Checkbox

Incomparably convincing in action: the Checkbox

Unrivaled efficient

Contact-free parts inspection using the Checkbox enables an uninterrupted flow of conveyed parts to be realized within the production process. The result: disruptions in the supply of parts caused by mechanical problems is a thing of the past down-time approaches zero for your assembly machines. Integrated quality inspection assures uniform, high product quality for conveyed parts. At the same time, this type of inspection prevents wear and tear at conveyed parts and guide elements.

A unique ability to learn

Each Checkbox unit is capable of automatically learning the contours of up to 48 different parts by means of a Teach-in function – without any need of programming. The simple press of a button is enough to set up the conveyor system for the next part type. This is your assurance of the greatest possible degree of flexibility in production: even greatly differing parts can be run via the same conveyor system – and the expense associated with separate bowl feeders can be avoided.

Totally systematic

A complete system: from the Identbox, the basic unit for separating good parts, incorrectly oriented parts and bad parts, to the Countbox which additionally counts good parts and can be programmed with a preselected setpoint quantity, right on up to the Sortbox with an additional sorting and compiling function.

**Optoelectronic orientation detection,
quality inspection and sorting**

Wherever small parts are conveyed to assembly and production equipment, the limitations of mechanical guide elements are very quickly exceeded, especially where complex part geometries, part diversity and high cycle rates are involved. The use of intelligent optics represents an ideal supplement in such cases. The Checkbox analyses the orientation and quality of complex parts based on their contours using its integrated camera.
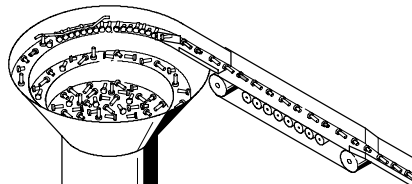
Optoelectronic systems:
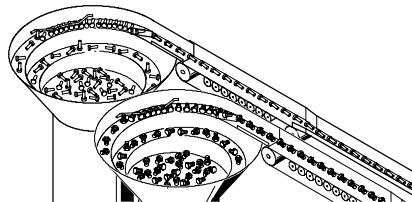**Conventional separation and positioning of small parts**

– Parts of complex shape lead to
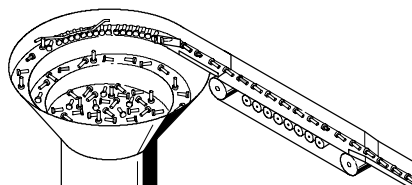   malfunctions and reduced machine
   availability
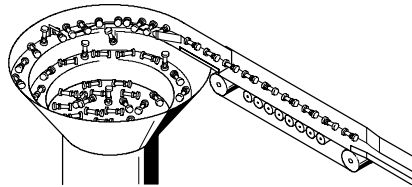
– Adaption of mechanical facilities
   incur considerable development
   costs

– Retooling is often complicated and
   therefore time-consuming and
   expensive

– Quality control using mechanical
   systems subject to wear is not
   always possible and often not reli-
   able

Optoelectronic systems:
Contactless separation and positioning of small parts

– Modular construction allows simple
  integration – also into existing
  systems
– Learns new parts thanks to the
  Teach-in function without the need
  for time-consuming programming
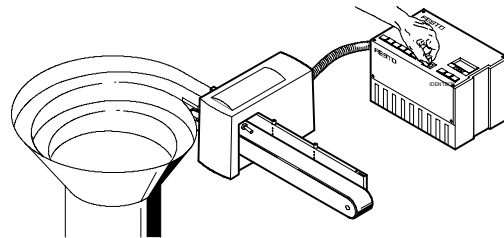
– Optical detection – complements
  feed systems, increases system
  availability and prevents wear
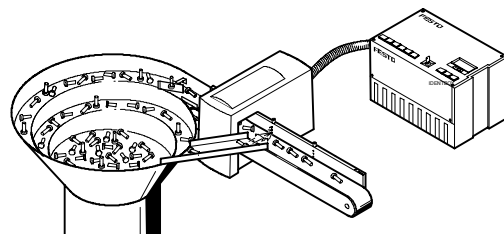
– Retooling via push button – saves
  time and costs when changing parts
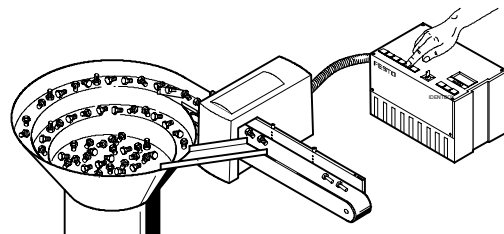
– Integrated quality inspection –
  guarantees highest product quality,
  higher cycle rates and fast
  amortization

Defective and foreign parts

Incorrectly oriented parts

Checkbox CHB
Key features

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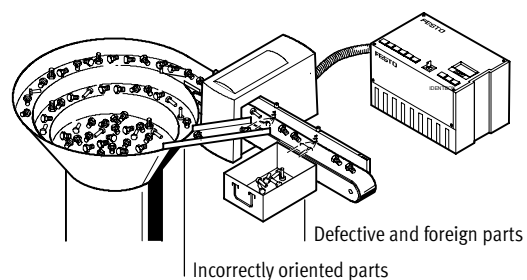### Industrial design

■ Compact integrated construction,
  protected against external light
  and maladjustment,
  IP54 protection class
■ Flexible installation, thanks to a
  modular system concept

Easy to use

■ Automatic Teach-in of new parts in
  seconds, no programming
  required
■ Robust recognition algorithm
  based on part characteristics
■ Up to 48 different parts can be
  saved to memory
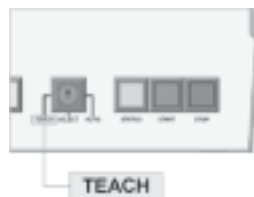
Sturdy construction and high functionality

■ High conveying performance
  thanks to variable belt speed
  (standard: 300 mm/s)
■ Maintenance-free system
■ Sturdy pneumatic components:
  Integrated valves and flow controls
■ Long service life thanks to
  brushless DC servo motor

High reliability and checking performance

■ Simple, sturdy optics with high-
  quality industrial line-scan camera
  and LED light strip
■ Insensitive to extraneous light,
  with contour detection via back-
  lighting method
■ High resolution:
  0.02 mm or 0.1 mm

TEACH

Checkbox CHB
Key features

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The Checkbox family CHB

The Checkbox is a system for the optical orientation detection and quality inspection of small parts. It consists of an optical unit, e.g. a conveying unit with integral camera and a control unit.

The part to be inspected is fed past the camera on the conveyor belt. The control unit analyses the contour of the part and distinguishes between good parts and those which are incorrectly oriented or defective and foreign parts.

All Checkbox units feature a Teach-in function which allows them to "learn" different parts automatically – without the need for programming. They are easy to use – the press of a button is all that is needed to change your feed system over from one part type to another.

The Checkbox is used wherever small parts need to be fed to assembly or machining units. This is where mechanical sorting devices reach their limits, especially where parts of complex shape or fast cycle times are involved. This calls for intelligent optical devices: The Checkbox family.

Defective or foreign parts

Incorrectly oriented parts
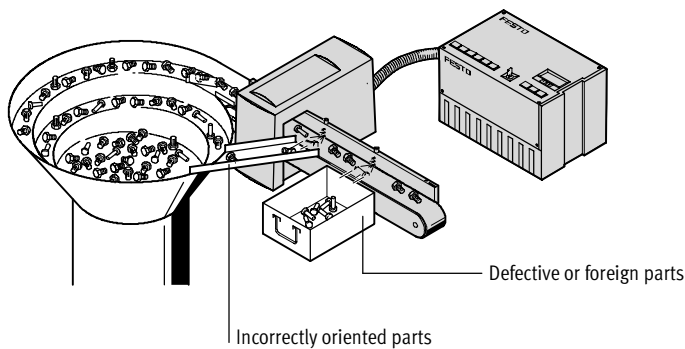
Identbox CHB-IB

The Identbox is the basic unit in the Checkbox family and is used to separate good parts, incorrectly-oriented parts and defective parts.

Countbox CHB-CB

The Countbox combines the features of the Identbox with a function for counting good parts with pre-selection of the desired quantity.

Sortbox CHB-SB

The Sortbox unites the functions of the Identbox and the Countbox in one unit and also conveys, sorts and compiles several different types of parts.

Checkbox CHB

Key features

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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

Which industries use the Checkbox family?

- 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 CHB

Key features

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What does the camera see?

Part to be checked
Brass sleeve

Part to be checked
Valve spring

Part to be checked
Plug connector

Camera image
Brass sleeve

Camera image
Valve spring

Camera image
Plug connector

Part to be checked
Unmachined rod clevis

Part to be checked
Link plate

Part to be checked
Insulating terminal insert

Camera image
Unmachined rod clevis

Camera image
Link plate

Camera image
Insulating terminal insert

Checkbox CHB

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Product range and peripherals overview

Possible combinations		
Identbox CHB-IB	Countbox CHB-CB	Sortbox CHB-SB

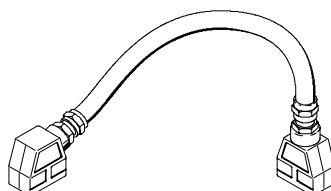Technical data ➜ 5 / 4.2-14   Technical data ➜ 5 / 4.2-14   Technical data ➜ 5 / 4.2-14

Connecting cable
Control unit/conveying unit

Cable lengths: 2 m
                 3 m
                 5 m

Conveying unit	Tunnel version	OEM version
with reject positions and conveyor belt	without reject positions and conveyor belt	without reject positions, conveyor belt and housing

Part ∅   0.5 ... 10 mm   Part ∅   3 ... 30 mm   Part ∅   3 ... 30 mm
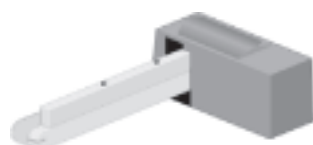Part length: 3 mm and above   Part length: 3 mm and above   3 ... 80 mm
                                                                          Part length: 3 mm and above

Part ∅   3 ... 30 mm   Part ∅   3 ... 80 mm
Part length: 3 mm and above   Part length: 5 mm and above

Part ∅   3 ... 80 mm
Part length: 5 mm and above

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Selection aid

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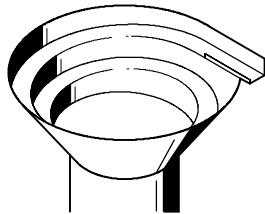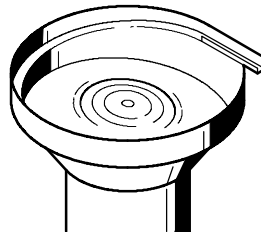| Product features			
	Identbox CHB-IB	**Countbox CHB-CB**	**Sortbox CHB-SB**
Performance characteristics			
Basic unit with full checking functionality	■	■	■
Up to 48 parts can be taught-in	■	■	■
Three feed paths: – Good parts ⋯⋗ to the assembly station – Incorrectly oriented parts ⋯⋗ back to the bowl feeder – Defective or foreign parts ⋯⋗ to the reject bin	■	■	■
Automatic control of the bowl feeder	■	■	■
Monitoring of part buffer zones	■	■	■
Self-diagnosis	■	■	■
Can be remote-controlled	■	■	■

Integrated counting function:
– 1 … 10 million parts can be pre-selected
  – When desired quantity is reached ⋯⋗ signal to downstream machine
  – Upon acknowledgement ⋯⋗ start of next cycle
– Continuous counting for production monitoring
		■	■

Simultaneous conveying of different part types and sorting into different buffer zones			■
Compiling of several parts			■
Sample applications			
Correctly oriented feeding at high cycle rates	■	■	■
Automatic rejection of defective or foreign parts	■	■	■
Quality inspection of turned and milled components for chips, burrs, etc.	■	■	■
Ejection of end pieces following automatic bar turning	■	■	■
Feeding of predetermined quantities of parts for packaging and compiling functions		■	■
Set feeding of small parts on to assembly pallets		■	■
Triggering of maintenance cycles		■	■
Feeding to several buffer zones from one bowl feeder (space saving)			■
Packaging terminal: Fully-automated control and monitoring of compiling procedures with several parts and different numbers of items			■
Sorting of mixed parts (e.g. after galvanising or grinding)			■

Checkbox CHB

Sample applications

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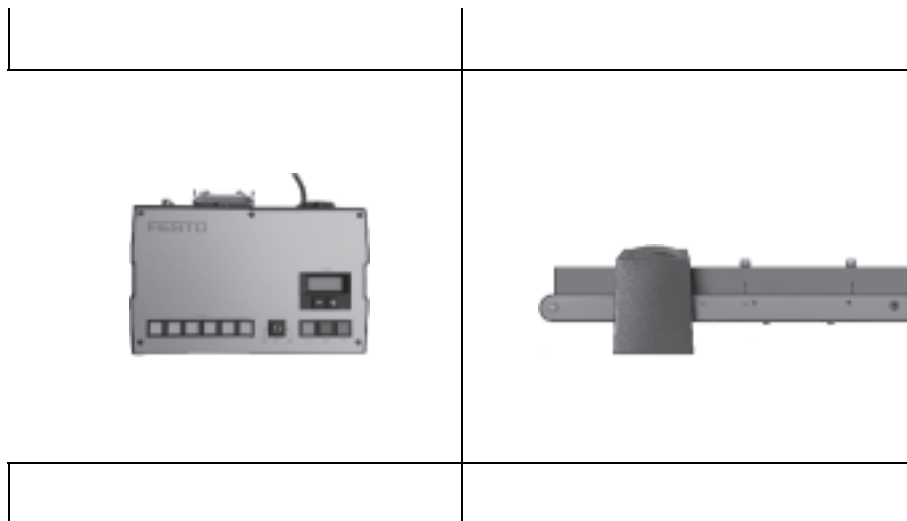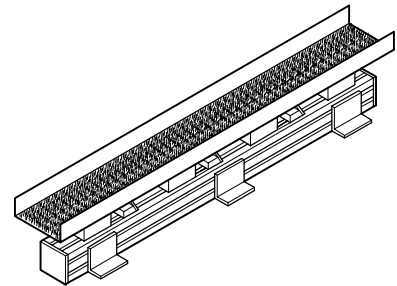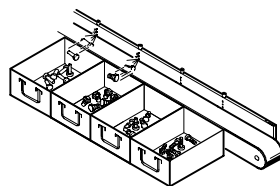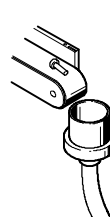| Feeding of parts		
Vibratory bowl feeder	Centrifugal bowl feeder	Linear conveyor

Transfer of parts			
Slide into the processing centre	Chute	Downpipe	Triple buffer zone
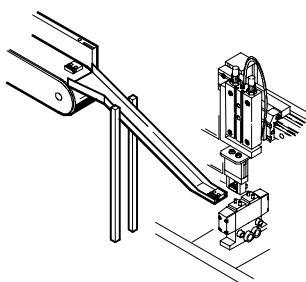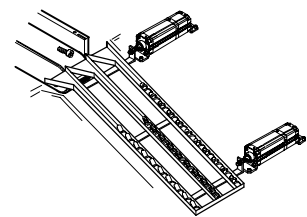
Checkbox CHB

Type code

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CHB – SB – F30 – L4P – K20 – D – EC – V33 – VA – BTA – UE – MP

Basic function	
CHB	Checkbox family

Control function	
IB	Identbox
CB	Countbox
SB	Sortbox

Component size	
F10	for ∅ 0.5 … 10 mm
F30	for ∅ 3 … 30 mm
F80	for ∅ 3 … 80 mm

Transport function	
L2P	2 reject pos., belt transport dir.: to the left
R2P	2 reject pos., belt transport dir.: to the right
L4P	4 reject pos., belt transport dir.: to the left
R4P	4 reject pos., belt transport dir.: to the right
L6P	6 reject pos., belt transport dir.: to the left
R6P	6 reject pos., belt transport dir.: to the right
TU	without reject positions and conveyor belt
OEM	without reject positions, conveyor belt and housing

Connecting cable	
K20	2 m long
K30	3 m long
K50	5 m long

User manual	
D	German
E	English
F	French
S	Spanish
I	Italian

Additional function	
EC	Encoder

Field of view	
V10	Adjustment to 10 mm
V20	Adjustment to 20 mm
V33	Adjustment to 33 mm

Guiding bar material	
VA	Stainless steel

Alternative conveyor belts	
BTA	with longitudinal ridges
BTB	with longitudinal recesses
BTD	with smooth surface, made of silicone

Belt end	
UE	Guide roller unit with belt

Accessories	
MP	Mounting plates

Checkbox CHB

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Technical data

Identbox
CHB-IB

Countbox
CHB-CB

Sortbox
CHB-SB

CHB-IB-...   CHB-CB-.../CHB-SB-...
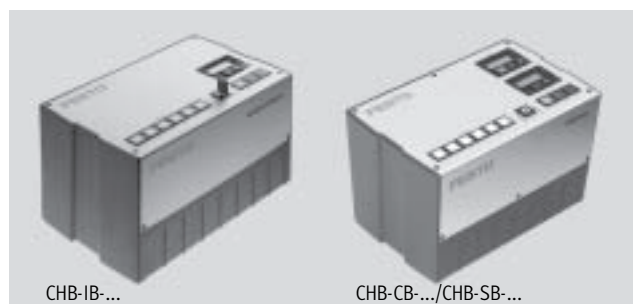
General technical data				
For part sizes		∅ 10 mm	∅ 30 mm	∅ 80 mm
Component ∅		0.5 … 10	3 … 30	3 … 80
Component length	[mm]	3 and above	3 and above	5 and above
Component range		Rotationally symmetrical parts and pre-oriented parts of any shape		
Camera resolution	[mm]	0.02	0.1	
Exposure time	[µs]	72 … 8 192		136 … 8 192
Number of part memories		48		
Orientation		Max. 8 different orientations per part type		
Belt speed	[mm/s]	200 (adjustable: 100 … 250)	300 (adjustable: 100 … 400)	
Conveyor rate for good parts		Dependent on part size, as well as number and frequency of actual and required part orientation. Example: 4 screws (M3x25) per second, correctly oriented for assembly 4 shafts (∅ 18 x 5 mm) per second, for quality inspection		
Only with CHB-CB and CHB-SB				
Quantity pre-selection		Required quantities can be pre-selected separately for all stored parts		
Counting range		1 … 10 million per part type		

Electrical connection technology				
For part sizes		∅ 10 mm	∅ 30 mm	∅ 80 mm
Operating voltage	[V AC]	85 … 264 (at 50/60 Hz), automatic detection		
Max. power consumption	[VA]	100		
Nominal value for short-circuit protection	[A]	1, slow-blow, automatic circuit-breaker integrated into mains switch		

Operating and environmental conditions				
For part sizes		∅ 10 mm	∅ 30 mm	∅ 80 mm
Operating medium		Filtered, unlubricated compressed air		
Operating pressure	[bar]	0 … 6		
Temperature range	[°C]	10 … 50 (non-condensing)		
Protection class		IP54		
Installation site		Dry, screened from extreme external light sources, cleanest possible ambient air		

Checkbox CHB

Technical data

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Interfaces					
For part sizes			∅ 10 mm	∅ 30 mm	∅ 80 mm
PLC coupling outputs			The connection of an external power supply is recommended in order to achieve full electrical isolation. Load per output: < 100 mA, total load < 1 A		
			Ready for operation		
			Error output		
			Feeder control		
			Conveyor belt control		
			Part acceptable and correctly oriented		
			Part acceptable but incorrectly oriented		
			Wrong part		
	Additionally with	CHB-CB CHB-SB	Pre-selected counter reading reached		
		CHB-SB	1 … 6 (recognised type)		
PLC coupling inputs			External type select		
			External start		
			Buffer zone sensors		
			External sensor		
	Additionally with	CHB-CB CHB-SB	Start new counting cycle		
Diagnostic interface			RS 232 interface for laptop connection (cable included in scope of delivery)		

Weights [g]			
For part sizes	∅ 10 mm	∅ 30 mm	∅ 80 mm
Control unit	6 000		
Conveying unit with 2 reject positions	4 000	7 000	12 000

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Technical data

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

Control unit

Rear view (rotated 180°)

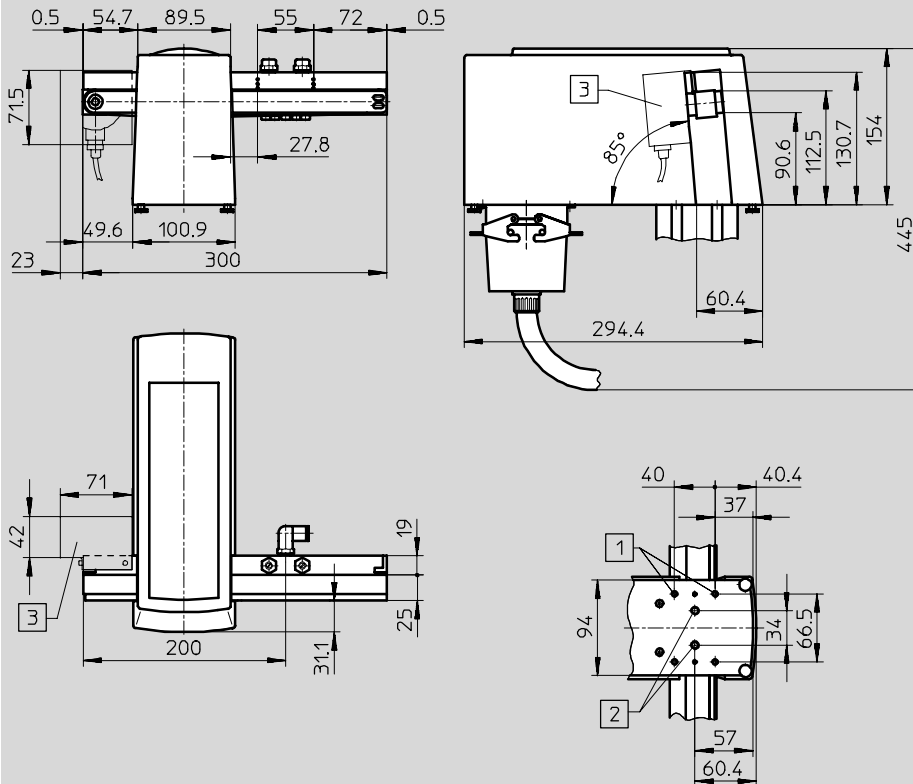|	
1	PLC coupling
2	RS 232 diagnostic interface
3	Small-parts conveyor control
4	Buffer zone sensors
5	Cable to conveying unit
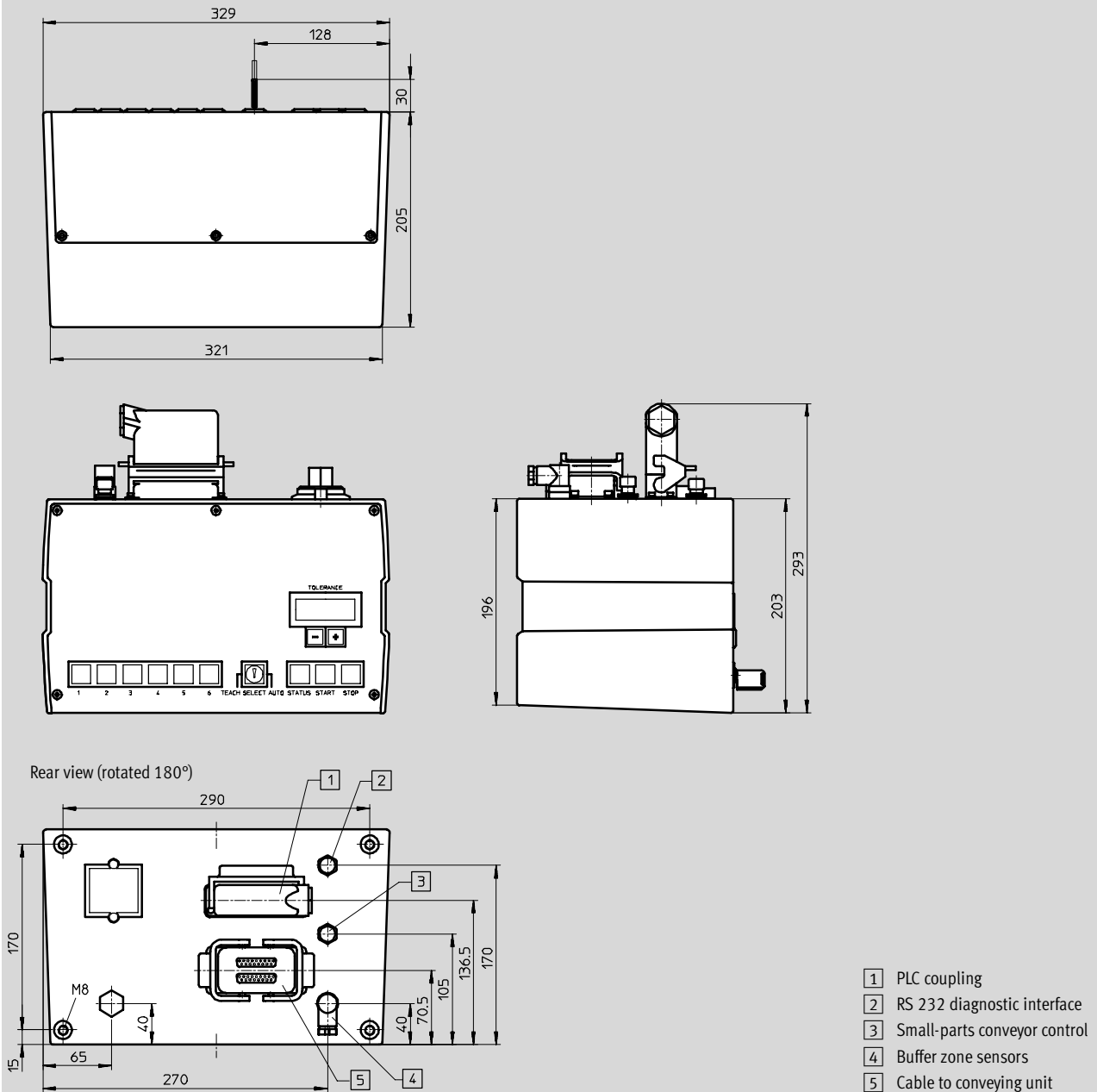
Checkbox CHB

Technical data

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Dimensions – Conveying unit, part sizes up to ⌀ 10 mm Download CAD data ➔ www.festo.com/en/engineering

2 reject positions

1	4x connecting thread M6 for 80x80 mm profile support
2	2x connecting thread M8 for 50x50 mm profile support
3	Encoder (optional)

4 reject positions

6 reject positions

Checkbox CHB

Technical data

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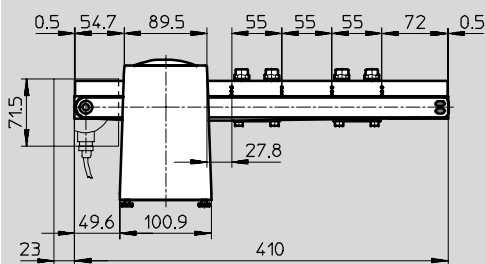**Dimensions – Conveying unit, part sizes up to ⌀ 30 mm**   Download CAD data → **www.festo.com/en/engineering**
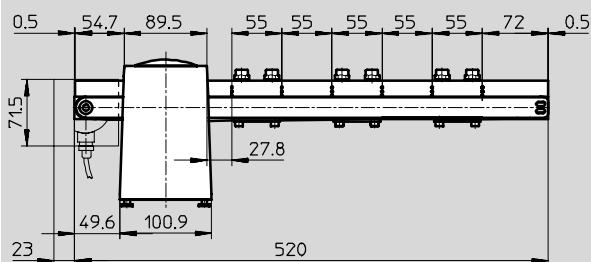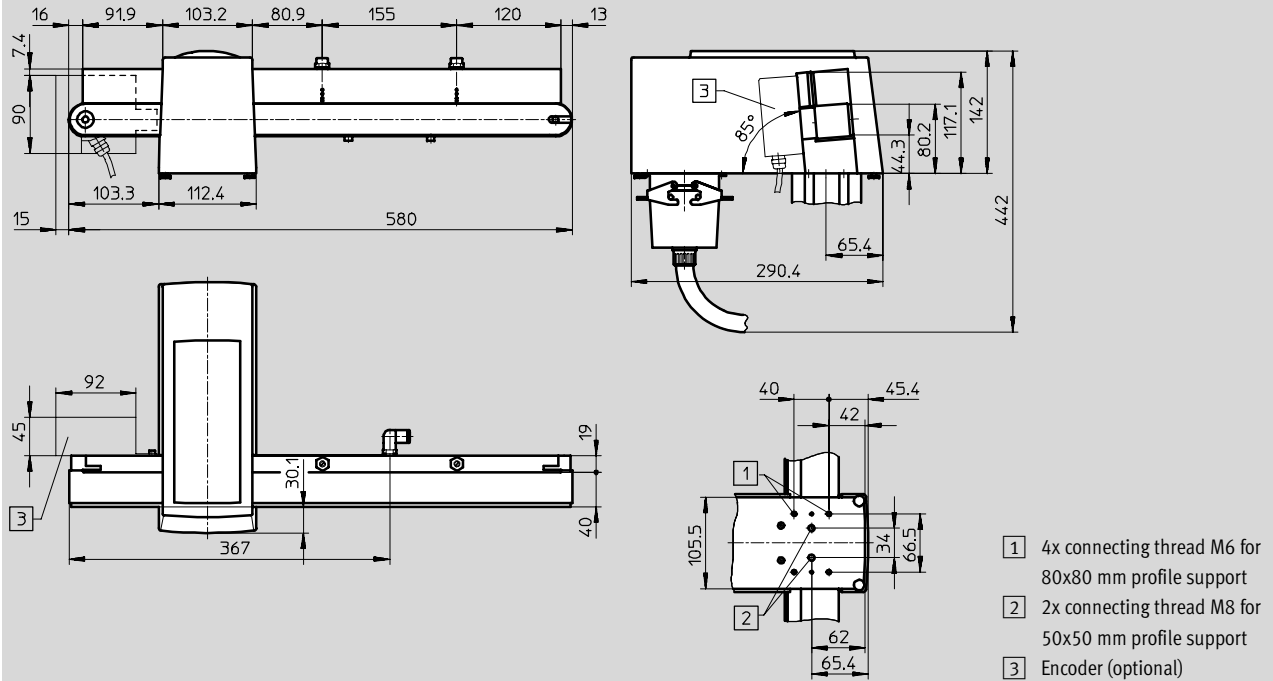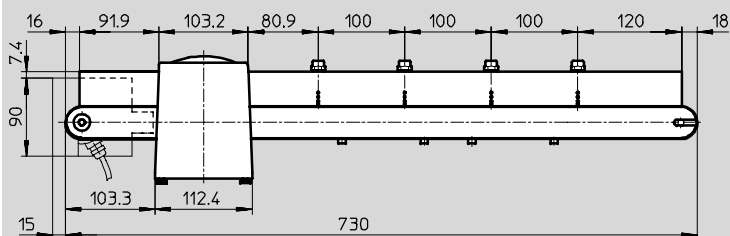
2 reject positions

1	4x connecting thread M6 for 80x80 mm profile support
2	2x connecting thread M8 for 50x50 mm profile support
3	Encoder (optional)

4 reject positions

6 reject positions

4 Guide roller unit with extended guiding bar
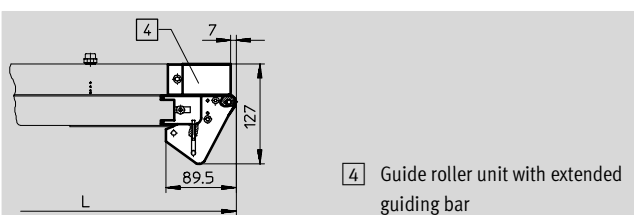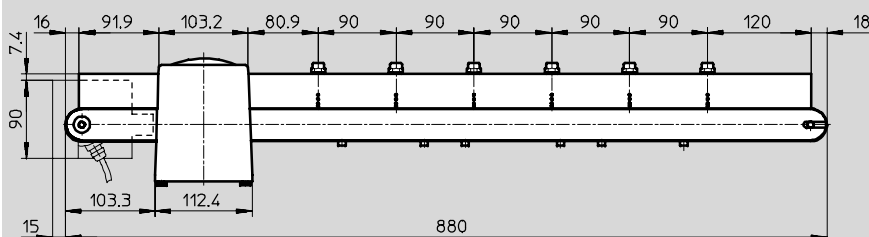
Guide roller unit

Reject positions	L
2	632
4	782
6	932

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Technical data

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2 reject positions

1	4x connecting thread M6 for 80x80 mm profile support
2	2x connecting thread M8 for 50x50 mm profile support
3	Encoder (optional)

Checkbox CHB

Technical data

FESTO

Dimensions – Tunnel variant, for part sizes up to ⌀ 30 mm   Download CAD data ➜ **www.festo.com/en/engineering**

Without reject positions and conveyor belt

M8
34
25

108
112.4
60
20
5 4 2
116
76
85°
70
141.5
27
3
442
281

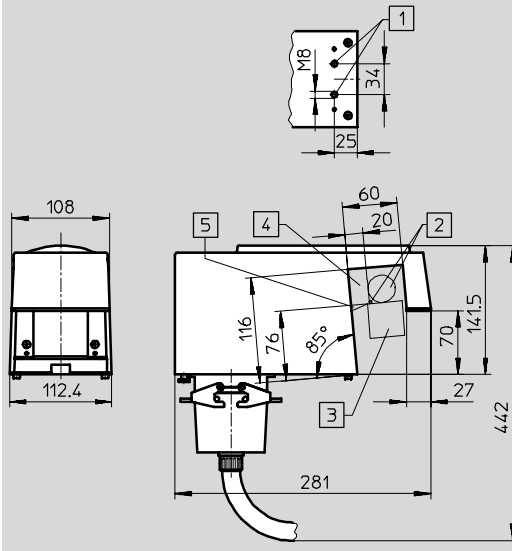| 1 | 2x connecting thread M8 for 50x50 mm profile support |
2	Part sizes ⌀ 3 … ⌀ 30 mm
3	Conveyor belt
4	Guiding bar
5	Provide cutout for camera light beam (approx. 5°)

Dimensions – Tunnel variant, for part sizes up to ⌀ 80 mm   Download CAD data ➜ **www.festo.com/en/engineering**

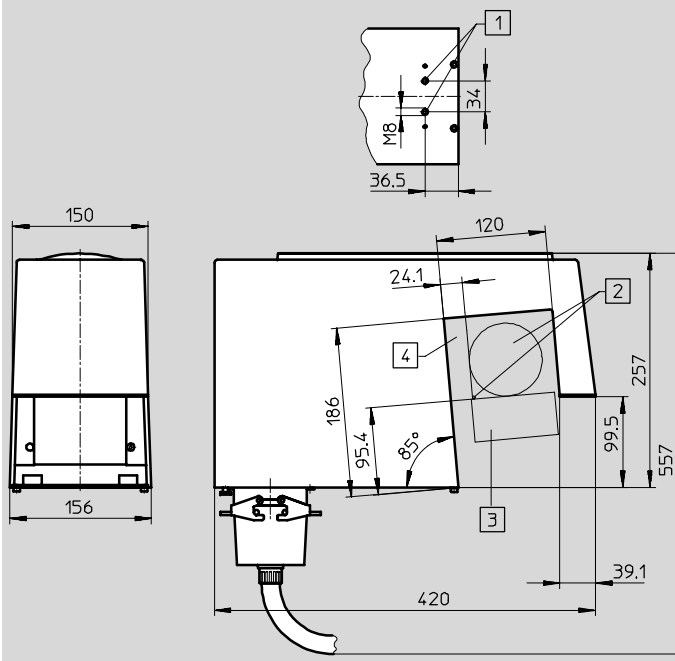Without reject positions and conveyor belt

M8
34
36.5

150
156
120
24.1
2
4
186
95.4
85°
257
99.5
557
3
39.1
420

1	2x connecting thread M8 for 50x50 mm profile support
2	Part sizes ⌀ 3 … ⌀ 80 mm
3	Conveyor belt
4	Guiding bar

Checkbox CHB
Technical data

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Without reject positions, conveyor belt and housing

	Camera with adapter, lens and extension tube
1	Camera with adapter, lens and extension tube
2	Camera bracket
3	Lighting bracket
4	Guiding bar for part guide
5	Parts conveyor
6	Viewing slot, 1 mm wide
7	Connection for light
8	Connection for camera

Lighting bracket

Camera bracket

Checkbox CHB

Technical data

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Dimensions – OEM variant, for part sizes up to ⌀ 80 mm

Without reject positions, conveyor belt and housing
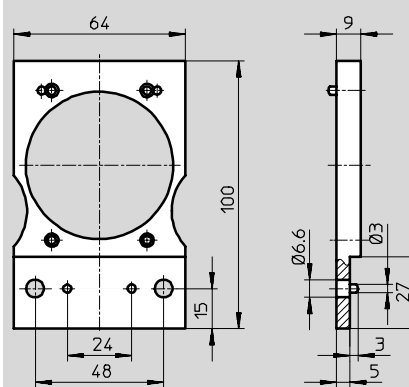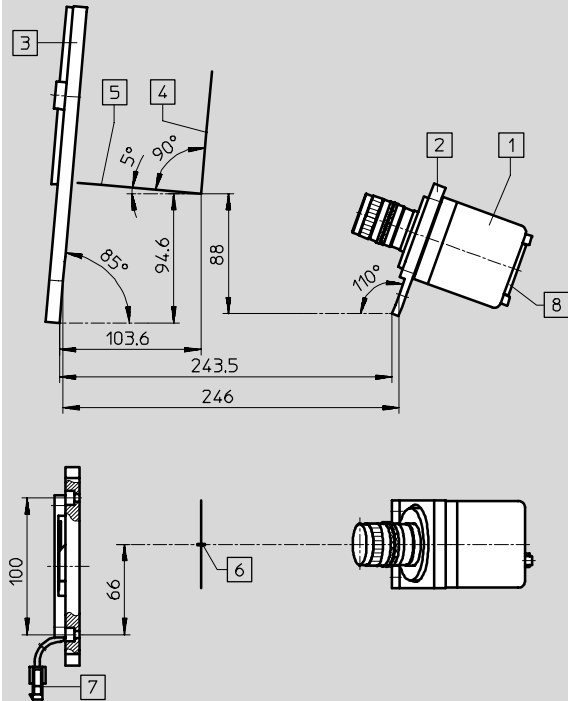

1 Camera with adapter, lens and
   extension tube
2 Camera bracket
3 Lighting bracket
4 Guiding bar for part guide
5 Parts conveyor
6 Viewing slot, 1 mm wide
7 Connection for light
8 Connection for camera

Lighting bracket
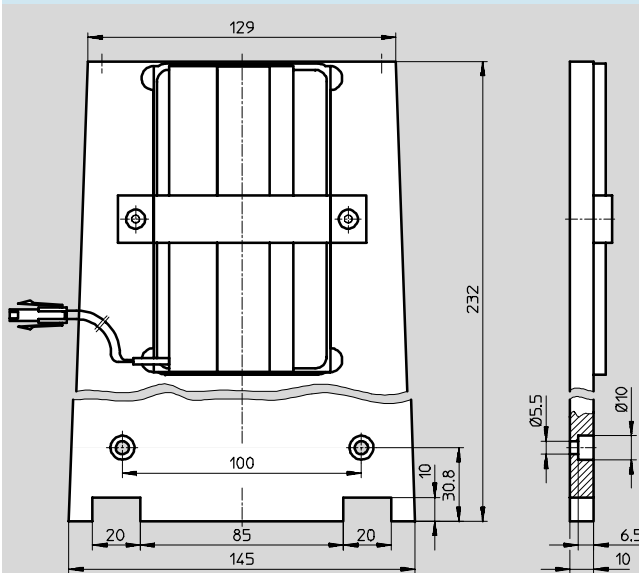
Camera bracket
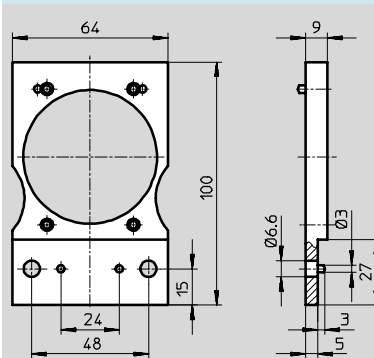
Checkbox CHB

Accessories

FESTO

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

50x50 mm profile support

50
34
M8
15
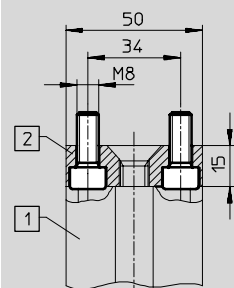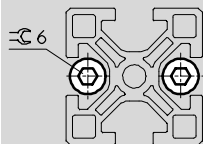
| ① | 50x50 mm profile support |
| ② | Profile connector HV-50 as adapter |

80x80 mm profile support

66.5
80
40
80

M6
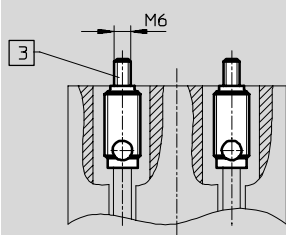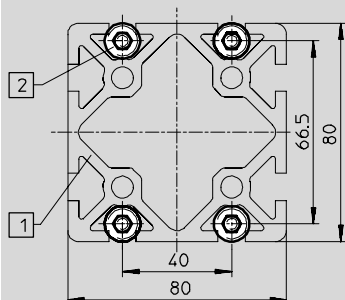
①	80x80 mm profile support
②	Automatic profile connector
③	4 socket head screws M6x40 DIN 912

Checkbox CHB

Ordering data – Modular products

FESTO

| M | **Mandatory data** | | | | | ➜ |

Module No.	Basic function	Control function	Component size	Transport function	Connecting cable	User manual
197 890	CHB	IB CB SB	F10 F30 F80	L2P R2P L4P R4P L6P R6P TU OEM	K20 K30 K50	D E F S I

Ordering example

| **197 890** | **CHB** | – | **SB** | – | **F30** | – | **L4P** | – | **K20** | – | **D** |

Ordering table

|			Conditions	Code	Enter code
M	Module No.	**197 890**			
	Basic function	**Checkbox family**		**CHB**	CHB
	Control function	Identbox		**-IB**	
		Countbox		**-CB**	
		Sortbox		**-SB**	
	Component size	Part size ⌀ 0.5 … 10 mm, part length 3 mm and above		**-F10**	
		Part size ⌀ 3 … 30 mm, part length 3 mm and above		**-F30**	
		Part size ⌀ 3 … 80 mm, part length 5 mm and above	1	**-F80**	
	Transport function	2 reject positions, belt transport direction: to the left		**-L2P**	
		2 reject positions, belt transport direction: to the right		**-R2P**	
		4 reject positions, belt transport direction: to the left	2	**-L4P**	
		4 reject positions, belt transport direction: to the right	2	**-R4P**	
		6 reject positions, belt transport direction: to the left	2	**-L6P**	
		6 reject positions, belt transport direction: to the right	2	**-R6P**	
		No reject positions and conveyor belt	3	**-TU**	
		No reject positions, conveyor belt and housing	3	**-OEM**	
	Connecting cable	Cable length 2 m		**-K20**	
		Cable length 3 m		**-K30**	
		Cable length 5 m		**-K50**	
	User manual	German		**-D**	
		English		**-E**	
		French		**-F**	
		Spanish		**-S**	
↓		Italian		**-I**	

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1 **F80** Not in combination with field of view V10 and V20.

2 **L4P, R4P, L6P, R6P** Not in combination with component size F80.

3 **TU, OEM** Not in combination with component size F10.

Transfer order code

| **197 890** | **CHB** | – | | – | | – | | – | | – | |

Checkbox CHB

Ordering data – Modular products

FESTO

O Options					
Additional function	**Field of view**	**Guiding bar material**	**Alternative conveyor belt**	**Belt end**	**Accessories**
EC	V10 V20 V33	VA	BTA BTB BTD	UE	MP
– **EC**	– **V33**	– **VA**	– **BTA**	– **UE**	– **MP**

Ordering table			Condi-tions	Code	Enter code
↓ Additional function	Encoder			**-EC**	
O Field of view	Adjustment of field of view to 10 mm		4	**-V10**	
	Adjustment of field of view to 20 mm		4	**-V20**	
	Adjustment of field of view to 33 mm		5	**-V33**	
Guiding bar material	Stainless steel			**-VA**	
Alternative conveyor belt	Conveyor belt with longitudinal ridges		6	**-BTA**	
	Conveyor belt with longitudinal recesses		6	**-BTB**	
	Conveyor belt with smooth surface, made of silicone		7	**-BTD**	
Belt end	Guide roller unit with belt		8	**-UE**	
Accessories (supplied loose)	Mounting plates			**-MP**	

4 **V10, V20**	Not in combination with component size F10, F80.		7 **BTD**	Not in combination with belt end UE.
5 **V33**	Not in combination with component size F10.		8 **UE**	Not in combination with component size F30.
6 **BTA, BTB**	Not in combination with component size F80. Not in combination with belt end UE.			

Transfer order code

– ☐ – ☐ – ☐ – ☐ – ☐ – ☐

Checkbox CHB

Accessories

FESTO

Programming cable KDI

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

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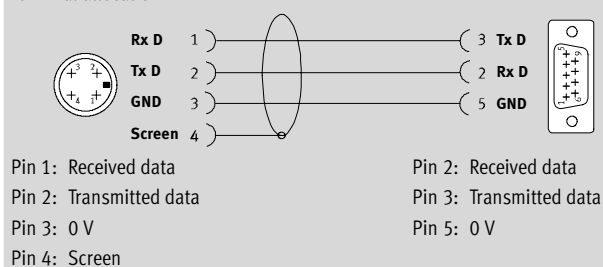
Ordering data					
Cable length [m]	Plug	Socket	Weight [g]	Part No.	Type
5	M12, 4-pin	9-pin	181	**150 268**	**KDI-SB202-BU9**

DUO cable KM12-DUO
for buffer zone sensors

Material:
Cable sheath: Polyurethane
Plug, socket: Polyurethane
Knurled screw, locknut: Brass

Terminal allocation

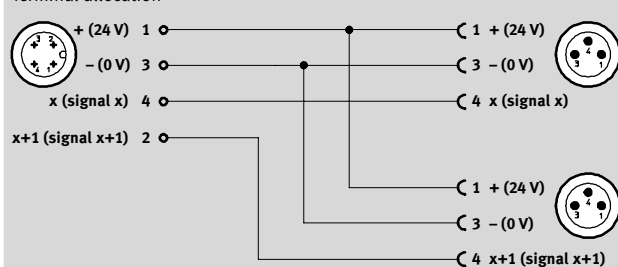| Ordering data					
Cable length [m]	Plug	Socket	Weight [g]	Part No.	Type
0.6	M12, 4-pin	M8, 3-pin	58.2	**18 685**	**KM12-DUO-M8-GDGD**

Connecting cable KM12-KM12
for buffer zone sensors

Material:
Cable sheath: Polyurethane
Plug, socket: Polyurethane
Knurled screw, locknut: Brass

Terminal allocation

Ordering data					
Cable length [m]	Plug	Socket	Weight [g]	Part No.	Type
2.5	M12, 4-pin	M12, 4-pin	100.32	**18 684**	**KM12-M12-GSGD-2,5**
5			173.17	**18 686**	**KM12-M12-GSGD-5**

Checkbox CHB

Accessories

FESTO

CheckKon

Performance characteristics

Using this software the processes within the Checkbox 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
- 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

Performance characteristics

"CheckOpti" is used in cases where the standard Checkbox 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" facilitates a complete analysis of the Checkbox recognition processes based upon contour data for the parts to be checked.

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

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

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Everything under optoelectronic control – The Checkbox

Feed technology is child's play with
the Checkbox.

		Benefits for designers	Benefits for purchasers
1.	**Standardized system solution**	■ No costly in-house fabrication required ■ Greatest retooling flexibility ■ No required programming	■ Immediate availability ■ Reduced ordering costs
2.	**Greatest possible system availability**	■ Minimized downtime thanks to contact-free inspection ■ Shortest possible set-up times	■ No procurement expenses for maintenance and repair ■ Quality inspection integrated
3.	**Easy initial start-up and oper-ation**	■ Plug-in and go! Thanks to Teach-in function	■ No complex logistics sequences resulting from in-house engineering ■ One system for different conveyed parts – no extra training required

Festo automation components

Important components in our product range

Parts sorting and testing

- Checkbox family

Compressed air preparation

- D-series service units

Control technology

- Individual valve CPE
- Valve terminal CPV
- Smart Positioning Controller SPC200
- Front End Controller IPC FEC® Standard FC640

Long linear movement

- Rodless cylinder DGPL
- Electric toothed-belt drive DGE
- Standard cylinder DNC and DSNU
- Compact cylinder ADVU

Short linear movement

- Linear module HMP
- Guided drive DFM
- Mini slide SLT
- Flat slide SLG
- Linear module HMPL
- Short-stroke cylinder ADVC

Rotary movement

- Rotary drive DRQD
- Swivel module DSM
- Swivel/linear module DSL

Gripping, mechanical …

- Precision gripper HGPP
- Micro gripper HGWM
- Three-point gripper HGD

… or with vacuum

- Suction gripper ESG
- Vacuum generator VADMI
- Vacuum generator VN

Connecting and installing

- Basic elements
- Screw connectors
- Fittings and restrictors
- Tubing

Further products and details: http://catalog.festo.com or consult your Festo technical advisor.

Pneumatic Pictograms

Stroke length		Service	
Flow rate		Repair service	
Voltage		Worldwide service	
Force		Hotline	
Pressure		Collection facility	
Temperature		Delivery time	
Diameter		In stock	
Vacuum		Important	
Width		Type discontinued	
		New	
		Spare parts service	