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.
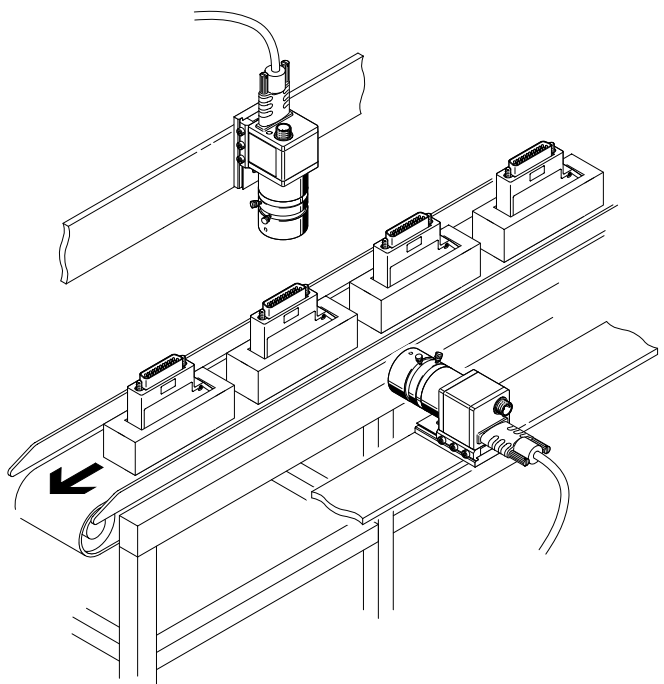
Areas of application

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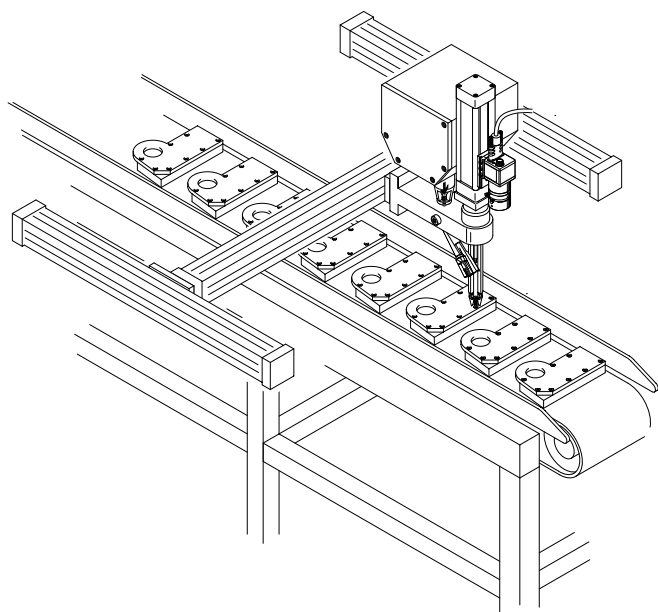- Reading plain text (OCR)
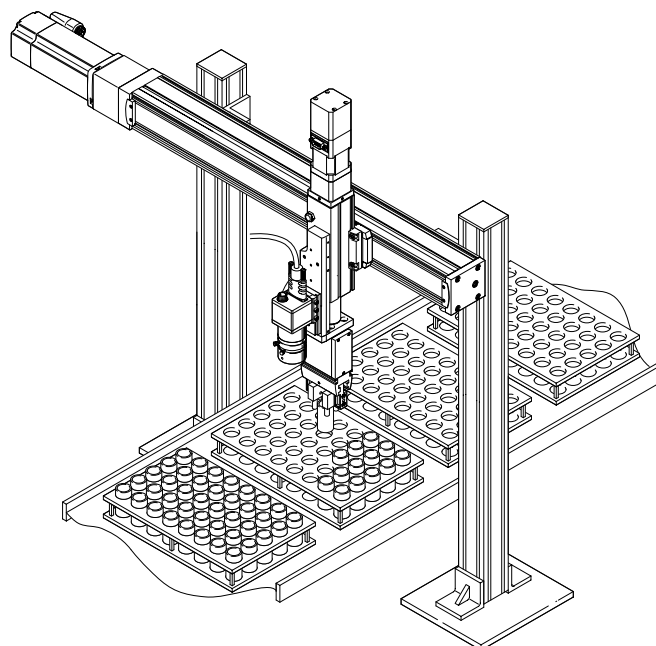
Application examples
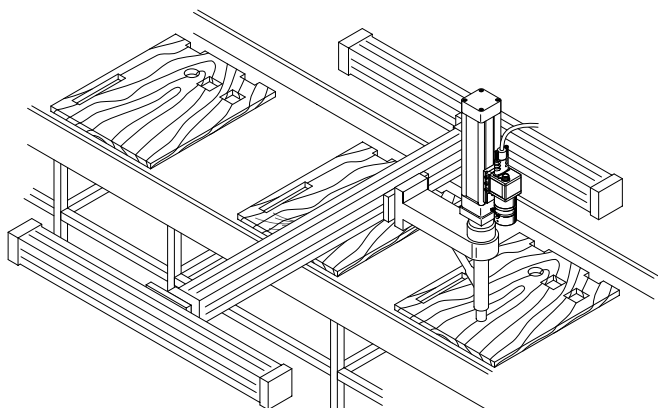
Roller alignment
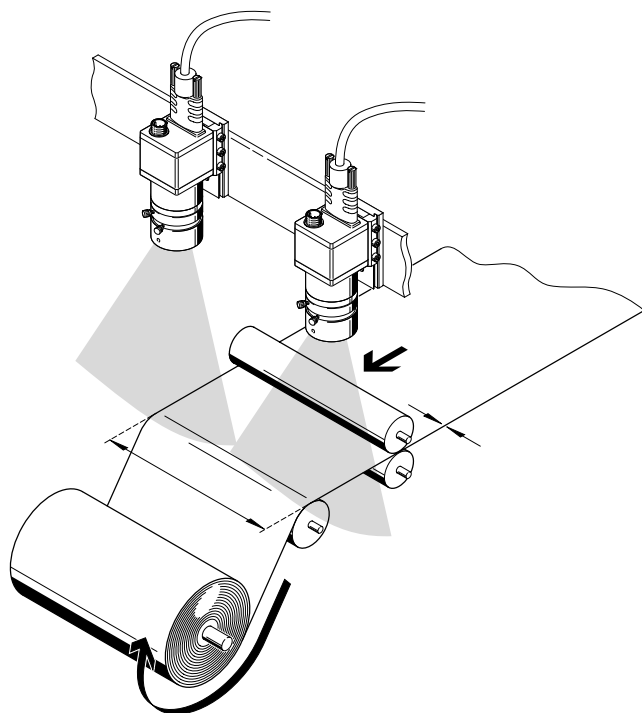
Measuring

Key features

Screws

Pick & place

Bonding

Sorting screws
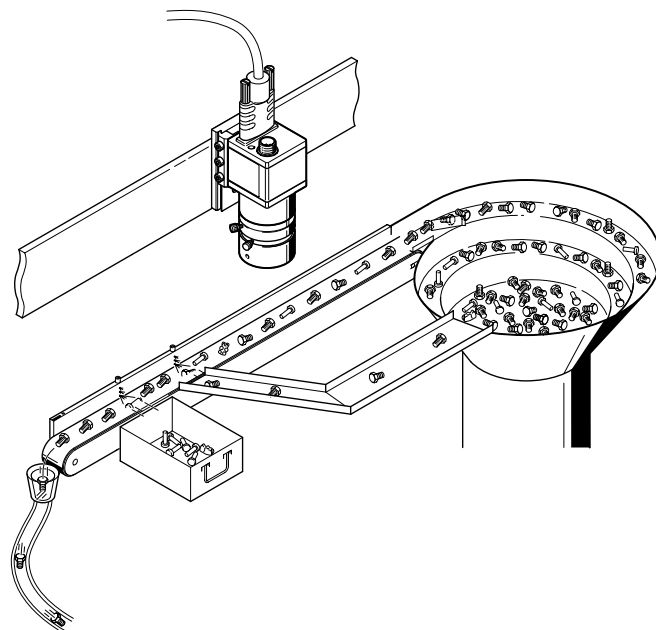
Peripherals overview
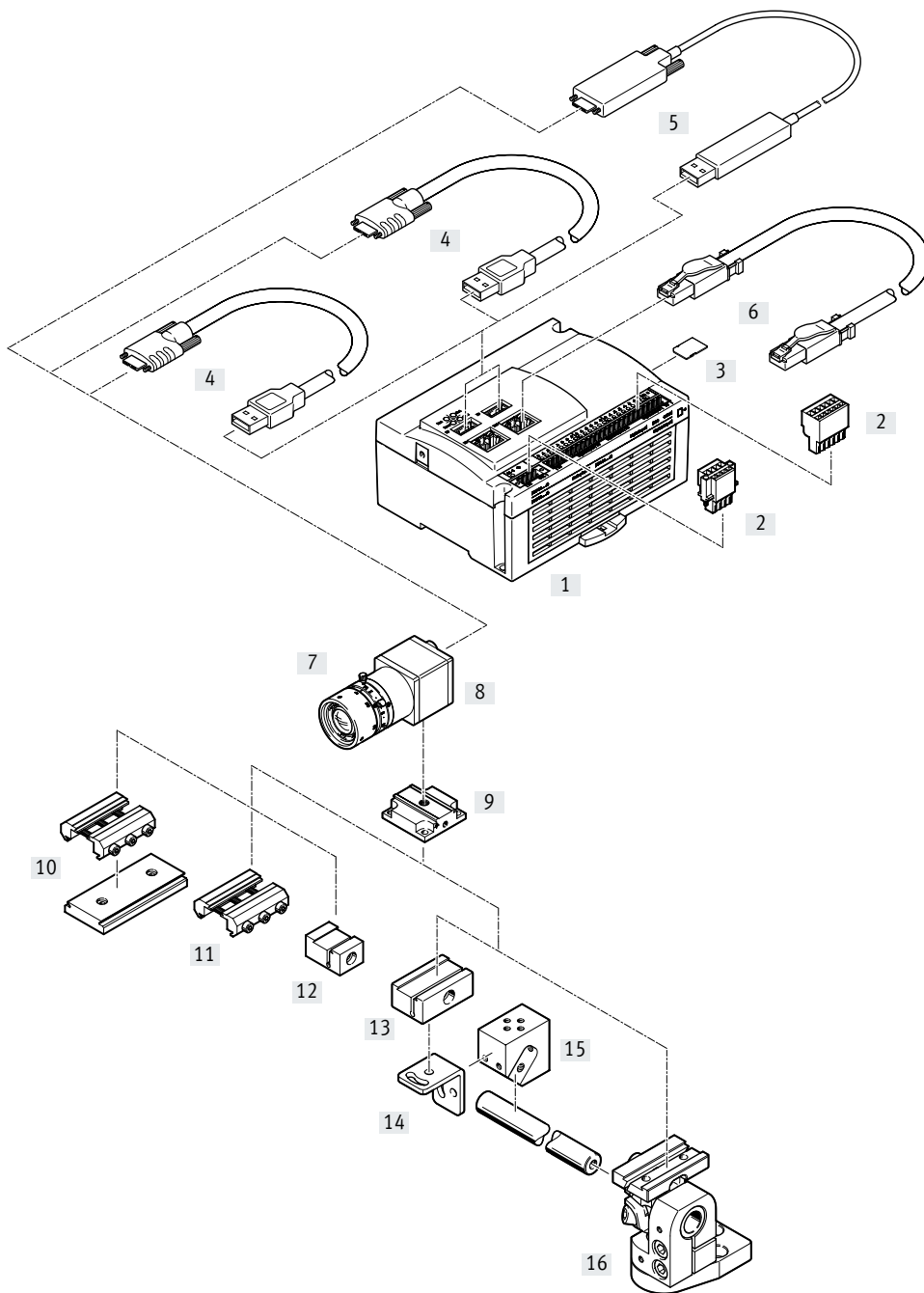
Accessories		→ Page		Accessories		→ Page
[1]	Controller SBRD-Q	7		[10]	Adapter kit SBOA-HMSV-39	13
[2]	Plug NECC-L2G...	17		[11]	Adapter kit SBOA-HMSV-40	13
[3]	Memory card CAMC-M-MS-G32	17		[12]	Adapter kit SBOA-HMSV-41	13
[4]	Connecting cable NEBC-U7G10-KS-5-N-S-U5G9	17		[13]	Mounting SBAM-C6-CP	14
[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	
SBRD	Controller	

002	Function	
Q	Quality test	

Type codes – Camera head

001	Series	
SBPB	Camera head	

002	Resolution	
R2	1280x1024	
R5	1600x1200	
R9	2456x2054	

003	Image sensor	
B	Monochrome	
C	Colour	

004	Communication interface	
U3	USB 3.0	

005	Digital inputs	
1E	1 input	

006	Digital outputs	
1A	1 output	
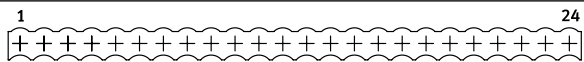
007	Lens connection	
C	C mount	

Data sheet
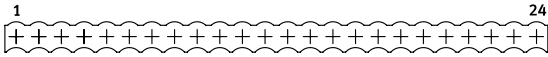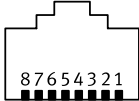
- 🌡 - Temperature range
  −5 ... 50°C

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		(diagram: pins 1 to 24)
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
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		1 24

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	9 8 7 6 5 / 1 2 3 4

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		8 7 6 5 4 3 2 1

Operating and environmental conditions

Housing material	Reinforced PA
Note on materials	RoHS-compliant

Data sheet
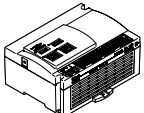
Dimensions　　　　　　　　　　　　　　　　　　　　　　　　　Download CAD data ➜ www.festo.com
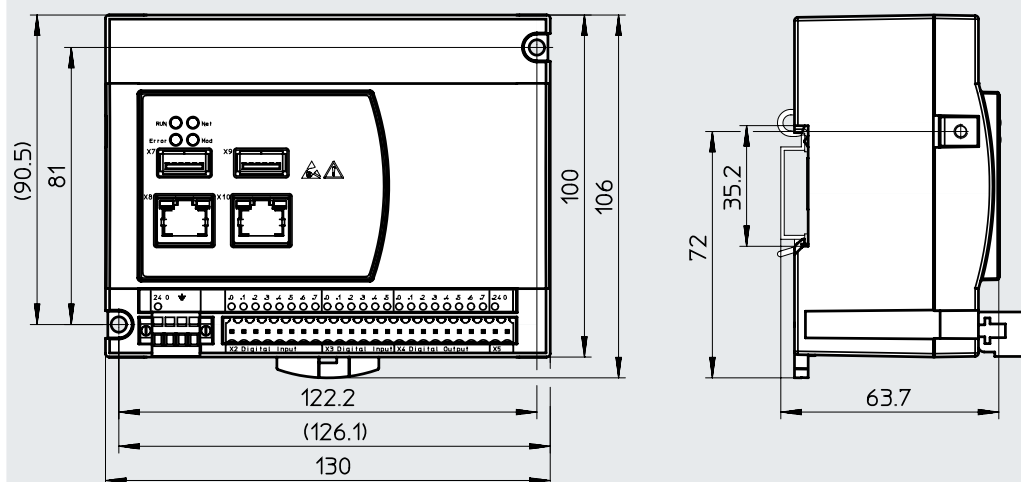
Type	B1	D1 ∅	H1	H2	H3	H4	H5	H6	L1	L2	L3
SBRD-Q	63.7	4.5	106	100	90.5	81	72	35.2	130	126.1	122.2

Ordering data

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

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

→ Internet: www.festo.com/catalogue/…   Subject to change – 2022/07

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

SBPB-R...-U3-1E1A-C
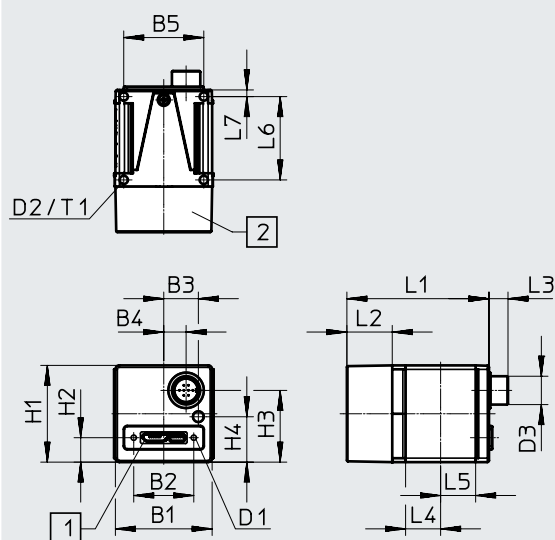
[1] USB 3.0 micro connection
[2] Protective cap

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

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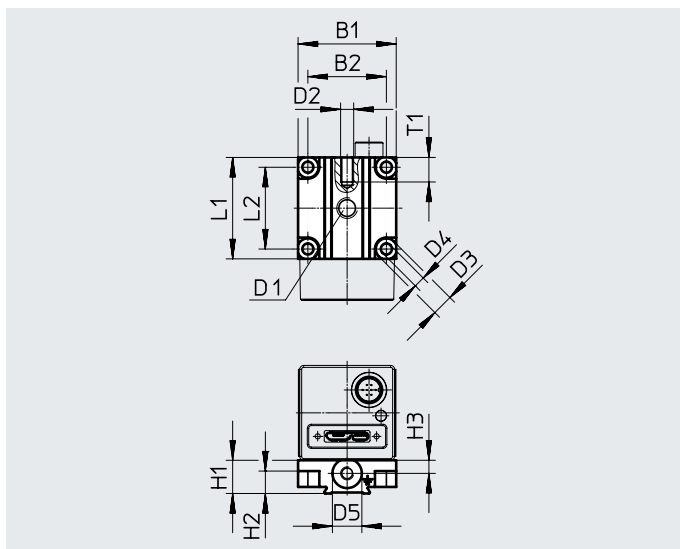
Type	B1	B2	D1	D2	D3 ∅	D4 ∅	D5 ∅	H1 −0.2	H2	H3	L1	L2	T1
SBAM-C11-CP	30	24	1/4-20 UNC	M4	6.5	3.4	9	10.2	6.9	4	31	25	7.5

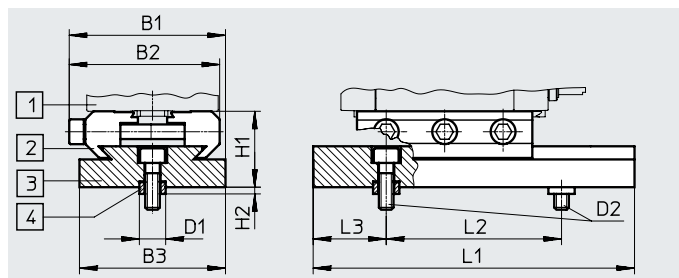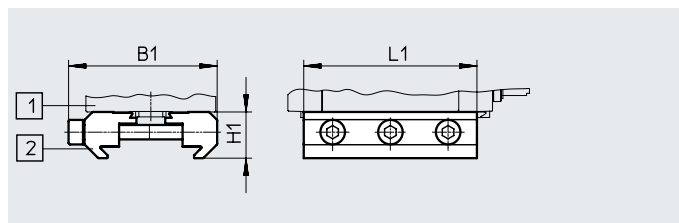| Ordering data					
Mounting			Weight [g]	Part no.	Type
			19	**8066474**	**SBAM-C11-CP**

Accessories – Ordering data

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

Material:
Anodised wrought aluminium alloy

[1]   Compact vision system   [3]   Adapter plate
[2]   Clamping element   [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

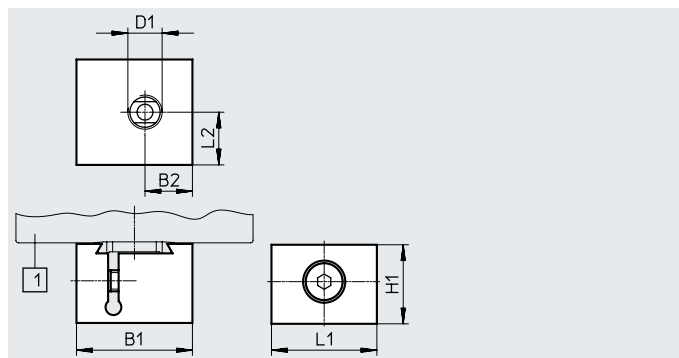**Adapter kit**
SBOA-HMSV-41
With female thread G1/4 for mounting
on commercially available tripods

Material:
Anodised wrought aluminium alloy

[1]   Compact vision system

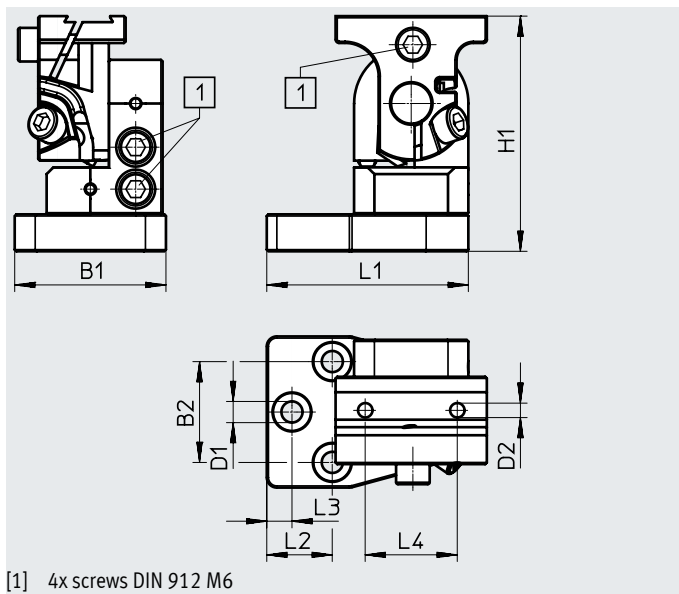| Ordering data		Part no.	Type
Adapter kit		542140	SBOA-HMSV-41

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

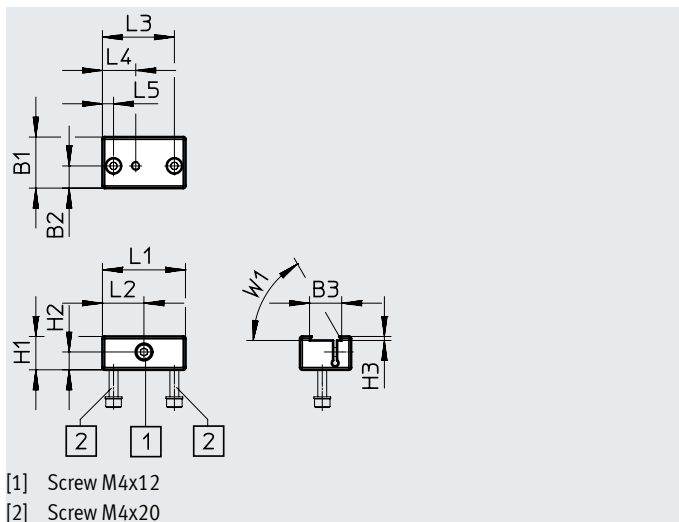| B1	B2	D1 ∅	D2 ∅	H1	L1	L2	L3	L4	Weight [g]	Part no.	Type
45	30	6.3	4.3	70	65.5	19.5	7.5	27.4	209	**8058739**	**SBAM-C6-A2-AF**
									28	**8058740**	**SBAM-C6-CP-AF**

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[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.
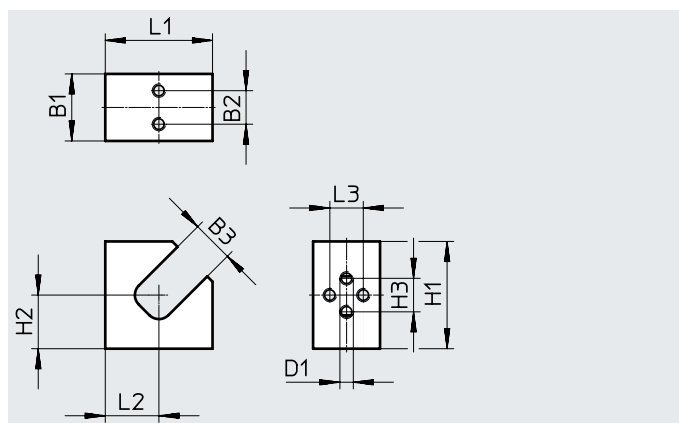
Accessories – Ordering data

Mounting
SBAM-C6-CP-AF
Type of mounting: With thread,
clamped
Information on materials: Anodised
wrought aluminium alloy
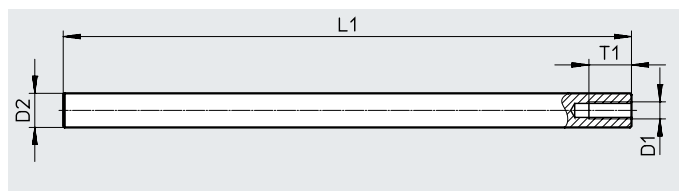Note on materials: RoHS-compliant

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 ∅	L1	T1	Corrosion resistance class [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 can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.
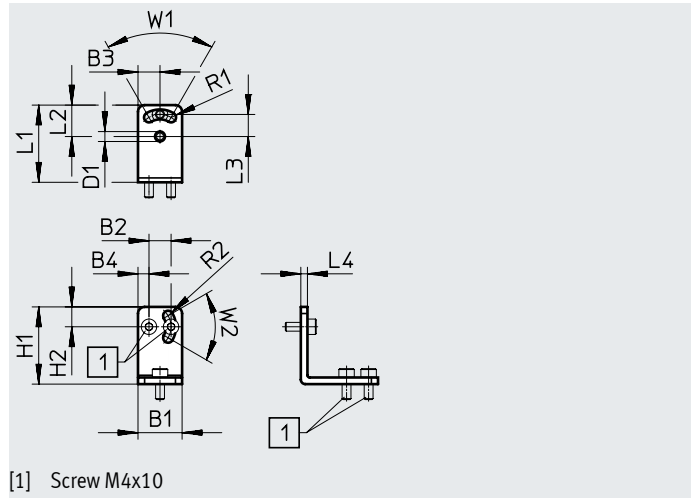
Accessories – Ordering data

Mounting bracket
SBAM-C6-A
Type of mounting: With through-hole
Information on materials: High-alloy steel
Note on materials: RoHS-compliant

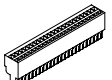[1]   Screw M4x10

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.
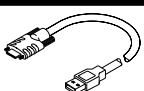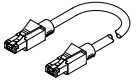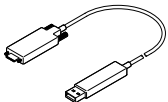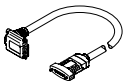
Accessories – Ordering data

Ordering data – Plugs

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

1) Packaging unit

Ordering data – Memory card

	Storage capacity [GB]	Speed class	Max. read speed [MB/s]	Part no.	Type
	32	Class 10	20	**8094425**	**CAMC-M-MS-G32-G2**

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**
	Straight socket	Open end	5	160	**8132476**	**NEBC-H25G8-ES-5-N-B-LE4**
	Angled socket	Straight socket USB 3.0 type B micro	0.45	35	**8093270**	**NEBC-U7W10-KS-0.5-N-SB-U7G10**