

VISOR® Robotic

An eye on everything – the vision sensor for robotics applications



The VISOR® Robotic detects the component's position in a universal tray. It can then be reliably removed. Up to 255 configurations enable utmost production flexibility.



The VISOR® Robotic determines the exact position of the sensor housing. Offset data is used to correct the robot's trajectory.

HIGHLIGHTS OF VISOR® ROBOTIC

- User-friendly configuration and display software
- Different detectors for locating components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications:
 - Calibration plate: simple, fast and precise
 - Point pair list: considerable flexibility when selecting calibration object and field of view
- Offset of work plane through Z-offset function
- EtherNet/IP, PROFINET (Conformances Class B), EtherNet (TCP/IP) supported
- Flexible output protocol
- The right version for every application
 - Different resolutions
 - Focal length of 6 mm to 75 mm
 - Monochrome and color version

Picking up components

Feeding systems in a production line are becoming increasingly versatile – in addition to universal trays, components can be supplied with utmost flexibility using hopper feeders. Thanks to the VISOR® Robotic, components can be reliably located and gripped with both feed options. When loose components are supplied, the sensor not only checks their position but also inspects the free space around the gripper. The VISOR® determines both sets of information and sends them to the robot controller via one of the integrated and standardised process interfaces. The process is managed on the basis of this information – the object is gripped or the feeder is triggered.

The application can also be flexibly adapted to individual goods carriers without the need for a costly centring device. The VISOR® detects the position and the fill level of the tray and transmits this information to the robot. If the camera is mounted in a stationary manner, this is cycle time-neutral.

Placing parts

What happens after components have been reliably collected by the gripper? The VISOR® Robotic also supplies important information for the next work steps, and demonstrates its skills in robot-controlled applications, such as the placing of screws, the mounting of clips or the application of glue. The detection of component positions is carried out effortlessly; this allows the correction of any offset and increases the quality of production. Knowledge of the exact position of a component ensures, for example, the precise insertion of a windscreen. Mechanical effort is reduced, and the production line becomes even more flexible. The VISOR® Robotic concept enables direct communication between the VISOR® and the robot, an additional instance is no longer necessary for many applications.

VISOR® Robotic – product overview					
	Product variants	Resolution	Focal length	Integrated lighting	Page
V20x-RO-A3-xxx	Advanced	1440 x 1080 mono/color	wide	White, red ¹ or infrared ¹ LEDs	94
V20x-RO-A3-xxx			medium	White, red ¹ or infrared ¹ LEDs	96
V20x-RO-A3-xxx			narrow	White, red ¹ or infrared ¹ LEDs	98
V20x-RO-A3-C-2			C-mount	None	100
V20x-RO-P3-xxx	Professional		wide	White, red ¹ or infrared ¹ LEDs	102
V20x-RO-P3-xxx			medium	White, red ¹ or infrared ¹ LEDs	104
V20x-RO-P3-xxx			narrow	White, red ¹ or infrared ¹ LEDs	106
V20x-RO-P3-C-2			C-mount	None	108
V10-RO-A3-xxx	Advanced	800 x 600 mono	wide	White, red ¹ or infrared ¹ LEDs	110
V10-RO-A3-xxx			medium	White, red ¹ or infrared ¹ LEDs	112
V10-RO-A3-xxx			narrow	White, red ¹ or infrared ¹ LEDs	114
V10-RO-A3-C-2			C-mount	None	116

¹ Only with monochrome version


VISOR® V20 Robotic Advanced, wide field of view

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

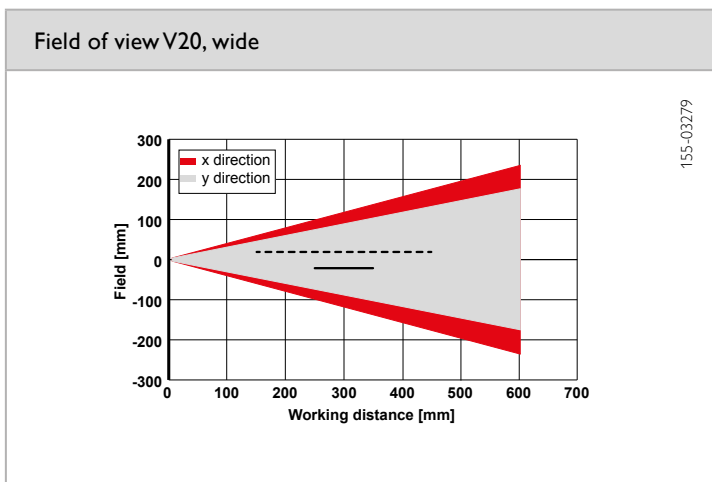
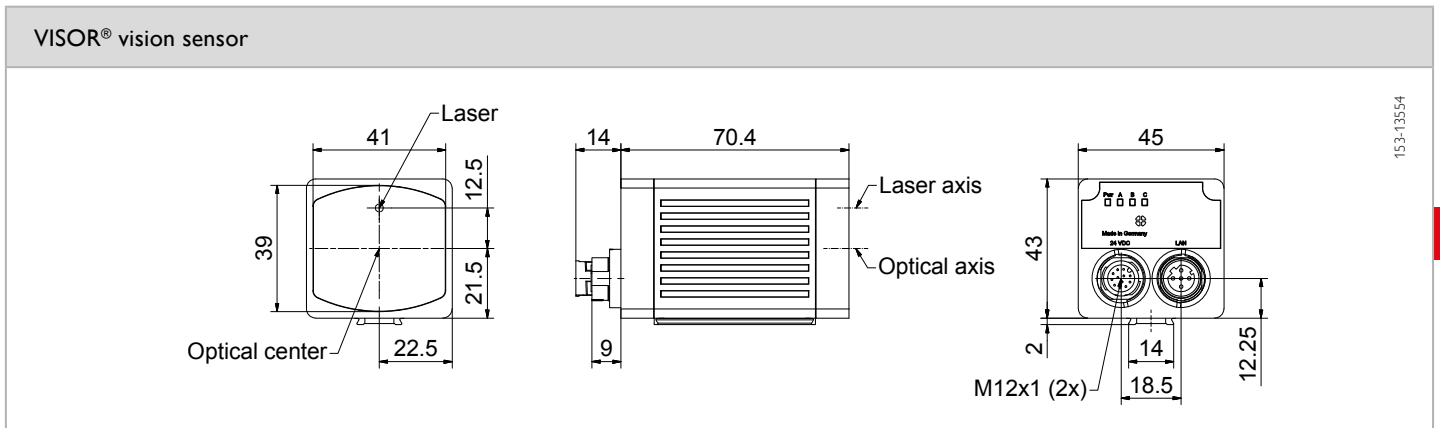


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	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
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)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-RO-A3-W-W-M2-L	632-91064	Connection cables	From Page A-46
Red	V20-RO-A3-R-W-M2-L	632-91067	Illumination	From Page A-33
Infrared	V20-RO-A3-I-W-M2-L	632-91070	Brackets	From Page A-4
White	V20C-RO-A3-W-W-M2-L	632-91074	Interface accessories	From Page A-53


VISOR® V20 Robotic Advanced, medium field of view

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

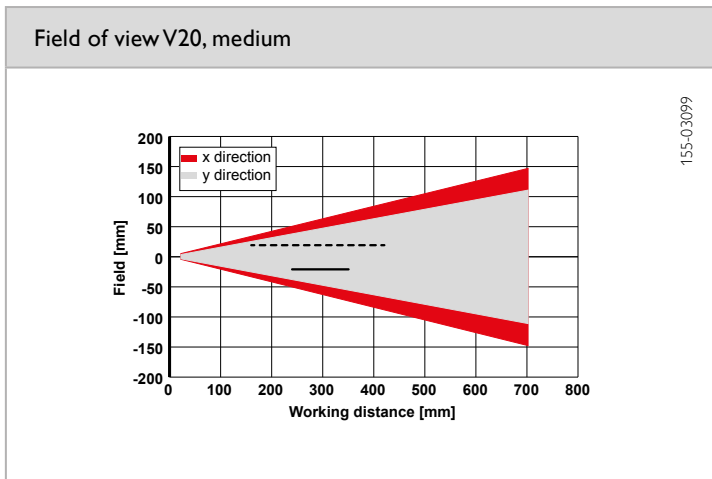
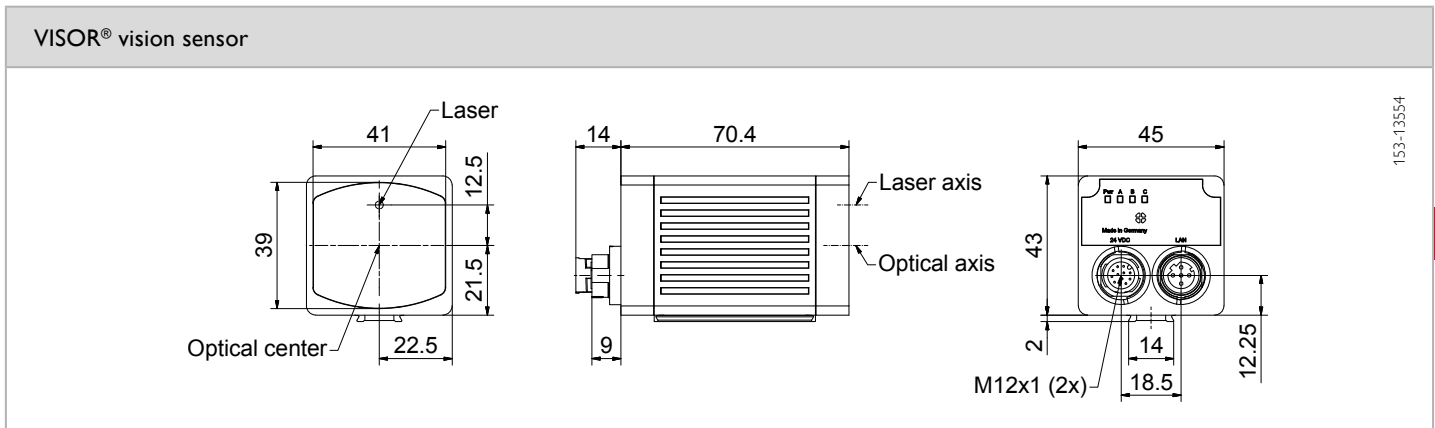


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	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
Integrated lens, focal length [mm]	12 (medium)		
Pixel size	3.45 µm × 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 × Y	10 × 8 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-RO-A3-W-M-M2-L	632-91065	Connection cables	From Page A-46
Red	V20-RO-A3-R-M-M2-L	632-91068	Illumination	From Page A-33
Infrared	V20-RO-A3-I-M-M2-L	632-91071	Brackets	From Page A-4
White	V20C-RO-A3-W-M-M2-L	632-91075	Interface accessories	From Page A-53


VISOR® V20 Robotic Advanced, narrow field of view

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

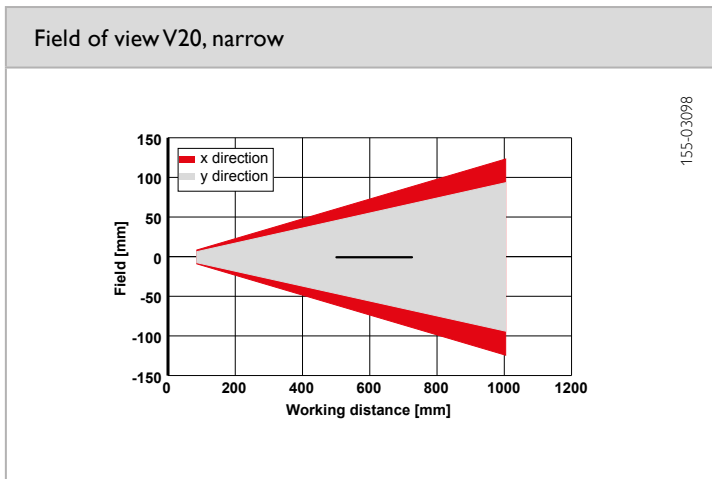
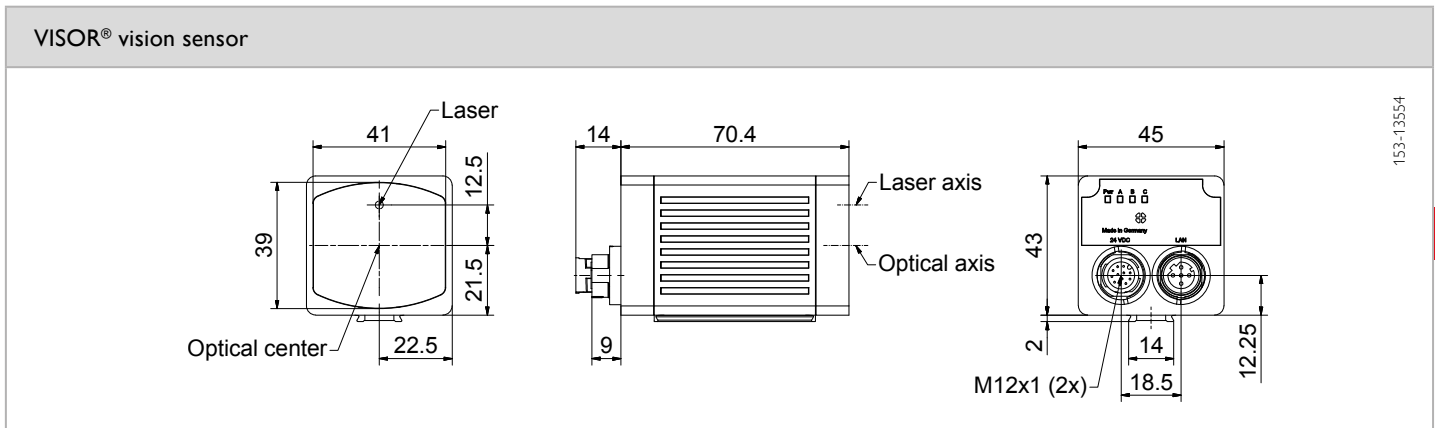


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	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
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	3.45 µm × 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 × Y	18 × 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



— Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-RO-A3-W-N-M2-L	632-91066	Connection cables	From Page A-46
Red	V20-RO-A3-R-N-M2-L	632-91069	Illumination	From Page A-33
Infrared	V20-RO-A3-I-N-M2-L	632-91072	Brackets	From Page A-4
White	V20C-RO-A3-W-N-M2-L	632-91076	Interface accessories	From Page A-53

VISOR® V20 Robotic Advanced, C-Mount

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



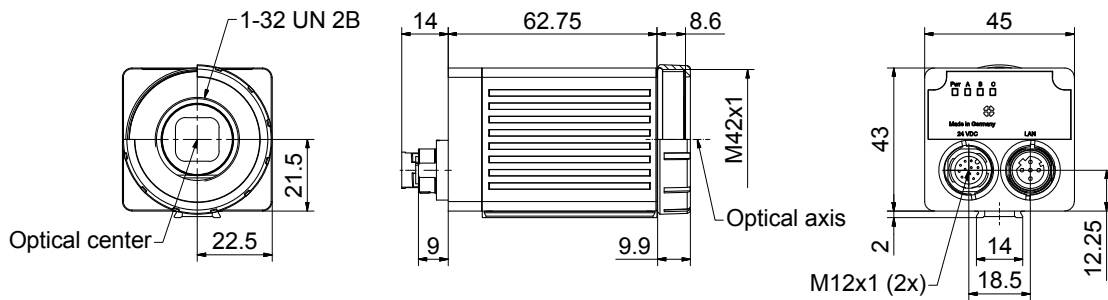
PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	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
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		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ²	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² max. Restwelligkeit < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing

Vision-Sensor VISOR® C-mount



153-13555

3



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-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-RO-A3-C-2	632-91073	Connection cables
V20C-RO-A3-C-2	632-91077	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53


VISOR® V20 Robotic Professional, wide field of view

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

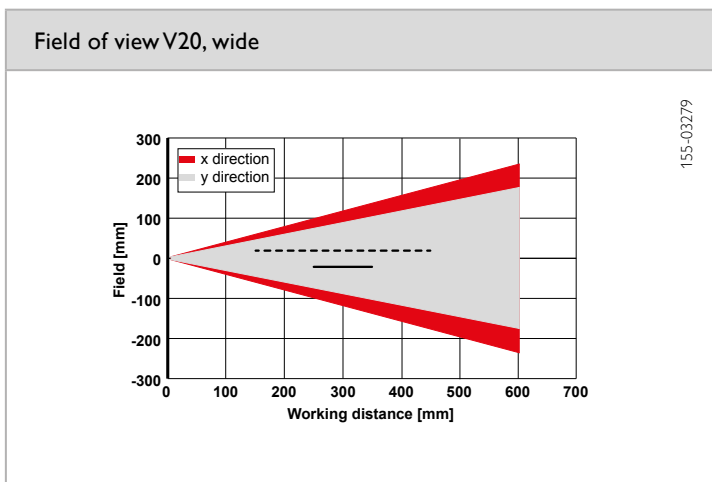
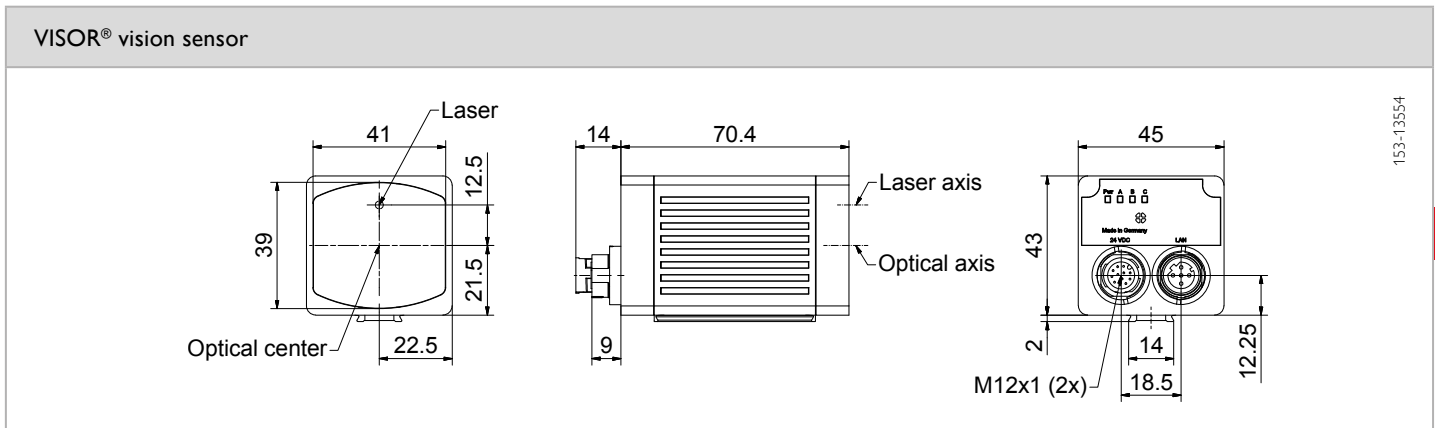


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check
- Can be used for all common 2D codes (ECC 200 data matrix) , common 1D bar codes and OCR

Optical data		Functions	
Resolution	1440 x 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	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; CBarcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
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)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V, Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-RO-P3-W-W-M2-L	632-91120	Connection cables	From Page A-46
Red	V20-RO-P3-R-W-M2-L	632-91123	Illumination	From Page A-33
Infrared	V20-RO-P3-I-W-M2-L	632-91126	Brackets	From Page A-4
White	V20C-RO-P3-W-W-M2-L	632-91130	Interface accessories	From Page A-53


VISOR® V20 Robotic Professional, medium field of view

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

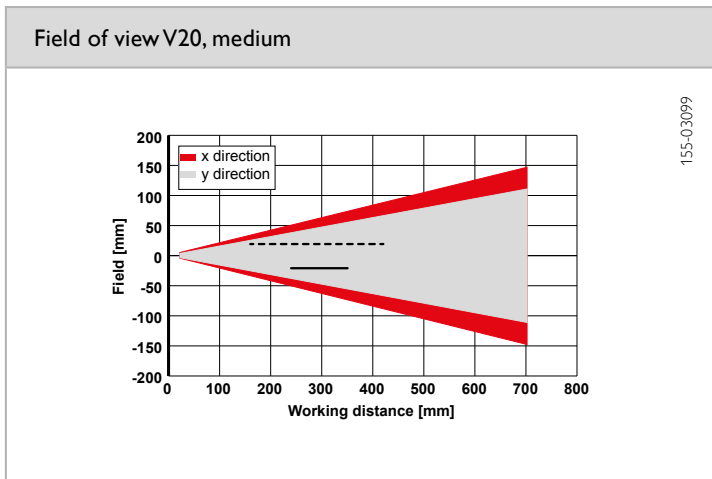
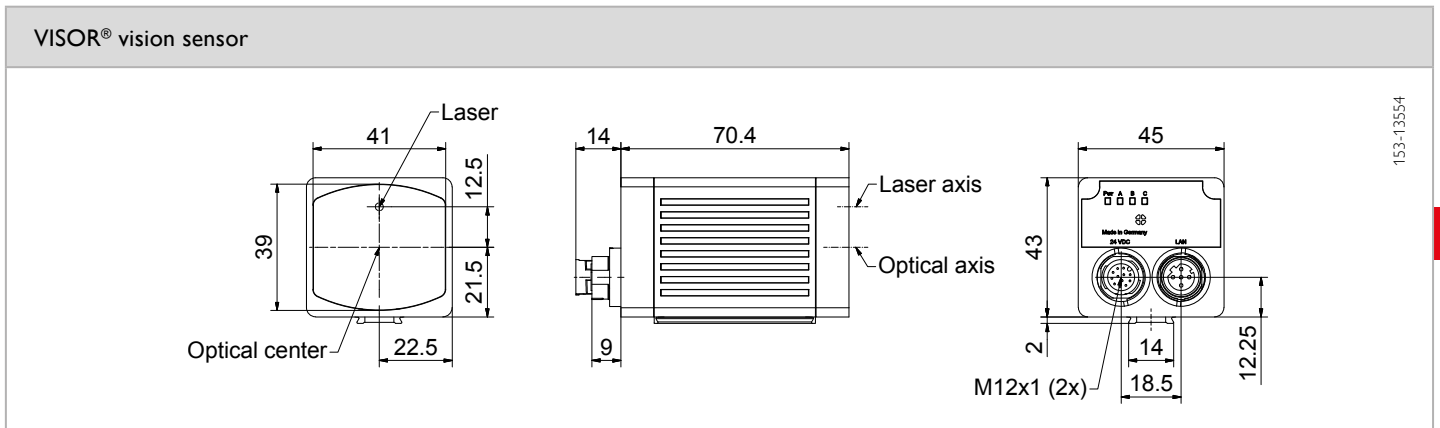


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
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- Result offset
- Offset of work plane
- Gripping space check
- Can be used for all common 2D codes (ECC 200 data matrix) , common 1D bar codes and OCR

Optical data		Functions	
Resolution	1440 x 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	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 Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
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)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP / NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-RO-P3-W-M-M2-L	632-91121	Connection cables	From Page A-46
Red	V20-RO-P3-R-M-M2-L	632-91124	Illumination	From Page A-33
Infrared	V20-RO-P3-I-M-M2-L	632-91127	Brackets	From Page A-4
White	V20C-RO-P3-W-M-M2-L	632-91131	Interface accessories	From Page A-53


VISOR® V20 Robotic Professional, narrow field of view

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

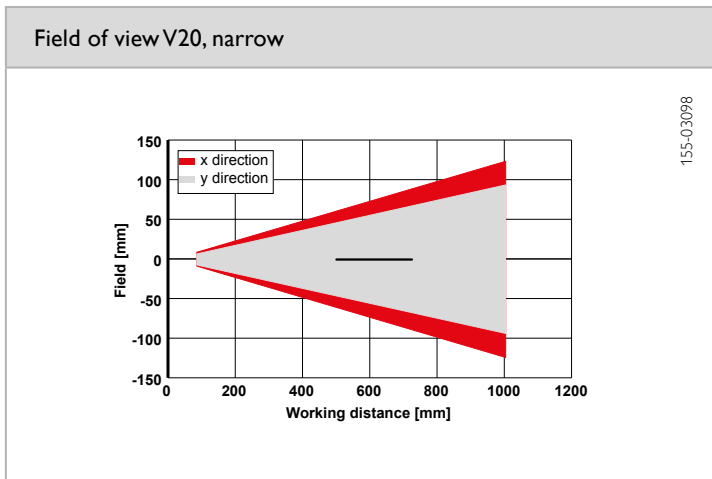
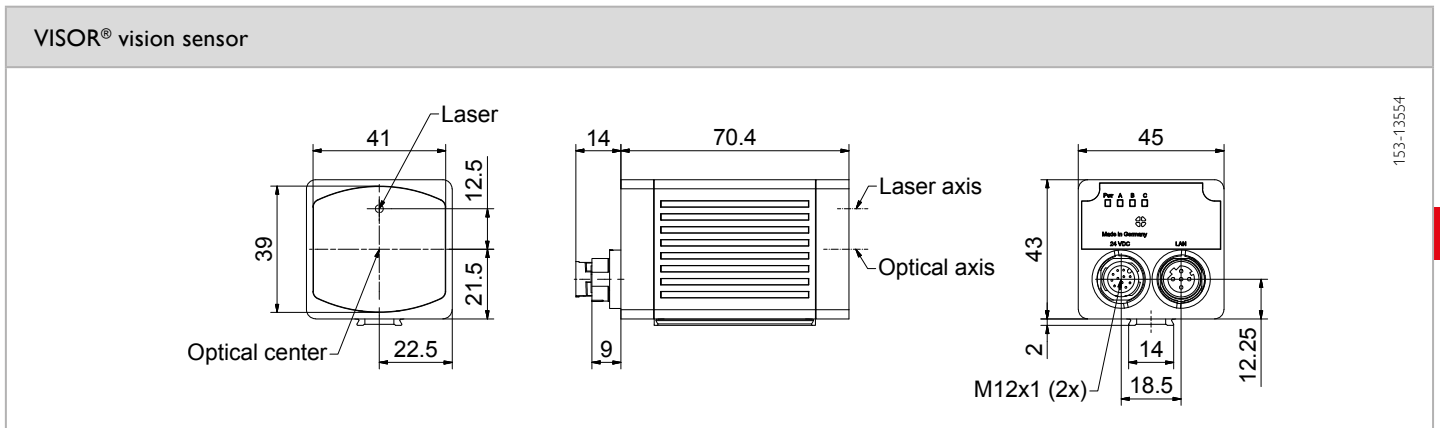


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Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
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)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-RO-P3-W-N-M2-L	632-91122	Connection cables	From Page A-46
Red	V20-RO-P3-R-N-M2-L	632-91125	Illumination	From Page A-33
Infrared	V20-RO-P3-I-N-M2-L	632-91128	Brackets	From Page A-4
White	V20C-RO-P3-W-N-M2-L	632-91132	Interface accessories	From Page A-53

VISOR® V20 Robotic Professional, C-Mount

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

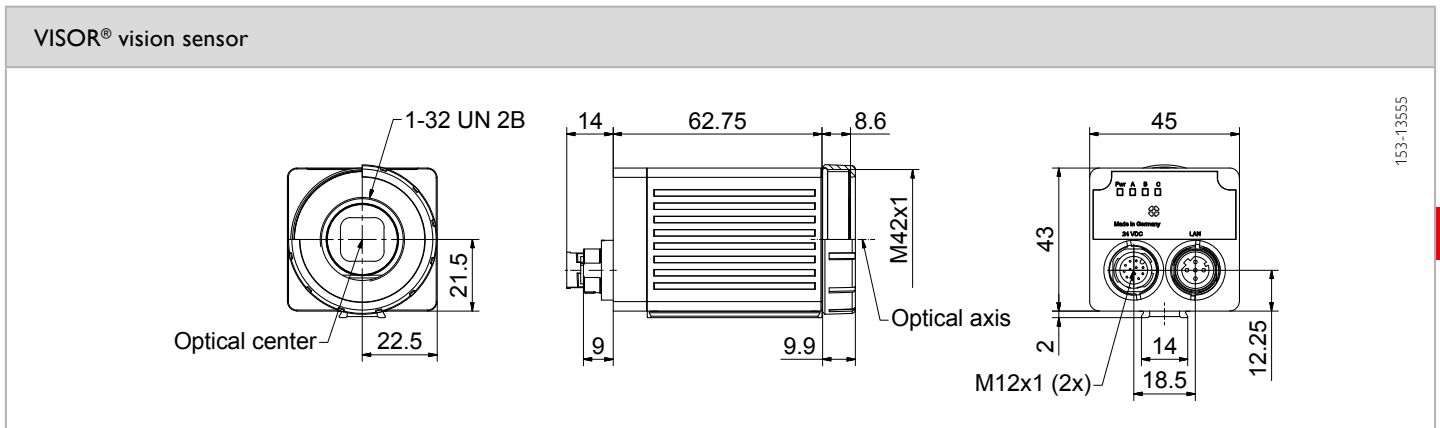


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check
- Can be used for all common 2D codes (ECC 200 data matrix) , common 1D bar codes and OCR

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	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 Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
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		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ²	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> en fonction de l'objectif	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

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



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-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-RO-P3-C-2	632-91129	Connection cables
V20C-RO-P3-C-2	632-91133	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53


VISOR® V10 Robotic Advanced, wide field of view

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

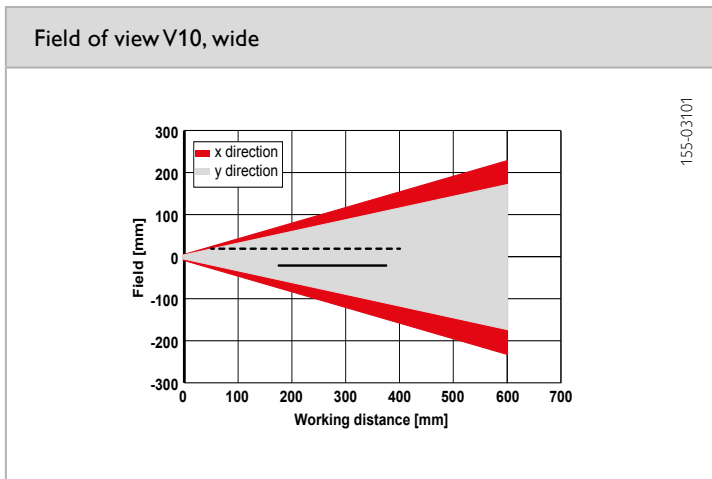
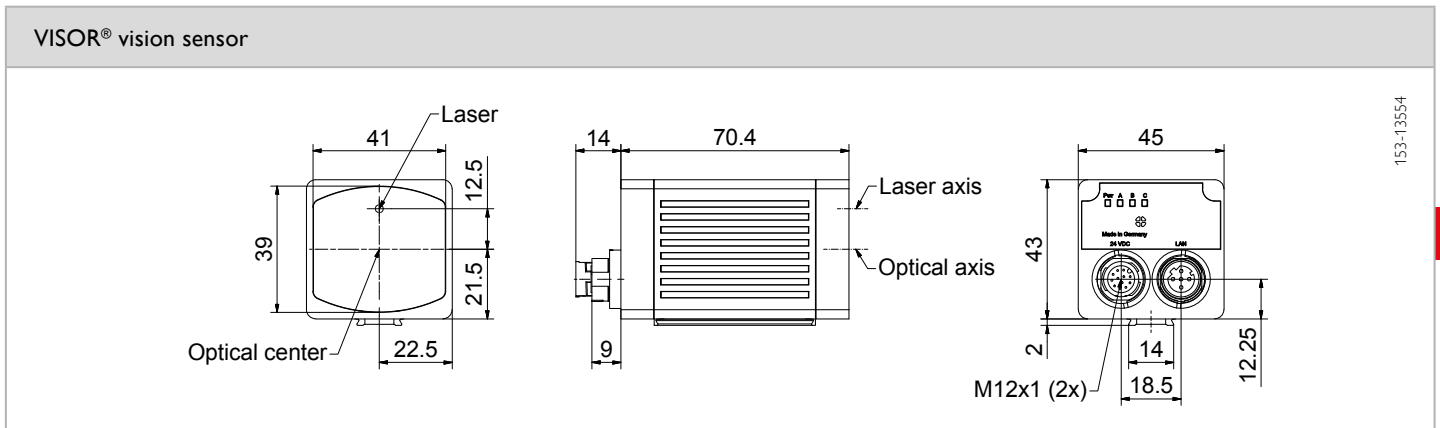


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 × 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	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;
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 µm × 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 × Y	2 × 1 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5 V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-RO-A3-W-W-M2-L	631-91073	Connection cables	From Page A-46
Red	V10-RO-A3-R-W-M2-L	631-91076	Illumination	From Page A-33
Infrared	V10-RO-A3-I-W-M2-L	631-91079	Brackets	From Page A-4
			Interface accessories	From Page A-53


VISOR® V10 Robotic Advanced, medium field of view

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

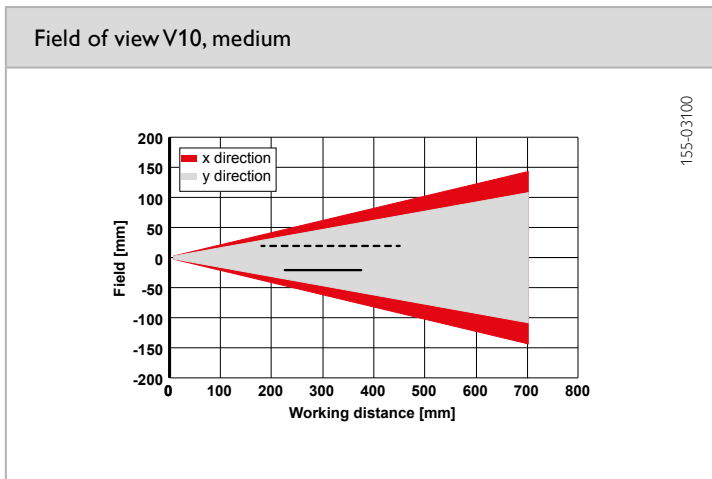
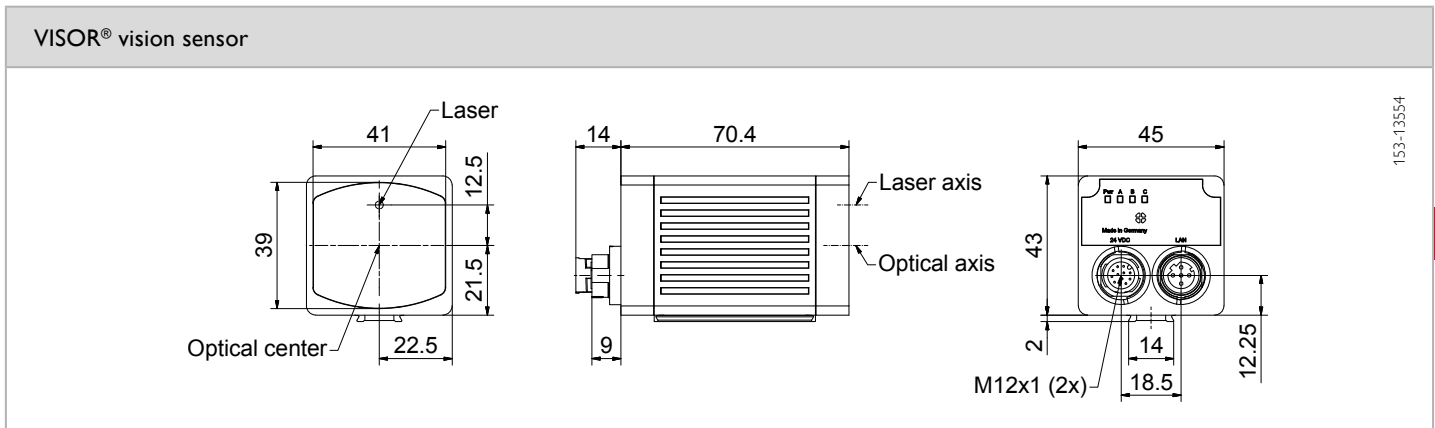


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	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;
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)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5 V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-RO-A3-W-M-M2-L	631-91074	Connection cables	From Page A-46
Red	V10-RO-A3-R-M-M2-L	631-91077	Illumination	From Page A-33
Infrared	V10-RO-A3-I-M-M2-L	631-91080	Brackets	From Page A-4
			Interface accessories	From Page A-53


VISOR® V10 Robotic Advanced, narrow field of view

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

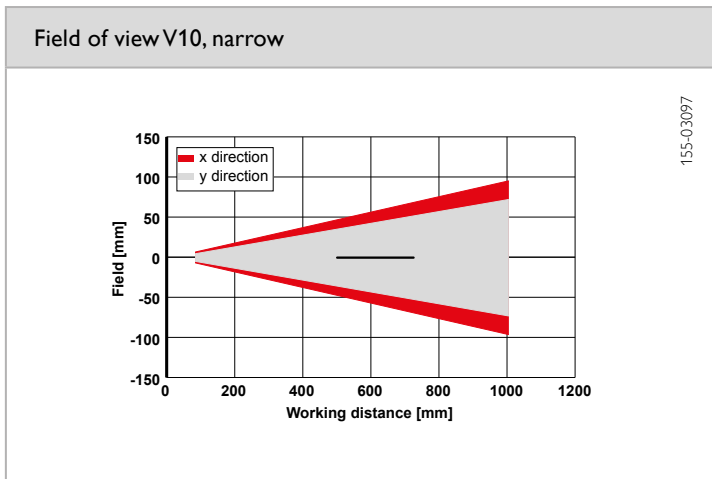
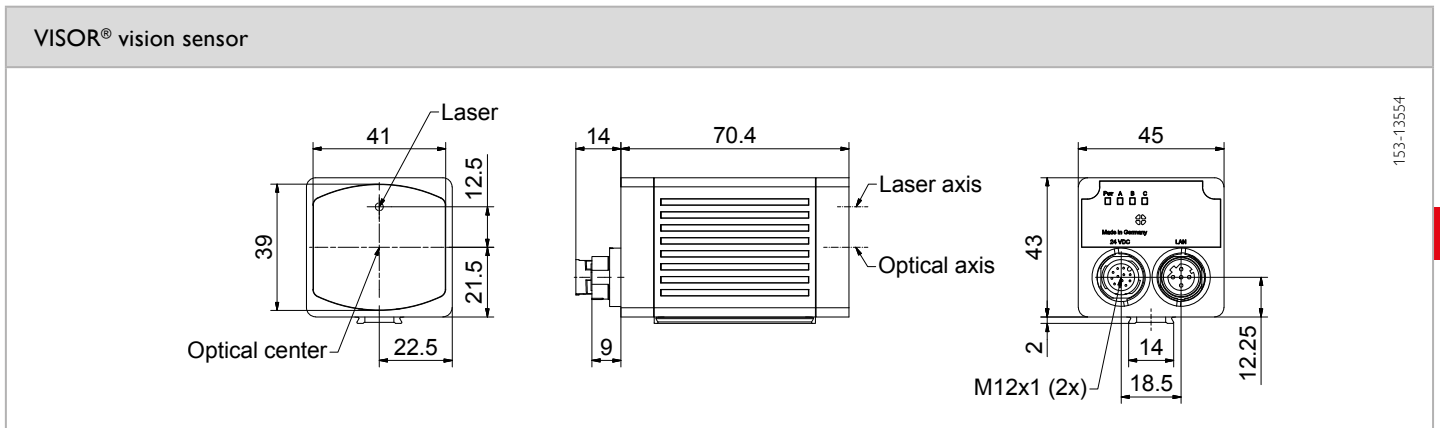


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	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;
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)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-RO-A3-W-N-M2-L	631-91075	Connection cables	From Page A-46
Red	V10-RO-A3-R-N-M2-L	631-91078	Illumination	From Page A-33
Infrared	V10-RO-A3-I-N-M2-L	631-91081	Brackets	From Page A-4
			Interface accessories	From Page A-53


VISOR® V10 Robotic Advanced, C-Mount

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

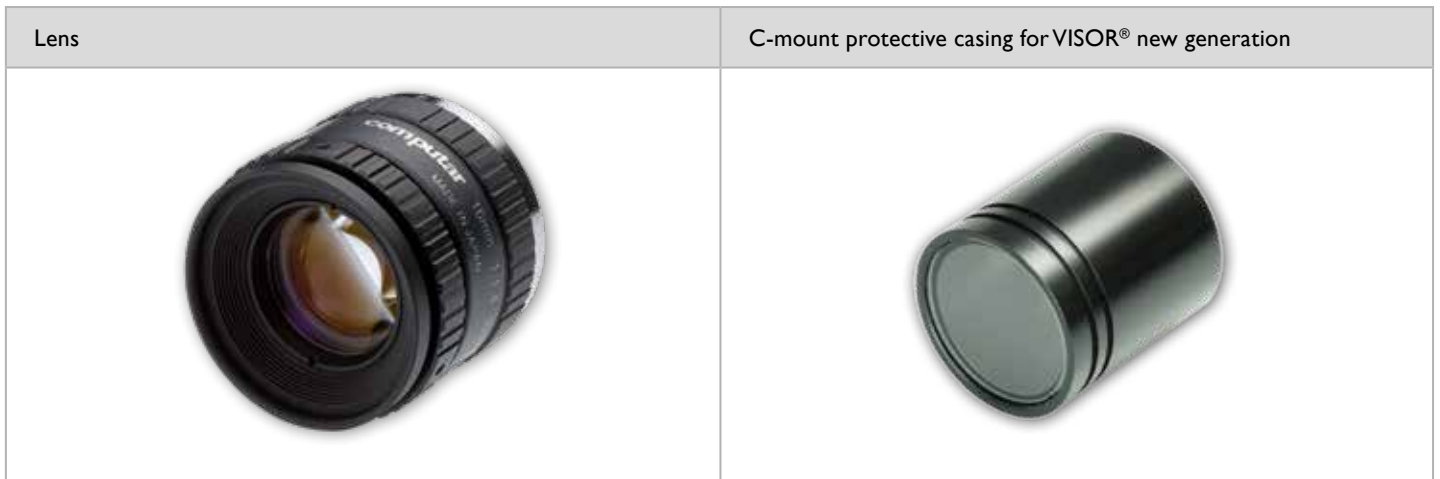
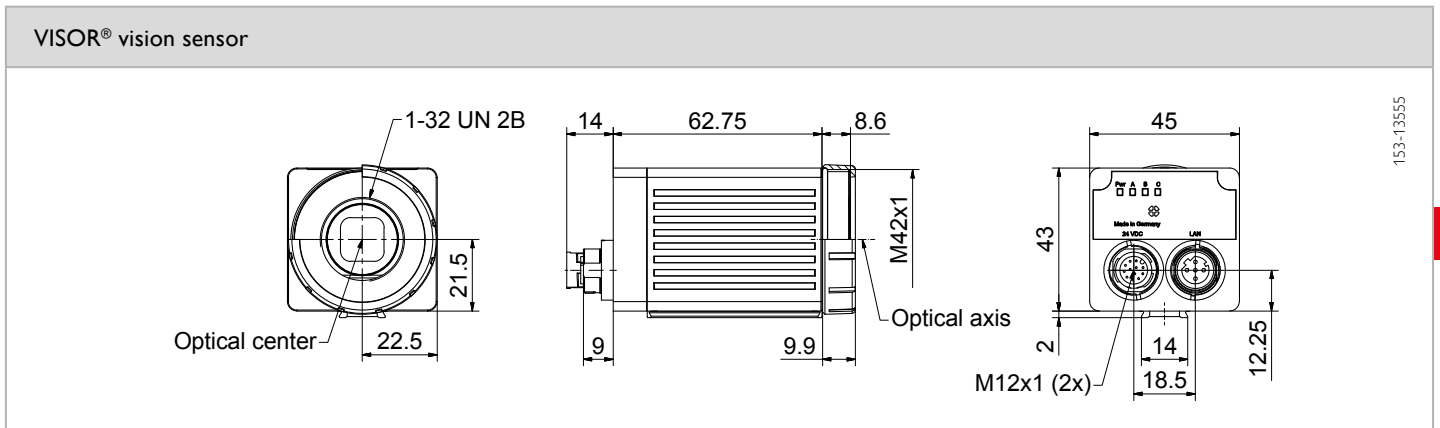


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	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;
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	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ²	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

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



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-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-RO-A3-C-2	631-91082	<table border="1"> <tr> <td>Connection cables</td> <td>From Page A-46</td> </tr> <tr> <td>Illumination</td> <td>From Page A-33</td> </tr> <tr> <td>Lenses</td> <td>From Page A-28</td> </tr> <tr> <td>Brackets</td> <td>From Page A-4</td> </tr> <tr> <td>Interface accessories</td> <td>From Page A-53</td> </tr> </table>	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
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® Robotic

An eye on everything – the Vision sensor for robotics applications



 made in Germany



The VISOR® Robotic detects the component's position in a universal tray. It can then be reliably removed. Up to 255 configurations enable utmost production flexibility.



The VISOR® Robotic determines the exact position of the sensor housing. Offset data is used to correct the robot's trajectory.

HIGHLIGHTS OF VISOR® ROBOTIC

- User-friendly configuration and display software
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications:
 - Calibration plate: simple, fast and precise
 - Point pair list: considerable flexibility when selecting calibration object and field of view
- Offset of work plane through Z-offset function
- Integrated and standardised interfaces (PROFINET, EtherNet/IP, TCP/IP)
- Flexible output protocol
- The right version for every application
 - Different resolutions
 - Focal length of 6 mm to 75 mm
 - Monochrome and color version

Picking up components

Feeding systems in a production line are becoming increasingly versatile – in addition to universal trays, components can be supplied with utmost flexibility using hopper feeders. Thanks to the VISOR® Robotic, components can be reliably located and gripped with both feed options. When loose components are supplied, the sensor not only checks their position but also inspects the free space around the gripper. The VISOR® determines both sets of information and sends them to the robot controller via one of the integrated and standardised process interfaces. The process is managed on the basis of this information – the object is gripped or the feeder is triggered. The application can also be flexibly adapted to individual goods carriers without the need for a costly centring device. The VISOR® detects the position and the fill level of the tray and transmits this information to the robot. If the camera is mounted in a stationary manner, this is cycle time-neutral.

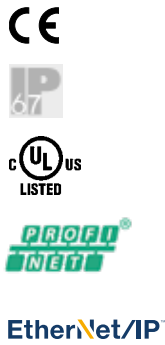
Placing parts

What happens after components have been reliably collected by the gripper? The VISOR® Robotic also supplies important information for the next work steps, and demonstrates its skills in robot-controlled applications, such as the placing of screws, the mounting of clips or the application of glue. The detection of component positions is carried out effortlessly; this allows the correction of any offset and increases the quality of production. Knowledge of the exact position of a component ensures, for example, the precise insertion of a windscreen. Mechanical effort is reduced, and the production line becomes even more flexible. The VISOR® Robotic concept enables direct communication between the VISOR® and the robot, an additional instance is no longer necessary for many applications.

VISOR® Robotic – product overview					
	Product variant	Resolution	Focal length	Integrated illumination	Page
V20-RO-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White, red or infrared LEDs	186
V20-RO-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	188
V10-RO-A2-xxx	Advanced	736 x 480 pixels	6 mm	White, red or infrared LEDs	190
V10-RO-A2-xxx	Advanced	736 x 480 pixels	12 mm	White, red or infrared LEDs	192
V10-RO-A2-xxx	Advanced	736 x 480 pixels	25 mm	White, red, or infrared LEDs	194
V10-RO-A2-xxx	Advanced	736 x 480 pixels	C-Mount	None	196
V20C-RO-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White LEDs	198
V20C-RO-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	200

VISOR® V20 Robotic

Advanced vision sensor for robotics applications, 12 mm



PRODUCT HIGHLIGHTS

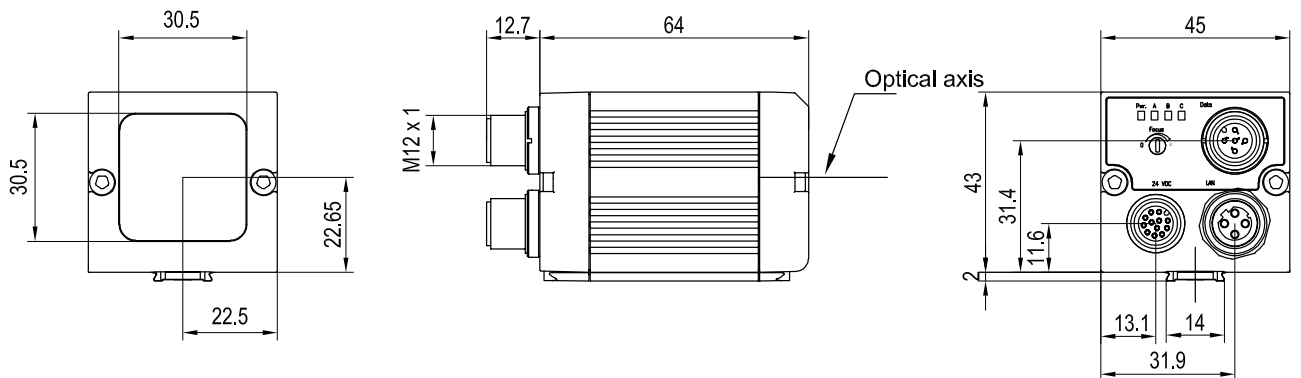
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel resolution

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	12 mm, adjustable focal position	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	30 mm to infinity	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
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V20 Object sensor
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin 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, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Part number	Article number
White	V20-RO-A2-W12	536-91047
Red	V20-RO-A2-R12	536-91048
Infrared	V20-RO-A2-I12	536-91049

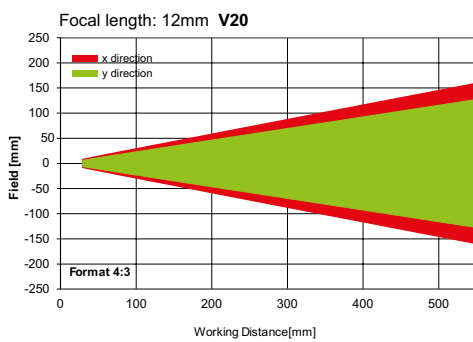
VISOR® vision sensor



153-00911

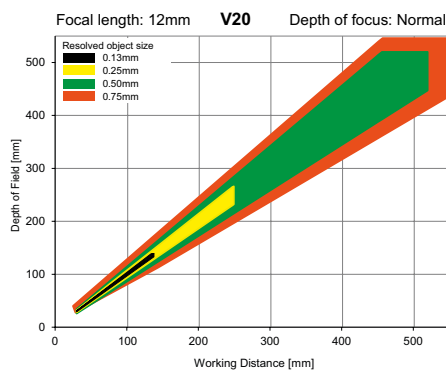
3

Field of view



155-01637

Depth of field: normal



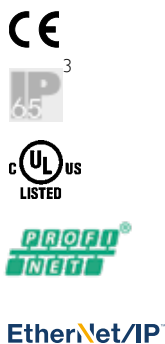
155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V20 Robotic

Advanced vision sensor for robotics applications, C-mount



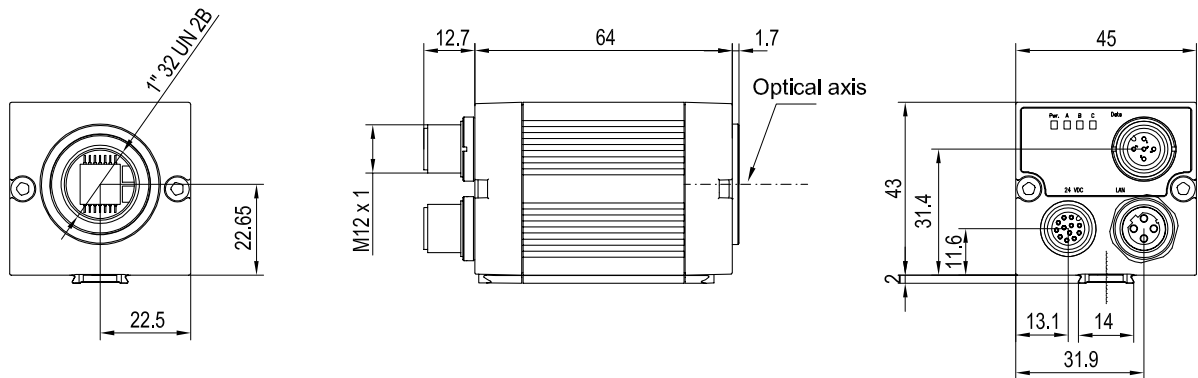
PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel resolution

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	C-Mount	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	Dependent on lens	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
Integrated illumination	None	Typical cycle times	same as VISOR® V20 Object sensor
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin 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, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Part number	Article number
V20-RO-A2-C	536-91053

VISOR® vision sensor


153-00912

3

Lens

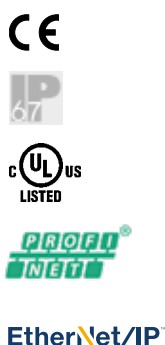

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

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
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, 6 mm



PRODUCT HIGHLIGHTS

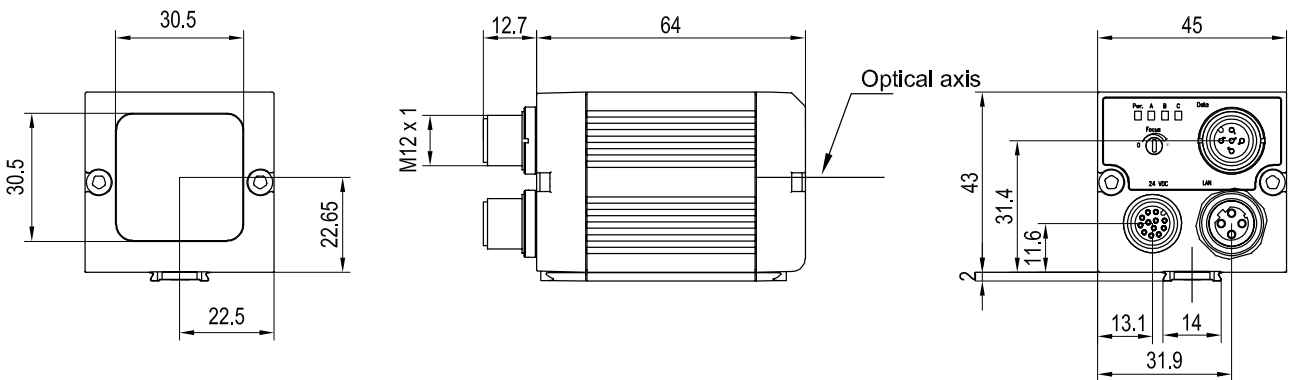
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	6 mm, adjustable focal position	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Adjustment range	6 mm to infinity	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
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoVweb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-RO-A2-W6	535-91123
Red	Normal	V10-RO-A2-R6	535-91124
Infrared	Normal	V10-RO-A2-I6	535-91125

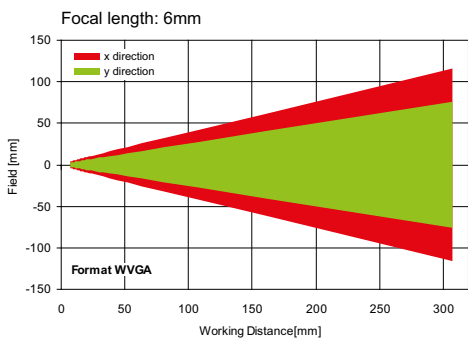
VISOR® vision sensor



153-00911

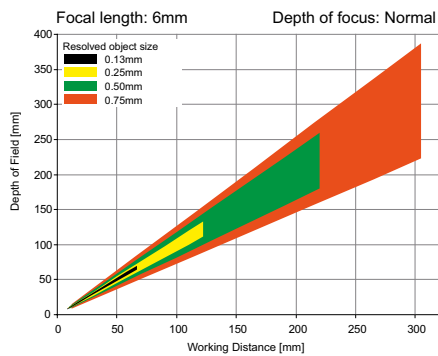
3

Field of view



155-01422

Depth of field: normal



155-01409

Depth of field: enhanced

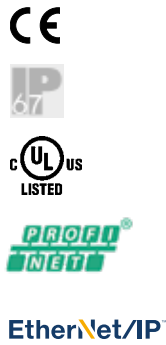
155-01421

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, 12 mm



PRODUCT HIGHLIGHTS

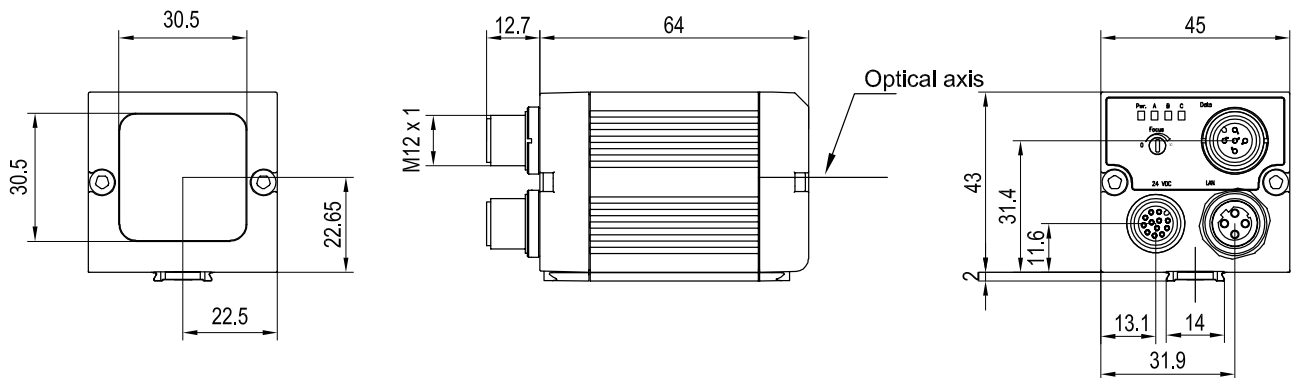
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	12 mm, adjustable focal position	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Adjustment range	30 mm to infinity	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
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

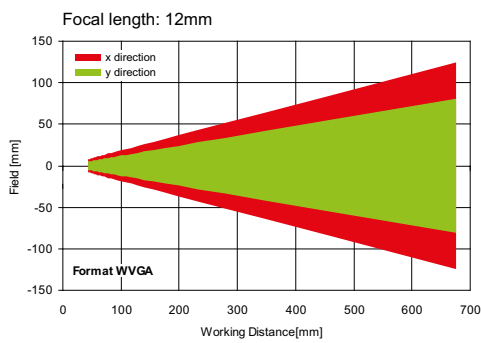
Illumination	Depth of field	Part number	Article number
White	Normal	V10-RO-A2-W12	535-91116
Red	Normal	V10-RO-A2-R12	535-91117
Infrared	Normal	V10-RO-A2-I12	535-91118

VISOR® vision sensor



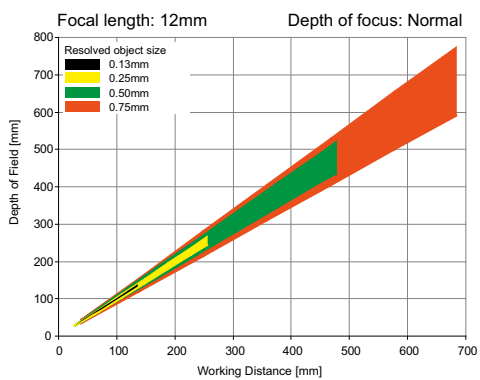
153-00911

Field of view



155-01423

Depth of field: normal



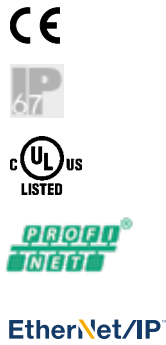
155-01410

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, 25 mm



PRODUCT HIGHLIGHTS

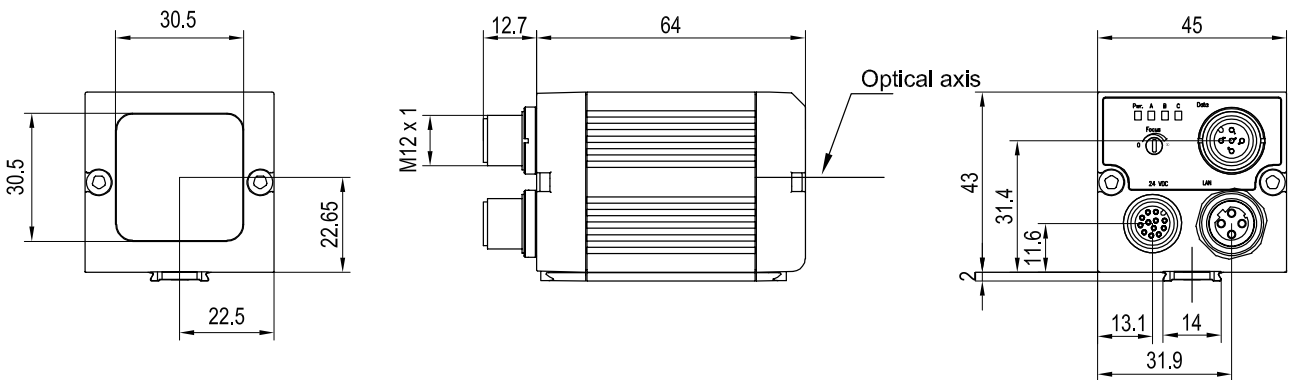
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	25 mm, adjustable focal position	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Adjustment range	140 mm to infinity	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
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	18 x 14 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin 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, SensoVWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-RO-A2-W25	535-91119
Red	Normal	V10-RO-A2-R25	535-91120
Infrared	Normal	V10-RO-A2-I25	535-91121

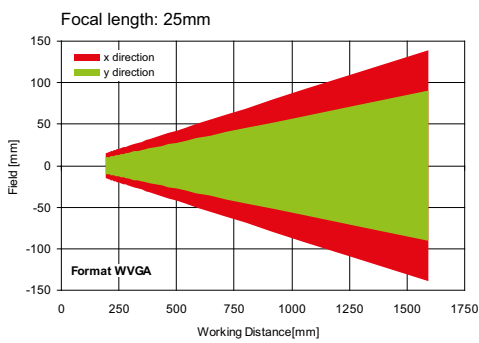
VISOR® vision sensor



153-00911

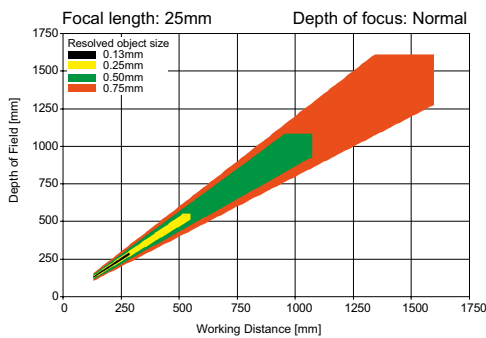
3

Field of view



155-01424

Depth of field: normal



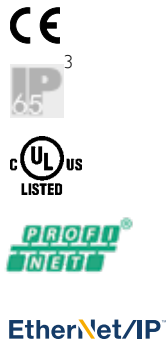
155-01412

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, C-mount



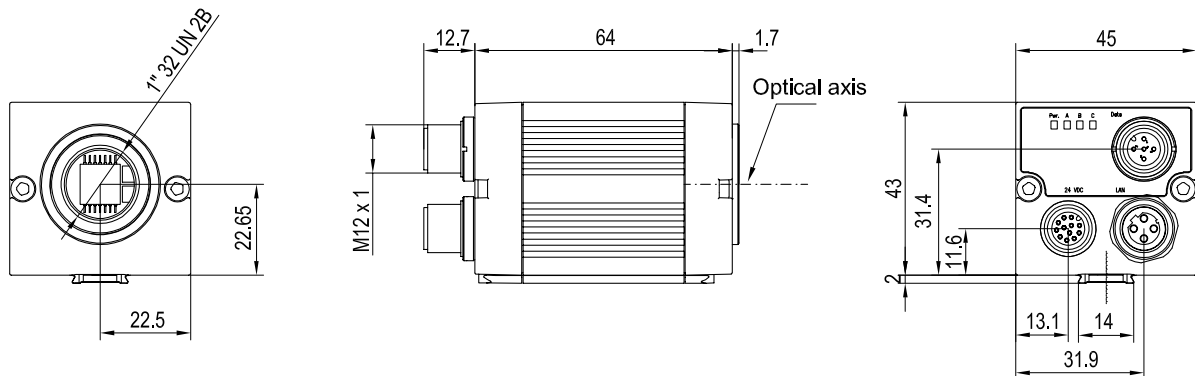
PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	C-Mount	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	Dependent on lens	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
Integrated illumination	None	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin 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, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Part number	Article number
V10-RO-A2-C	535-91122

VISOR® vision sensor


153-00912

3

Lens

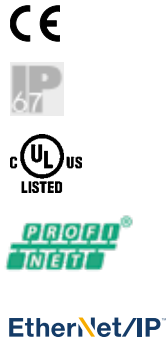

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

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
Calibration	From Page A-44

VISOR® V20C Robotic Color

Advanced vision sensor for robotics applications, color, 12 mm



PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel color resolution

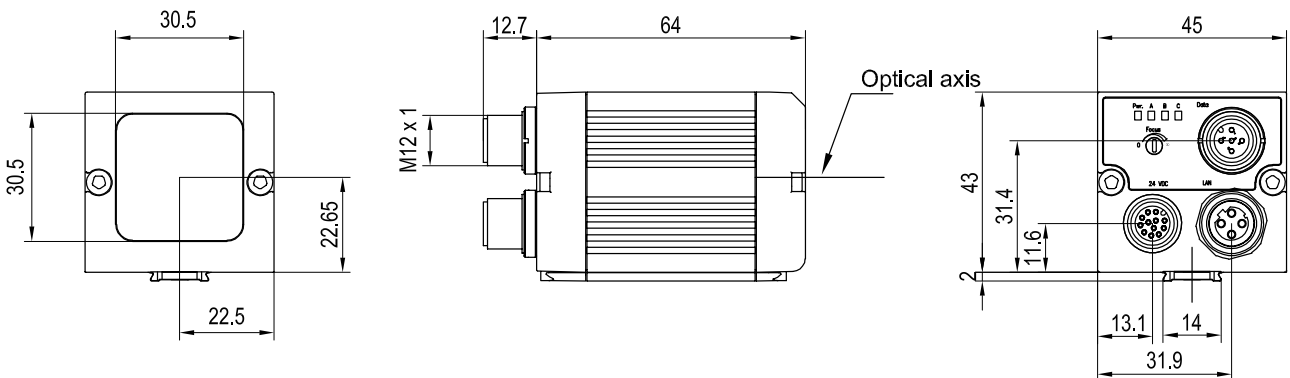
Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction Virtual color filter
Integrated lens, focal length	12 mm, adjustable focal position	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	30 mm to infinity	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
Integrated illumination	White LEDs	Typical cycle times	same as VISOR® Color V20C
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin 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, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS}

² 80 % air humidity, non-condensing

Illumination	Part number	Article number
White	V20C-RO-A2-W12	536-91051

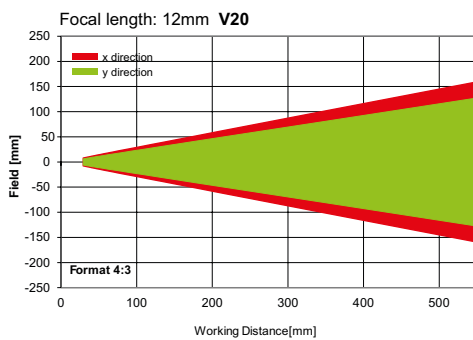
VISOR® vision sensor



153-00911

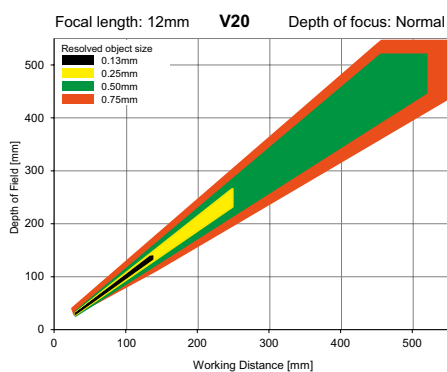
3

Field of view



155-01637

Depth of field: normal



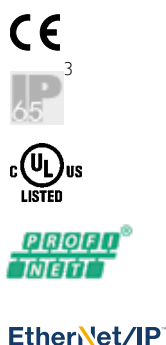
155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V20C Robotic Color

Advanced vision sensor for robotics applications, color, C-mount



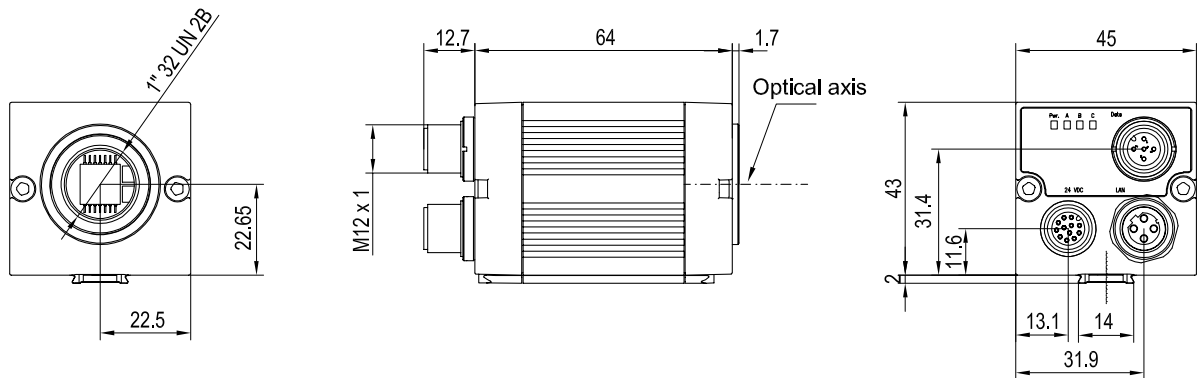
PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel color resolution

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction Virtual color filter
Integrated lens, focal length	C-Mount	Detectors	Contour; pattern comparison, calliper; BLOB; contrast; brightness; grey level
Adjustment range	Dependent on lens	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
Integrated illumination	None	Typical cycle times	same as VISOR® Color V20C
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power-On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Part number	Article number
V20C-RO-A2-C	536-91050

VISOR® vision sensor


153-00912

3

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
Calibration	From Page A-44