Eyesight vision system – everything is possible

At last. You can do what you want!



No. 2,0/

open

The dimensional accuracy of an object (e.g. a turned or pressed part) is an important quality feature, and can indirectly provide information on its consistency, stresses or wear, preventing rejects in downstream processes.



Providing direction:

The correct alignment of an object is an important prerequisite for downstream processes, e.g. for positioning and tracking a gripper. Colours, shapes and contours are suitable for monitoring correct

EYESIGHT HIGHLIGHTS

- Complete image-processing package with robust and flexible smart camera
- Programming via drag & drop of function blocks
- Complex iterative linkage of individual inspections
- Image and result visualisation in inspection mode
- Interpreter for programming one's own functions
- Image processing simulated on PC without camera
- Freely programmable data protocol for Ethernet and serial interface

Most image-processing applications can be rapidly and easily solved with pre-configured VISOR® vision sensors. However, their range of functions is not always sufficient for particularly demanding or specific tasks – but here, too, SensoPart has the right solution: the freely programmable Eyesight vision system offers comprehensive configuration possibilities so that you can also implement very complex automation applications with the smart camera. Whereby complex is not synonymous with complicated: graphic programming by means of drag & drop makes it easy for you to "construct" your own applications.

You can choose between two expansion stages: Eyesight Basic already has all the important routines for object measurement, position determination and tracking, and data communication. Eyesight Advanced offers you additional tools such as warpage point determination, contour inspection/tracking, colour selection/monitoring, brightness correction as well as a variety of filter functions. What can otherwise only be achieved by fully-fledged image-processing systems, you can implement with Eyesight Basic and Eyesight Advanced with considerably less effort – and at a relatively reasonable price.

Eyesight Vision Systems – Product Overview				
	Firmware Option	Focal length	Integrated illumination	Page
V10-EYE-A1-xxx	Advanced	6	White, red or infrared LEDs	76
V10-EYE-A1-xxx	Advanced	12	White, red or infrared LEDs	78
V10-EYE-A1-xxx	Advanced	C-mount	None	80
FA 45-300-xxx-EBxxx	Basic	6	White or red LEDs	82
FA 45-300-xxx-EBxxx	Basic	12	White or red LEDs	84
FA 45-300-xxx-EBxxx	Basic	C-mount	None	86
FA 45-300-xxx-EAxxx	Advanced	6	White or red LEDs	88
FA 45-300-xxx-EAxxx	Advanced	12	White or red LEDs	90
FA 45-300-xxx-EAxxx	Advanced	C-mount	None	92

Bilberry Juice

o-Colour GREEN

Preventing faults:

Very different features can be checked at a glance with the Eyesight – here, for example, the position and colour of the cap, filling level and presence of the usenoticed fault may be expensive later.

by date. This pays, because each un-

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Advanced vision system for complex image-processing applications, 6 mm



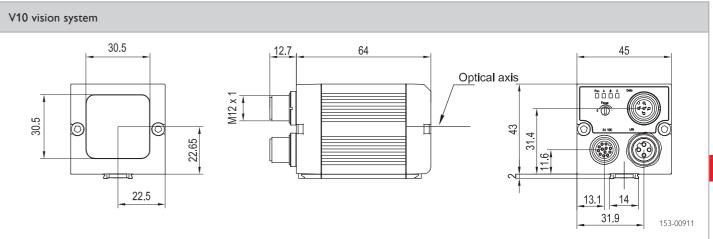


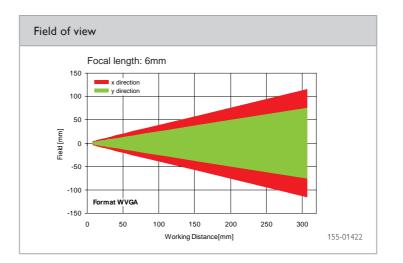
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- Image and result visualisation in inspection mode
- Script interpreter for advanced user functions
- Advanced range of commands for complex inspection tasks

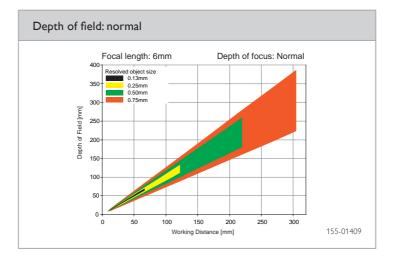
Optical data		Functions		
Resolution CMOS	736 x 480 pixels 1/3", monochrome	Number of inspection programs	No limitation (max. ca. 40 MB)	
Integrated lens, focal length	6 mm, adjustable focal position	Functions	All function blocks for object meas-	
Adjustment range	6 mm to infinity		urement, position determination /	
Integrated illumination	White, red, infrared LEDs		tracking, sequence control, data and image transfer, contour inspection,	
Minimum field of view, X x Y	5 x 4 mm ²		sub-programs, Basic Interpreter.	
		Properties	See overview of commands	
		Typical cycle times	Dependent on inspection program	
Electrical data		Mechanical data		
Operating voltage, +U _B	18 26.4 V DC ¹	Dimensions	65 × 45 × 45 mm³ (without plug)	
Current consumption	≤ 120 mA	Enclosure rating	IP 67	
(without illumination and I/O)		Material, housing	Aluminium, plastic	
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic	
Protective circuits	Reverse-polarity protection, $U_{\rm B}$ /	Ambient temperature: operation	0 +50 °C²	
	short-circuit protection of all outputs	Ambient temperature: storage	-20 +60 °C²	
Readiness delay	Ca. 13 s after Power on	Weight	Ca. 160 g	
Outputs	PNP	Plug connections	Supply and I/O M12, 12-pin	
Max. output current (per output)	50 mA, 100 mA (pin 12)	_	Ethernet M12, 4-pin	
Inputs	PNP High $> U_B-1 \text{ V, Low} < 3 \text{ V}$		Data M12, 5-pin	
Input resistance	> 20 kΩ	Vibration and impact resistance	EN 60947-5-2	
Interfaces: Eyesight vision system, Advanced	Ethernet (LAN), RS422			
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs			

 $^{^{1}}$ Max. ripple $< 5 \, V_{ss}$ 3 80 % air humidity, non-condensing

Depth of field	Part number	Article number
Normal	V10-EYE-A1-W6	537-91000
Normal	V10-EYE-A1-R6	537-91002
Normal	V10-EYE-A1-I6	537-91005
	Normal Normal	Normal V10-EYE-A1-W6 Normal V10-EYE-A1-R6







Accessories		
Connection cables	From Page 670	
Illumination	From Page 663	
Brackets	From Page 642	
Interface accessories	From Page 674	

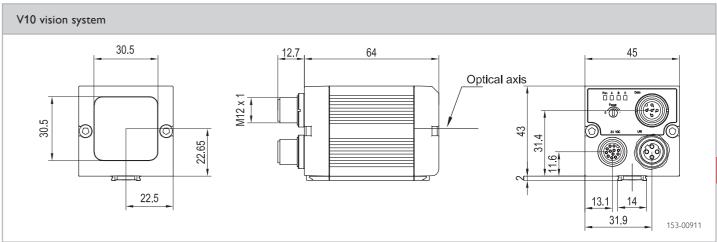
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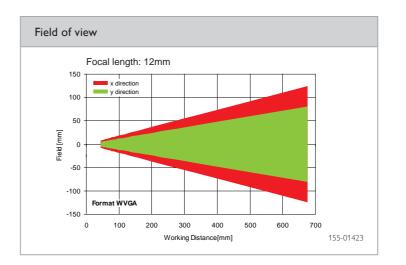
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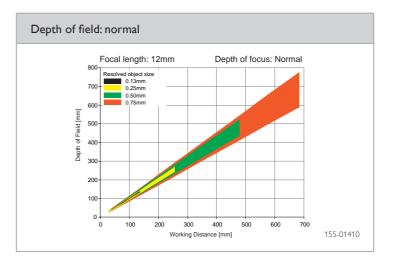
Optical data		Functions	
Resolution CMOS	736 x 480 pixels 1/3", monochrome	Number of inspection programs	No limitation (max. ca. 40 MB)
Integrated lens, focal length Adjustment range Integrated illumination Minimum field of view, X x Y	12 mm, adjustable focal position 30 mm to infinity White, red, infrared LEDs 8 × 6 mm ²	Functions	All function blocks for object measurement, position determination tracking, sequence control, data and image transfer, contour inspection, sub-programs, Basic Interpreter.
		Properties Typical cycle times	See overview of commands Dependent on inspection program
Electrical data		Mechanical data	
Operating voltage, +U _R	18 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm³ (without plug)
Current consumption (without illumination and I/O)	≤120 mA	Enclosure rating Material, housing	IP 67 Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Ambient temperature: operation Ambient temperature: storage	0 +50 °C² -20 +60 °C²
Readiness delay	Ca. 13 s after Power on	Weight	Ca. 160 g
Outputs Max, output current (per output)	PNP 50 mA, 100 mA (pin 12)	Plug connections	Supply and I/O M12, 12-pin
Inputs	PNP High > U _p -1 V, Low < 3 V		Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	$> 20 \text{ k}\Omega$	Vibration and impact resistance	EN 60947-5-2
Interfaces: Eyesight vision system, Advanced	Ethernet (LAN), RS422		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

 $^{^{1}}$ Max, ripple \leq 5 $\rm V_{SS}$ $^{-2}$ 80 % air humidity, non-condensing

Illumination	Depth of field	Part number	Article number
White	Normal	V10-EYE-A1-W12	537-91001
Red	Normal	V10-EYE-A1-R12	537-91003
Infrared	Normal	V10-EYE-A1-I12	537-91006







Accessories		
Connection cables	From Page 670	
Illumination	From Page 663	
Brackets	From Page 642	
Interface accessories	From Page 674	

Advanced vision system for complex image-processing applications, C-mount





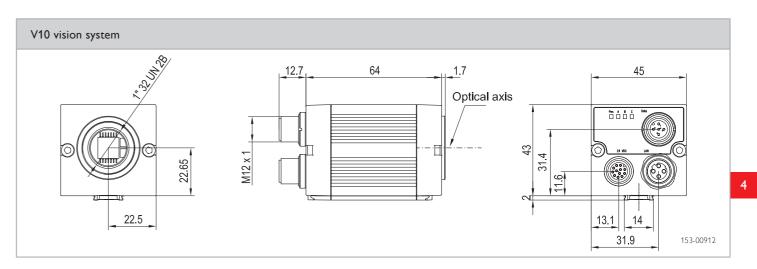
PRODUCT HIGHLIGHTS

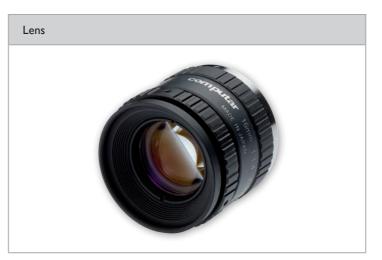
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Optical data		Functions	
Resolution CMOS	736 × 480 pixels 1/3", monochrome	Number of inspection programs	No limitation (max. ca. 40 MB)
Integrated lens, focal length	C-mount	Functions	All function blocks for object measurement, position determination
Adjustment range	Dependent on lens		tracking, sequence control, data and
Integrated illumination Minimum field of view, X x Y	None Dependent on lens		image transfer, contour inspection, sub-programs, Basic Interpreter.
		Properties	See overview of commands
		Typical cycle times	Dependent on inspection program
Electrical data		Mechanical data	
Operating voltage, +U _R	18 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm³ (without plug)
Current consumption	≤ 120 mA	Enclosure rating	IP 65 ²
(without illumination and I/O)		Material, housing	Aluminium, plastic
Current consumption (without I/O)	≤ 200 mA	Material, front screen	Plastic
Protective circuits	Reverse-polarity protection, $U_{\rm B}$ /	Ambient temperature: operation	0 +50 °C³
	short-circuit protection of all outputs	Ambient temperature: storage	-20 +60 °C³
Readiness delay	Ca. 13 s after Power on	Weight	Ca. 160 g
Outputs	PNP	Plug connections	Supply and I/O M12, 12-pin
Max. output current (per output)	50 mA, 100 mA (pin 12)		Ethernet M12, 4-pin
Inputs	PNP High $> U_B - 1 \text{ V, Low} < 3 \text{ V}$		Data M12, 5-pin
Input resistance	> 20 kΩ	Vibration and impact resistance	EN 60947-5-2
Interfaces: Eyesight vision system, Advanced	Ethernet (LAN), RS422		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

 $^{^{1}}$ Max. ripple < 5 V $_{\rm SS}$ $^{-2}$ With LPT45 C-mount protective casing $^{-3}$ 80 % air humidity, non-condensing

Part number	Article number
V10-EYE-A1-C	537-91004





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

Accessories	
Connection cables	From Page 670
Illumination	From Page 663
Lenses	From Page 661
Brackets	From Page 642
Interface accessories	From Page 674

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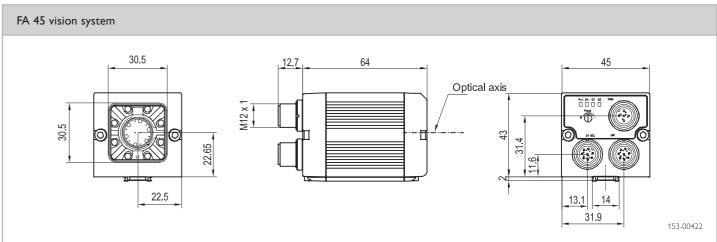
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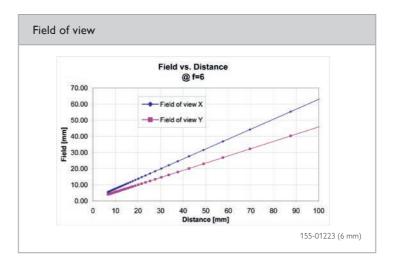
Optical data		Functions		
Resolution CCD Integrated lens, focal length Adjustment range Integrated illumination Minimum field of view, X x Y	640 x 480 pixels 1/4", monochrome 6 mm, adjustable focal position 20 mm to infinity White, red LEDs 18 x 14 mm ²	Number of inspection programs Functions Properties Typical cycle times	No limitation (max. ca. 3 MB) All important function blocks for object measurement, position determination/tracking, data transfer and sequence control See overview of commands Dependent on inspection program	
Electrical data		Mechanical data		
Operating voltage, +U _B	18 30 V DC ¹	Dimensions	$65 \times 45 \times 45 \text{ mm}^3 \text{ (without plug)}$	
Current consumption (without I/O)	≤ 200 mA	Enclosure rating	IP 67	
Protective circuits	Reverse-polarity protection, $U_{\rm B}$ /	Material, housing	Aluminium, plastic	
	short-circuit protection of all outputs	Material, front screen	Plastic	
Readiness delay	Ca. 6 s after Power on	Ambient temperature: operation	0 +50 °C²	
Outputs	PNP (N.O.)	Ambient temperature: storage	-20 +50 °C²	
Max. output current (per output)	200 mA (max. 9.6 W)	Weight	Ca. 170 g	
Inputs	High 10 24V (+10 %), Low 0 3V	Plug connections	Supply and I/O M12, 8-pin	
Input resistance	> 20 kOhm		Ethernet M12, 4-pin	
Interfaces:	Ethernet (LAN), RS422		Data M12, 5-pin	
Eyesight vision system, Basic		Vibration and impact resistance	EN 60947-5-2	
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 $^{^{1}}$ Max, ripple \leq 5 V_{ss} $^{-2}$ 80 % air humidity, non-condensing

Illumination	CCD	Part number	Article number
White	Monochrome	FA45-300-WCC-EBO6HS6	522-91133
Red	Monochrome	FA45-300-RCC-EBO6HS6	522-91139







Accessories		
Connection cables	From Page 670	
Illumination	From Page 663	
Brackets	From Page 642	
Interface accessories	From Page 674	



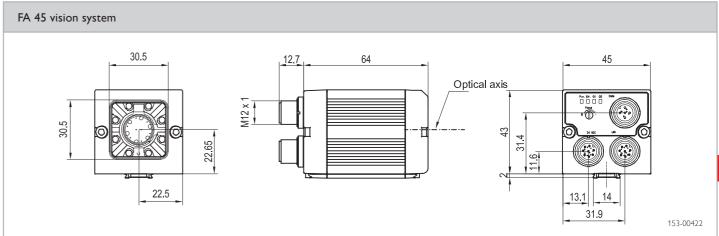
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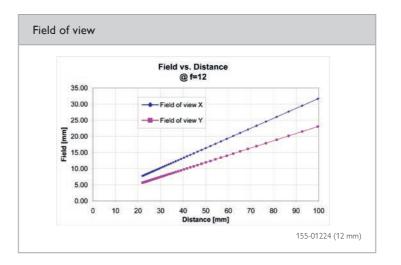
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Optical data		Functions	
Resolution CCD Integrated lens, focal length Adjustment range Integrated illumination Minimum field of view, X x Y	640 × 480 pixels 1/4", monochrome 12 mm, adjustable focal position 20 mm to infinity White, red LEDs 8 × 6 mm ²	Number of inspection programs Functions Properties Typical cycle times	No limitation (max. ca. 3 MB) All important function blocks for object measurement, position determination/tracking, data transfer and sequence control See overview of commands Dependent on inspection program
Electrical data		Mechanical data	
Operating voltage, +U _B	18 30 V DC ¹	Dimensions	65 × 45 × 45 mm³ (without plug)
Current consumption (without I/O)	≤ 200 mA	Enclosure rating	IP 67
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, plastic
Readiness delay	Ca. 6 s after Power on	Material, front screen	Plastic
Outputs	PNP (N.O.)	Ambient temperature: operation	0 +50 °C² -20 +50 °C²
Max. output current (per output)	200 mA (max. 9.6 W)	Ambient temperature: storage Weight	-20 +50 C ² Ca. 170 g
Inputs	High 10 24V (+10 %), Low 0 3V	Plug connections	Supply and I/O M12, 8-pin
Input resistance	> 20 kOhm	I lug connections	Ethernet M12, 4-pin
	Ethernet (LAN), RS422		Data M12, 5-pin
Interfaces:			=> 1 (00 (= = 0
Interfaces: Eyesight vision system, Basic	,,	Vibration and impact resistance	EN 60947-5-2

 $^{^{1}}$ Max, ripple \leq 5 $\rm V_{SS}$ $^{-2}$ 80 % air humidity, non-condensing

Illumination	CCD	Part number	Article number
White Red	Monochrome Monochrome	FA45-300-WCC-EBO12HS6 FA45-300-RCC-FBO12HS6	522-91134 522-91140
reu	Monochrome	FA43-300-NCC-EDO12H30	322-71140





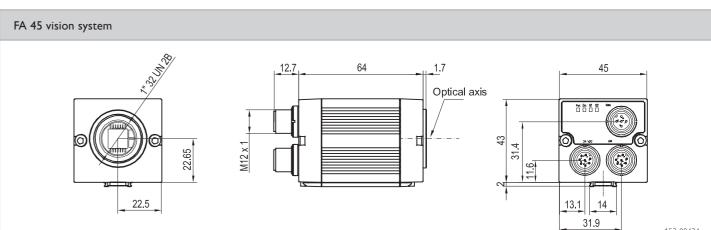
Accessories		
Connection cables	From Page 670	
Illumination	From Page 663	
Brackets	From Page 642	
Interface accessories	From Page 674	

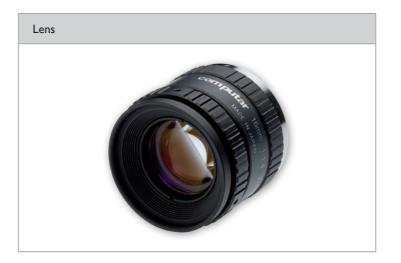
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Optical data		Functions	
Resolution CCD Integrated lens, focal length Adjustment range Integrated illumination Minimum field of view, X x Y	640 x 480 pixels 1/4", monochrome C-mount Dependent on lens None Dependent on lens	Number of inspection programs Functions Properties Typical cycle times	No limitation (max. ca. 3 MB) All important function blocks for object measurement, position determination/tracking, data transfer and sequence control See overview of commands Dependent on inspection program
Electrical data		Mechanical data	
Operating voltage, +U _B	18 30 V DC ¹	Dimensions	65 x 45 x 45 mm³ (without plug)
Current consumption (without I/O)	≤ 200 mA	Enclosure rating	IP 65 ²
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing Material, front screen	Aluminium, plastic Plastic
Readiness delay	Ca. 6 s after Power on	Ambient temperature: operation	0 +50 °C ³
Outputs	PNP (N.O.)	Ambient temperature: storage	-20 +50 °C ³
Max. output current (per output)	200 mA (max. 9.6 W)	Weight	Ca. 170 g
Inputs Input resistance Interfaces:	High 10 24 V (+10 %), Low 0 3 V > 20 kOhm Ethernet (LAN), RS422	Plug connections	Supply and I/O M12, 8-pin Ethernet M12, 4-pin Data M12, 5-pin
ii itci iaccs.	Edicinica (D (14), 150 122	Vibration and impact resistance	EN 60947-5-2
Eyesight vision system, Basic			

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

CCD	Part number	Article number
Monochrome	FA45-300-CC-EBOCSHS6	522-91135





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

Accessories	
Connection cables	From Page 670
Illumination	From Page 663
Lenses	From Page 661
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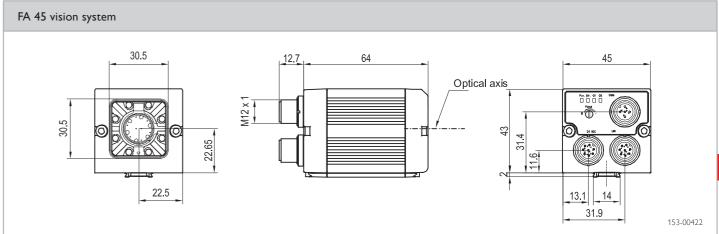
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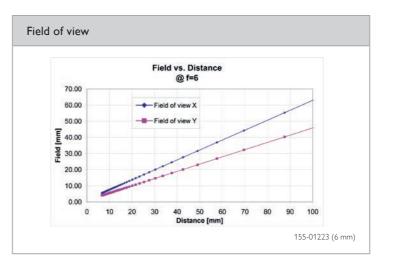
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Optical data		Functions	
Resolution	640 x 480 pixels	Number of inspection programs	No limitation (max. ca. 3 MB)
CCD	1/4", monochrome or colour	Functions	All function blocks for object
Integrated lens, focal length	6 mm, adjustable focal position		measurement,
Adjustment range	20 mm to infinity		position determination/tracking,
Integrated illumination	White, red LEDs		sequence control, data and image transfer,
Minimum field of view, X x Y	18 × 14 mm ²		contour inspection, sub-programs, Basic Interpreter; with colour CCD, additional function blocks for colour.
		Properties	See overview of commands
		Typical cycle times	Dependent on inspection program
Electrical data		Mechanical data	
Operating voltage, +U _B	18 30 V DC ¹	Dimensions	65 x 45 x 45 mm³ (without plug)
6		Faulanius astina	IP 67
Current consumption (without I/O)	≤ 200 mA	Enclosure rating	IF 0/
Protective circuits	≤ 200 mA Reverse-polarity protection, U _R /	Material, housing	Aluminium, plastic
/		- 0	
/	Reverse-polarity protection, U _B /	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing Material, front screen	Aluminium, plastic Plastic
Protective circuits Readiness delay	Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on	Material, housing Material, front screen Ambient temperature: operation	Aluminium, plastic Plastic 0 +50 °C²
Protective circuits Readiness delay Outputs	Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.)	Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage	Aluminium, plastic Plastic 0 +50 °C² -20 +50 °C²
Protective circuits Readiness delay Outputs Max. output current (per output)	Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.) 200 mA (max. 9.6 W)	Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight	Aluminium, plastic Plastic 0 +50 °C² -20 +50 °C² Ca. 170 g Supply and I/O M12, 8-pin Ethernet M12, 4-pin
Protective circuits Readiness delay Outputs Max. output current (per output) Inputs	Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.) 200 mA (max. 9.6 W) High 10 24V (+10 %), Low 0 3V	Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight	Aluminium, plastic Plastic 0 +50 °C² -20 +50 °C² Ca. 170 g Supply and I/O M12, 8-pin

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

Illumination	CCD	Part number	Article number
White Red White	Monochrome Monochrome Colour	FA45-300-WCC-EAO6HS6 FA45-300-RCC-EAO6HS6 FA45-300-WCCC-EAO6HS6	522-91136 522-91141 522-91143





Accessories	
Connection cables	From Page 670
Illumination	From Page 663
Brackets	From Page 642
Interface accessories	From Page 674

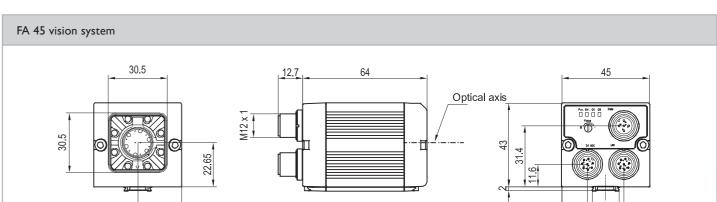


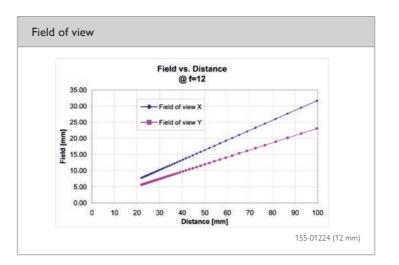
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Optical data		Functions	
Resolution	640 x 480 pixels	Number of inspection programs	No limitation (max. ca. 3 MB)
CCD	1/4", monochrome or colour	Functions	All function blocks for object
Integrated lens, focal length	12 mm, adjustable focal position		measurement,
Adjustment range	20 mm to infinity		position determination/tracking,
Integrated illumination	White, red LEDs		sequence control, data and image transfer,
Minimum field of view, X x Y	8 x 6 mm ²		contour inspection, sub-programs, Basic Interpreter; with colour CCD, additional functio blocks for colour.
		Properties	See overview of commands
		Typical cycle times	Dependent on inspection program
Electrical data		Mechanical data	
Electrical data Operating voltage, +U _B	18 30V DC ¹	Mechanical data Dimensions	65 × 45 × 45 mm³ (without plug)
	18 30 V DC¹ ≤ 200 mA		65 × 45 × 45 mm³ (without plug) IP 67
Operating voltage, +U _B		Dimensions	(1 0/
Operating voltage, +U _B Current consumption (without I/O) Protective circuits	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs	Dimensions Enclosure rating	IP 67
Operating voltage, +U _B Current consumption (without I/O)	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on	Dimensions Enclosure rating Material, housing	IP 67 Aluminium, plastic
Operating voltage, +U _B Current consumption (without I/O) Protective circuits	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.)	Dimensions Enclosure rating Material, housing Material, front screen	IP 67 Aluminium, plastic Plastic
Operating voltage, +U _B Current consumption (without I/O) Protective circuits Readiness delay	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on	Dimensions Enclosure rating Material, housing Material, front screen Ambient temperature: operation	IP 67 Aluminium, plastic Plastic 0 +50 °C²
Operating voltage, +U _B Current consumption (without I/O) Protective circuits Readiness delay Outputs	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.)	Dimensions Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +50 °C²
Operating voltage, +U _B Current consumption (without I/O) Protective circuits Readiness delay Outputs Max. output current (per output)	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.) 200 mA (max. 9.6 W)	Dimensions Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +50 °C² Ca. 170 g Supply and I/O M12, 8-pin Ethernet M12, 4-pin
Operating voltage, +U _B Current consumption (without I/O) Protective circuits Readiness delay Outputs Max. output current (per output) Inputs	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.) 200 mA (max. 9.6 W) High 10 24V (+10 %), Low 0 3V	Dimensions Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight	IP 67 Aluminium, plastic Plastic 0 +50 °C² -20 +50 °C² Ca. 170 g Supply and I/O M12, 8-pin

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

Illumination	CCD	Part number	Article number
White Red White	Monochrome Monochrome Colour	FA45-300-WCC-EAO12HS6 FA45-300-RCC-EAO12HS6 FA45-300-WCCC-EAO12HS6	522-91137 522-91142 522-91144





Accessories		
Connection cables	From Page 670	
Illumination	From Page 663	
Brackets	From Page 642	
Interface accessories	From Page 674	

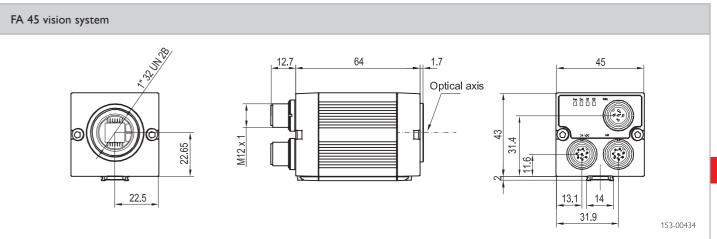


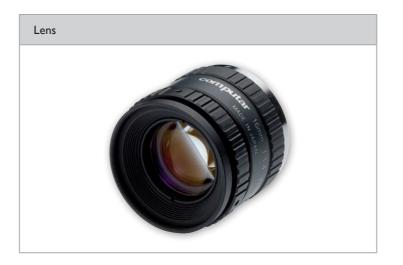
- Complete image-processing package with robust and flexible hardware
- Programming via drag & drop of function blocks
- Complex, iterative linkage of individual inspections
- Image processing can be simulated on the PC without camera
- Image and result visualisation in inspection mode
- Script interpreter for advanced user functions
- Advanced range of commands for complex inspection tasks

Optical data		Functions		
Resolution	640 x 480 pixels	Number of inspection programs	No limitation (max. ca. 3 MB)	
CCD	1/4", monochrome or colour	Functions	All function blocks for object	
Integrated lens, focal length	C-mount		measurement,	
Adjustment range	Dependent on lens	7	position determination/tracking,	
Integrated illumination	None		sequence control, data and image transfer,	
Minimum field of view, X x Y	Dependent on lens		contour inspection,	
		7	sub-programs,	
			Basic Interpreter;	
			with colour CCD, additional functional blocks for colour.	
		Properties	See overview of commands	
		Typical cycle times	Dependent on inspection program	
			<u> </u>	
Electrical data		Mechanical data		
Operating voltage, +U _B	18 30 V DC ¹	Dimensions	65 x 45 x 45 mm³ (without plug)	
Operating voltage, +U _B Current consumption (without I/O)	18 30 V DC¹ ≤ 200 mA	Dimensions Enclosure rating	65 × 45 × 45 mm³ (without plug) IP 65 ²	
Current consumption (without I/O)	≤ 200 mA	Enclosure rating	IP 65 ²	
Current consumption (without I/O)	≤ 200 mA Reverse-polarity protection, U _B /	Enclosure rating Material, housing	IP 65 ² Aluminium, plastic	
Current consumption (without I/O) Protective circuits	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs	Enclosure rating Material, housing Material, front screen	IP 65 ² Aluminium, plastic Plastic	
Current consumption (without I/O) Protective circuits Readiness delay	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on	Enclosure rating Material, housing Material, front screen Ambient temperature: operation	IP 65 ² Aluminium, plastic Plastic 0 +50 °C ³	
Current consumption (without I/O) Protective circuits Readiness delay Outputs	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.)	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage	IP 65 ² Aluminium, plastic Plastic 0 +50 °C ³ -20 +50 °C ³	
Current consumption (without I/O) Protective circuits Readiness delay Outputs Max. output current (per output)	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.C.) 200 mA (max. 9.6 W)	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight	Aluminium, plastic Plastic 0 +50 °C³ -20 +50 °C³ Ca. 170 g Supply and I/O M12, 8-pin Ethernet M12, 4-pin	
Current consumption (without I/O) Protective circuits Readiness delay Outputs Max. output current (per output) Inputs	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.) 200 mA (max. 9.6 W) High 10 24V (+10 %), Low 0 3V	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight Plug connections	IP 65 ² Aluminium, plastic Plastic 0 +50 °C ³ -20 +50 °C ³ Ca. 170 g Supply and I/O M12, 8-pin Ethernet M12, 4-pin Data M12, 5-pin	
Current consumption (without I/O) Protective circuits Readiness delay Outputs Max. output current (per output) Inputs Input resistance	≤ 200 mA Reverse-polarity protection, U _B / short-circuit protection of all outputs Ca. 6 s after Power on PNP (N.O.) 200 mA (max. 9.6 W) High 10 24 V (+10 %), Low 0 3 V > 20 kOhm	Enclosure rating Material, housing Material, front screen Ambient temperature: operation Ambient temperature: storage Weight	Aluminium, plastic Plastic 0 +50 °C³ -20 +50 °C³ Ca. 170 g Supply and I/O M12, 8-pin Ethernet M12, 4-pin	

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

CCD	Part number	Article number
Monochrome	FA45-300-CC-EAOCSHS6	522-91138
Colour	FA45-300-CCC-EAOCSHS6	522-91145





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

Accessories		
Connection cables	From Page 670	
Illumination	From Page 663	
Lenses	From Page 661	
Brackets	From Page 642	
Interface accessories	From Page 674	