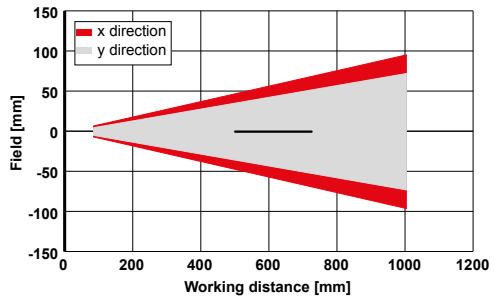
[1] Not Color hardware [2] Color hardware [3] Max. ripple < 5 V_{SS} [4] 80 % air humidity, noncondensing

VISOR® vision sensor



153-13554

Field of view V10, narrow



155-03097

——— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-A3-W-N-M2-L	631-91016	Connection cables	From Page A-46
Red	V10-OB-A3-R-N-M2-L	631-91021	Illumination	From Page A-33
Infrared	V10-OB-A3-I-N-M2-L	631-91026	Brackets	From Page A-4
White	V10C-OB-A3-W-N-M2-L	631-91002	Interface accessories	From Page A-53

VISOR® V10 Object Advanced, C-Mount

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	800 x 600 Pixel
Imaging chip CMOS	1/3.6", monochrome / color
Integrated lens, focal length [mm]	C-mount
Pixel size	4.8 µm x 4.8 µm
Focus	Manual
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X x Y	Dependent on lens
Target laser	none

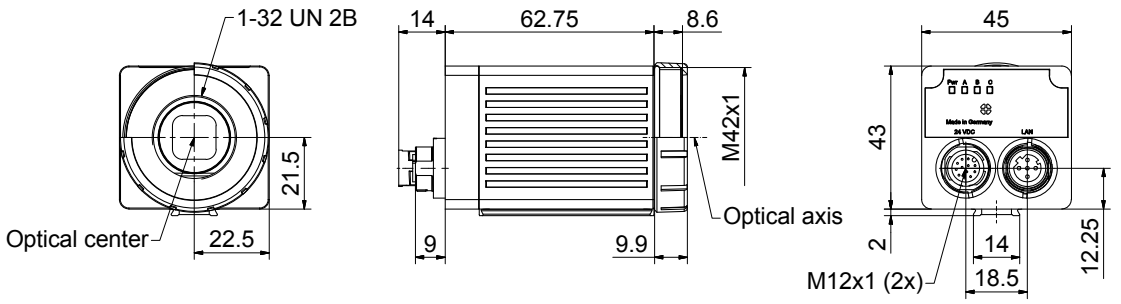
Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Position tracking: X/Y and orientation; **Pattern matching / Contour:** teach-in and detection of patterns and contours; **Calliper**: distance between edges; **BLOB, Grey threshold, Brightness:** evaluation of brightness; **Contrast:** evaluation of contrast; **Color value**[1]: output of color values; **Color area**[1]**:** area inspection of colors, with selectable tolerance; **Color list**[1]: finding the most similar colors

Electrical data	
Operating voltage, $+U_B$	18 … 30 DC[2]
Current consumption (without I/O)	≤ 300 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Approx. 13 s after Power on
Outputs	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Switching threshold inputs incl. encoder	PNP/NPN High > U_B-1 V / Low < 3 V
Input resistance	> 20 kΩ
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs
Encoder	✓

Mechanical data	
Dimensions	70.4 x 45 x 45 mm (without plug)
Enclosure rating	IP 67 & IP 65[3]
Material, housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 200 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration resistance	EN 60068-2-6
Shock resistance	EN 60068-2-27

[1] Color hardware [2] Max. ripple < 5 V_{SS} [3] only with protective casing [4] 80 % air humidity, noncondensing

VISOR® vision sensor



153-13555

3

Lens

C-mount protective casing for VISOR® new generation

Part number	Article number
LPT Vxx-G37.5	651-01006
LPT Vxx-25.0	651-01007

	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

Part number	Article number	Accessories	
V10-OB-A3-C-2	631-91001	Connection cables	From Page A-46
V10C-OB-A3-C-2	631-91042	Illumination	From Page A-33
		Lenses	From Page A-28
		Brackets	From Page A-4
		Interface accessories	From Page A-53

VISOR® object sensor for part detection

Detects the right part in the wrong place and vice versa

The one with a BLOB: *With the new BLOB detector (Binary Large Object), the VISOR® detects even small differences between objects, counts parts or detects whether a part is face up or face down.*

Calibration function:
With the VISOR®, positions and distances in the sensor image can now be easily converted into relative world coordinates or absolute robot coordinates. Distortions resulting from diagonal view angles and other image errors are simultaneously corrected. Thus robot applications can be easily solved.

HIGHLIGHTS OF VISOR® OBJECT SENSOR

- User-friendly configuration and viewer software with hierarchical user rights and online help
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: x/y-position and orientation
- Comprehensive logic functions for the digital switching outputs
- Flexible definition of output data (header, trailer, net data)
- Support of EtherNet/IP and PROFINET
- Comprehensive possibilities for archiving pictures and data

Objects that sometimes appear in unexpected positions and have complex shapes and details – classic switching sensors would be completely overwhelmed by such detection tasks. Not the VISOR® object sensor from SensoPart: it always maintains its overview, detecting defective parts, parts in the wrong position, wrong orientation, wrong sequence or a combination of them all – in an instant. The comprehensive calibration functions range from a simple scaling factor via the correction of image and lens distortions at a mouse click through to a point pair list for robot applications.
With its highly precise position and orientation detection, our VISOR® object sensor is one of the best in its class.

Seven detectors plus position detection
A total of seven detectors are available for inspection tasks and evaluations: pattern comparison, contour detection, calliper, BLOB, brightness, grey threshold and contrast detection. Position tracking offers permits reliable detection of those features that are not always present in precisely the taught-in position. All evaluations take place relative to the current part position and orientation, without them having to be defined for every possible position of an individual feature. This powerful tool allows you to solve even demanding applications confidently!

VISOR® Object Sensors – Product Overview					
	Firmware Option	Resolution	Focal length	Integrated illumination	Page
V20-OB-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White, red or infrared LEDs	150
V20-OB-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	152
V10-OB-S1-xxx	Standard	736 x 480 pixels	6 mm	White, red or infrared LEDs	154
V10-OB-S1-xxx	Standard	736 x 480 pixels	12 mm	White, red or infrared LEDs	156
V10-OB-A1-xxx	Advanced	736 x 480 pixels	6 mm	White, red or infrared LEDs	158
V10-OB-A1-xxx	Advanced	736 x 480 pixels	12 mm	White, red or infrared LEDs	160
V10-OB-A1-xxx	Advanced	736 x 480 pixels	25 mm	White, red or infrared LEDs	162
V10-OB-A1-xxx	Advanced	736 x 480 pixels	C-mount	None	164

VISOR® V20 object sensor

Advanced vision sensor for object detection, 12 mm

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1.3 mega pixel
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	1280 x 1024 pixels
CMOS	1/1.8", monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X x Y	16 x 13 mm[2]

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; 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
Typical cycle times[2]	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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

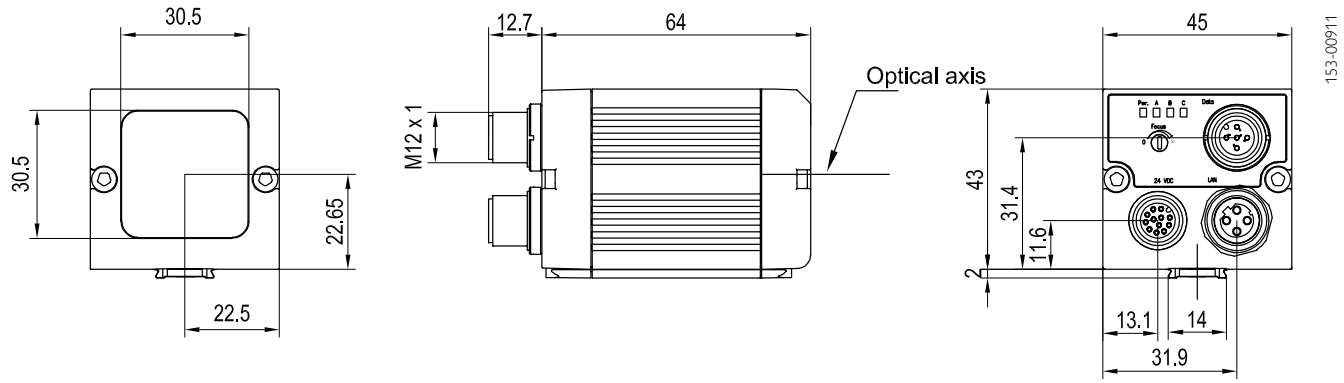
Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50° C[3]
Ambient temperature: storage	-20 … +60° C[3]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

[1] Max. ripple < 5 V_{SS} [2] with VGA-resolution (640 x 480 pixels) [3] 80 % air humidity, non-condensing

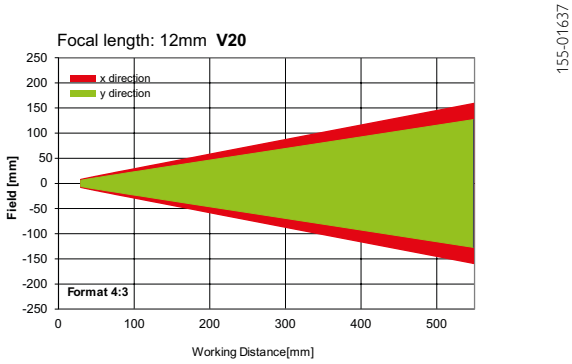
Illumination	Part number	Article number
White	V20-OB-A2-W12	536-91011
Red	V20-OB-A2-R12	536-91012
Infrared	V20-OB-A2-I12	536-91013

Version: 02/2019. Subject to changes; diagrams similar

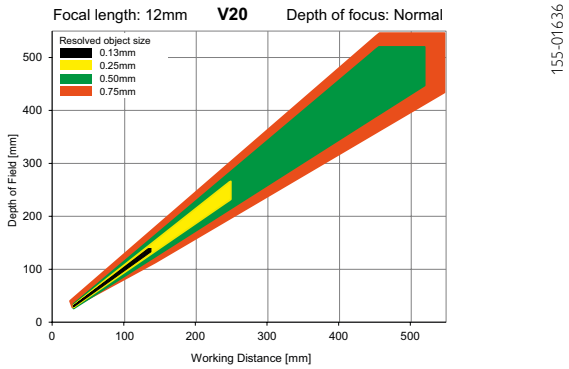
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 object sensor

Advanced vision sensor for object detection, C-mount

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1.3 mega pixel
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	1280 x 1024 pixels
CMOS	1/1.8", monochrome
Integrated lens, focal length	C-Mount
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X x Y	Dependent on lens

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; 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
Typical cycle times[2]	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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

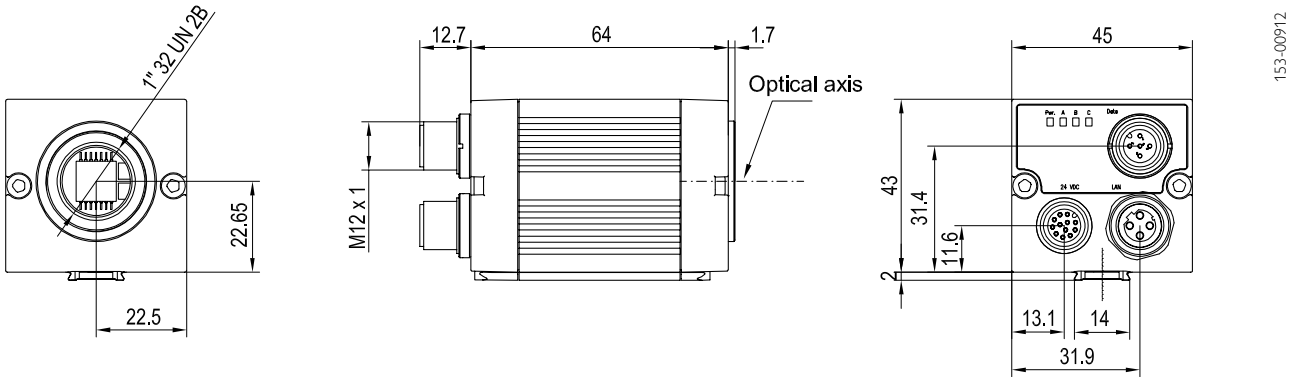
Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 65[3]
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

[1] Max. ripple < 5 V_{SS} [2] With VGA-resolution (640 x 480 Pixel) [3] With LPT45 C-mount protective casing [4] 80 % air humidity, non-condensing

Part number	Article number
V20-OB-A2-C	536-91010

Version: 02/2019. Subject to changes; diagrams similar

VISOR® vision sensor



Lens

	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-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Standard vision sensor for object detection, 6 mm

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Powerful part-finding and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", monochrome
Integrated lens, focal length	6 mm, adjustable focal position
Adjustment range	6 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X x Y	5 x 4 mm[2]

Functions	
Number of jobs / detectors	8 / 32
Detectors	Contour, pattern comparison, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; Pattern comparison / contour: teach-in and detection of patterns and contours; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs

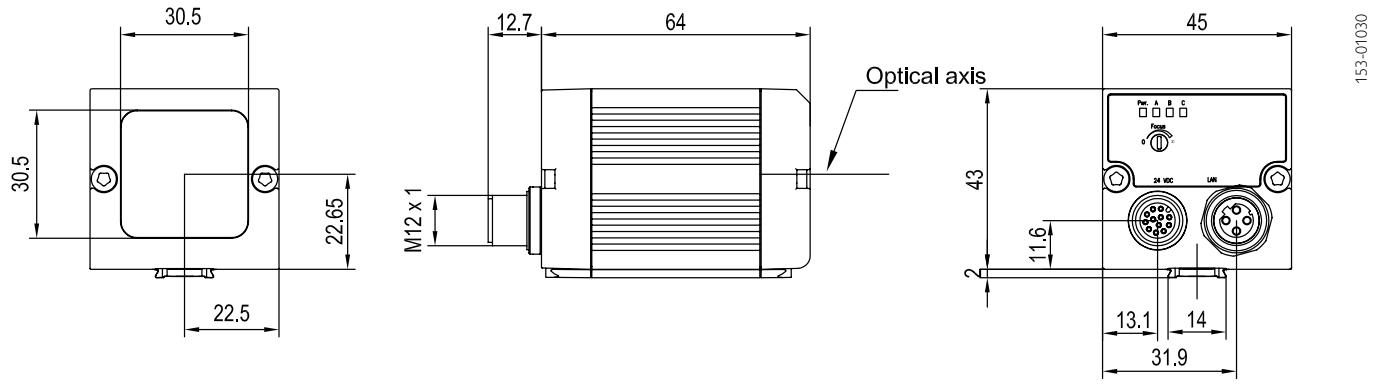
Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration and impact resistance	EN 60947-5-2

[1] Max. ripple < 5 V_{SS} [2] 80 % air humidity, non-condensing

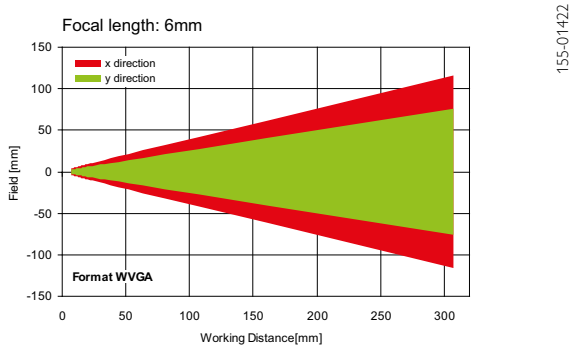
Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-S1-W6	535-91008
Red	Normal	V10-OB-S1-R6	535-91010
Infrared	Normal	V10-OB-S1-I6	535-91046

Version: 02/2019. Subject to changes; diagrams similar

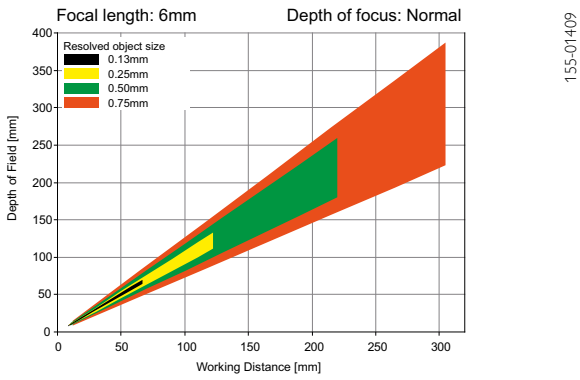
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Standard vision sensor for object detection, 12 mm

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Powerful part-finding and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X x Y	8 x 6 mm[2]

Functions	
Number of jobs / detectors	8 / 32
Detectors	Contour, pattern comparison, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; Pattern comparison / contour: teach-in and detection of patterns and contours; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs

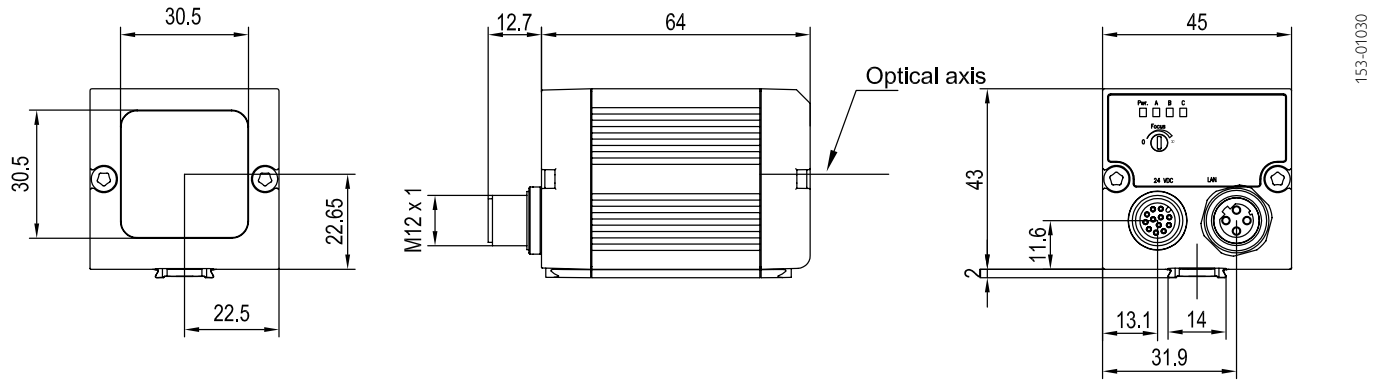
Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration and impact resistance	EN 60947-5-2

[1] Max. ripple < 5 V_{SS} [2] 80 % air humidity, non-condensing

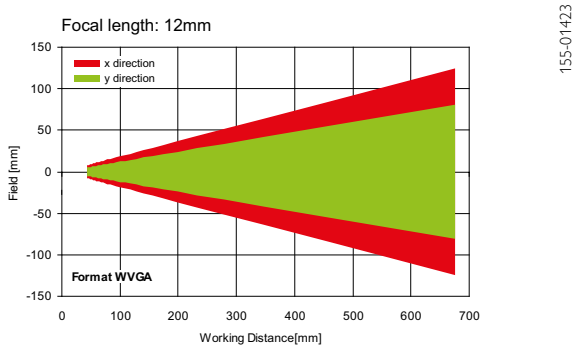
Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-S1-W12	535-91009
Red	Normal	V10-OB-S1-R12	535-91011
Infrared	Normal	V10-OB-S1-I12	535-91047

Version: 02/2019. Subject to changes; diagrams similar

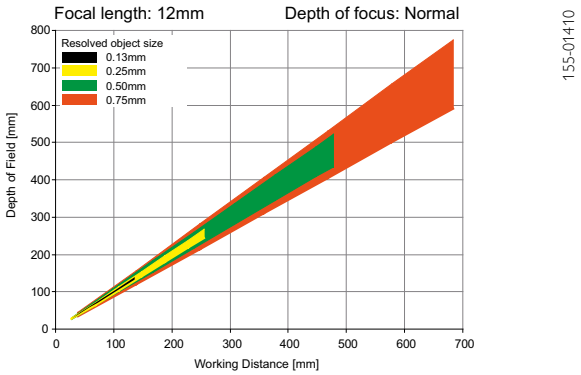
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, 6 mm

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", monochrome
Integrated lens, focal length	6 mm, adjustable focal position
Adjustment range	6 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X x Y	5 x 4 mm[2]

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; 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
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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

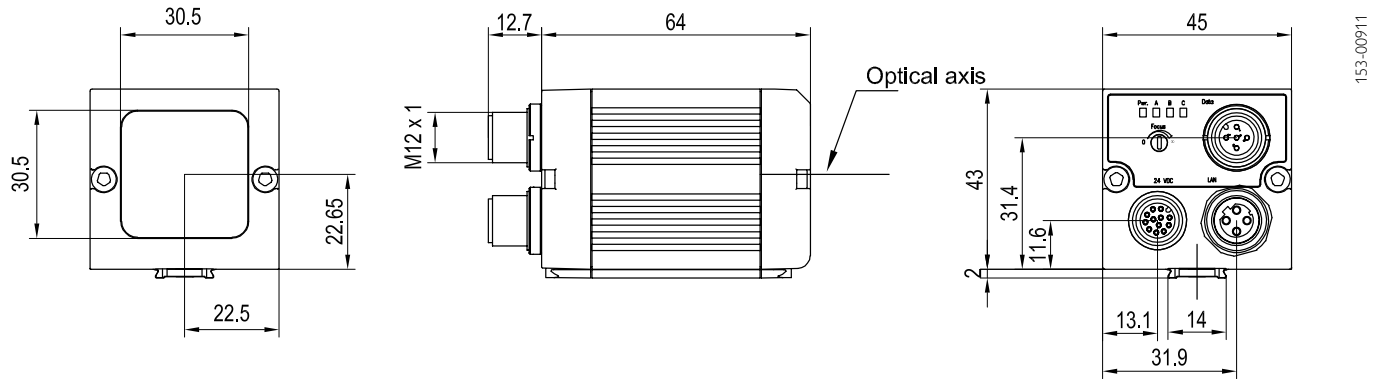
Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

[1] Max. ripple < 5 V_{SS} [2] 80 % air humidity, non-condensing

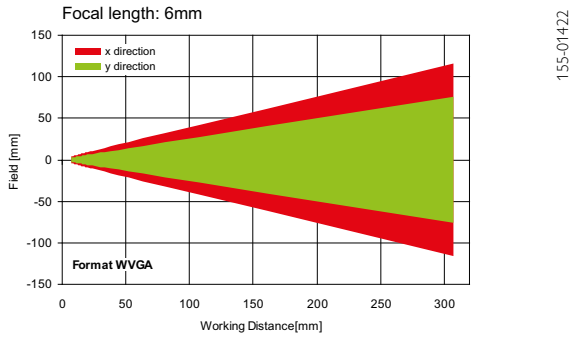
Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-A1-W6	535-91001
White	Enhanced	V10-OB-A1-W6D	535-91013
Red	Normal	V10-OB-A1-R6	535-91003
Red	Enhanced	V10-OB-A1-R6D	535-91016
Infrared	Normal	V10-OB-A1-I6	535-91006
Infrared	Enhanced	V10-OB-A1-I6D	535-91019

Version: 02/2019. Subject to changes; diagrams similar

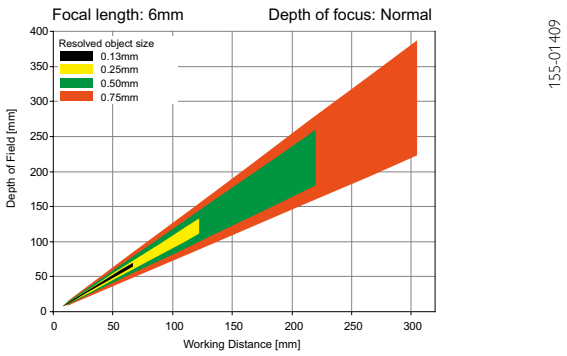
VISOR® vision sensor



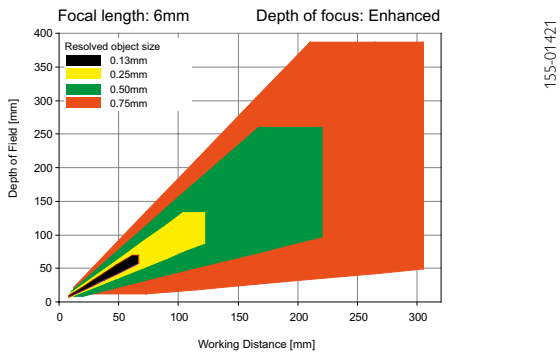
Field of view



Depth of field: normal



Depth of field: enhanced



Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, 12 mm

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X x Y	8 x 6 mm[2]

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; 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
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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

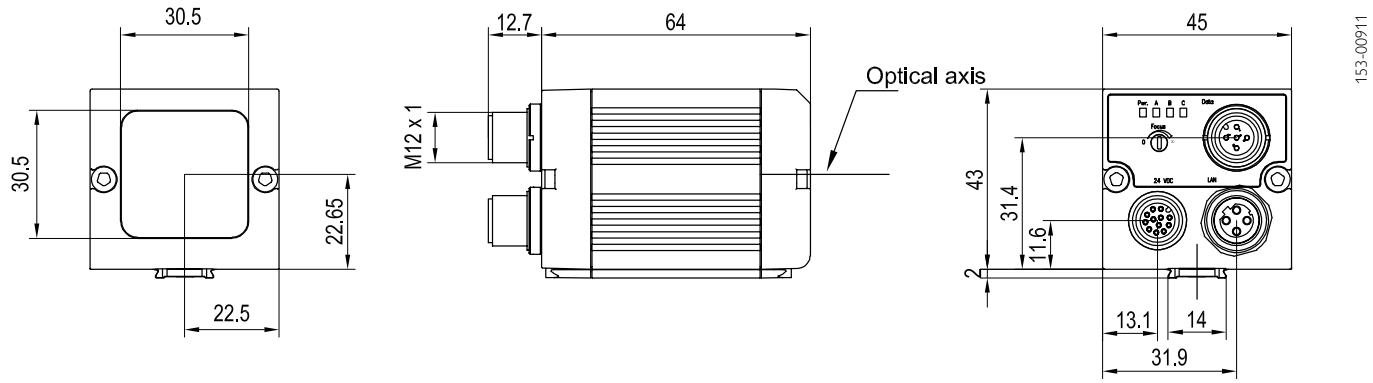
Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50° C[2]
Ambient temperature: storage	-20 … +60° C[2]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

[1] Max. ripple < 5 V_{SS} [2] 80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-A1-W12	535-91002
White	Enhanced	V10-OB-A1-W12D	535-91014
Red	Normal	V10-OB-A1-R12	535-91004
Red	Enhanced	V10-OB-A1-R12D	535-91017
Infrared	Normal	V10-OB-A1-I12	535-91007
Infrared	Enhanced	V10-OB-A1-I12D	535-91020

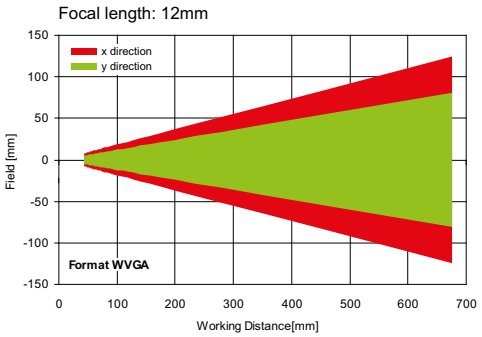
Version: 02/2019. Subject to changes; diagrams similar

VISOR® vision sensor



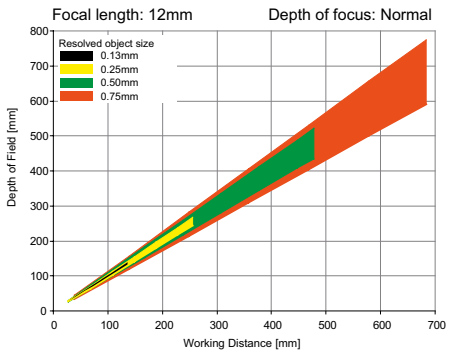
153-00911

Field of view



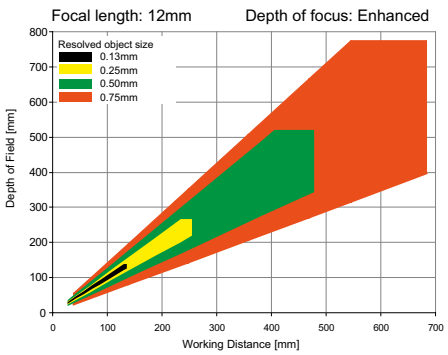
155-01423

Depth of field: normal



155-01410

Depth of field: enhanced



155-01411

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, 25 mm

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", monochrome
Integrated lens, focal length	25 mm, adjustable focal position
Adjustment range	140 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X x Y	18 x 14 mm[2]

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; 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
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

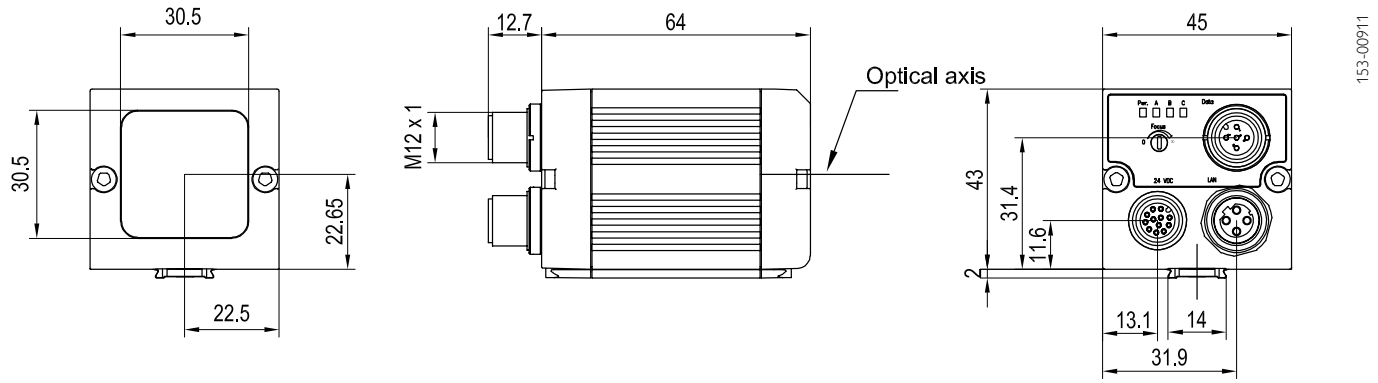
Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

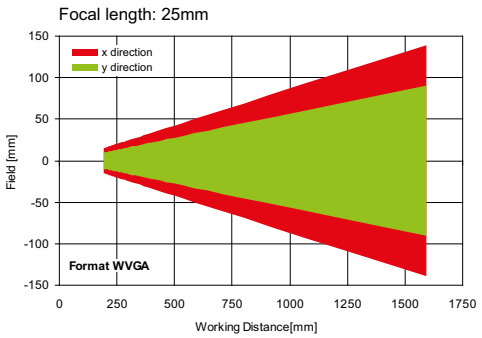
[1] Max. ripple < 5 V_{SS} [2] 80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-A1-W25	535-91012
Red	Normal	V10-OB-A1-R25	535-91015
Infrared	Normal	V10-OB-A1-I25	535-91018

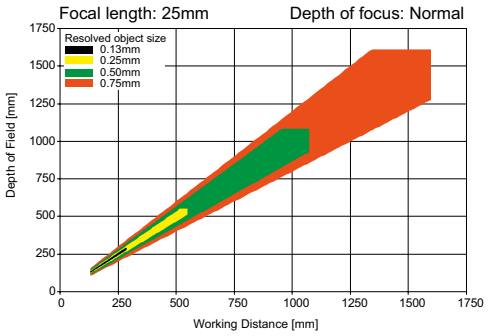
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, C-mount

PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", monochrome
Integrated lens, focal length	C-Mount
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X x Y	Dependent on lens

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Properties	Position tracking: X/Y and orientation; 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
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

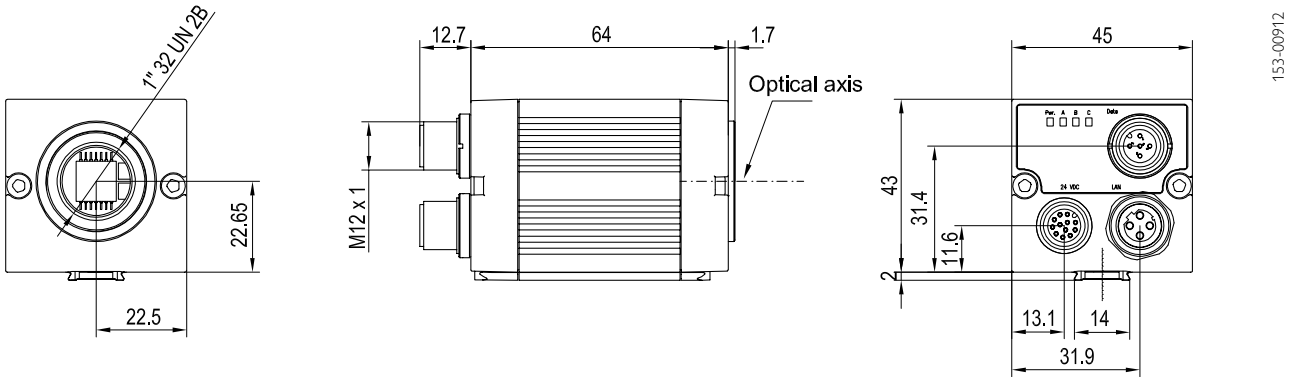
Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data	
Dimensions	65 x 45 x 45 mm (without plug)
Enclosure rating	IP 65[2]
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[3]
Ambient temperature: storage	-20 … +60 °C[3]
Weight	Ca. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

[1] Max. ripple < 5 V_{SS} [2] With LPT45 C-mount protective casing [3] 80 % air humidity, non-condensing

Part number	Article number
V10-OB-A1-C	535-91005

VISOR® vision sensor



Lens

	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-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53