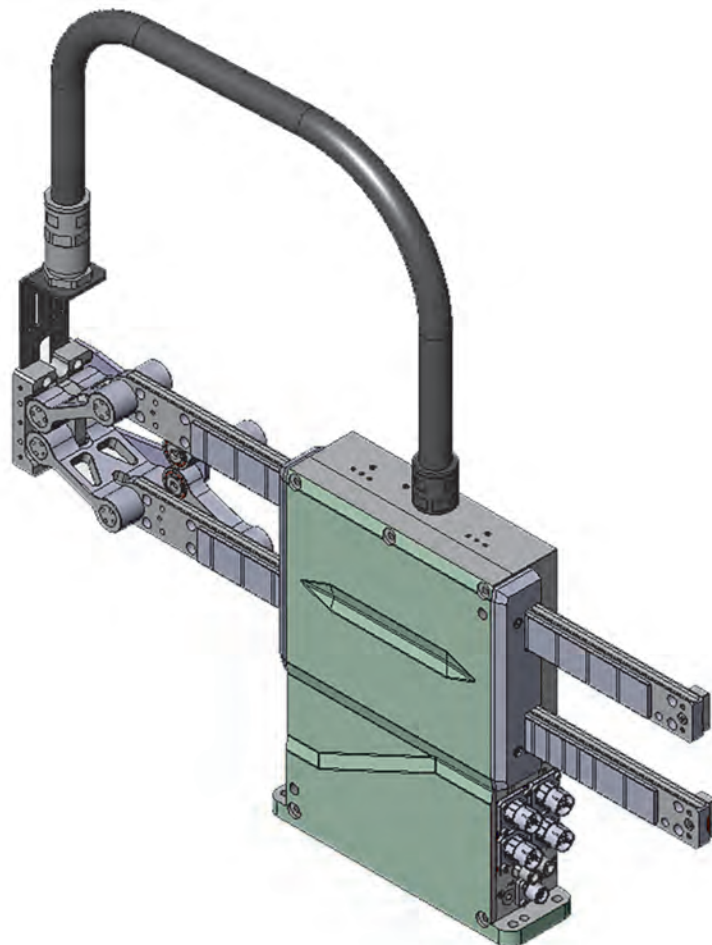


# PICK & PLACE HP70

## MOUNTING INSTRUCTIONS

TD 1005009

052020\_1.0\_EN



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# 1 Introduction

## 1.1 About these mounting instructions

These mounting instructions describe the product "PICK & PLACE HP70" (also referred to as "product" in this document).

These mounting instructions are part of the product.

- You may only use the product if you have fully read and understood these mounting instructions.
- Verify that these mounting instructions are always accessible for any type of work performed on or with the product.
- Pass these mounting instructions as well as all other product-related documents on to all owners of the product.
- If you feel that these mounting instructions contain errors, inconsistencies, ambiguities or other issues, contact the manufacturer prior to using the product.

These mounting instructions are protected by copyright and may only be used as provided for by the corresponding copyright legislation. We reserve the right to modifications.

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe these mounting instructions or from failure to comply with directives, regulations and standards and any other statutory requirements applicable at the installation site of the product.

## 1.2 Intended use

The product is a partly complete machine pursuant to Directive 2006/42/EU, articles 1g and 2g. The product is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which Directive 2006/42/EU applies.

The product may only be used within the limits specified in these mounting instructions and in the applicable documents. The applicable documents are also part of the product.

The machinery must not be put into service until the machinery into which the product has been incorporated has been determined and declared in conformity with the provisions of Directive 2006/42/EU and with all other applicable directives and regulations.

In addition, perform a risk assessment in view of the planned application, according to an approved risk assessment method, and implement the appropriate safety measures, based on the results of the risk assessment. Take into account the consequences of installing or integrating the product into a system or a plant.

When using the product, perform all work and all other activities in conjunction with the product in compliance with the conditions specified in the mounting instructions, in the applicable documents, and on the nameplate, as well as with all directives, standards, and safety regulations applicable at the installation site of the product.

### 1.3 Predictable incorrect application

Any use of the product beyond the explicitly indicated intended use is an impermissible, incorrect application of the product.

The product must never be used in the following cases, under the following conditions, and for the following purposes:

- Operation in residential environments
- Operation in life-supporting systems
- Operation in potentially explosive atmospheres/hazardous areas
- Operation on ships, in rail vehicles, land craft or in aircraft
- Operation in military facilities
- Operation outside of the specified order data
- Applications involving transportation of persons (fairground rides)

### 1.4 Applicable documents

In addition to these mounting instructions, the following documents are binding for and apply to any type of use of the product:

- Order data (including, but not limited to, design data, load data, performance data, transportation and storage instructions, information attached to the product and the package, as well as other specifications).
- Documentations of the manufacturers of all products belonging to the scope of delivery (for example, motor, accessories, attachment parts). This includes, among other things:

| Type of manual                       | Type   | Manufacturer          | Delivery     |            |
|--------------------------------------|--|-----------------------|--------------|------------|
|                                      |  |                       | Paper format | Electronic |
| Operating instructions               | Encoder<br>BML-S1F...                            | Balluff GmbH          | -            | X          |
| Certificate MTTF and<br>MTTFD / B10d | Encoder<br>BML-S1F1-Q61D-M310-P0-<br>KA00,3-S284 | Balluff GmbH          | -            | X          |
| Operating instructions               | Encoder<br>BML-S1H...                            | Balluff GmbH          | -            | X          |
| Certificate MTTF and<br>MTTFD / B10d | Encoder<br>BML-S1H1-S6QC-M3AA-D0-<br>KA00,3-S284 | Balluff GmbH          | -            | X          |
| Data sheet                           | Pneumatic valve<br>SY3143-5LOU-Q                 | SMC                   | -            | X          |
| Safety data sheet                    | Lubricant<br>LE-Spezialfett Synt EP 2            | HERM GmbH & Co.<br>KG | X            | X          |

| In the case of delivery with WEISS GmbH controller/software package: |   |            | Delivery     |            |
|--|---|------------|--------------|------------|
|  |   |            | Paper format | Electronic |
| User manual  | "W.A.S. 2 COMPACT"<br>TD0079A-XX00-0000-00  | WEISS GmbH | -            | X          |
| User manual  | "W.A.S. 2 SCALABLE"<br>TD0081A-XX00-0000-00   | WEISS GmbH | -            | X          |
| Electrical documentation   | List of applicable documents, per product (see documents on the USB flash drive delivered with the product) | WEISS GmbH | -            | X          |

## 1.5 Warranty

See our website for our General Terms and Conditions at [www.weiss-international.com](http://www.weiss-international.com) or your purchase order.

## 2 Safety

### 2.1 Safety messages and hazard categories

These mounting instructions contain safety messages to alert you to potential hazards and risks. Safety messages in these mounting instructions are highlighted with warning symbols and warning words.

The signal word describes the source of the hazard. The text contains instructions on how to avoid the hazard as well as the consequence resulting from failure to follow the instructions given in the safety message.

Depending on the severity of a hazard, the safety messages are classified according to different hazard categories.



#### **DANGER**

DANGER indicates an immediately hazardous situation, which, if not avoided, will result in death or serious injury.



#### **WARNING**

WARNING indicates a hazardous situation, which, if not avoided, can result in death or serious injury or equipment damage.



#### **CAUTION**

CAUTION indicates a hazardous situation, which, if not avoided, can result in injury or equipment damage.

#### **NOTICE**

NOTICE indicates a hazardous situation, which, if not avoided, can result in equipment damage.

In addition to the instructions and safety messages provided in these mounting instructions, you must comply with all directives, standards, and safety regulations applicable at the installation site of the product.



## 2.2 Hazard symbols

The following symbols are used in these mounting instructions:



This is the general safety alert symbol. It alerts to injury hazards or equipment damage. Comply with all safety instructions in conjunction with this symbol to help avoid possible death, injury, or equipment damage.



This symbol alerts to hazardous electrical voltage. If this symbol is used in a safety message, there is a hazard of electric shock.

Hazard symbols may also be attached to the product.



Hazard of hot surface



Hazard of magnetic field



No access for persons with heart pacemakers or other medical implants

## 2.3 Responsibilities of the system integrator and/or operator

The system integrator (the person who incorporates the product in a machine pursuant to Directive 2006/42/EU, i.e., for example, the machine builder) and/or the operator must ensure the following:

- The application and use of the product must be limited to the specified intended use.
- In the integration of the product, all functional safety requirements must be met.
- All directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, applicable at the installation site of the product must be complied with.
- Any type of work whatsoever on and with the product may only be performed by qualified personnel.
- The product may only be operated when it is in flawless, fully functional condition.
- All safety equipment must operate as required and planned.
- The personal protective equipment for the personnel/operator must be available and must be used.
- The mounting instructions and all applicable documents must always be accessible in their entirety to the personnel at the installation site of the product.
- Safety instructions, labels, and any other information attached to the product must not be removed.
- A complete manual must be available for the machine into which the product is incorporated; this manual must describe all types of work on and with the machine and contain all information relevant with regard to the product.

If the system integrator himself is not in the position to comply with any of these obligations, the system integrator must impose compliance with these obligations on the operator.

## 2.4 Qualification of personnel

Only trained personnel who have fully read and understood the mounting instructions and all applicable documents for the product may perform work on and with the product.

This trained personnel must have sufficient technical training, knowledge, and experience, and be able to foresee and detect potential hazards that may be caused by using the product.

All trained personnel working on and with the product must be fully familiar with all directives, standards, and safety regulations that must be observed for performing such work.

## 2.5 Hazards caused by strong magnetic fields

The magnetic attraction of the motor components containing permanent magnets increases with decreasing distance and can be higher than several kN in the hazardous exposure range (distance less than 100 mm).



### DANGER

#### **ELECTRIC SHOCK**

Each movement of electrically conductive materials vis à vis permanent magnets results in inductive voltage.

**Failure to follow these instructions will result in death or serious injury.**

- Avoid any movement of components with permanent magnets vis à vis electrically conductive materials in vice versa.



### WARNING

#### **ELECTROMAGNETIC FIELDS**

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**



- Verify compliance with all international, national, and local directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, with regard to strong magnetic fields.
- Take all necessary measures to ensure that persons with active medical implants (such as heart pacemakers or insulin pumps), metal implants, and magnetically or electrically conductive objects are not exposed to the magnetic fields generated by the product.
- Do not operate devices in the vicinity of the product which are sensitive to electromagnetic emission.
- Verify that a distance to the product of at least 15 cm is kept.

**⚠ WARNING****FORCES OF ATTRACTION ACTING ON MAGNETIZABLE MATERIALS**

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Verify that you do not move objects consisting of magnetizable materials (such as watches, steel or iron tools) and/or permanent magnets into the hazardous exposure range of a component containing a permanent magnet.
- The following must be available to free trapped parts of the body in case of accidents during work with permanent magnets:
  - Hammer (approx. 3 kg) made of solid, non-magnetizable material
  - Two pointed wedges (wedge angle approx. 10 ° to 15 °) made of solid, non-magnetizable material

**NOTICE****LOSS OF DATA AND DAMAGE TO ELECTRONIC EQUIPMENT**

**Failure to follow these instructions can result in equipment damage.**

- Do not allow electronic devices which are sensitive to magnetic attraction forces in the vicinity of the product.

## 2.6 Functional safety



### ⚠ WARNING

#### INSUFFICIENT AND/OR MISSING SAFETY-RELATED FUNCTIONS

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Perform a risk assessment as per ISO 12100 and/or another equivalent risk assessment, and appropriately consider all applicable regulations and standards that apply to your machine/process before using the product.
- In your risk assessment and with regard to all requirements, determine the Safety Integrity Level (SIL), the Performance Level (PL), and any other safety-related requirements and capabilities necessary to safely operate your machine/process in any operating state and to reach the required safe state.
- In your risk assessment, verify that the product meets all requirements regarding the Safety Integrity Level (SIL), the Performance Level (PL), and any other safety-related requirements and capabilities applicable to your machine/process.
- In your risk assessment, consider all documents mentioned in the section "Applicable Documents" of the present document.
- Verify that the type of integration of the product into your machine/process does not compromise or reduce the data on functional safety specified in the present document and in the applicable documents.
- Do not use wiring information, programming or configuration logic, parameter values, or any other settings described in the present document in your machine/process without validating and verifying their suitability for your application according to the applicable directives, regulations, and standards.
- During initial commissioning, each subsequent recommissioning, and during each restart of the machine/process, verify correct operation and the effectiveness of all safety-related functions and all non-safety-related functions by performing systematic, defined tests for all operating states, for the safe state, and for all potential error conditions.
- Verify that the instructions/documentation you have to create as a system integrator describe all safety-related functions and all non-safety-related functions in a way compliant with all applicable directives, regulations, and standards.
- Verify that your machine/process in which the product is used is properly certified and/or approved according to all standards, regulations, and directives applicable at the installation site of the machine/process.

The product comprises the following components which can be used as safety-related parts of a control system pursuant to ISO 13849-1:

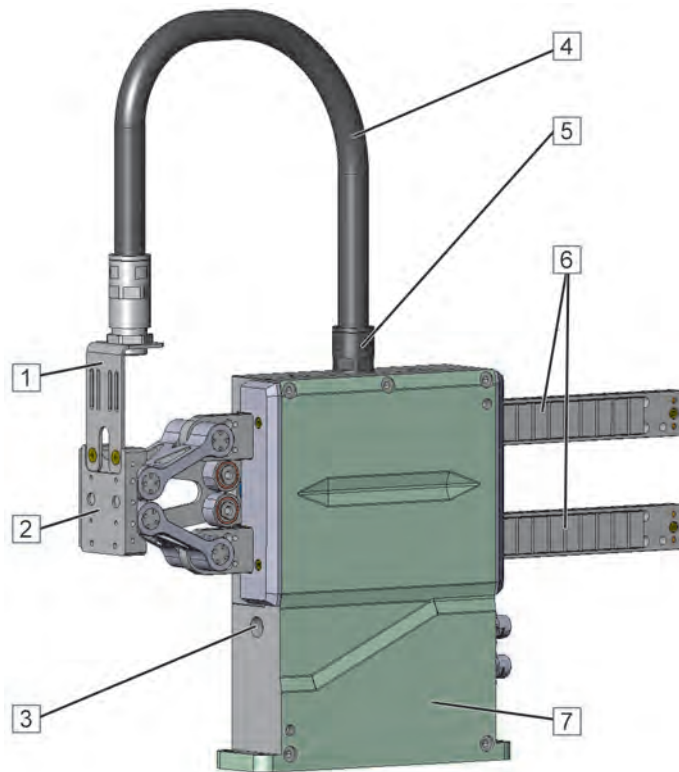
- Encoder (BML-S1F1-Q61D-M310-P0-KA00,3-S284)
- Encoder (BML-S1H1-S6QC-M3AA-D0-KA00,3-S284)

Refer to the section "Functional safety encoder" for data on functional safety provided by the manufacturer of these components. Refer to the documents of the manufacturer listed in the chapter "Applicable documents" for additional data.

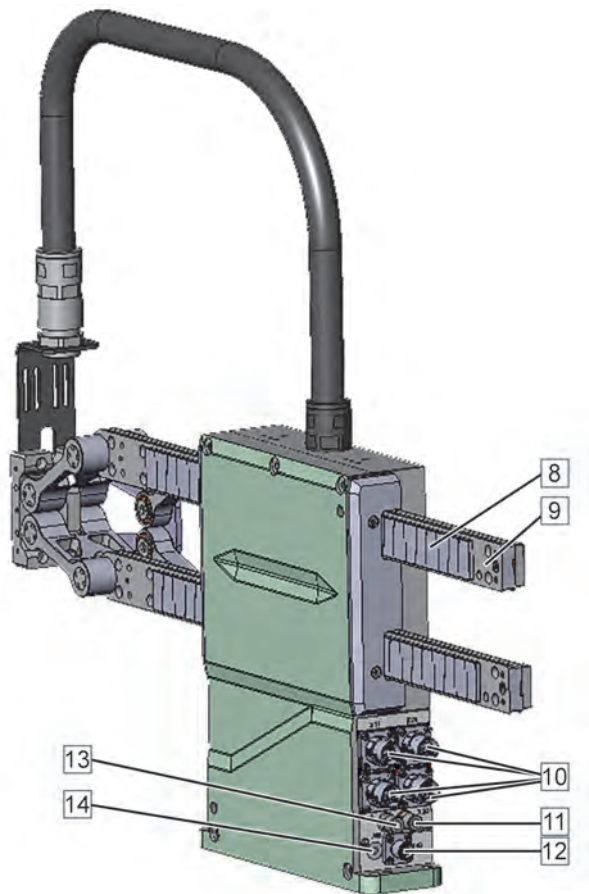
### 3 Product description

#### 3.1 Overview

The product consists of the following components:



- |   |  |   |  |
|---|--|---|--|
| 1 | Bracket for tool connector (optional)                    | 5 | Rapid-action connector "Tool-Connector" (optional) |
| 2 | Front plate  | 6 | Horizontal axes                                    |
| 3 | Pushbutton for releasing the clamping element (optional) | 7 | Housing  |
| 4 | Corrugated hose tool connector (optional)                |   |  |



**8** Magnet way

**9** Guide rail

**10** Connections for motor and encoder

**11** Lubrication connection

**12** Connection inputs/outputs

**13** Connection compressed air

- Clamping element

- Pneumatic valves for gripper functions

**14** Connection protective ground conductor

## **3.2 Function description**

The product is designed for typical pick & place applications.

The horizontal stroke (Y) is generated by the two parallel horizontal axes. The vertical stroke (Z) is generated by the different position of the horizontal axes in conjunction with the kinematic parallel system.

The linear motors of the two axes are controlled by servo drives. The integrated magnetic encoder provides for high positioning accuracy and repeatability.

The product can be equipped with an optional WEISS tool connector. The tool connector provides a simplified cable guide system for a gripper system connected to the product. The integrated cable guide routes the signal cable and the pneumatic hoses from the connections at the rear side of the product to the front plate.

To reduce the maintenance, the product can be equipped with an optional automatic lubrication pump.

For commissioning, parameterization and diagnostics, the product can be operated with the WEISS Application Software (W.A.S. 2).

### 3.3 Nameplate

The nameplate is attached to the housing of the product; it contains the following information:

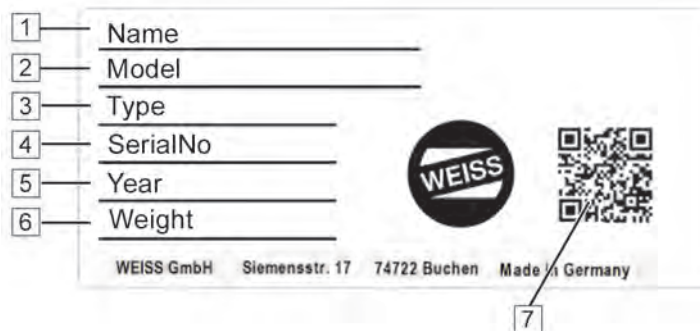


Figure 1: Example of nameplate

- |   |               |   |                         |
|---|---------------|---|-------------------------|
| 1 | Name          | 5 | Year of manufacture     |
| 2 | Model         | 6 | Weight                  |
| 3 | Type          | 7 | QR code company website |
| 4 | Serial number |   |                         |

The scope of delivery contains a second nameplate. If the factory-mounted nameplate is covered by attachments, the second nameplate can be attached at a readily visible position of the product or machine for identification of the product.

### 3.4 Type code

Structure of the type code:

| Type | Horizontal stroke | Encoder  | Clamping element                          | Tool connector   |
|------|-------------------|--|---|--|
| HP70 | 125<br>225<br>325 | <b>SICO1</b> (Incremental 1Vpp)<br><b>SSI20B</b> (absolute SSI 20Bit Bosch)<br><b>BiSS20</b> (absolute BiSS-C 20Bit) | <b>NCL</b> (without)<br><b>WCL</b> (with) | <b>NTC</b> (without)<br><b>ETC</b> (with empty pipe and lateral cable entry)<br><b>CTC</b> (with two integrated signal cables)<br><b>PTC</b> (with two integrated cable entries and two 5/2 pneumatic valves plus pneumatic hoses) |



### 3.5 Mounting positions

#### NOTICE

##### EQUIPMENT DAMAGE DUE TO INCORRECT MOUNTING POSITION

Failure to follow these instructions can result in equipment damage.

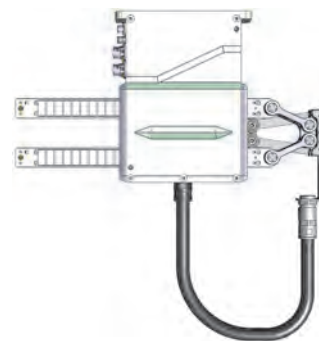
- Verify that you only use the standard mounting positions approved in these mounting instructions.
- Only use special mounting positions if such special mounting positions have been approved by the manufacturer in writing.

##### Permissible standard mounting positions

The product may only be mounted as shown below.



Horizontal



Upside down

## 4 Technical data

### 4.1 General

| Characteristic   | Unit  | Value                    |
|--|-------|--------------------------|
| Stroke horizontal<br>(depending on type, see nameplate)                      | mm    | 125, 225, 325            |
| Stroke vertical<br>(depending on type, see nameplate)                        | mm    | 70                       |
| Unidirectional positioning accuracy (within a temperature range of +/- 15 K) | mm    | 0.01                     |
| Repeatability (at a constant temperature +/- 10 K)                           | mm    | 0.005                    |
| Maximum load   | kg    | 1                        |
| Weight   | kg    | See nameplate            |
| Total weight including packaging   | kg    | See bill of delivery     |
| Sound pressure   | dB(A) | < 70                     |
| Lubricant  | -     | LE-Spezialfett Synt EP 2 |

### 4.2 Motor

| Characteristic             | Unit               | Value  |
|----------------------------|--------------------|--------|
| Pole width                 | mm                 | 27.6   |
| Maximum DC bus voltage     | V DC               | 560    |
| Voltage constant (rms)     | V/(m/s)            | 23     |
| Maximum acceleration       | m/s <sup>2</sup>   | 40     |
| Maximum velocity           | m/s                | 4      |
| Nominal force              | N                  | 65     |
| Peak force                 | N                  | 180    |
| Force constant             | N/A <sub>rms</sub> | 35     |
| Nominal current            | A                  | 2.5    |
| Peak current               | A                  | 6.5    |
| Winding cross section      | mm <sup>2</sup>    | 0.176  |
| Stator resistance at 20°C* | Ohm                | 7.5    |
| Stator inductance*         | Henry              | 0.0212 |
| Rotor mass                 | kgm <sup>2</sup>   | 1.5    |

\* Measured between phase and phase (star connection)

### 4.3 Clamping element

| Characteristic             | Unit | Value |
|----------------------------|------|-------|
| Nominal current            | A    | 0.05  |
| Braking force              | N    | 145   |
| Releasing pressure         | bar  | 4.2   |
| Maximum operating pressure | bar  | 7     |
| Time delay for applying    | sec  | 0.3   |
| Time delay for releasing   | sec  | 0.3   |

### 4.4 Encoder

Refer to the documentation of the manufacturer for the technical data of the encoder; see applicable documents.

#### Incremental

| Characteristic           | Unit            | Value                  |
|--------------------------|-----------------|------------------------|
|                          |                 | <b>Balluff BML-S1F</b> |
| Supply voltage           | V               | 5 ± 5 %                |
| Incremental signals      | V <sub>pp</sub> | sin/cos 1              |
| Signal period/resolution | mm              | 1                      |
| Reference mark           | -               | Without                |
| Accuracy                 | µm/m            | ± 10                   |

#### Absolute BiSS

| Characteristic           | Unit      | Value                            |
|--------------------------|-----------|----------------------------------|
|                          |           | <b>Balluff BML-S1H - 20 bits</b> |
| Supply voltage           | V         | 5 ± 5 %                          |
| Absolute signals         | -         | BiSS                             |
| Resolution               | /mm       | 1024                             |
| SSI cycle frequency      | kHz       | 70 ... 900                       |
| Coding                   | -         | Binary code                      |
| CRC                      | -         | 6                                |
| CRC numerator polynomial | hex / dec | 0 x 43 / 67                      |
| Number of data bits      | -         | 20                               |
| Number of error bits     | -         | 0                                |
| Number of zero bits      | -         | 2                                |

| Characteristic      | Unit            | Value                                 |
|---------------------|-----------------|---------------------------------------|
| Order of data       | -               | Position: 20<br>Zero bit: 2<br>CRC: 6 |
| Incremental signals | V <sub>pp</sub> | sin/cos 1                             |
| Signal period       | mm              | 1                                     |

#### Absolute SSI

| Characteristic       | Unit            | Value                            |                               |
|----------------------|-----------------|----------------------------------|-------------------------------|
|                      |                 | <b>Balluff BML-S1H - 20 bits</b> |                               |
| Option               |                 | Parameteriza-<br>tion BOSCH      | Parameteriza-<br>tion Siemens |
| Supply voltage       | V               | 5 ± 5 %                          |                               |
| Absolute signals     | -               | SSI                              |                               |
| Resolution           | /mm             | 1024                             |                               |
| SSI cycle frequency  | kHz             | 400                              | 100                           |
| Monoflop time        | µs              | 8                                | 16                            |
| Coding               | -               | Binary code                      |                               |
| Number of data bits  | -               | 20                               |                               |
| Number of error bits | -               | 0                                |                               |
| Number of zero bits  | -               | 2                                |                               |
| Order of data        | -               | Position: 20<br>Zero bit: 2      |                               |
| Incremental signals  | V <sub>pp</sub> | sin/cos 1                        |                               |
| Signal period        | mm              | 1                                |                               |

## 4.5 Pneumatic valve (optional)

| Characteristic                                | Unit  | Value                   |
|---|-------|-------------------------|
| Manufacturer                                  | -     | SMC                     |
| Type  | -     | SYJ3143-5LOU-Q          |
| Function                                      | -     | 5/2 monostable          |
| Operating pressure                            | MPa   | 0.15 - 0.7              |
| Flow rate                                     | l/min | 98                      |
| Diameter connection for compressed air supply | mm    | 6                       |
| Hose  | -     | FESTO PUN-4x0,75-DUO-BS |

| Characteristic | Unit | Value             |
|----------------|------|-------------------|
| Hose length    | m    | Approximately 1.3 |
| Voltage        | VDC  | 24                |
| Valve 1        | -    | A1 - output 1     |
| Valve 2        | -    | A2 - output 2     |

#### 4.6 Climatic environmental conditions "Operation"

| Characteristic   | Unit | Value       |
|--|------|-------------|
| Ambient temperature  | °C   | +15 ... +45 |
| Relative humidity, non-condensing  | %    | +5 ... +70  |
| Maximum surface temperature  | °C   | 80          |
| Maximum installation altitude above mean sea level without derating motor and drive/frequency inverter | m    | 1000        |
| External magnetic fields (to help avoid permanent damage)  | mT   | < 30        |
| External magnetic fields (to help avoid deterioration of the measurement)                              | mT   | < 1         |

#### 4.7 Climatic environmental conditions "Transportation and Storage"

| Characteristic  | Unit | Value                         |
|---|------|-------------------------------|
| Ambient temperature                                   | °C   | +5 ... +55                    |
| Relative humidity, non-condensing                     | %    | +5 ... +70                    |
| Degree of protection                                  | -    | IP20                          |
| Protection class (as per EN 61140)                    | -    | I                             |
| Maximum storage duration of the mechanical components | -    | <a href="#">see chapter 7</a> |

## 4.8 Dimensions

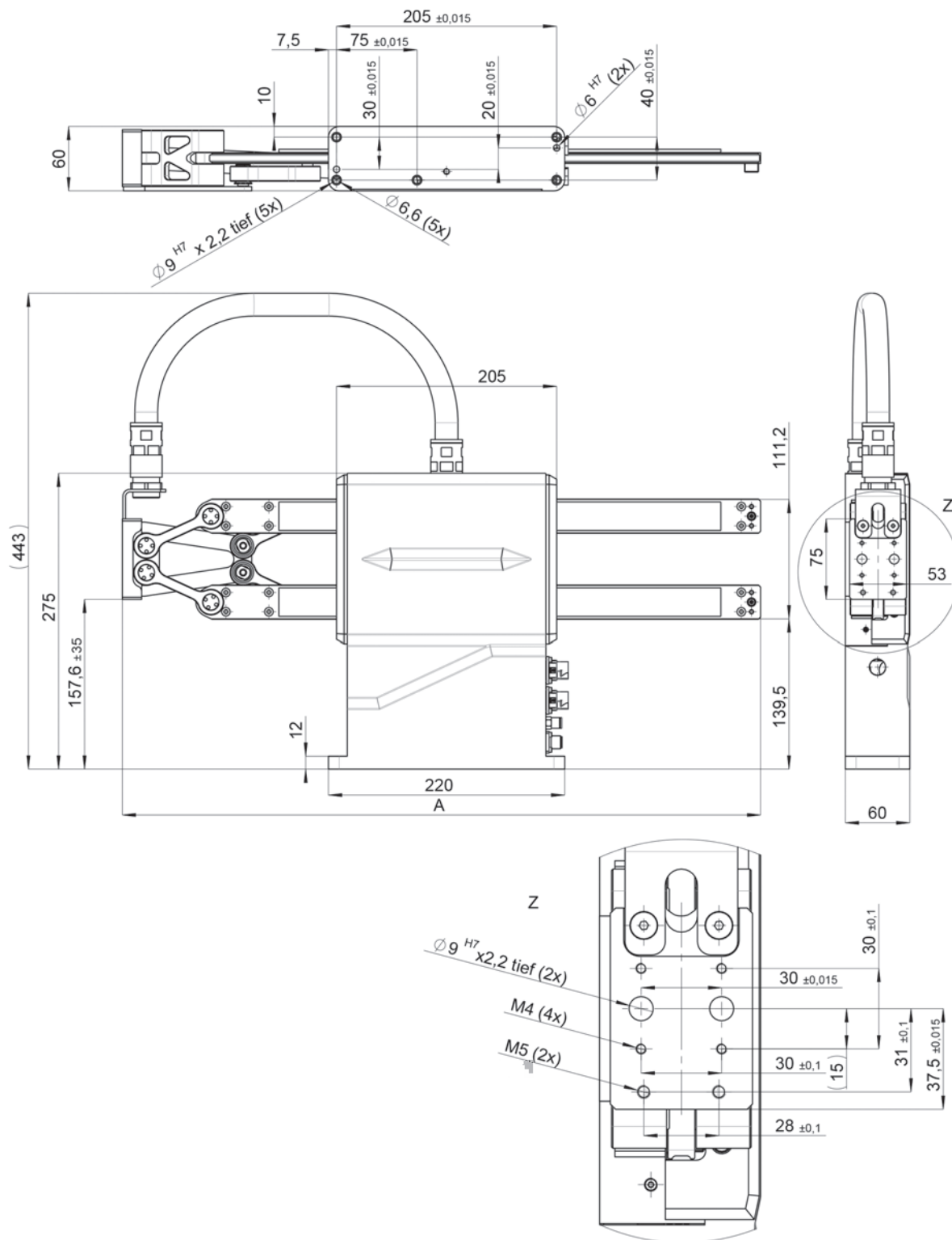


Figure 2: Lengths and diameters in mm

| Horizontal stroke | Dimension A in mm |
|-------------------|-------------------|
| 125               | 497.5             |
| 225               | 594.5             |
| 325               | 691.1             |

#### 4.8.1 Dimensions "Automatic lubrication pump" (optional)

With one lubrication hose connection

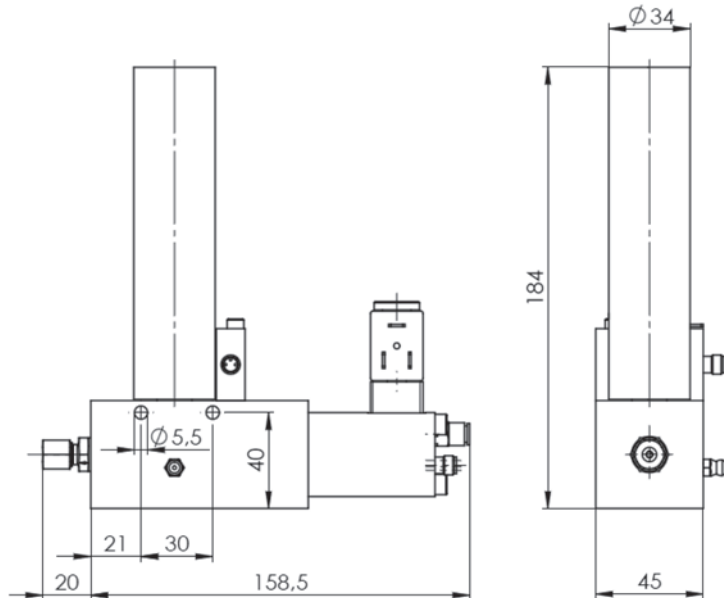


Figure 3: Lengths and diameters in mm

With two lubrication hose connections

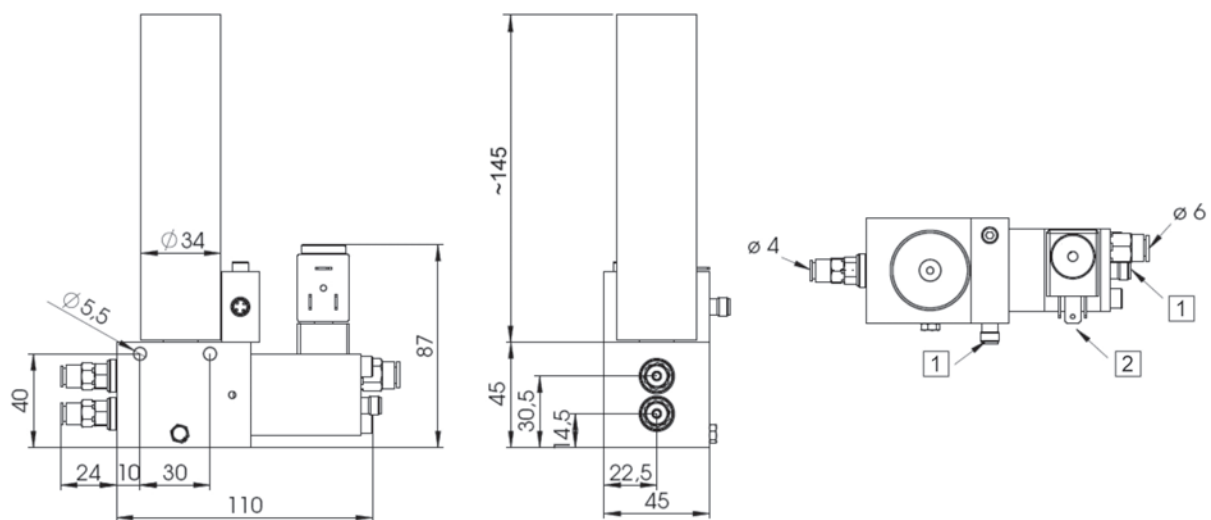


Figure 4: Lengths and diameters in mm




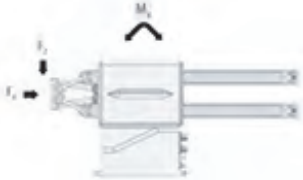
1 M8 - 3-pin

2 Valve, type B



## 4.9 Load data

### Static load data

| Characteristic                          | Representation   | Unit | Value |
|---|--|------|-------|
| Maximum static moment around the X axis |    | Nm   | 61    |
| Maximum static moment around the Y axis |     | Nm   | 41    |
| Maximum static moment around the Z axis |   | Nm   | 120   |
| Maximum static force in the y axis      |  | N    | 100   |
| Maximum static force in the z axis      |  | N    | 100   |

## 4.10 Data functional safety

The following data on functional safety relate to the following components integrated in the product:

- Encoder (BML-S1F1-Q61D-M310-P0-KA00,3-S284)
- Encoder (BML-S1H1-S6QC-M3AA-D0-KA00,3-S284)

You can use these components as safety-related components of a control system pursuant to ISO 13849-1. Use the data for your functional safety calculations.

### BML-S1F1-Q61D-M310-P0-KA00

| Characteristic    | Unit  | Value |
|-------------------|-------|-------|
| MTTF (40 °C)      | Years | 510   |
| MTTF <sub>D</sub> | Years | 1020  |
| B10d              | -     | -     |
| Mission time      | Years | 20    |

| Characteristic      | Unit | Value  |
|---------------------|------|--|
| Diagnostic coverage | %    | 0 (sensor heads do not have diagnostics functionality) |

**BML-S1H1-S6QC-M3AA-D0-KA00**

| Characteristic      | Unit  | Value  |
|---------------------|-------|--|
| MTTF (40 °C)        | Years | 1189   |
| MTTF <sub>D</sub>   | Years | 2378   |
| B10d                | -     | -  |
| Mission time        | Years | 20   |
| Diagnostic coverage | %     | 0 (sensor heads do not have diagnostics functionality) |

## 5 Packaging

### 5.1 Types of packaging



The product is packaged in a cardboard box with foam plastic material.

### 5.2 Unpacking the product

1. Do not remove the packaging until immediately prior to mounting.
2. Dispose of the packaging material in compliance with all directives, standards, and safety regulations applicable at the installation site.

### 5.3 Verification of the delivery

- Check the delivery for completeness and transportation damage upon reception.
- In the case of damage, reject the delivery or accept it only conditionally.
- Document the damage in the transportation documents/bill of delivery (any damage detected must be immediately reported to the forwarding agent and confirmed by the forwarding agent).
- Take photographs of the damage.
- Report the damage to WEISS GmbH.

## 6 Transportation



### ⚠ WARNING

#### **FALLING, TOPPLING, OR LOWERING LOADS**

Insufficiently rated load lifting and handling equipment may break. Transportation vehicles, lifting gear, chains, belts, and other equipment not rated for the product may fail or tilt.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Only use transportation vehicles, lifting gear, chains, belts, and other lifting and handling equipment that comply with all applicable regulations and that are rated for the weight of the product including packaging.
- Verify that there are no persons in the danger zone.
- Verify that the product is properly secured against falling and toppling.

### 6.1 Transporting the product

Packages fastened to a pallet can be transported with a fork lift truck, a pallet jack or similar transportation means. Verify that the transportation means used is suitable and approved for the weight and the dimensions of the package.



1. Place the forks below the pallet.
2. Verify that the pallet with the package fully rests on the forks.
3. Fasten the pallet with the package using additional straps if the center of gravity is not in the center of the pallet.

## 7 Storage

### 7.1 Storing the product



#### ⚠ CAUTION

##### **STRONG MAGNETIC FIELDS**

The permanent magnets of the magnet way generate magnetic fields. The magnetic attraction forces considerably increase in the range of hazardous exposure (distance of less than 100 mm). Magnetizable materials, but also the linear motor axes, are attracted with high forces.

**Failure to follow these instructions can result in injury or equipment damage.**

- Transport and store the products separately.
- Do not stack the products.
- Verify that separating tools are available for emergencies.

The mechanical components of the product can be stored for a period of up to two years.

Conditions for the specified maximum storage duration:

- Storage in original packaging
- Compliance with all specified storage conditions
- Storage in suitable closed, dry, dust-free room, protected against direct sunlight
- No contact with corrosive media
- Corrosion protection intact

The electrical components (for example, the encoder) have a different maximum storage duration (see documentations of the manufacturers).

If the maximum storage duration has been exceeded, you must contact the manufacturer prior to commissioning the product. This also applies if the machine in which the product has been incorporated has not been operated for a period of time exceeding the maximum storage durations specified for the mechanical and electrical components.

If you plan to store the product for a period of time exceeding the maximum permissible storage duration specified for the mechanical components, you must uninstall the electrical components prior to storing the product. The electrical components must be stored according to the specifications of the manufacturers (see documentations of the manufacturers).

If the product is to be stored for a period of more than three months, the product must first be preserved. If the factory-applied anti-corrosion agent is no longer intact, you must request preservation instructions from the manufacturer.

## 8 Mounting

### 8.1 Prerequisites for mounting

Prior to mounting, verify that the dimensions of the installation site and construction conditions meet the requirements and the dimensions specified in these mounting instructions and the applicable documents.

- Verify that the supporting base is level and rigid.
- Verify that the supporting structure at the installation site has a sufficient structural strength to carry the weight of the product and of all loads.

### 8.2 Equipment and tools



#### ⚠ CAUTION

##### **STRONG MAGNETIC FIELDS**

The permanent magnets of the magnet way generate magnetic fields. The magnetic attraction forces considerably increase in the range of hazardous exposure (distance of less than 100 mm). Magnetizable materials are attracted with high forces.

**Failure to follow these instructions can result in injury or equipment damage.**

- Only use non-magnetic tools.

The following is required for mounting:

- Torque wrench
- Set of hex keys
- Locating pieces (depending on mounting version)
- Cotter pin punch (for mounting centering elements and locating pins)
- Ball pane hammer

### 8.3 Tightening torques and property classes

For fastening the product, only use screws with the property class shown in the following table unless a different property class is explicitly specified for a screw connection.

Use the tightening torque shown in the following table unless a different tightening torque is explicitly specified for a screw connection.

|                          |  |
|--------------------------|--|
| Property class of screws | 10.9 (coefficient of friction $\mu_{\text{tot.}} 0.10$ ) |
| Thread                   | M6   |
| Tightening torque        | 13.2 Nm  |

## 8.4 Bolting down the product



### WARNING

#### **FALLING, TOPPLING, OR LOWERING LOADS**

Insufficiently rated load lifting and handling equipment may break. Transportation vehicles, lifting gear, chains, belts, and other equipment not rated for the product may fail or tilt.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Only use transportation vehicles, lifting gear, chains, belts, and other lifting and handling equipment that comply with all applicable regulations and that are rated for the weight of the product including packaging.
- Verify that there are no persons in the danger zone.
- Verify that the product is properly secured against falling and toppling.



### WARNING

#### **ELECTROMAGNETIC FIELDS**

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**



- Verify compliance with all international, national, and local directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, with regard to strong magnetic fields.
- Take all necessary measures to ensure that persons with active medical implants (such as heart pacemakers or insulin pumps), metal implants, and magnetically or electrically conductive objects are not exposed to the magnetic fields generated by the product.
- Do not operate devices in the vicinity of the product which are sensitive to electromagnetic emission.
- Verify that a distance to the product of at least 15 cm is kept.



### WARNING

#### **IMPROPERLY FASTENED PARTS**

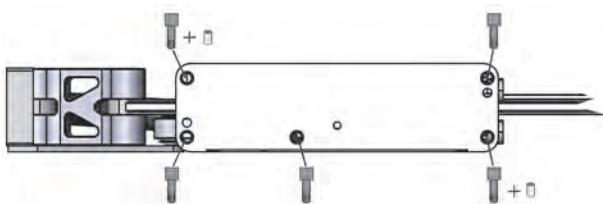
**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Verify that the supporting structure and/or the frame and/or the mounting surface for fastening the product are sufficiently rated to withstand all static and dynamic loads and forces during operation.
- Verify that the fastening parts comply with the specifications indicated and that they are sufficiently rated for all load conditions during operation.

**NOTICE****HARMFUL EXTERNAL INFLUENCES**

**Failure to follow these instructions can result in equipment damage.**

- Verify that the magnet way does not come into contact with magnetized objects.
- Do not subject the magnet way to mechanical impact.
- If you mount several products, avoid any contact between the magnet ways of the products.

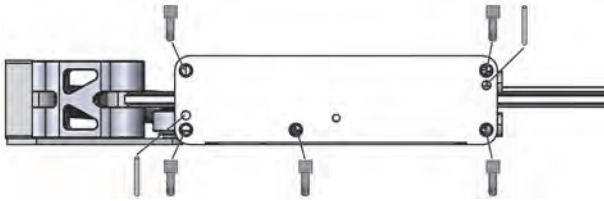
**Fastening by means of locating pieces**

Use M6 screws with the property class specified to mount the product. When determining the length of the screws, take into account the loads and forces acting in your application as well as the characteristics of the supporting structure to which the product is mounted.

1. Lower the product onto the mounting surface in compliance with the transportation instructions.
2. Fit the locating pieces into the holes.
- ✓ For correct centering, at least two locating pieces must be used in a diagonal arrangement.
3. Tighten the five screws (M6) at the mounting surface of the product with a tightening torque of 13.2 Nm.
4. Remove all transportation aids and equipment as well as all mounting tools from the product.



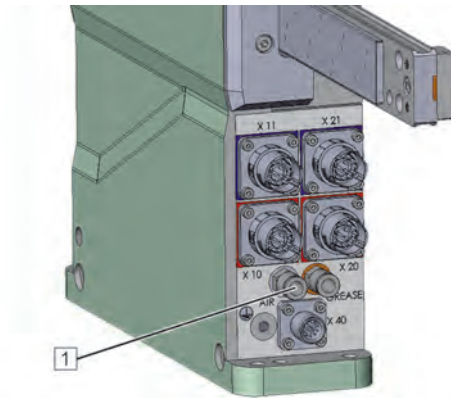
### Fastening by means of locating pins



Use M6 screws with the property class specified to mount the product. When determining the length of the screws, take into account the loads and forces acting in your application as well as the characteristics of the supporting structure to which the product is mounted.

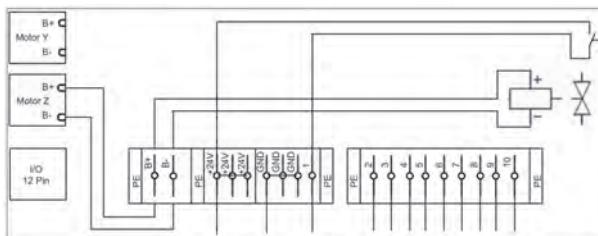
1. Lower the product onto the mounting surface in compliance with the transportation instructions.
2. Hand-tighten the five screws (M6) in the mounting surface.
3. Fully drive the two locating pins into the pin holes.
4. Tighten the five screws (M6) at the mounting surface of the product with a tightening torque of 13.2 Nm.
5. Remove all transportation aids and equipment as well as all mounting tools from the product.

## 8.5 Compressed air supply clamping element (optional)



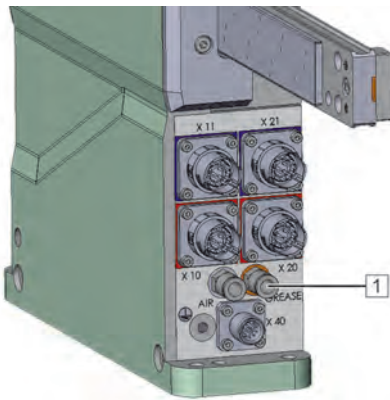
If the product is equipped with a clamping element, pressure ([see chapter 4.3](#)) must be applied to the product.

1. Connect the pneumatic hose to plug connection [1] to supply the clamping element with compressed air.



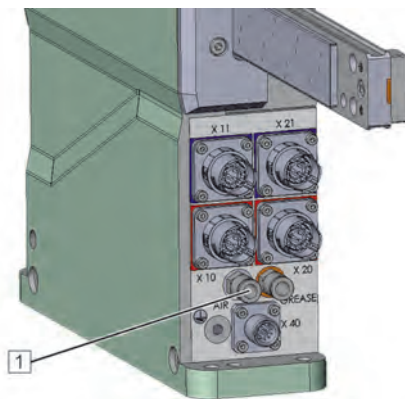
The brake valve is controlled by the servo controller. The required signals are transmitted via the motor cable.

## 8.6 Connecting the lubrication hose (for optional automatic lubrication)



- ✓ Ensure that the lubrication hose is completely bled prior to mounting.
  - ✓ Make sure that the length of a replacement lubrication hose does not exceed 1.5 m.
1. Unscrew the lubrication nipple (for manual lubrication).
  2. Mount the connector [1] included in the scope of delivery (for automatic lubrication).
  3. Connect the lubrication hose to connection [1].

## 8.7 Compressed air supply pneumatic valves (optional)



The product can be delivered two optional pneumatic valves for customer-specific gripper applications.

If the product is equipped with a clamping element, you have already connected the pneumatic hose for compressed air supply to plug connection [1] in a previous mounting step.

If the product is not equipped with a clamping element, the pneumatic hose for the grippers must be connected.

## 8.8 Tool connector (optional)



The product can be equipped with an optional tool connector to route two data cables and two pneumatic hoses to the gripper.

The tool connector consists of the corrugated hose [1], a bracket [2] and the quick-action connector [3].

## 8.9 Mounting safety equipment

The product is a partly complete machine pursuant to Directive 2006/42/EU and intended to be incorporated into or assembled with other machinery. The requirements concerning functional safety and the corresponding safety equipment result from the risk analysis and the risk assessment for the final machine or plant.

Selection, mounting, installation, commissioning, operation and maintenance of the safety equipment must be performed by the system integrator (the person who incorporates the product in a machine pursuant to Directive 2006/42/EU, i.e., for example, the machine builder) and/or the operator.

The product requires at least the following safety equipment:

- Emergency Stop system as per IEC 60204-1 / ISO 13850
- Lockable main switch to interrupt the complete power supply to all electrical components of the product

## 9 Electrical connection



### **⚠ DANGER**

#### **ELECTRIC SHOCK CAUSED BY LIVE PARTS**

**Failure to follow these instructions will result in death or serious injury.**

- Disconnect the mains supply voltage before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects.
- Verify that all cables for the power supply are disconnected from power.
- Verify that all electrical connections are made to the specifications in the wiring diagrams.



### **⚠ WARNING**

#### **UNANTICIPATED MOVEMENT**

Interchanging the motor connections inverts the direction of rotation of the motor.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Verify correct wiring and connection of all electrical connections.



### **⚠ CAUTION**

#### **IMPROPERLY INSTALLED CABLES**

**Failure to follow these instructions can result in injury or equipment damage.**

- Verify that the cables are correctly routed.
- Verify compliance with the bend radius specifications for the electrical lines.
- Only use cables with the correct cross sections.
- Verify that the electrical cables are correctly connected to the terminals.

The product is factory-wired. The electrical installation is limited to connecting the cables between the product and the drives.

Electrical installation of any other equipment is the responsibility of the system integrator and/operator.

The electrical cables are pre-assembled with a connector at one cable end.

## 9.1 Connecting the protective ground conductor

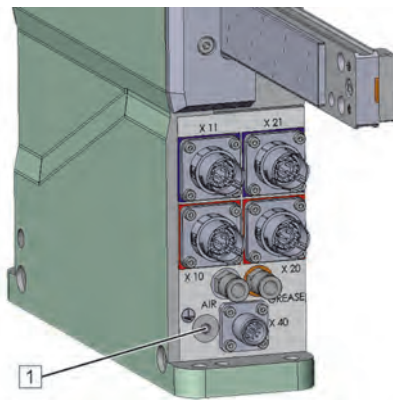


### DANGER

#### ELECTRIC SHOCK DUE TO INSUFFICIENT PROTECTIVE GROUNDING

Failure to follow these instructions will result in death or serious injury.

- Verify compliance with all local and national electrical code requirements as well as all other applicable directives, regulations, and standards with regard to protective grounding of the entire machine.
- Before applying voltage, implement protective grounding of the product according to the valid standard (EN 60204-1:2019-08-01; section 8.2.6).
- Do not use cable shields as protective ground conductors.



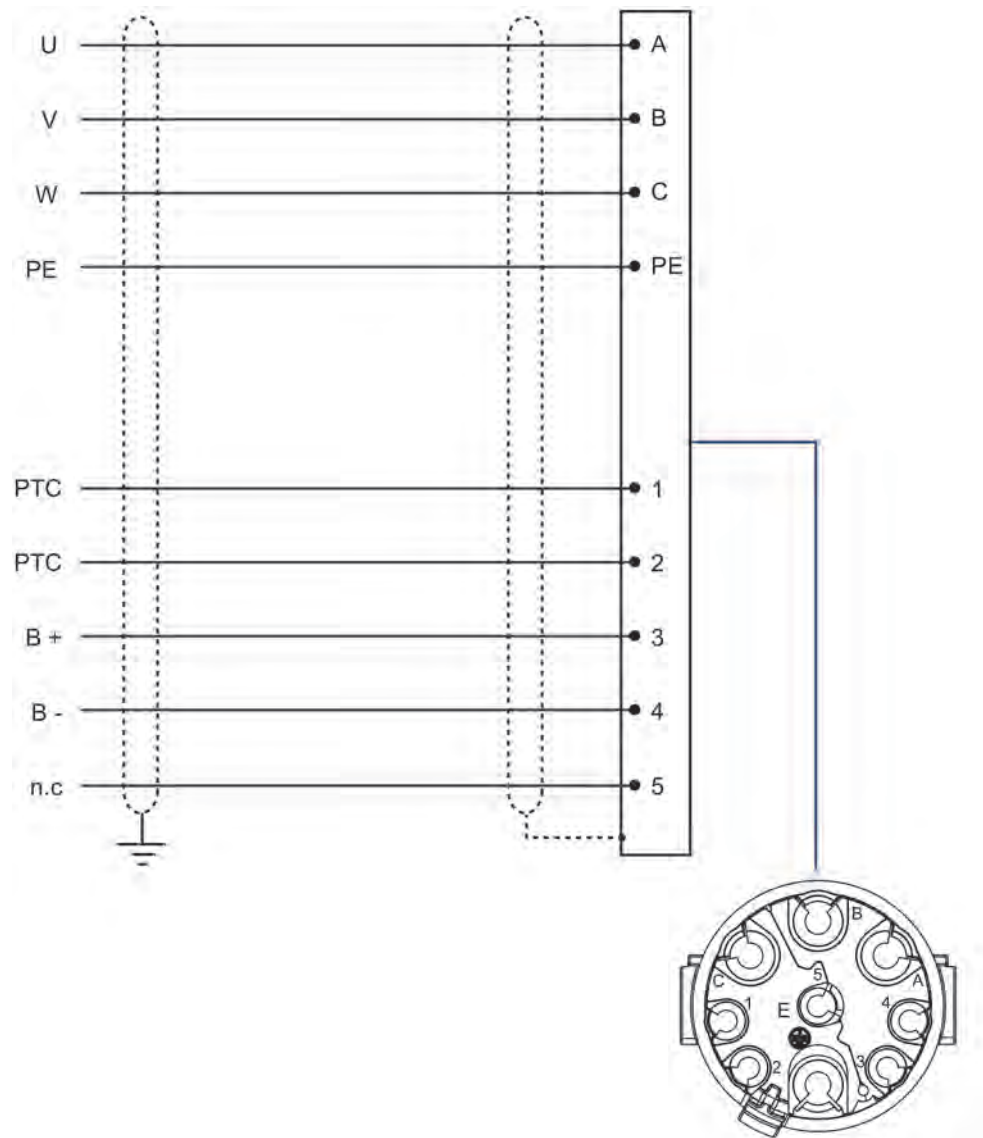
1. Connect a protective ground conductor with a minimum cross section of 10 mm<sup>2</sup> (copper) to the housing [1].

## 9.2 Connection assignment

**Motor (X10/X11)**

<- to servo drive

Pin assignment

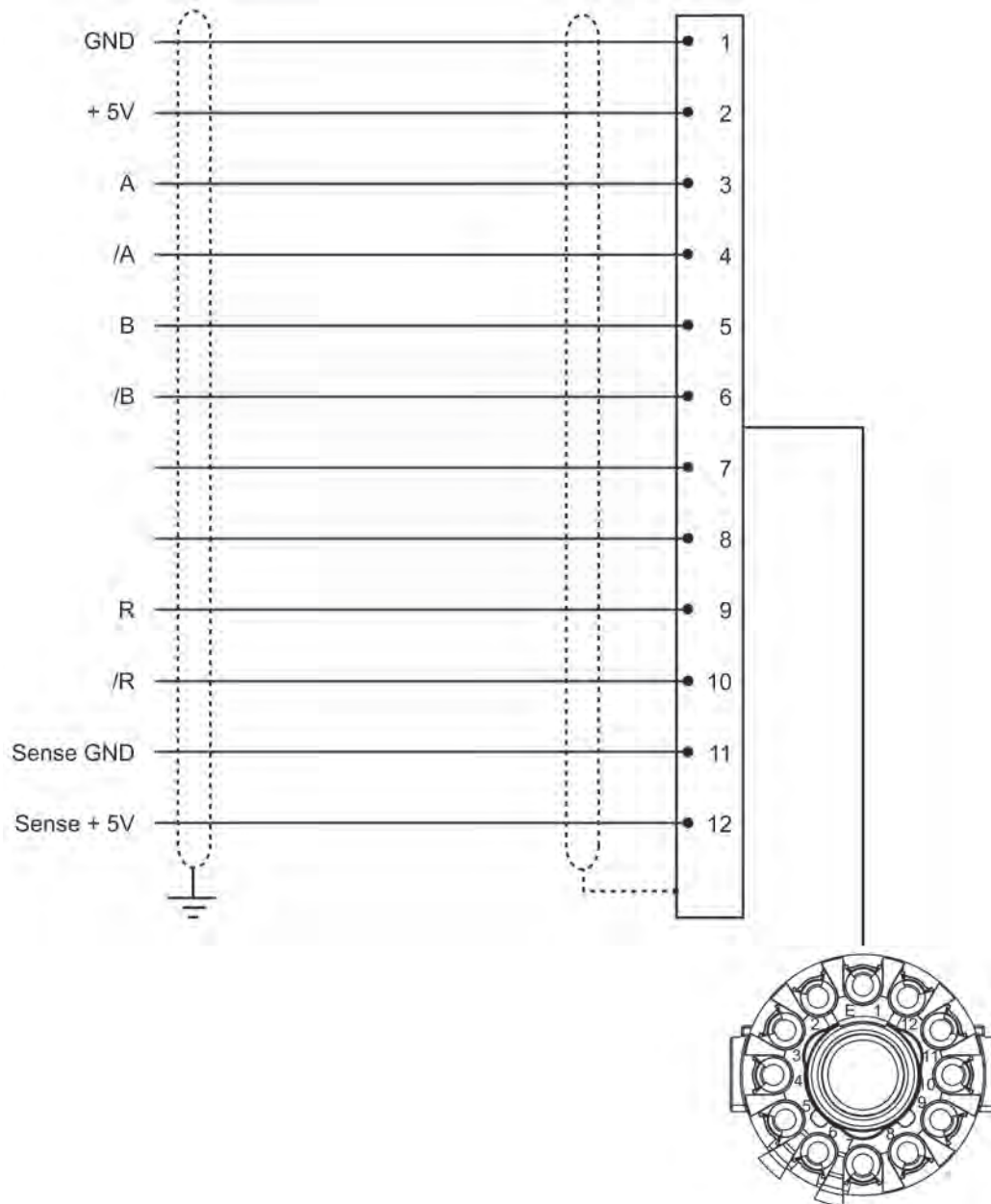


InterContec yTec - 9-pin

# Incremental encoder (X20/X21)

<- to servo drive

Pin assignment

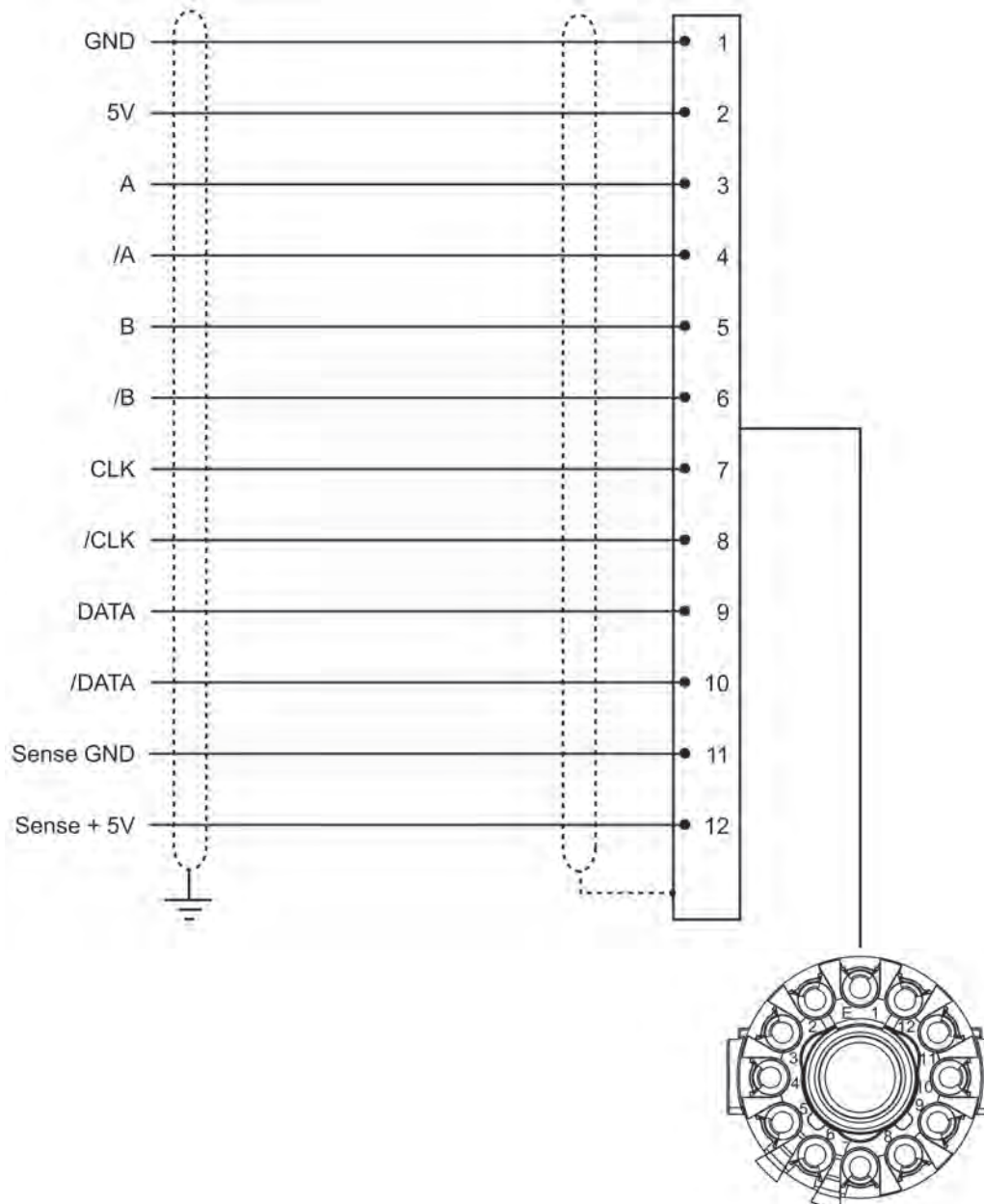


InterContec yTec - 12-pin

**Encoder absolute (X20/X21)**

&lt;- to servo drive

Pin assignment

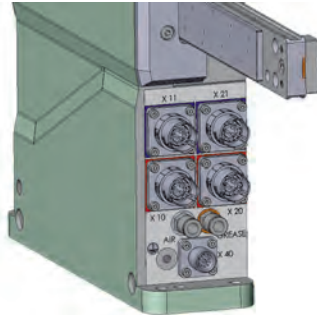


InterContec yTec - 12-pin



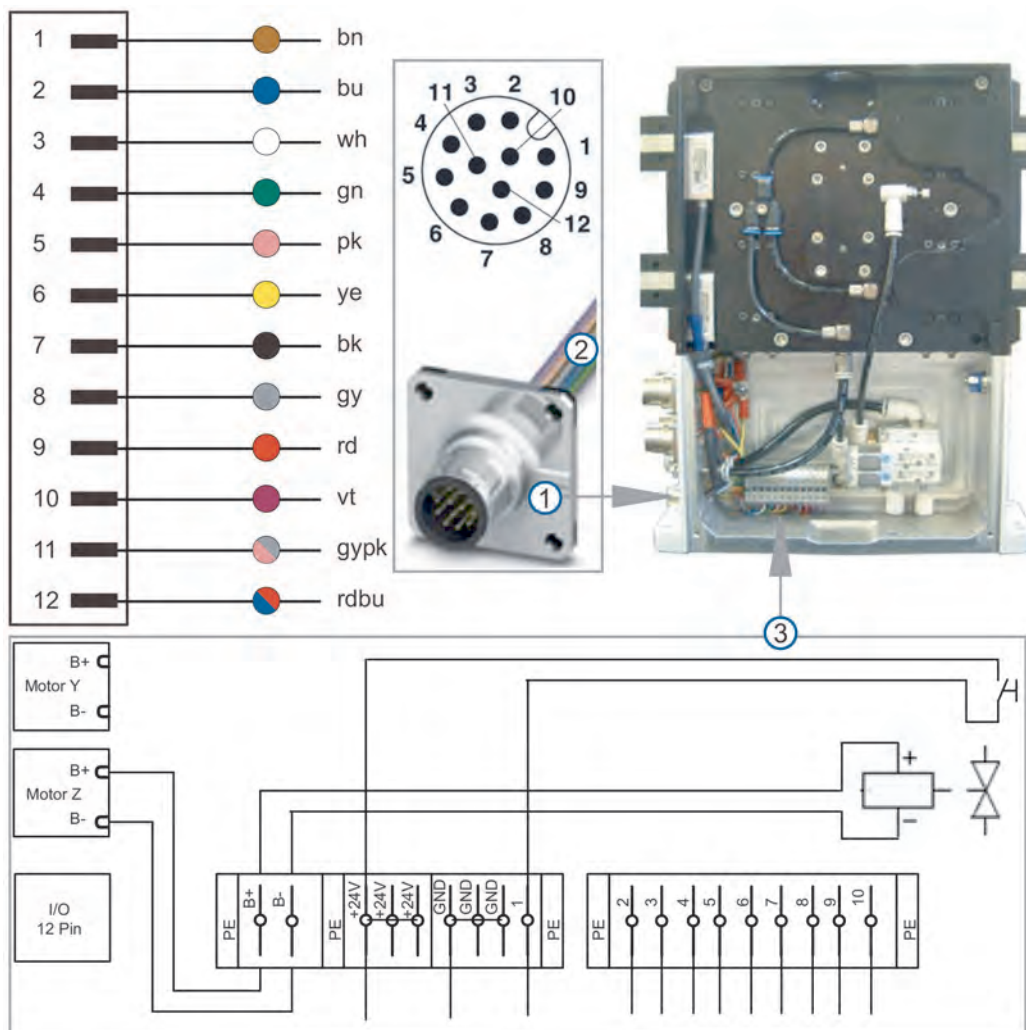
### 9.3 Plug connectors

When the electrical package is delivered by WEISS GmbH, the servo drives and the pre-assembled electrical cables with connectors at both cable ends are contained in the scope of delivery.



- X10 = Connection lower linear motor
- X11 = Connection upper linear motor
- X20 = Connection encoder lower linear motor
- X21 = Connection encoder upper linear motor
- X40 = Inputs/outputs

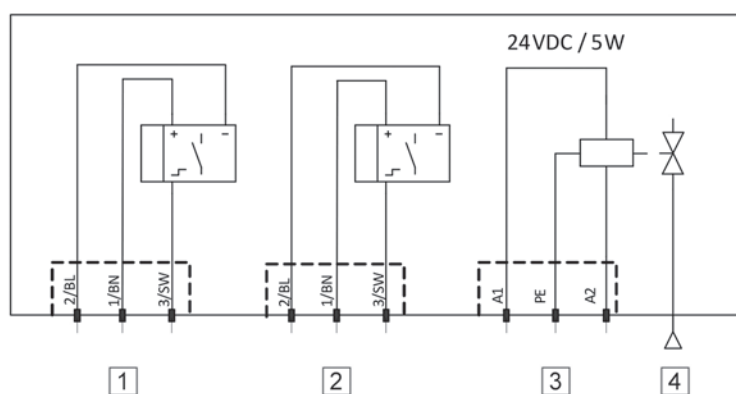
### 9.4 Connection inputs/outputs (X40)



| Designation        | Remark                        |
|--------------------|-------------------------------|
| Connector [1]      | M12 connector IEC 61076-2-101 |
| TPE wire [2]       | 12 x 0.14 mm <sup>2</sup>     |
| Terminal block [3] | -                             |

| Pin connector | Terminal terminal | Function                    |
|---------------|-------------------|-----------------------------|
| 1             | +24 VDC           | Supply 24 V                 |
| 2             | GND               | Supply GND                  |
| 3             | 1                 | Pushbutton clamping element |
| 4             | 2                 | M8 connector 1, pin 4 (CTC) |
| 5             | 3                 | M8 connector 2, pin 4 (CTC) |
| 6             | 4                 | M8 connector 3, pin 4 (PTC) |
| 7             | 5                 | M8 connector 4, pin 4 (PTC) |
| 8             | 6                 | NC                          |
| 9             | 7                 | NC                          |
| 10            | 8                 | NC                          |
| 11            | 9                 | NC                          |
| 12            | 10                | NC                          |

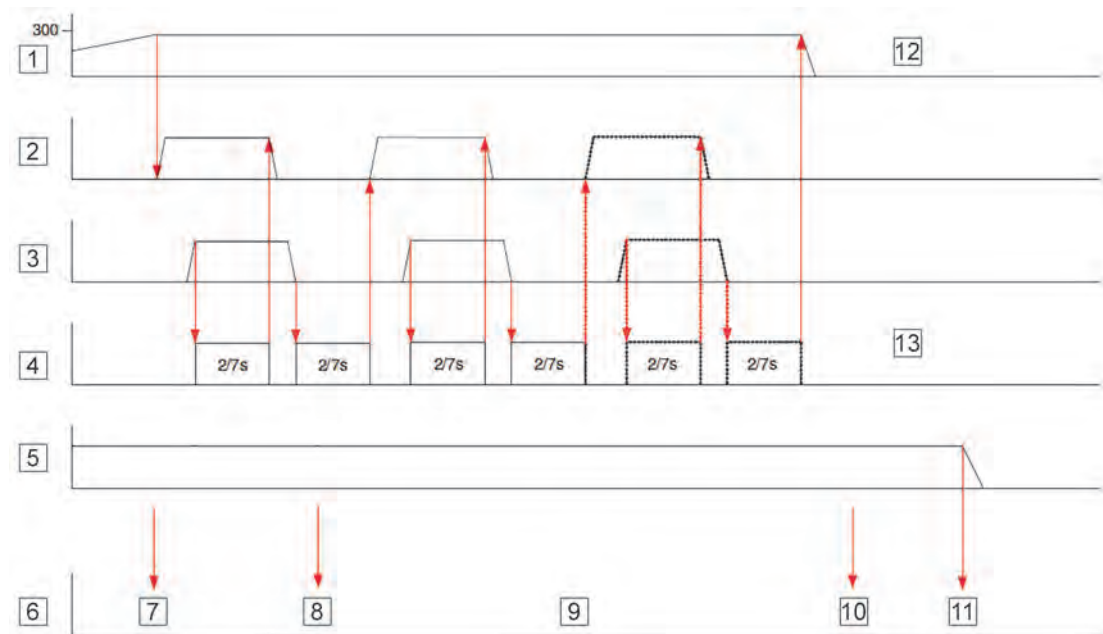
## 9.5 Connection assignment "Automatic lubrication pump" (optional)



- 1 Level sensor  
M8 - 3-pin
- 2 Sensor function  
M8 - 3-pin

- 3 Valve connector, type B
- 4 Connection

### Operation of the automatic lubrication pump without WEISS GmbH controller



- |  |  |   |
|--|--|---|
| <p><b>1</b> Kilometrage [km]</p> <p><b>2</b> SPS-OUT<br/>Valve coil</p> <p><b>3</b> SPS-IN<br/>Lubrication active</p> <p><b>4</b> Waiting time</p> | <p><b>5</b> SPS-IN<br/>Level</p> <p><b>6</b> Software</p> <p><b>7</b> Check:<br/>- Level OK<br/>- Input lubrication "Active LOW"</p> | <p><b>8</b> Check:<br/>- Input lubrication "Active LOW"</p> <p><b>9</b> If the input lubrication does not turn "Active LOW", the error message "Error pneumatic supply" is generated</p> <p><b>10</b> Check:<br/>- Level OK</p> <p><b>11</b> Error message "Level"<br/>(If the error message is generated during the 2 cycles of a running lubrication procedure, the remaining cycles are completed and the lubrication procedure is terminated)</p> |
|  |  | <p><b>12</b> Lubrication after 150 km</p> <p><b>13</b> Number of cycles: see tables</p>   |

| Lubricant volume    | Lubrication interval | Cycles of the automatic lubrication pump | Additional time with 1 m hose | Additional time with 2 m hose |
|---------------------|----------------------|--|-------------------------------|-------------------------------|
| 1.2 cm <sup>3</sup> | 150 km               | 2  | 2 sec                         | 7 sec                         |

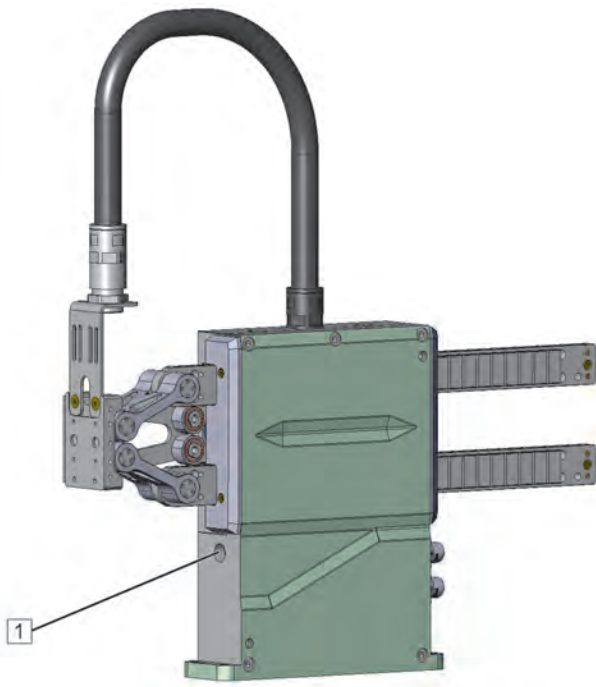
## 9.6 Pushbutton for releasing the clamping element (optional)

The product can be equipped with an optional clamping element.

If the product is equipped with a clamping element, the clamping element must be supplied with the compressed air required to release the clamping element via a compressed air unit ([see chapter 4.3](#)).

To be able to use the function for releasing the clamping element via the pushbutton [1], the signal at pin 3 ([see chapter 9.4](#)) of the connection inputs/outputs (X40) must be evaluated by the controller.

The controller must trigger the command for releasing the clamping element.



## 10 Controller

### 10.1 Basic information on control



#### WARNING

##### LOSS OF CONTROL

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Consider all potential failure modes of all control paths in your control concept.
- Implement means and measures for all critical functions to achieve a safe state if a control path fails (for example, emergency stop, overtravel of positions, power outage, and restart).
- Implement separate or redundant control paths for all critical functions.
- If the control system of the machine comprises communication links, consider the consequences of unanticipated transmission delays or failures of the link and implement appropriate measures.
- Subject each machine in which the product described in these mounting instructions is used to a comprehensive and thorough commissioning test before operating the machine.

### 10.2 WEISS GmbH controller/software package (optional)



WEISS GmbH offers a controller/software package for controlling the product.

If this option is used, you must follow all instructions in the corresponding documentations.

The documentations can be found on the USB flash drive delivered with the product in your Technical Documentation folder.

## 11 Commissioning

### 11.1 Prerequisites for commissioning

The following requirements must be met before the product may be commissioned:

- The product is properly mounted.
- The electrical equipment for the power supply of the electrical components of the product is correctly installed.
- All cables are properly routed and connected.
- All electrical connections have been made properly.
- The static discharge must be performed properly.
  - The leakage resistance must have been measured and have a value of less than 10 Ohm.
- All parts of the system are properly grounded in compliance with all applicable directives, regulations, and standards.
- All safety equipment and EMERGENCY-STOP circuits are operational.
- All environmental conditions are respected.
- All protective covers are properly mounted.
- All tools, equipment, and other objects have been removed from the zone of operation of the product.
- All hazards are excluded.

Prior to commissioning, perform a test for each prerequisite mentioned and verify compliance with all information and specifications contained in these mounting instructions, in all applicable documents, and in all applicable directives, regulations, and standards.

### 11.2 Performing commissioning



#### ⚠ WARNING

##### UNANTICIPATED MOVEMENT

Incorrect connections or external influences on electrical equipment can cause unanticipated movements.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Verify correct wiring.
- Verify that there are no persons or obstacles in the danger zone of the product before starting the product.
- Perform initial test movements without loads and without other processing units.
- Verify that all safety equipment and EMERGENCY STOP circuits are activated prior to commissioning.



### ⚠ WARNING

#### UNINTENDED EQUIPMENT OPERATION

Incorrect or unsuitable parameter values or settings can cause unintended movements, trigger signals, and compromise functional safety.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Verify that parameter values and settings can only be modified by authorized personnel who fully understand each and every effect of such a modification.
- Verify that all parameter values and settings are correct by performing a test run.



### ⚠ WARNING

#### ELECTROMAGNETIC FIELDS

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**



- Verify compliance with all international, national, and local directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, with regard to strong magnetic fields.
- Take all necessary measures to ensure that persons with active medical implants (such as heart pacemakers or insulin pumps), metal implants, and magnetically or electrically conductive objects are not exposed to the magnetic fields generated by the product.
- Do not operate devices in the vicinity of the product which are sensitive to electromagnetic emission.
- Verify that a distance to the product of at least 15 cm is kept.



### ⚠ WARNING

#### HOT SURFACES

The temperature of the product can exceed 80 °C during operation.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive objects in the vicinity of hot surfaces.
- Before performing work on the product, verify that you wait for a sufficient period of time to allow such parts to cool down to a temperature that allows for safe contact.

Power on the power supply to the product via the main switch.

Check the following points during commissioning:

- Operating state, potential error conditions, and protective equipment
  - During commissioning, perform tests for all operating states and error conditions. In doing so, verify that all protective equipment operates as planned and required.
- Correct operation of the horizontal axes

- There are no overloads.
- There are no unusual jerks. Immediately stop the product in the case of overloads or unusual jerks and verify correct mounting.
- Noise emission
  - Excessive noise emission can be an indication of incorrect mounting, for example, an uneven ground that causes mechanical stress. Immediately stop the product in the case of high noise emission and verify correct mounting and correct setting of the controller parameters.

If the product and/or the machine into which the product is incorporated is temporarily decommissioned, it must be recommissioned. For recommissioning, the same prerequisites must be met as for initial commissioning.

Perform the same tests for each recommissioning of the product as for initial commissioning.



## 12 Operation

### 12.1 Basic information on operation



#### ⚠ WARNING

##### UNINTENDED EQUIPMENT OPERATION

Incorrect or unsuitable parameter values or settings can cause unintended movements, trigger signals, and compromise functional safety.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Verify that parameter values and settings can only be modified by authorized personnel who fully understand each and every effect of such a modification.
- Verify that all parameter values and settings are correct by performing a test run.



#### ⚠ WARNING

##### ELECTROMAGNETIC FIELDS

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**



- Verify compliance with all international, national, and local directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, with regard to strong magnetic fields.
- Take all necessary measures to ensure that persons with active medical implants (such as heart pacemakers or insulin pumps), metal implants, and magnetically or electrically conductive objects are not exposed to do the magnetic fields generated by the product.
- Do not operate devices in the vicinity of the product which are sensitive to electromagnetic emission.
- Verify that a distance to the product of at least 15 cm is kept.

The product is a partly complete machine pursuant to Directive 2006/42/EU and intended to be incorporated into or assembled with other machinery. The information required for operation results from the functionality of the machine or system into which the product is incorporated and from the application implemented with it.

The instructions for the safe operation of the final machine or system must be provided by the system integrator (the person who incorporates the product in a machine pursuant to Directive 2006/42/EU) and/or the operator in the form of a manual with operating instructions, [see chapter 2.3](#).

These operating instructions must be a complete manual which describes all work on and with the product and which contains all information relevant to the product. The system integrator and/or operator must ensure compliance of the operating instructions with all applicable directives, regulations, and standards.

## 13 Troubleshooting

### 13.1 Issue, cause and remedy



#### **⚠ DANGER**

##### **ELECTRIC SHOCK CAUSED BY LIVE PARTS**

**Failure to follow these instructions will result in death or serious injury.**

- Disconnect the mains supply voltage before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects.
- Verify that all cables for the power supply are disconnected from power.
- Verify that all electrical connections are made to the specifications in the wiring diagrams.



#### **⚠ WARNING**

##### **ELECTROMAGNETIC FIELDS**

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**



- Verify compliance with all international, national, and local directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, with regard to strong magnetic fields.
- Take all necessary measures to ensure that persons with active medical implants (such as heart pacemakers or insulin pumps), metal implants, and magnetically or electrically conductive objects are not exposed to the magnetic fields generated by the product.
- Do not operate devices in the vicinity of the product which are sensitive to electromagnetic emission.
- Verify that a distance to the product of at least 15 cm is kept.



#### **⚠ WARNING**

##### **UNANTICIPATED MOVEMENT**

In the case of vertical installation of the product, the axes may move due to forces of gravity when the holding brake is released.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Block or safeguard the axes in such a way that a movement of the axes is safely prevented before releasing the holding brake.


**⚠ WARNING**
**HOT SURFACES**

The temperature of the product can exceed 80 °C during operation.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive objects in the vicinity of hot surfaces.
- Before performing work on the product, verify that you wait for a sufficient period of time to allow such parts to cool down to a temperature that allows for safe contact.

| Issue  | Cause   | Remedy  |
|--|---|---|
| The horizontal axes do not move freely or not at all | Guide rails and/or magnet ways are polluted         | <ul style="list-style-type: none"> <li>▪ Clean the guide rails and the magnet ways, <a href="#">see chapter 14.1</a></li> </ul>   |
|  | The horizontal axes are not sufficiently lubricated | <p>In the case of automatic lubrication</p> <ul style="list-style-type: none"> <li>▪ Check the grease cartridge of the automatic lubrication pump, <a href="#">see chapter 15.4</a></li> <li>▪ Verify correct settings of the automatic lubrication pump, <a href="#">see chapter 9.5</a></li> </ul> <p>In the case of manual lubrication</p> <ul style="list-style-type: none"> <li>▪ Lubricate the horizontal axes, <a href="#">see chapter 15.3</a></li> </ul> |

## 14 Cleaning

### 14.1 Performing cleaning



#### **⚠ DANGER**

##### **ELECTRIC SHOCK CAUSED BY LIVE PARTS**

**Failure to follow these instructions will result in death or serious injury.**

- Disconnect the mains supply voltage before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects.
- Verify that all cables for the power supply are disconnected from power.
- Verify that all electrical connections are made to the specifications in the wiring diagrams.



#### **⚠ WARNING**

##### **ELECTROMAGNETIC FIELDS**

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**



- Verify compliance with all international, national, and local directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, with regard to strong magnetic fields.
- Take all necessary measures to ensure that persons with active medical implants (such as heart pacemakers or insulin pumps), metal implants, and magnetically or electrically conductive objects are not exposed to the magnetic fields generated by the product.
- Do not operate devices in the vicinity of the product which are sensitive to electromagnetic emission.
- Verify that a distance to the product of at least 15 cm is kept.



#### **⚠ WARNING**

##### **MISSING PROTECTIVE EQUIPMENT**

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Immediately reinstall protective equipment that you may have removed to perform maintenance work after having completed the maintenance work and verify the effectiveness of the protective equipment.

**⚠ WARNING****UNANTICIPATED MOVEMENT**

In the case of vertical installation of the product, the axes may move due to forces of gravity when the holding brake is released.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Block or safeguard the axes in such a way that a movement of the axes is safely prevented before releasing the holding brake.

**⚠ WARNING****HOT SURFACES**

The temperature of the product can exceed 80 °C during operation.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive objects in the vicinity of hot surfaces.
- Before performing work on the product, verify that you wait for a sufficient period of time to allow such parts to cool down to a temperature that allows for safe contact.

For cleaning of electrical components and additional components, respect the instructions in the documentations of the manufacturer; refer to the applicable documents.

Use the following cleaning agents for cleaning the product:

| Component  | Cleaning agents          |
|------------|--------------------------|
| Housing    | Neutral, mildly alkaline |
| Guide rail | Dry cleaning             |
| Magnet way |                          |

1. Clean the guide rail and the magnet way of the horizontal axes with a dry, lint-free cloth.
2. Remove excess lubricant with a dry, lint-free cloth.
3. Use a wet cloth and a neutral, mildly alkaline cleaning agent to remove stains from the housing.
4. Dry the cleaned areas.
5. Remove all equipment from the product.
6. Restore the readiness for operation of the product.

## 15 Maintenance

### 15.1 Maintenance plan

| When                                   | Activity  |
|--|---|
| At least once per month                | <ul style="list-style-type: none"> <li>Manually move the horizontal axes along the entire stroke length and verify smooth operation without running noise</li> </ul>                                  |
| At least every six months              | <ul style="list-style-type: none"> <li>Clean all surfaces of the product, <a href="#">see chapter 14.1</a></li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Verify correct tightening torque of all screw connections used to fasten the product, <a href="#">see chapter 8.4</a></li> </ul>                               |
|  | <ul style="list-style-type: none"> <li>Verify correct connection of all plug connections</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Check all cables and compressed air hoses for damage</li> </ul>  |
| Every 300 km (manual lubrication only) | <ul style="list-style-type: none"> <li>Lubricate the horizontal axes, <a href="#">see chapter 15.3</a></li> </ul>   |
| If required                            | <ul style="list-style-type: none"> <li>Replace the grease cartridge at the automatic lubrication pump (verify continuous, even consumption of lubricant), <a href="#">see chapter 15.4</a></li> </ul> |
|  | <ul style="list-style-type: none"> <li>Bleed the lubrication hose, <a href="#">see chapter 15.5</a></li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Replace the corrugated hose (tool connector), <a href="#">see chapter 15.6</a></li> </ul>  |

### 15.2 Lubricant

#### NOTICE

##### INSUFFICIENT LUBRICATION

**Failure to follow these instructions can result in equipment damage.**

- Respect the lubrication intervals specified in these mounting instructions.
- Only use the lubricants specified in these mounting instructions for lubrication of the product.
- If you want to use a lubricant without FDA approval for relubrication, the factory-applied lubricant must first be completely removed because the two lubricants are not compatible.

The lubricant "LE-Spezialfett Synt EP 2" is used for initial factory-lubrication and relubrication.

Refer to the safety datasheet of the manufacturer for information on the lubricants used; see applicable documents.

### 15.3 Lubricating the product (manual lubrication)



#### ⚠ WARNING

##### UNANTICIPATED MOVEMENT

In the case of vertical installation of the product, the axes may move due to forces of gravity when the holding brake is released.

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Block or safeguard the axes in such a way that a movement of the axes is safely prevented before releasing the holding brake.

The product must be lubricated after 300 km of operation.

The kilometrage can be read out via the W.A.S. 2 software. In addition, it is possible to read out and reset the value via various parameters (as described in the manual for the W.A.S. 2 software).

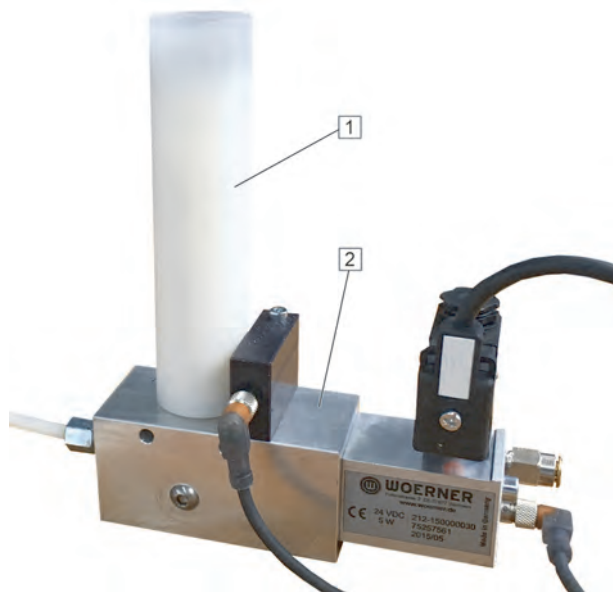
If the product has not been operated for an extended period of time, verify that all axes are lubricated before recommissioning it.



1. Use a grease gun to apply the specified amount of grease via the lubrication nipple.
  - If a pushbutton for releasing the holding brake is present, you must hold it down to move the axes.
  - Manually move the axes along the entire stroke several times during the lubrication procedure.
2. Remove excess grease with a soft, lint-free cloth from both axes.

| Axis            | Lubricant volume    |
|-----------------|---------------------|
| Horizontal axis | 0.6 cm <sup>3</sup> |

## 15.4 Replacing the grease cartridge at the automatic lubrication pump



1. Unscrew the grease cartridge [1] from the pump housing [2].



2. Remove the cap from the new grease cartridge.
3. Press from the bottom until grease escapes from the grease cartridge.
- ✓ This helps to keep air from getting into the lubrication hose.



4. Verify that the seal [3] and the magnets [4] are in the new grease cartridge.
5. Screw the grease cartridge into the pump housing.
6. Bleed the lubrication hose at the automatic lubrication pump, [see chapter 15.5](#).





## 15.5 Bleeding the lubrication hose

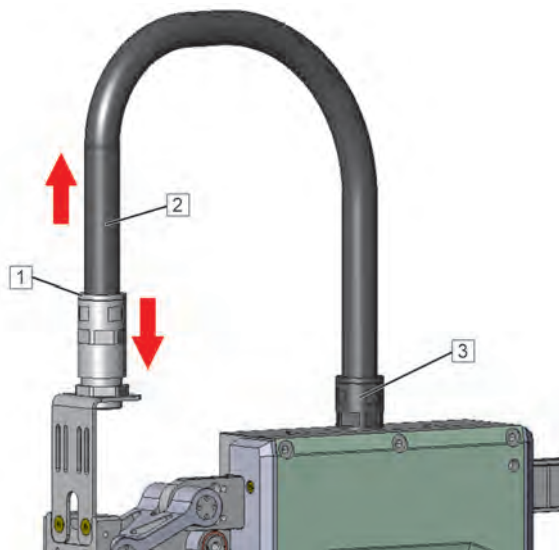
The automatic lubrication pump is delivered with the lubrication hose bled.



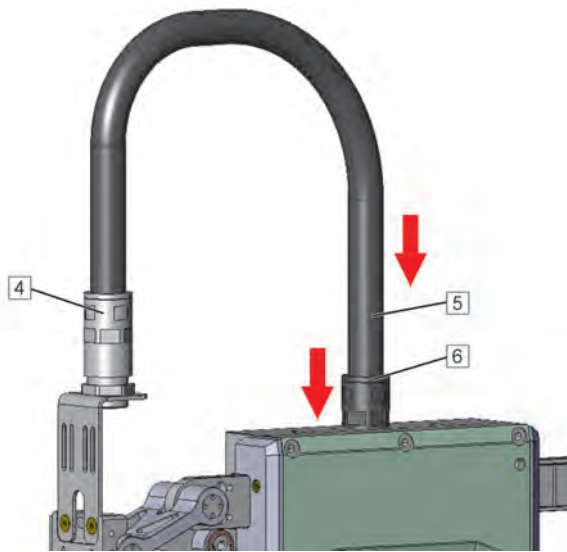
The automatic lubrication pump can be operated manually via a rotary switch [1] at the pneumatic valve. For this, compressed air must be supplied.

1. Turn the rotary switch [1] from position "0" to position "1" and back to position "0".
- ✓ A single pump stroke is performed.

## 15.6 Replacing the corrugated hose (tool connector)



1. Remove the connections (data cable, pneumatic hose) from the gripper.
2. Push the upper ring [1] of the connector down and pull out the corrugated hose [2] towards the top.
3. Perform the same step at the other quick-action connector [3].
4. Pull the corrugated hose over the disconnected gripper connections off of the data cable and the pneumatic hose.



5. Route the data cable and the pneumatic hose through the new corrugated hose.
6. Push the upper ring [6] of the quick-action connector down and push the corrugated hose [5] into the quick-action connector.
7. Perform the same step at the other connector [4].
8. Reconnect the data cable and the pneumatic hose to the gripper.
9. Perform a test run.

## 16 Decommissioning

### 16.1 Decommissioning the product

1. Switch off the product and secure it against unintended switching on.
2. Remove all workpieces and all other objects not belonging to the product from the product.
3. In the case of recommissioning, follow the instructions described, [see chapter 11](#).

## 17 Dismounting

### 17.1 Dismounting the product



#### ⚠ WARNING

#### ELECTROMAGNETIC FIELDS

**Failure to follow these instructions can result in death, serious injury, and equipment damage.**

- Verify compliance with all international, national, and local directives, standards, and safety regulations, including all regulations concerning workplace safety and prevention of accidents, with regard to strong magnetic fields.
- Take all necessary measures to ensure that persons with active medical implants (such as heart pacemakers or insulin pumps), metal implants, and magnetically or electrically conductive objects are not exposed to the magnetic fields generated by the product.
- Do not operate devices in the vicinity of the product which are sensitive to electromagnetic emission.
- Verify that a distance to the product of at least 15 cm is kept.

1. Switch off the supply voltage.
2. Dismount the product (reverse sequence of steps), [see chapter 8](#).

## 18 Disposal

### 18.1 Disposing of the product

Dispose of the product in compliance with all applicable directives, standards, and safety regulations.

#### **Environmental protection**

Dispose of lubricants, greases, residue of cleaning agents and other non-recyclable materials according to the applicable directives, standards, and safety regulations.

## 19 Service and spare parts

### 19.1 Worldwide service

If you need the assistance of our service departments, please provide the following information:

- Serial number of the product (see nameplate)
- Description of the problem
- Time of occurrence and circumstances of the problem
- Suspected cause

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## 19.2 Ordering spare parts



### ⚠ WARNING

#### UNSUITABLE SPARE PARTS AND ACCESSORIES

Failure to follow these instructions can result in death, serious injury, and equipment damage.

- Only use spare parts and accessories which are approved by the manufacturer.

Please provide the following information when ordering spare parts:

- Serial number of the product (see nameplate)
- Part number of the spare part according to spare parts list
- Quantity of spare parts required

## 19.3 Spare parts

| Part number (NAV18) | Part number (NAV13)  | Designation                    | Description            | Qty |
|---------------------|----------------------|--------------------------------|------------------------|-----|
| 1001062             | 711-250000014        | Corrugated hose Ø 20.7         | -                      | 1 m |
| 1001367             | 784-000000007        | Hose 6 x 1                     | -                      | 1 m |
| 1001387             | 790-000000046        | Hose 4 x 0.75 DUO              | -                      | 1 m |
| 1002671             | HP0070T-2330-0000-00 | Connector receptacle           | -                      | 1   |
| 1001060             | 711-250000004        | Counter nut                    | -                      | 1   |
| 1001058             | 711-250000002        | Hose connector                 | Without strain relief  | 1   |
| 1001059             | 711-250000003        | Hose connector                 | With strain relief     | 1   |
| 1001197             | 720-100000058        | Connector with cable           | M8, 3-pole, 1.5 m      | 1   |
| 1005106             | LUBEMAN-0800-0000-00 | Manual grease gun              | For manual lubrication | 1   |
| 1005114             | LUBEMAN-0810-0001-00 | Spare cartridge for grease gun | Lubricant Synth EP2    | 1   |
| 1004966             | LUBESYS-0800-0000-00 | Automatic lubrication pump     | Lubricant Synth EP2    | 1   |
| 1004957             | LUBESYS-0810-0000-00 | Spare cartridge                | Lubricant Synth EP2    | 1   |

## 20 Appendix

### 20.1 Versions

These mounting instructions are valid for the following versions/variants.

| Part number | Description             |  | Part number | Description             |
|-------------|-------------------------|--|-------------|-------------------------|
| 1003813     | HP70 125 SICO1 NCL NTC  |  | 1003814     | HP70 125 SICO1 WCL NTC  |
| 1003815     | HP70 125 SSI20B WCL PTC |  | 1003816     | HP70 125 BISS20 NCL NTC |
| 1003817     | HP70 125 BISS20 WCL NTC |  | 1003818     | HP70 225 SICO1 WCL PTC  |
| 1003819     | HP70 225 SSI20B WCL PTC |  | 1003820     | HP70 225 BISS20 WCL PTC |
| 1003821     | HP70 325 SICO1 WCL PTC  |  | 1003822     | HP70 325 SSI20B WCL PTC |
| 1003851     | HP70 125 SICO1 NCL ETC  |  | 1003852     | HP70 125 SICO1 WCL ETC  |
| 1003853     | HP70 125 SSI20B WCL CTC |  | 1003854     | HP70 125 BISS20 NCL ETC |
| 1003855     | HP70 125 BISS20 WCL ETC |  | 1003856     | HP70 225 SICO1 WCL CTC  |
| 1003857     | HP70 225 SSI20B WCL CTC |  | 1003858     | HP70 225 BISS20 WCL CTC |
| 1003859     | HP70 325 SICO1 WCL CTC  |  | 1003860     | HP70 325 SSI20B WCL CTC |
| 1003862     | HP70 325 BISS20 NCL NTC |  | 1003992     | HP70 125 SICO1 NCL CTC  |
| 1003993     | HP70 325 BISS20 WCL PTC |  | 1003994     | HP70 125 SICO1 NCL PTC  |
| 1003995     | HP70 325 BISS20 WCL CTC |  | 1003996     | HP70 325 BISS20 WCL ETC |
| 1003997     | HP70 325 BISS20 WCL NTC |  | 1003998     | HP70 325 BISS20 NCL PTC |
| 1003999     | HP70 325 BISS20 NCL CTC |  | 1004000     | HP70 325 BISS20 NCL ETC |
| 1004001     | HP70 125 SICO1 WCL CTC  |  | 1004003     | HP70 125 SICO1 WCL PTC  |
| 1004006     | HP70 125 SSI20B NCL NTC |  | 1004010     | HP70 125 SSI20B NCL ETC |
| 1004011     | HP70 325 SSI20B WCL ETC |  | 1004012     | HP70 325 SSI20B WCL NTC |
| 1004013     | HP70 125 SSI20B NCL CTC |  | 1004014     | HP70 325 SSI20B NCL PTC |
| 1004015     | HP70 125 SSI20B NCL PTC |  | 1004016     | HP70 325 SSI20B NCL CTC |
| 1004017     | HP70 325 SSI20B NCL ETC |  | 1004018     | HP70 125 SSI20B WCL NTC |
| 1004019     | HP70 125 SSI20B WCL ETC |  | 1004020     | HP70 325 SSI20B NCL NTC |
| 1004023     | HP70 325 SICO1 WCL ETC  |  | 1004025     | HP70 325 SICO1 WCL NTC  |
| 1004026     | HP70 325 SICO1 NCL PTC  |  | 1004028     | HP70 325 SICO1 NCL CTC  |
| 1004030     | HP70 325 SICO1 NCL ETC  |  | 1004032     | HP70 325 SICO1 NCL NTC  |
| 1004034     | HP70 225 BISS20 WCL ETC |  | 1004036     | HP70 225 BISS20 WCL NTC |
| 1004037     | HP70 125 BISS20 NCL CTC |  | 1004038     | HP70 225 BISS20 NCL PTC |
| 1004039     | HP70 125 BISS20 NCL PTC |  | 1004040     | HP70 225 BISS20 NCL CTC |
| 1004041     | HP70 125 BISS20 WCL CTC |  | 1004042     | HP70 225 BISS20 NCL ETC |
| 1004043     | HP70 125 BISS20 WCL PTC |  | 1004044     | HP70 225 BISS20 NCL NTC |

| Part number | Description             |  | Part number | Description             |
|-------------|-------------------------|--|-------------|-------------------------|
| 1004045     | HP70 225 SICO1 NCL NTC  |  | 1004054     | HP70 225 SICO1 NCL ETC  |
| 1004055     | HP70 225 SICO1 NCL CTC  |  | 1004056     | HP70 225 SICO1 NCL PTC  |
| 1004057     | HP70 225 SICO1 NCL PTC  |  | 1004058     | HP70 225 SICO1 WCL ETC  |
| 1004059     | HP70 225 SSI20B NCL NTC |  | 1004060     | HP70 225 SSI20B NCL ETC |
| 1004061     | HP70 225 SSI20B NCL CTC |  | 1004062     | HP70 225 SSI20B NCL PTC |
| 1004063     | HP70 225 SSI20B WCL NTC |  | 1004064     | HP70 225 SSI20B WCL ETC |



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