Compact Vision System SBOC-M/SBOI-M

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Compact Vision System SBOC-M/SBOI-M

Key features

Problem description

Modern automation systems are for the most part designed for high production speeds which the human eye has trouble following.

Disadvantage of this high speed: Fitters and service employees cannot detect errors in the motion sequence and their causes straight away.

It is also becoming increasingly difficult to set the system parameters to their optimum values.

Typical applications

Mobile deployment of the high-speed camera for service and commissioning to increase the productivity and availability of automation systems

- Cycle time reduction through pinpointing of idle periods in motion sequences
- Optimum harmonisation of the travel times of individual axes in multi-axis systems, localisation of critical movements
- Time-synchronised visualisation of movement processes from several sides on a PC for greater ease of handling
- Localisation of unwanted vibrations which have a negative effect on the repetition accuracy of movement processes and can cause premature material fatigue
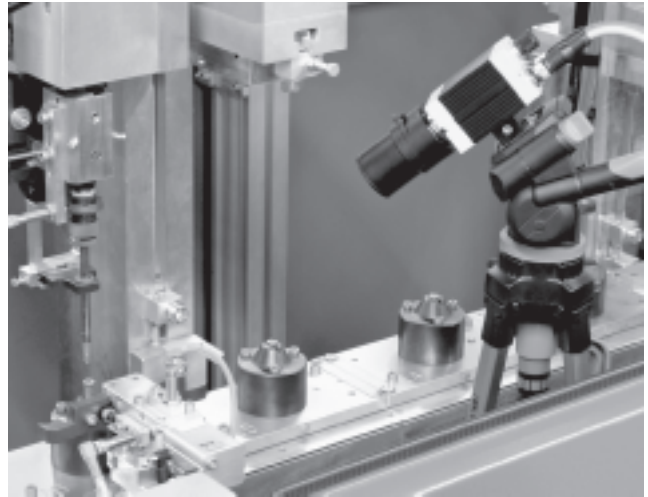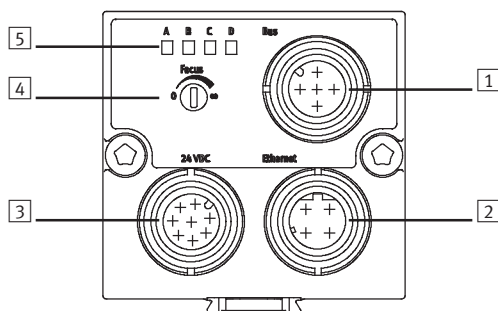

Stationary mounting of the high-speed camera to increase the availability of automation systems

- Continuous recording of processes in the ring buffer of the camera
- If a fault occurs, recording is stopped by an external signal. The case history of the fault is then stored in the camera, thus permitting an analysis of the cause
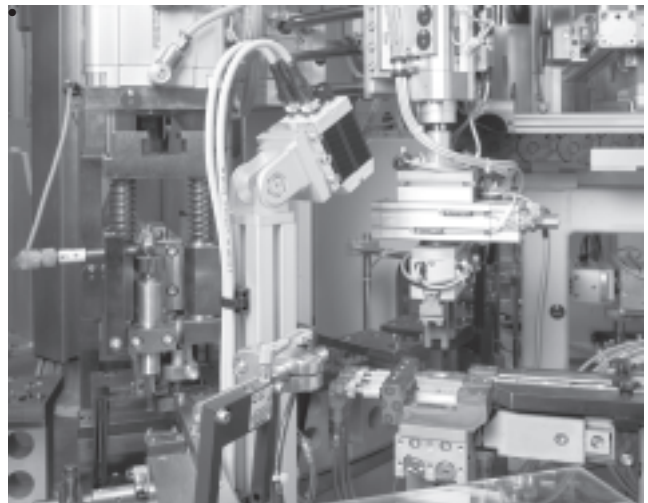
Interfaces

1	Bus connection
2	Ethernet connection
3	Power supply and inputs/outputs
4	Adjusting screw for focus

5	Status LEDs:
A	Operating system
B	Ethernet traffic
C	Recording
D	Recording status

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

Subject to change – 2011/05

FCT software with SBO.. Network plug-in
Configuring a camera network
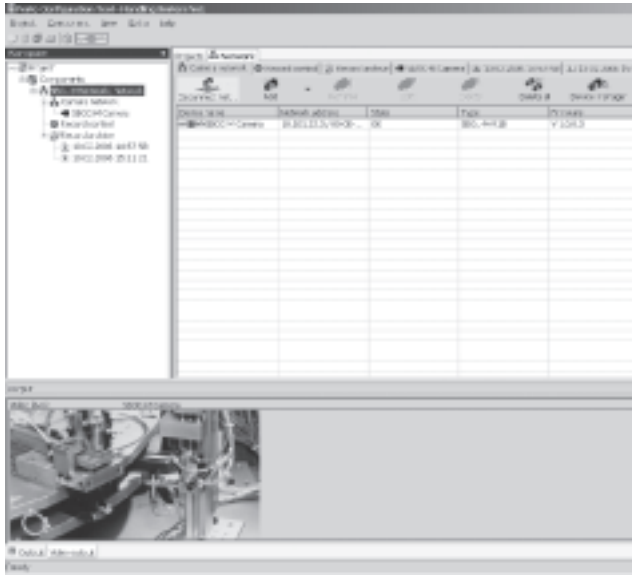
The "SBO..-M Network" is a plug-in for the Festo configuration tool (FCT for short). It provides the following functions:

- Configuration and commissioning of a camera network with any desired number of Compact Vision Systems of the type SBOC-M or SBOI-M
- Creation of time-synchronised recordings using all devices in the camera network in order to record a scene from various angles, for example

Setting the camera
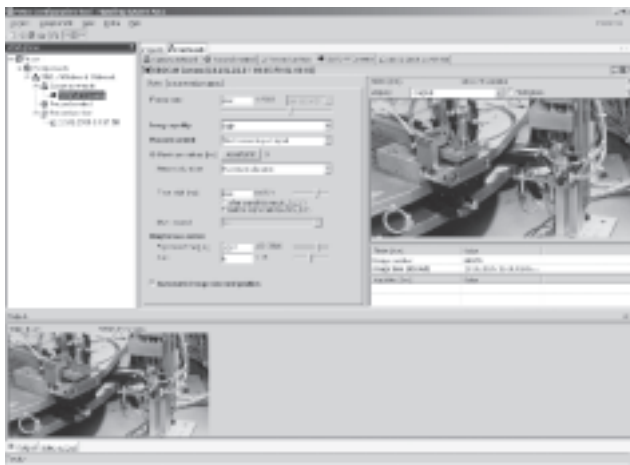
Using the live pictures from the camera, the lens can be set and parameters such as exposure time, frames per second, recording duration and picture quality, for example, adjusted.

With the parameters you can also define what is to happen when a trigger signal (edge change of an external 24 V signal) occurs:

- Start the recording
- Stop the recording
- Record only one picture

Time delays between trigger signal and start of recording or stop recording as well as recording several films or pictures in the camera memory (multi-recording) can also be determined in a user-friendly manner.

Recording control
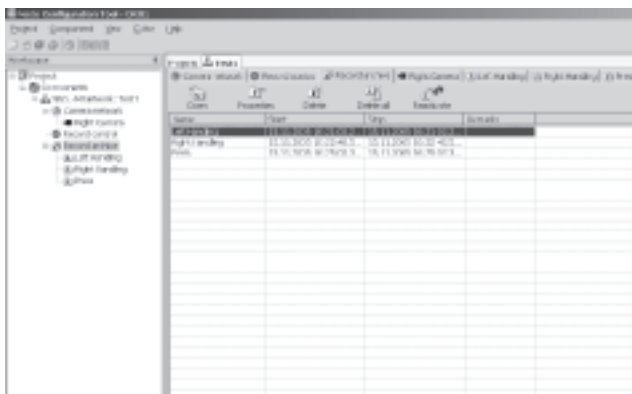
Recording can be started once the camera has been set up. You can choose whether the camera should wait for the occurrence of an external trigger condition, start recording directly following initialisation or store the pictures sent via Ethernet on a PC without buffering them in the camera. The PC can be removed once recording has been started in "Wait for trigger signal" mode. The camera operates automatically and waits for the trigger condition to occur. Recorded sequences are stored in the internal memory of the respective camera and can be transmitted to the FCT software once a connection has been re-established with a PC. The sequences are archived and can be analysed on the PC.
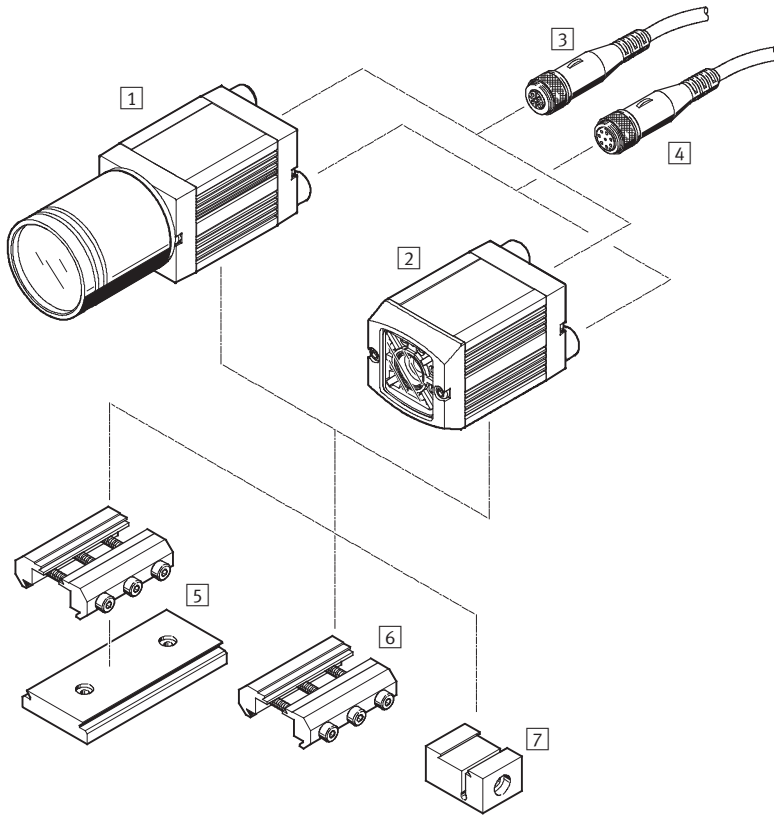
Accessories	Brief description	→ Page/Internet
Compact Vision System		
[1] SBOC-M-R1B	For standard lens with C mount connection	6
[2] SBOI-M-R1B	With integrated lens and light	
– SBOA-M-SYSTAINER	Systainer with Compact Vision System SBOC-M-R1B and an extensive range of accessories	9
Cable with socket		
[3] SBOA-K30E-M12S	Ethernet diagnostic cable	11
[4] SIM-M12-8GD-…-PU	For supplying the operating voltage	
Lens		
– SASF-C-L-F…	Focal distance 6 … 35 mm	10
Mounting components		
[5] Adapter kit SBOA-HMSV-39	With screw-on adapter plate	8
[6] Adapter kit SBOA-HMSV-40	Without screw-on adapter plate	
[7] Adapter kit SBOA-HMSV-41	With female thread G¼ for mounting on commercially available tripods	
– Adapter SBOL-C-5	5 mm spacer ring (CS mount to C mount)	8

Compact Vision System SBOC-M/SBOI-M

Type codes
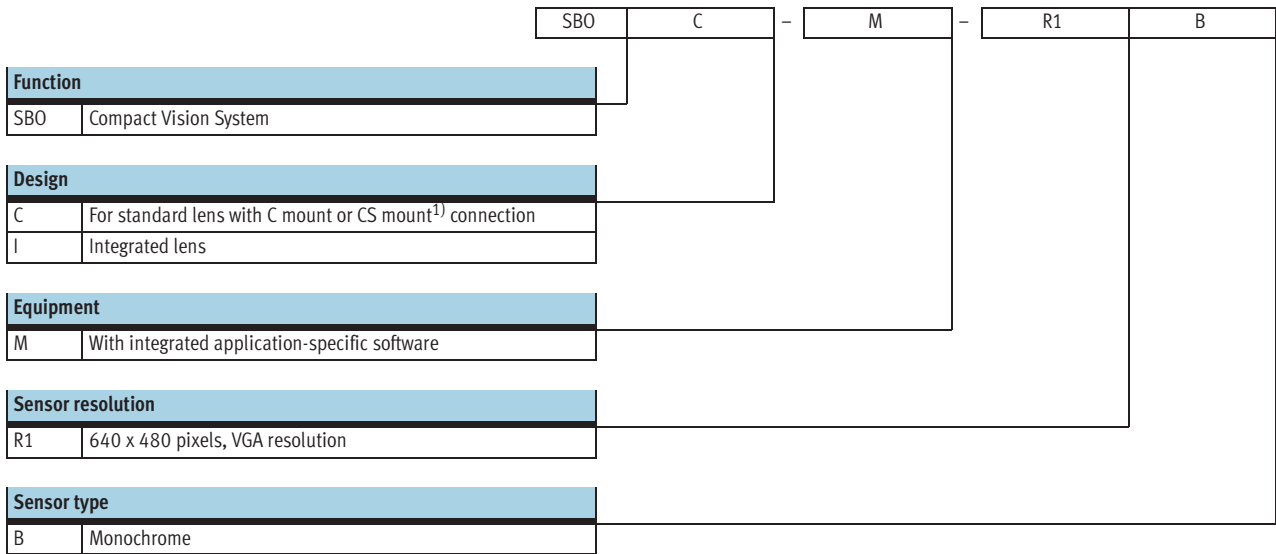
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SBO	C	–	M	–	R1	B

Function	
SBO	Compact Vision System

Design	
C	For standard lens with C mount or CS mount[1] connection
I	Integrated lens

Equipment	
M	With integrated application-specific software

Sensor resolution	
R1	640 x 480 pixels, VGA resolution

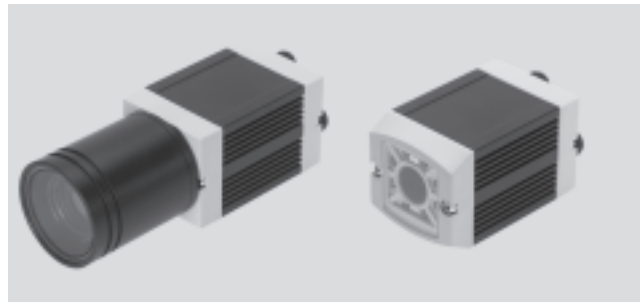| **Sensor type**	
B	Monochrome

1) CS mount without protective tube.

Compact Vision System SBOC-M/SBOI-M

Technical data

- ⌐ Voltage
  24 V DC

- ⌐ Temperature range
  −10 ... +50 °C

General technical data			
Type		SBOC-M	SBOI-M
Sensor resolution	[pixels]	640x480	
Exposure time	[ms]	0.04 ... 1,000	
Frame rate (full image)	[fps]	185	
Sensor type		Monochrome	
Lens mounting		C mount	Integrated lens
		CS mount[1]	
Operating distance	[mm]	Dependent on the lens selected	22 ... 1,000
Field of vision	[mm]	Dependent on the lens selected	14x10 ... 520x390

1) Without protective tube.

Electrical data			
Type		SBOC-M	SBOI-M
Nominal operating voltage	[V DC]	24	
Permissible voltage fluctuations	[%]	±10	
Current consumption with load-free outputs	[mA]	120	
Max. residual current	[A]	1.5 at the 24 V outputs	
Protection class		IP65, IP67[1]	IP65, IP67
Ethernet interface			
Bus interface		IEEE802.3U (100BaseT)	
Connection technology		Plug M12	
Transmission speed	[Mbps]	100	
Supported protocols		TCP/IP	

1) Only in combination with protective tube (included in scope of delivery).

Operating and environmental conditions		
Ambient temperature	[°C]	−10 ... +50
Storage temperature	[°C]	−10 ... +60
Ambient conditions		Screened from extreme external light sources
		Cleanest possible ambient air
CE mark		To EU EMC Directive
Certification		c UL us - Recognized (OL)
		C-Tick

Compact Vision System SBOC-M/SBOI-M

Technical data

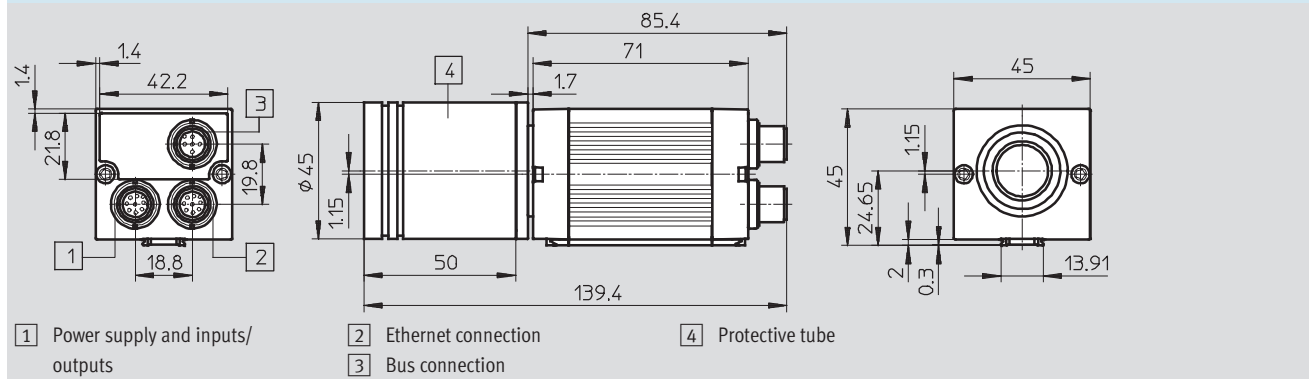| Materials	
Housing	Anodised aluminium
Cap	Acrylic butadiene styrene, glass fibre reinforced
Note on materials	Free of copper and PTFE
	RoHS-compliant

Weight [g]		
Lens mounting	C mount/CS mount[1]	Integrated lens
Type	SBOC-M	SBOI-M
Compact Vision System	182	184

1) CS mount without protective tube.

Dimensions

C mount/CS mount[1] SBOC-M

1	Power supply and inputs/outputs	4	Protective tube
2	Ethernet connection		
3	Bus connection		

Integrated lens SBOI-M

1	Power supply and inputs/outputs	2	Ethernet connection
3	Bus connection		
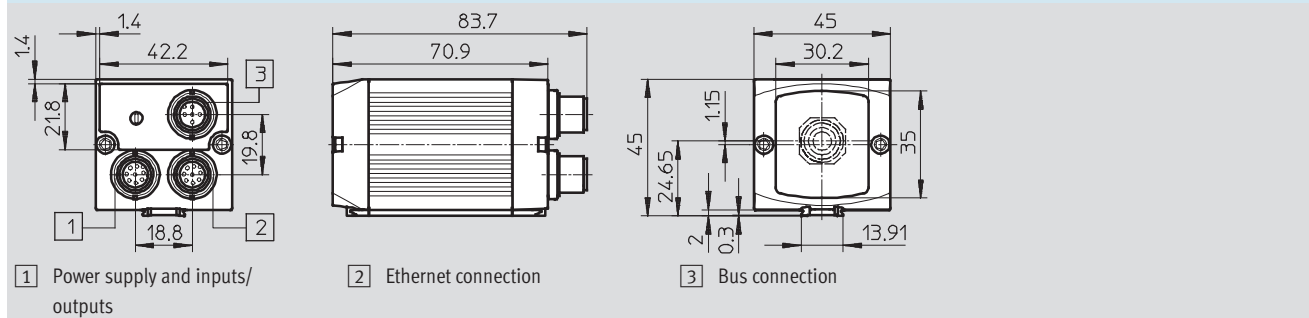
1) CS mount without protective tube.

Ordering data		
	Part No.	Type
For standard lens with C mount or CS mount[1] connection	541398	SBOC-M-R1B
Integrated lens	541395	SBOI-M-R1B

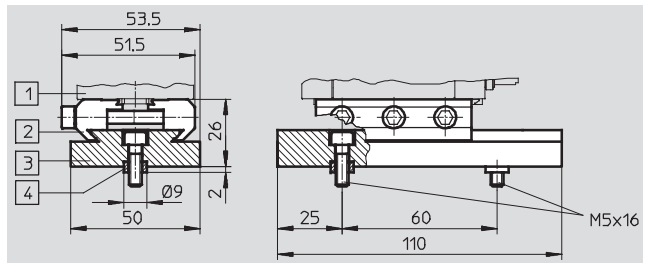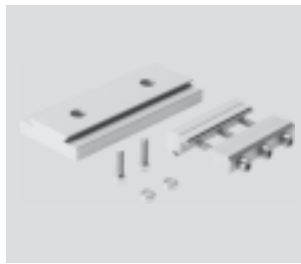1) CS mount without protective tube.

Compact Vision System SBOC-M/SBOI-M

Accessories

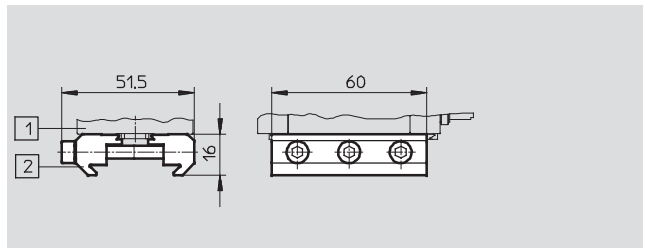**Adapter kit**
SBOA-HMSV-39
with screw-on adapter plate

Material:
Anodised wrought aluminium alloy

Ordering data		
	Part No.	Type
Adapter kit	**541599**	**SBOA-HMSV-39**

Adapter kit
SBOA-HMSV-40
without screw-on adapter plate

Material:
Anodised wrought aluminium alloy

Ordering data		
	Part No.	Type
Adapter kit	**541600**	**SBOA-HMSV-40**

Adapter kit
SBOA-HMSV-41
with female thread G¼ for mounting
on commercially available tripods

Material:
Anodised wrought aluminium alloy
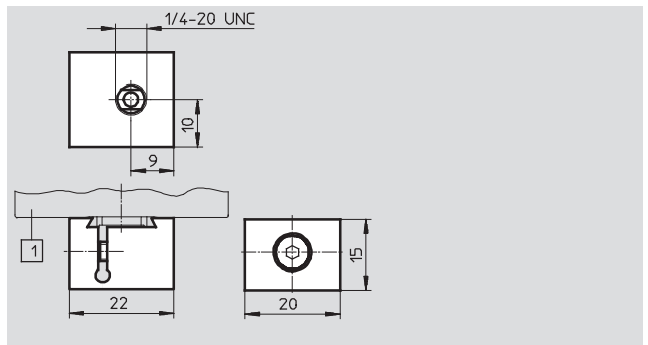
Ordering data		
	Part No.	Type
Adapter kit	**542140**	**SBOA-HMSV-41**

Adapter SBOL-C-5
5 mm spacer ring
(CS mount to C mount)

Material:
Anodised wrought aluminium alloy
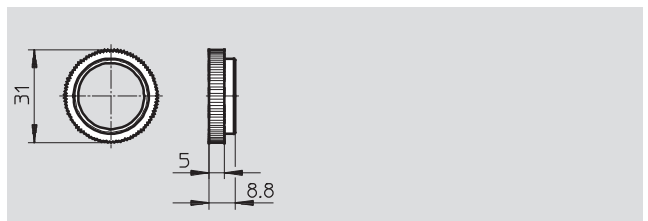
Ordering data		
	Part No.	Type
Adapter	**541601**	**SBOL-C-5**

Compact Vision System SBOC-M/SBOI-M

Accessories

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**Vision system
SBOA-M-SYSTAINER**

Systainer with Compact Vision System
SBOC-M-R1B and accessories for
mains voltage 230 V

Note on materials:
Contains PWIS (paint wetting
impairment substances)

Ordering data			
Contents	Pieces	Part No.	Type
Compact Vision System SBOC-M-R1B, without protective tube	1	**543408**	**SBOA-M-SYSTAINER**
Zoom lens, focal depth 10 … 40 mm, CS mount	1		
Adapter kit SBOA-HMSV-41 for mounting on commercially available tripods	1		
Tripod for camera and lighting	2		
Ethernet diagnostic cable SBOA-K30E-M12S	1		
Crossover patch cable	1		
Coupler, RJ45	1		
System light 1,000 W/75 h, with tilting head and four-way folding frame	1		
Spare light bulb, U-shaped halogen lamp, 1,000 W/75 h, 230 V	1		
Manual cable drum	1		
Trigger with pushbutton and extension cable	1		
Power supply for camera/power supply unit	1		
CD-ROM with FCT configuration package and documentation	1		

**Vision system
SBOA-M-SYSTAINER-110V**

Systainer with Compact Vision System
SBOC-M-R1B and accessories for
mains voltage 110 V

Note on materials:
Contains PWIS (paint wetting
impairment substances)

| Ordering data			
Contents	Pieces	Part No.	Type
Compact Vision System SBOC-M-R1B, without protective tube	1	**572909**	**SBOA-M-SYSTAINER-110V**
Zoom lens, focal depth 10 … 40 mm, CS mount	1		
Adapter kit SBOA-HMSV-41 for mounting on commercially available tripods	1		
Tripod for camera and lighting	2		
Ethernet diagnostic cable SBOA-K30E-M12S	1		
Crossover patch cable	1		
Coupler, RJ45	1		
System light incl. plug for USA, 850 W/75 h, with tilting head and four-way folding frame	1		
Spare light bulb, U-shaped halogen lamp, 850 W/110 V	1		
Trigger with pushbutton and extension cable	1		
Power supply for camera/power supply unit with plug-in adapter for USA	1		
CD-ROM with FCT configuration package and documentation	1		

Compact Vision System SBOC-M/SBOI-M

Accessories

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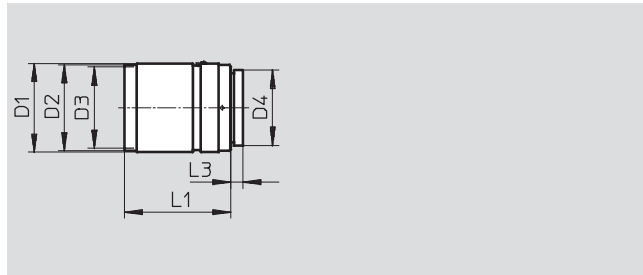**Lens SASF-C-L-F6**
Focal depth 6 mm

Note on materials:
Contains PWIS (paint wetting
impairment substances)
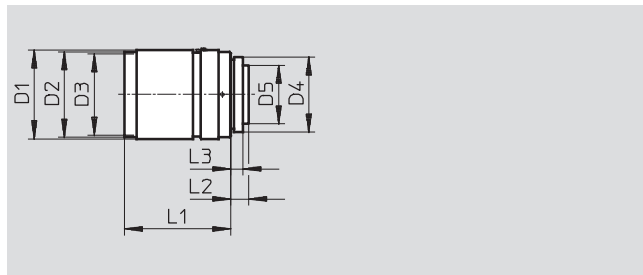RoHS-compliant
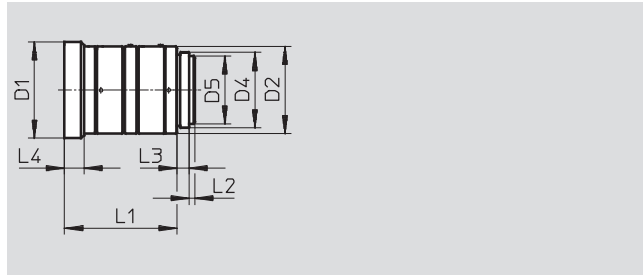
Lens SASF-C-L-F16
Focal depth 16 mm

Note on materials:
Contains PWIS (paint wetting
impairment substances)
RoHS-compliant

Lens SASF-C-L-F12/25/35
Focal depth 12/25/35 mm

Note on materials:
Contains PWIS (paint wetting
impairment substances)
RoHS-compliant

Dimensions									
Type	D1 $\varnothing$	D2 $\varnothing$	D3 $\varnothing$	D4	D5 $\varnothing$	L1	L2	L3	L4
SASF-C-L-F6	32	29	–	1-32UN	22.5	37.5	1.9	4	6.5
SASF-C-L-F16	29.5	28.5	27, P=0.5	1-32UN-2A	–	33.2	–	4	–
SASF-C-L-F12	29.5	28.5	27, P=0.5	1-32UN-2A	16.5	28.5	7.1	4	–
SASF-C-L-F25						32	6.9		
SASF-C-L-F35					19.5	35.4	6		
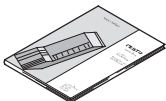
Ordering data – Lenses					Technical data → Internet: sasf-c
	Brief description	Operating distance [mm]	Focal depth [mm]	Part No.	Type
	C mount for Compact Vision System with sensor resolution R1 and R3	≥200	6	**572910**	**SASF-C-L-F6**
	C mount for Compact Vision System with sensor resolution R1 and R3	≥250	12	**572911**	**SASF-C-L-F12**
	C mount for Compact Vision System with sensor resolution R1, R2 and R3	≥250	16	**572912**	**SASF-C-L-F16**
		≥250	25	**572913**	**SASF-C-L-F25**
		≥350	35	**572914**	**SASF-C-L-F35**

Compact Vision System SBOC-M/SBOI-M

Accessories

Ordering data – Cable M12x1					Technical data ➔ Internet: sim, sboa	
	Assembly	Use	Connection	Cable length [m]	Part No.	Type
Straight socket						
	Union nut M12x1	Operating voltage supply	8-pin	2	**525616**	**SIM-M12-8GD-2-PU**
				5	**525618**	**SIM-M12-8GD-5-PU**
	Union nut M12x1	Ethernet diagnostic cable	4-pin, d-coded	3	**542139**	**SBOA-K30E-M12S**

Ordering data – Documentation				
	Brief description	Language	Part No.	Type
	Description A manual in paper form is not included in the scope of delivery for the Compact Vision System	German	**542122**	**P.BE-SBO-M-DE**
		English	**542123**	**P.BE-SBO-M-EN**
	Documentation package The manual on CD-ROM is included in the scope of delivery of the Compact Vision System	German, English	**542121**	**P.BE-SBO-M-UDOK**
	Configuration package The FCT (Festo configuration tool) configuration package on CD-ROM is included in the scope of delivery of the Compact Vision System	German, English, French	**539622**	**P.SW-FCT**