Controller SBRD-Q

FESTO

Controller SBRD-Q

Key features

The images taken by the remote camera heads are sent to the electronic evaluation unit. Here, different inspection features are calculated, such as length, height, area, centre of mass, grey or colour value and roundness, depending on the application task.

By scanning various sample parts when setting up the camera, tolerance ranges for good parts are determined for each inspection feature. During the running operation, the camera computes characteristic values for the part to be inspected. Depending on whether these are within or outside the programmed tolerance range, the part is identified as good or bad. The results from the calculation of the characteristics can also be transmitted to a PLC via Ethernet, PROFINET, Telnet or EtherNet/IP.

Up to 256 inspection programs can be stored on the camera.

The characteristics calculated by the camera are not dependent on the angular orientation and position of the inspection part; they are determined relative to the position of the inspection part and so any tilting and/or movement of the inspection part in the field of vision is irrelevant for the inspection process. The behaviour of the camera during inspection is determined by the so-called evaluation mode. There are two different modes:
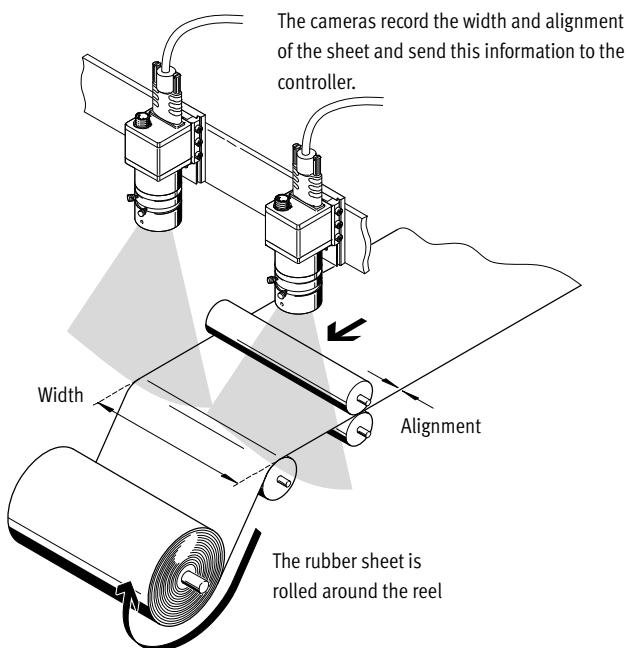
* Triggered: single image recording and inspection with each trigger signal (image evaluation is triggered by an external signal)
* Free run: continuous image recording and inspection (without fixed frame rate) as long as there is a trigger signals.
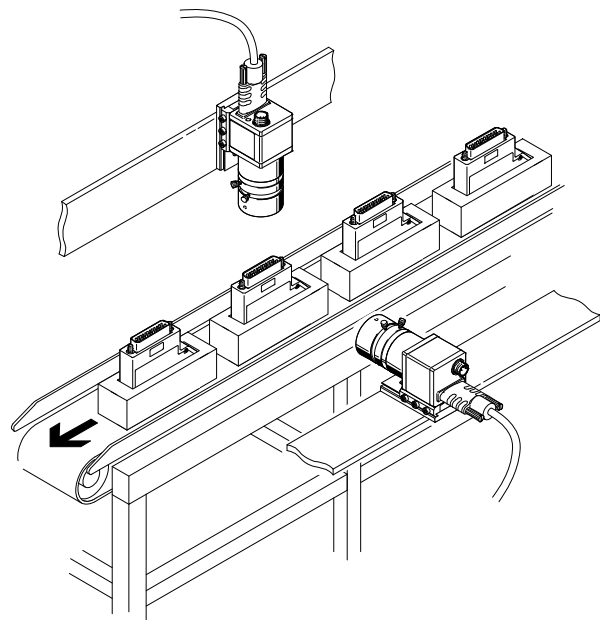
Areas of application

* Detecting the position and rotary orientation of parts
* Pick & place
* Quality inspection
* Measurement
* Reading bar codes and data matrix codes (1D and 2D codes)
* Reading plain text (OCR)
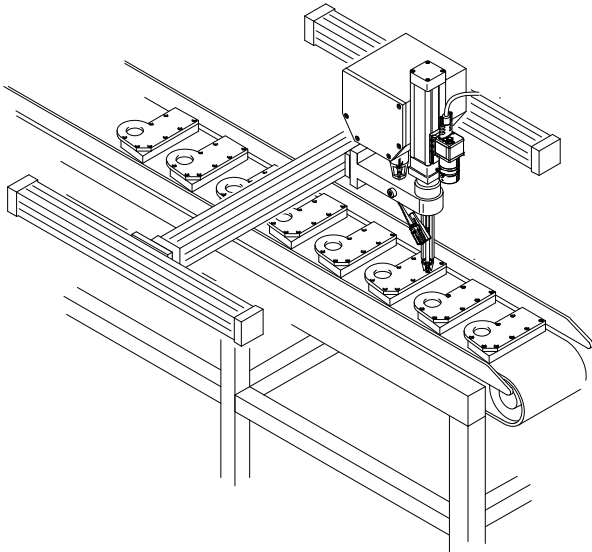
Application examples

Roller alignment

The cameras record the width and alignment of the sheet and send this information to the controller.

Width

Alignment
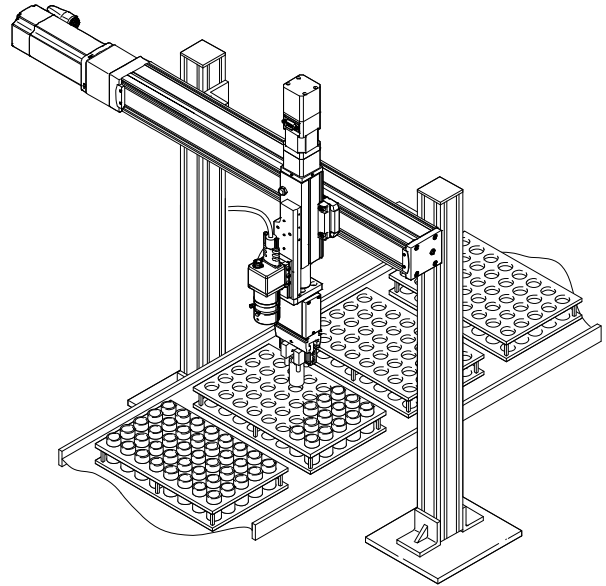
The rubber sheet is rolled around the reel

Measurement

Application examples

Screws

Pick & place

Gluing
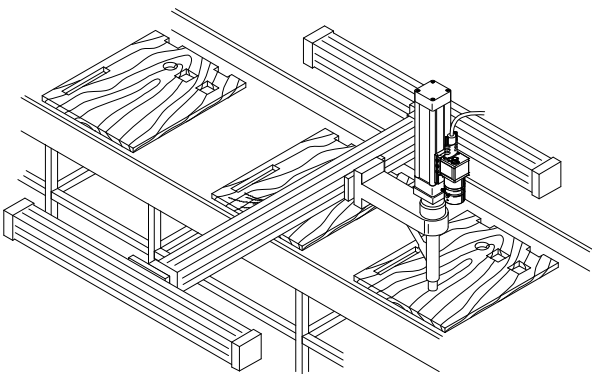
Sorting screws
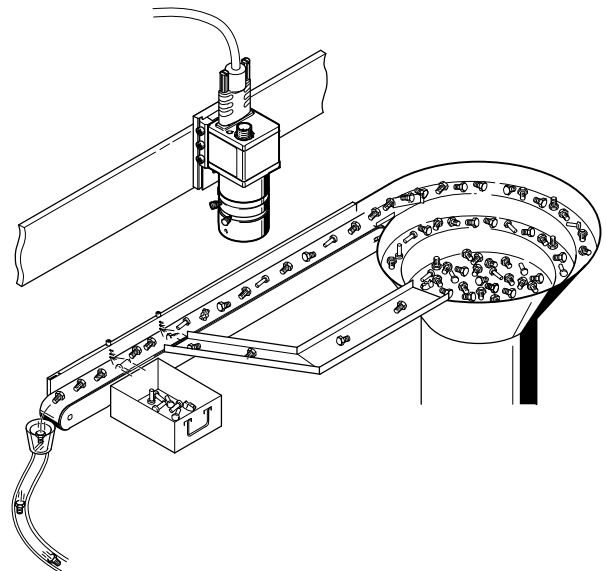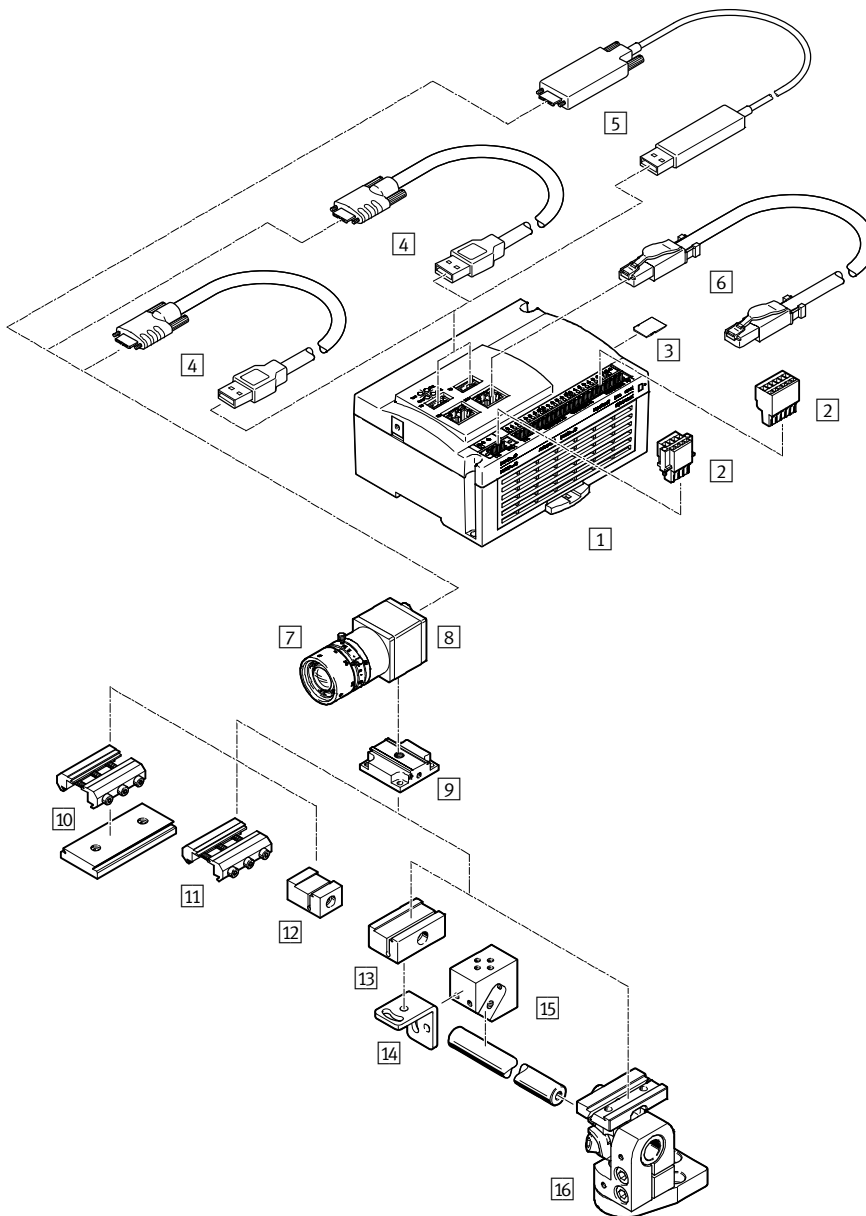
Accessories		→ Page/Internet
1	Controller SBRD-Q	7
2	Plug NECC-L2G…	17
3	Memory card CAMC-M-MS-G32	17
4	Connecting cable NEBC-U7G10-KS-5-N-S-U5G9	17
5	Connecting cable NEBC-U7G10-EH-…-N-S-U5G9	17
6	Connecting cable NEBC-R3G4-ES-1-S-R3G4-ET	17
7	Camera head SBPB-R2…	10
8	Lens SASF-C-L-…	12
9	Mounting SBAM-C11-CP	12

Accessories		→ Page/Internet
10	Adapter kit SBOA-HMSV-39	13
11	Adapter kit SBOA-HMSV-40	13
12	Adapter kit SBOA-HMSV-41	13
13	Mounting SBAM-C6-CP	14
14	Mounting bracket SBAM-C6-A	16
15	Mounting SBAM-C6-CP-AF	15
16	Swivel mounting SBAM-C6-…	14

Controller SBRD-Q

Type codes - Controller

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| | SBRD | – | Q |

Image processing controllers

| SBRD | Series D |

Function

| Q | Quality inspection |
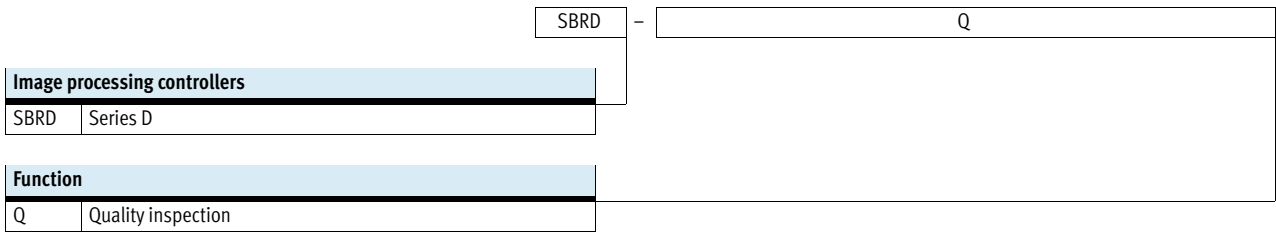
Controller SBRD-Q

Type codes - Camera head

| | SBPB | – | | – | | – | | – | 1E | – | 1A | – | C |

Function	
SBPB	Camera head

Resolution	
R2	1280 x 1024
R5	1600 x 1200
R9	2456 x 2054

Image sensor	
B	Monochrome
C	Colour

Communication interface	
U3	USB 3.0

Digital inputs	
1E	1 input

Digital outputs	
1A	1 output

Lens mount	
C	C mount

→ Internet: www.festo.com/catalogue/…
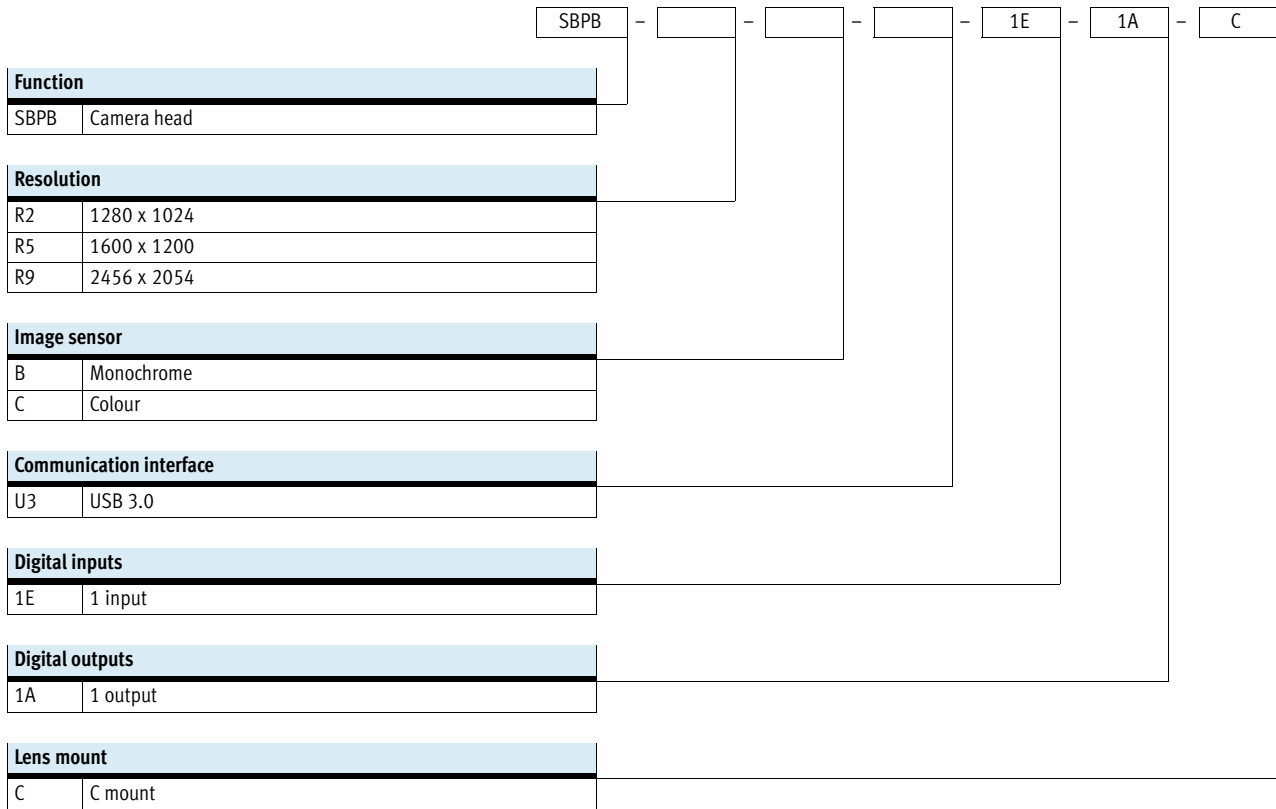
Controller SBRD-Q
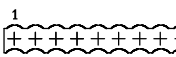
Technical data

FESTO

- 🌡 - Temperature range
  −5 … +50 °C
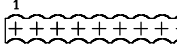
General technical data		
Dimensions W x H x L	[mm]	130 x 106 x 60
Type of mounting		With through-hole for M4 screw
		With H-rail
Product weight	[g]	315
CE marking (see declaration of conformity)		To EU EMC Directive
Protection against direct and indirect contact		PELV
Nominal operating voltage DC	[V]	24
Permissible voltage fluctuations	[%]	±10
Power consumption 24 V	[W]	20
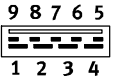
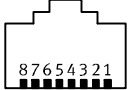| Input/output interface		
Function		10x digital input
		2x digital input with pull-up resistor
		8x digital output
		Ground
		Power supply
Connection type		Plug
Connection technology	[mm]	Circuit board plug, contact spacing 3.5 mm
Number of pins/wires		24
Connection pattern		
Number of inputs		12
Note on inputs		2 of the 12 inputs with integrated pull-up resistor
Switching level	[V]	Signal 1: ≥ 10
		Signal 0: ≤ 1
Note on the switching level	[V]	Signal 0: ≤ 1
		Signal 1: ≥ 8
		For integrated pull-up resistor
Switching logic at inputs		PNP (positive switching)
Number of outputs		8
Digital outputs, output current	[mA]	450
Switching logic at outputs		PNP (positive switching)

Controller SBRD-Q

Technical data

Power supply

Function		Electronic system
Connection type		Plug
Connection technology	[mm]	Circuit board plug, contact spacing 3.5 mm
Number of pins/wires		4
Connection pattern		

Camera interface

Function	Only communication with camera
Connection type	2x socket
Connection technology	USB 3.0 type A
Number of pins/wires	9
Note on the camera interface	Only use the cables explicitly identified by Festo as accessories
Connection pattern	

Fieldbus interface

Function	PROFINET

Card slot

Storage medium	microSD
Memory capacity	≤ 32 GB

Immissions/emissions

Storage temperature	[°C]	−20 … +70
Degree of protection		IP20
Ambient temperature	[°C]	−5 … +50
Relative humidity	[%]	95
		Non-condensing

Ethernet interface

Protocol		TCP/IP
Function		Diagnostics
		Programming
Connection type		Socket
Connection technology		RJ45
Number of pins/wires		8
Transmission rate	[Mbit/s]	10
	[Mbit/s]	100
	[Mbit/s]	1000
Connection pattern		

Operating and environmental conditions

Housing material	PA reinforced
Note on materials	RoHS-compliant

Controller SBRD-Q

Technical data

Type	B1	D1 ∅	H1	H2	H3	H4	H5	H6	L1	L2	L3
SBRD-Q	63.7	4.5	106	100	90.5	81	72	35.2	130	126.1	122.2

Ordering data		Part no.	Type
Controller			
		8067301	**SBRD-Q**

Camera head, SBPB

Accessories – Ordering data

- ⌐ - Voltage
  5 V

- ⌐ - Temperature range
  0 ... +40 °C

General technical data			
Sensor resolution	-R2		1280 x 1024 pixels (SXGA)
	-R5		1600 x 1200 pixels (UXGA)
	-R9		2456 x 2054 pixels (5MPix)
Sensor type	-B		Monochrome
	-C		Colour
Lens mounting			C mount
Field of vision		[mm]	Depends on the lens chosen
Width		[mm]	29
Height		[mm]	29
Length		[mm]	49
Type of mounting			Via through-hole for M3 screw
Product weight		[g]	52
CE marking (see declaration of conformity)			To EU EMC Directive

USB interface			
Function			Power supply
			Communication
Connection type			Socket
Connection technology			USB 3.0 type B micro
Number of pins/wires			10
Nominal operating voltage DC		[V]	5
Permissible voltage fluctuations		[%]	+/- 5
Electrical power consumption	-R2	[W]	1.3 ... 1.5
	-R5	[W]	1.3 ... 1.5
	-R9	[W]	2.3 ... 3

Input/output interface	
Function	No function

Immissions/emissions		
Degree of protection		IP30 in assembled state
Storage temperature	[°C]	−20 ... +60
Ambient temperature	[°C]	0 ... +40

Electronic system			
Working distance		[mm]	Depends on the lens chosen
Exposure time	-R2		9 µs - 2000 ms
	-R5		20 µs - 10000 ms
	-R9		27 µs - 999 ms

Operating and environmental conditions	
Ambient conditions	Screened from extreme external light sources
	Cleanest possible ambient air
	Dry
Relative humidity [%]	20 … 80
Housing material	Anodised wrought aluminium alloy
Note on materials	RoHS-compliant

Dimensions Download CAD data → www.festo.com

SBPB-R…-U3-1E1A-C

1 USB 3.0 – micro connection
2 Protective cap

Type	B1	B2	B3	B4	B5	D1	D2	D3 ⌀	H1	H2
SBPB-R … -U3-1E1A-C	29	18	10.4	6.7	24	M2x4	M3	8.5	29	7.3

Type	H3	H4	L1	L2	L3	L4	L5	L6	L7	T1
SBPB-R … -U3-1E1A-C	21.5	13.6	42.6	13.6	5.7	10.5	10.5	25	2	3.5

Ordering data – Camera head					
	Sensor resolution	Exposure time	Frame rate (full image) [fps]	Part no.	Type
	1280 x 1024 pixels (SXGA)	9 µs - 2000 ms	60	**8066466**	**SBPB-R2B-U3-1E1A-C**
			60	**8066467**	**SBPB-R2C-U3-1E1A-C**
	1600 x 1200 pixels (UXGA)	20 µs - 10000 ms	60	**8066468**	**SBPB-R5B-U3-1E1A-C**
			60	**8066469**	**SBPB-R5C-U3-1E1A-C**
	2456 x 2054 pixels (5MPix)	27 µs - 999 ms	36	**8066470**	**SBPB-R9B-U3-1E1A-C**
			36	**8066471**	**SBPB-R9C-U3-1E1A-C**

Ordering data – Lenses

	Format [inch]	Working distance [mm]	Focal length [mm]	Part no.	Type
	1/2	≥200	6	**572910**	**SASF-C-L-F6**
		≥250	12	**572911**	**SASF-C-L-F12**
	2/3	≥250	16	**572912**	**SASF-C-L-F16**
			25	**572913**	**SASF-C-L-F25**
		≥350	35	**572914**	**SASF-C-L-F35**

Technical data → Internet: sasf-c

Mounting SBAM-C11-CP
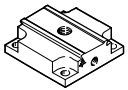
Type of mounting: clamped with thread

Material: anodised wrought aluminium alloy

Note on materials:
RoHS-compliant
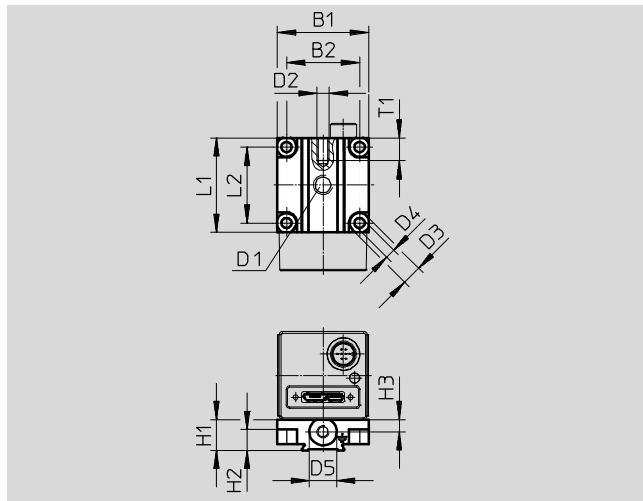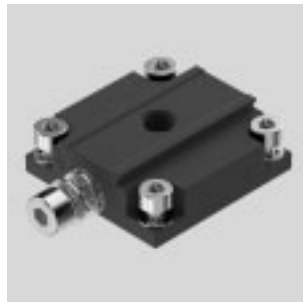
Type	B1	B2	D1	D2	D3 ∅	D4 ∅	D5 ∅	H1 −0.2	H2	H3	L1	L2	T1
SBAM-C11-CP	30	24	1/4-20 UNC	M4	6.5	3.4	9	10.2	6.9	4	31	25	7.5

Ordering data

Mounting		Weight [g]	Part no.	Type
		19	**8066474**	**SBAM-C11-CP**

Adapter kit
SBOA-HMSV-39
With screw-on adapter plate

Material:
Anodised wrought aluminium alloy
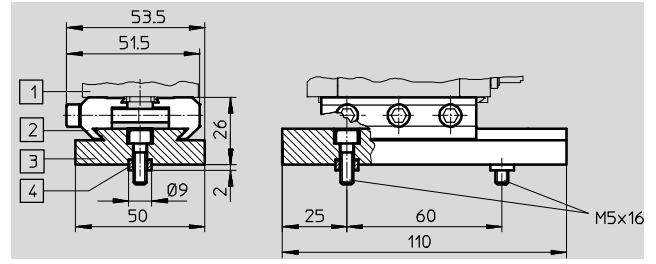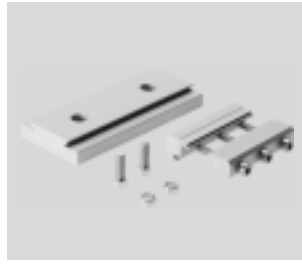
Ordering data		
	Part no.	Type
Adapter kit	541599	SBOA-HMSV-39

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

Material:
Anodised wrought aluminium alloy
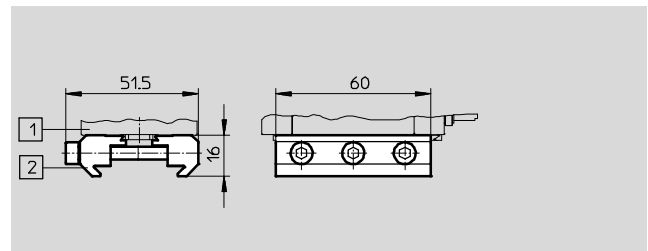
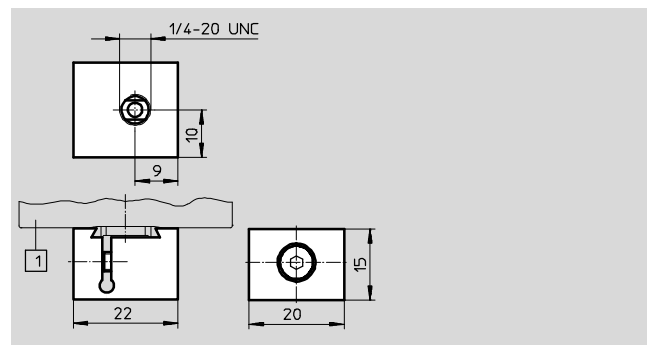| Ordering data		
	Part no.	Type
Adapter kit	541600	SBOA-HMSV-40

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

Material:
Anodised wrought aluminium alloy

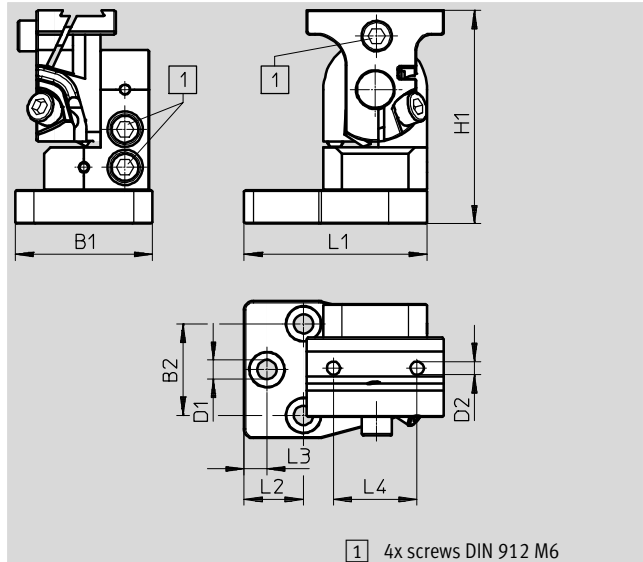| Ordering data		
	Part no.	Type
Adapter kit	542140	SBOA-HMSV-41

Accessories – Ordering data

Swivel mounting
SBAM-C6-...

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

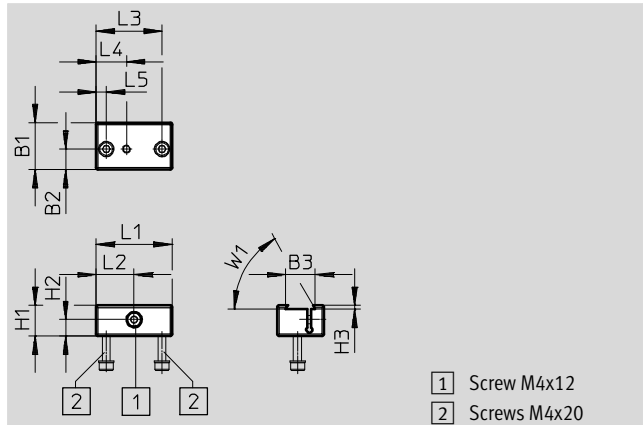| Dimensions [mm] and ordering data											
B1	B2	D1 $\varnothing$	D2 $\varnothing$	H1	L1	L2	L3	L4	Weight [g]	Part no.	Type
45	30	6.3	4.3	70	65.5	19.5	7.5	27.4	209	**8058739**	SBAM-C6-A2-AF
									28	**8058740**	SBAM-C6-CP-AF

Mounting
SBAM-C6-CP

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 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.
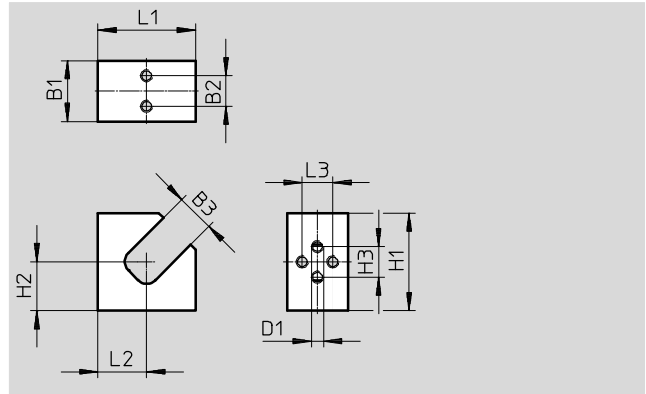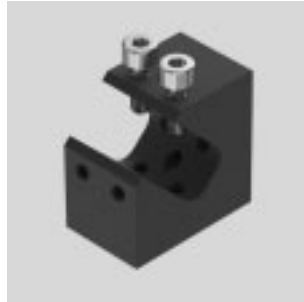
Mounting
SBAM-C6-CP-AF

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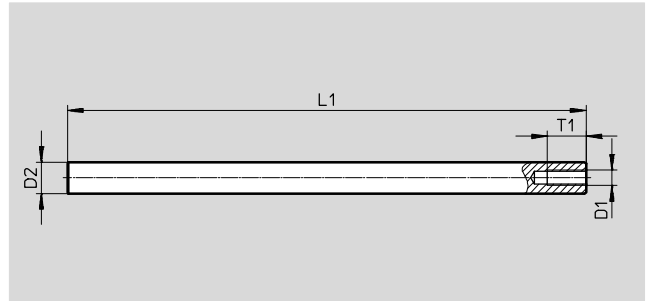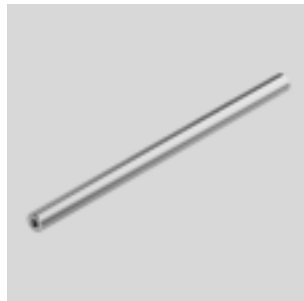wrought aluminium alloy
Note on materials: RoHS-compliant

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 [CRC[1]]	Weight [g]	Part no.	Type
M6	12	200	15	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 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.
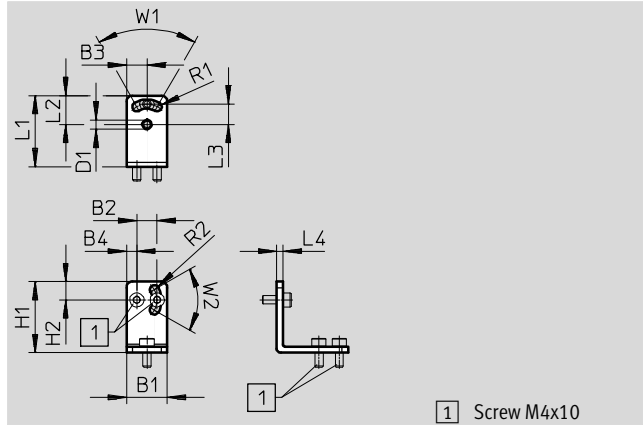
Mounting bracket
SBAM-C6-A
Type of mounting: with through-hole
Information on materials: high-alloy
steel
Note on materials: RoHS-compliant

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

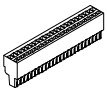| L4	R1	R2	W1	W2	Weight [g]	CRC[1]	Part no.	Type
3	2.3	2.3	60°	60°	27	2	**8031377**	**SBAM-C6-A**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmo-
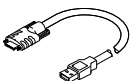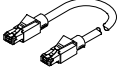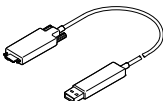sphere typical for industrial applications.

Accessories – Ordering data

Ordering data – Plug

	Description	PU[1]	Part no.	Type
	Plug for self-assembly	1	**575303**	**NECC-L2G4-C1-M**
	Plug for self-assembly, 2-pin	1	**575302**	**NECC-L2G2-C1**
	Plug for self-assembly, 4-pin	1	**8024782**	**NECC-L2G4-C1**
	Plug for self-assembly, 5-pin	1	**575304**	**NECC-L2G5-C1**
	Plug for self-assembly, 6-pin	1	**575305**	**NECC-L2G6-C1**
	Plug for self-assembly, 8-pin	1	**575306**	**NECC-L2G8-C1**
	Plug for self-assembly, 24-pin	1	**575307**	**NECC-L2G24-C1**

1) Packaging unit

Ordering data – Memory card

	Memory capacity [GB]	Speed class	Max. read speed [MB/s]	Part no.	Type
	32	Class 10	20	**4553880**	**CAMC-M-MS-G32**

Ordering data – Connecting cable

	Electrical connection 1	Electrical connection 2	Cable length [m]	Weight [g]	Part no.	Type
	Straight plug USB 3.0 type B micro	Straight plug USB 3.0 type A	5	282	**8072582**	**NEBC-U7G10-KS-5-N-S-U5G9**
	Straight plug, RJ45	Straight plug, RJ45	1	87	**8040455**	**NEBC-R3G4-ES-1-S-R3G4-ET**
	Straight plug USB 3.0 type B micro	Straight plug USB 3.0 type A	15	444	**8093271**	**NEBC-U7G10-EH-15-N-S-U5G9**
	Straight plug USB 3.0 type B micro	Straight plug USB 3.0 type A	30	530	**8093272**	**NEBC-U7G10-EH-30-N-S-U5G9**