Vision sensors SBS

FESTO

Key features

Vision sensors SBS

The vision sensors SBS are an easy introduction to image processing 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. The vision sensors SBSC are also available as a C-mount variant. If necessary, external lighting 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 lighting SBAL can be connected directly: plug and work

Code reader SBSx-B

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 verification 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, etc.
- Reading 2D matrix codes: DMC ECC200, QR code, PDF 417
- Reading directly marked codes

Object sensor SBSx-Q

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

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 lighting can be connected directly to the vision sensor and is easy to activate from the parameterisation software.
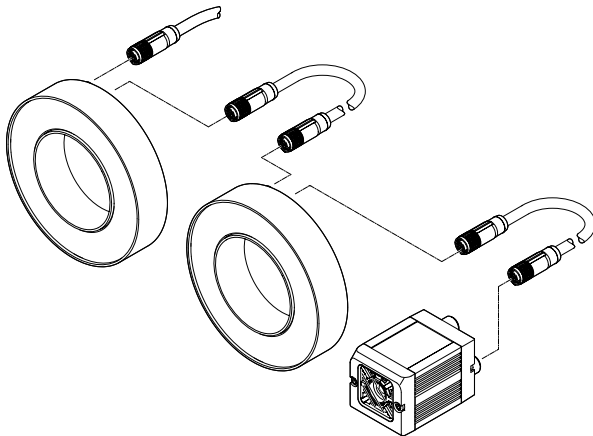
- OCR (optical character reader)
- BLOB
- Calliper
- Calibration

Key features

Connection of external surface lights SBAL-C6-A to the vision sensor SBS.
Up to 4 surface lights can be connected directly to the SBS.
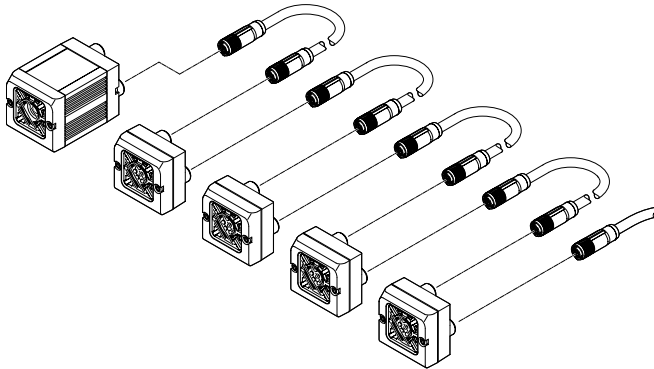
Connection of external ring lights SBAL-C6-R to the vision sensor SBS.
Up to 2 ring lights can be connected directly to the SBS.

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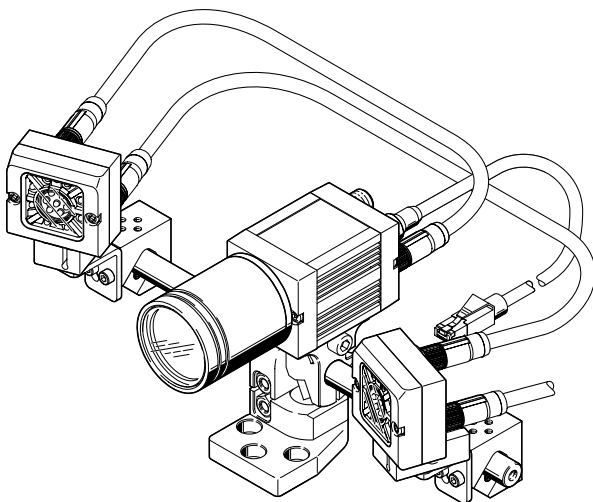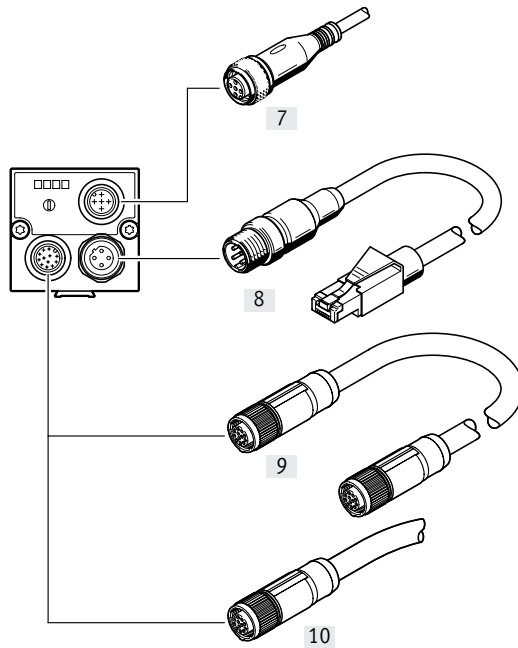
Peripherals overview

**Mechanical connection options**
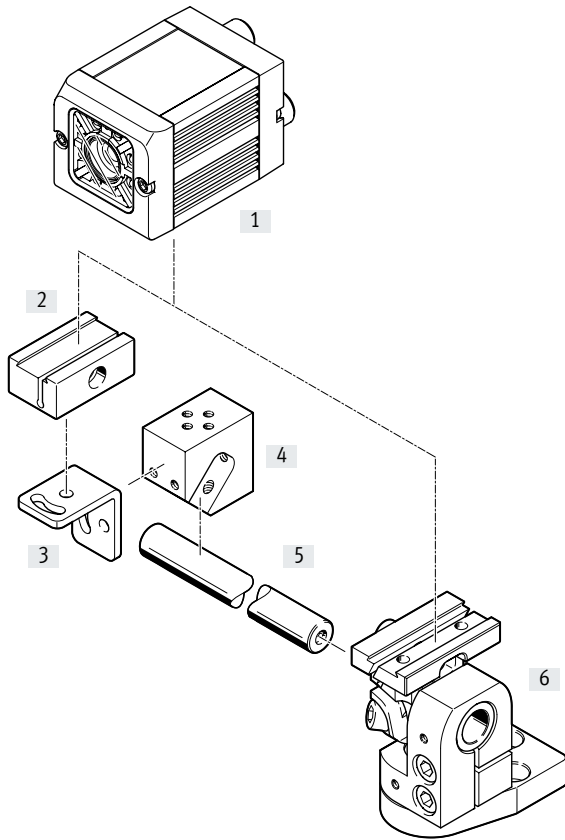
Electrical connection options

	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	39
[3]	Mounting bracket SBAM-C6-A	Mounting bracket 90°. Adjustment option with 2 levels	40
[4]	Mounting SBAM-C6-CP-AF	Mounting block for 12 mm mounting rod	41
[5]	Mounting SBAM-C6-…	Mounting rod for clamp mounting of sensors, cameras and lighting	41
[6]	Swivel mounting SBAM-C6-A2-AF	Clamp fitting with dovetail slot. Can be swivelled and rotated around 2 axes. With drill-hole and clamp for 12 mm mounting rod SBAM-C6-…	39
[7]	Connecting cable NEBS-M12G5-ES-…-LE5	Serial data cable (M12, 5-pin on open end); length 5 m or 10 m (interface for code reader only)	42
[8]	Connecting cable NEBC-D12G4-KS-…-R3G4	Ethernet cable (M12, 4-pin on RJ45); length 1 m, 3.5 m or 10 m	42
[9]	Connecting cable NEBS-M12G12-KS-…-SM12G12	Cable for connecting the external lighting SBAL (M12, 12-pin on M12, 12-pin); length 0.5 m or 2 m	42
[10]	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

Peripherals overview

Mechanical connection options with external lighting
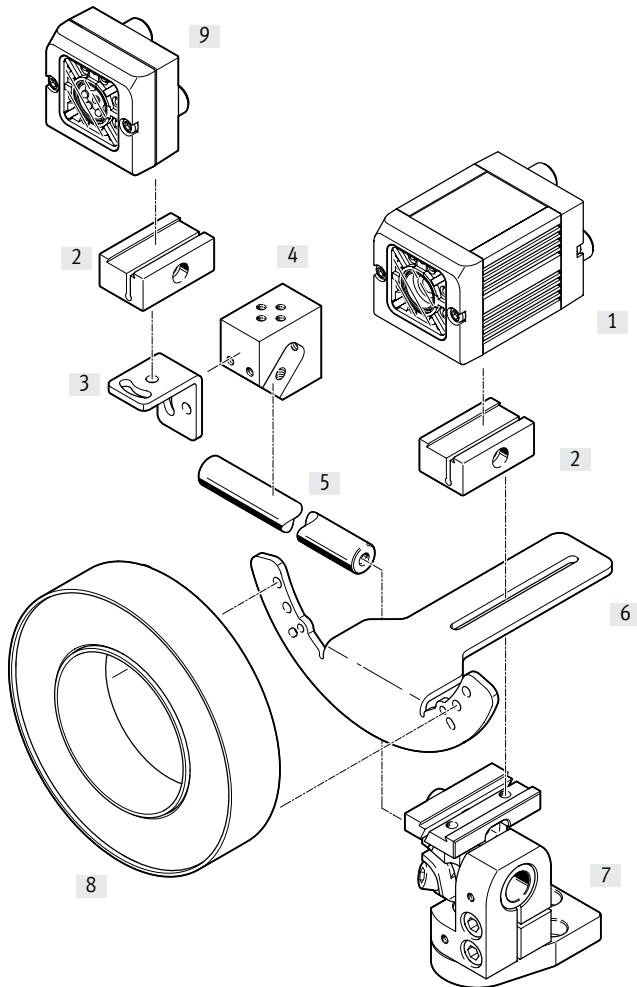
Mounting attachments and accessories

		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	39
[3]	Mounting bracket SBAM-C6-A	Mounting bracket 90°. Adjustment option with 2 levels	40
[4]	Mounting SBAM-C6-CP-AF	Mounting block for 12 mm mounting rod	41
[5]	Mounting SBAM-C6-...	Mounting rod for clamp mounting of sensors, cameras and lighting	41
[6]	Retaining bracket SBAM-C7-A	Mounting bracket 90° for ring light SBAL-C6-R-...-D	40
[7]	Swivel mounting SBAM-C6-A2-AF	Clamp fitting with dovetail slot. Can be swivelled and rotated around 2 axes. With drill-hole and clamp for 12 mm mounting rod SBAM-C6-...	39
[8]	Ring light SBAL-C6-R-...-D	Type of light: LED, diffuse. Colours white, red and infrared	37
[9]	Surface light SBAL-C6-A-...	Type of light: LED, clear. Colours white, red and infrared	35

Type codes SBSI

001	Series	
SBSI	Vision sensor	

002	Function	
B	Read code	
F	Colour detection	
Q	Quality test	

003	Function range	
	Standard	
AF	Expanded	

004	Resolution	
R2	1280x1024	
R3	752x480	

005	Image sensor	
B	Monochrome	
C	Colour	

006	Focal length	
F6	6 mm	
F12	12 mm	

007	Lighting colour	
R	Red	
W	White	
NR	Infrared (NIR)	

008	Additional characteristics	
	Standard	
D	Depth of field	

Type codes SBSC

001	Series	
SBSC	Vision sensor with CS mount	

002	Function	
B	Read code	
F	Colour detection	
Q	Quality test	
U	Universal	

003	Function range	
AF	Expanded	

004	Resolution	
R2	1280x1024	
R3	752x480	

005	Image sensor	
B	Monochrome	
C	Colour	

Data sheet – Code reader SBSI-B

- ⌐ - Voltage
  19.2 ... 30 V DC

- ⌐ - Temperature range
  0 ... +50°C
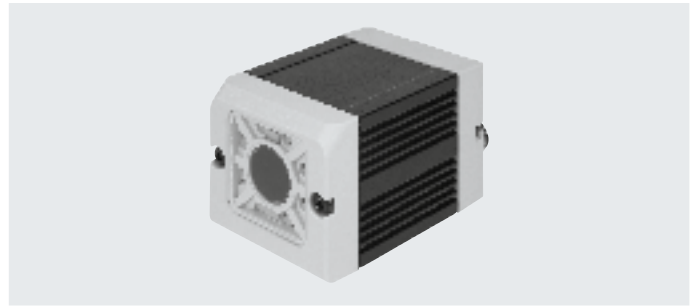
General technical data			
Type		SBSI-B-R3B-F6-...	SBSI-B-R3B-F12-...
Sensor resolution		736 x 480 pixels (wide VGA)	
Sensor type		Monochrome	
Focus setting		With adjusting screw	
Lens mounting		Integrated lens	
Lighting type		Integrated	
Frame rate (full image)	[fps]	50	
Max. number of test programs/jobs		8	
Focal length	[mm]	6	12
Field of view	[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	
		Interleaved 2/5	
		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		Reinforced ABS	
Note on materials		RoHS-compliant	

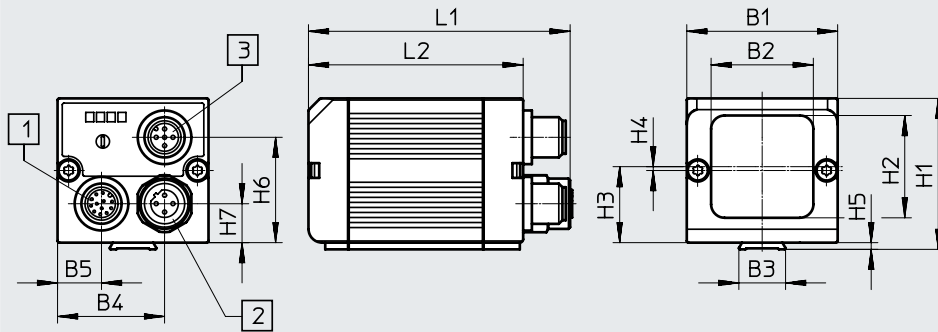# Data sheet – Code reader SBSI-B

Ethernet interface

Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, data transfer speed	100 Mbit/s
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface

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

Digital inputs, outputs and power supply

Electrical connection		Plug, 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: ≥ UB −1
Switching output		PNP/NPN, switchable
Max. output current	[mA]	50
Short circuit current rating		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[1]
Certification		c UL us listed (OL)
		RCM

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
   If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet – Code reader SBSI-B

Dimensions

[1] M12 plug, 12-pin
[2] M12 socket, 4-pin
[3] M12 plug, 5-pin

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	Wavelength [nm]	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	–	640	Red	**2930234**	**SBSI-B-R3B-F6-R**
	12	–	640	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	–	880	Infrared	**2930238**	**SBSI-B-R3B-F6-NR**
	12	–	880	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**

Data sheet – Code reader SBSI-B-AF

- ⌐ **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 test programs/jobs		255	
Focal length	[mm]	→ Page 13	12
Field of view	[mm]		Min. 16 x 3
Working distance	[mm]		30 - infinite
Max. number of test criteria/ detectors		255	
Function of detectors/characteristics		2/5 Industrial	
		Interleaved 2/5	
		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		Reinforced ABS	
Note on materials		RoHS-compliant	

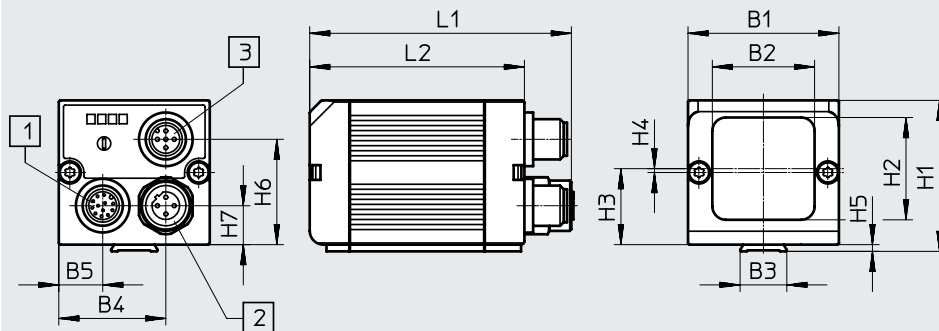## Data sheet – Code reader SBSI-B

Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, data transfer speed	100 Mbit/s
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

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

Digital inputs, outputs and power supply		
Electrical connection		Plug, 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: ≥ UB −1
Switching output		PNP/NPN, switchable
Max. output current	[mA]	50
Short circuit current rating		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[1]
Certification		c UL us listed (OL)
		RCM

[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➜ Certificates.
  If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet – Code reader SBSI-B

Dimensions

Download CAD data → www.festo.com

[1] M12 plug, 12-pin
[2] M12 socket, 4-pin
[3] M12 plug, 5-pin

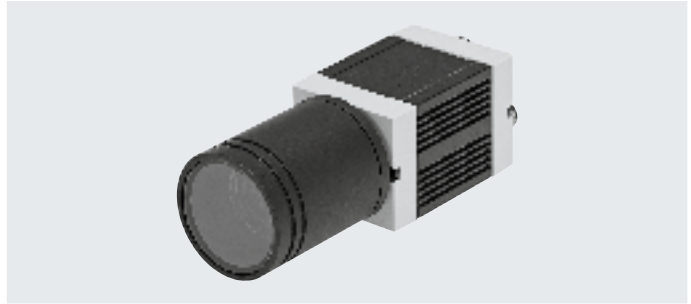| Type	B1	B2	B3	B4	B5	H1	H2	H3	H4	H5	H6	H7	L1	L2
SBSI-B- ...	45	30.5	14	31.9	13.1	45	30.5	22.7	1.2	2	31.4	11.6	76.7	64

Ordering data

Code reader	Integrated lens, focal length [mm]	Field of view	Working distance	Wavelength [nm]	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	640	Red	**8058717**	**SBSI-B-AF-R3B-F6-R**
	12	Min. 8 x 6 mm	30 mm - infinite	640	Red	**8058718**	**SBSI-B-AF-R3B-F12-R**
	6	Min. 5 x 4 mm	6 mm - infinite	880	Infrared	**8058719**	**SBSI-B-AF-R3B-F6-NR**
	12	Min. 8 x 6 mm	30 mm - infinite	880	Infrared	**8058720**	**SBSI-B-AF-R3B-F12-NR**
	12	Min. 16 x 13 mm	30 mm - infinite	640	Red	**8058723**	**SBSI-B-AF-R2B-F12-R**

Data sheet – Code reader SBSC-B

- ⌐ - 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	
		Interleaved 2/5	
		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		Reinforced ABS	
Note on materials		RoHS-compliant	

→ Internet: www.festo.com/catalogue/…

Data sheet – Code reader SBSC-B

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	
		BLOB	
Typical cycle time	[ms]	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	

Data sheet – Code reader SBSC-B

Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, data transfer speed	100 Mbit/s
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

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

Digital inputs, outputs and power supply		
Electrical connection		Plug, 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: $\geq UB -1$
Switching output		PNP/NPN, switchable
Max. output current	[mA]	50
Short circuit current rating		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 lens protection tube	
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[1]	
Certification		c UL us listed (OL)	
		RCM	

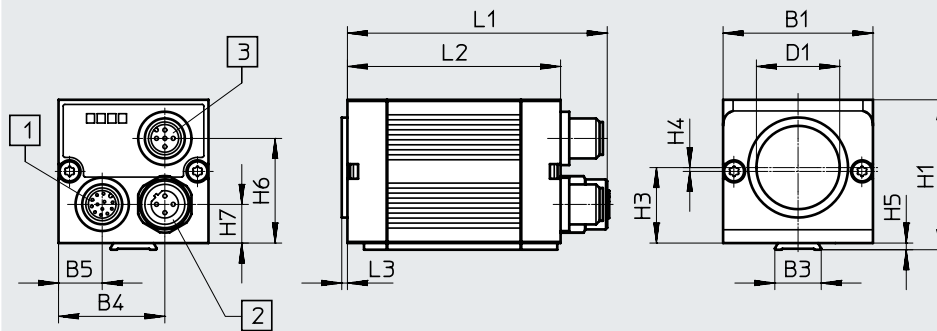[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➜ Certificates.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet – Code reader SBSC-B

Dimensions

[1]   M12 plug, 12-pin
[2]   M12 socket, 4-pin
[3]   M12 plug, 5-pin

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

Data sheet – Object sensor SBSI-Q

- ⌐ - Voltage
  19.2 … 30 V DC

- ¦ - Temperature range
  0 … +50°C
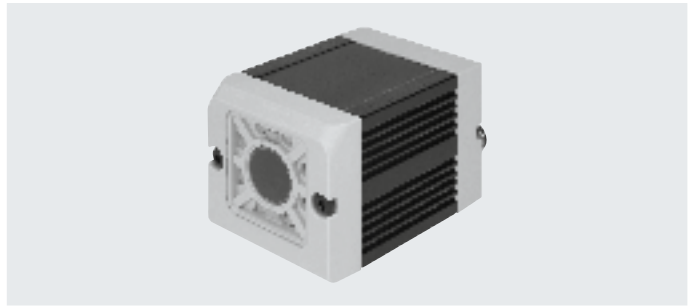
General technical data			
Type		SBSI-Q-R3B-F6-...	SBSI-Q-R3B-F12-...
Sensor resolution		736 x 480 pixels (wide VGA)	
Sensor type		Monochrome	
Focus setting		With adjusting screw	
Lens mounting		Integrated lens	
Lighting type		Integrated	
Frame rate (full image)	[fps]	50	
Max. number of test programs/jobs		8	
Focal length	[mm]	6	12
Field of view	[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		Reinforced ABS	
Note on materials		RoHS-compliant	

Data sheet – Object sensor SBSI-Q

Ethernet interface

Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, data transfer speed	100 Mbit/s
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Digital inputs/outputs and power supply

Electrical connection		Plug, 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: ≥ UB −1
Switching output		PNP/NPN, switchable
Max. output current	[mA]	50
Short circuit current rating		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[1]
Certification		c UL us listed (OL)
		RCM

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
   If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet – Object sensor SBSI-Q

Dimensions

Download CAD data → www.festo.com
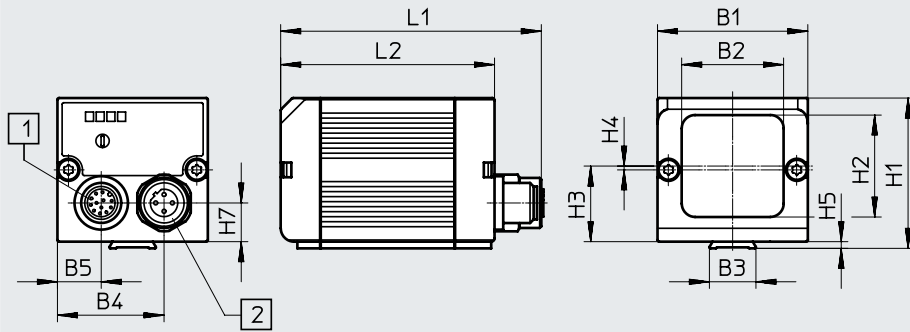
[1] M12 plug, 12-pin
[2] M12 socket, 4-pin

| 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]	Wavelength [nm]	Type of light: LED	Part no.	Type
	6	–	White	**2942261**	**SBSI-Q-R3B-F6-W**
	12	–	White	**2942262**	**SBSI-Q-R3B-F12-W**
	6	880	Infrared	**2942265**	**SBSI-Q-R3B-F6-NR**
	12	880	Infrared	**2942266**	**SBSI-Q-R3B-F12-NR**

Data sheet – Object sensor SBSI-Q-AF

⌐ Voltage
19.2 ... 30 V DC

⌐ Temperature range
0 ... +50°C
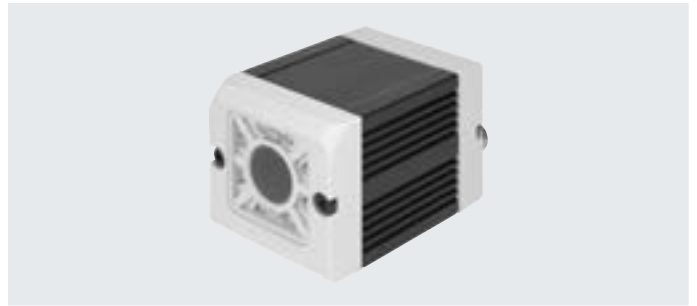
General technical data			
Type		SBSI-Q-AF-R3B-...	SBSI-Q-AF-R2B-...
Sensor resolution		736 x 480 pixels (wide VGA)	1280 x 1024 pixels (SXGA)
Sensor type		Monochrome	
Focus setting		With adjusting screw	
Lens mounting		Integrated lens	
Lighting type		Integrated	
Frame rate (full image)	[fps]	50	40
Max. number of test programs/jobs		255	
Focal length	[mm]	6	12
Field of view	[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		Reinforced ABS	
Note on materials		RoHS-compliant	

# Data sheet – Object sensor SBSI-Q-AF

Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet data transfer speed	100 Mbit/s
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

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

Digital inputs/outputs and power supply		
Electrical connection		Plug, 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: ≥ UB −1
Switching output		PNP/NPN, switchable
Max. output current	[mA]	50
Short circuit current rating		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 lens protection tube
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[1]
Certification		c UL us listed (OL)
		RCM

[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
    If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet – Object sensor SBSI-Q-AF

Dimensions

Download CAD data → www.festo.com
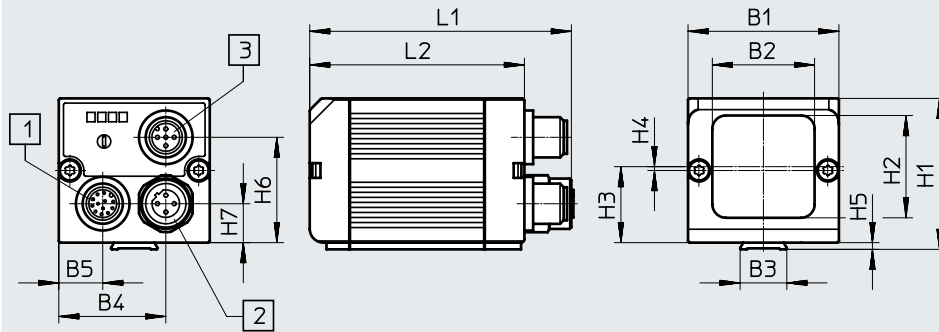
[1] M12 plug, 12-pin
[2] M12 socket, 4-pin
[3] M12 plug, 5-pin

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	Wavelength [nm]	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	880	Infrared	**8058726**	**SBSI-Q-AF-R3B-F6-NR**
	12	Min. 8 x 6 mm	30 mm - infinite	880	Infrared	**8058727**	**SBSI-Q-AF-R3B-F12-NR**
	12	Min. 16 x 13 mm	30 mm - infinite	–	White	**8058730**	**SBSI-Q-AF-R2B-F12-W**

Data sheet – Colour sensor SBSI-F/SBSC-F

- ⌐ - Voltage
  19.2 … 30 V DC

- ▮ - Temperature range
  0 … +50°C
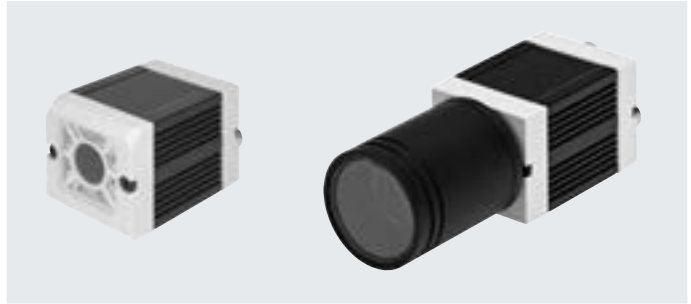
General technical data

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		Reinforced ABS		
Note on materials		RoHS-compliant		

## Data sheet – Colour sensor SBSI-F/SBSC-F

Ethernet interface	
Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet data transfer speed	100 Mbit/s
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, 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
Electrical connection		Plug, 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: ≥ UB −1		
Switching output		PNP/NPN, switchable		
Max. output current	[mA]	50		
Short circuit current rating		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 lens protection tube
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[1]		
Certification		c UL us listed (OL)		
		RCM		

[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
    If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet – Colour sensor SBSI-F/SBSC-F

Dimensions Download CAD data ➜ www.festo.com
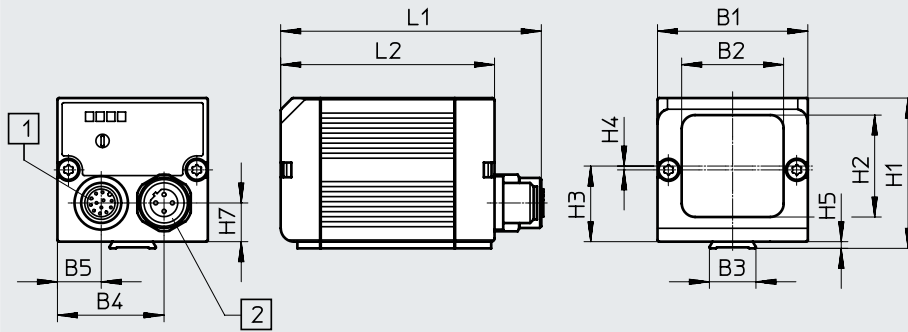
[1] M12 plug, 12-pin
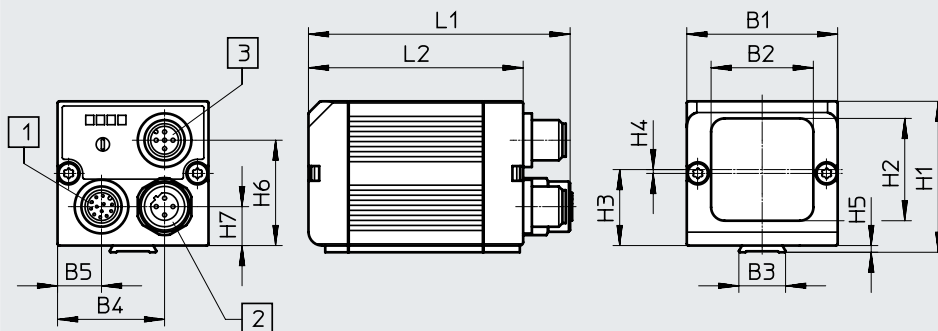[2] M12 socket, 4-pin

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

[1] M12 plug, 12-pin
[2] M12 socket, 4-pin
[3] M12 plug, 5-pin

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
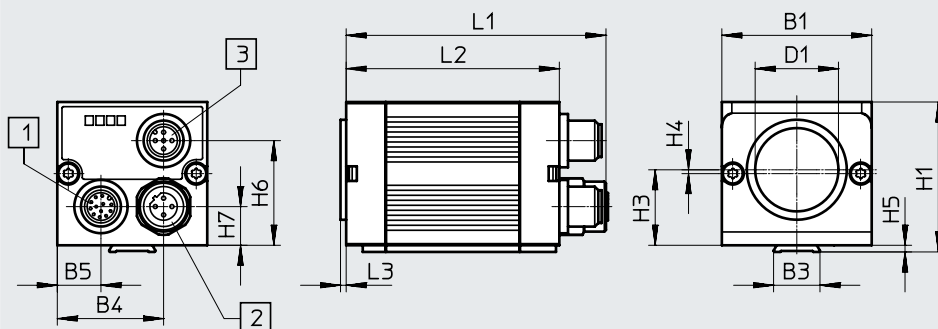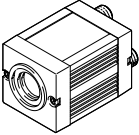
[1] M12 plug, 12-pin
[2] M12 socket, 4-pin
[3] M12 plug, 5-pin

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

➜ **Internet: www.festo.com/catalogue/...** Subject to change – 2021/04

Data sheet – Colour sensor SBSI-F/SBSC-F

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**

Data sheet – Universal sensor SBSC

- ⌐ - Voltage
      19.2 … 30 V DC

- ⌐ - Temperature range
      0 … +50°C
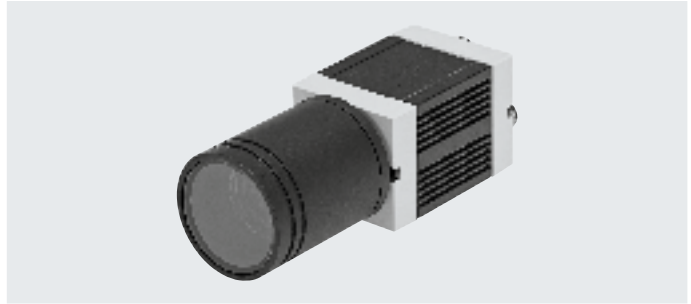
General technical data			
Type		SBSC-U-AF-R2B	SBSC-U-AF-R3B
Sensor resolution		1280 x 1024 pixels (SXGA)	736 x 480 pixels (wide VGA)
Sensor type		Monochrome	
Lens mounting		CS mount	
Frame rate (full image)	[fps]	50	
Max. number of test programs/jobs		255	
Max. number of test criteria/detectors		255	
Function of detectors/characteristics		2/5 Industrial	
		Interleaved 2/5	
		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	

Data sheet – Universal sensor SBSC

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	Reinforced ABS		
Note on materials	RoHS-compliant		

Data sheet – Universal sensor SBSC

Ethernet interface

Information on Ethernet, connection technology	M12 socket, 4-pin
Ethernet, data transfer speed	100 Mbit/s
Ethernet, supported protocols	TCP/IP, Ethernet/IP, FTP, SMB, PROFINET

Serial interface

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

Digital inputs/outputs and power supply

Electrical connection		Plug, 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: ≥ UB −1
Switching output		PNP/NPN, switchable
Max. output current	[mA]	50
Short circuit current rating		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 lens protection tube
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[1]
Certification		c UL us listed (OL)
		RCM

[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➜ Certificates.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet – Universal sensor SBSC

Dimensions Download CAD data ➜ www.festo.com
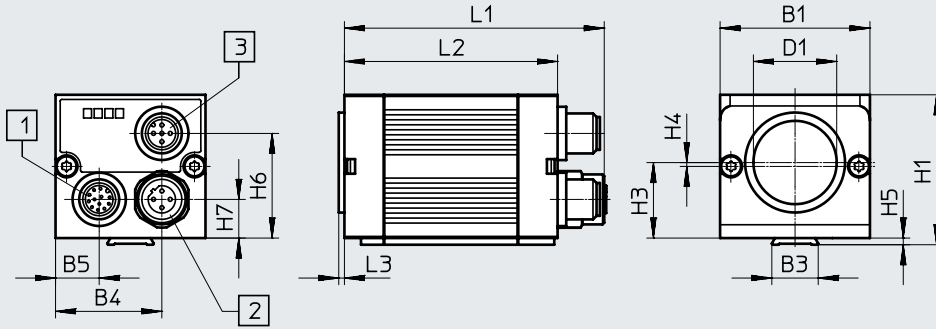
[1] M12 plug, 12-pin
[2] M12 socket, 4-pin
[3] M12 plug, 5-pin

Type	B1	B3	B4	B5	D1 ∅	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														

Ordering data

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

Data sheet

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

Field of view (6 mm focal length)

d = 150 mm

x = 120 mm

y = 78 mm
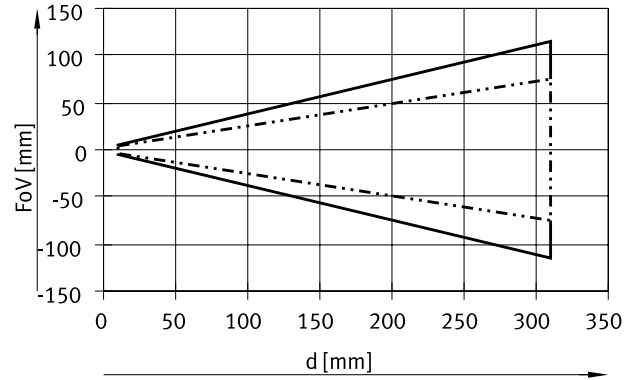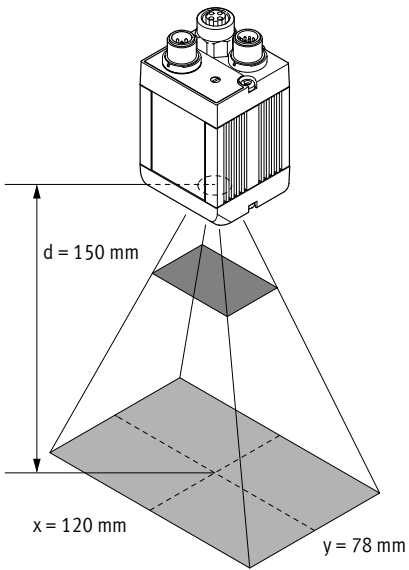
—————— X direction

—·—·—·— Y direction

d = working distance
FoV = field of view

Field of view (12 mm focal length)

d = 150 mm

x = 57 mm

y = 37 mm

—————— X direction

—·—·—·— Y direction

d = working distance
FoV = field of view

→ Internet: www.festo.com/catalogue/...

Subject to change – 2021/04

Data sheet

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

SBSx (field of view 12 mm)

d = 150 mm

x = 89 mm

y = 71 mm
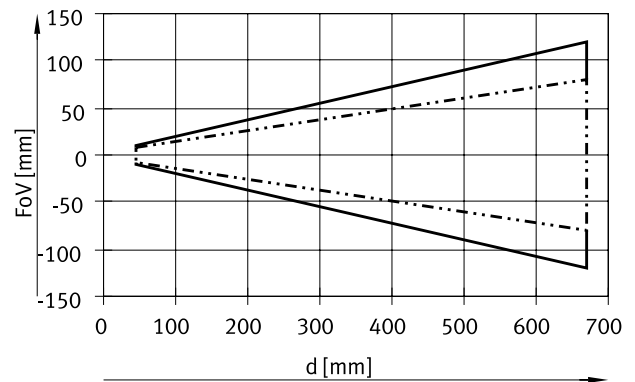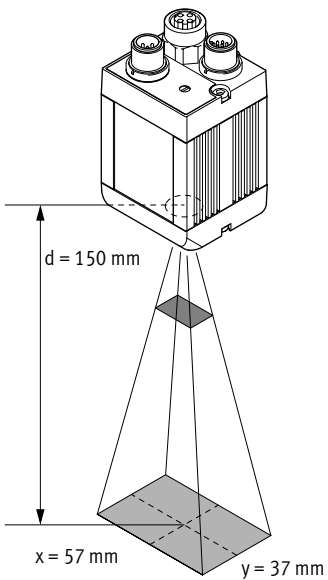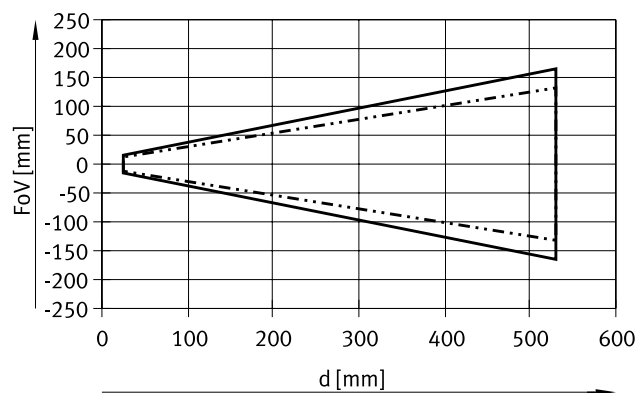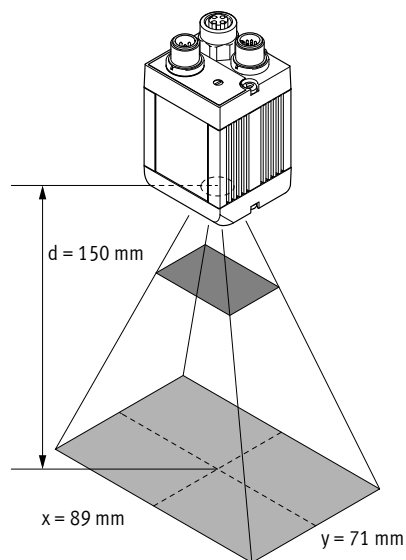
——— X direction

—·—·—·— Y direction

d = working distance
FoV = field of view

Data sheet

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

Normal depth of field (6 mm), sensor size R3
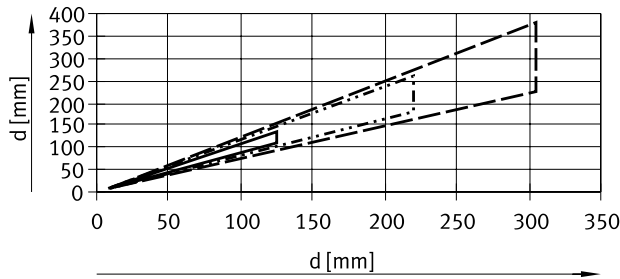
Increased depth of field (6 mm), sensor size R3
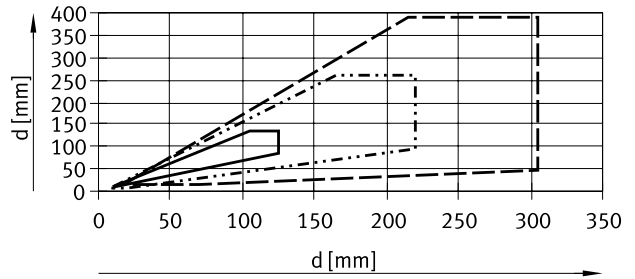
Module size/bar width of code:

————	0.25 mm
▪·▬·▪▬·▪	0.50 mm
▬ ▬ ▬ ▬	0.75 mm

d = working distance
Δ d = depth of field

Module size/bar width of code:

————	0.25 mm
▪·▬·▪▬·▪	0.50 mm
▬ ▬ ▬ ▬	0.75 mm

d = working distance
Δ d = depth of field

Normal depth of field (12 mm), sensor size R3
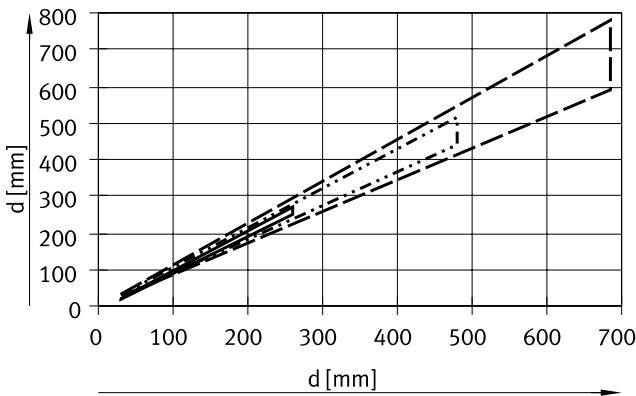
Increased depth of field (12 mm), sensor size R3
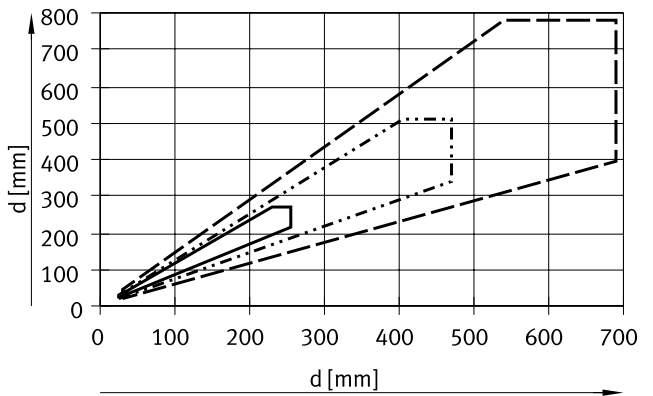
Module size/bar width of code:

————	0.25 mm
▪·▬·▪▬·▪	0.50 mm
▬ ▬ ▬ ▬	0.75 mm

d = working distance
Δ d = depth of field

Module size/bar width of code:

————	0.25 mm
▪·▬·▪▬·▪	0.50 mm
▬ ▬ ▬ ▬	0.75 mm

d = working distance
Δ d = depth of field

Normal depth of field (12 mm), sensor size R2
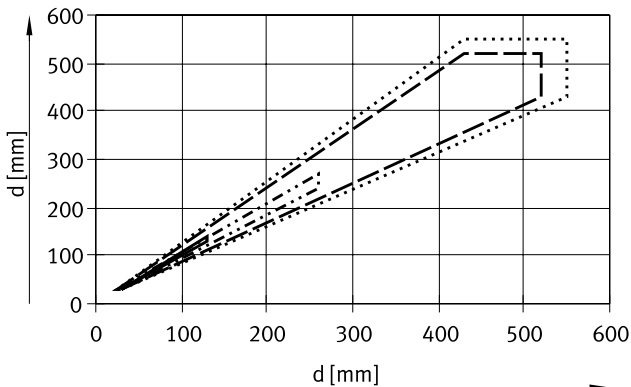
————	0.13
▪·▬·▪▬·▪	0.25
▬ ▬ ▬ ▬	0.50
··········	0.75

Accessories

- ⌐ Voltage
  19.2 … 30 V DC
- ╵ Temperature range
  0 … +50°C
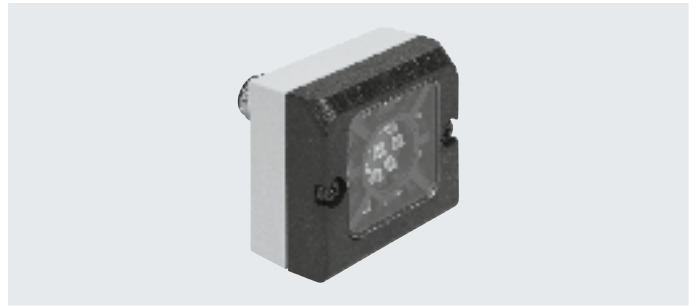
General technical data

Surface light		SBAL-C6-A-W	SBAL-C6-A-R	SBAL-C6-A-NR
Lighting type		Surface light		
Type of light		LED, clear		
		White	Red	Infrared
Wavelength	[nm]	410 … 750	620	860
Type of mounting		Clamped in dovetail slot		
		With accessories		
Working distance	[mm]	100 … 300		
Electrical connection		2 x M12, plug 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		Reinforced ABS		
Note on materials		RoHS-compliant		
RoHS status		RoHS-compliant to 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

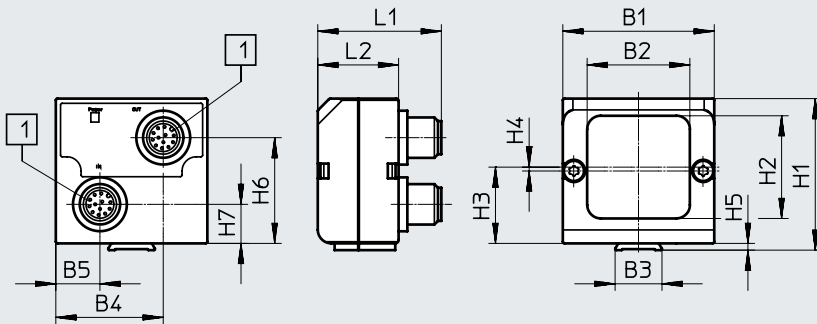| Operating and environmental conditions		SBAL-C6-A-W	SBAL-C6-A-R	SBAL-C6-A-NR
CE marking (see declaration of conformity)		To EU EMC Directive[1]		
Ambient temperature during continuous operation	[°C]	0 … +50		
Ambient temperature during flash operation	[°C]	0 … +50		
Storage temperature	[°C]	−20 … +60		
Degree of protection		IP67		
Certification		RCM		

[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➜ Certificates.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Accessories

Dimensions   Download CAD data → www.festo.com

[1] M12 plug, 12-pin

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

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

Accessories

- ⌐ 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
Wavelength	[nm]	410 ... 750	630	860
Type of mounting		Via mounting bracket		
Working distance	[mm]	100 ... 300		
Electrical connection		2 x M12, plug 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 to 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

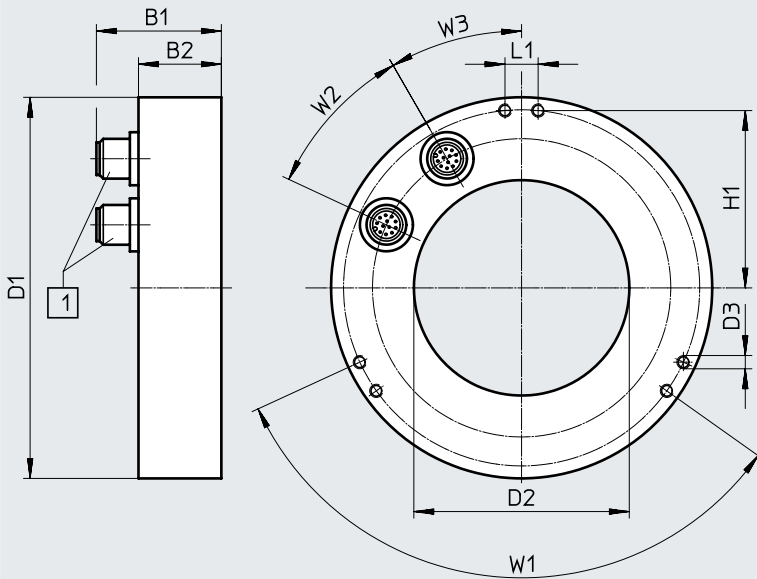|		SBAL-C6-R-W-D	SBAL-C6-R-R-D	SBAL-C6-R-NR-D
CE marking (see declaration of conformity)		To EU EMC Directive[1]		
Ambient temperature during continuous operation	[°C]	0 ... +35		
Ambient temperature during flash operation	[°C]	0 ... +50		
Storage temperature	[°C]	−20 ... +60		
Degree of protection		IP67		
Certification		RCM		

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
   If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Accessories

Dimensions

Download CAD data ➔ www.festo.com

[1]   M12 plug, 12-pin

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

Ordering data

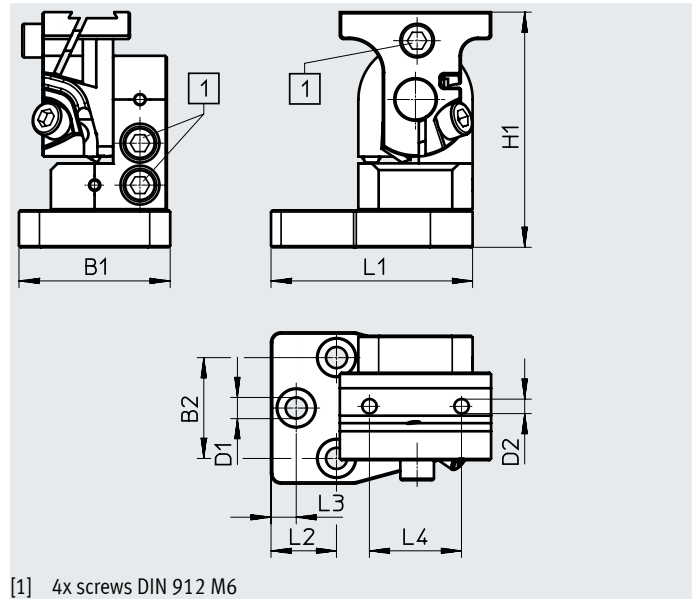|	Type of light: LED, diffuse	Part no.	Type
	White	**8031161**	**SBAL-C6-R-W-D**
	Red	**8031162**	**SBAL-C6-R-R-D**
	Infrared	**8031163**	**SBAL-C6-R-NR-D**

Accessories

Swivel mounting

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

Information on materials: Anodised wrought aluminium alloy

Note on materials: RoHS-compliant
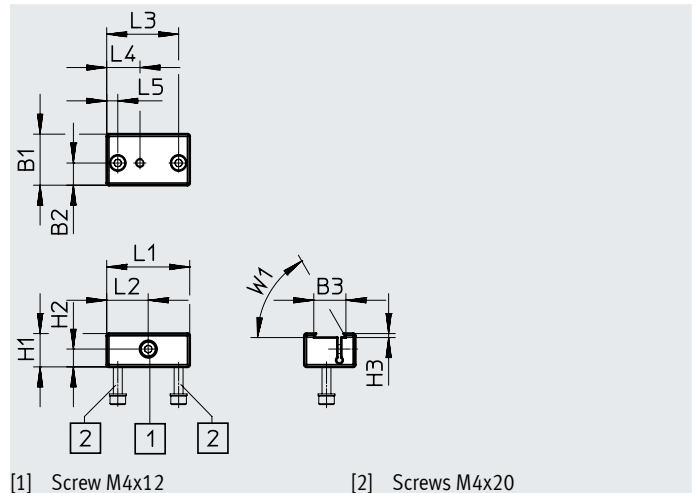

[1] 4x screws DIN 912 M6

Dimensions [mm] and ordering data

B1	B2	D1 ⌀	D2 ⌀	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**

Mounting

Type of mounting: With dovetail slot, with thread

Information on materials: Anodised aluminium

Note on materials: RoHS-compliant

[1] Screw M4x12   [2] Screws M4x20

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**

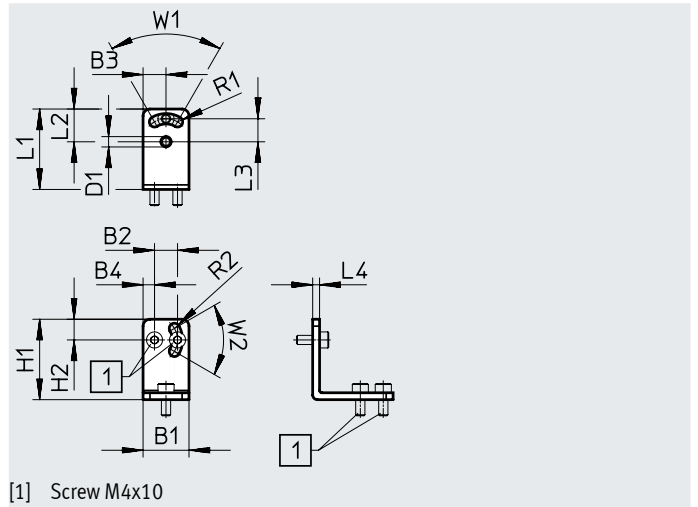1)   Corrosion resistance class CRC 2 to Festo standard FN 940070
     Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Accessories

Mounting bracket

Type of mounting: With through-hole
Information on materials: High-alloy steel
Note on materials: RoHS-compliant

[1] Screw M4x10

Dimensions [mm] and ordering data

B1	B2	B3	B4	D1 ∅	H1	H2	L1	L2	L3
20	10	10	5	4.5	35	9	35	14.3	10

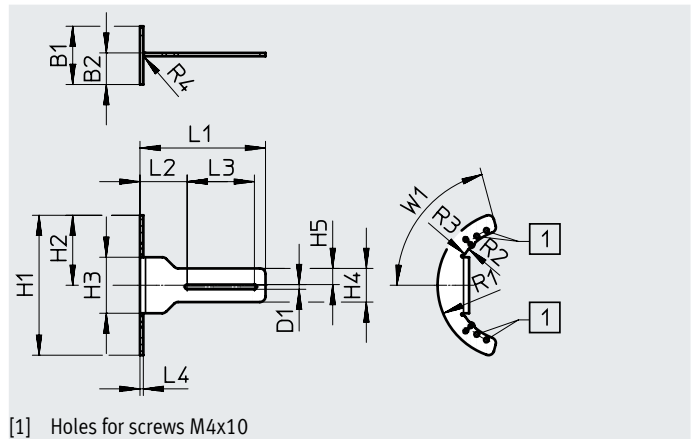| L4	R1	R2	W1	W2	Weight [g]	CRC[1]	Part no.	Type
3	2.3	2.3	60°	60°	27	2	**8031377**	**SBAM-C6-A**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
    Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Mounting bracket

Type of mounting: With through-hole
Information on materials: High-alloy steel
Note on materials: RoHS-compliant

[1] Holes for screws M4x10

Dimensions [mm] and ordering data

B1	B2	D1 ∅	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 can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.
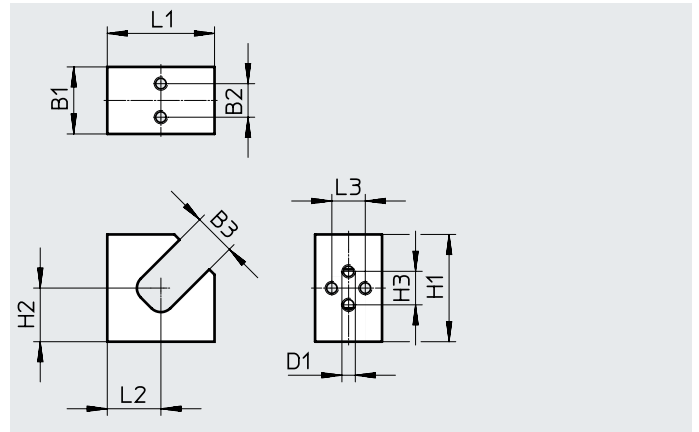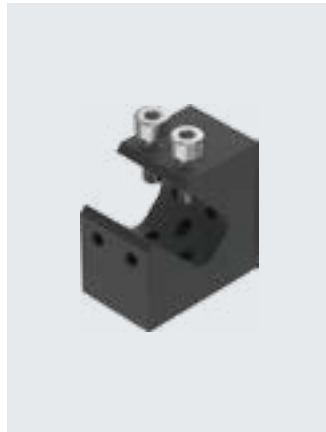
Accessories

Mounting

Type of mounting: With thread,
clamped
Information on materials: Anodised
wrought aluminium alloy
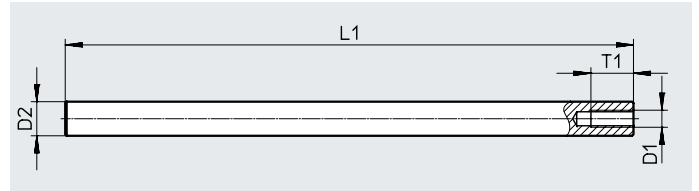Note on materials: RoHS-compliant

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**

Mounting

Type of mounting: With thread,
clamped
Information on materials: High-alloy
steel
Note on materials: RoHS-compliant

Dimensions [mm] and ordering data

D1	D2 ∅	L1	T1	Corrosion resistance class [CRC[1]]	Weight [g]	Part no.	Type
M6	12	200		2	178	**8058741**	**SBAM-C6-MR-200**
		300			265	**8058742**	**SBAM-C6-MR-300**

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

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.
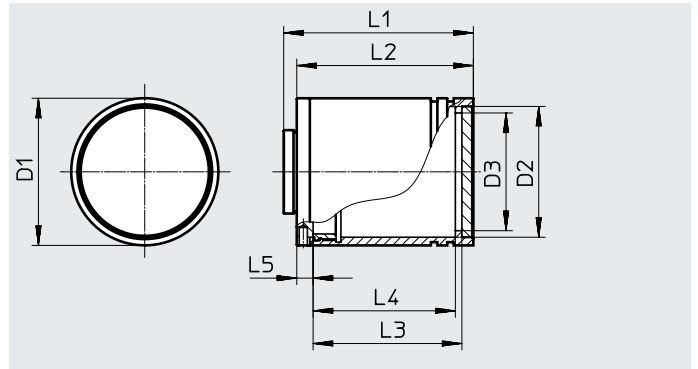
Accessories

Lens protection tube
Type of mounting: With thread
Information on materials: Anodised
wrought aluminium alloy
Note on materials: RoHS-compliant

Dimensions [mm] and ordering data

D1 ⌀	D2 ⌀	D3 ⌀	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			Data sheets → 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-ES-5-LE5
		8030963	NEBS-M12G5-ES-10-LE5
	Cable for connecting the external lighting 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			Data sheets → 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