Checkbox Compact CHB-C

FESTO

- Compact design
- User-friendly
- Defined interfaces
- Individual integration

Checkbox Compact CHB-C

Key features

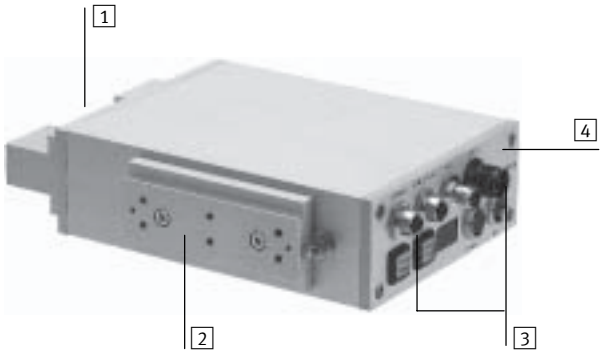
FESTO

High functionality

The integrated inspection units in detail

The Checkbox Compact consists of a housing which comprises all the necessary components. In addition to the user interface (keys, LEDs, displays), the connectors for the electrical connection of actuators, buffer zone sensors, diagnostics PC, voltage supply, encoder and master PLC, there is the entire imaging sensor system (optics, lighting and camera).

The optical channel underneath the Checkbox Compact is open towards the rear side, thus it can be easily integrated in the material flow.

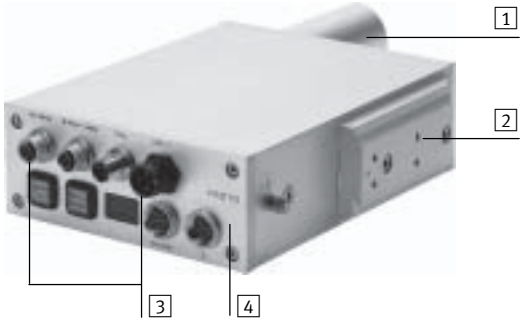


1 Optical channel
2 Mounting elements
- 6xM5 threaded hole
- Dowel pins
- Dovetail guide for connecting kit HMSV-12

3 Electrical connections
- Digital I/O
- Diagnostic interface
- Encoder
- Voltage supply

4 Front plate with the user interface
- Buttons
- Control LEDs
- Display

The Checkbox Compact Flex has the same structure and functionality, but is equipped with a C-mount lens and has no lighting.



1 Lens in protective tube
2 Mounting elements
- 6xM5 threaded hole
- Dowel pins
- Dovetail guide for connecting kit HMSV-12

3 Electrical connections
- Digital I/O
- Diagnostic interface
- Encoder
- Voltage supply

4 Front plate with the user interface
- Buttons
- Control LEDs
- Display

Checkbox Compact CHB-C

Key features

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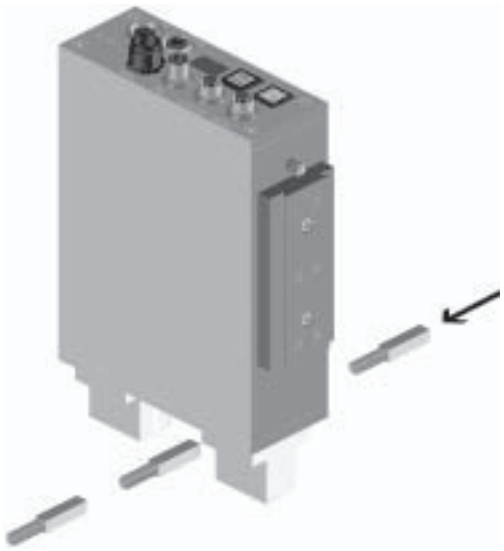
Optimum inspection of parts

Economical, variable, reliable

Components are scanned as they pass through the “optical channel”. Compared with recognition by means of an area scan camera, this image detection concept has major advantages: A mixture of any number of parts as well as objects of considerable length (up to 1 000 mm) can be recognized and processed without the need to observe minimum distances.

In order to obtain a reliable and reproducible inspection result, the speed of the parts to be checked must be constant and their position stable. A fluctuating object speed can be compensated by means of connecting an encoder (PLC-/Plus-/Flex-version).



The vertical arrangement of the lens in the Checkbox Compact Flex permits the inspection of flat parts such as gearwheels, flat plates and rubber seals, for example in combination with a transparent conveyor belt or in top light mode.

Checkbox Compact CHB-C

Key features

Which parts are suitable?

Here is a small selection of the many possibilities:

- Axes
- Bolts
- Brushes
- Buttons
- Ceramic seals
- Curtain hangers
- Drill bits
- Drills
- Fuses
- Game pieces
- Glass ampoules
- Inserts
- Insulating terminals
- Lever stoppers
- Link plates
- Lipstick casings
- Lock nuts
- Mouldings
- Mountings
- Needles
- O-rings
- Pen tops
- Plastic housings
- Plug connectors
- Screws
- Self-locking nuts
- Sensor housings
- Shafts
- Sleeves
- Small wares
- Sockets
- Spring washers
- Springs
- Stampings
- Switch contacts
- Tablets
- Threaded pins
- Toothbrush components
- Turned parts
- Wall plugs
- Washers
- Wooden dowels
- Zip-fastener components

In which branches of industry is the Checkbox Compact used?

- Metalworking industry
- Electrical engineering industry
- Woodworking industry
- Electroplating industry
- Injection moulding industry
- Packaging industry
- Pharmaceutical industry
- Cosmetics industry
- Jewellery industry
- Textile and clothing industry
- Assembly-systems industry
- Food industry
- Precision engineering industry

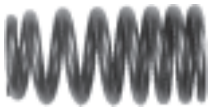
Checkbox Compact CHB-C

Key features

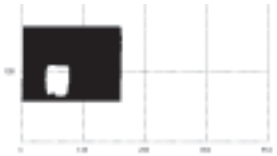
What does the camera see?

Part to be checked
Insulating terminal insert

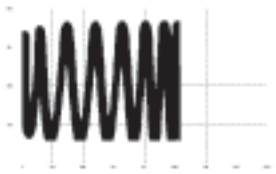
Part to be checked
Valve spring



Camera image
Insulating terminal insert



Camera image
Valve spring

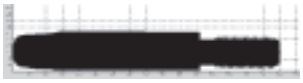


Part to be checked
Glass ampoule

Part to be checked
Glow bar

Camera image
Glass ampoule

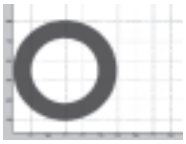
Camera image
Glow bar



Part to be checked
O-ring

Part to be checked
Aroma valve

Camera image
O-ring



Camera image
Aroma valve

Checkbox Compact CHB-C

Technical data

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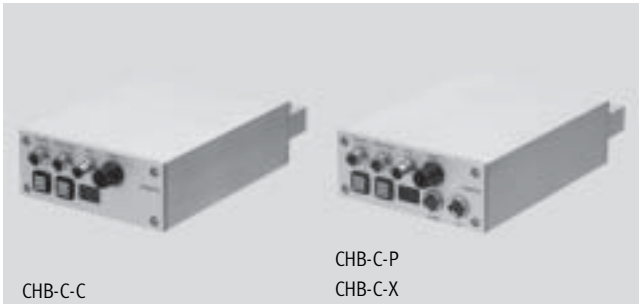
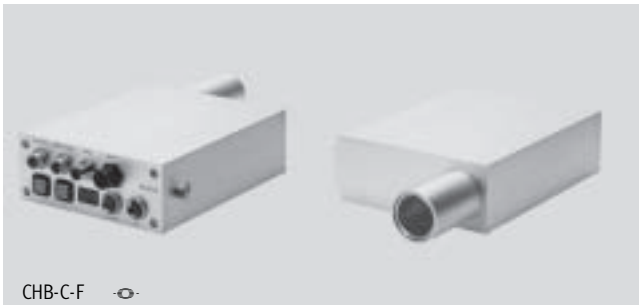
Checkbox Compact Classic
CHB-C-C

Checkbox Compact PLC
CHB-C-P

Checkbox Compact Plus
CHB-C-X



Checkbox Compact Flex
CHB-C-F



General technical data					
Type		CHB-C-C	CHB-C-P	CHB-C-X	CHB-C-F
Component ∅	[mm]	0.5 ... 25			0.5 ... 45
Component length	[mm]	Depending on belt speed and required resolution			
Part range		Flat and rotationally symmetrical parts and pre-oriented parts of any shape			
Operating distance	[mm]	–			95 ... 99
Field of vision	[mm]	–			42 ... 45
Internal passage of optical channel	[mm]	60			–
Internal height of optical channel	[mm]	40			–
Camera resolution	[mm]	0.06			0.04
Exposure time	[µs]	128 ... 1 024			
Number of part memories		1	4	16	
Counting function		–	Yes		
Quantity pre-selection		–	Desired quantities of good parts can be preselected via the diagnostic interface		
Counting range		–	1 ... 2 billion		
Orientation		Max. 8 different orientations per part type			
		–	Part orientation function within checking and counting process can be switched off via diagnostic interface		

Electrical connection technology					
Type		CHB-C-C	CHB-C-P	CHB-C-X	CHB-C-F
Operating voltage		24 V DC ±15%			
Current consumption at load-free outputs	[mA]	Typically 750			
Internal fuse protection		8 A fuse			

Operating and environmental conditions					
Type		CHB-C-C	CHB-C-P	CHB-C-X	CHB-C-F
Temperature range	[°C]	–10 ... +50			
Protection class		IP 64			
Installation site		Dry, screened from extreme external light sources, cleanest possible ambient air			

Checkbox Compact CHB-C

Technical data

FESTO

Interfaces to EN 61 131-2				
Type	CHB-C-C	CHB-C-P	CHB-C-X	CHB-C-F
Outputs	Part acceptable and correctly oriented			
	Part acceptable but incorrectly oriented			
	Wrong part			
	Feeder control			
	Conveyor belt control/ready for operation			
	–	"Warning" status signal		
		Error output		
		Preselect counter reached		
	All outputs electronically limited to max. 700 mA			
	–	Max. sum current at "PLC" connection 1A		
Inputs	Buffer sensor 1			
	–	Buffer sensor 2		
		Camera enable		
		External error		
		Counter reset		
		External start		
		External sensor		
		Key lock		
		Type select 0		
		Type select 1		
Connection for encoder	–	To RS 485 specification		
Diagnosis interface	RS 232 interface (230 kBaud)			

Checkbox Compact CHB-C

Technical data

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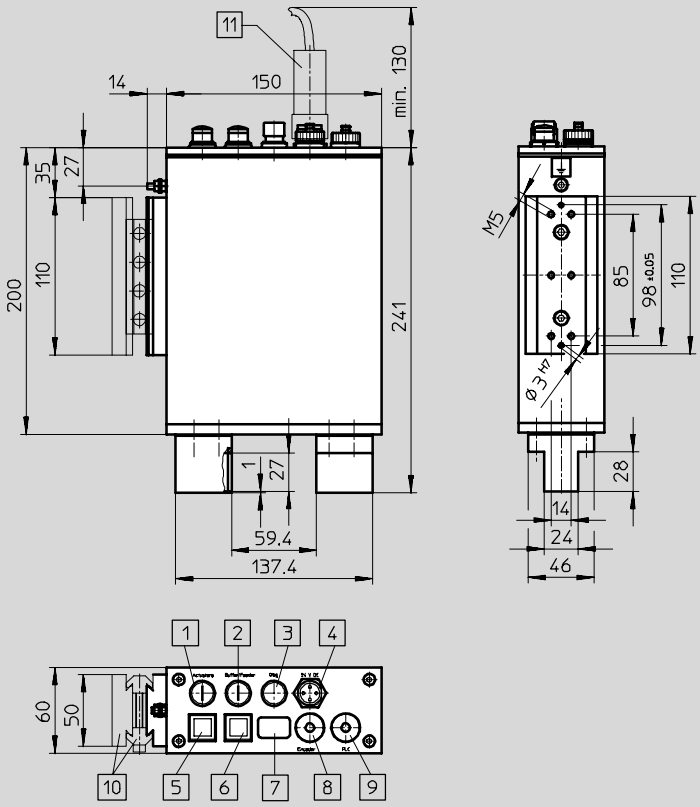
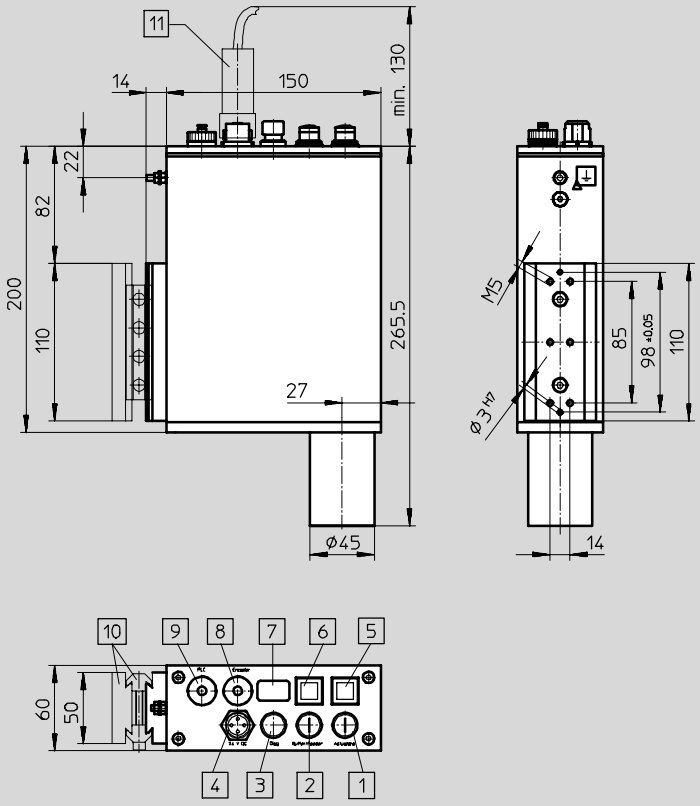
Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

CHB-C-C/-P/-X



1 Actuator connection
2 Buffer/feeder connection
3 Diagnostics connection
4 24 V DC connection
5 Start/stop button
6 Status/Teach button
7 Display
8 Encoder connection (type CHB-C-P/X only)
9 PLC connection (type CHB-C-P/X only)
10 Connecting kit 177 658 HMSV-12 (not included in scope of delivery)
11 Connector plug, 4-pin M18 socket (not included in scope of delivery)

CHB-C-F



1 Actuator connection
2 Buffer/feeder connection
3 Diagnostics connection
4 24 V DC connection
5 Start/stop button
6 Status/Teach button
7 Display
8 Encoder connection
9 PLC connection
10 Connecting kit 177 658 HMSV-12 (not included in scope of delivery)
11 Connector plug, 4-pin M18 socket (not included in scope of delivery)

Checkbox Compact CHB-C

Technical data

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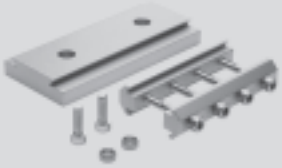
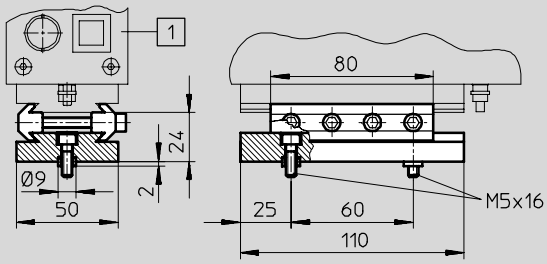
Ordering data			
Version		Part No.	Type
Checkbox Compact Classic	User documentation included in scope of delivery	**532 271**	**CHB-C-C**
Checkbox Compact PLC		**532 270**	**CHB-C-P**
Checkbox Compact Plus		**536 084**	**CHB-C-X**
Checkbox Compact Flex		**539 076**	**CHB-C-F**

User documentation (for reorder)	Part No.	Type
German	**533 411**	**P.BE-CB-COMP-DE**
English	**533 412**	**P.BE-CB-COMP-EN**
French	**533 413**	**P.BE-CB-COMP-FR**
Spanish	**533 414**	**P.BE-CB-COMP-ES**
Italian	**533 415**	**P.BE-CB-COMP-IT**

Connecting kit HMSV-12

Material:
Adapter plate, dovetail clamps:
Wrought aluminium alloy
Centring sleeves: High-alloy steel
Screws: Galvanised steel





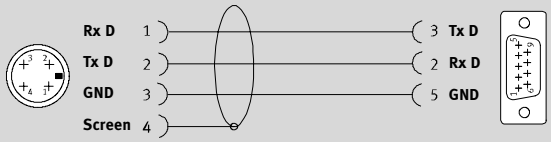
1 Checkbox Compact CHB-C

Ordering data			
Type of mounting	Weight [g]	Part No.	Type
Dovetail	283	**177 658**	**HMSV-12**

Programming cable KDI

Material:
Cable sheath: Polyvinyl chloride
Round connector:
Polybutylenterephthalate
Socket: Steel

Pin allocation



Pin 1: Received data
Pin 2: Transmitted data
Pin 3: 0 V
Pin 4: Screen

Pin 2: Received data
Pin 3: Transmitted data
Pin 5: 0 V

Ordering data					
Cable length [m]	Plug	Socket	Weight [g]	Part No.	Type
5	M12, 4-pin	9-pin	181	**150 268**	**KDI-SB202-BU9**

Checkbox Compact CHB-C

Technical data

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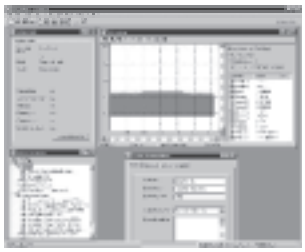
Software to meet individual requirements

CheckKon



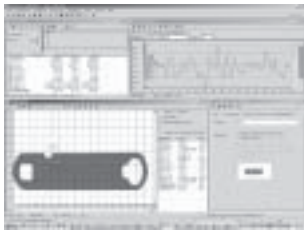
Performance characteristics

Using this software the processes within the Checkbox Compact can be displayed, logged and adapted from the camera image evaluation through to the I/O parameters.

This means:

- Transfer of new programs to the Checkbox Compact
- Display and editing of system parameters
- Display of the evaluation of the last inspected parts recorded
- Display and logging of part contour and characteristics derived
- Display and print-out of system configuration

CheckOpti



Software program

"CheckOpti" is used in cases where the standard Checkbox Compact learning program reaches its limits due to the fact that contour differences are too small, meaning that part orientation or quality features cannot be reliably recognised. "CheckOpti" enables a complete analysis of the Checkbox Compact recognition processes based on the contour data of the parts to be inspected.

Additional, high performance test features can be defined and optimised if necessary. The new configuration can subsequently be transferred to the Checkbox Compact.

Ordering data

Version	Language	Part No.	Type
CheckKon software with manual	German	**194 496**	**P.SW-CB-KON-DE**
	English	**194 497**	**P.SW-CB-KON-EN**
CheckOpti software with manual	German	**192 144**	**P.SW-CB-OPTI-DE**
	English	**192 145**	**P.SW-CB-OPTI-EN**

Checkbox Compact CHB-C

Application examples

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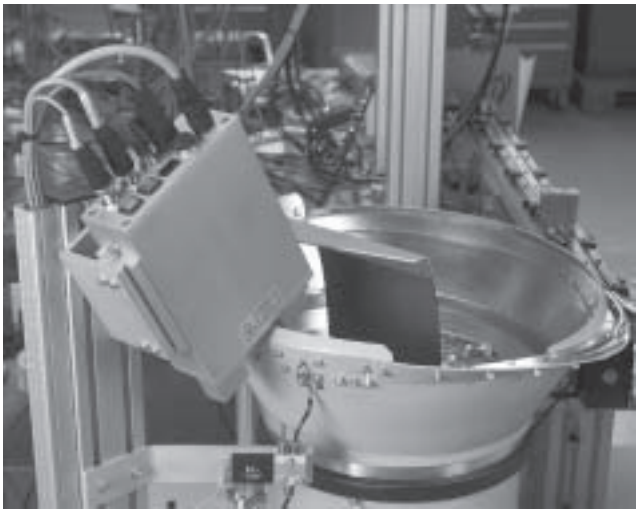
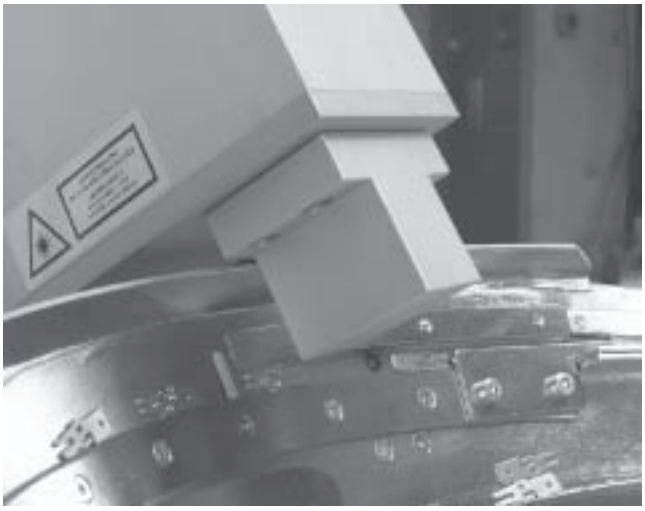
The Checkbox Compact in application

- Orientation detection of electrical contacts for the automotive industry
- Direct integration of the Checkbox Compact in a vibratory bowl feeder
- Checking of three part types with only one feeder





Checkbox Compact CHB-C

Application examples

FESTO

The Checkbox Compact in application

- Orientation detection of insulating terminal inserts for the electrical industry (20 checked parts/sec)
- Direct integration of the Checkbox Compact in a centrifugal feeder

- Orientation detection and quality inspection of hollow bolts for the metalworking industry
- Assembly of the Checkbox Compact on an industrial conveyor belt
- The entire feeding system is controlled by the Checkbox Compact (control of the conveyor, valve actuation and buffer sensing)