

SBS, vision sensor

FESTO



SBS, vision sensor

Key features

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Vision sensor SBS

The vision sensors SBS are an easy introduction into vision systems and can be used to read 1D/2D codes or for quality inspection of parts, depending on the model. Their impressive features include intuitive software for easy parameterisation, even with no expert knowledge, and powerful, fast detection algorithms. In the model variants SBSI, the lighting and lens are already integrated in the compact IP67 housing, designed for use in harsh industrial environments. In addition, the vision sensors SBSC are available as a C mount variant. If necessary, external lights SBAL can be connected directly to the vision sensor.

- All-in-one product with integrated lens, lighting, evaluation and communication
- Simple user interface, just 3 or 4 steps to a solution
- Powerful and fast software tools
- Resolution of up to 1.3 megapixels
- C mount version for utmost flexibility
- Calibration of pixels to global coordinates
- Extensive image filters: Gauss, erosion, dilation, median, mean value, amplitude, standard deviation, edge filters, multiplication, inversion
- External lights SBAL can be connected directly, plug and work

Code reader SBSx-B

→ Page 8

The range of code readers SBSx-B is designed especially for reading 1D bar codes and 2D matrix codes. The powerful algorithms have no problem with even hard-to-read, directly marked codes (e.g. dot-peened or laser-machined onto metal). The code readers are also equipped with position tracking and other check algorithms. The high resolution of 1.3 megapixels means that even small codes can be read.

- Reading 1D bar codes: EAN, code 39, code 128, ...
- Reading 2D matrix codes: DMC ECC200, QR code, PDF 417
- Reading directly marked codes

Object sensor SBSx-Q

→ Page 18

With the range of object sensors SBSx-Q, checking product quality is child's play. It is very easy to inspect an item for alignment/orientation and check it is complete/present, for example. If the parts are not being fed in the correct position, a powerful tracking algorithm is available which flexibly detects the position and 360° rotary orientation of the parts and automatically aligns the other detection tools.

- Easy quality inspection
- 360° position tracking
- Fast and powerful detection algorithms
- BLOB function for position sensing, quality inspection or for counting multiple parts in the image
- Calliper function for measuring products (distance, edge position)

Universal sensor SBSC-U

→ Page 28

The universal sensors SBSC-U have all the detectors from the code reader and object sensor range. The devices are equipped with a C mount connection, thereby offering maximum flexibility for the user. The image field can be set individually using a suitable lens. The external light can be connected directly to the vision sensor and is easy to activate from the parameterisation software.

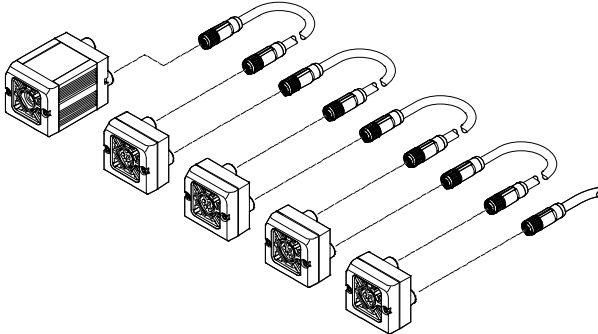
- OCR (optical character reader)
- BLOB
- Calliper
- Calibration

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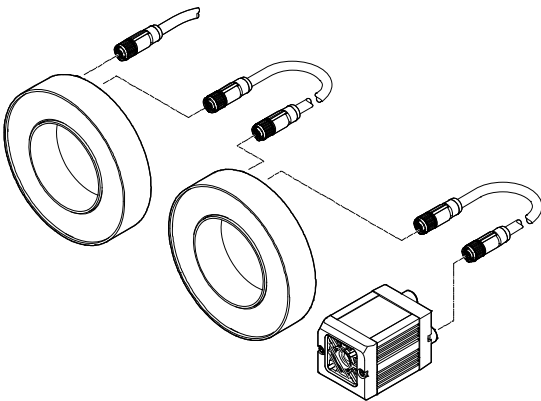
Key features

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Connection of external area lights SBAL-C6-A to the vision sensor SBS.
Up to 4 area lights can be connected directly to the SBS.

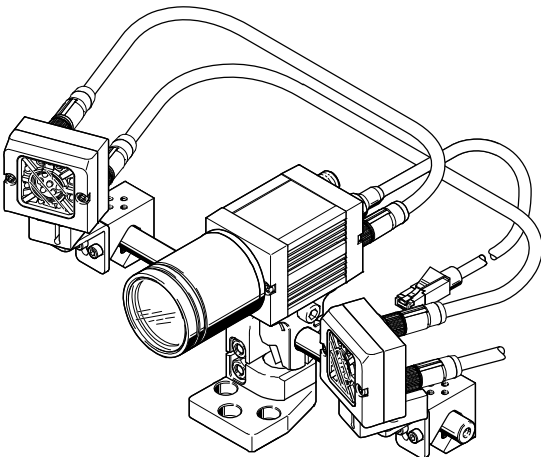


Connection of external ring lights SBAL-C6-R to the vision sensor SBS.
Up to 2 ring lights can be connected directly to the SBS.



SBSC with external light.

Connection of external lights SBAL in combination with mounting components SBAM. The light and vision sensor are connected to one another such that, if they are adjusted, their position relative to one another remains the same.

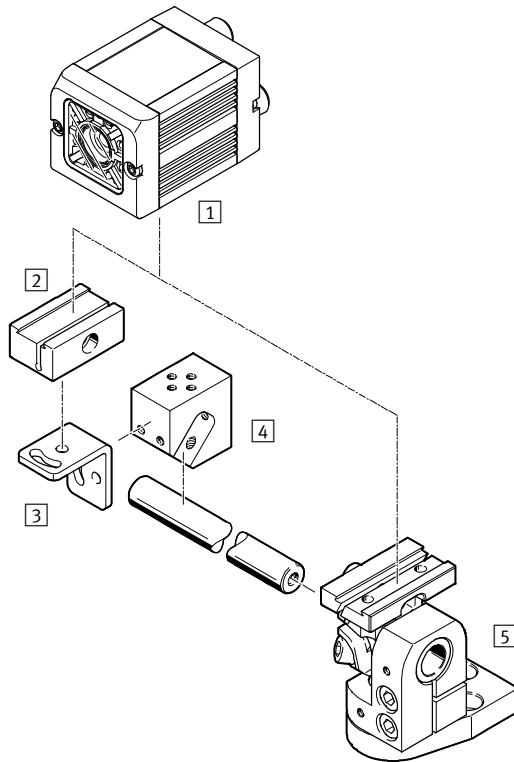


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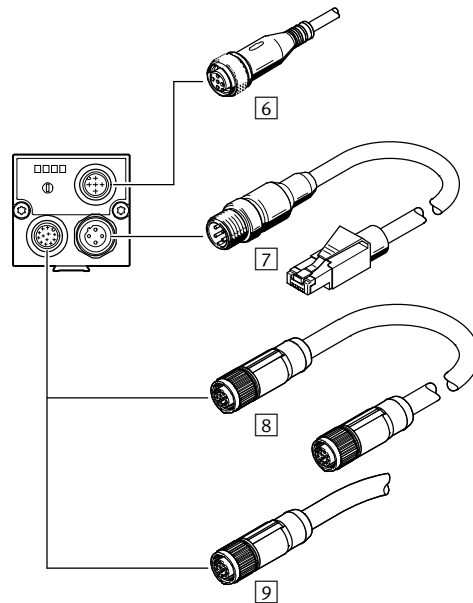
Peripherals overview

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Mechanical connection options



Electrical connection options



Mounting components and connecting cables

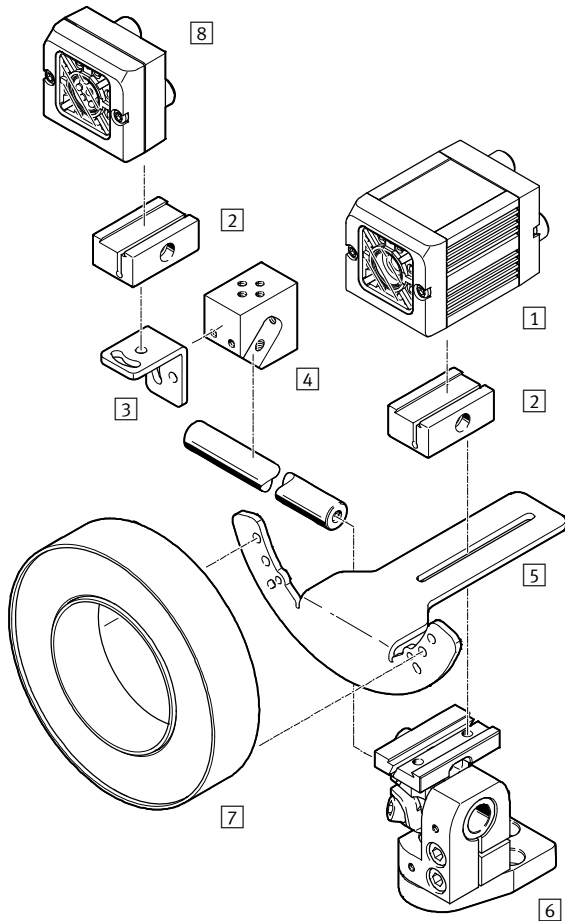
	Brief description	→ Page
[1] Vision sensor SBS-...	Vision sensor SBS with integrated lens and lighting in code reader SBS-B-... or object sensor SBS-Q-... versions	8, 18
[2] Mounting SBAM-C6-CP	Clamp fitting with dovetail slot	41
[3] Mounting bracket SBAM-C6-A	Mounting bracket 90°. Adjustment option with 2 levels	40
[4] Mounting SBAM-C6-CP-AF	Clamp fitting for mounting rod	41
[5] Swivel mounting SBAM-C6-A2	Clamp fitting with dovetail slot. Can be turned and rotated around 2 axes	39
[6] Connecting cable NEBS-M12G5-KS-...-LE5	Serial data cable (M12, 5-pin on open end); length 5 m or 10 m (interface for code reader only)	42
[7] Connecting cable NEBC-D12G4-KS-...-R3G4	Ethernet cable (M12, 4-pin on RJ45); length 1 m, 3.5 m or 10 m	42
[8] Connecting cable NEBS-M12G12-KS-...-SM12G12	Cable for connecting the external lights SBAL (M12, 12-pin on M12, 12-pin); length 0.5 m or 2 m	42
[9] Connecting cable NEBS-M12G12-KS-...-LE12	Cable for power supply and digital I/Os (M12, 12-pin on open end); length 5 m or 10 m	42

SBS, vision sensor

Peripherals overview

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Mechanical connection options with external lighting



Mounting components and accessories			
		Brief description	➔ Page
1	Vision sensor SBS-...	Vision sensor SBS with integrated lens and lighting in code reader SBS-B-... or object sensor SBS-Q-... versions	8, 18
2	Mounting SBAM-C6-CP	Clamp fitting with dovetail slot	41
3	Mounting bracket SBAM-C6-A	Mounting bracket 90°. Adjustment option with 2 levels	40
4	Mounting SBAM-C6-CP-AF	Clamp fitting for mounting rod	41
5	Holder SBAM-C7-A	For ring light SBAL-C6-R-...-D	40
6	Swivel mounting SBAM-C6-A2	Clamp fitting with dovetail slot. Can be turned and rotated around 2 axes	39
7	Ring light SBAL-C6-R-...-D	Type of light: LED, diffuse. Colours white, red and infrared	37
8	Area light SBAL-C6-A-...	Type of light: LED, clear. Colours white, red and infrared	35

SBS, vision sensor

Type codes SBSI

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SBSI

		SBS	I	-		-		-		-		-		-		-	D
Basic version																	
SBSI	Vision sensor with integrated lighting/lens																
Function																	
B	Code reader																
Q	Object sensor																
F	Colour sensor																
Function range																	
	Standard																
AF	Extended																
Resolution																	
R2	1280 x 1024 pixels (SXGA)																
R3	736 x 480 pixels (WVGA)																
Image sensor																	
C	Colour																
B	Monochrome																
Focal length																	
F6	6 mm																
F12	12 mm																
Lighting colour																	
W	White																
R	Red																
NR	Infrared (NIR)																
Additional features																	
D	Increased depth of field																

SBS, vision sensor

Type codes SBSC

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SBSC

		SBS	C	-		-		-		
Basic version										
SBSC	Vision sensor with CS mount									
Function										
B	Code reader									
Q	Object sensor									
F	Colour sensor									
U	Universal sensor									
Function range										
	Standard									
AF	Extended									
Resolution										
R2	1280 x 1024 pixels (SXGA)									
R3	736 x 480 pixels (WVGA)									
Image sensor										
C	Colour									
B	Monochrome									

SBS, vision sensor

Technical data – Code reader SBSI-B

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-  - Voltage
19.2 ... 30 V DC
-  - Temperature range
0 ... +50 °C



General technical data		
Type	SBSI-B-R3B-F6-...	SBSI-B-R3B-F12-...
Sensor resolution	736 x 480 pixels (Wide VGA)	
Sensor type	Monochrome	
Focus setting	With adjusting screw	
Lens mounting	Integrated lens	
Lighting type	Integrated	
Frame rate (full image) [fps]	50	
Max. number of inspection programs/jobs	8	
Focal length [mm]	6	12
Field of vision [mm]	Min. 5 x 4	Min. 8 x 6
Working distance [mm]	6 - infinite	30 - infinite
Max. number of test criteria/detectors	2	
Function of detectors/characteristics	2/5 Industrial	
	2/5 Interleaved	
	Codabar	
	Code 128	
	Code 39	
	Code 93	
	EAN	
	ECC200	
	GS1	
	PDF 417	
	Pharmacode	
	QR code	
	RSS	
	UPC	
Typical cycle time [ms]	1D barcode: 30	
	2D code: 40	
Dimensions W x L x H [mm]	45 x 45 x 76.7	
Product weight [g]	160	
Information on materials: housing	Anodised aluminium	
Information on materials: cover	ABS reinforced	
Note on materials	RoHS compliant	

SBS, vision sensor

Technical data – Code reader SBSI-B

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Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, transmission speed	100 Mbps
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface	
Serial interface, connection technology	Plug connector, M12, 5-pin
Type of serial interface	RS232/RS422

Digital inputs, outputs and power supply	
Electrical connection	Plug connector, M12, 12-pin
Number of digital inputs	2
Number of digital outputs	2
Number of selectable digital inputs/outputs	4
Switching input	PNP/NPN, switchable
Switching level [V]	Signal 0: ≤ 3 Signal 1: $\geq U_B - 1$
Switching output	PNP/NPN, switchable
Max. output current [mA]	50
Short circuit protection	For all electrical connections
Nominal operating voltage [V DC]	24
Permissible voltage fluctuations [%]	-25 ... +10
Max. current consumption [mA]	550
Current consumption with load-free outputs [mA]	200

Operating and environmental conditions	
Ambient temperature [°C]	0 ... +50
Storage temperature [°C]	-20 ... +60
Degree of protection	IP67
Vibration resistance	To EN 60068-2-6
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾
Certification	c UL us listed (OL) RCM compliance mark

- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

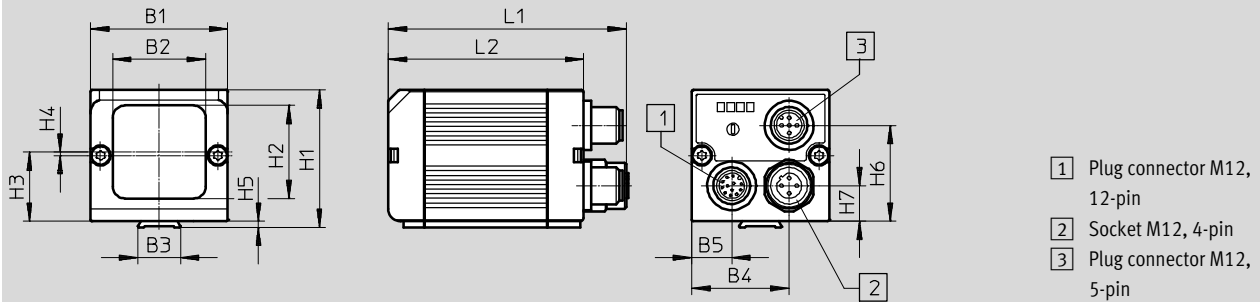
SBS, vision sensor

Technical data – Code reader SBSI-B

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Dimensions

Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H6	H7	L1	L2
SBSI-B- ...	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	31.4	11.6	76.7	64

Ordering data

Code reader	Integrated lens, focal length [mm]	Additional features	Type of light: LED	Part No.	Type
	6	–	White	2930232	SBSI-B-R3B-F6-W
	12	–	White	2930233	SBSI-B-R3B-F12-W
	6	Increased depth of field	White	2930242	SBSI-B-R3B-F6-W-D
	12	Increased depth of field	White	2930243	SBSI-B-R3B-F12-W-D
	6	–	Red	2930234	SBSI-B-R3B-F6-R
	12	–	Red	2930235	SBSI-B-R3B-F12-R
	6	Increased depth of field	Red	2930236	SBSI-B-R3B-F6-R-D
	12	Increased depth of field	Red	2930237	SBSI-B-R3B-F12-R-D
	6	–	Infrared	2930238	SBSI-B-R3B-F6-NR
	12	–	Infrared	2930239	SBSI-B-R3B-F12-NR
	6	Increased depth of field	Infrared	2930240	SBSI-B-R3B-F6-NR-D
	12	Increased depth of field	Infrared	2930241	SBSI-B-R3B-F12-NR-D

SBS, vision sensor

Technical data – Code reader SBSI-B-AF

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-  - Voltage
19.2 ... 30 V DC
-  - Temperature range
0 ... +50 °C



General technical data		
Type	SBSI-B-AF-...	SBSI-B-AF-R2B-F12-...
Sensor resolution	736 x 480 pixels (wide VGA)	1280 x 1024 pixels (SXGA)
Sensor type	Monochrome	
Focus setting	With adjusting screw	
Lens mounting	Integrated lens	
Lighting type	Integrated	
Frame rate (full image) [fps]	50	40
Max. number of inspection programs/jobs	255	
Focal length [mm]	➔ Page 13	12
Field of vision [mm]		Min. 16 x 3
Working distance [mm]		30 - infinite
Max. number of test criteria/detectors	255	
Function of detectors/characteristics	2/5 Industrial	
	2/5 Interleaved	
	Codabar	
	Code 128	
	Code 39	
	Code 93	
	EAN	
	ECC200	
	GS1	
	PDF 417	
	Pharmacode	
	QR code	
	RSS	
	UPC	
Typical cycle time [ms]	1D barcode: 30	
	2D code: 40	
Dimensions W x L x H [mm]	45 x 45 x 76.7	
Product weight [g]	160	
Information on materials: housing	Anodised aluminium	
Information on materials: cover	ABS reinforced	
Note on materials	RoHS compliant	

SBS, vision sensor

Technical data – Code reader SBSI-B

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Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, transmission speed	100 Mbps
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface	
Serial interface, connection technology	Plug connector, M12, 5-pin
Type of serial interface	RS232/RS422

Digital inputs, outputs and power supply	
Electrical connection	Plug connector, M12, 12-pin
Number of digital inputs	2
Number of digital outputs	2
Number of selectable digital inputs/outputs	4
Switching input	PNP/NPN, switchable
Switching level [V]	Signal 0: ≤ 3 Signal 1: $\geq U_B - 1$
Switching output	PNP/NPN, switchable
Max. output current [mA]	50
Short circuit protection	For all electrical connections
Nominal operating voltage [V DC]	24
Permissible voltage fluctuations [%]	-25 ... +10
Max. current consumption [mA]	550
Current consumption with load-free outputs [mA]	200

Operating and environmental conditions	
Ambient temperature [°C]	0 ... +50
Storage temperature [°C]	-20 ... +60
Degree of protection	IP67
Vibration resistance	To EN 60068-2-6
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾
Certification	c UL us listed (OL) RCM compliance mark

- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

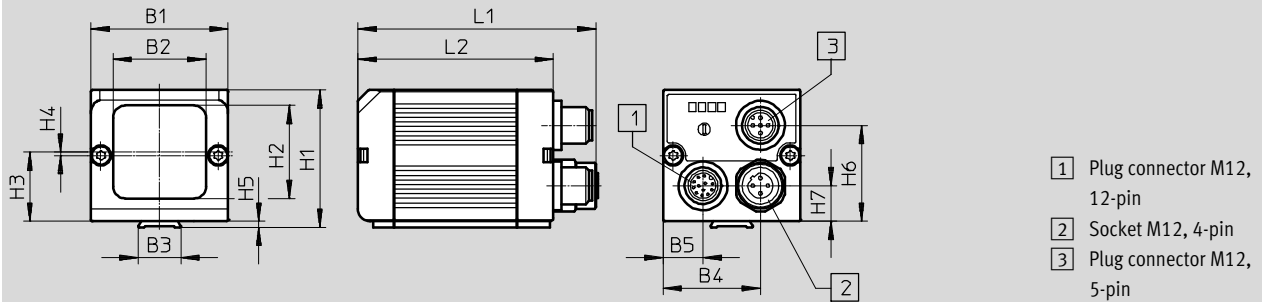
SBS, vision sensor

Technical data – Code reader SBSI-B

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Dimensions

Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H6	H7	L1	L2
SBSI-B- ...	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	31.4	11.6	76.7	64

Ordering data

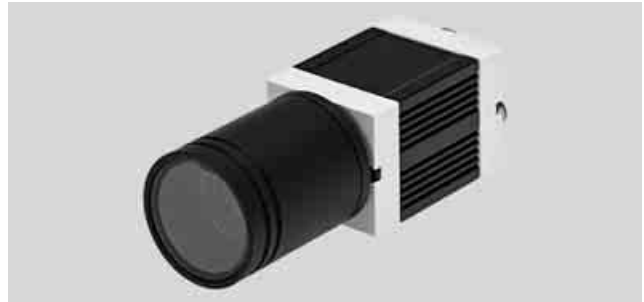
Code reader	Integrated lens, focal length [mm]	Field of view	Working distance	Type of light: LED	Part No.	Type
	6	Min. 5 x 4 mm	6 mm - infinite	White	8058715	SBSI-B-AF-R3B-F6-W
	12	Min. 8 x 6 mm	30 mm - infinite	White	8058716	SBSI-B-AF-R3B-F12-W
	6	Min. 5 x 4 mm	6 mm - infinite	Red	8058717	SBSI-B-AF-R3B-F6-R
	12	Min. 8 x 6 mm	30 mm - infinite	Red	8058718	SBSI-B-AF-R3B-F12-R
	6	Min. 5 x 4 mm	6 mm - infinite	Infrared	8058719	SBSI-B-AF-R3B-F6-NR
	12	Min. 8 x 6 mm	30 mm - infinite	Infrared	8058720	SBSI-B-AF-R3B-F12-NR
	12	Min. 16 x 13 mm	30 mm - infinite	Red	8058723	SBSI-B-AF-R2B-F12-R

SBS, vision sensor

Technical data – Code reader SBSC-B

FESTO

-  - Voltage
19.2 ... 30 V DC
-  - Temperature range
0 ... +50 °C



General technical data		
Type	SBSC-B-AF-R3B	SBSC-B-AF-R2B
Sensor resolution	736 x 480 pixels (wide VGA)	1280 x 1024 pixels (SXGA)
Sensor type	Monochrome	
Lens mounting	CS mount / C mount	
Lighting type	Integrated	
Frame rate (full image) [fps]	50	40
Max. number of test programs/jobs	255	
Max. number of test criteria/detectors	255	
Function of detectors/characteristics	2/5 Industrial	
	2/5 Interleaved	
	Codabar	
	Code 128	
	Code 39	
	Code 93	
	EAN	
	ECC200	
	GS1	
	PDF 417	
	Pharmacode	
	QR code	
	RSS	
	UPC	
Dimensions W x L x H [mm]	45 x 45 x 76.7	
Product weight [g]	160	
Information on materials: housing	Anodised wrought aluminium alloy	
Information on materials: cover	ABS reinforced	
Note on materials	RoHS compliant	

SBS, vision sensor

Technical data – Code reader SBSC-B

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General technical data		
Type	SBSC-Q-AF-R3B	SBSC-Q-AF-R2B
Sensor resolution	736 x 480 pixels (wide VGA)	1280 x 1024 pixels (SXGA)
Sensor type	Monochrome	
Lens mounting	CS mount	
Lighting type	–	
Frame rate (full image) [fps]	50	40
Max. number of test programs/jobs	255	
Max. number of test criteria/detectors	255	
Function of detectors/characteristics	Position tracking via contour	
	Pattern matching	
	Contour matching	
	Edge detection	
	Contrast	
	Brightness	
	Grey scale threshold	
	Vernier calliper	
Typical cycle time [ms]	BLOB	
	1D barcode: 30	
	2D code: 40	
	Position tracking: 30	
	Contour matching: 30	
	Contrast: 4	
	Brightness: 2	
	Grey scale threshold: 4	
	Vernier calliper: 8	
	BLOB: 30	

SBS, vision sensor

Technical data – Code reader SBSC-B

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Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, transmission speed	100 Mbps
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface	
Serial interface, connection technology	Plug connector, M12, 5-pin
Type of serial interface	RS232/RS422

Digital inputs, outputs and power supply	
Electrical connection	Plug connector, M12, 12-pin
Number of digital inputs	2
Number of digital outputs	2
Number of selectable digital inputs/outputs	4
Switching input	PNP/NPN, switchable
Switching level [V]	Signal 0: ≤ 3 Signal 1: $\geq U_B - 1$
Switching output	PNP/NPN, switchable
Max. output current [mA]	50
Short circuit protection	For all electrical connections
Nominal operating voltage [V DC]	24
Permissible voltage fluctuations [%]	-25 ... +10
Max. current consumption [mA]	550
Current consumption with load-free outputs [mA]	200

Operating and environmental conditions	SBSC-B...	SBSC-Q...
Ambient temperature [°C]	0 ... +50	
Storage temperature [°C]	-20 ... +60	
Degree of protection	IP65	IP67
Note on degree of protection	With protective tubing	
Vibration resistance	To EN 60068-2-6	
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾	
Certification	c UL us listed (OL) RCM compliance mark	

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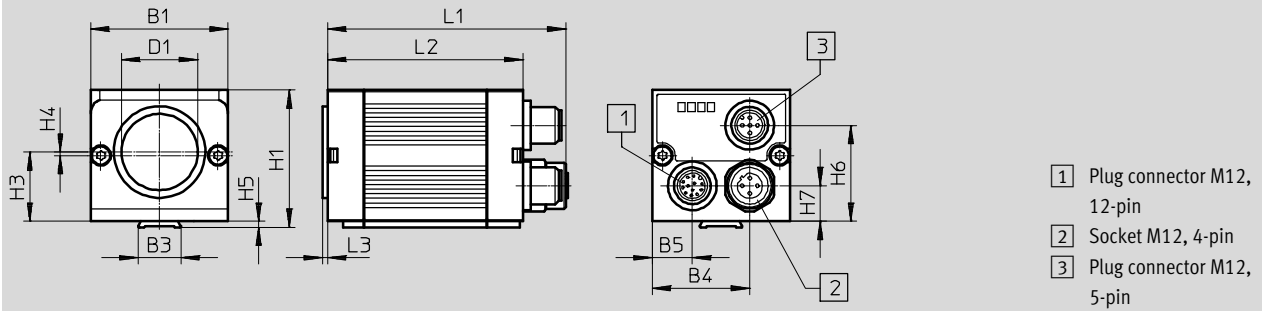
SBS, vision sensor

Technical data – Code reader SBSC-B

FESTO

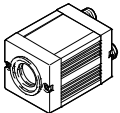
Dimensions

Download CAD data → www.festo.com



Type	B1	B3	B4	B5	D1 Ø	H1	H3	H4	H5	H6	H7	L1	L2	L3
SBSC-B- ...	45	14	31.9	13.1	25	45	22.7	1.2	2	31.4	11.6	76.7	64	1.7
SBSC-Q- ...														

Ordering data

Code reader	Field of view and working distance	Part No.	Type
	Depends on the lens chosen	8058721	SBSC-B-AF-R3B
		8058722	SBSC-B-AF-R2B
		8058728	SBSC-Q-AF-R3B
		8058729	SBSC-Q-AF-R2B

SBS, vision sensor

Technical data – Object sensor SBSI-Q

FESTO

-  - Voltage
19.2 ... 30 V DC
-  - Temperature range
0 ... +50 °C



General technical data		
Type	SBSI-Q-R3B-F6-...	SBSI-Q-R3B-F12-...
Sensor resolution	736 x 480 pixels (Wide VGA)	
Sensor type	Monochrome	
Focus setting	With adjusting screw	
Lens mounting	Integrated lens	
Lighting type	Integrated	
Frame rate (full image) [fps]	50	
Max. number of test programs/jobs	8	
Focal length [mm]	6	12
Field of vision [mm]	Min. 5 x 4	Min. 8 x 6
Working distance [mm]	6 - infinite	30 - infinite
Max. number of test criteria/detectors	32	
Function of detectors/characteristics	Grey scale threshold	
	Brightness	
	Contrast	
	Contour matching	
	Position tracking via contour	
	Pattern matching	
Typical cycle time		
Grey scale threshold [ms]	4	
Brightness [ms]	2	
Contrast [ms]	4	
Contour matching [ms]	30	
Position tracking [ms]	30	
Pattern matching [ms]	20	
Dimensions W x L x H [mm]	45 x 45 x 76.7	
Product weight [g]	160	
Information on materials: housing	Anodised aluminium	
Information on materials: cover	ABS reinforced	
Note on materials	RoHS compliant	

SBS, vision sensor

Technical data – Object sensor SBSI-Q

Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, transmission speed	100 Mbps
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Digital inputs/outputs and power supply	
Electrical connection	Plug connector, M12, 12-pin
Number of digital inputs	2
Number of digital outputs	4
Number of selectable digital inputs/outputs	2
Switching input	PNP/NPN, switchable
Switching level [V]	Signal 0: ≤ 3 Signal 1: $\geq U_B - 1$
Switching output	PNP/NPN, switchable
Max. output current [mA]	50
Short circuit protection	For all electrical connections
Nominal operating voltage [V DC]	24
Permissible voltage fluctuations [%]	-25 ... +10
Max. current consumption [mA]	550
Current consumption with load-free outputs [mA]	200

Operating and environmental conditions	
Ambient temperature [°C]	0 ... +50
Storage temperature [°C]	-20 ... +60
Degree of protection	IP67
Vibration resistance	To EN 60068-2-6
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾
Certification	c UL us listed (OL) RCM compliance mark

- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
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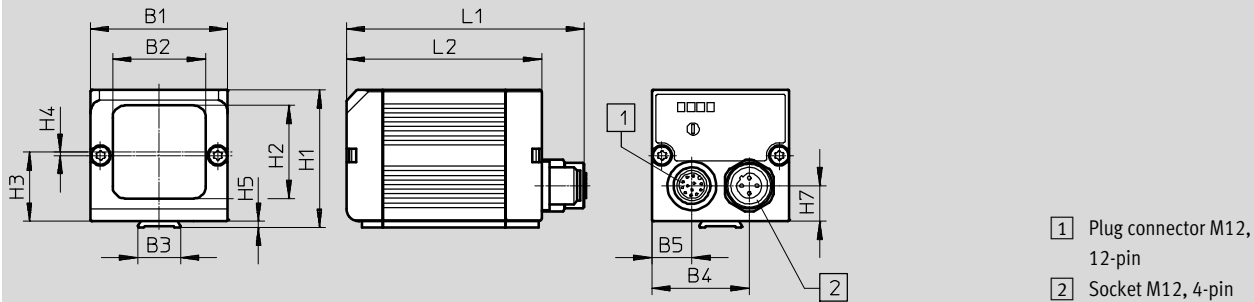
SBS, vision sensor

Technical data – Object sensor SBSI-Q

FESTO

Dimensions

Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H7	L1	L2
SBSI-Q-R3B-F- ...	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	11.6	76.7	64

Ordering data

	Focal length [mm]	Type of light: LED	Part No.	Type
	6	White	2942261	SBSI-Q-R3B-F6-W
	12	White	2942262	SBSI-Q-R3B-F12-W
	6	Infrared	2942265	SBSI-Q-R3B-F6-NR
	12	Infrared	2942266	SBSI-Q-R3B-F12-NR

SBS, vision sensor

Technical data – Object sensor SBSI-Q-AF

FESTO

-  Voltage
19.2 ... 30 V DC
-  Temperature range
0 ... +50 °C



General technical data		
Type	SBSI-Q-AF-R3B-...	SBSI-Q-AF-R2B-...
Sensor resolution	736 x 480 pixels (wide VGA)	1280 x 1024 pixels (SXGA)
Sensor type	Monochrome	
Focus setting	With adjusting screw	
Lens mounting	Integrated lens	
Lighting type	Integrated	
Frame rate (full image) [fps]	50	40
Max. number of test programs/jobs	255	
Focal length [mm]	6	12
Field of vision [mm]	Min. 5 x 4	Min. 8 x 6
Working distance [mm]	6 - infinite	30 - infinite
Max. number of test criteria/detectors	255	
Function of detectors/characteristics	Grey scale threshold	
	Brightness	
	Contrast	
	Contour matching	
	Position tracking via contour	
	Pattern matching	
	Edge detection	
	Vernier calliper	
BLOB		
Typical cycle time		
Grey scale threshold [ms]	4	
Brightness [ms]	2	
Contrast [ms]	4	
Contour matching [ms]	30	
Position tracking [ms]	30	
Pattern matching [ms]	20	
Vernier calliper [ms]	8	
BLOB [ms]	30	
Dimensions W x L x H [mm]	45 x 45 x 76.7	
Product weight [g]	160	
Information on materials: housing	Anodised wrought aluminium alloy	
Information on materials: cover	ABS reinforced	
Note on materials	RoHS compliant	

SBS, vision sensor

Technical data – Object sensor SBSI-Q-AF



Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, transmission speed	100 Mbps
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface	
Serial interface, connection technology	Plug connector, M12, 5-pin
Type of serial interface	RS232/RS422

Digital inputs/outputs and power supply	
Electrical connection	Plug connector, M12, 12-pin
Number of digital inputs	2
Number of digital outputs	2
Number of selectable digital inputs/outputs	4
Switching input	PNP/NPN, switchable
Switching level [V]	Signal 0: ≤ 3 Signal 1: $\geq U_B - 1$
Switching output	PNP/NPN, switchable
Max. output current [mA]	50
Short circuit protection	For all electrical connections
Nominal operating voltage [V DC]	24
Permissible voltage fluctuations [%]	-25 ... +10
Max. current consumption [mA]	550
Current consumption with load-free outputs [mA]	200

Operating and environmental conditions	
Ambient temperature [°C]	0 ... +50
Storage temperature [°C]	-20 ... +60
Degree of protection	IP67
Note on degree of protection	With protective tubing
Vibration resistance	To EN 60068-2-6
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾
Certification	c UL us listed (OL) RCM compliance mark

- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
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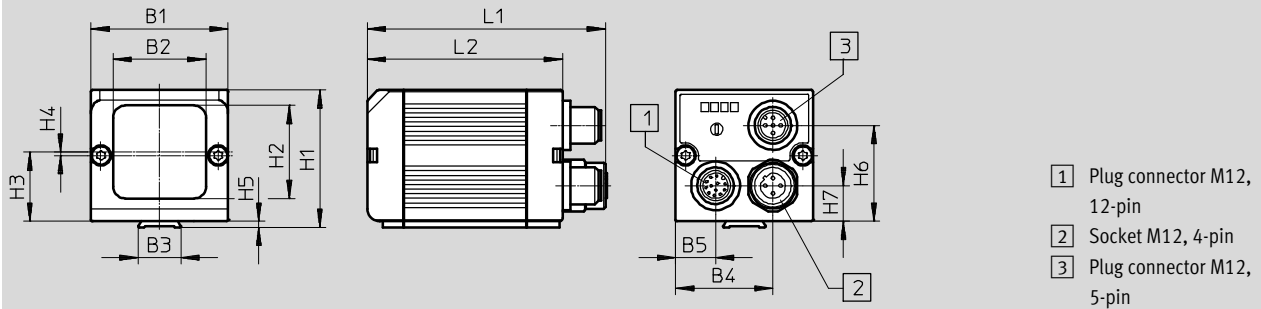
SBS, vision sensor

Technical data – Object sensor SBSI-Q-AF

FESTO

Dimensions

Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H7	L1	L2
SBSI-Q-AF-R3B-...	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	11.6	76.7	64

Ordering data

	Focal length [mm]	Field of view	Working distance	Type of light: LED	Part No.	Type
	6	Min. 5 x 4 mm	6 mm - infinite	White	8058724	SBSI-Q-AF-R3B-F6-W
	12	Min. 8 x 6 mm	30 mm - infinite	White	8058725	SBSI-Q-AF-R3B-F12-W
	6	Min. 5 x 4 mm	6 mm - infinite	Infrared	8058726	SBSI-Q-AF-R3B-F6-NR
	12	Min. 8 x 6 mm	30 mm - infinite	Infrared	8058727	SBSI-Q-AF-R3B-F12-NR
	12	Min. 16 x 13 mm	–	White	8058730	SBSI-Q-AF-R2B-F12-W

SBS, vision sensor

Technical data – Colour sensor SBSI-F/SBSC-F

FESTO

-  Voltage
19.2 ... 30 V DC
-  Temperature range
0 ... +50 °C



General technical data				
Type		SBSI-F-F3C	SBSI-F-AF-R3C-...	SBSC-F-AF-R3C
Sensor resolution		736 x 480 pixels (Wide VGA)		
Sensor type		Colour		
Focus setting		With adjusting screw		–
Lens mounting		Integrated lens		CS mount
Lighting type		Integrated		–
Focal length	[mm]	➔ Page 27		
Field of view	[mm]			
Working distance	[mm]			
Frame rate (full image)	[fps]	40		
Max. number of test programs/jobs		8	255	
Max. number of test criteria/detectors		2	255	
Function of detectors/characteristics		–	Grey scale threshold	
		–	Brightness	
		Contrast		
		–	Contour matching	
		Position tracking via contour		
		–	Pattern matching	
		–	Edge detection	
		–	Vernier calliper	
		–	BLOB	
		–	Colour value	
		Colour surface		
		–	Colour list	
Typical cycle time				
Grey scale threshold	[ms]	2		
Brightness	[ms]	2		
Contrast	[ms]	2		
Contour matching	[ms]	60		
Position tracking	[ms]	30		
Pattern matching	[ms]	30		
Vernier calliper	[ms]	12		
BLOB	[ms]	50		
Colour surface	[ms]	30		
Colour value	[ms]	2		
Colour list	[ms]	2		
Dimensions W x L x H	[mm]	45 x 45 x 76.7		
Product weight	[g]	160		
Information on materials: housing		Anodised wrought aluminium alloy		
Information on materials: cover		ABS reinforced		
Note on materials		RoHS compliant		

SBS, vision sensor

Technical data – Colour sensor SBSI-F/SBSC-F

Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, transmission speed	100 Mbps
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface	SBSI-F-R3C	SBSI-F-AF-R3C-...	SBSC-F-AF-R3C
Serial interface, connection technology	–	Plug connector, M12, 5-pin	
Type of serial interface	RS232/RS422		

Digital inputs/outputs and power supply	SBSI-F-F3C	SBSI-F-AF-R3C-...	SBSC-F-AF-R3C
Electric connection	Plug connector, M12, 5-pin		
Number of digital inputs	2		
Number of digital outputs	2		
Number of selectable digital inputs/outputs	2	4	4
Switching input	PNP/NPN, switchable		
Switching level [V]	Signal 0: ≤ 3 Signal 1: $\geq U_B - 1$		
Switching output	PNP/NPN, switchable		
Max. output current [mA]	50		
Short circuit protection	For all electrical connections		
Nominal operating voltage [V DC]	24		
Permissible voltage fluctuations [%]	–25 ... +10		
Max. current consumption [mA]	550		
Current consumption with load-free outputs [mA]	200		

Operating and environmental conditions	SBSI-F-F3C	SBSI-F-AF-R3C-...	SBSC-F-AF-R3C
Ambient temperature [°C]	0 ... +50		
Storage temperature [°C]	–20 ... +60		
Degree of protection	IP67		IP65
Note on degree of protection	–		With protective tubing
Vibration resistance	To EN 60068-2-6		
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾		
Certification	c UL us listed (OL) RCM compliance mark		

2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

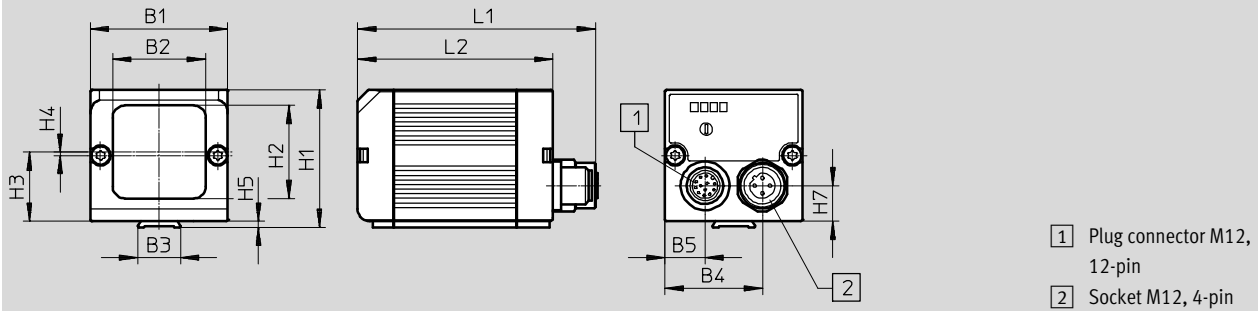
SBS, vision sensor

Technical data – Colour sensor SBSI-F/SBSC-F

FESTO

Dimensions

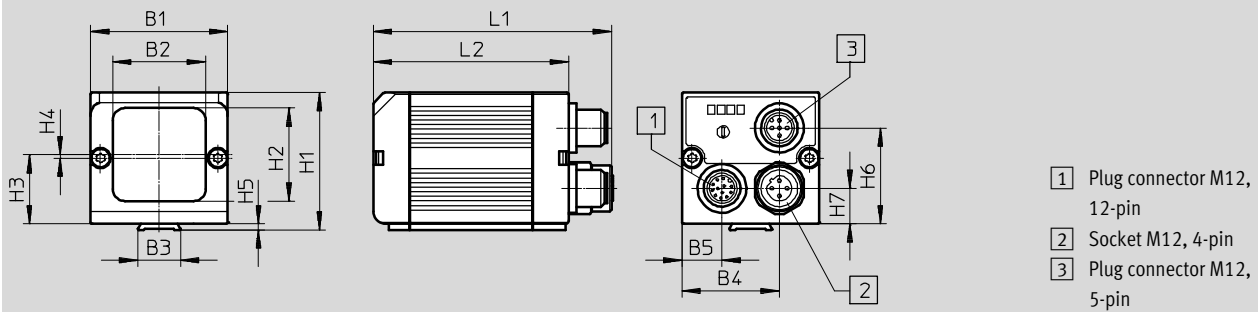
Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H7	L1	L2
SBSI-F-R3C-F6-W	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	11.6	76.7	64
SBSI-F-R3C-F12-W													

Dimensions

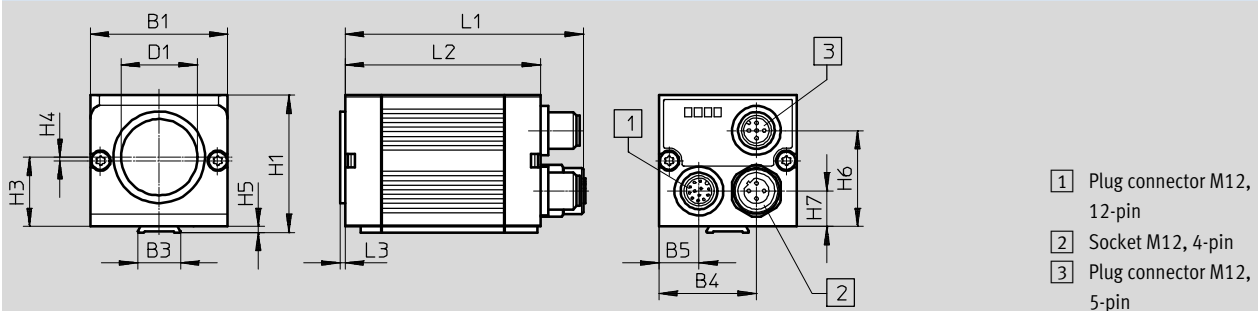
Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H7	L1	L2
SBSI-F-AF-R3C-F6-W	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	11.6	76.7	64
SBSI-F-AF-R3C-F12-W													

Dimensions

Download CAD data → www.festo.com

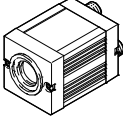


Type	B1	B3	B4	B5	D1 Ø	H1	H3	H4	H5	H6	H7	L1	L2	L3
SBSC-F-AF-R3C	45	14	31.9	13.1	25	45	22.7	1.2	2	31.4	11.6	76.7	64	1.7

SBS, vision sensor

Technical data – Colour sensor SBSI-F/SBSC-F

FESTO

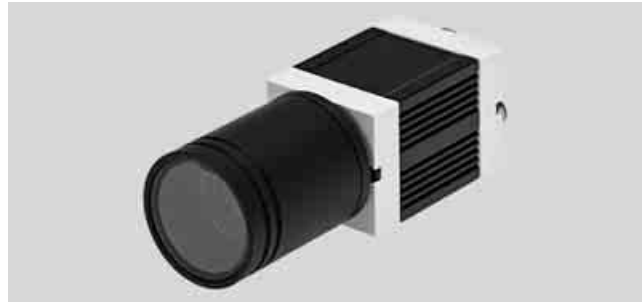
Ordering data						
	Focal length [mm]	Field of view	Working distance	Type of light	Part No.	Type
	6 mm	Min. 5 x 4 mm	6 mm - infinite	LED, white	8058731	SBSI-F-R3C-F6-W
	12 mm	Min. 8 x 6 mm	30 mm - infinite	LED, white	8058732	SBSI-F-R3C-F12-W
	6 mm	Min. 5 x 4 mm	6 mm - infinite	LED, white	8058733	SBSI-F-AF-R3C-F6-W
	12 mm	Min. 8 x 6 mm	30 mm - infinite	LED, white	8058734	SBSI-F-AF-R3C-F12-W
	–	Depends on the lens chosen	–	–	8058735	SBSC-F-AF-R3C

SBS, vision sensor

Technical data – Universal sensor SBSC

FESTO

-  - Voltage
19.2 ... 30 V DC
-  - Temperature range
0 ... +50 °C



General technical data		
Type	SBSC-U-AF-R2B	SBSC-U-AF-R3B
Sensor resolution	1280 x 1024 pixels (SXGA)	736 x 480 pixels (wide VGA)
Sensor type	Monochrome	
Lens mounting	CS mount	
Frame rate (full image) [fps]	50	
Max. number of test programs/jobs	255	
Max. number of test criteria/detectors	255	
Function of detectors/characteristics	2/5 Industrial	
	2/5 Interleaved	
	Codabar	
	Code 128	
	Code 39	
	Code 93	
	Code 32	
	EAN	
	ECC200	
	GS1	
	PDF 417	
	Pharmacode	
	QR code	
	RSS	
	UPC	
	OCR	
	Grey scale threshold	
	Brightness	
	Contrast	
	Contour matching	
	Position tracking via contour	
	Pattern matching	
	Edge detection	
	Vernier calliper	
	BLOB	

SBS, vision sensor

Technical data – Universal sensor SBSC

FESTO

General technical data		
Type	SBSC-U-AF-R2B	SBSC-U-AF-R3B
Typical cycle time		
Grey scale threshold	1D barcode: 30 ms	
	2D code: 40 ms	
	OCR per character: 15 ms	
	Position tracking: 30 ms	
	Pattern matching: 20 ms	
	Contour matching: 30 ms	
	Contrast: 4 ms	
	Brightness: 2 ms	
	Grey value threshold: 4 ms	
	Vernier calliper: 8 ms	
	BLOB: 30 ms	
Dimensions W x L x H	[mm]	45 mm x 45 mm x 76.7
Product weight	[g]	160
Information on materials: housing	Anodised wrought aluminium alloy	
Information on materials: cover	ABS reinforced	
Note on materials	RoHS compliant	

SBS, vision sensor

Technical data – Universal sensor SBSC

FESTO

Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, transmission speed	100 Mbps
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface	
Serial interface, connection technology	Plug connector, M12, 12-pin
Type of serial interface	RS232/RS422

Digital inputs/outputs and power supply	
Electrical connection	Plug connector, M12, 12-pin
Number of digital inputs	2
Number of digital outputs	2
Number of selectable digital inputs/outputs	4
Switching input	PNP/NPN, switchable
Switching level [V]	Signal 0: ≤ 3 Signal 1: $\geq U_B - 1$
Switching output	PNP/NPN, switchable
Max. output current [mA]	50
Short circuit protection	For all electrical connections
Nominal operating voltage [V DC]	24
Permissible voltage fluctuations [%]	-25 ... +10
Max. current consumption [mA]	550
Current consumption with load-free outputs [mA]	200

Operating and environmental conditions	
Ambient temperature [°C]	0 ... +50
Storage temperature [°C]	-20 ... +60
Degree of protection	IP65
Note on degree of protection	With protective tubing
Vibration resistance	To EN 60068-2-6
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾
Certification	c UL us listed (OL) RCM compliance mark

- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Technical data – Universal sensor SBSC

- | Type | B1 | B3 | B4 | B5 | D1
σ | H1 | H3 | H4 | H5 | H6 | H7 | L1 | L2 | L3 |
|---------------|----|----|------|------|---------|----|------|-----|----|------|------|------|----|-----|
| SBSC-U-AF-R2B | 45 | 14 | 31.9 | 13.1 | 25 | 45 | 22.7 | 1.2 | 2 | 31.4 | 11.6 | 76.7 | 64 | 1.7 |
| SBSC-U-AF-R3B | | | | | | | | | | | | | | |

	Field of view and working distance	Part No.	Type
	Depends on the lens chosen	8058736	SBSC-U-AF-R2B
		8058737	SBSC-U-AF-R3B

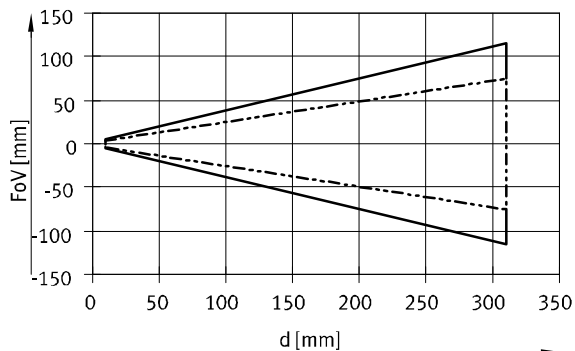
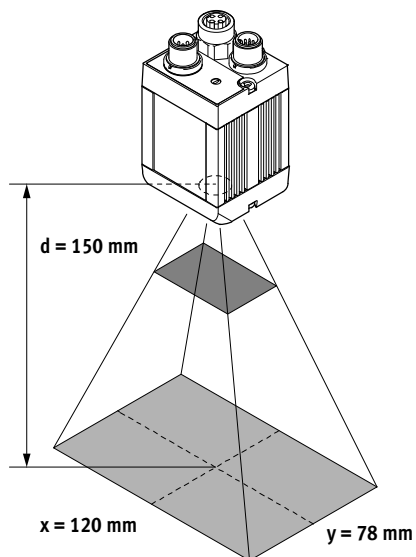
SBS, vision sensor

Technical data

FESTO

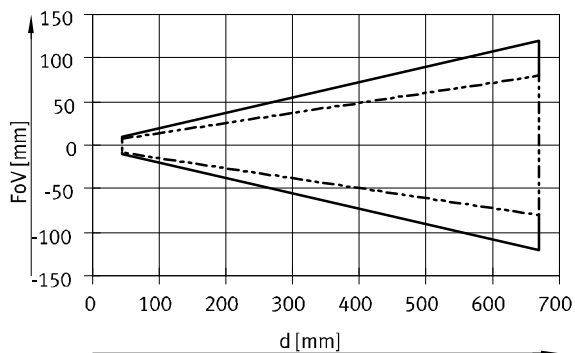
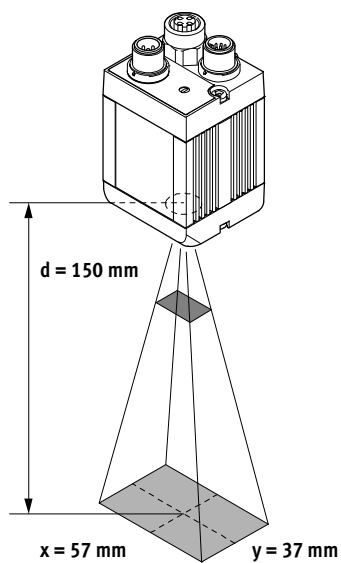
Integrated lenses – Fields of view with sensor size 1/3" (resolution R3B/R3C)

Field of view (6 mm focal length)



— X direction
 - - - Y direction
 d = working distance
 FoV = field of view

Field of view (12 mm focal length)



— X direction
 - - - Y direction
 d = working distance
 FoV = field of view

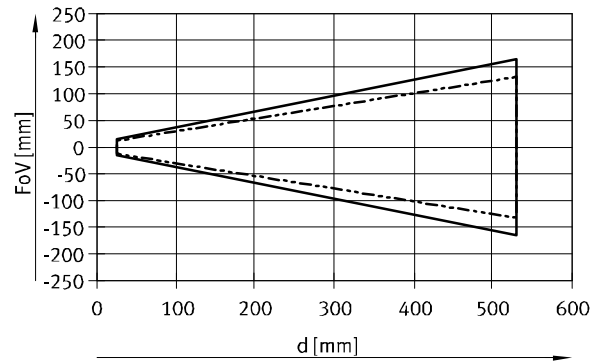
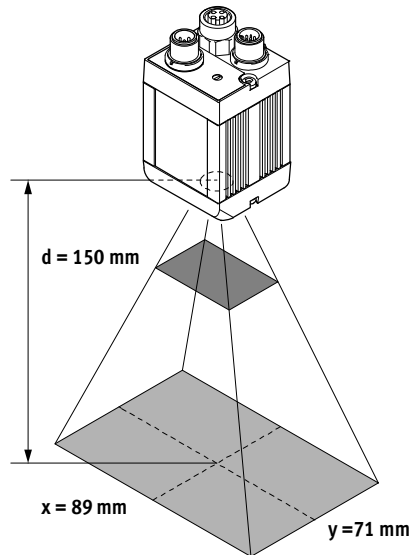
SBS, vision sensor

Technical data

FESTO

Integrated lenses – Fields of view with sensor size 1/1.8" (resolution R2B)

SBSx (field of view 12 mm)



— X direction
 - - - Y direction
 d = working distance
 FoV = field of view

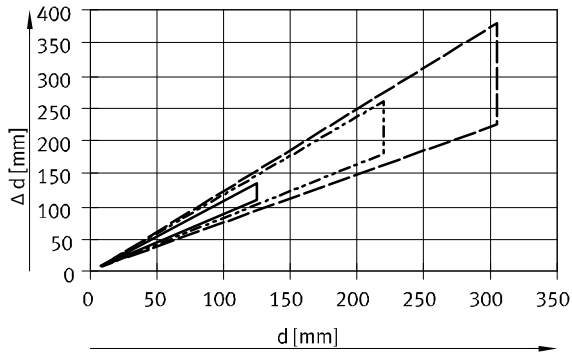
SBS, vision sensor

Technical data

FESTO

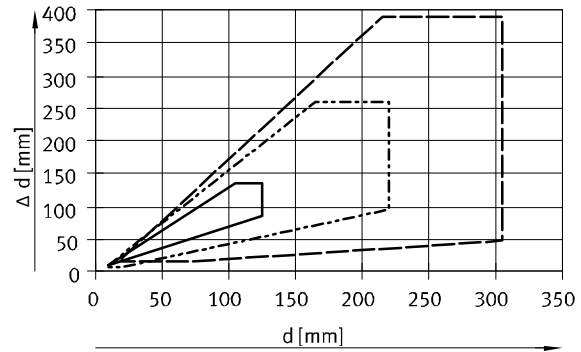
Approximate reading areas with respect to module size/bar width of codes

Normal depth of field (6 mm), sensor size R3



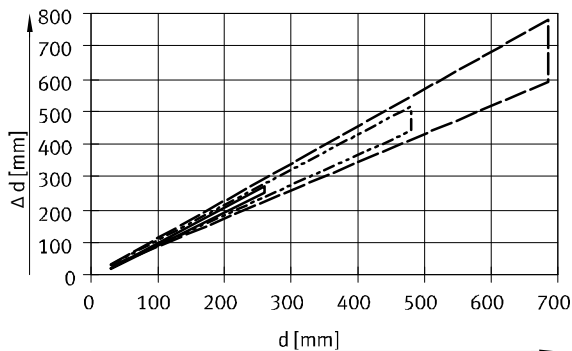
Module size/bar width of code: d = working distance
 Δd = depth of field
 — 0.25 mm
 - - - 0.50 mm
 - · - 0.75 mm

Increased depth of field (6 mm), sensor size R3



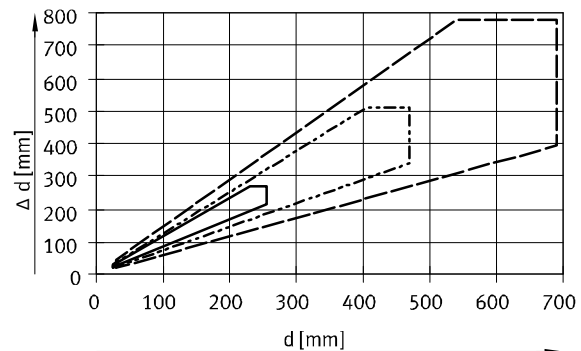
Module size/bar width of code: d = working distance
 Δd = depth of field
 — 0.25 mm
 - - - 0.50 mm
 - · - 0.75 mm

Normal depth of field (12 mm), sensor size R3



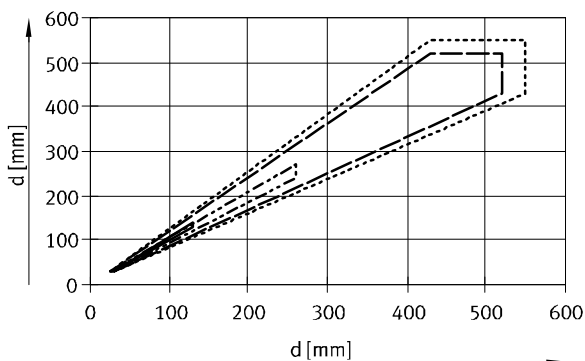
Module size/bar width of code: d = working distance
 Δd = depth of field
 — 0.25 mm
 - - - 0.50 mm
 - · - 0.75 mm

Increased depth of field (12 mm), sensor size R3



Module size/bar width of code: d = working distance
 Δd = depth of field
 — 0.25 mm
 - - - 0.50 mm
 - · - 0.75 mm

Normal depth of field (12 mm), sensor size R2



— 0.13
 - - - 0.25
 - · - 0.50
 - · · - 0.75

SBS, vision sensor

Accessories

FESTO

-  - Voltage
19.2 ... 30 V DC
-  - Temperature range
0 ... +50 °C



General technical data			
Area light	SBAL-C6-A-W	SBAL-C6-A-R	SBAL-C6-A-NR
Lighting type	Area light		
Type of light	LED, clear		
	White	Red	Infrared
Type of mounting	Clamped in dovetail slot		
	Via accessories		
Working distance [mm]	100 ... 300		
Electrical connection	2 x M12, plug connector 12-pin		
Maximum number of devices connectable in series (diagram)	4		
Reverse polarity protection	For all electrical connections		
Product weight [g]	60		
Information on materials: housing	ABS reinforced		
Note on materials	RoHS compliant		
RoHS status	RoHS compliant in accordance with EU Directive		

Electrical data			
	SBAL-C6-A-W	SBAL-C6-A-R	SBAL-C6-A-NR
Nominal operating voltage [V DC]	24		
Permissible voltage fluctuations [%]	±10		
Trigger level	Level 10 V ... UB		
Residual ripple [%]	10		
Current consumption during continuous operation [mA]	80	80	90
Current consumption during flash operation [mA]	200	250	100

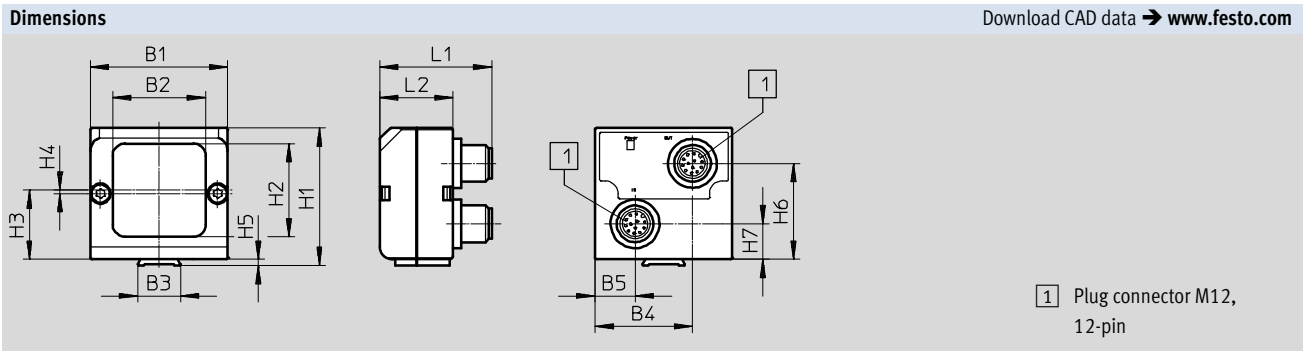
Operating and environmental conditions			
	SBAL-C6-A-W	SBAL-C6-A-R	SBAL-C6-A-NR
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾		
Ambient temperature during continuous operation [°C]	0 ... +50		
Ambient temperature during flash operation [°C]	0 ... +50		
Storage temperature [°C]	-20 ... +60		
Degree of protection	IP67		
Certification	RCM compliance mark		

2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

SBS, vision sensor

Accessories

FESTO



Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H6	H7	L1	L2
SBAL-C6-A-W	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	31.4	11.6	36.7	24
SBAL-C6-A-R														
SBAL-C6-A-NR														

Ordering data		Part No.	Type
	Type of light: LED, clear		
	White	8031158	SBAL-C6-A-W
	Red	8031159	SBAL-C6-A-R
	Infrared	8031160	SBAL-C6-A-NR

SBS, vision sensor

Accessories

FESTO

-  - Voltage
19.2 ... 30 V DC
-  - Temperature range
0 ... +50 °C



General technical data			
Ring light	SBAL-C6-R-W-D	SBAL-C6-R-R-D	SBAL-C6-R-NR-D
Lighting type	Ring light		
Type of light	LED, diffuse		
	White	Red	Infrared
Type of mounting	Via mounting bracket		
Working distance [mm]	100 ... 300		
Electrical connection	2 x M12, plug connector 12-pin		
Maximum number of devices connectable in series (diagram)	2		
Reverse polarity protection	For all electrical connections		
Product weight [g]	150		
Information on materials: housing	Anodised aluminium		
Note on materials	RoHS compliant		
RoHS status	RoHS compliant in accordance with EU Directive		

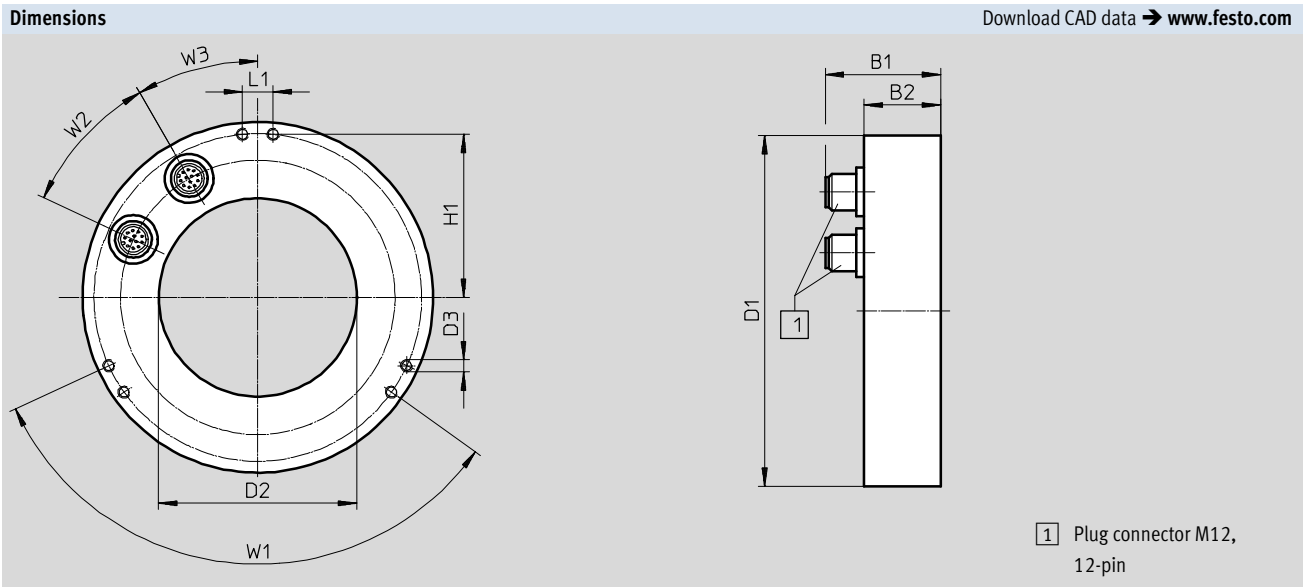
Electrical data			
	SBAL-C6-R-W-D	SBAL-C6-R-R-D	SBAL-C6-R-NR-D
Nominal operating voltage [V DC]	24		
Permissible voltage fluctuations [%]	±5		
Trigger level	Level 18 V ... UB		
Residual ripple [%]	5		
Current consumption during continuous operation [mA]	390	290	390
Current consumption during flash operation [mA]	390	290	390

Operating and environmental conditions			
	SBAL-C6-R-W-D	SBAL-C6-R-R-D	SBAL-C6-R-NR-D
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾		
Ambient temperature during continuous operation [°C]	0 ... +35		
Ambient temperature during flash operation [°C]	0 ... +50		
Storage temperature [°C]	-20 ... +60		
Degree of protection	IP67		
Certification	RCM compliance mark		

2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

SBS, vision sensor

Accessories



Type	B1	B2	D1 - Ø -	D2 - Ø -	D3	H1	L1	W1	W2	W3
SBAL-C6-R-...	37.7	25	115	65	M4	53.5	10	120°	35°	30°

Ordering data			
	Type of light: LED, diffuse	Part No.	Type
	White	8031161	SBAL-C6-R-W-D
	Red	8031162	SBAL-C6-R-R-D
	Infrared	8031163	SBAL-C6-R-NR-D

SBS, vision sensor

Accessories

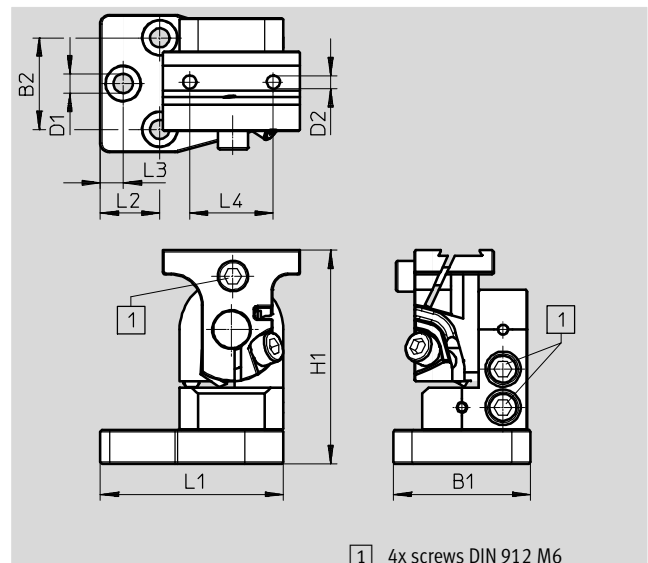
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Swivel mounting

Type of mounting: With dovetail slot,
with through-hole

Information on materials: Anodised
wrought aluminium alloy

Note on materials: RoHS compliant



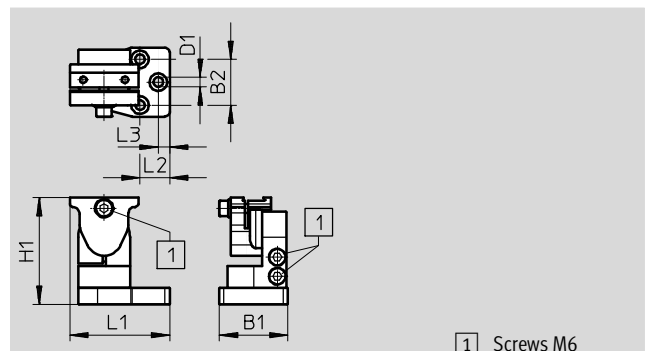
Dimensions [mm] and ordering data											
B1	B2	D1 Ø	D2 Ø	H1	L1	L2	L3	L4	Weight [g]	Part No.	Type
45	30	6.3	4.3	70	65.5	19.5	7.5	27.4	209	8058739	SBAM-C6-A2-AF
									28	8058740	SBAM-C6-CP-AF
									178	8058741	SBAM-C6-MR-200
									265	8058742	SBAM-C6-MR-300

Swivel mounting

Type of mounting: With through-hole

Information on materials: Anodised
aluminium

Note on materials: RoHS compliant



Dimensions [mm] and ordering data										
B1	B2	D1 Ø	H1	L1	L2	L3	Weight [g]	CRC ¹⁾	Part No.	Type
45	30	6.3	70	65.5	19.5	7.5	215	2	8031378	SBAM-C6-A2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

SBS, vision sensor

Accessories

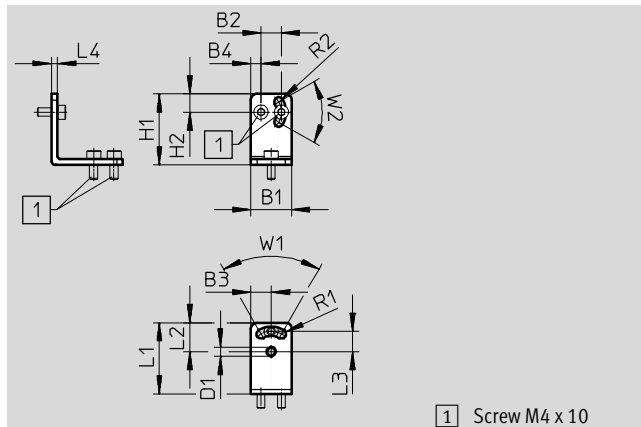
FESTO

Mounting bracket

Type of mounting: With through-hole

Information on materials: High-alloy steel

Note on materials: RoHS compliant



Dimensions [mm] and ordering data									
B1	B2	B3	B4	D1 Ø	H1	H2	L1	L2	L3
20	10	10	5	4.5	35	9	35	14.3	10

L4	R1	R2	W1	W2	Weight [g]	CRC ¹⁾	Part No.	Type
3	2.3	2.3	60°	60°	27	2	8031377	SBAM-C6-A

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

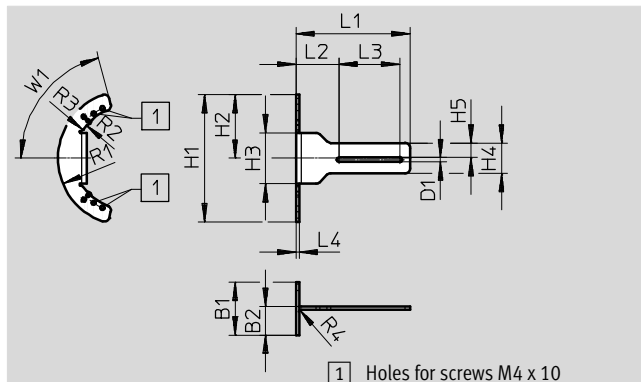
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Mounting bracket

Type of mounting: With through-hole

Information on materials: High-alloy steel

Note on materials: RoHS compliant



Dimensions [mm] and ordering data										
B1	B2	D1 Ø	H1	H2	H3	H4	H5	L1	L2	L3
52	28.2	4.2	124.9	62.4	50	30	14.4	112	42.1	60

L4	R1	R2	R3	R4	W1	Weight [g]	CRC ¹⁾	Part No.	Type
3	66	50	2	2	75°	147	2	8031379	SBAM-C7-A

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

SBS, vision sensor

Accessories

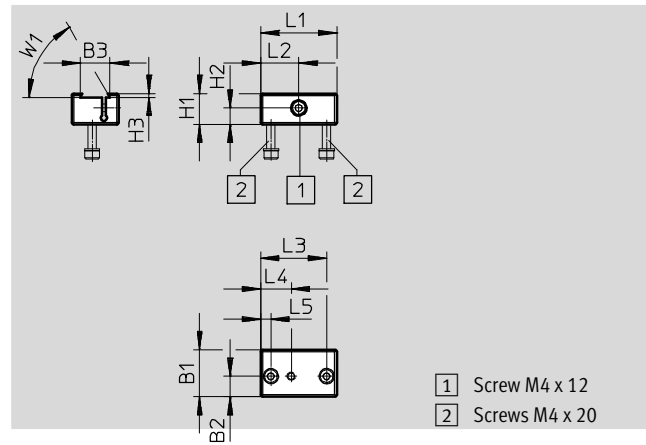
FESTO

Mounting

Type of mounting: With dovetail slot, with thread

Information on materials: Anodised aluminium

Note on materials: RoHS compliant



Dimensions [mm] and ordering data

B1	B2	B3	H1	H2	H3	L1	L2	L3	L4	L5	W1	Weight [g]	CRC ¹⁾	Part No.	Type
23	10	14.5	15	8	1.8	37.4	18.7	32.4	15	5	60°	28	2	8031376	SBAM-C6-CP

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

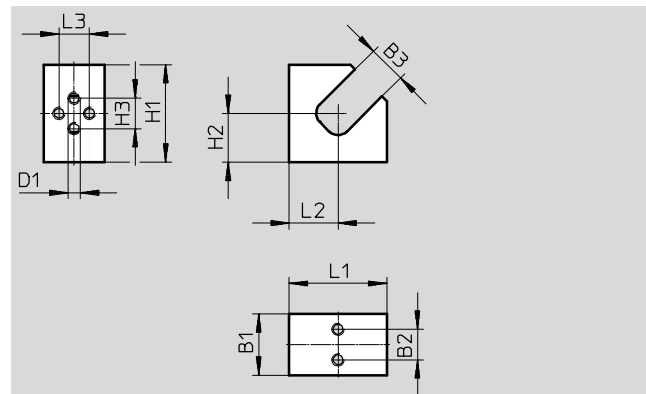
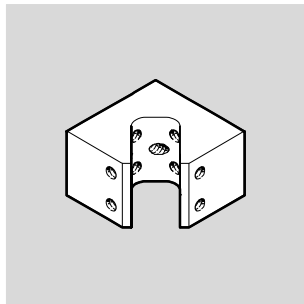
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Mounting

Type of mounting: With thread, clamped

Information on materials: Anodised wrought aluminium alloy

Note on materials: RoHS compliant



Dimensions [mm] and ordering data

B1	B2	B3	D1	H1	H2	H3	L1	L2	L3	Weight [g]	Part No.	Type
20	10	12.5	M4	32	16	10	32	16	10	28	8058740	SBAM-C6-CP-AF

SBS, vision sensor

Accessories

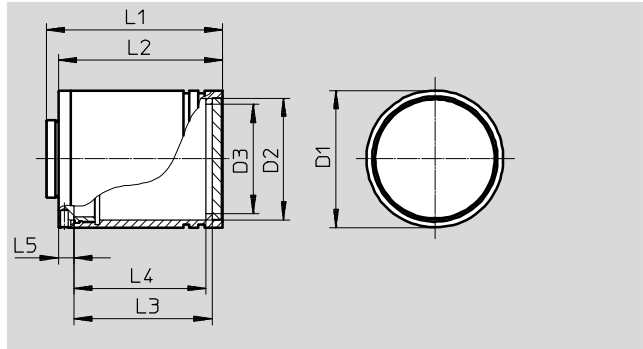
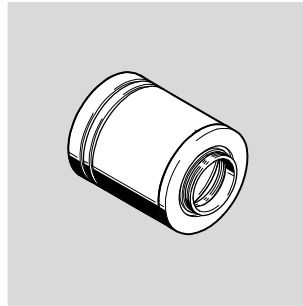
FESTO

Protective tube

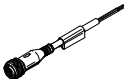
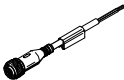
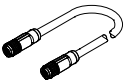
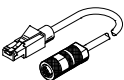
Type of mounting: With thread

Information on materials: Anodised wrought aluminium alloy

Note on materials: RoHS compliant



Dimensions [mm] and ordering data										
D1 Ø	D2 Ø	D3 Ø	L1	L2	L3	L4	L5	Weight [g]	Part No.	Type
45	40	36	58	54	45.5	43.5	5	69	8058738	SBAP-C9-S

Ordering data			
	Description	Part No.	Type
Connecting cable		Technical data ➔ Internet: nebs	
	Cable for power supply and digital I/Os (M12, 12-pin on open end); length 5 m or 10 m	3058614	NEBS-M12G12-KS-5-LE12
		2912452	NEBS-M12G12-KS-10-LE12
	Serial data cable (M12, 5-pin on open end); length 5 m or 10 m	8030962	NEBS-M12G5-KS-5-LE5
		8030963	NEBS-M12G5-KS-10-LE5
	Cable for connecting the external lights SBAL (M12, 12-pin on M12, 12-pin); length 0.5 m or 2 m	3056124	NEBS-M12G12-KS-0.5-SM12G12
		3058527	NEBS-M12G12-KS-2-SM12G12
Connecting cable		Technical data ➔ Internet: nebc	
	Ethernet cable (M12, 4-pin on RJ45); length 1 m, 3 m, 5 m or 10 m	8040451	NEBC-D12G4-ES-1-S-R3G4-ET
		8040452	NEBC-D12G4-ES-3-S-R3G4-ET
		8040453	NEBC-D12G4-ES-5-S-R3G4-ET
		8040454	NEBC-D12G4-ES-10-S-R3G4-ET

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