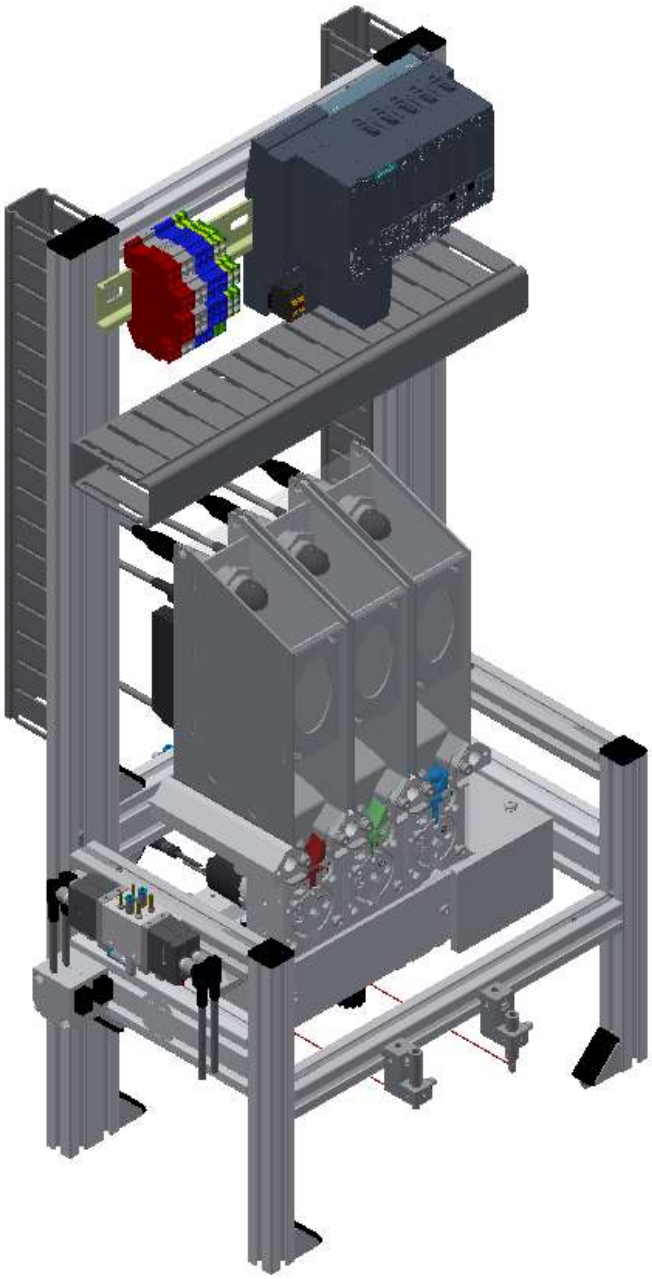
# 8101854

## Dispense

FESTO

**CP Factory/CP Lab**

original operating instructions



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Original operating instructions



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Where only pronouns such as he and him are used in these operating instructions, these pronouns are of course intended to refer to both male and female persons. The use of a single gender (e.g. he, him) should not be construed as gender discrimination; it is intended solely to make the manual easier to read and the formulations easier to understand.

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**CAUTION**

These operating instructions must be available to the user at all times.
The operating instructions must be read before commissioning.
The safety instructions must be observed.
Non-observance may result in severe personal injury or damage to property.

**Main document**
Associated documents attached:

Safety instructions concerning transport (print/electronic)
Component datasheets (print/electronic)
Circuit diagram (print/electronic)

# Contents

# 1 Safety instructions

## 1.1 Warning notice system

These operating instructions contain notes that must be observed for your personal safety and in order to prevent property damage. The notes concerning your personal safety are indicated by a safety symbol. Notes that only concern property damage are not indicated by a safety symbol.
The notes below are listed in order of hazard level.

**DANGER**

... indicates an **imminently** hazardous situation that will result in fatal or severe personal injury if not avoided.

**WARNING**

... indicates a **potentially** hazardous situation which may result in fatal or severe personal injury if not avoided.

**CAUTION**

... indicates a **potentially** hazardous situation that may result in moderate or slight personal injury or severe property damage if not avoided.

***NOTE***

... indicates a **potentially** hazardous situation that may result in property damage or loss of function if not avoided.

In cases where more than one hazard level applies, the safety note with the highest hazard level will be shown. A safety note may concern both personal injury and property damage.
Hazards that will only result in property damage are indicated with the word "Note".

### 1.2 Pictograms

This document and the hardware described in it include warnings concerning possible hazards which may arise if the system is used incorrectly.
The following pictograms are used:

Hazard warning

Warning - dangerous electric voltage

Read and observe the operating and safety instructions prior to commissioning.

Switch off the device and unplug the connection for power supply from the plug socket before commencing installation, repair, maintenance or cleaning work.

Warning – hand injuries

Warning – lifting heavy loads

Information and/or references to other documentation

### 1.3 General prerequisites for installing the product

- Festo Didactic products must only be used for the applications specified in their respective operating instructions. Products or components supplied by other manufacturers must only be used if recommended or approved by Festo.
- The products must be transported, stored, installed, assembled, commissioned, operated and maintained properly in order to ensure their safe operation.
- The approved ambient conditions must be observed. The specifications in the relevant operating instructions must be observed.
- The safety equipment must be tested every working day.
- Connecting cables must be checked for damage before each use. In case of damage, they must be replaced.

Connecting cables must correspond to the minimum specifications.

### 1.4 General prerequisites for operating the devices

General requirements for safe operation of the system:

- In industrial facilities, the national accident prevention regulations must be observed.
- The laboratory or classroom must be overseen by a supervisor.
  – A supervisor is a qualified electrician or a person who has been trained in electrical engineering, knows the respective safety requirements and safety regulations, and whose training has been documented accordingly.

The laboratory or the classroom must be equipped with the following devices:

- An emergency-off device must be provided.
  – At least one emergency-off device must be located inside the laboratory or the classroom, and at least one outside it.
- The laboratory or classroom must be secured so that the operating voltage and compressed air supply cannot be activated by any unauthorized persons, for example by means of:
  – e.g. a keyswitch
  – e.g. lockable shut off valves
- The laboratory or classroom must be protected by residual current devices (RCDs).
  – RCDs with a differential current of ≤ 30 mA, Type B. When operating machinery with unavoidable leakage current, suitable measures must be implemented and documented in the corresponding workplace risk assessment.
- The laboratory or classroom must be protected by overcurrent protection devices.
  – Fuses or circuit breakers
- Devices must not be used if they are damaged or defective.
  – Damaged devices must be barred from further use and removed from the laboratory or classroom.
  – Damaged connecting cables, pneumatic tubing and hydraulic hoses represent a safety risk and must be removed from the laboratory or classroom.
- Safety devices must be checked every working day to ensure that they are fully functional.
- Connecting cables and accessories must be checked for damage before each use.

# 2 Intended use

Festo Didactic systems and components must only be used:

- For their intended use in teaching and training applications
- When their safety functions are in perfect condition

The components and systems are designed in accordance with the latest technology and recognized safety rules. However, life and limb of the user and third parties may be endangered and the components may be impaired if they are used incorrectly.

The Festo Didactic learning system has been developed and produced exclusively for education and training in the field of automation technology. The training company and/or trainers must ensure that all trainees observe the safety precautions described in these operating instructions.

Training with complex machinery is a highly hazardous activity. The operating company must draw up and document a workplace risk assessment. The trainees must be briefed on all the relevant safety aspects before work commences.

**Festo Didactic hereby excludes any and all liability for damages suffered by apprentices, the training company and/or any third parties, which occur during use of the device in situations which serve any purpose other than training and/or vocational education, unless such damages have been caused by Festo Didactic due to malicious intent or gross negligence.**

All extensions and accessories must be approved by Festo Didactic, and are only permitted for use for their intended purpose.

The machine fulfils the requirements of the European directives that applied when it was commissioned. Any modification to the machine shall render the manufacturer's CE Declaration of Conformity null and void. The CE Declaration of Conformity must be renewed following each major modification.

# 3 For your safety

## 3.1 Important information

Knowledge of the basic safety instructions and safety regulations is a fundamental prerequisite for safe handling and trouble-free operation of Festo Didactic components and systems.

These operating instructions include the most important instructions for safe use of the components and systems. In particular, the safety instructions must be adhered to by all persons who work with these components and systems. Furthermore, all pertinent accident prevention rules and regulations that are applicable at the respective place of use must be adhered to.

**WARNING**

- **Malfunctions which could impair safety must be eliminated immediately!**

**CAUTION**

- **Improper repairs or modifications may result in unforeseeable operating statuses. Do not carry out any repair or alternation work on components or systems that is not described in these operating instructions.**

### 3.2 Qualified persons

- The product described in these operating instructions is only permitted for operation by persons who are qualified for the task in question in accordance with the operating instructions, especially the safety instructions.
- Qualified persons are defined as persons whose training and experience enables them to recognize risks and avoid potential dangers when working with this product.

### 3.3 Obligations of the operating company

It is the responsibility of the operating company to ensure that the station is operated safely.

The operating company undertakes to allow only those persons to work with the components and systems who:

- Are familiar with the basic regulations regarding occupational safety, with the safety instructions, and with the accident prevention regulations, and who have been instructed in the use of the components and systems
- Have read and understood the safety chapter and warnings in these operating instructions
- Are qualified to operate the components and systems in question
- Are governed by and trained in suitable organizational measures to ensure safe training

Personnel should be tested at regular intervals to ensure that they are safety-conscious in their work habits.

### 3.4 Obligations of the trainees

All persons who have been entrusted to work with the components and systems undertake to complete the following steps before beginning work:

- Read the chapter concerning safety and the warnings in these operating instructions
- Familiarize themselves with the basic regulations regarding occupational safety and accident prevention

# 4 Basic safety instructions

## 4.1 General information

**CAUTION**

- **Trainees must be supervised by an instructor at all times when working with the components and systems.**
- **Observe the specifications included in the technical data for the individual components, and in particular all the safety instructions!**
- **Wear your personal protective equipment (safety goggles, safety shoes).**
- **Never leave objects lying on the top of protective enclosures. Vibrations could cause such objects to fall off.**

## 4.2 Mechanical components

**WARNING**

- **Switch off the power supply!**
  - Switch off both the operating power and the control power before commencing work on the circuit.
  - Never reach into the setup unless it is at a complete standstill.
  - Be aware of potential overtravel times for the actuators.
- **Risk of injury during troubleshooting!**
  - Use a tool such as a screwdriver for actuating sensors.

**CAUTION**

- **Risk of burns due to hot surfaces**
  - Devices can reach high temperatures during operation, as a result of which they can cause burns if touched.
- **Measures to take when maintenance is required.**
  - Allow the device to cool off before commencing work.
  - Use suitable personal protective clothing, e.g. safety safety gloves.

### 4.3 Electrical components

**WARNING**

- **Disconnect from all sources of electrical power!**
  - Switch off the power supply before working on the circuit.
  - Please note that electrical energy may be stored in individual components. Further information on this issue is available in the datasheets and operating instructions included with the components.
  - **Warning!**
    Capacitors inside the device may still be charged even after being disconnected from all sources of voltage.
- **Danger due to malfunction**
  - Never place or leave liquids (e.g. drinks) on the station in open containers.
  - The machine must not be switched on if there is condensation (moisture) on its surface.
  - Never lay pipes/hoses designed to carry liquid media near the machine.
- **Electric shock due to connection to unsuitable power supply!**
  - When devices are connected to an unsuitable power supply, exposed components can cause dangerous electrical voltage that can lead to severe or fatal injury.
  - Always use power supplies that provide SELV (safety extra-low voltage) or PELV (protective extra-low voltage) output voltages for all the connections and terminals on the electronics modules.
- **Electric shock when there is no protective grounding in place**
  - If there is no protective grounding terminal in place for a Protection Class I device, or if the protective grounding terminal has not been installed correctly, exposed, conductive parts may carry high voltages, thus causing severe or fatal injury if touched.
  - Ground the device in accordance with the applicable regulations.

**WARNING**

- **Risk of fire due to use of unsuitable power supply**
  - If a device i connected to an unsuitable power supply, this can cause components to overheat, leading to a breakout of fire.
  - Always use limited power supplies (LPSs) for all the connections and terminals on the electronics modules.

## ⚠ CAUTION

- **Always ensure that your connecting cables are designed for use with the electrical connections in question.**
- **When laying connecting cables, make sure they are not kinked, sheared or pinched. Cables laid on the floor must be covered with a cable bridge to protect them.**
- **Do not lay cables over hot surfaces.**
  - Hot surfaces are identified with a corresponding warning symbol.
- **Make sure that connecting cables are not subjected to continuous tensile loads.**
- **Devices with a grounding terminal must always be grounded.**
  - If a ground connection (green-yellow laboratory socket) is available, it must always be connected to the protective grounding. The protective grounding must always be connected first (before voltage) and disconnected last (after disconnecting the voltage).
  - Some devices have high leakage current. These devices must be fitted with a grounding conductor for additional grounding.
- **When replacing fuses, always use specified fuses with the correct current rating and tripping characteristics.**
- **The device is not equipped with a built-in fuse unless otherwise specified in the technical data.**
- **Safe operation of the device is not possible in the event of any of the following circumstances:**
  - Visible damage
  - Malfunction
  - Inappropriate storage
  - Incorrect transport

  Switch off the power supply immediately.
- **Protect the device to prevent it from being restarted accidentally.**

### 4.4 Pneumatic components

**WARNING**

- **Depressurize the system!**
  - Switch off the compressed air supply before working on the circuit.
  - Check the system using pressure gauges to make sure that the entire circuit is fully depressurized.
  - Please note that energy may be stored in reservoirs. Further information on this issue is available in the datasheets and operating instructions included with the components.
- **Risk of injury when switching on compressed air!**
  Cylinders may advance and retract automatically.
- **Risk of accident due to advancing cylinders!**
  - Always position pneumatic cylinders so that the piston rod's working space is unobstructed along its entire stroke range.
  - Make sure that the piston rod cannot collide with any of the rigid components in the setup.
- **Risk of accident due to pneumatic tubing slipping off!**
  - Use shortest barbed tubing connectors possible.
  - If pneumatic tubing slips off, switch off the compressed air supply immediately.
- **Do not exceed the maximum permissible pressure of 600 kPa (6 bar).**
- **Do not switch on the compressed air until all the barbed tubing connectors have been connected and secured.**
- **Do not disconnect pneumatic tubing while it is under pressure.**
  - Do not attempt to seal or plug pneumatic tubing or plug connectors with your hands or fingers.
- **Check the condition of the condensate in the service unit regularly. If necessary, drain the condensate and dispose of it properly.**

**CAUTION**

- **Setting up pneumatic circuits**
  - Connect the devices with plastic tubing with an outside diameter of 4 or 6 mm.
  - Push the pneumatic tubing into the push-in connector as far as it will go.
- **Dismantling pneumatic circuits**
  - Switch off the compressed air supply before dismantling the circuit.
  - Press the blue release ring down so that the tubing can be pulled out.
- **Noise due to escaping compressed air**
  - Noise caused by escaping compressed air may damage your hearing. Reduce noise by using mufflers, or wear hearing protection if the noise cannot be avoided.
  - All of the exhaust ports on the components included in the equipment set are equipped with mufflers. Do not remove these mufflers.

### 4.5 Guarantee and liability for application examples

The application examples are not legally binding, and we cannot guarantee their completeness in terms of their configuration, their equipment or any events that may occur. The application examples are not representations of any specific customer solution; they are merely intended to illustrate typical tasks for which the product in question could be used. You bear the responsibility for ensuring that the products described here are operated properly. These application examples do not in any way relieve you of your responsibility to ensure that the system is handled safely when it is being used, installed, operated or maintained.

### 4.6 Cyber security

**Note**

Festo Didactic offers products with industrial security functions that aid the safe operation of plants, systems, machines and networks. In order to protect plants, systems, machines and networks from cyber threats, a comprehensive industrial security concept must be implemented and continuously updated. Festo's products and services only constitute one part of such a concept.

The customer is responsible for preventing unauthorized access to their plants, systems, machines and networks. Systems, machines and components should only be connected to a company's network or the Internet if and as necessary, and only when the suitable security measures (e.g. firewalls and network segmentation) are in place. Furthermore, Festo's guidelines on suitable security measures should be observed. Festo products and solutions are constantly being developed further in order to make them more secure. Festo strongly recommends that customers install product updates as soon as they become available and always use the latest versions of its products. Any use of product versions that are no longer supported or any failure to install the latest updates may render the customer vulnerable to cyber attacks.

**WARNING**

- **Unsecure operating conditions due to software tampering**
  - Forms of software tampering (e.g. viruses, Trojans, malware and worms) can lead to unsecure operating conditions in your system, which may in turn lead to severe or fatal injury or property damage.
  - Keep your software up to date.
  - Integrate the automation and actuator components into an overarching and comprehensive industrial security concept for the installation or machine in question that is in line with the latest technological developments.
  - Make sure that all the products you have installed are incorporated into your overarching industrial security concept.
  - Use suitable measures, such as a virus scanner, to protect files save on exchangeable storage media from malware.

### 4.7 Additional safety instructions

General requirements for safe operation of the devices:

- Do not lay cables over hot surfaces.
  - Hot surfaces are identified with a corresponding warning symbol.
- Maximum permissible current loads for connector cables and devices must not be exceeded.
  - Always compare the current ratings of the device, the cable and the fuse to ensure that they match.
  - If they do not match, use a separate upstream fuse in order to provide appropriate overcurrent protection.
- Devices with a grounding terminal must always be grounded.
  - If a ground terminal (green-yellow laboratory socket) is available, it must always be connected to protective ground. The protective grounding must always be connected first (before voltage) and disconnected last (after disconnecting the voltage).
- The device is not equipped with a built-in circuit unless otherwise specified in the technical data.

**WARNING**

- **This product is designed for use in industrial environments, and may cause malfunctions if used in domestic or small commercial environments.**

### 4.8 Guarantee and liability

Our General Terms and Conditions of Sale and Delivery shall apply at all times. These shall be made available to the operating company no later than upon conclusion of the sales contract. Guarantee and liability claims resulting from personal injury and/or property damage are excluded if they can be traced back to one or more of the following causes:

- Use of the equipment for purposes other than its intended use
- Improper installation, commissioning, operation or maintenance of the system
- Operation of the system with defective safety equipment, or with improperly attached or non-functional safety equipment and protective guards
- Non-compliance with directions included in the operating instructions with regard to transport, storage, installation, commissioning, operation, maintenance and setup of the system
- Unauthorized modifications to the system
- Improperly executed repairs
- Disasters resulting from the influence of foreign bodies and acts of God
- Dust generated during construction work must be kept away from the system (use coverings).
  See the Environmental Requirements section (contamination level) for more details.

### 4.9 Transport

**WARNING**

- **Danger due to tipping over**
  - Suitable packaging and transport equipment must be used when transporting the station. The station can be lifted from underneath using a forklift truck. Please note that eccentric centers of gravity can cause the station to tip over.
  - Stations with attachments at height will have a high center of gravity.
  - Take care to avoid tipping over during transportation.

***NOTE***

- **Station contains delicate components!**
  - Take care not to shake during transportation
- **The station is only permitted for installation on solid, non-vibrating surfaces.**
  - Make sure that the ground underneath the station has sufficient load-bearing capacity.

### 4.10 Name plates


Name plate example

| Position | Description |
|---|---|
| 1 | Type code |
| 2 | Material number |
| 3 | Production code |
| 4 | Technical data |
| 5 | Technical data |
| 6 | Technical data |
| 7 | Safety note |
| 8 | Manufacturer address |
| 9 | UK importer address |
| 10 | Country of origin |
| 11 | Internet address service portal |
| 12 | CE Mark |
| 13 | UKCA mark |
| 14 | Warning mark |
| 15 | Symbol read manual |
| 16 | WEEE Marking |
| 17 | QR Code (Type-and serial number) |

## 4.11 CE Declaration of Conformity

FESTO

(DE) Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. Der beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union.

(EN) This declaration of conformity is issued under the sole responsibility of the manufacturer. The object of the declaration described is in conformity with the relevant Union harmonisation legislation.

(BG) Настоящата декларация за съответствие е издадена на отговорността на производителя. Предметът на описаната декларация отговаря на съответното законодателство на Съюза за хармонизация.

(CS) Toto prohlášení o shodě se vydává na výhradní odpovědnost výrobce. Popsaný předmět prohlášení je ve shodě s příslušnými harmonizačními právními před-pisy Unie.

(DA) Denne overensstemmelseserklæring udstedes på fabrikantens ansvar. Genstanden for erklæringen, som beskrevet, er i overensstemmelse med den relevante EU-harmoniseringslovgivning.

(EL) Η παρούσα δήλωση συμμόρφωσης εκδίδεται με αποκλειστική ευθύνη του κατασκευαστή. Ο περιγραφόμενος στόχος της δήλωσης είναι σύμφωνος με τη σχετική ενωσιακή νομοθεσία εναρμόνισης.

(ES) La presente declaración de conformidad se expide bajo la exclusiva responsabilidad del fabricante. El objeto de la declaración descrita es conforme con la legislación de armonización pertinente de la Unión.

(ET) Käesolev vastavusdeklaratsioon on välja antud tootja ainuvastutusel. Kirjeldatud deklareeritav toode on kooskõlas asjaomaste liidu ühtlustamisaktidega.

(FI) Tämä vaatimustenmukaisuusvakuutus on annettu valmistajan yksinomaisella vastuulla. Kuvattu vakuutuksen kohde on asiaa koskevan unionin yhdenmukaistamislainsäädännön vaatimusten mukainen.

(FR) La présente déclaration de conformité est établie sous la seule responsabilité du fabricant. L'objet décrit de la déclaration est conforme à la législation d'harmonisation de l'Union applicable.

(HU) Ezt a megfelelőségi nyilatkozatot a gyártó kizárólagos felelősségre mellett adják ki. Az ismertetett nyilatko-zat tárgya megfelel a vonatkozó uniós har-monizációs jogszabályoknak.

(IT) La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante. L'oggetto della dichiarazione descritto è conforme alla pertinente normativa di armonizzazione dell'Unione.

(LT) Ši atitikties deklaracija išduota tik gamintojo atsakomybe. Aprašytas deklaracijos objektas atitinka susijusius derinamuosius Sąjungos teisės aktus.

(LV) Šī atbilstības deklarācija ir izdota vienīgi uz ražotāja atbildību. Aprakstītais deklarācijas objekts atbilst attiecīgajam Savienības saskaņošanas tiesību aktam.

(NL) Deze conformiteitsverklaring wordt verstrekt onder volledige verantwoordelijkheid van de fabrikant. Het beschreven voorwerp is in overeenstemming de desbetreffende harmonisatiewetgeving van de Unie.

(PL) Niniejsza deklaracja zgodności wydana zostaje na wyłączną odpowiedzialność producenta. Wymieniony przedmiot niniejszej deklaracji jest zgodny z odnośnymi wymaganiami unijnego prawodawstwa harmonizacyjnego.

(PT) A presente declaração de conformidade é emitida sob a exclusiva responsabilidade do fabricante. O objeto da declaração descrito está em conformidade com a legislação aplicável de harmonização da União.

(RO) Prezenta declarație de conformitate este emisă pe răspunderea exclusivă a producătorului. Obiectul descris al declarației este în conformitate cu legislația relevantă de armonizare a Uniunii.

(SK) Toto vyhlásenie o zhode sa vydáva na vlastnú zodpovednosť výrobcu. Uvedený predmet vyhlásenia je v zhode s príslušnými harmonizačnými právnymi predpismi Únie.

(SL) Za izdajo te izjave o skladnosti je odgovoren izključno proizvajalec. Opisani predmet izjave je v skladu z ustrezno zakonodajo Unije o harmonizaciji.

(SV) Denna försäkran om överensstämmelse utfärdas på tillverkarens eget ansvar. Föremålet för försäkran överensstämmer med den relevanta harmoniserade unionslagstiftningen.

(TR) Bu Uygunluk Belgesi tamamen üreticinin sorumluluğu altındadır. Belgede açıklanan obje, Birliğin ilgili uyum mevzuatına uygundur.

EG-Konformitätserklärung
EU Declaration of Conformity
Декларация за съответствие на ЕС
Prohlášení o shodě ES
EF-overensstemmelseserklæring
Δηλωση συμμορφωσης ΕΚ
Declaración de conformidad CE
EÜ vastavusdeklaratsioon
EY-vaatimustenmukaisuusvakuutus
Déclaration CE de conformité
EK megfelelőségi nyilatkozat
Dichiarazione di conformità EU
EB atitikties deklaracija
EK atbilstības deklarācija
EG-verklaring van overeenstemming
Deklaracja zgodności WE
Declaração de conformidade CE
Declarație de conformitate CE
Vyhlásenie o zhode ES
Izjava ES o skladnosti
EG-försäkran om Överensstämmelse

The installation instructions according to the manual have to be followed. The person authorized to compile the technical documents is Philippe Drolet, Product conformity, Festo Didactic Ltée/Ltd. Canada.

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FESTO

2022-03-02

| | |
|---|---|
| 8032510 | CP-AM-DRILL |
| 8032507 | CP-AM-PRESS |
| 8032508 | CP-AM-MAG |
| 8032509 | CP-AM-TURNOVER |
| 8032511 | CP-AM-CAM |
| 8038567 | CP-AM-MPRESS |
| 8043598 | CP-AM-iDRILL-C21 |
| 8050101* | CP-L-LINEAR-C11-M0 |
| 8050102* | CP-L-LINEAR-C13-M0 |
| 8058667* | CP-L-BRANCH-C21 |
| 8061184 | CP-AM-OUT |
| 8068413 | CP-AM-iPICK-C21 |
| 8088783 | CP-AM-OVEN-230V |
| 8091107 | CP Lab HMI Panel |
| 8092833* | SC CP LAB STD CFG 4 |
| 8092834* | SC CP LAB STD CFG 6 |
| 8092835* | SC CP LAB STD CFG 8 |
| 8092836* | SC CP LAB STD CFG 10 |
| 8108237* | CP-L-LINEAR-C11-M6 |
| 8129428 | CP-Lab/MPS HMI Panel |
| 8132970* | CP-L-LINEAR-C11-M0-V2 |
| 8146023* | CP-L-LINEAR-C13-M0-V2 |
| 8146024* | CP-L-LINEAR-C11-M6-V2 |
| 8152450 | CP-AM-LABEL-V2 |
| 8154245 | CP-AM-MEASURE-V2 |
| 8155207 | CP-AM-CAM-V2 |
| 8167762* | CP-L-LINEAR-C11-M0 V2 |
| 8167762* | CP-L-LINEAR-C11-M0 V2 |
| 8167764* | CP-L-LINEAR-C11-M6 V2 |
| 8172797* | CP-L-LINEAR-NO-PLC-M0 |

| | |
|---|---|
| 2006/42/EC | EN 60204-1:2018 |
| 2014/30/EU | EN 61326-1:2013-01 |
| 2011/65/EU | EN 63000:2016-10 |
| 2014/53/EU* | See Appendix A for details |

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Francis Larrivée, ing.
Engineering

Philippe Drolet, ing.
Product Compliance

**Appendix A:**
Extracted from: Siemens EU-Declaration of Conformity No. A5E50679864A; REV.: 001 /
CE-DoC_A5E50679864A_RF200R_RF300R_RED_RoHS_2020-12-11.pdf (siemens.com)

SIEMENS

Anhang RED & RoHS / *Annex RED & RoHS*
zur EU–Konformitätserklärung / *to EU-Declaration of Conformity*
Nr./No. A5E50679864A; REV.: 001

Produktgruppenbezeichnung/-modell SIMATIC RF200R / RF300R HF RFID READERS
*Product group identification/-model* (13.56 MHz)

Die Übereinstimmung der bezeichneten Produkte (unter Verwendung des Zubehörs) des oben genannten Gegenstandes mit den Vorschriften der angewandten Richtlinie(n) wird nachgewiesen durch die vollständige Einhaltung folgender Normen / Vorschriften (variantenabhängig, siehe Anhang Produkte - Tabelle 1. Angewandt Normen werden durch ein „x" gekennzeichnet, wohingegen nicht angewandte Normen durch ein „-" gekennzeichnet werden.):

*The conformity of the designated products (using the accessory) of the object described above with the provisions of the applied Directive(s) is proved by full compliance with the following standards / regulations (depending on versions, see annex Products - Table 1. Applicable Standards are marked by a "x" whereas not applicable Standards are marked by a "-"):*

Art. 3 (1) a) Schutz der Gesundheit und Sicherheit - Normen / *Health and Safety - standards:*

| Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* | Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* |
|---|---|---|---|
| EN 62368-1 + A11 | 2014/2017 | EN 50364 | 2018 |

Art. 3 (1) b) EMV Normen / *EMC standards:*

| Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* | Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* |
|---|---|---|---|
| ETSI EN 301 489-1 | V2.2.3 | EN IEC 61000-6-1 | 2019 |
| ETSI EN 301 489-3 | V2.1.1 | EN IEC 61000-6-2 | 2019 |
| EN 55011 + A1 + A11 | 2016/2017/2020 | EN 61000-6-3 + A1 | 2007/2011 |
| EN 55032 + A11 Class A/B | 2015/2020 | EN IEC 61000-6-4 | 2019 |
| EN 55035 + A11 | 2017/2020 | EN IEC 61000-6-8 | 2020 |

Art. 3 (2) Effiziente Nutzung des Funkspektrums Harmonisierte Normen / *Efficient usage of spectrum Harmonized standards:*

| Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* | Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* |
|---|---|---|---|
| ETSI EN 300 330 | V2.1.1 | | |

Art. 3 (3) a)-i) Delegierte Rechtsakte für Funkanlagen / *Delegated acts for Radio equipment*

| Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* | Referenznummer / *Reference number* | Ausgabedatum / *Date of issue* |
|---|---|---|---|

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### 4.12 General product safety

**WARNING**

- **General product safety, CE conformity**
  - The product fulfills the requirements of all applicable EU directives. We confirm this with the CE mark.
  - As a consequence of
    Changes (hardware / software)
    Additions
    or improper use
  - Product safety can no longer be guaranteed by the operator.
  - In this case, the manufacturer's CE declaration of conformity expires. The operator must re-evaluate the safety and determine the CE conformity.

### 4.13 Protective devices

In order to reduce risks, this machine contains guards to prevent access to dangerous areas. These guards must not be removed or tampered with.

**WARNING**

- **Damage to the safety window**
  - Windows must not be cleaned using aggressive or alcoholic cleaning agents. Risk of brittleness and breakage!
  - This protective device must be replaced if it shows any signs of damage. Please contact our Service department to arrange this.

#### 4.13.1 Emergency stop

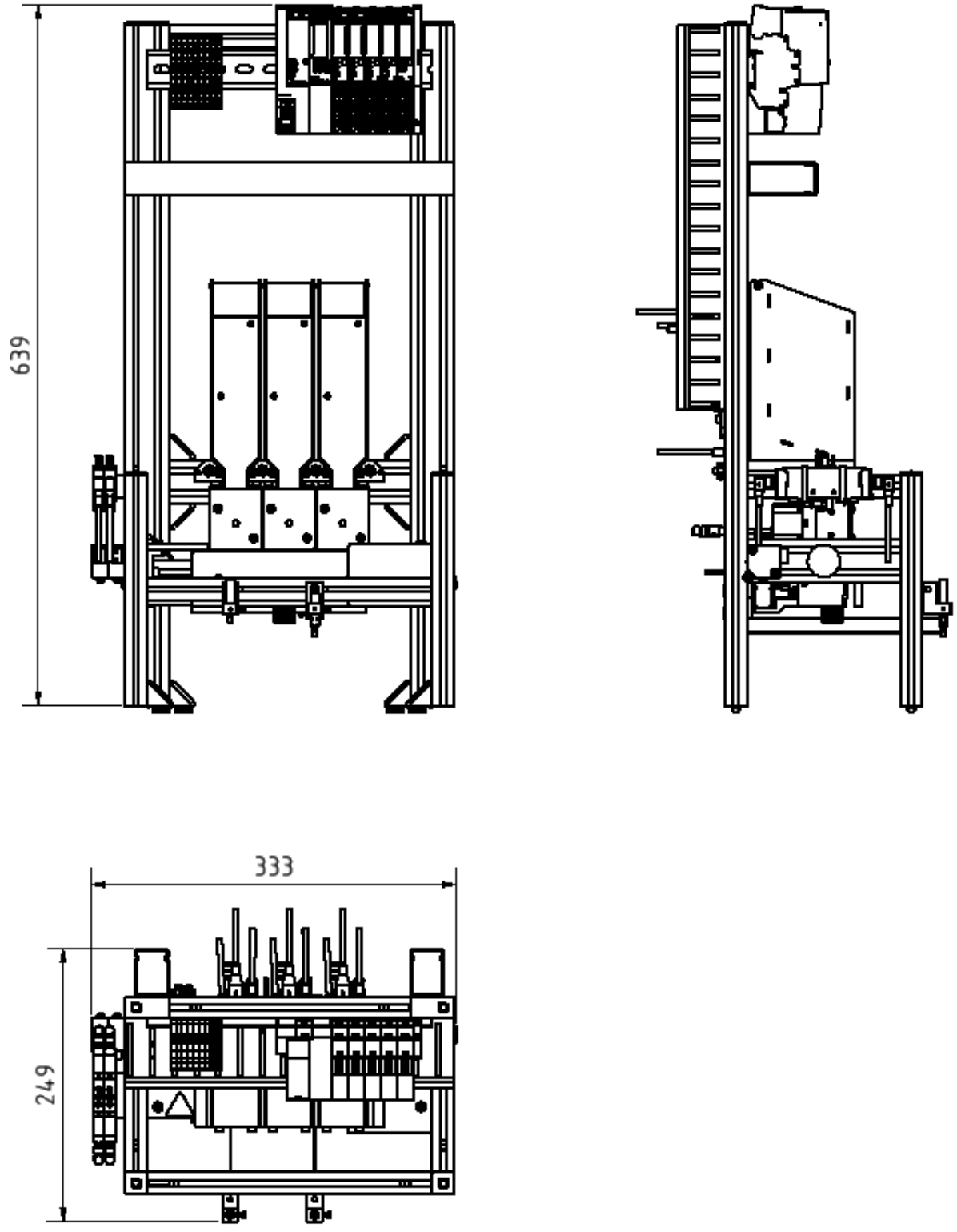
If a station has an emergency stop button, the emergency stop signal switches off all actuators. An acknowledgment by the operator is required for a restart, there is no automatic restart.

#### 4.13.2 Additional protective devices

The individual components, such as the power supplies and the controllers, possess built-in safety functions such as short-circuit protection, overcurrent protection, overvoltage protection and thermal monitoring. If necessary, consult the instruction manual for the device in question for more information.

# 5 Technical Data

| Parameter | Value |
|---|---|
| **Electrics** | |
| Power supply | 24 V DC, 1,0 A safe low voltage (PELV) |
| Digital inputs | 13 |
| Digital outputs | 16 |
| **Compressed air** | |
| Supply pressure | 6 bar, 90 psi |
| Supply rate | >= 40 l/min |
| Compressed air quality | EN ISO 8573-1 |
| Pressure dew point (Class 4) | <= +3°C |
| **Ambient conditions** | |
| Operating environment | Use inside building only |
| Ambient temperature | 5°C ... 40°C |
| Rel. air humidity | 80% up to 31°C |
| Pollution degree | 2, Dry, non-conductive contamination |
| Operating height | Up to 2000 m above NN (sea level) |
| Noise emission level | $L_{pA}$ < 70 dB |
| **Certification** | |
| CE marking in accordance with: | Machinery Directive<br>EMC Directive<br>RoHS Directive |
| EMC environment | Industrial environment, Class A (in acc. with EN 55011) |
| **Measurements** | |
| Length | 332 mm |
| Width | 249 mm |
| Height | 639 mm |
| Weight | Approx 10,5 kg |
| **Subject to change** | |




Measurements / illustration similar

# 6 Design and Function

## 6.1 Transport

**WARNING**

- **Damage to transport equipment when moving heavy machines/machine sections**
  - When the stations are shipped out, extra care must be taken to ensure that heavy machines/machine sections are always transported using a suitable fork-lift truck. A single station can weigh up to 50 kg.
  - Always use suitable transport equipment.
  - Always use the lifting points provided to move the machine/machine sections.
  - Always use the designated load take-up point.

**WARNING**

- **Securing transit routes**
  - The supply routes must be cleared prior to transport, and must be suitable for the forklift truck to pass through. If necessary, warning signs or barrier tape must be set up to keep the routes clear.
- **Caution**
  - When opening transport boxes, care must be taken to ensure that any additional components delivered in the same box, such as computers, do not fall out.

**WARNING**

- **Danger of crushing for hands/feet**
  - It is not permitted to grip onto or under the feet when handling the machine, as there is an increased risk of hands or feet getting crushed or trapped in these areas.
  - When setting down the station, make sure no persons have their feet under the machine's feet.

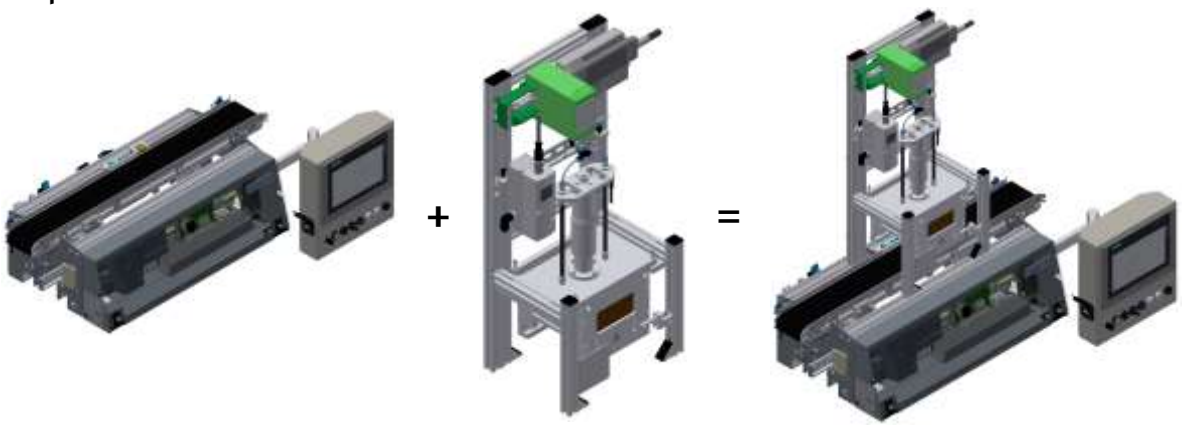
**NOTE**

- When opening the transport box, any additional components must be secured to prevent them from falling out, and removed first.
- Once this is done, the transport box can be removed/opened up fully, and the station can be taken out and moved to its intended location.
- Care must be taken with all components projecting from the machine, as sensors and similar small parts can easily be damaged if the machine is not transported correctly.
- Check that all the profile connectors are seated correctly using a size 4 – 6 Allen key. Unavoidable vibrations can loosen the connectors during transport.

### 6.2 Overview of the System

CP Lab Conveyor, CP Factory Linear, CP Factory Shunt and CP Factory Bypass are called basic modules. If an application module, e.g. the CP Application Module muscle press is attached to a basic module, it becomes a station.

**Example**



basic module, e.g. CP Lab Conveyor

application module, e.g. muscle press

station muscle press

If several stations are put in a row one behind the other, this will form a production line.

carrier

pallet

workpiece

Carriers are transported on the conveyors of the basic modules. And on the carriers, there are pallets with a fixed workpiece reception placed. The workpieces are placed on the workpiece reception or taken from it. Pallets can also be placed on a carrier in some stations or gripped from there.

The typical workpiece of a CP Factory/Lab System is the roughly simplified version of a mobile phone. The workpiece consists of a front cover, of a back cover, of a board and of a maximum of two fuses.

front cover

board

back cover

### 6.2.1 Application module dispense

The task of the application module dispense is

- To separate spheres (balls) of different diameters from magazines and fill in 3-fold trays.

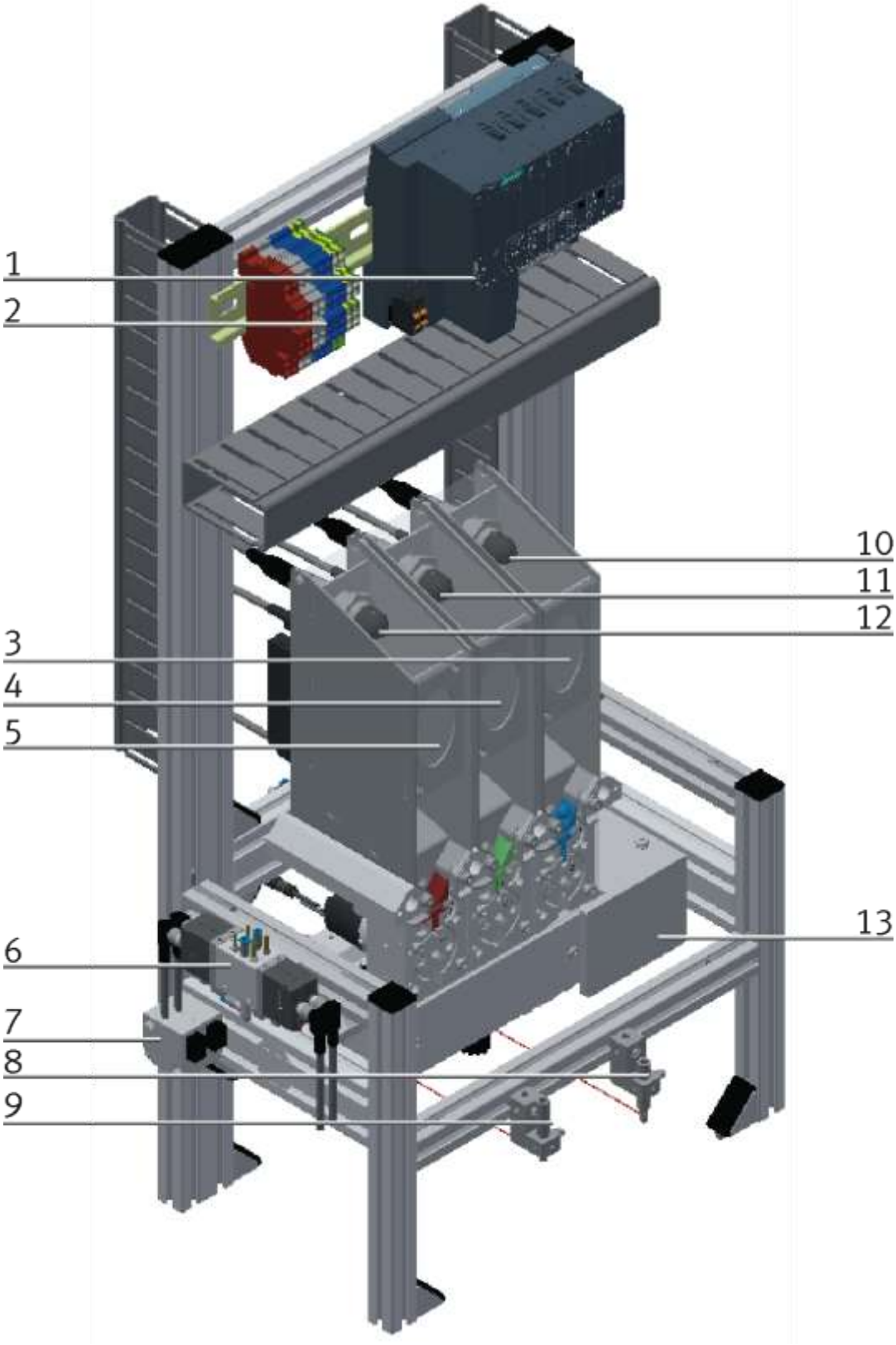



Illustration similar

| Position | Description |
|---|---|
| 1 | Controller Siemens IM155-6 PN HF |
| 2 | Clamps |
| 3 | Magazine for blue balls |
| 4 | Magazine for green balls |
| 5 | Magazine for red balls |
| 6 | Valve for X-axis |
| 7 | Ligth barrier unit |
| 8 | Light barrier workpiece available BG10 |
| 9 | Light barrier lid available BG14 |
| 10 | Ultrasonic sensor Balluff blue balls |
| 11 | Ultrasonic sensor Balluff green balls |
| 12 | Ultrasonic sensor Balluff red balls |
| 13 | Saftey cover |

### 6.2.2 Electrics

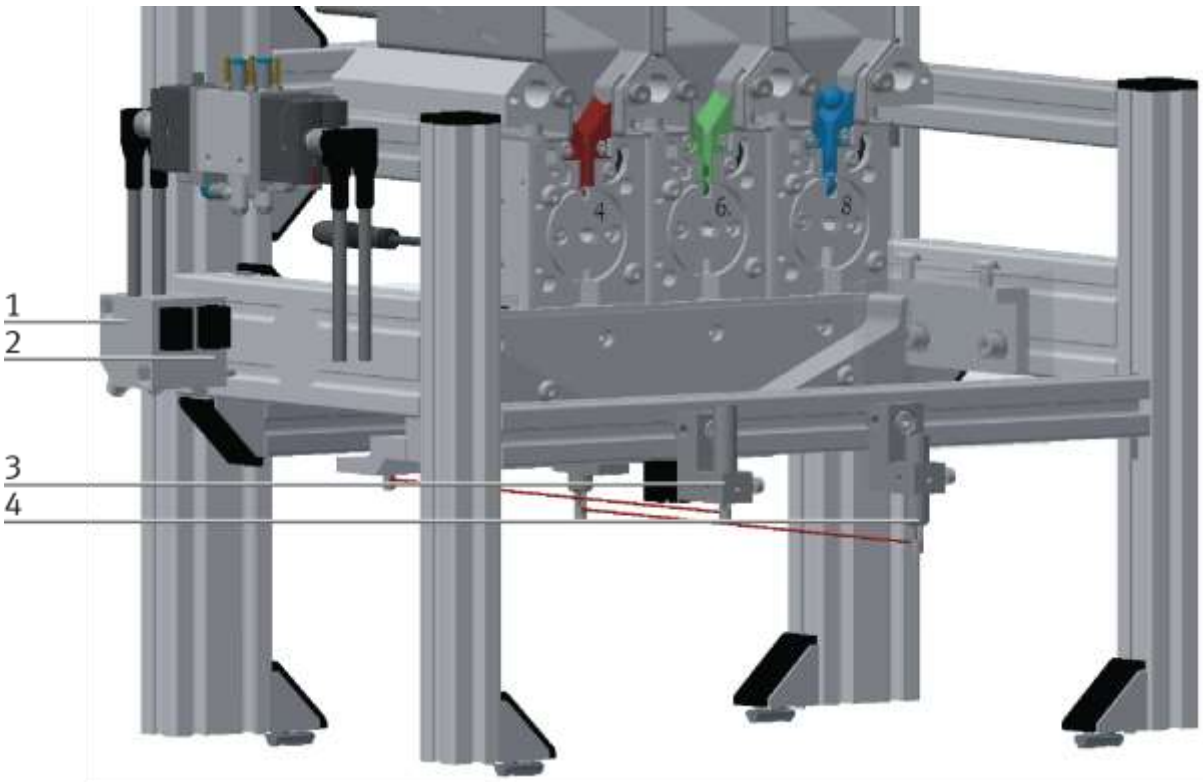



Illustration similar

| Position | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Light guide unit D: SOEG-L-Q30-P-A-S-2L | 8127556 | BG14 | Lid available |
| 2 | Light guide unit D: SOEG-L-Q30-P-A-S-2L | 8127556 | BG10 | Workpiece tray available |
| 3 | Light guide SOOC-TB-M4-2-R25 | 552812 | BG14 | Lid available |
| 4 | Light guide SOOC-TB-M4-2-R25 | 552812 | BG10 | Workpiece tray available |

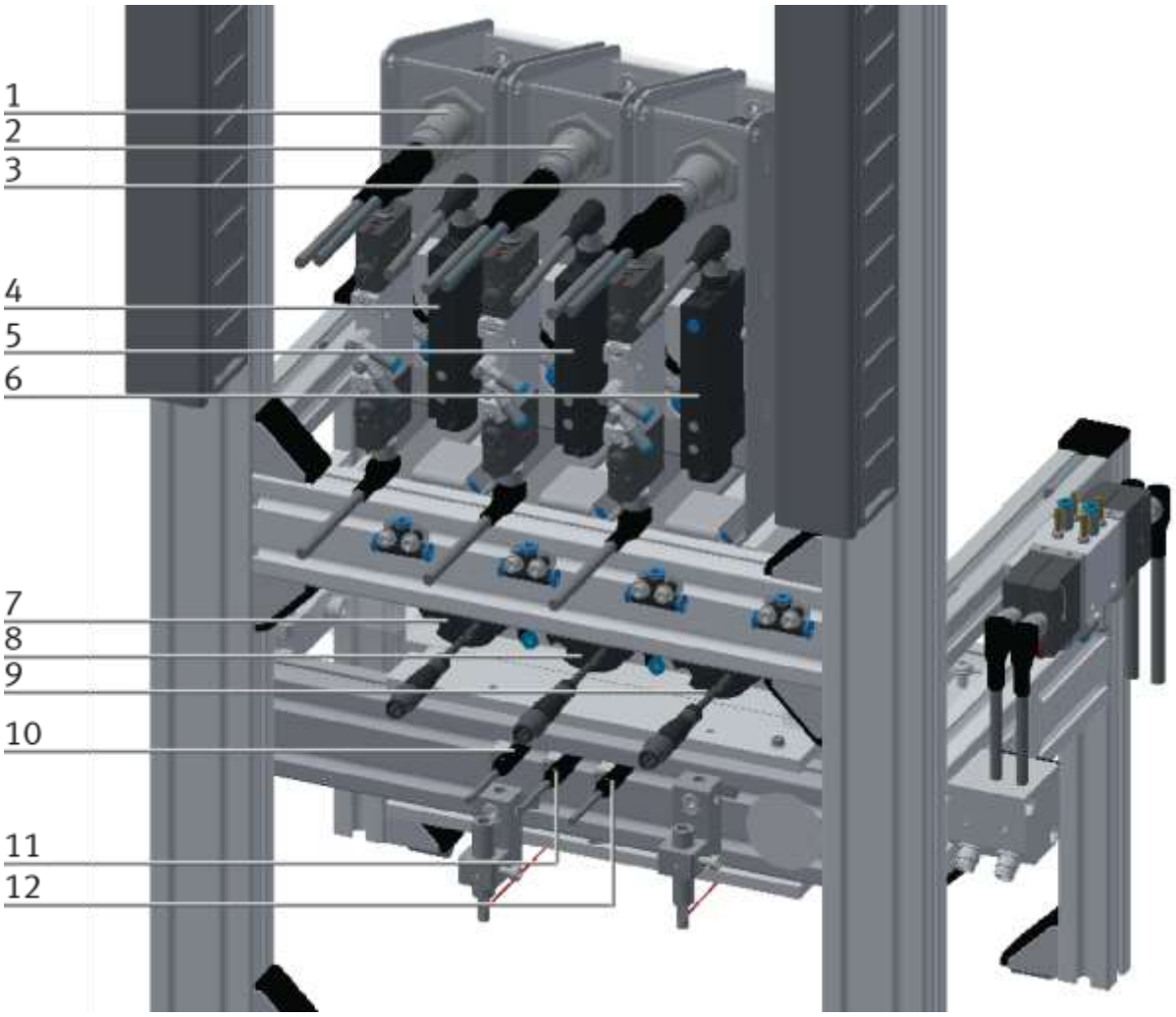



Illustration similar

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG13 | Filling level magazine 3 |
| 2 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG12 | Filling level magazine 2 |
| 3 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG11 | Filling level magazine 1 |
| 4 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG6 | Magazine 3 / 1 = balls available |
| 5 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG4 | Magazine 2 / 1 = balls available |
| 6 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG2 | Magazine 1 / 1 = balls available |
| 7 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG5 | Rotation cylinder 3 initial position top |
| 8 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG3 | Rotation cylinder 2 initial position top |
| 9 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG1 | Rotation cylinder 1 initial position top |
| 10 | Position sensors X-axis / SMT-8G-PS-24V-E-2,5Q-OE | 547859 | BG9 | X-Axis right end position |
| 11 | Position sensors X-axis / SMT-8G-PS-24V-E-2,5Q-OE | 547859 | BG8 | X-Axis middle position |
| 12 | Position sensors X-axis / SMT-8G-PS-24V-E-2,5Q-OE | 547859 | BG7 | X-Axis left end position |

### 6.2.3 Pneumatics

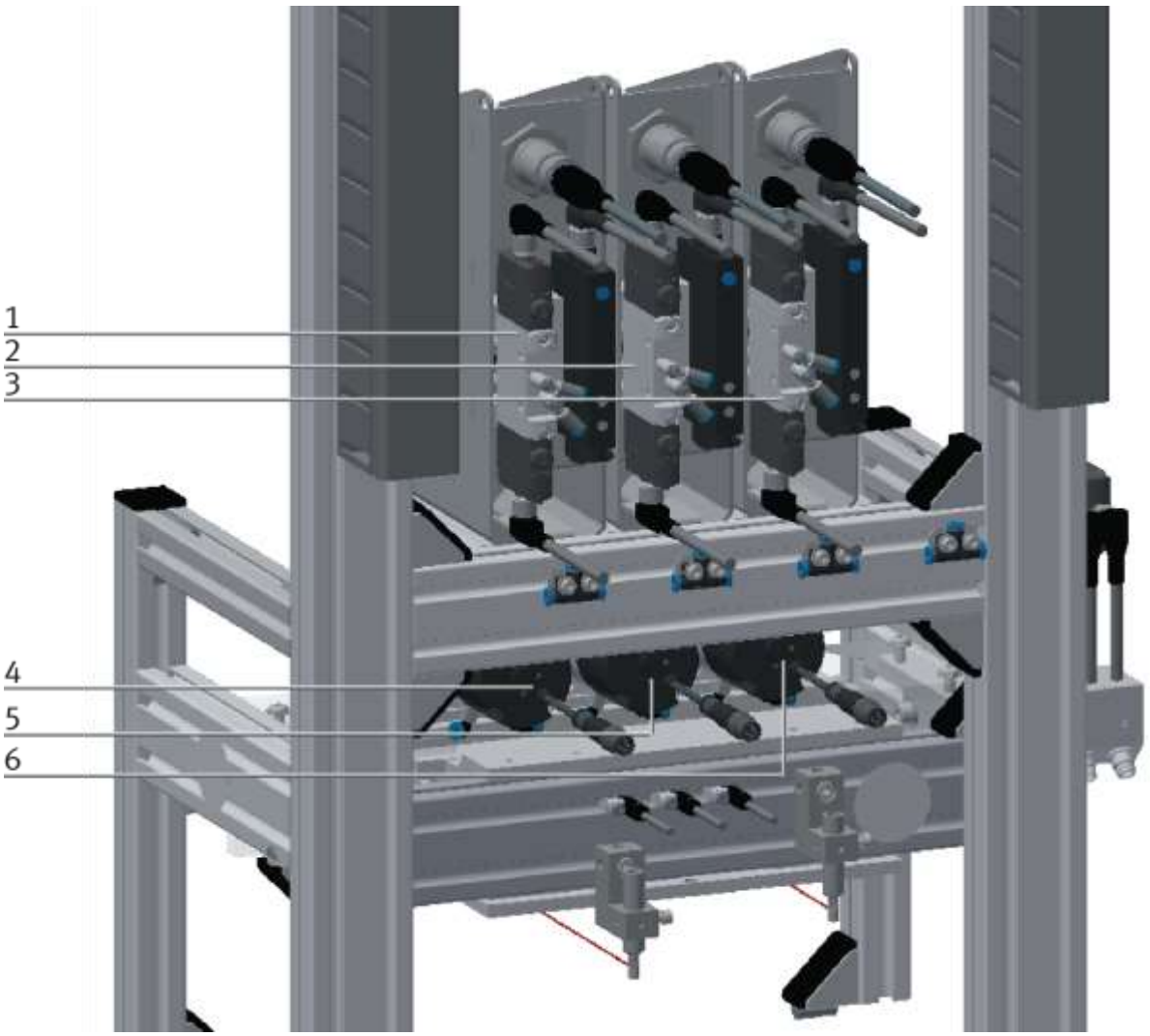



Illustration similar

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Valve / VUVG-L10A-P53U-T-M3-1P3 | 566441 | MB5<br>MB6 | Rotation cylinder 3 to initial position<br>Rotation cylinder 3 to ball output |
| 2 | Valve / VUVG-L10A-P53U-T-M3-1P3 | 566441 | MB3<br>MB4 | Rotation cylinder 2 to initial position<br>Rotation cylinder 2 to ball output |
| 3 | Valve / VUVG-L10A-P53U-T-M3-1P3 | 566441 | MB1<br>MB2 | Rotation cylinder 1 to initial position<br>Rotation cylinder 1 to ball output |
| 4 | Rotation cylinder / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | MM3 | Rotation cylinder 3 |
| 5 | Rotation cylinder / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | MM2 | Rotation cylinder 2 |
| 6 | Rotation cylinder / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | MM1 | Rotation cylinder 1 |

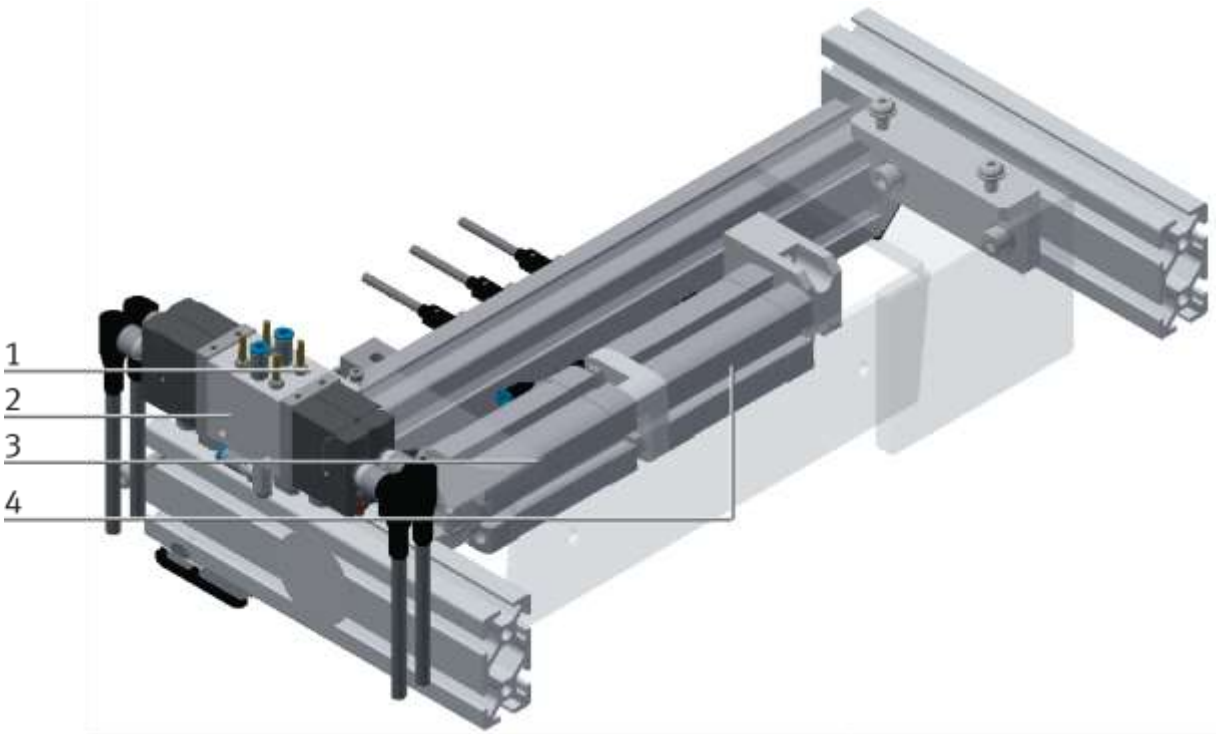



Illustration similar

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Valve / VUVG-L10A-P53E-T-M3-1P3 | 566440 | MB7<br>MB8 | X-axis 1 lift back (left)<br>X-axis 1 expand (+20mm) |
| 2 | Valve / VUVG-L10A-P53E-T-M3-1P3 | 566440 | MB9<br>MB10 | X-axis 2 lift back (right)<br>X-axis 2 expand (+20mm) |
| 3 | Cylinder / ADN-12-20-I-P-A | 536214 | MM4 | X-axis 1 |
| 4 | Cylinder / ADN-12-20-I-P-A | 536214 | MM5 | X-axis 2 |

### 6.3 Function

The application module separates spheres (balls) from three different magazines. If a workpiece carrier moves into the module, it is stopped. Depending on the order, the three shelfs of the carrier are filled from the 3 magazines. The separating mechanism can be moved to fill the three shelfs with 2 cylinders. The magazines are monitored with ultrasound sensors from above and light barriers on the back of each magazine. At the separation, another sensor monitors a magazine jam. If this sensor is activated, but the ultrasonic sensor reports magazine full, an air pulse is sent to the separation to release the jam. When all the balls are deposited in the carrier as desired, the process is completed and then the product carrier is released again and out of the application module.

### 6.4 Process description

**Start Conditions**

- All connections have been made properly
- The magazines must be filled up

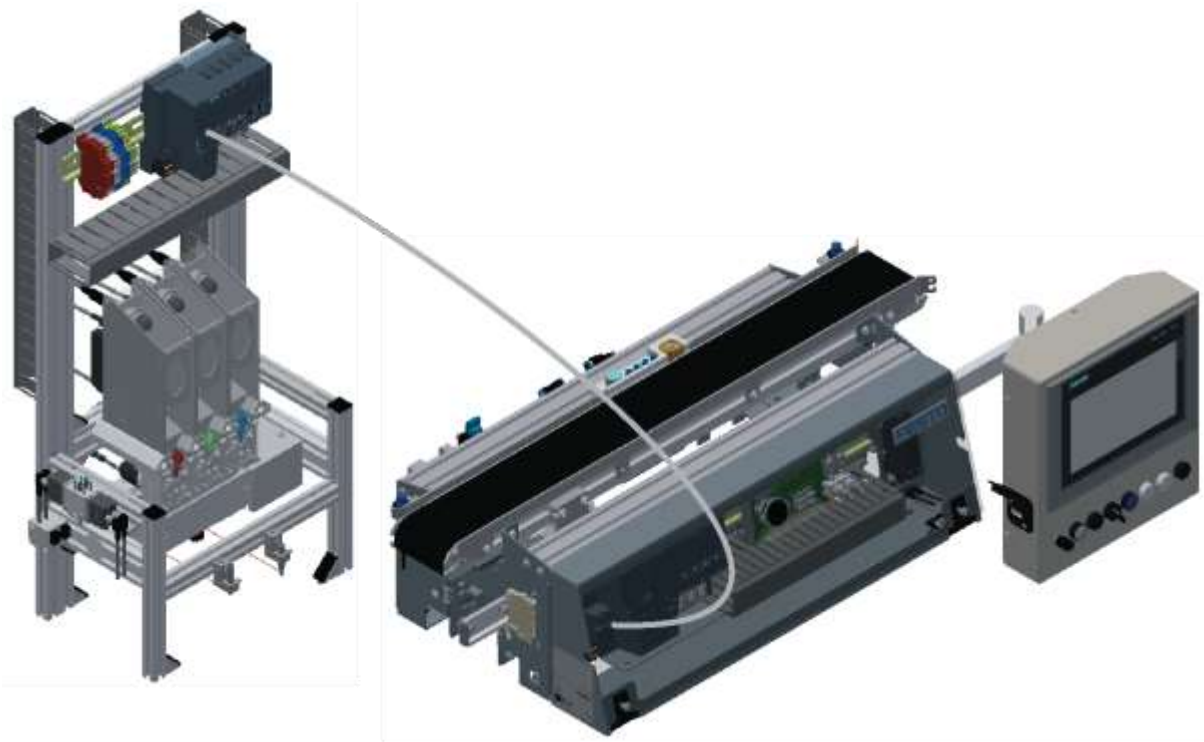
**Procedure**

1. If a workpiece carrier with a workpiece is transported to the stopper and the application module is activated, the workpiece carrier is stopped and an automatic process is started.
2. If the conditions of the workpiece carrier match the requirements, the separator moves over the desired box of the workpiece on the carrier and a ball is isolated.
3. If more balls are to be distributed, the separator passes over the corresponding shelf of the workpiece on the carrier and the required number of balls are separated into the corresponding shelf.
4. When the workpiece on the carrier is filled, the application program is finished, the stopper moves down and the workpiece carrier leaves the station.

For parameters for the sequence, see chapter Operation.

### 6.5 Electrical Connections

The actuators and sensors are connected to a controller directly on the application module. The control of the application module is connected via an Ethernet cable to the controller of the CP-Lab conveyor. The protocol is Profinet.



### 6.5.1 Assignment of the control on the application module

**Inputs I/O**

| Description | Label | Clamp sensor | Clamp PLC | Name PLC |
|---|---|---|---|---|
| Rotation cylinder 1 (4mm) Initial position top | +CL1 -BG1 | -WG1:4 | -KF2:1 lx | I100.0 |
| Rotation cylinder 1 (4mm) ball output (bottom) | +CL1 –BG1 | -WG1:2 | -KF2:2 lx+1 | I100.1 |
| Magazine 1 (4mm) / 1= Balls available | +CL1 –BG2 | -WG2:4 | -KF2:3 lx+2 | I100.2 |
| X-axis left end position | -BG7 | load | -KF2:4 lx+3 | I100.3 |
| Rotation cylinder 2 (8mm) Initial position top | +CL2 –BG3 | -WG3:4 | -KF2:5 lx+4 | I100.4 |
| Rotation cylinder 2 (8mm) ball output (bottom) | +CL2 –BG3 | -WG3:2 | -KF2:6 lx+5 | I100.5 |
| Magazine 2 (8mm) / 1= balls available | +CL2 –BG4 | -WG4:4 | -KF2:7 lx+6 | I100.6 |
| X-axis middle position | -BG8 | load | -KF2:8 lx+7 | I100.7 |
| Rotation cylinder 3 (6mm) Initial position | +CL3 –BG5 | -WG5:4 | -KF3:1 lx | I101.0 |
| Rotation cylinder 3 (6mm) balls output (bottom) | +CL3 –BG5 | -WG5:2 | -KF3:2 lx+1 | I101.1 |
| Magazine 3 (6mm) / 1= balls available | +CL3 –BG6 | -WG6:4 | -KF3:3 lx+2 | I101.2 |
| X-axis right end position | -BG9 | load | -KF3:4 lx+3 | I101.3 |

**Input I/O Link**

| Description | Label | Clamp sensor | Clamp PLC | Name PLC |
|---|---|---|---|---|
| Filling level magazine 1 | +CL1 -BG11 | -WG11:4 | -KF6:1 lx | ID110 |
| Filling level magazine 2 | +CL1 –BG12 | -WG12:4 | -KF6:2 lx+1 | ID118 |
| Filling level magazine 3 | +CL1 –BG13 | -WG13:4 | -KF6:3 lx+2 | ID126 |

**Outputs I/O**

| Description | Label | Clamp PLC | Name PLC |
|---|---|---|---|
| Rotation cylinder to initial position 1 (top) | +CL1 -Q1 -MB1 | -KF4:1 0x | Q100.0 |
| Rotation cylinder 1 to ball output (bottom) | +CL1 -Q1 –MB2 | -KF4:2 0x+1 | Q100.1 |
| Blast pipe magazine 1 | -Q7 -MB11 | -KF4:3 0x+2 | Q100.2 |
| Rotation cylinder to initial position 2 (top) | +CL2 –Q2 –MB3 | -KF4:5 0x+4 | Q100.4 |
| Rotation cylinder 2 to ball output (bottom) | +CL2 –Q2 –MB4 | -KF4:6 0x+5 | Q100.5 |
| Blast pipe magazine 2 | -Q8 -MB12 | -KF4:7 0x+6 | Q100.6 |
| Blast pipe magazine 3 | -Q9 –MB13 | -KF4:8 0x+7 | Q100.7 |
| Rotation cylinder to initial position 3 (top) | +CL3 –Q3 –MB5 | -KF5:1 0x | Q101.0 |
| Rotation cylinder 3 to ball output (bottom) | +CL3 –Q3 –MB6 | -KF5:2 0x+1 | Q101.1 |
| X-axis 1 lift back (left) | -Q4-MB7 | -KF5:5 0x+4 | Q101.4 |
| X-axis 1 expend (+20mm) | -Q4-MB8 | -KF5:6 0x+5 | Q101.5 |
| X-axis 2 lift back (right) | -Q5-MB9 | -KF5:7 0x+6 | Q101.6 |
| X-axis 2 expend (+20mm) | -Q5-MB10 | -KF5:8 0x+7 | Q101.7 |

# 7 Commissioning

**NOTE**

– The following applies to the start-up as well as to the restart.

- The CP Application Module is delivered pre-assembled.
- All attachment parts are individually packaged.
- All components, tubings and cablings have been clearly marked in order to guarantee a problem-free retrieving of all connections.
- For the operation within a CP Factory/Lab System, the CP Application Module has to be put on and attached to a basic module.

**NOTE**

– You can read the general installation instructions in the manual of your basic module. The following instructions apply particularly to the CP Application Module.

### 7.1 Workplace

The commissioning of the CP Application Module requires:

- a CP Application Module
- a basic module CP Factory or a basic module CP Lab Conveyor for the installation of the CP Application Module
- a SysLink cable for the connection between the I/O terminal of the CP Application Module and the basic module CP Factory
- an Ethernet cable for the connection of the motor controller (option)
- an on-site electrical connection in the room, see data sheet basic module
- an on-site pneumatically connection in the room, see data sheet basic module

### 7.2 Visual Inspection

**WARNING**

- **Any damages must always be repaired instantly.**

Visual inspection has to be carried out prior to every commissioning!
Before you start the CP Application Module, you must always inspect the following parts regarding visual damages and function:

- Electrical connections
- Mechanical components and connections
- Emergency Stop devices

### 7.3 Safety Regulations

**WARNING**

- **Any damages must always be repaired instantly.**

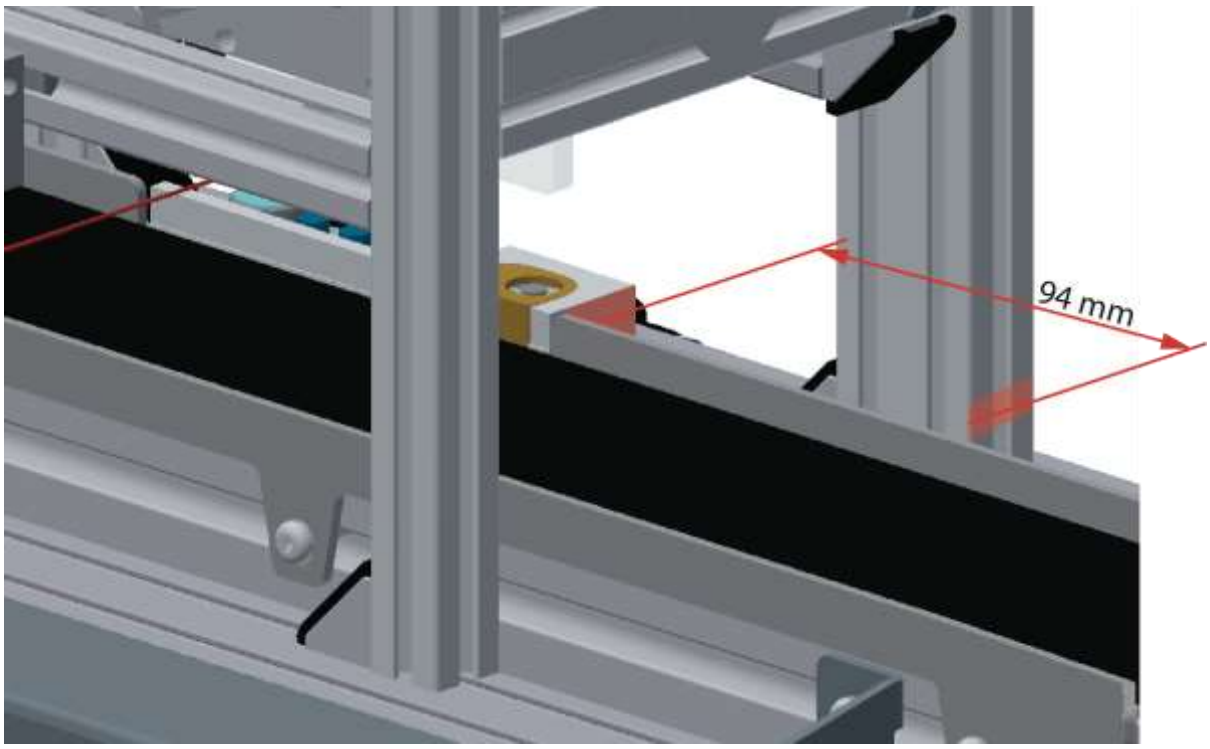
The CP Application Module may only be operated on the following conditions:

- The technical condition – mechanically and electrically – of the CP Application Module is perfect.
- The CP Application Module is used in accordance with the regulations.
- The operating instructions have been read and understood.
- All safety devices are available and active.

### 7.4 Assembly

The application module is mounted on the basic module with the following distance (see picture): the distance between the stopper edge and the profile edge is the same with a CP-Lab conveyor as with a CP-Factory basic module.

The assembly process is explained in the following chapter as an example. The displayed dimension is an approximation, it is possible that a fine adjustment is necessary for error-free processing.




Example distance between application module and stopper / illustration similar

### 7.4.1 Assembly of an CP application module to basic module CP Lab Conveyor

**NOTE**

The procedure of attaching the CP application module to a basic module is the same as with all basic modules. The following description for the attachment to a basic module. CP Lab Conveyor is an example for all basic modules and all application modules.

**Positioning slot nuts in the cross profiles of the basic module CP Lab Conveyor**

Mounting the CP application module is very easy:

- Two M5-slot nuts (2) have to be put into the inner front slot of the cross profile (4) of the basic module CP Lab Conveyor.
- Then put two additional M5-slot nuts (2) into the inner back slot of the cross profile (3) of the basic module CP Lab conveyor.
- Then you have to position the slot nuts (2) approximately to the distance of the vertical cross profiles of the CP application module.

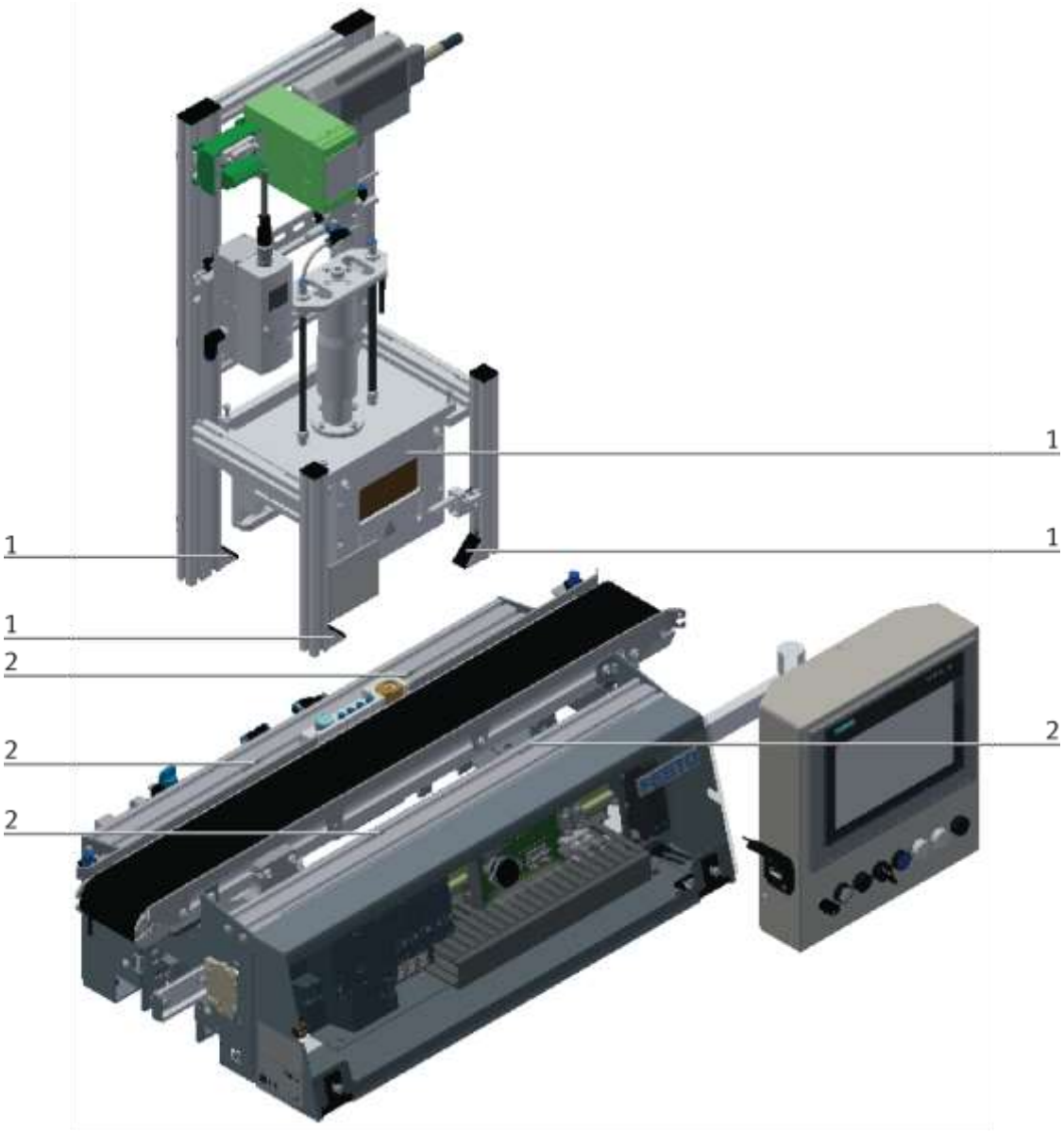

Positioning slot nuts / illustration similar

| Position | Description |
|---|---|
| 1 | back cross profile |
| 2 | slot nut |
| 3 | Inner slot (back cross profile) |
| 4 | Inner slot (front cross profile) |
| 5 | front cross profile |

**Attaching the application module to the basic module CP Lab Conveyor**

- Put the CP application module on the basic module CP Lab Conveyor.
- Position the slot nuts (2) underneath the mounting brackets (1) of the CP application module so that the internal threads of the slot nuts are visible underneath the elongated holes of the mounting brackets.

| | |
|---|---|
|  | ***NOTE***<br>Use Allen keys for lateral adjustment of the slot nuts. |

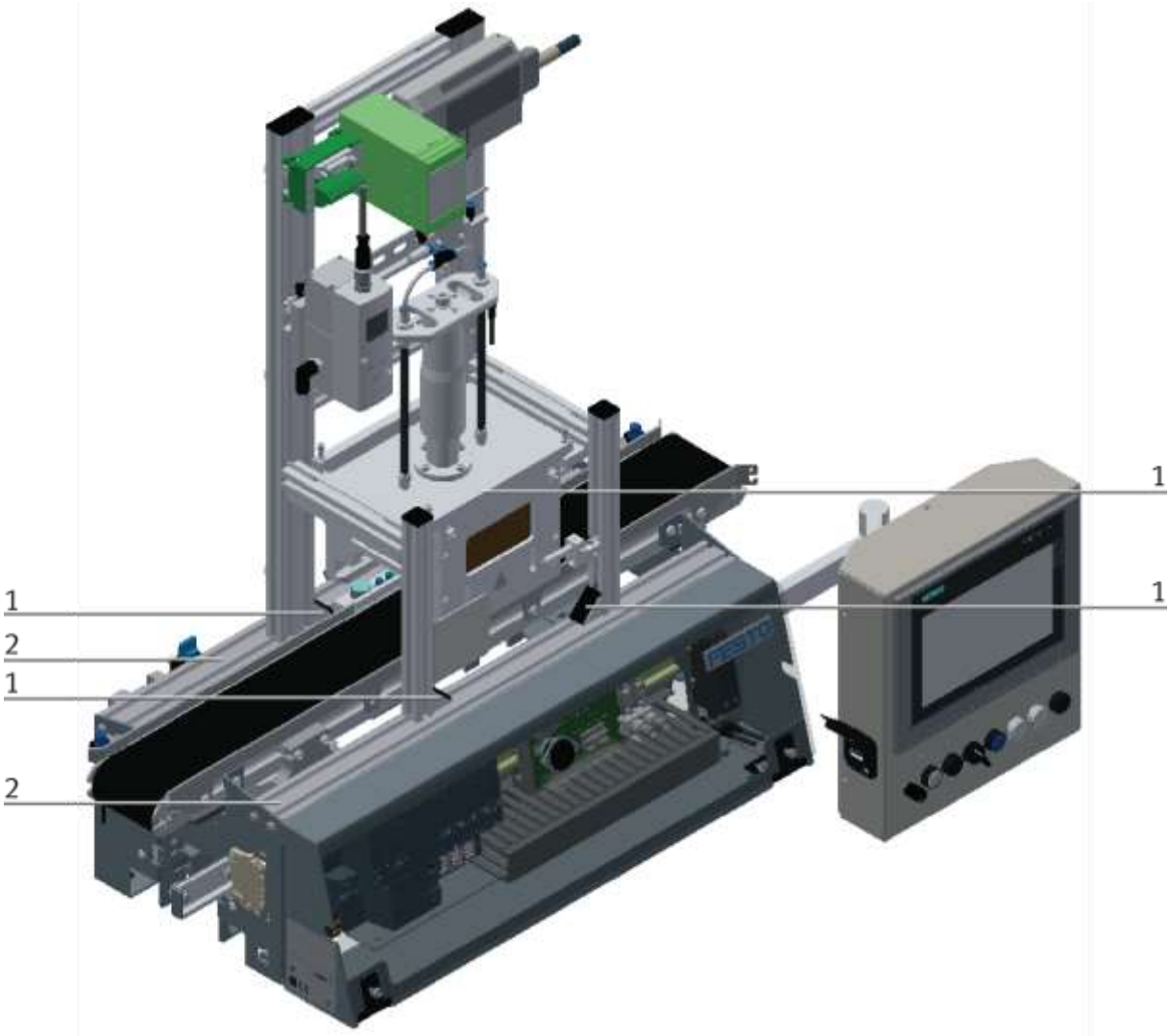



How to put on the CP application module / illustration similar

| Position | Description |
|---|---|
| 1 | CP application module: mounting bracket |
| 2 | slot nut |

**Adjusting the CP application module and fixing it on the basic module CP Lab Conveyor**

- Use raised head screws M5x8, in order to connect the mounting brackets (1) of the CP application module Measuring, at first loosely, with the cross profiles (2) of the basic module CP Lab Conveyor.
- After setting all raised head screws, you can still move the CP application module to the position required.
- Push a carrier with pallet and front cover to the stopper position. The front cover points with its inside upwards. The drilled hole of the front cover is on the left side.
- Have a visual inspection to make sure that the two distance sensors are capable of registering the front cover more or less in medium range.
- Now tighten the raised head screws.
- Then put the black covers onto the mounting brackets.




Tightening the CP application module / illustration similar

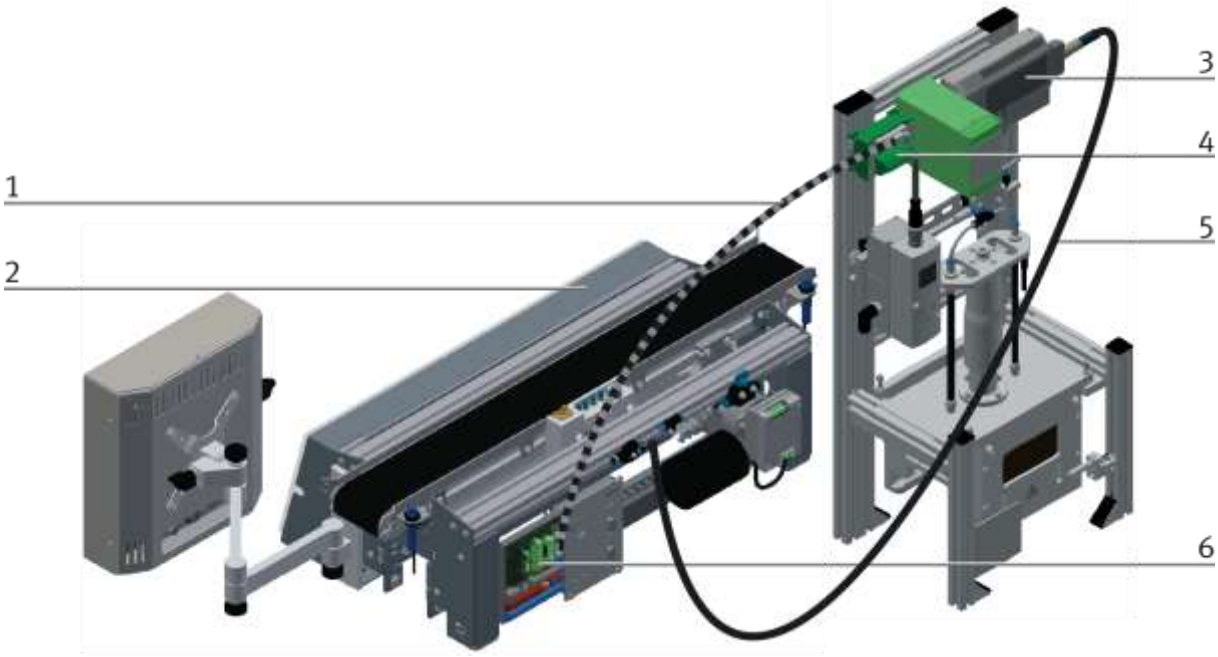
| Position | Description |
|---|---|
| 1 | CP application module: mounting bracket with cover |
| 2 | basic module CP Lab Conveyor: cross profile |

### 7.4.2 Connecting the CP application module electrically to basic module CP Lab Conveyor SysLink-interface for digital signals

| | NOTE |
|---|---|
| | With special variants of the basic module CP Lab Conveyor, you absolutely have to observe the corresponding operation instructions of the basic module CP Lab Conveyor! |

The CP application module exchanges digital input and output signals with the basic module via the SysLink interface:

- Connect the I/O terminal (3) of the CP application module with the control (1) of the basic module CP Lab Conveyor. Therefore use the connecting cable with SysLink plugs (5) which has already been attached to the control and is led out on the back side of the basic module CP Lab Conveyor.



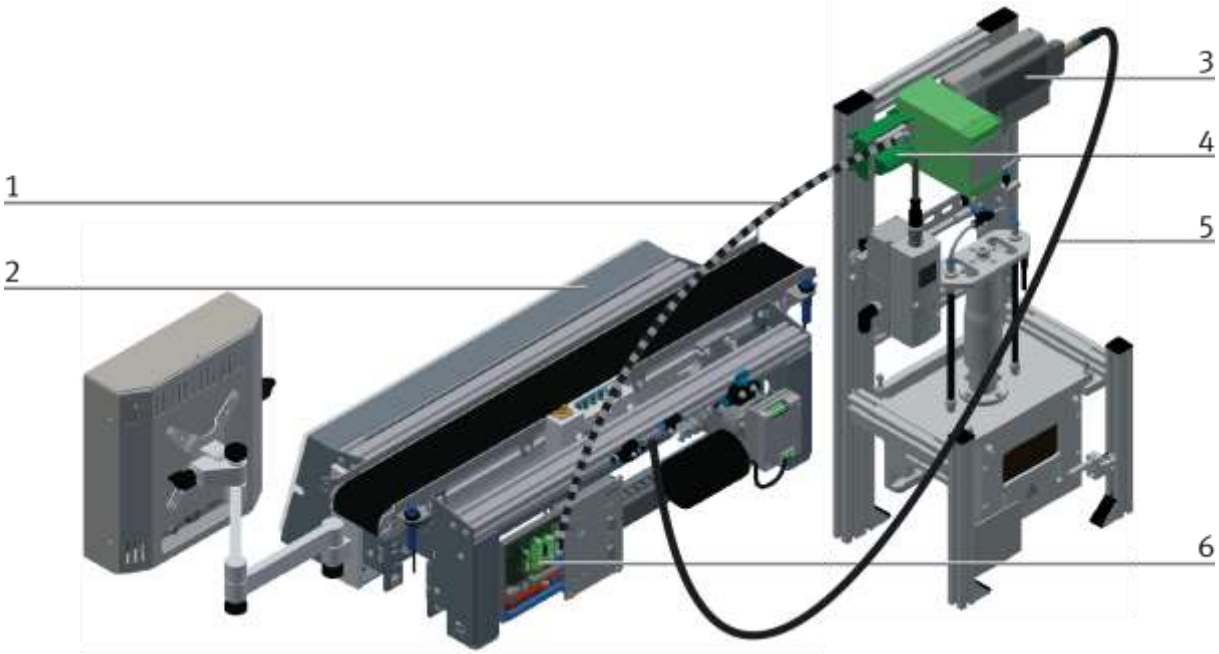

Electrical connections / illustration similar

| Position | Description |
|---|---|
| 1 | connecting cable with15-pin standard D-Sub-plugs |
| 2 | basic module CP Lab Conveyor:  control or decentralized periphery |
| 3 | CP application module: I/O terminal (+BG-XD1) |
| 4 | CP application module: analogue terminal (+BG-XD2A) |
| 5 | connecting cable with a SysLink-plug (SysLink-cable) |
| 6 | basic module CP Lab Conveyor: board at the back (+G1-XZ2) |

**D-Sub-interface for analogue signals (option – not available at all application modules)**

The CP application module produces a analogue output signal. These is put on the analogue terminal (4) and must be connected with the analogue inputs of the basic module:

- Connect the analogue terminal (4) of the CP application module with the D-Sub-interface for analogue signals (6) on the rear board of the basic module CP Lab Conveyor. Therefore use the provided connecting cable (1) with standard D-Sub plugs: 15-pin, two-rowed.

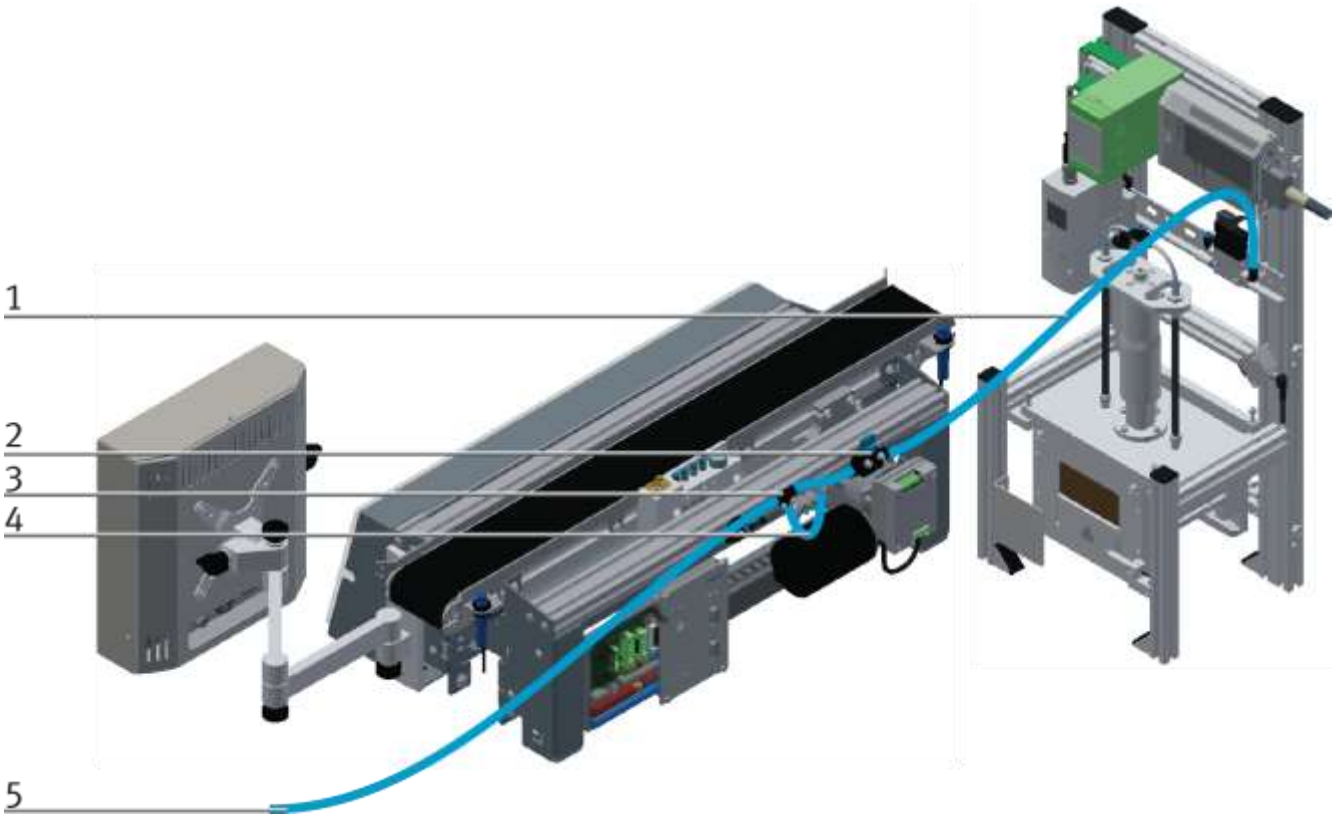



Electrical connections / illustration similar

| Position | Description |
|---|---|
| 1 | connecting cable with15-pin standard D-Sub-plugs |
| 2 | basic module CP Lab Conveyor:  control or decentralized periphery |
| 3 | CP application module: I/O terminal (+BG-XD1) |
| 4 | CP application module: analogue terminal (+BG-XD2A) |
| 5 | connecting cable with a SysLink-plug (SysLink-cable) |
| 6 | basic module CP Lab Conveyor: board at the back (+G1-XZ2) |

### 7.4.3 Pneumatic connection from application modules to basic module CP Lab Conveyor (option – not available at all application modules)

The pneumatic connection is based on the principle of the following sketch. The application module is connected from the valve terminal to the shut-off valve (2) on the conveyor belt. The hose (1) (nominal width 4) is simply inserted into the QS connector. The supply line (5) is plugged into the T-plug (3)
The CP Lab Band is also supplied with a T-connector (4).




Pneumatically connect application module / illustration similar

### 7.4.4 Assembly of an CP application module to a CP Factory basic module

**NOTE**

The procedure for installing a CP application module on a basic module is identical for all basic modules. The following example is an example for all basic modules and applications.

**Positioning slot nuts in the cross profiles of the CP Factory basic module**

Mounting the CP application module is very easy:

- Two M5-slot nuts (1) have to be put into the inner front slot of the cross profile (4) of the CP Factory basic module.
- Then put two additional M5-slot nuts (1) into the inner back slot of the cross profile (2) of the basic module.
- Then you have to position the slot nuts (1) approximately to the distance of the vertical cross profiles of the CP application module.

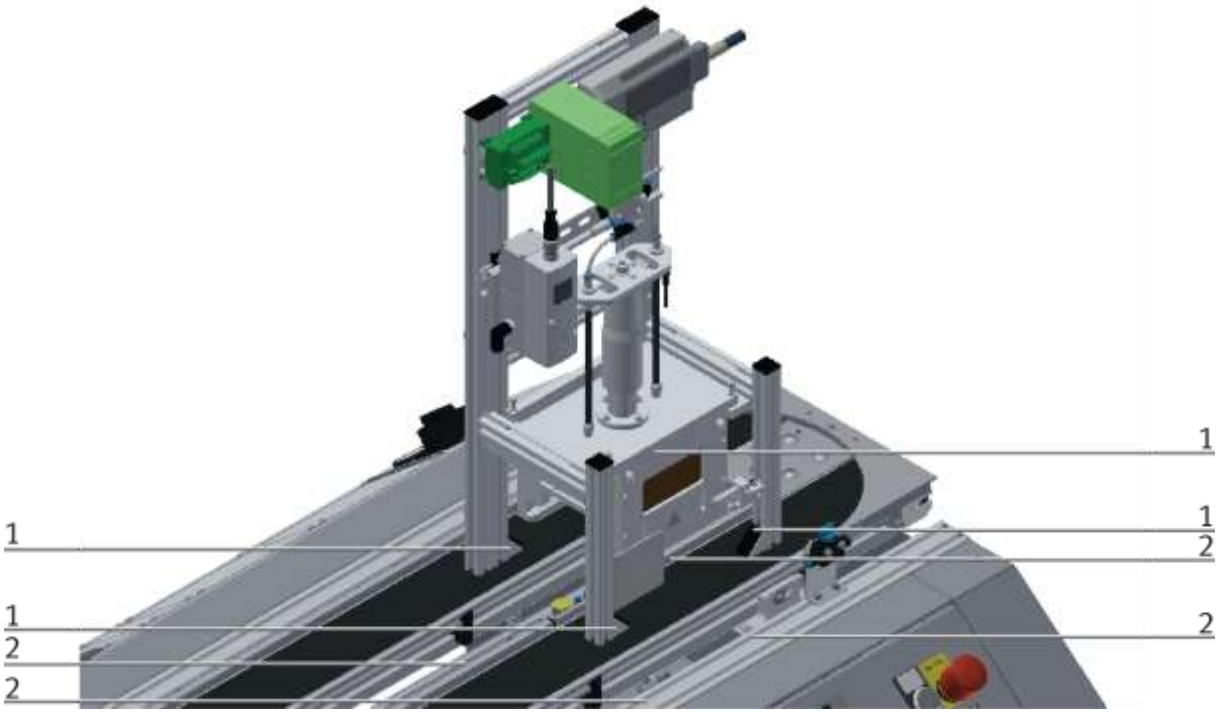

Positioning slot nuts / illustration similar

| Position | Description |
|---|---|
| 1 | slot nut |
| 2 | back cross profile |
| 3 | Inner slot (front cross profile) |
| 4 | front cross profile |

**Attaching the application module to the CP Factory basic module**

- Put the CP application module on the CP Factory basic module.
- Position the slot nuts (2) underneath the mounting brackets (1) of the CP application module so that the internal threads of the slot nuts are visible underneath the elongated holes of the mounting brackets.

| | NOTE |
|---|---|
| | Use Allen keys for lateral adjustment of the slot nuts. |

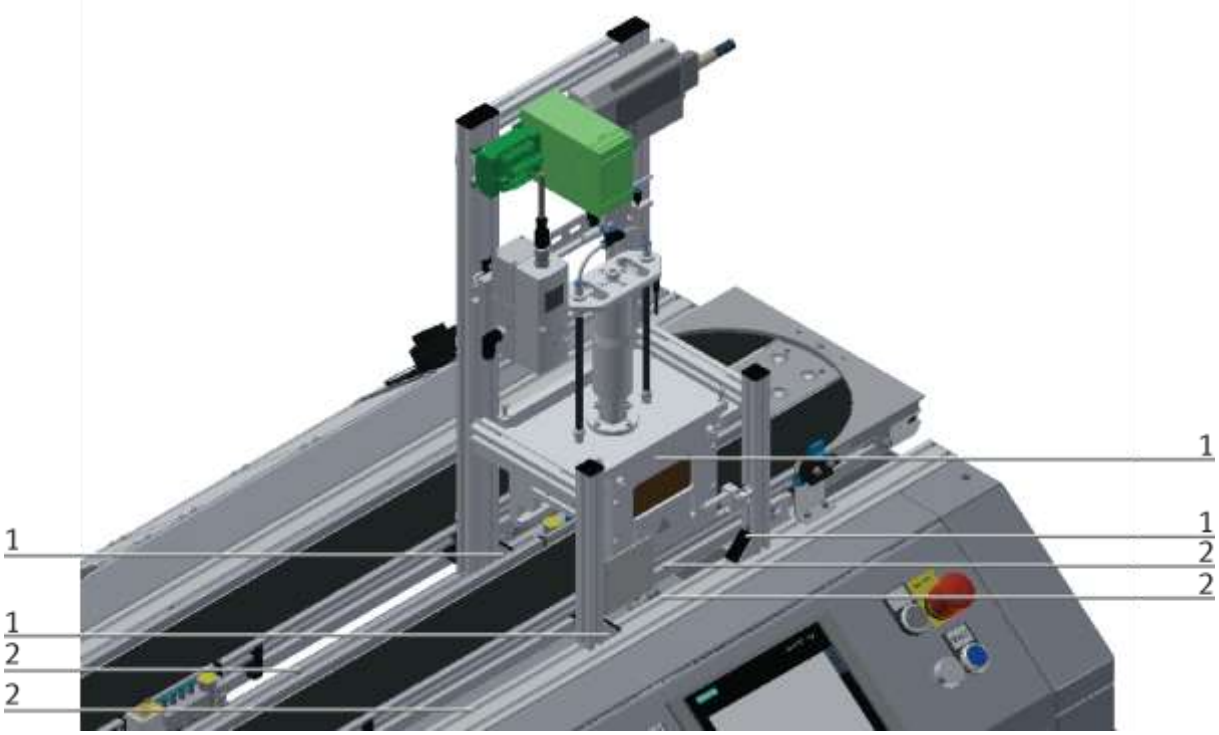



How to put on the CP application module / illustration similar

| Position | Description |
|---|---|
| 1 | CP application module: mounting bracket |
| 2 | slot nut |

**Adjusting the CP application module and fixing it on the CP Factor basic module**

- Use raised head screws M5x8, in order to connect the mounting brackets (1) of the CP application module Measuring, at first loosely, with the cross profiles (2) of the CP Factory basic module.
- After setting all raised head screws, you can still move the CP application module to the position required.
- Push a carrier with pallet and front cover to the stopper position. The front cover points with its inside upwards. The drilled hole of the front cover is on the left side.
- Have a visual inspection to make sure that the two distance sensors are capable of registering the front cover more or less in medium range.
- Now tighten the raised head screws.
- Then put the black covers onto the mounting brackets.




Tightening the CP application module / illustration similar

| Position | Description |
|---|---|
| 1 | CP application module: mounting bracket with cover |
| 2 | CP Factory basic module: cross profile |

### 7.4.5 Connecting the CP application module electrically to the CP Factory basic module

**SysLink-interface for digital signals**

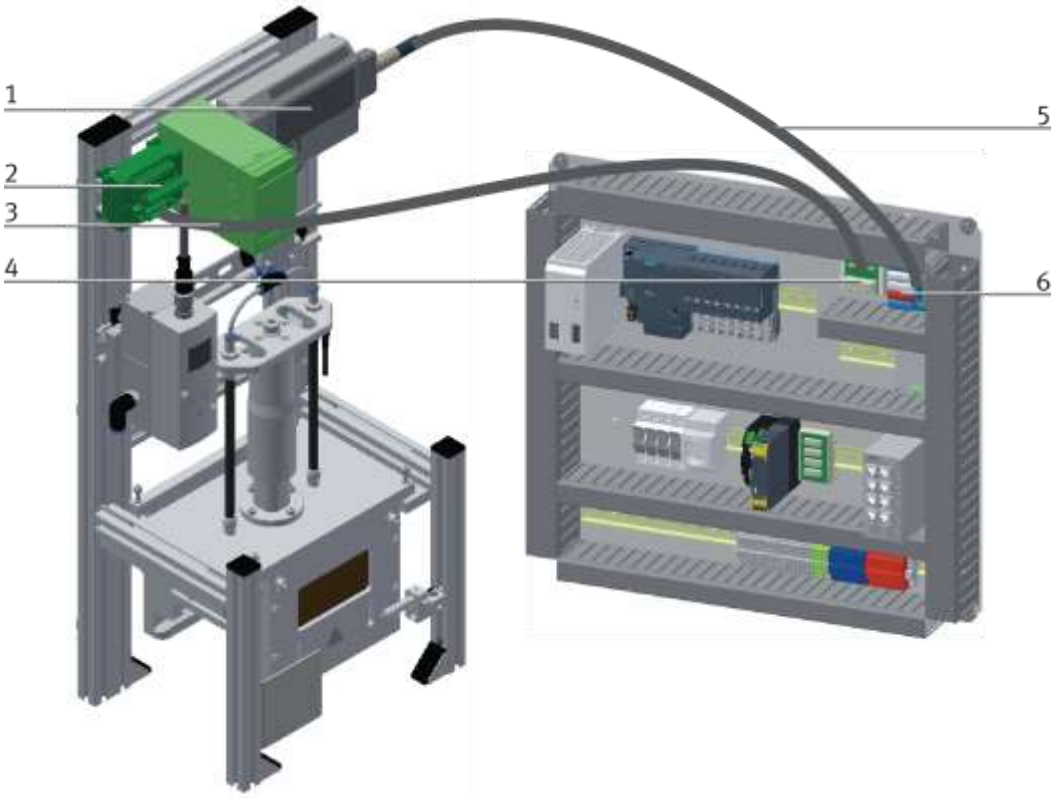
The CP application module exchanges digital input and output signals with the basic module via the SysLink interface:

- Connect the I/O terminal (1) of the CP application module with the I/O terminal (6) on the electric board of the CP Factory basic module. Therefore use the provided connecting cable with SysLink plugs (5).

**D-Sub-interface for analogue signals (option – not available at all CP application modules)**

The CP application module produces two analogue output signals with the distance sensors. These are set on the analogue terminal and have to be connected with the analogue inputs of the CP Factory basic module:

- Connect the analogue terminal (2) of the CP application module with the analogue terminal (4) on the electric board of the CP Factory basic module. Therefore use the provided connecting cable (3) with standard D-Sub plugs: 15-pin, two-rowed.

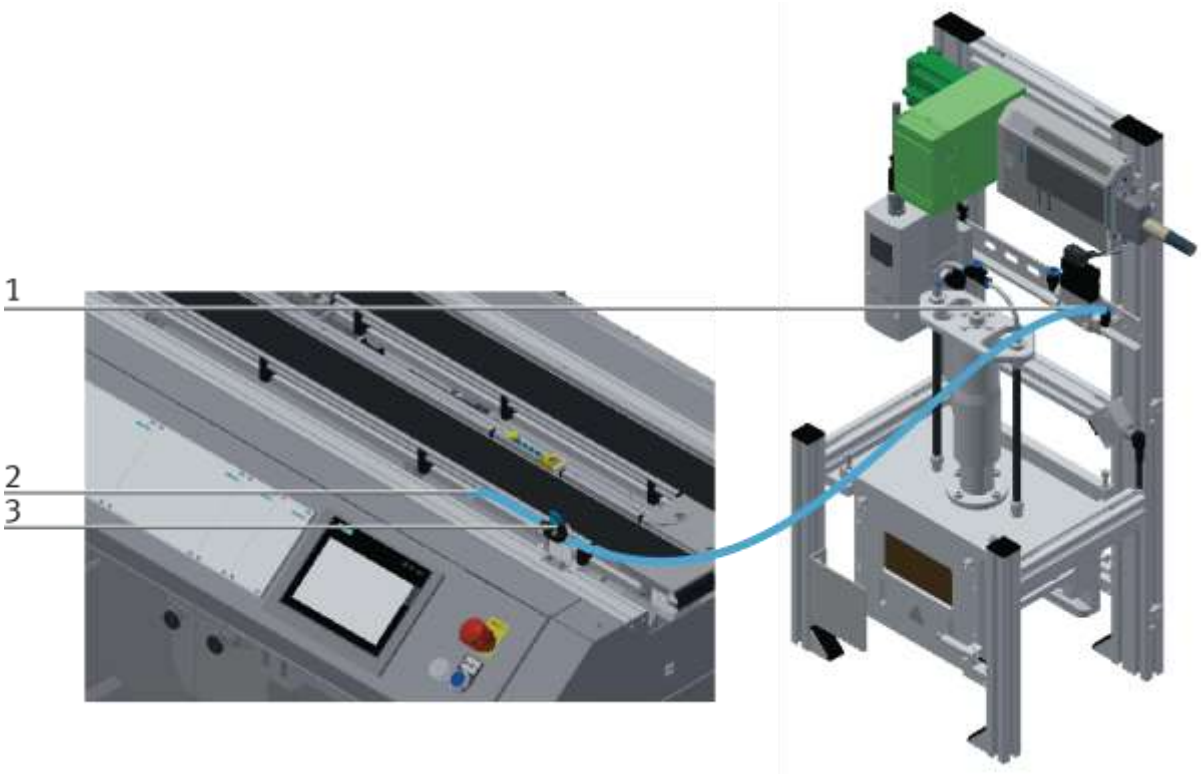



Electrical connections / illustration similar

| Position | Description |
|---|---|
| 1 | CP application module: I/O terminal (+BG-XD1) |
| 2 | CP application module: analogue terminal (+BG-XD2A) |
| 3 | connecting cable with 15-pin D-Sub-plugs |
| 4 | electric board CP Factory basic module: analogue terminal (+K1-XD16A) |
| 5 | connecting cable with SysLink-plugs (SysLink-cable) |
| 6 | electric board CP Factory basic module: I/O terminal (+K1-XD15) |

### 7.4.6 Pneumatic connection from application modules to CP Factory basic module

The pneumatic connection is based on the principle of the following sketch. The application module is connected from the valve (terminal) to the shut-off valve (3) on the conveyor belt.
The hose (nominal width 4) is simply inserted into the QS connector.
The supply line (2) is plugged into the shut off-valve (3).




Pneumatically connect application module / illustration similar

## 7.5 Adjusting the sensors

### 7.5.1 Position sensor magazine

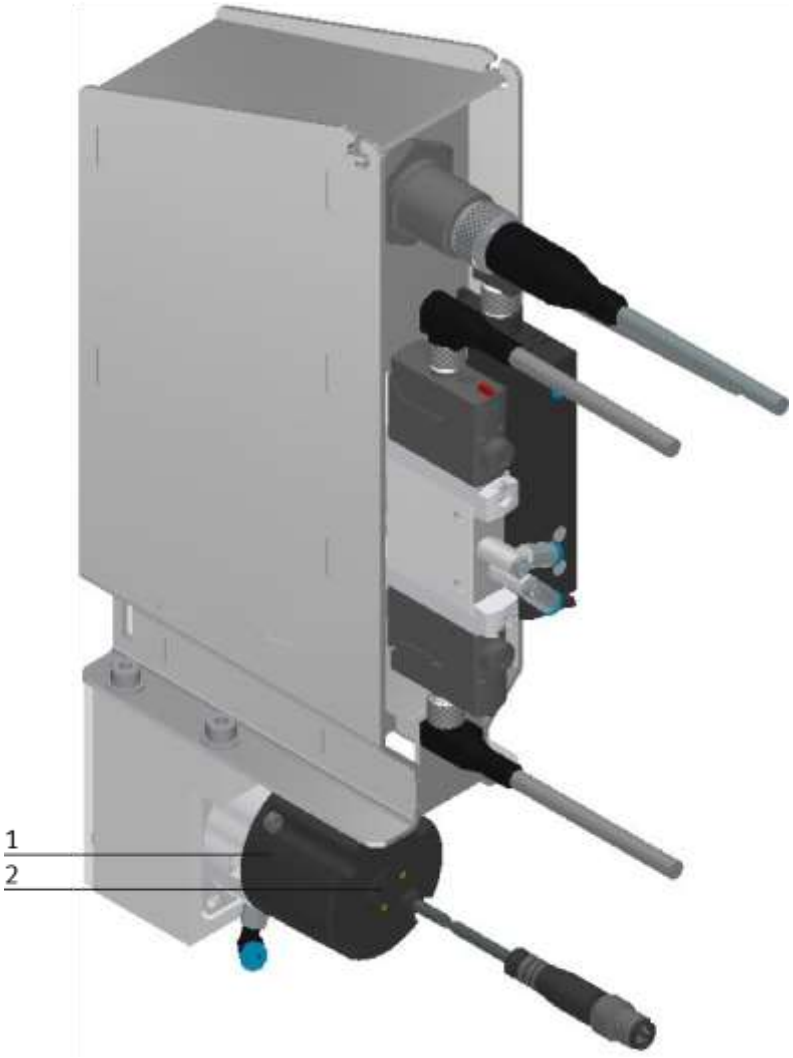



Illustration similar

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG5 | Rotation cylinder 3 position sensor |
| 2 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG3 | Rotation cylinder 3 position sensor |
| 3 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG1 | Rotation cylinder 3 position sensor |

With the help of the position sensor (1), the position of the separator disc can be requested. With the control button (2) you can get through the sensor menu.

**Requirements in general**

– Position sensor mounted.
– Electrical connection of the position sensor made.
– Power supply is available

**Set switching point**

The teach value is the middle of the switching path. For switching path and hysteresis fixed values are stored.

**Requirement:**

The LEDs flash alternately (delivery status) or indicate the current switching status.

**Set switching point for switching output 1:**

1. Set the request position on the rotation cylinder.
2. Press the control button 3 times.
   • The LEDs flash as running light (set-up mode)
3. Press the control button once.
   • LED 1 flashes (1 time, then 2 s pause).
4. Press the control button once.
   • The switching point is fixed.
   • Change to operating mode (normal operation).

**Set switching point for switching output 2:**

1. Set the request position on the rotation cylinder.
2. Press the control button 3 times.
   • The LEDs flash as running light (set-up mode)
3. Press the control button twice.
   • LED 2 flashes (2 times, then 2 s pause).
4. Press the control button once.
   • The switching point is fixed.
   • Change to operating mode (normal operation).

**Documents**

Datasheets / instruction manual
Position sensor SRBS (2619972)

### 7.5.2 Ultrasonic sensor

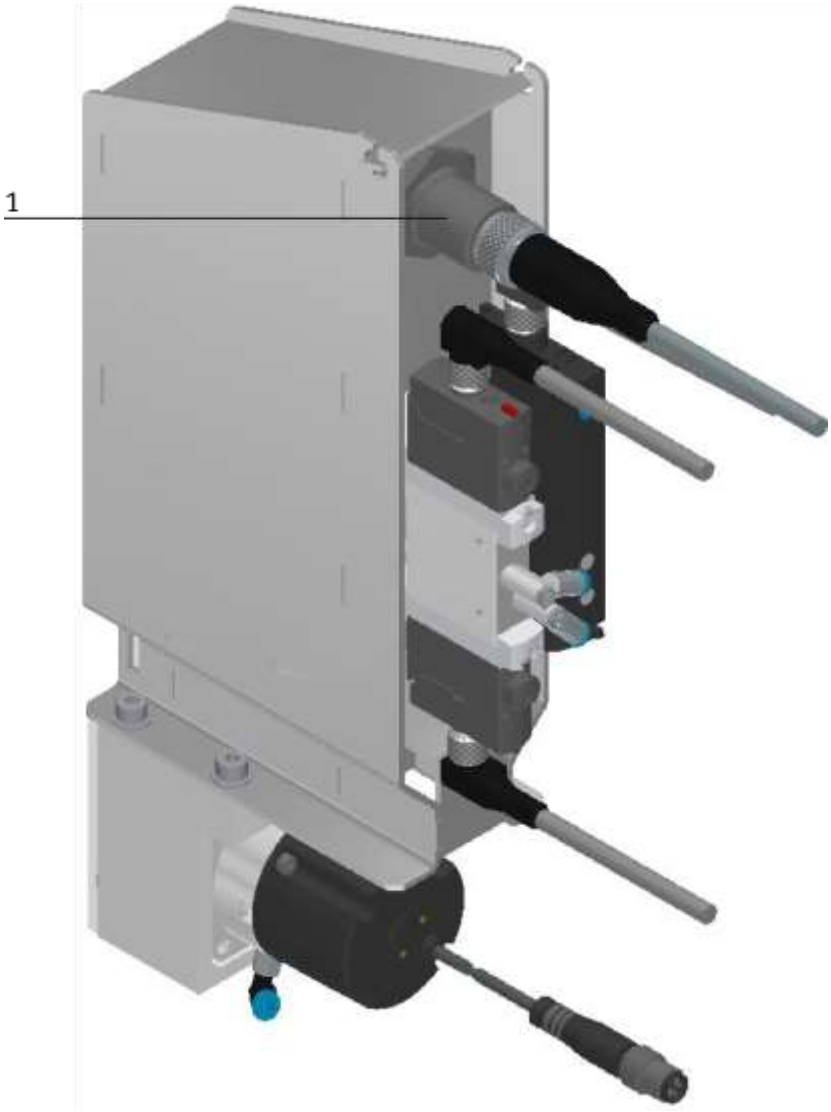



Illustration similar

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG13 | Filling level magazine 3 |
| 2 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG12 | Filling level magazine 3 |
| 3 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG11 | Filling level magazine 3 |

The ultrasonic sensors are used for the level indicator of the magazines.

**Start-up**
Connect the power supply.
Carry out sensor adjustment in accordance with the diagram.

**Factory setting**
Detect point operation
Switched output on NOC
Detect distance at operating range
Multi-function input »Com« set to »Teach-in«
Filter at F01
Filter strength at P01

**Operating modes**
Three operating modes are available for the switched output:
1. Operation with one detect point
   The switched output is set when the object falls below the set detect point.
2. Window mode
   The switched output is set when the object is within the set window.
3. Reflective barrier
   The switched output is set when the object is between sensor and fixed reflector.

**Synchronisation**
If under multiple sensor operation the assembly distance falls below the values, the internal synchronisation should be used. For this purpose set the switched outputs of all sensors in accordance with the diagram »Sensor adjustment with the Teach-in procedure«. Then change the multi-function output »Com« to »synchronisation« (see »Further settings in sensor description«). Finally interconnect each pin 5 of the sensors to be synchronised

**I / O-Link Mode**
The BUS _18M sensors are IO-Link able according to specification V1.0.

**Note**
- In IO-Link mode, teach-in and synchronization via pin 5 are not available.
- In IO-Link mode, pin 5 must not be connected.
- For up-to-date information on IOLink please contact Balluff Sales.

**Synchronization in IO-Link mode**
In IO-Link mode, each sensor synchronizes to the master protocol. If the master protocols are synchronous when several sensors are in operation, the sensors also work synchronously.

**process data**
The BUS _18M transmits cyclically the measured distance value with 0.1 mm resolution as well as the state of the switching output.

**service data**
The following sensor parameters can be accessed via the IO-Link interface using the Set IODD description file.

**Detect point 1**
The switched output is activated when the distance to an object is under that of the present detect point.

**Return detect point 1**
The switched output is reactivated when the distance to an object is greater than the present return detect point (detect point + hysteresis).

**Note**
The return detect point 1 must always be greater than the detect point 1.

**Detect point 2, return detect point 2**
By programming these two detect distances the window mode is activated.

**Note**
The return detect point 2 must always be smaller than the detect point 2.

**NOC/NCC operation**
The NCC or NOC output function can be preset for the switched output.

**Measurement filter**
BUS _18M ultrasonic sensors provide for a choice of 3 filter settings:

1. F00
   No filter, each ultrasonic measurement acts in an unfiltered manner on the output.
2. F01
   Standard filter, on the object continuously approaching the sensor, the ongoing interval is immediately taken on and the output correspondingly activated. The effect of the object abruptly moving away from the sensor is for the existing distance to be saved for a retaining time dependent on the filter strength and for the switched output state to be maintained.
3. F02
   Average value filter, forms the arithmetic mean across a number of measurements. The output is activated in keeping with the average value. The number of measurements, from which the average value is formed, depends on the selected filter strength.

**Filter strength**
A filter strength between 0 – weak filter effect – and 9 – pronounced filter effect – can be selected for each measurement filter.

**Foreground suppression**
Spurious reflections, caused by objects in the foreground of the sensor may be blocked out by the foreground suppression.

**Note**
Check that the object in the foreground does not cause multiple reflections. The object in the foreground must not cover the sensor in a way that the detection zone is influenced.

**System commands**
With 4 system commands the following settings may be carried out:
- Teach-in detect point – method A.
- Teach-in detect point – method B.
- Teach-in reflective barrier.
- Reset sensor to factory settings.

**Note**
To achieve the maximum resolution the Master Cycle Time has to comply with the following requirements:
- Min Cycle Time ≤ Master Cycle Time ≤ Min Cycle Time + 1.2 ms.
- If this condition can not be fullfilled, sporadic discontinuities of the measurement value can occur. In this case the Master Cycle Time has to be increased in 400 µs steps until the discontinuities of the measurement disappear.

**Note**
If the BUS _18M sensor was set using Teach-in it is recommended to reset the sensor to the factory setting prior to using it in IO-Link mode (s. »Further settings«). For further informations on IO-Link see www.io-link.com.

### 7.5.3 Fibre optic device

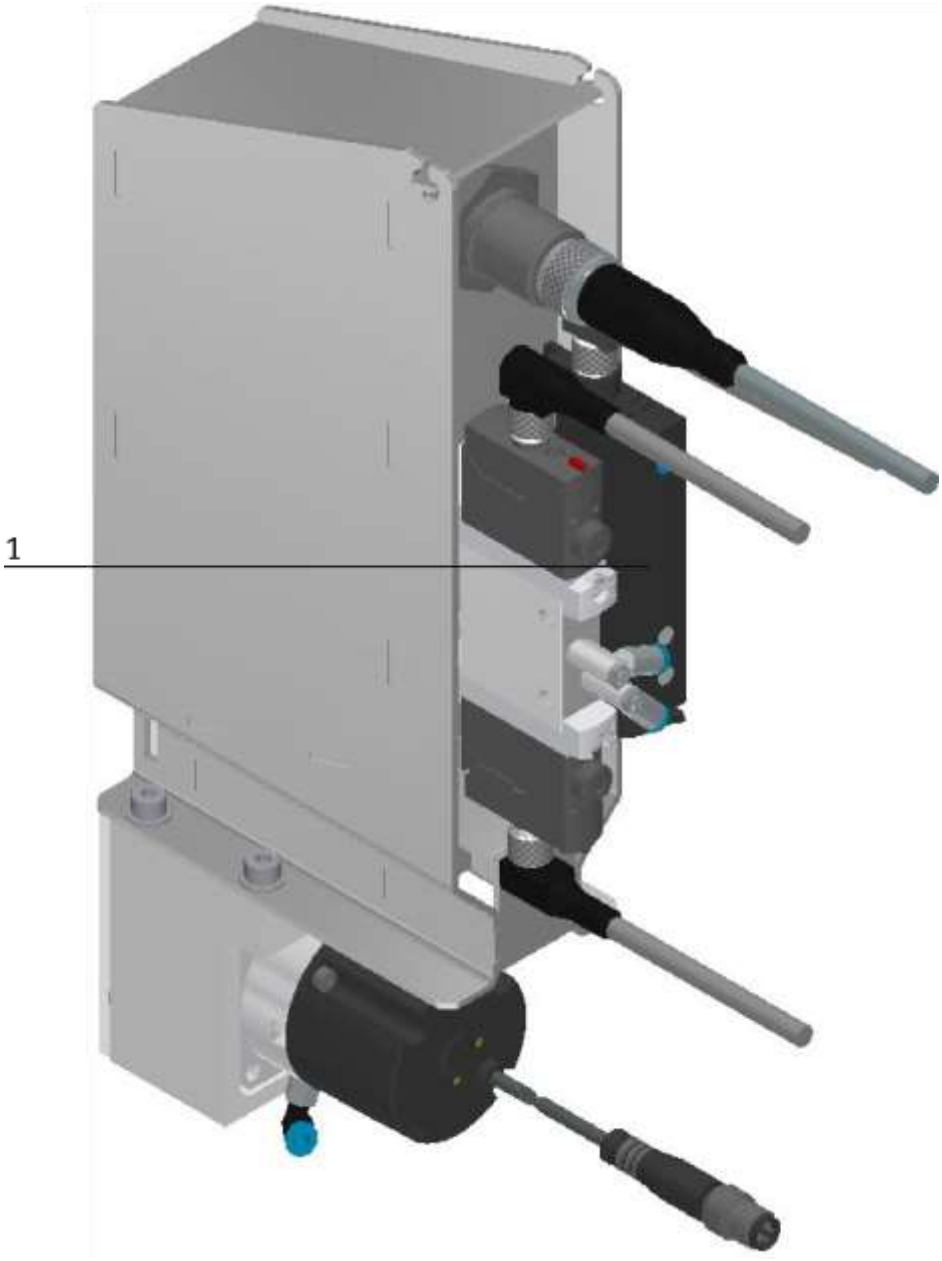



Illustration similar

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG6 | Magazine 3 / 1 = balls available |
| 2 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG4 | Magazine 2 / 1 = balls available |
| 3 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG2 | Magazine 1 / 1 = balls available |

The fibre optic device with the fibre optics are responsible for the workpiece detection at the separator disk.

**Connection of fibre optics**

1. Open the quick release lever.
2. Insert the fibre optic as far as possible (pass resistance due to ring).
3. Close the quick release lever.

**Proximity mode:**

Setup of sensitivity, static

1. Line up fibre to the object: => yellow LED and green LED are on.
2. Press button for 3 s until both LEDs are flashing synchronously: => first threshold is taught.
3. Take the object out of the scanning area.
4. Press button for 1 s: learning of background.
   a) green LED flashes and stays on: => both thresholds have been taught, sensor is ready to operate.
   b) both LEDs are flashing synchronously: => the sensor can not detect the object, no thresholds are taught.

**Proximity mode:**

Setup of sensitivity with only one object, static

1. Line up fibre to the object: => green LED on, yellow LED is undefined.
2. Press button for 3 s until both LEDs are flashing synchronously. => first threshold is taught.
3. Leave the object in the scanning area.
4. Press button for 1 s: => green LED flashes and stays on, the second threshold is taught, sensor is ready to operate.

**Through beam mode:**

Setup of sensitivity

1. Line up transmitter to the receiver: => green LED on, yellow LED is undefined.
2. Press button for 3 s until both LEDs are flashing synchronously: => first threshold is taught.
3. Put the object into the scanning area.
4. Press button for 1 s: learning of object.
   a) green LED flashes and stays on: => both thresholds have been taught, sensor is ready to operate.
   b) both LEDs are flashing synchronously: => the sensor can not detect the object, no thresholds are taught.

**Setup of sensitivity during a running process**

1. Line up fibre to the object: => green LED on, yellow LED is undefined.
2. The chosen running process must be the only thing in the scanning area! Press button for 3 s until both LEDs are flashing synchronously.
3. Press button until a minimum of one process cycle is completed:
   a) green LED flashes and stays on: => both thresholds have been taught, sensor is ready to operate.
   b) both LEDs are flashing synchronously: => the sensor can not detect the object, no thresholds are taught.

**N.O. / N.C. setup**

1. Press button for 13 s: => both LEDs are flashing alternately.
2. Release button: => green LED is on.
3. When the green LED is on, the output is inverted by pressing the button. Yellow LED shows active function.
4. Do not press button for 10 s: => the present output function is saved, sensor is ready to operate.

Factory setting / Maximum sensitivity (default)

1. No object in sensing area. Press the button for 3 s until both LEDs are flashing synchronously.
2. No object in sensing area. Press the button for 1 s. => sensor is set to maximum sensitivity. => sensor is set to factory setting External Teach (ET) / Procedure external teach
   - 3 s at +UB define teach point 1
   - open
   - 3 s at +UB define teach point 2
   - open setting saved end of external teach

### 7.5.4 Proximity Switch (X-axis cylinder)


| Position | Description |
|---|---|
| 1 | Guide plate X-axis |
| 2 | Position of the built-in magnet |
| 3 | Sensor X-axis 547859 / SMT-8G-PS-24V-E-2,5Q-OE<br>BG9 – X-axis rirght end position<br>BG8 – X-axis middle position<br>BG7 – X-axis left end position |

The proximity switches are used for checking the end position of the X-axis. The proximity switches react to a permanent magnet in the guiding plate of the X-axis.

**Requirements**

– X-axis with guiding plate and magnet has been attached.
– Pneumatic port of the cylinder has been made.
– Compressed air supply is switched on.
– Electrical connection of the proximity switches has been made.
– Power supply is available.

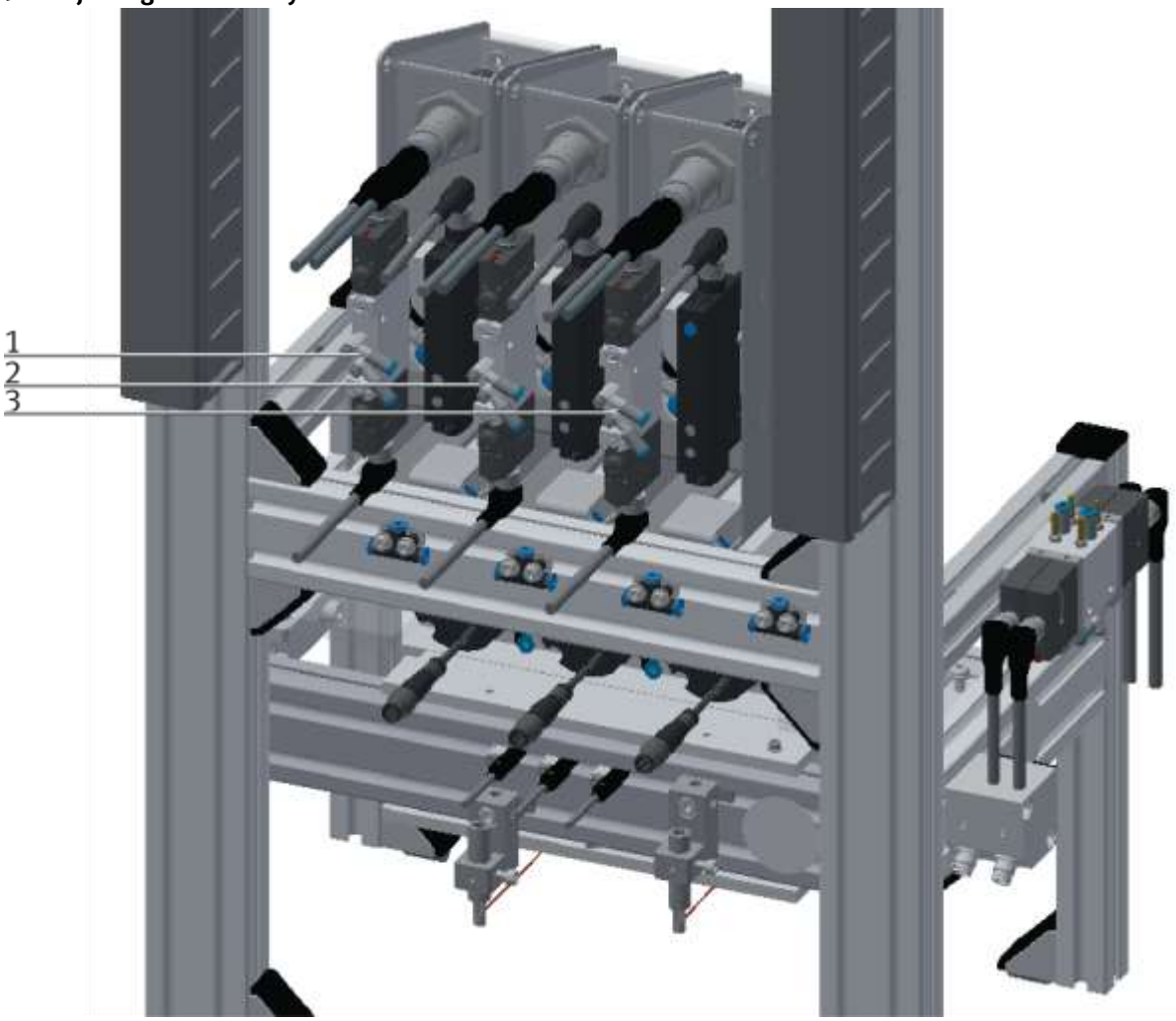
**Procedure**

1. The X-axis is in the position to be queried.
2. Move the proximity switch as far as the switching status display (LED) appears.
3. Move the proximity switch into the same direction by a few millimetres as far as the switching status display disappears.
4. Move the proximity switch halfway between the switch on and the switch off position.
5. Tighten the locking screw of the proximity switch with an Allen key SW1.3.
6. Please check the position of the proximity switch by repeated test runs of the axis.

**Documents**

- Data sheets / operating instructions
  Proximity switch SMT-8G-PS-24V-E-2,5Q-OE

## 7.6 Adjusting the one-way flow control valves




One-way flow control valves / illustration similar

| Position | Beschreibung |
|---|---|
| 1 | One-way flow control valves GRLA for rotation cylinder / distribution magazine 3 |
| 2 | One-way flow control valves GRLA for rotation cylinder / distribution magazine 2 |
| 3 | One-way flow control valves GRLA for rotation cylinder / distribution magazine 1 |

One-way flow control valves are used for regulating the exhaust air volume of double-acting drive units. In the opposite direction, the air flows through the flow control valve having a full cross-sectional flow.
The piston is clamped between air cushions by free supply air and throttled exhaust air (improvement of the operating behaviour even if the load changes).

**Requirements**

– Pneumatic port of the cylinders has been made.
– Compressed air supply is switched on.

**Procedure**

1. At first, turn off the two one-way control valves completely. Then turn them on again by about one rotation.
2. Start a test run.
3. Turn on the one-way flow control valves slowly until the required piston speed has been reached.

**Documents**

- Data sheets
  One-way flow control valve (193138)

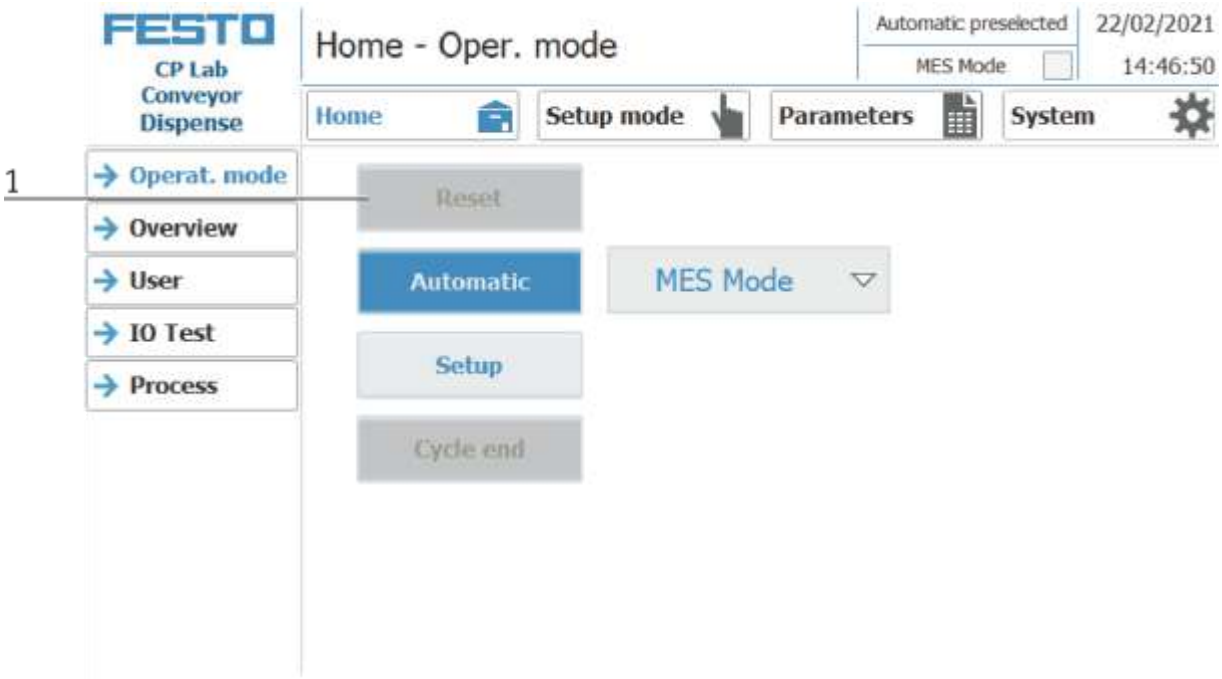
# 8 Operation

An application module has no control elements. Operation of the application module is only possible when it is mounted on a basic module of the CP-Lab or CP-Factory system.
The operation of the application module can be realized by every customer according to his wishes, the supplied programs are only an operating suggestion with which the application module is on CP-Lab or CP-Factory System can be operated. Own operating concepts or external controls are also possible.
If the application module is mounted on a CP Lab or a CP Factory basic module, the general operation for this is described in the manuals of the CP Lab or CP Factory system. All application-specific information is described in this manual for the application module.

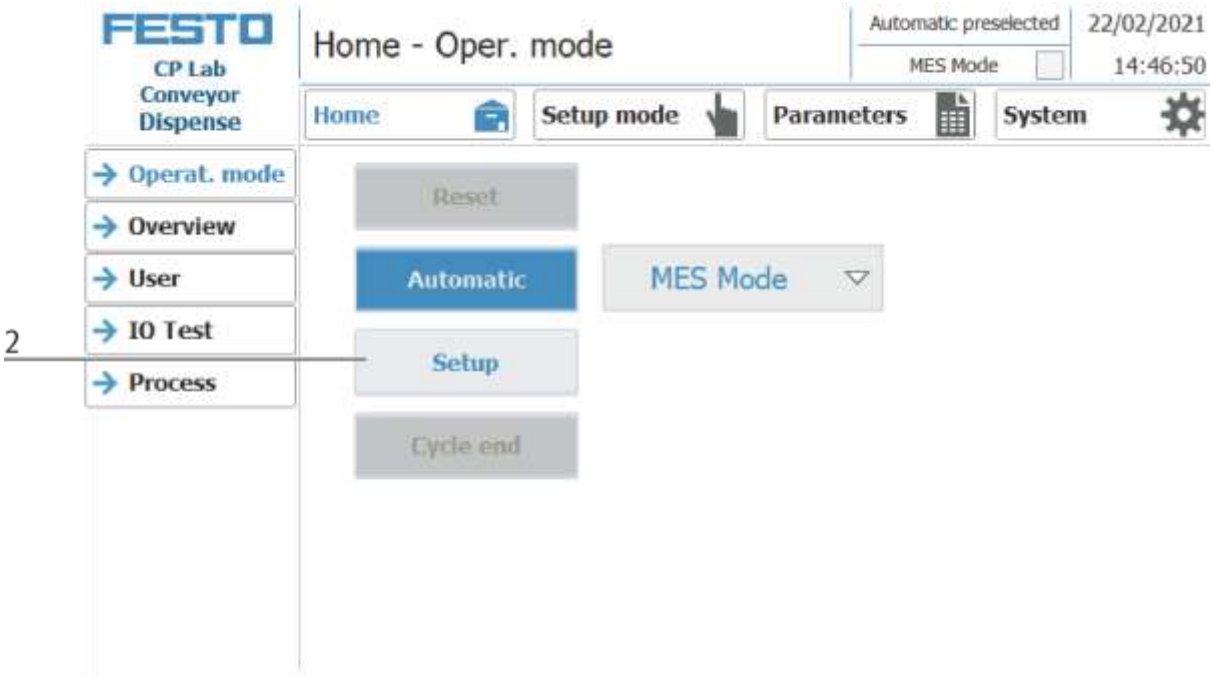
### 8.1 Setting the application module dispense at HMI

To set the application module, the application module must be set to setup mode.

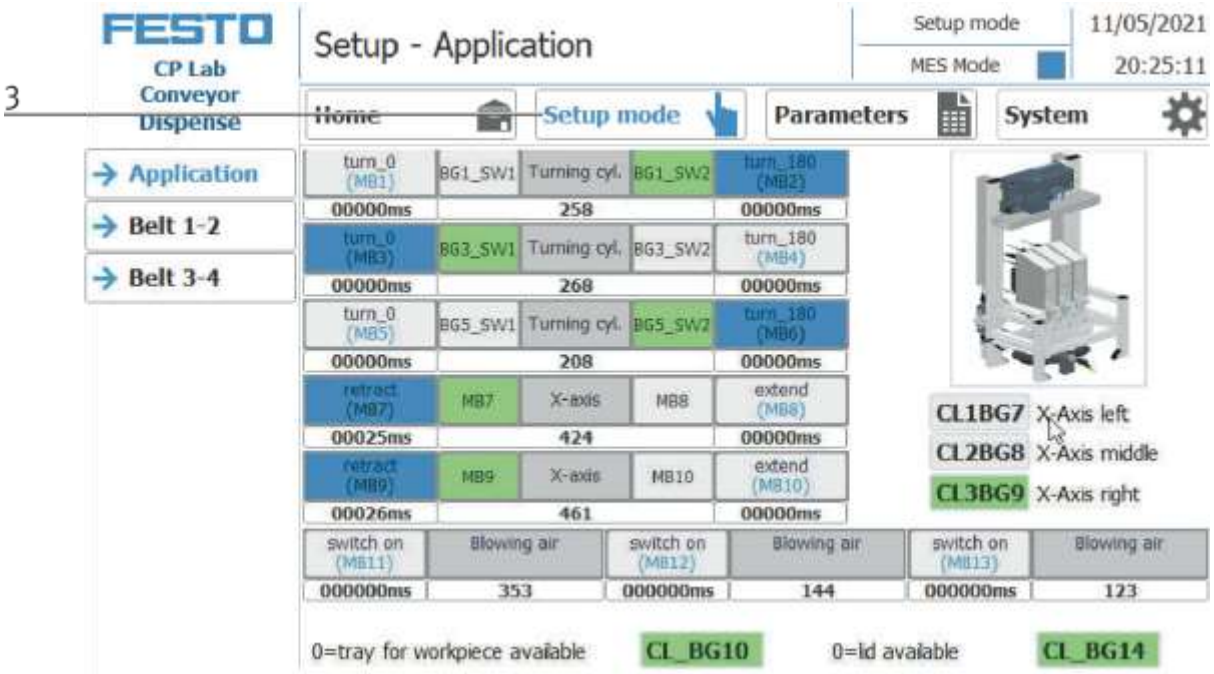
1. If the application module has not yet started, click on the Setup button under Operating mode on the home screen. The application module moves into its basic position



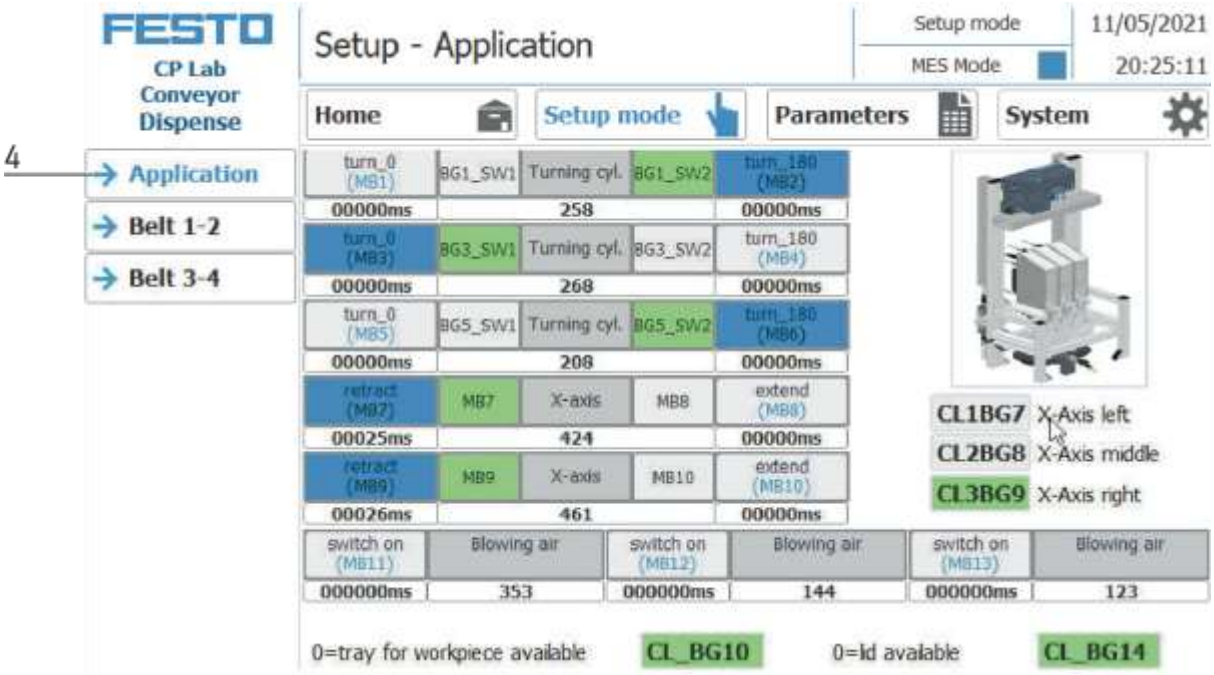

2. Then click on Setup, setup mode is active.



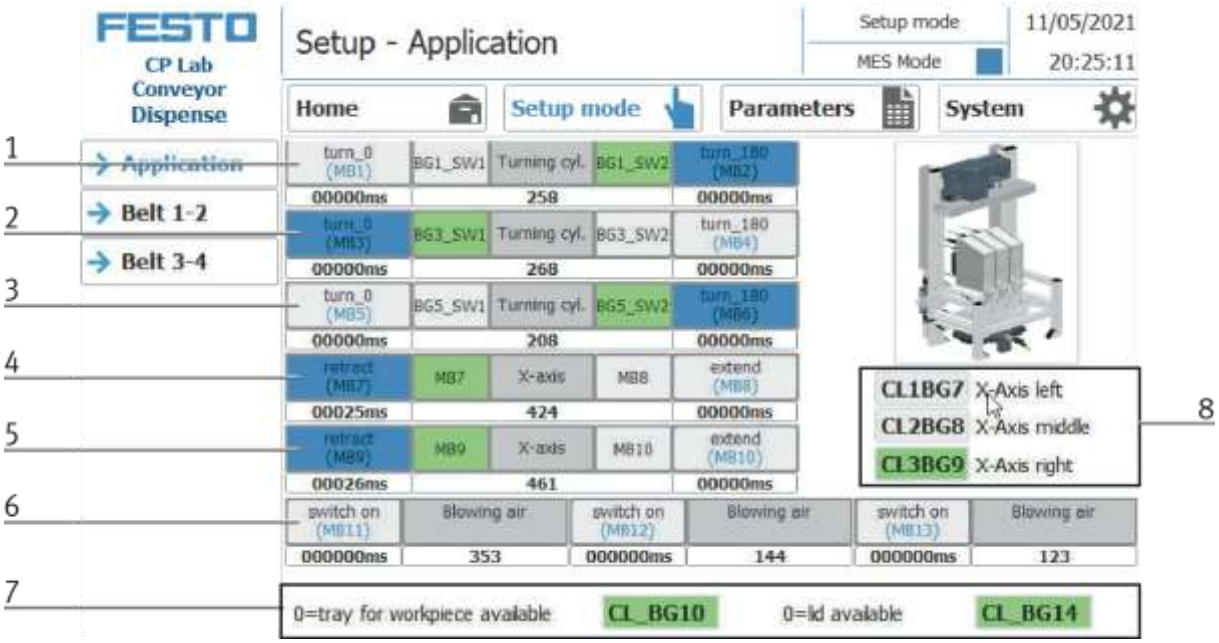
3. Change to Setup mode page.




4. Choose application



5. Application is selected to setup the application module. The corresponding actuators can be started by pressing the buttons. The sensors are only for display and cannot be set manually

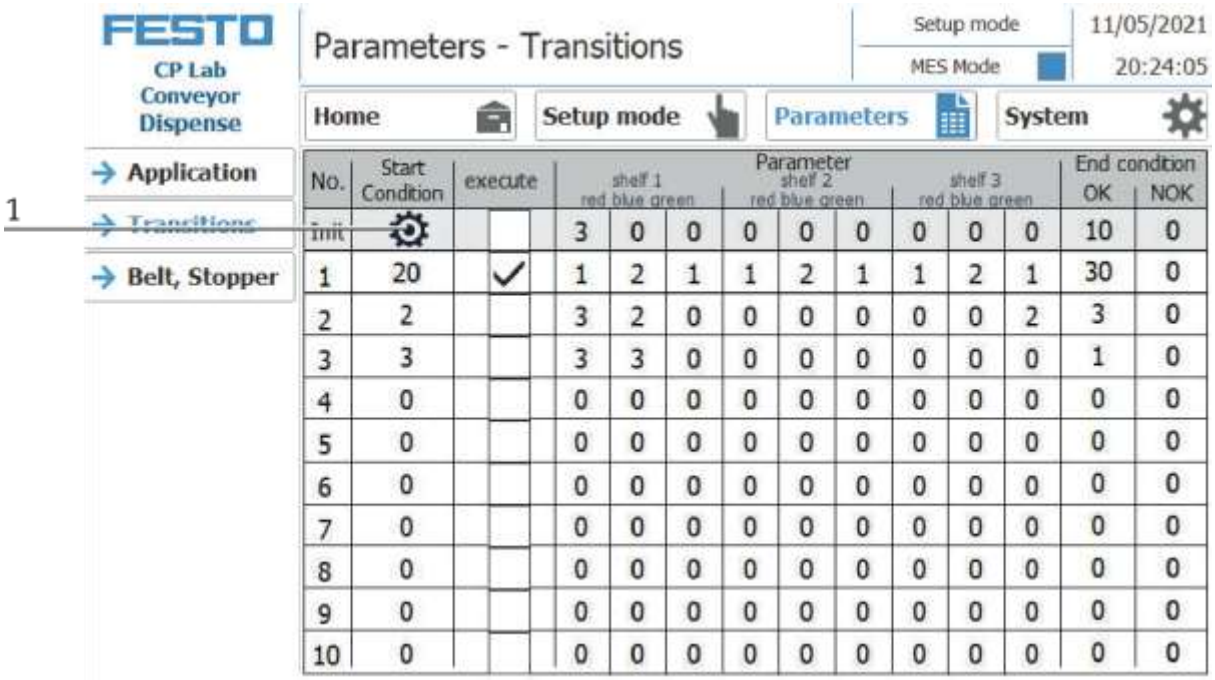



| Position number | Description |
|---|---|
| 1 | Magazine 1<br>turn_0: Move tunring cylinder to position 0/ counterclockwise (MB1 is activated, lights up blue when active)<br>BG1_SW1: Sensor BG1_SW1 indicator (lights up green when turning cylinder has moved to position 0)<br>Turning cyl.: display turning cylinder magazine 1<br>BG2_SW2: Sensor BG1_SW2 indicator (lights green when turning cylinder has moved to position 180)<br>turn_180: Move turning cylinder to position 180 / clockwise (MB2 is activated, lights up blue when active) |
| 2 | Magazine 2<br>turn_0: Move tunring cylinder to position 0/ counterclockwise (MB3 is activated, lights up blue when active)<br>BG3_SW1: Sensor BG3_SW1 indicator (lights up green when turning cylinder has moved to position 0)<br>Turning cyl.: display turning cylinder magazine 1<br>BG3_SW2: Sensor BG3_SW2 indicator (lights green when turning cylinder has moved to position 180)<br>turn_180: Move turning cylinder to position 180 / clockwise (MB4 is activated, lights up blue when active) |
| 3 | Magazine 3<br>turn_0: Move tunring cylinder to position 0/ counterclockwise (MB5 is activated, lights up blue when active)<br>BG5_SW1: Sensor BG5_SW1 indicator (lights up green when turning cylinder has moved to position 0)<br>Turning cyl.: display turning cylinder magazine 1<br>BG5_SW2: Sensor BG5_SW2 indicator (lights green when turning cylinder has moved to position 180)<br>turn_180: Move turning cylinder to position 180 / clockwise (MB6 is activated, lights up blue when active) |

| Position number | Description |
|---|---|
| 4 | X-axis stroke 1<br>retract: move X-axis hub 1 to the left (actuator MB7 is activated, lights up blue when active)<br>MB7: (lights green when X-axis hub 1 is activated to the left)<br>X-axis: Display X-axis stroke 1<br>MB8: (lights green when X-axis hub 1 is activated to the right)<br>extend: Move X-axis hub 1 to the right (actuator MB8 is activated, lights up blue when active) |
| 5 | X-axis stroke 2<br>retract: move X-axis hub 2 to the left (actuator MB9 is activated, lights up blue when active)<br>MB9: (lights green when X-axis hub 2 is activated to the left)<br>VertMov2: Display X-axis hub 2<br>MB10: (Lights green when X-axis Hub 2 is activated to the right)<br>Extend: move X-axis hub 2 to the right (actuator MB10 is activated, lights up blue when active) |
| 6 | Blow first magazine<br>Switch on: Blowing device on the first magazine blows (Actuator MB11 is activated, lights up blue when active)<br>Blowing air: (lights green when blowing device is activated)<br><br>Blow second magazine<br>Switch on: Blowing device on the first magazine blows (Actuator MB12 is activated, lights up blue when active)<br>Blowing air: (lights green when blowing device is activated)<br><br>Blow third magazine<br>Switch on: Blowing device on the first magazine blows (Actuator MB13 is activated, lights up blue when active)<br>Blowing air: (lights green when blowing device is activated) |
| 7 | Announcement of inputs |
| 8 | CL1BG7: Sensor BG7 Display (lights up green when X-axis is in left position)<br>CL2BG8: Sensor BG8 Display (Lights up green when X-axis is in middle position)<br>CL3BG9: Sensor BG9 Display (Lights up green when X-axis is in right position) |

### 8.2 Transitions of the application module

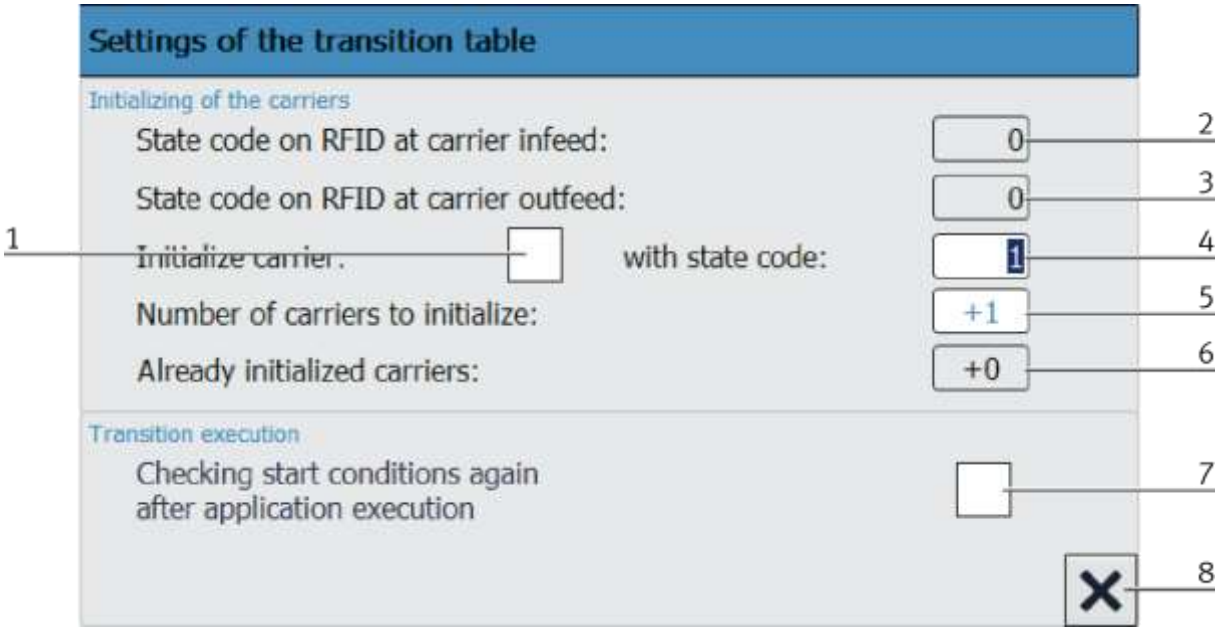
The transitions are located in the Parameters submenu




| No. | Start Condition | execute | Parameter shelf 1 red | shelf 1 blue | shelf 1 green | shelf 2 red | shelf 2 blue | shelf 2 green | shelf 3 red | shelf 3 blue | shelf 3 green | End condition OK | End condition NOK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Init | ⚙ | ☐ | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| 1 | 20 | ☑ | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 30 | 0 |
| 2 | 2 | ☐ | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 |
| 3 | 3 | ☐ | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4 | 0 | ☐ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | ☐ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | ☐ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | ☐ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | ☐ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | ☐ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | ☐ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

If the transitions submenu is selected, the transitions of the mounted application module are displayed. The transitions of all other application modules can be found in the corresponding manuals of the application modules.

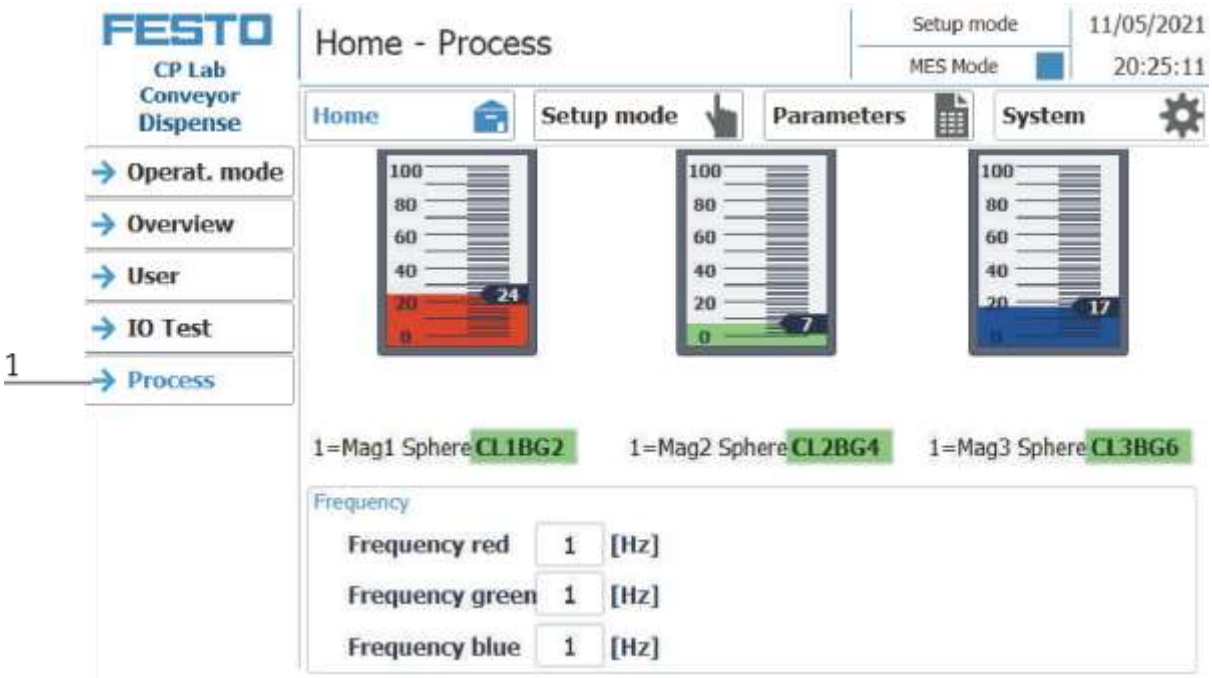
1. Click on the gear wheel to access the settings for the transitions. (see the following picture)

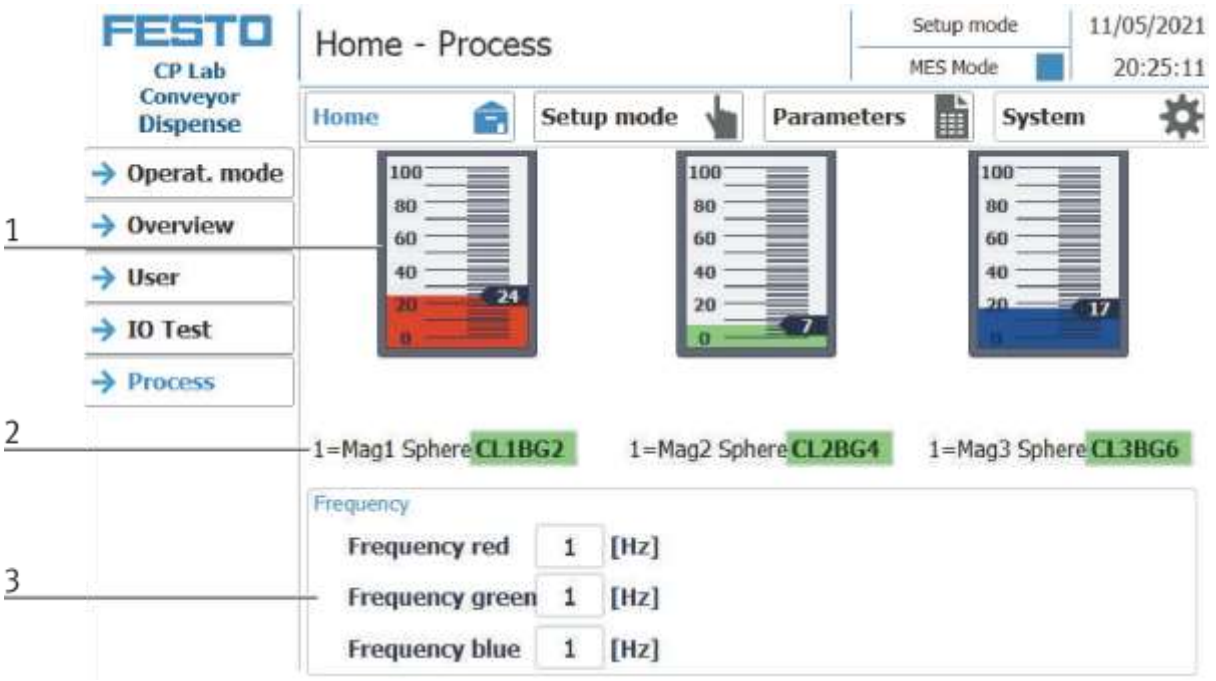



| Position number | Description |
|---|---|
| 1 | Initialize workpiece carrier:<br>The next carrier arriving at the stopper position is initialized with the end state (state code can be entered under item 4) of the first line of the transition table. |
| 2 | Status code on the RFID at carrier infeed:<br>Display of the start condition for application processing |
| 3 | Status code on the RFID at carrier outfeed:<br>Display of the start condition after application processing |
| 4 | With state code:<br>During initialization (Pos. 1 / Initialize carrier), the carrier is initialized with the state code entered here. |
| 5 | Number of carriers to be initialized:<br>Editable, the number of workpiece carriers to be initialized can be entered here. |
| 6 | Already initialized carriers:<br>Display of the already initialized workpiece carriers |
| 7 | Checking start conditions again after application execution:<br>If this function is activated, the start conditions are checked again after a transition condition has been processed. In this way it is possible to execute an application several times without the carrier leaving the working position. |
| 8 | Exit settings |

### 8.3 Process of the application module

1. The display page for the ultrasonic sensors is opened via the "Process" button. The page is for display purposes only, no action can be taken. (see following screen)






| Position number | Description |
|---|---|
| 1 | Graphical quantity display of the magazine - measured with the ultrasonic sensor<br>Left magazine- red workpieces<br>middle magazine - green workpieces<br>right magazine - blue workpieces |
| 2 | Indication if magazine is empty<br>1 = Mag1 empty / light barrier 1 balls present / CL1BG2 lights up green when the magazine is empty<br>1 = Mag2 empty / light barrier 2 balls present / CL2BG4 lights up green when the magazine is empty<br>1 = Mag3 empty / light barrier 3 balls present / CL3BG6 lights up green when the magazine is empty |
| 3 | Set frequency from ultrasonic sensor |

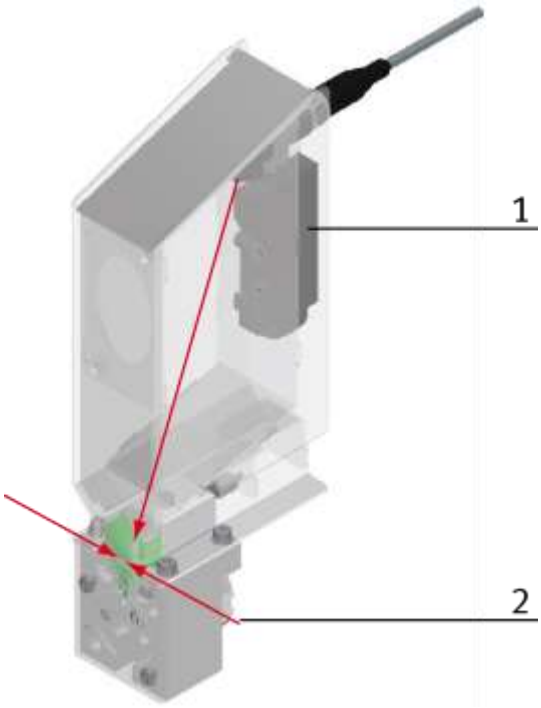
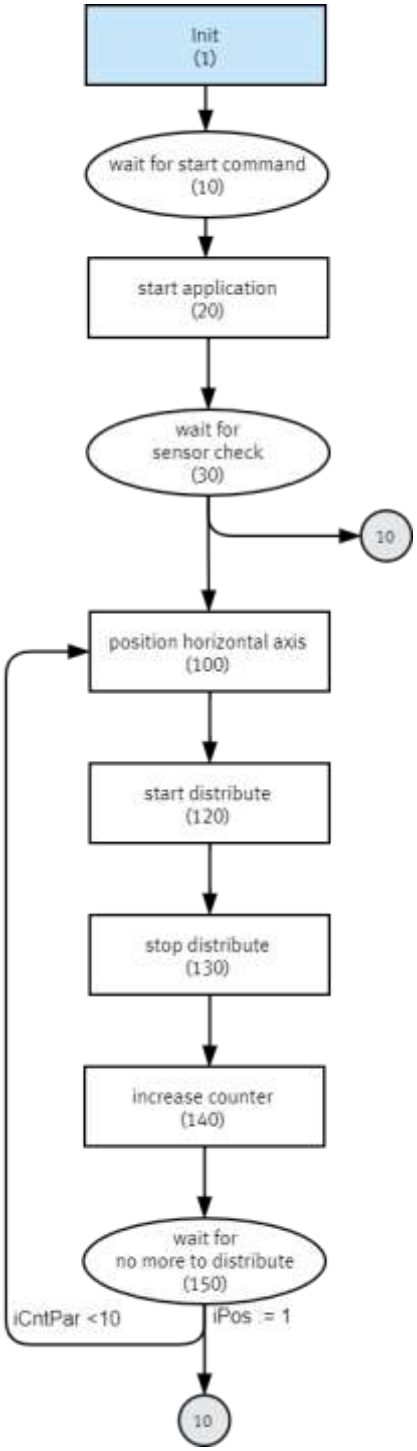



Illustration similar

| Position number | Description |
|---|---|
| 1 | Ultrasonic sensor measures from above |
| 2 | CL1BG2 for red magazine / CL2BG4 for green magazine / CL3BG6 for blue magazine<br>Sensors measure with light barrier. If no ball is detected by the light barriers, but the ultrasonic sensor reports a workpiece, there is a jam and a short pulse of air to remove the jam. |

## 8.4 Flow chart

| CP-AM-DISPENSE | 1 |
|---|---|
|  | **1: Init**<br>Initialization start conditions<br>**10: wait for start command**<br>wait for init pos, application ready and start<br>**20: start application**<br>set shelf series for: Red = 1, Blue = 2, Green = 3<br>set first position horizontal axis (left)<br>**30: wait for sensor Check**<br>set error code if front cover is not available (BG10) or back cover is already available (not BG14)<br>and go to step 10, else go to step 100<br>**100: position horizontal axis**<br>check horizontal axis "ready move", set pos horizontal axis and move<br>pos1 = left<br>pos2 = middle<br>pos3 = right<br>**120: start distribute**<br>if ready, start distributing target amount:<br>parameter[iCntRed] 1,4,7: red balls<br>parameter[iCntBlue] 2,5,8: blue balls<br>parameter[iCntGreen] 3,6,9: green balls<br>**130: stop distribute**<br>when target amount is reached<br>**140: increase counter**<br>set next position for horizontal axis<br>set next parameters for target amount red, blue, green<br>increase loop counter<br>**150: if iCntpar<10 go back to step 100**<br>else set iPos: = 1 (horizontal axis to the left) and jump to step 10 |

### 8.4.1 MES Parameter (DISP)

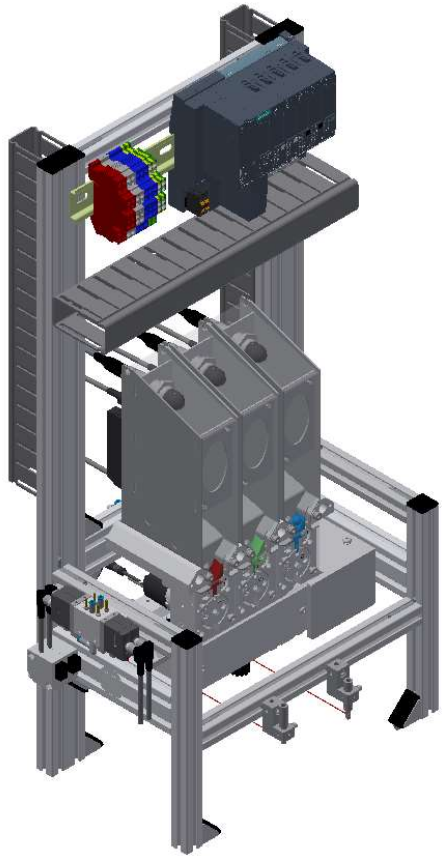
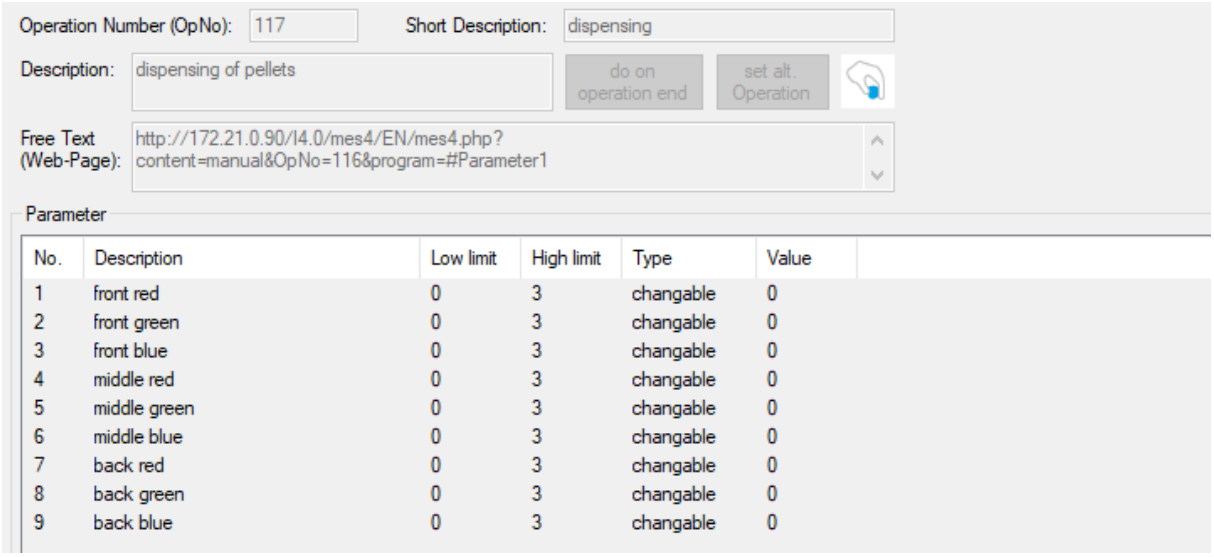


Illustration similar

The following MES-operations are available for the AM DISP.

| Operation number | Description |
|---|---|
| 117 | Dispensing / dispensing of pellets |




| No. | Description | Low limit | High limit | Type | Value |
|---|---|---|---|---|---|
| 1 | front red | 0 | 3 | changable | 0 |
| 2 | front green | 0 | 3 | changable | 0 |
| 3 | front blue | 0 | 3 | changable | 0 |
| 4 | middle red | 0 | 3 | changable | 0 |
| 5 | middle green | 0 | 3 | changable | 0 |
| 6 | middle blue | 0 | 3 | changable | 0 |
| 7 | back red | 0 | 3 | changable | 0 |
| 8 | back green | 0 | 3 | changable | 0 |
| 9 | back blue | 0 | 3 | changable | 0 |

### 8.4.2 Default Parameter (DISP)

| Parameter number | Description |
|---|---|
| 1 | **Shelf 1 - red**<br>Number of red balls to be filled in the first shelf. |
| 2 | **Shelf 1 - blue**<br>Number of blue balls to be filled in the first shelf. |
| 3 | **Shelf 1 - green**<br>Number of green balls to be filled in the first shelf. |
| 4 | **Shelf 2 - red**<br>Number of red balls to be filled in the second shelf. |
| 5 | **Shelf 2 – blue**<br>Number of blue balls to be filled in the second shelf. |
| 6 | **Shelf 2 – green**<br>Number of green balls to be filled in the second shelf. |
| 7 | **Shelf 3 - red**<br>Number of red balls to be filled in the third shelf. |
| 8 | **Shelf 3 - blue**<br>Number of blue balls to be filled in the third shelf. |
| 9 | **Shelf 3 - green**<br>Number of green balls to be filled in the third shelf. |

# 9 Message texts and interactive error messages at the HMI

In general, there are three different reporting classes. These are designed as follows

- Message class 0 (displayed red in the message line)
  - the program is immediately stopped and the automatic mode is terminated
  - the cause of the error has to be fixed
  - Then acknowledge the fault and restart the station
- Message class 1 (displayed red in the message line)
  - the program and the automatic mode are stopped at the end of the cycle
  - the cause of the error has to be fixed
  - Then acknowledge the fault and restart the station
- Message class 2 (displayed yellow in the message line)
  - the program and the automatic mode are executed further
  - If the cause of the fault is fixed, the error is automatically acknowledged
- Note
  - Displayed on the HMI but not processed in MES

## 9.1 Message texts

### 9.1.1 Message texts of the application module dispense

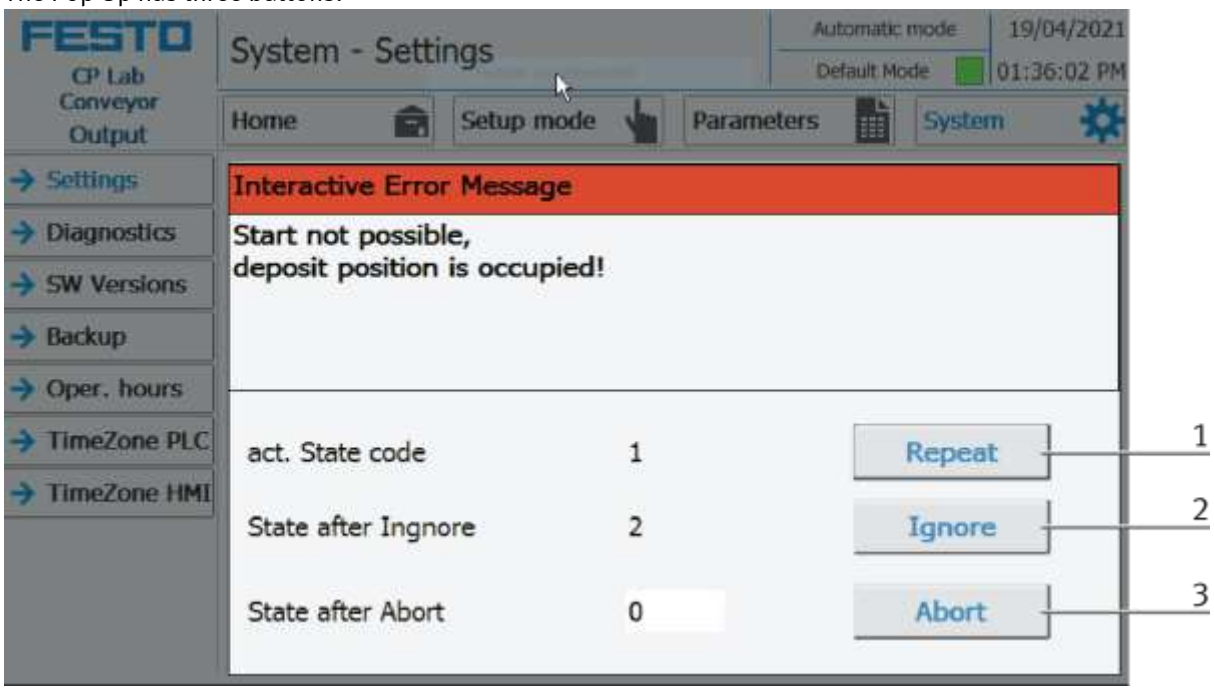
| Report class | Location | Alarm name | |
|---|---|---|---|
| 0 | | | Magazine 1 almost empty! Refill material. |
| 0 | | | Magazine 2 almost empty! Refill material. |
| 0 | | | Magazine 3 almost empty! Refill material. |
| 0 | | | No material in magazine feeder 1! Check feed. |
| 0 | | | No material in magazine feeder 2! Check feed. |
| 0 | | | No material in magazine feeder 3! Check feed. |
| 0 | | | No material in magazine 1! Refill material. |
| | | | No material in magazine 2! Refill material. |
| 2 | | | No material in magazine 3! Refill material. |

## 9.2 Interactive error messages

### 9.2.1 Default operation

Interactive messages are displayed via a pop-up window at HMI

The Pop Up has three buttons.



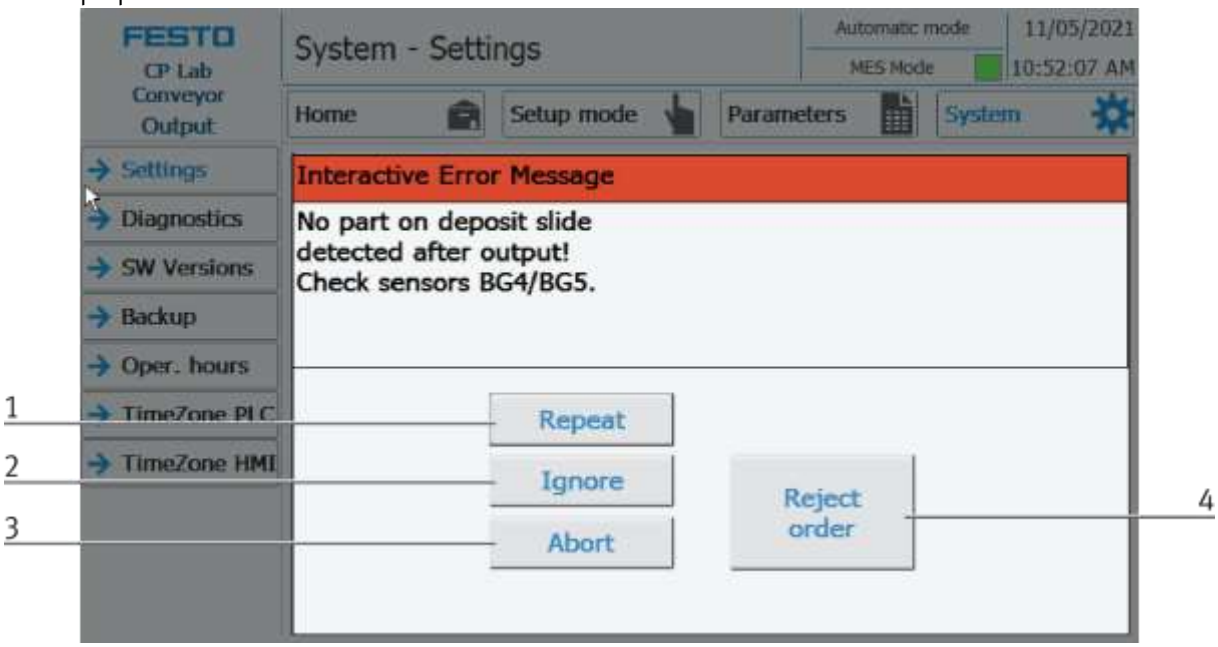

Example application module output - interactive error message in default mode

| Position | Note |
|---|---|
| 1 | Repeat - An attempt is made to run the application again. |
| 2 | Ignore – The error status is ignored; the workpiece carrier receives the status code as indicated in the transition table in the "Initial status" column. The application is no longer executed. |
| 3 | Abort – The error status is ignored; the workpiece carrier receives the status code as shown in the input / output field next to the value displayed. This can be changed in this interactive error message window. |

### 9.2.2 MES Operation

Interactive messages are displayed via a pop-up window at HMI

The Pop Up has four buttons.




Example application module output - interactive error message in default mode

| Position | Note |
|---|---|
| 1 | Repeat - An attempt is made to run the application again with the same parameters. |
| 2 | Ignore – The application is not executed, but is treated in the MES as if the order step had been executed without errors. |
| 3 | Abort – The application is no longer executed. In the MES, this order position is terminated with an error and canceled, depending on whether an error step has been defined or not. |
| 4 | Reject order - the application will not be executed. In the MES, the step of this order position is reset and restarted the next time the workpiece carrier arrives. |

### 9.2.3 General

| Value | Text | Fix error |
|---|---|---|
| 100 | Order aborted with errors! | Start order again |

### 9.2.4 Application modul dispense

| Value | Text | Fix error |
|---|---|---|
| 5071 | No lower part present! | Check palet / sensor BG10. |
| 5072 | Upper part already present! | Check workpiece / sensor BG14. |

# 10 Spare part list

## 10.1 Electric parts

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Light guide unit D: SOEG-L-Q30-P-A-S-2L | 8127556 | BG14 | Lid available |
| 2 | Light guide unit D: SOEG-L-Q30-P-A-S-2L | 8127556 | BG10 | Workpiece available |
| 3 | Light guide SOOC-TB-M4-2-R25 | 552812 | BG14 | Lid available |
| 4 | Light guide SOOC-TB-M4-2-R25 | 552812 | BG10 | Workpiece available |
| 5 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG13 | Filling level magazine 3 |
| 6 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG12 | Filling level magazine 3 |
| 7 | Ultrasonic sensor Balluff / W18M1-GPXI-02 | 015-S92G | BG11 | Filling level magazine 3 |
| 8 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG6 | Ligth barrier 3 balls available |
| 9 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG4 | Ligth barrier 3 balls available |
| 10 | Optical fibre device / SOE4-FO-L-HF2-1P-M8 | 552796 | BG2 | Ligth barrier 3 balls available |
| 11 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG5 | Rotation cylinder 3 position sensor |
| 12 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG3 | Rotation cylinder 3 position sensor |
| 13 | Position sensor / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | BG1 | Rotation cylinder 3 position sensor |
| 14 | Position sensors X-axis / SMT-8G-PS-24V-E-2,5Q-OE | 547859 | BG9 | right end position |
| 15 | Position sensors X-axis / SMT-8G-PS-24V-E-2,5Q-OE | 547859 | BG8 | middle position |
| 16 | Position sensors X-axis / SMT-8G-PS-24V-E-2,5Q-OE | 547859 | BG7 | left end position |

## 10.2 Pneumatic parts

| Pos | Description | Part number | Res.Ident | Use |
|---|---|---|---|---|
| 1 | Valve / VUVG-L10A-P53E-T-M3-1P3 | 566440 | MB7<br>MB8 | X-axis 1 lift back (left)<br>X-axis 1 expand (+20mm) |
| 2 | Valve / VUVG-L10A-P53E-T-M3-1P3 | 566440 | MB9<br>MB10 | X-axis 2 lift back (right)<br>X-axis 2 expand (+20mm) |
| 3 | Cylinder / ADN-12-20-I-P-A | 536214 | MM4 | X-axis 1 |
| 4 | Cylinder / ADN-12-20-I-P-A | 536214 | MM5 | X-axis 2 |
| 5 | Valve / VUVG-L10A-P53U-T-M3-1P3 | 566441 | MB5<br>MB6 | Rotation cylinder 3 to initial position<br>Rotation cylinder 3 to ball output |
| 6 | Valve / VUVG-L10A-P53U-T-M3-1P3 | 566441 | MB3<br>MB4 | Rotation cylinder 2 to initial position<br>Rotation cylinder 2 to ball output |
| 7 | Valve / VUVG-L10A-P53U-T-M3-1P3 | 566441 | MB1<br>MB2 | Rotation cylinder 1 to initial position<br>Rotation cylinder 1 to ball output |
| 8 | Turning cylinder / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | MM3 | Rotation cylinder 3 |
| 9 | Turning cylinder / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | MM2 | Rotation cylinder 2 |
| 10 | Turning cylinder / SRBS-Q12-8-E270-EP-1-S-M8 | 2619972 | MM1 | Rotation cylinder 1 |

# 11 Service and cleaning

The components and systems from Festo Didactic are maintenance-free.
At regular intervals you should have checked:

- the lenses of the optical sensors, fibre optics and reflectors
- the active surface of the proximity switch
- the entire station

can be cleaned with a soft, lint-free cloth or brush.

**NOTE**

Do not use aggressive or abrasive cleaners.

Protective covers must not be cleaned with alcoholic cleaning agents, there is a risk of embrittlement.

# 12 Further information and updating

Further information and updates on the technical documentation of Festo Didactic components and systems can be found on the Internet at:
www.ip.festo-didactic.com

# 13 Disposal

**NOTE**

Electronic waste contains recyclable materials and must not be disposed of with the domestic waste. Bring electronic waste to a designated municipal collection point.

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