Checkbox Compact CHB-C

- Compact design

- User-friendly

- Defined interfaces

- Individual integration

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.
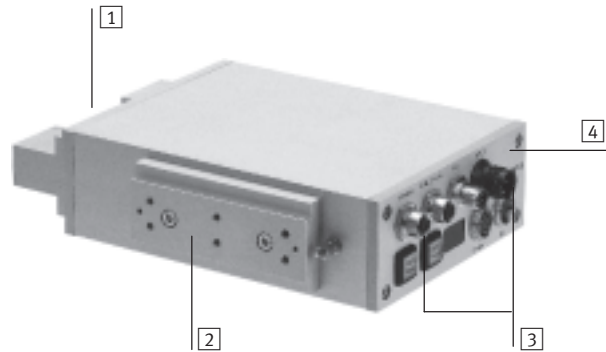

1	Optical channel	3	Electrical connections
2	Mounting elements		– Digital I/O
	– 6xM5 threaded hole		– Diagnostic interface
	– Dowel pins		– Encoder
	– Dovetail guide for connecting kit HMSV-12		– Voltage supply
		4	Front plate with the user interface
			– Buttons
			– Control LEDs
			– Display

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-version).
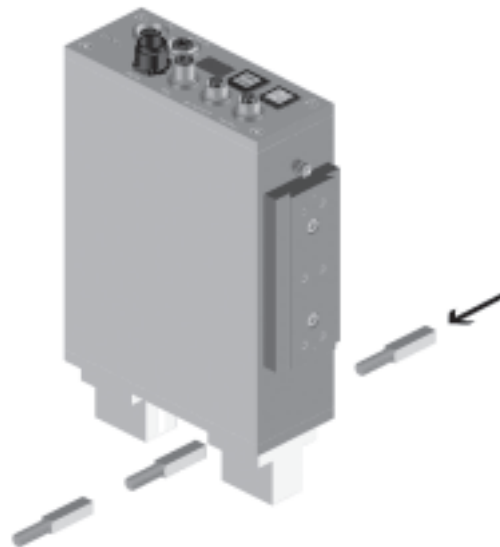
Checkbox Compact CHB-C

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
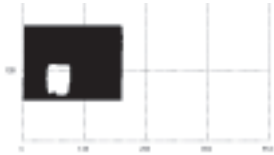- Food industry
- Precision engineering industry

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
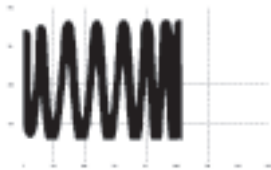
Part to be checked
Glass ampoule

Part to be checked
Glow bar

Camera image
Glass ampoule

Camera image
Glow bar

Part to be checked
O-ring

Part to be checked
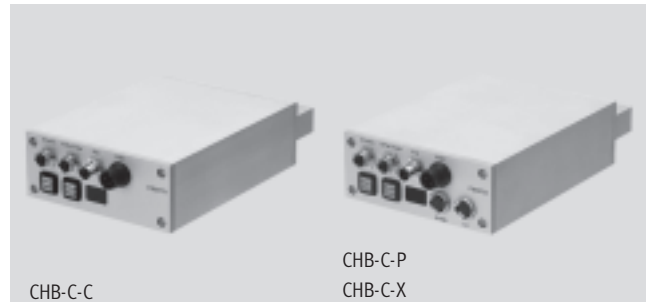Aroma valve

Camera image
O-ring

Camera image
Aroma valve

Checkbox Compact CHB-C

Technical data

Checkbox Compact Classic
CHB-C-C

Checkbox Compact PLC
CHB-C-P

Checkbox Compact Plus
CHB-C-X

CHB-C-C

CHB-C-P
CHB-C-X

General technical data				
Type		CHB-C-C	CHB-C-P	CHB-C-X
Component ⌀	[mm]	0.5 … 25		
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]	–		
Field of vision	[mm]	–		
Internal passage of optical channel	[mm]	60		
Internal height of optical channel	[mm]	40		
Camera resolution	[mm]	0.06		
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
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
Temperature range	[°C]	−10 … +50		
Protection class		IP 64		
Installation site		Dry, screened from extreme external light sources, cleanest possible ambient air		

Interfaces to EN 61 131-2			
Type	CHB-C-C	CHB-C-P	CHB-C-X
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)		

Dimensions

Download CAD data ➔ **www.festo.com**

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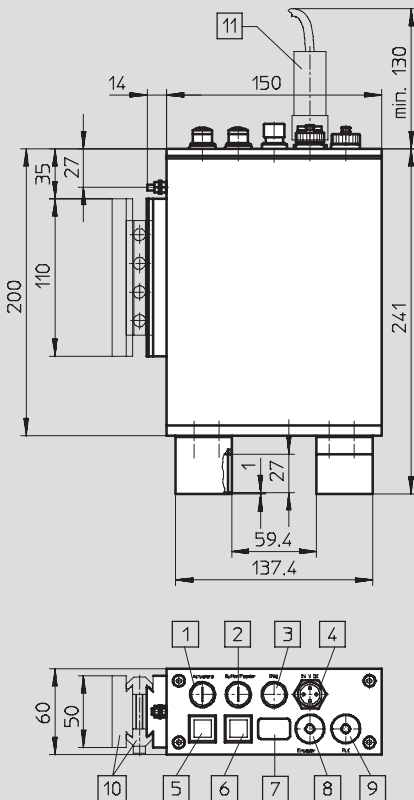
1 Actuator connection
2 Buffer/feeder connection
3 Diagnostics connection
4 24 V DC connection
5 Start/stop button
6 Status/Teach button
7 Display
8 Encoder connection
   (type CHB-C-P/X only)
9 PLC connection
   (type CHB-C-P/X only)
10 Connecting kit 177 658
   HMSV-12 (not included in
   scope of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

Technical data

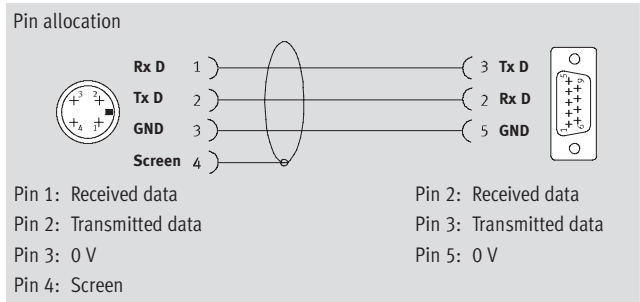| Ordering data		Part No.	Type
Checkbox Compact Classic	User documentation included in scope of delivery	**532 271**	**CHB-C-C**
Checkbox Compact PLC		**532 270**	**CHB-C-P**
Checkbox Compact Plus		**536 084**	**CHB-C-X**
User documentation (for reorder)			
German		**533 411**	**P.BE-CB-COMP-DE**
English		**533 412**	**P.BE-CB-COMP-EN**

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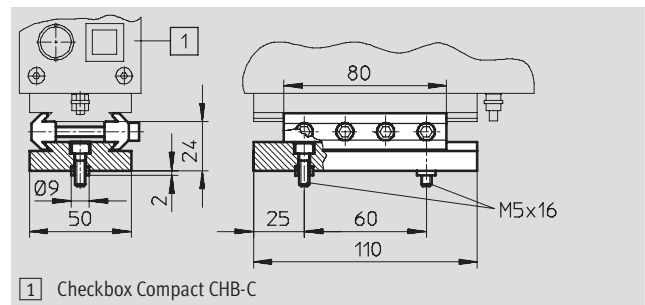
Ordering data			
Type of mounting	Weight [g]	Part No.	Type
Dovetail	283	**177 658**	**HMSV-12**

Programming cable KDI

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

Pin allocation

Rx D 1 — 3 Tx D
Tx D 2 — 2 Rx D
GND 3 — 5 GND
Screen 4

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**

## 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
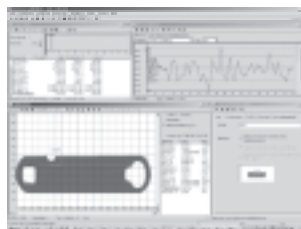
Software program

"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 – Software

|	Version	Language	Part No.	Type
	CheckKon software with manual	German, english	**194 496**	**P.SW-CB-KON**
	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

Orientation detection and quality inspection of electrocoils
The Checkbox Compact checks the electrocoils and controls the complete supply process, e.g. a following turning station for turning incorrectly orientated good parts and a reject nozzle for sorting out bad parts.

The following features are checked:
• Orientation
• Diameter
• Length
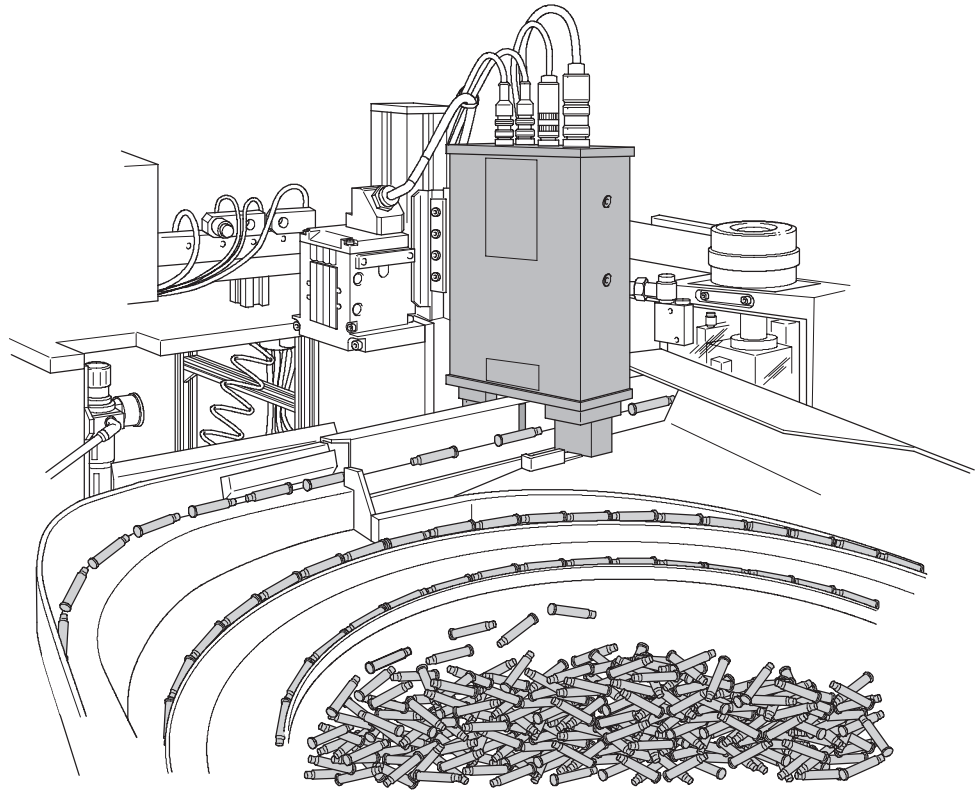
Position and quality check of fibre optic parts
The Checkbox Compact checks the transparent display elements, controls the parts flow and removes incorrectly orientated or faulty parts reliably by means of reject nozzles.

The following features are checked:
• Orientation
• Form
• Diameter