

## Controller SBRD-Q

**FESTO**



## Key features

### Functional principle

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 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 view is irrelevant for the inspection process. The behaviour of the camera during inspection is determined by what is called the evaluation mode. There are two different modes.

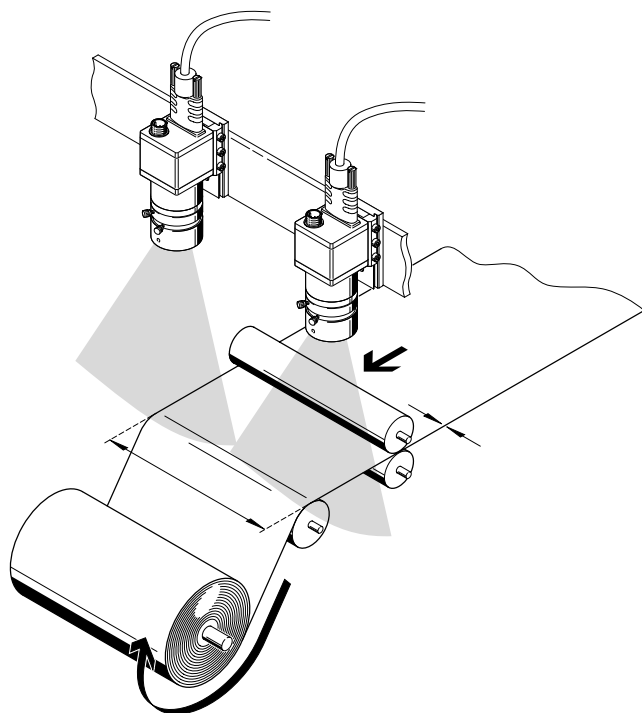
- Triggered: single image recording and inspection with each trigger signal (image evaluation is triggered by an external signal)
- Free run: continuous image recording and inspection (without fixed frame rate) as long as there is a trigger signal.

### Areas of application

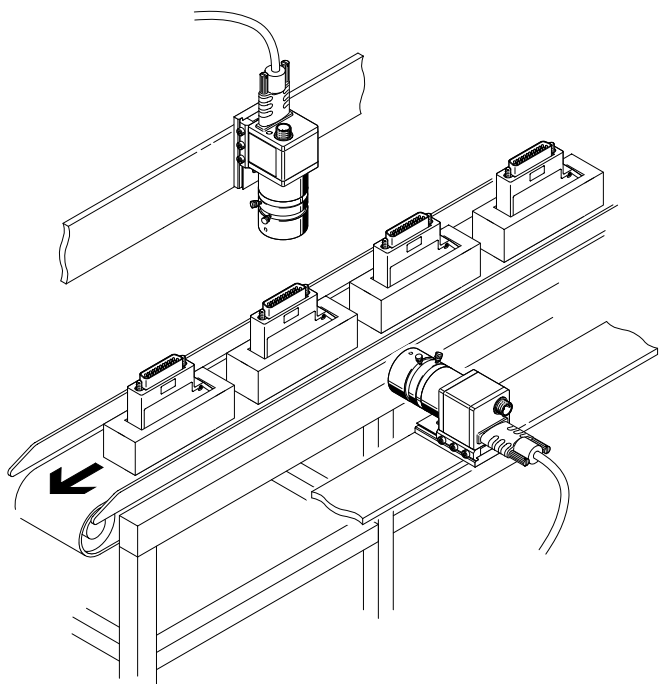
- Detecting the position and rotary orientation of parts
- Pick & place
- Quality inspection
- Measurement
- Reading of barcodes and data matrix codes (1D and 2D codes)
- Reading plain text (OCR)

### Application examples

Roller alignment



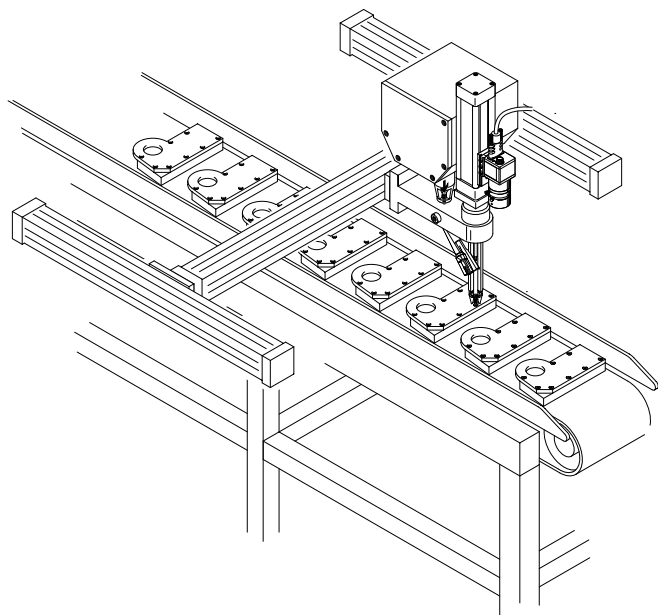
Measuring



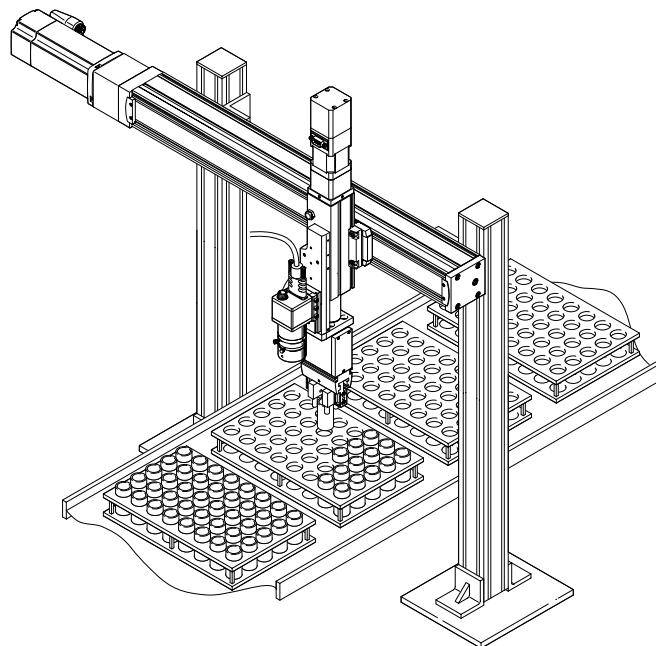
## Key features

### Application examples

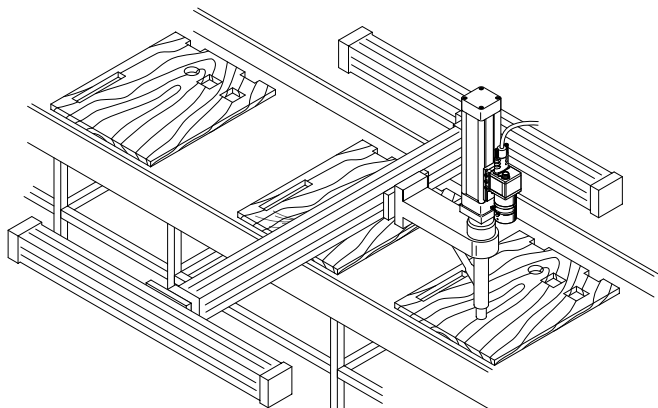
#### Screws



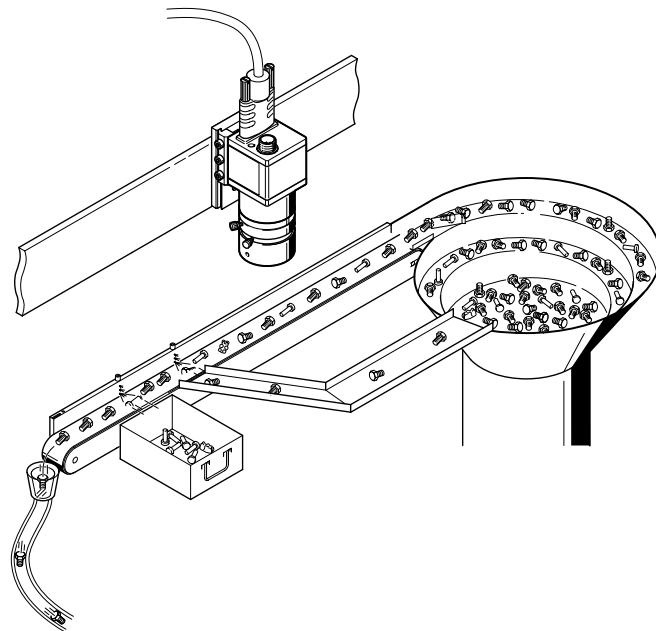
#### Pick & place



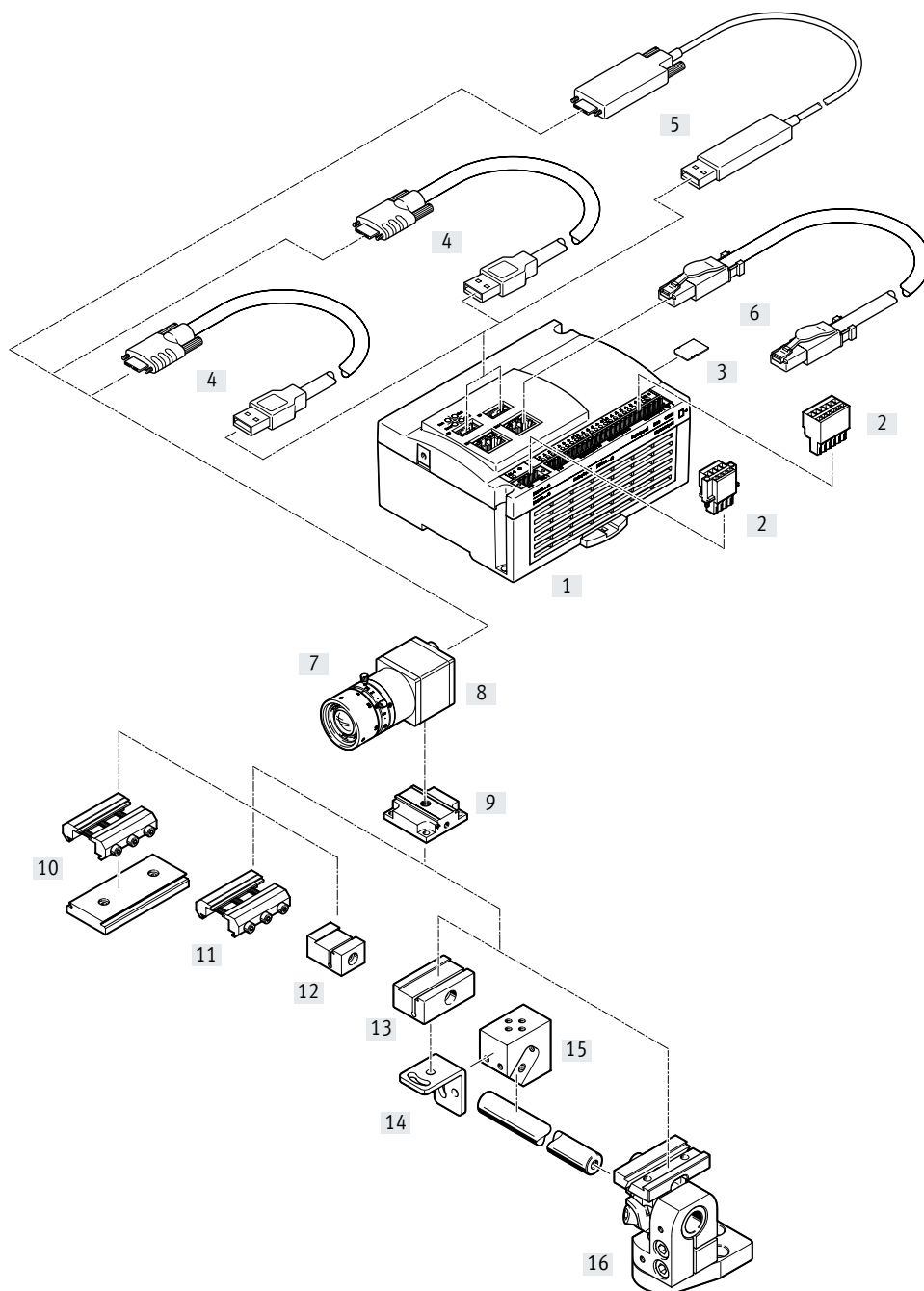
#### Bonding



#### Sorting screws



## Peripherals overview



Accessories			→ Page	Accessories			→ Page
[1]	Controller SBRD-Q		7	[10]	Adapter kit SBOA-HMSV-39		13
[2]	Plug NECC-L2G...		17	[11]	Adapter kit SBOA-HMSV-40		13
[3]	Memory card CAMC-M-MS-G32		17	[12]	Adapter kit SBOA-HMSV-41		13
[4]	Connecting cable NEBC-U7G10-KS-5-N-S-U5G9		17	[13]	Mounting SBAM-C6-CP		14
[5]	Connecting cable NEBC-U7G10-EH-...-N-S-U5G9		17	[14]	Mounting bracket SBAM-C6-A		16
[6]	Connecting cable NEBC-R3G4-ES-1-S-R3G4-ET		17	[15]	Mounting SBAM-C6-CP-AF		15
[7]	Camera head SBPB-R2...		10	[16]	Swivel mounting SBAM-C6-...		14
[8]	Lens SASF-C-L-...		12				
[9]	Mounting SBAM-C11-CP		12				

Type codes – Controller

001	Series	002	Function
SBRD		Q	Quality test

## Type codes – Camera head

001	Series	
<b>SBPB</b>	Camera head	

002	Resolution	
<b>R2</b>	1280x1024	
<b>R5</b>	1600x1200	
<b>R9</b>	2456x2054	

003	Image sensor	
<b>B</b>	Monochrome	
<b>C</b>	Colour	


004	Communication interface	
<b>U3</b>	USB 3.0	

005	Digital inputs	
<b>1E</b>	1 input	

006	Digital outputs	
<b>1A</b>	1 output	

007	Lens connection	
<b>C</b>	C mount	

## Data sheet

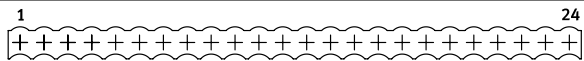
-  - Temperature range  
-5 ... 50°C



## General technical data

Dimensions W x H x L	[mm]	130 x 106 x 60
Type of mounting		Via through-hole for M4 screw With H-rail
Product weight	[g]	315
CE marking (see declaration of conformity)		To EU EMC Directive
KC mark		KC EMC
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]	Board connector, contact spacing 3.5 mm
Number of pins/wires		24
Plug pattern		
Number of inputs		12
Note on inputs		2 of the 12 inputs with integrated pull-up resistor
Switching level	[V]	Signal 1: $\geq 10$ Signal 0: $\leq 1$
Note on the switching level	[V]	Signal 0: $\leq 1$ Signal 1: $\geq 8$ For integrated pull-up resistor
Switching logic at inputs		PNP (positive switching)
Number of outputs		8
Digital outputs, output current	[mA]	450
Max. output current	[mA]	1510
Switching logic at outputs		PNP (positive switching)

## Data sheet

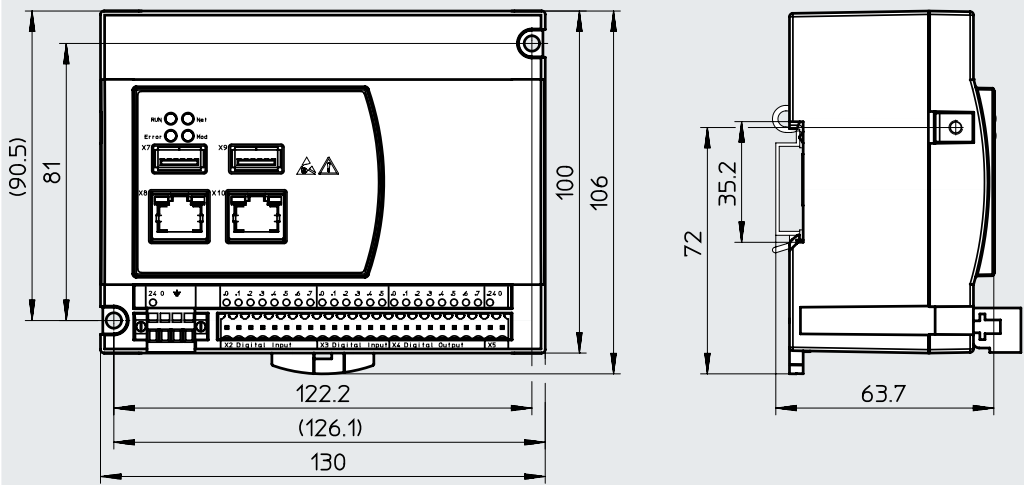
Power supply		
Function	Electronics	
Connection type	Plug	
Connection technology	[mm]	Board connector, contact spacing 3.5 mm
Number of pins/wires	4	
Plug pattern	<div>1<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div>24</div>	
Camera interface		
Function	Communication with camera only	
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	
Plug pattern	<div>9 8 7 6 5<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div>1 2 3 4</div>	
Fieldbus interface		
Function	No function	
Card slot		
Storage medium	microSD	
Storage capacity	≤ 32 GB	
Immission/emission		
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	[Mbps]	10
	[Mbps]	100
	[Mbps]	1000
Plug pattern	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div>8 7 6 5 4 3 2 1</div>	
Operating and environmental conditions		
Housing material	Reinforced PA	
Note on materials	RoHS-compliant	



Data sheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)





Type	B1	D1 Ø	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

Controller	Part no.	Type
	8067301	SBRD-Q

## 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 view	[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
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**Immission/emission**

Degree of protection	IP30 in assembled status	
Storage temperature	[°C]	-20 ... +60
Ambient temperature	[°C]	0 ... +40

**Electronics**

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

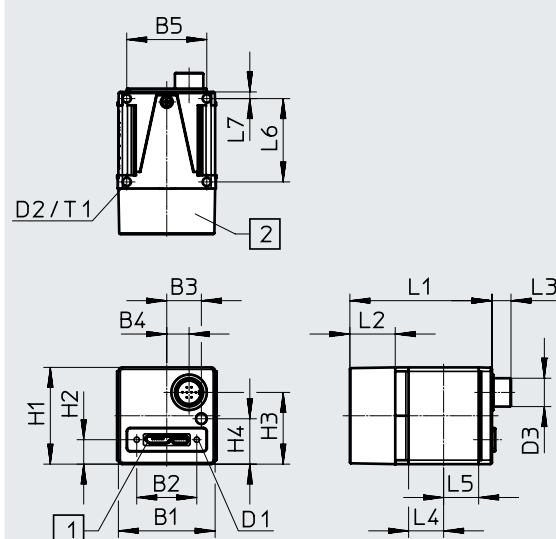
## Accessories – Ordering data

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](http://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 Ø	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

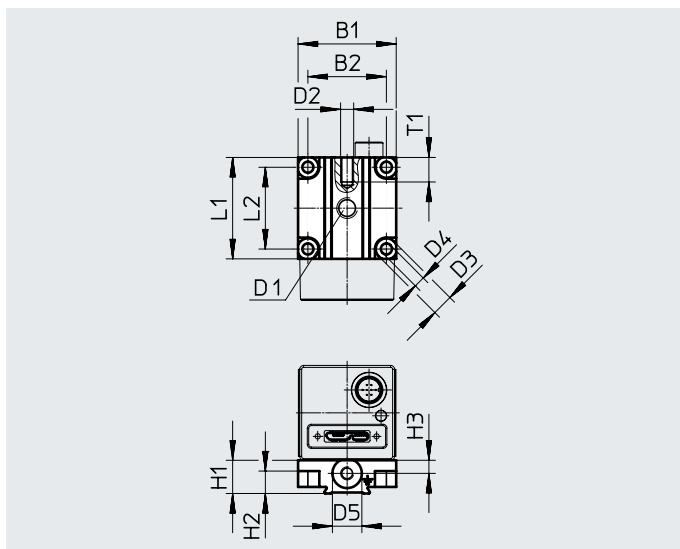
## Accessories – Ordering data

Ordering data – Lenses					Data sheets → Internet: sasf-c
	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

**Mounting SBAM-C11-CP**

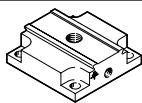
Type of mounting: Clamped with thread  
Material: Anodised wrought aluminium alloy

Note on materials:  
RoHS-compliant



Type	B1	B2	D1	D2	D3	D4	D5	H1	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		Weight [g]	Part no.	Type
Mounting		19	8066474	SBAM-C11-CP



## Accessories – Ordering data

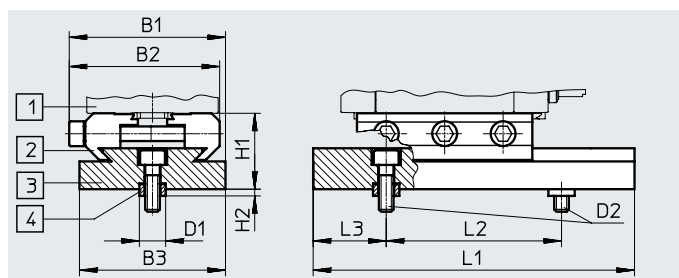
### Adapter kit

#### SBOA-HMSV-39

With screw-on adapter plate

Material:

Anodised wrought aluminium alloy



[1] Compact vision system  
[2] Clamping element

[3] Adapter plate  
[4] Centring sleeve ZBH 9

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

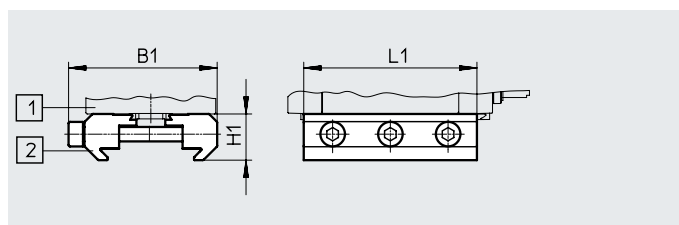
### Adapter kit

#### SBOA-HMSV-40

Without screw-on adapter plate

Material:

Anodised wrought aluminium alloy



[1] Compact vision system  
[2] Clamping element

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

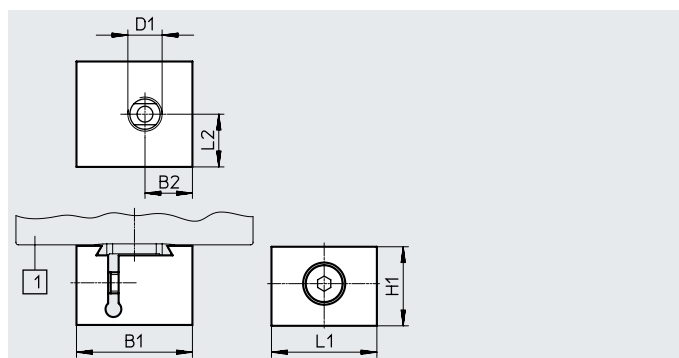
### Adapter kit

#### SBOA-HMSV-41

With female thread G1/4 for mounting on commercially available tripods

Material:

Anodised wrought aluminium alloy



[1] Compact vision system

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

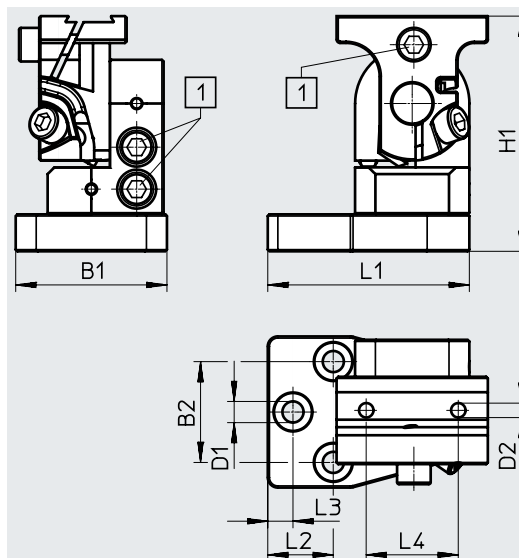
## Accessories – Ordering data

**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**

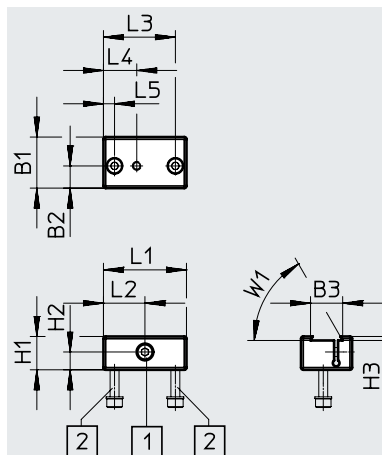
B1	B2	D1 ø	D2 ø	H1	L1	L2	L3	L4	Weight [g]	Part no.	Type
45	30	6.3	4.3	70	65.5	19.5	7.5	27.4	209	8058739	SBAM-C6-A2-AF
									28	8058740	SBAM-C6-CP-AF

**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] Screw M4x20

**Dimensions [mm] and ordering data**

B1	B2	B3	H1	H2	H3	L1	L2	L3	L4	L5	W1	Weight [g]	CRC <sup>1)</sup>	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 – Ordering data

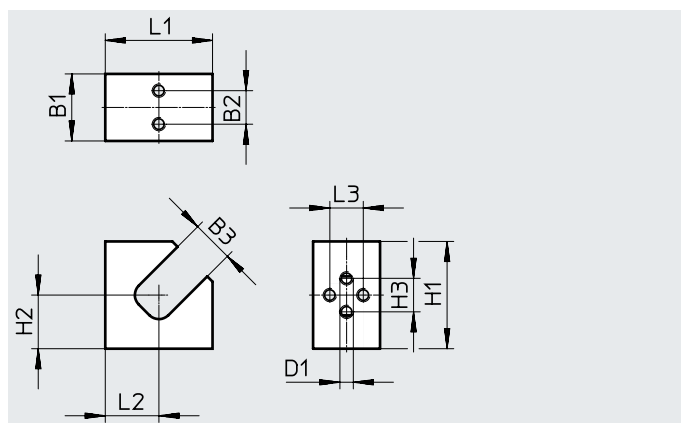
### Mounting

#### 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

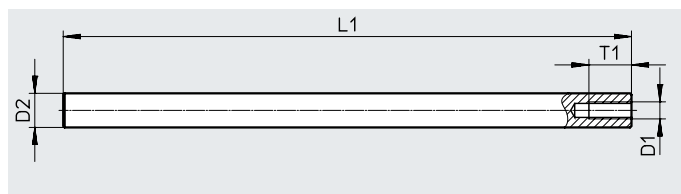
B1	B2	B3	D1	H1	H2	H3	L1	L2	L3	Weight [g]	Part no.	Type
20	10	12.5	M4	32	16	10	32	16	10	28	8058740	SBAM-C6-CP-AF

### 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 Ø	L1	T1	Corrosion resistance class [CRC <sup>1)</sup> ]	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 can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Accessories – Ordering data

Mounting bracket

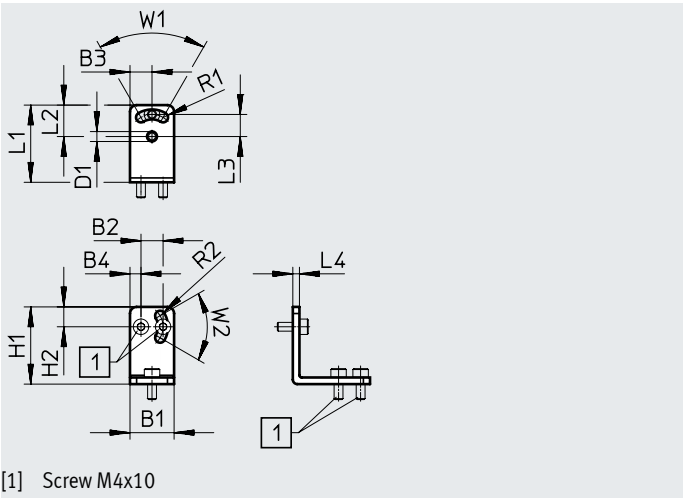
SBAM-C6-A

Type of mounting: With through-hole

Information on materials: High-alloy

steel

Note on materials: RoHS-compliant





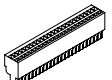
Dimensions [mm] and ordering data									
B1	B2	B3	B4	D1 ø	H1	H2	L1	L2	L3
20	10	10	5	4.5	35	9	35	14.3	10

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

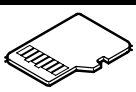
1) Corrosion resistance class CRC 2 to Festo standard FN 940070  
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

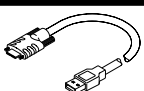
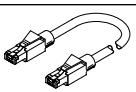
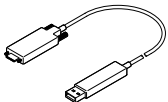

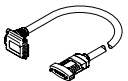


## Accessories – Ordering data

Ordering data – Plugs				
	Description	PU <sup>(1)</sup>	Part no.	Type
	Plugs for self-assembly	1	<b>575303</b>	<b>NECC-L2G4-C1-M</b>
	Plugs for self-assembly, 2-pin	1	<b>575302</b>	<b>NECC-L2G2-C1</b>
	Plugs for self-assembly, 4-pin	1	<b>8024782</b>	<b>NECC-L2G4-C1</b>
	Plugs for self-assembly, 5-pin	1	<b>575304</b>	<b>NECC-L2G5-C1</b>
	Plugs for self-assembly, 6-pin	1	<b>575305</b>	<b>NECC-L2G6-C1</b>
	Plugs for self-assembly, 8-pin	1	<b>575306</b>	<b>NECC-L2G8-C1</b>
	Plugs for self-assembly, 24-pin	1	<b>575307</b>	<b>NECC-L2G24-C1</b>

1) Packaging unit

Ordering data – Memory card					
	Storage capacity [GB]	Speed class	Max. read speed [MB/s]	Part no.	Type
	32	Class 10	20	<b>4553880</b>	<b>CAMC-M-MS-G32</b>

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	<b>8072582</b>	<b>NEBC-U7G10-KS-5-N-S-U5G9</b>
	Straight plug, RJ45	Straight plug, RJ45	1	87	<b>8040455</b>	<b>NEBC-R3G4-ES-1-S-R3G4-ET</b>
	Straight plug USB 3.0 type B micro	Straight plug USB 3.0 type A	15	444	<b>8093271</b>	<b>NEBC-U7G10-EH-15-N-S-U5G9</b>
	Straight plug USB 3.0 type B micro	Straight plug USB 3.0 type A	30	530	<b>8093272</b>	<b>NEBC-U7G10-EH-30-N-S-U5G9</b>
	Straight socket	Open end	5	160	<b>8132476</b>	<b>NEBC-H25G8-ES-5-N-B-LE4</b>
	Angled socket	Straight socket USB 3.0 type B micro	0.45	35	<b>8093270</b>	<b>NEBC-U7W10-KS-0.5-N-SB-U7G10</b>