

# turbo 3-36

Operating instructions



Operating instructions

turbo 3-36, series 6

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**Operating instructions**

1, 3, en\_US

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# 1 General

## 1.1 Operating instructions

### Product versions and special equipment

The operating instructions cover several versions of the described product. The lengths and the number of supports may vary. The diagrams may vary from the actual product. The principle described does, however, apply to all versions. You can see which version of the product you have in the field "Type" on the name plate.  
 ↗ "Name plate" on page 7.

The operating instructions also describe special equipment, which may not be installed on your product. The descriptions of special equipment state that they are optionally installed.

### Other applicable documents

The operating instructions refer to the following documents at various points, which are also kept in the technical documentation folder:

- Circuit diagram
- Pneumatics plan
- Dimension sheet (specific to the product version)
- Adapter set diagram (optional)

### Explanation of symbols



#### Warning Hazard

Warns of a hazard with a high risk level which, if not avoided, will cause death or severe injury.

#### Type and source of hazard

Consequences if the note is disregarded.

- Actions necessary to avert the hazard.



#### Warning Hazard

Warns of a hazard with a medium risk level which, if not avoided, could cause death or severe injury.

#### Type and source of hazard

Consequences if the note is disregarded.

- Actions necessary to avert the hazard.



#### Warning Caution

Warns of a hazard with a low risk level which, if not avoided, could cause minor or moderate injury.

#### Type and source of hazard

Consequences if the note is disregarded.

- Actions necessary to avert the hazard.



#### Note (material damage)

A note that misuse could cause material damage.

#### Type and source of hazard

Consequences if the note is disregarded.

- Actions necessary to avert the hazard.

## Useful information

Notes or additional information.



*Useful information.*

## Instructions on use

—> Instructions require the user to take action.

## Display text

Display text comprises terms or text which appear on the control panel of the loading magazine.

Example: **Display text**.

## Menu pathway

The menu pathway shows the path for actions, where you have to navigate through more than one menu level.

Example: “**Start** → **Sub menu** → **Destination**”

## Cross-reference

Cross-references refer to further information about a topic.

Example: ➔ “*Explanation of symbols*” on page 5.

## Intended use

The loading magazine is intended for attachment to machine tools, and is only allowed to be operated if it has been installed on a machine tool in accordance with the specifications of these operating instructions. The loading magazine is exclusively intended for the supply of material bars to machine tools. These materials are round or have multiple edges. In individual cases, special profiles are allowed to be supplied, which have been agreed with FMB in advance.

Furthermore, the intended use of the loading magazine can be seen by observing the Technical Data chapter of these operating instructions ➔ *Chapter 1.3 “Technical data” on page 12.*

The applicable accident prevention guidelines and other generally-recognized technical safety regulations are to be observed.

## Reasonably foreseeable misuse

- Non-observance of the requirements on the material bars. ➔ “*Requirements on the material bars*” on page 60.
- Operation with asymmetric profile bars without consultation with FMB.
- Operation with special profiles without consultation with FMB.
- Operation with non-homogenous material bars (imbalance).
- Processing outside of the permitted area (diameter, length). ➔ “*Technical data of the loading magazine*” on page 12.
- Use of unintended fuel. ➔ “*Lubricant*” on page 13.
- Operation without lubrication.
- Operation without a capacity adjustment set or with the wrong set.  
Operation without a clamping device or with the wrong clamping device.
- Transportation not done in accordance with the operating instructions. ➔ *Chapter 3.2 “Transporting the product” on page 21.*
- Operation outdoors.

- Manipulation of safety equipment.
- Performance of work without sufficient qualifications. ➔ *“Qualifications of the personnel” on page 7.*

Unauthorized alterations to the product are not permitted and exclude the liability of the manufacturer for any damage incurred as a result.

**Qualifications of the personnel**

The work described in these operating instructions is only allowed to be performed by personnel who have been qualified according to the table specified below.

Area of responsibility	Training by the manufacturer concerning assembly and start-up*	Product training**	Specific technical training***
Transport			X
Assembly / Start-up	X		
Operation		X	
Maintenance		X	X
Disposal			X

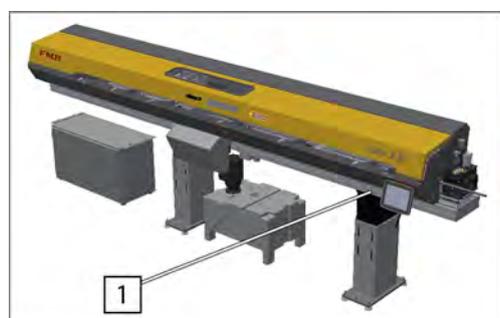
\*Extensive qualification in the assembly and start up of FMB loading magazines. Qualification is done by FMB.

\*\*Personnel who have received training for the loading magazine, are familiar with the functions and have been made aware of the risks. The training can be done by FMB or by a person who has already received training.

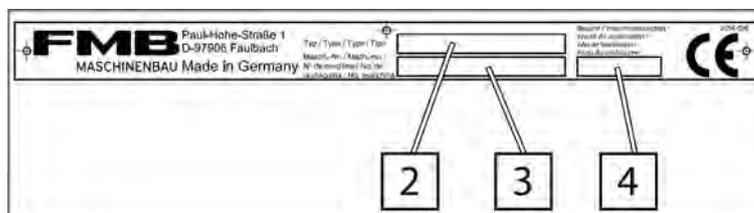
\*\*\*Personnel who have received training in the respective area of responsibility, and have qualifications allowing them to perform the work correctly, to properly estimate risks and avoid hazards.

**1.2 Information about the product**

**Name plate**

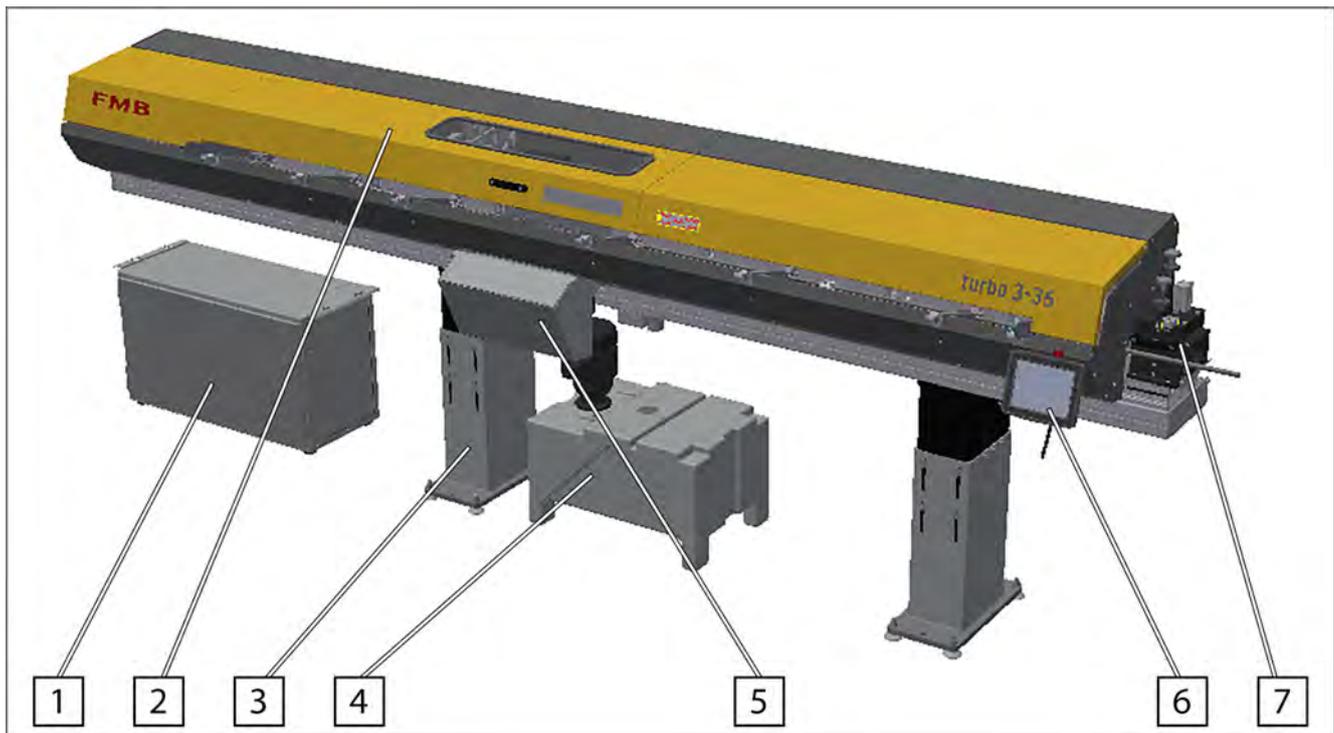


The name plate is attached to the loading magazine in the position 1.

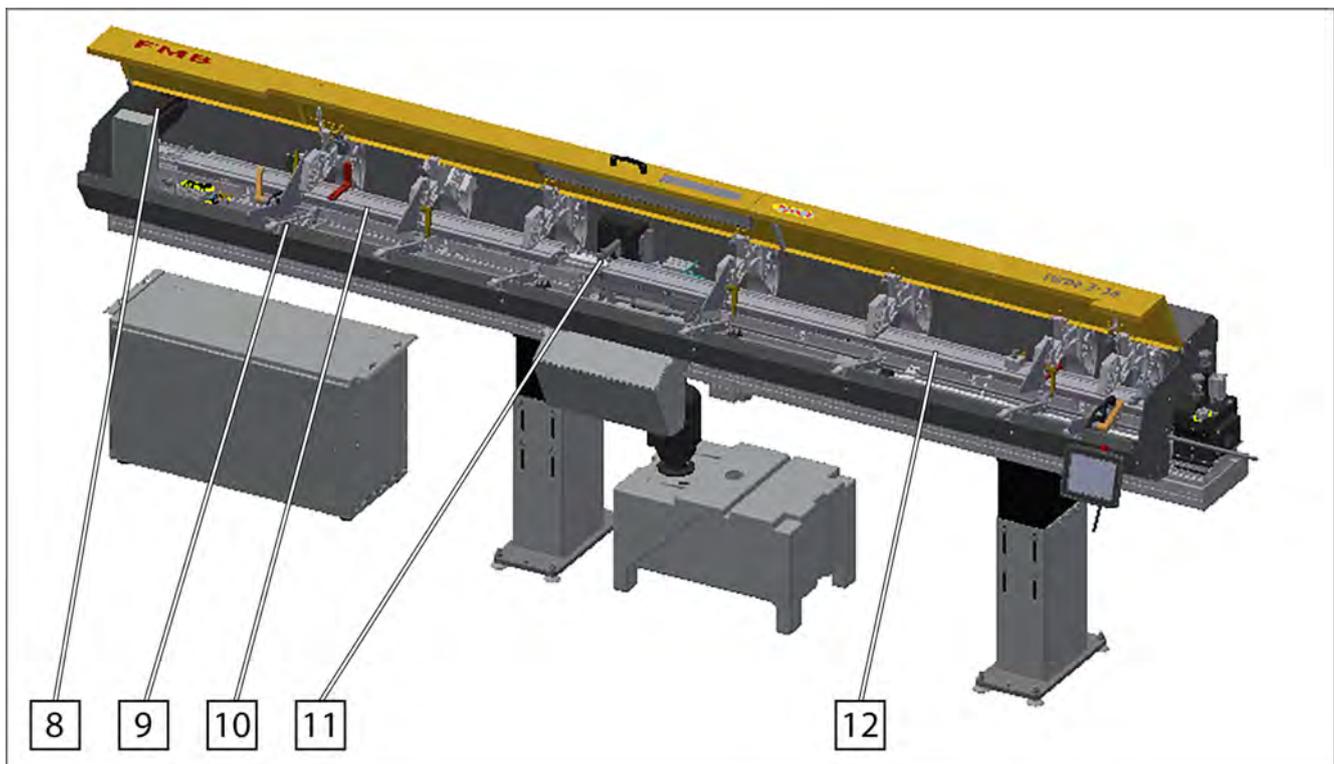


2	Types and lengths	3	Machine number
4	Year of construction		

## Overview



1	Control cabinet	2	Cover
3	Support	4	Oil tank
5	Remnant bin	6	Control panel
7	Steady		



8	Drive	9	Lateral material storage with separation device
10	Guide channel, rear	11	Material gripper
12	Guide channel, front		

### Functional description

The loading magazine supplies material bars and pushes them through the spindle into the processing area of the lathe. The loading magazine works at the speed of the lathe and thereby allows the automatic loading of the lathe.

The material bar slides from the lateral material storage into the guide channel and is moved by the short pusher into the area of the material gripper. The material gripper closes and holds the material bar in position, until the clamping sleeve at the end of the pusher has been pushed onto the material bar. The material gripper opens and the pusher moves the material bar.

The collet of the lathe closes and the processing begins. The guide channel filled with oil and the steady placed between the lathe and the guide channel ensure the exact bar guide required for the processing. After a turned part has been completed, the collet of the lathe opens. The pusher of the loading magazine moves the material bar into the cut-off position, the collet of the lathe closes and the next part is processed.

If the material bar has been used up and the last possible part has been made, the working process of the lathe is stopped. The collet of the lathe opens and the pusher is moved back. The material gripper closes and holds the remnant of the material bar in position. The remnant is taken out of the clamping sleeve and is ejected into the remnant bin. The working process begins again.

### Drive

The pusher is driven by a servomotor with a toothed belt. A sensor on the servomotor detects the exact position of the pusher.

### Servo drive

The servo drive is a unit consisting of a control unit and a power unit which holds the memory card with the logic unit for the PLC program and the parameters for the drive. The condition of the drive and error reports can be viewed on a control panel.

### Material gripper

The material gripper is equipped with blades, allowing it to grab the material bar. The newly-inserted material bars are held by the material gripper and pressed into the clamping device using the force of the pusher. Remnants of processed material bars are held by the material gripper and removed from the clamping device using the force of the pusher.

### Synchronizing unit

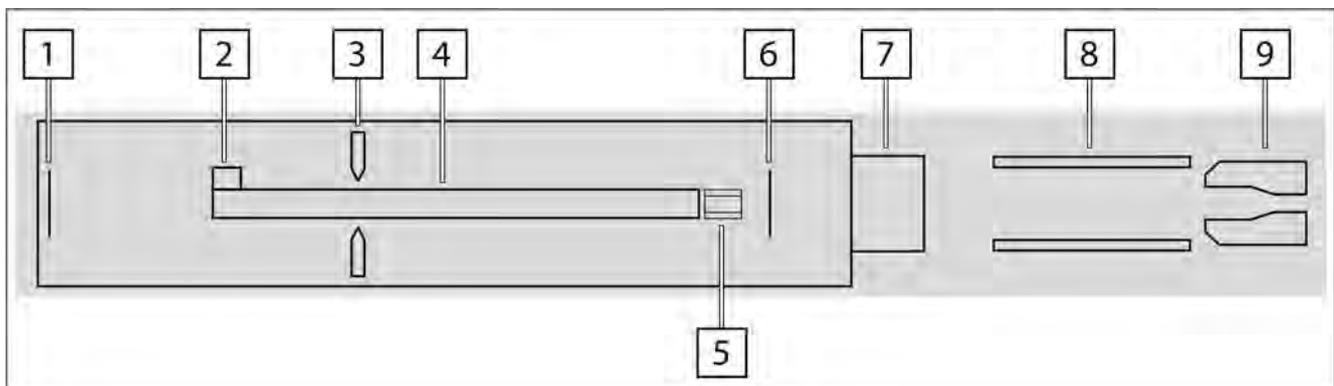
The synchronizing unit is only installed in loading magazines, which are intended for attaching to lathes with a moving headstock. The synchronizing unit ensures that the pusher of the loading magazine and the material bar also complete the traverse paths of the lathe headstock.

This is made possible by the synchronization bar, which is connected to the lathe headstock and transfers any movement of the lathe headstock to the pusher via the synchronization clutch.

During the processing by the lathe, the drive of the loading magazine is switched off and the synchronization clutch is closed. The movements of the lathe spindle are transferred to the pusher. The pusher and the material bar move at the speed of the lathe headstock.

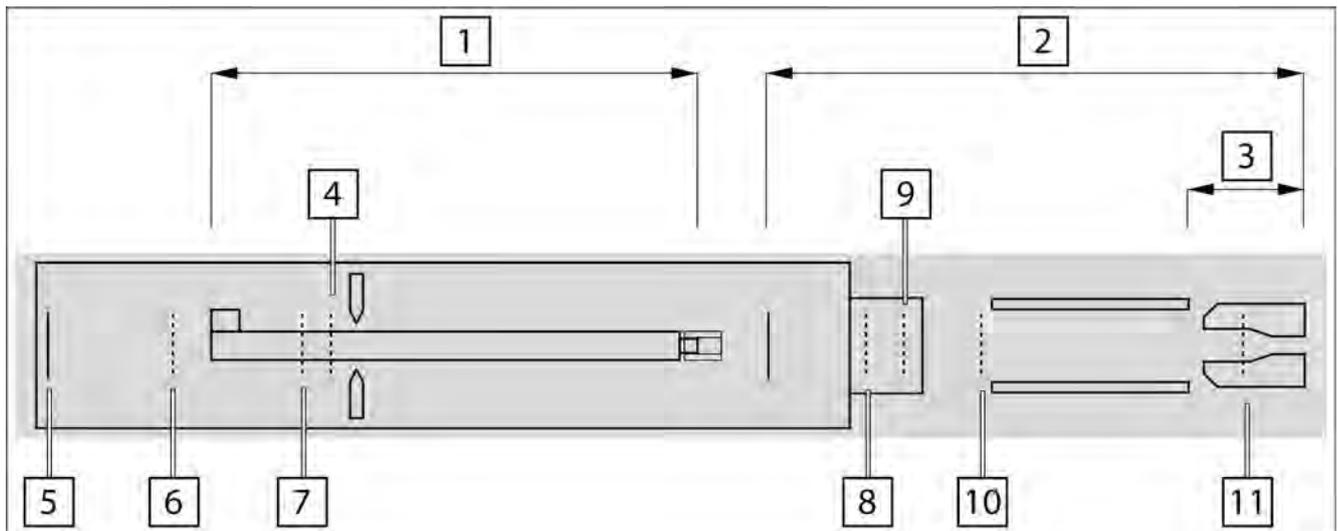
During the bar feed the drive of the loading magazine is switched on and the synchronization clutch is opened. The pusher is moved by the drive of the loading magazine. The material bar is pushed on.

## Layout of the components



1	End stop	2	Short pusher with flag
3	Material gripper	4	Pusher
5	Clamping sleeve	6	Starting switch
7	Steady	8	Lathe spindle
9	Lathe collet		

Positions and traverse paths



1	Pusher length	The parameter Pusher length is measured from the back edge of the pusher to the front edge of the bearing insert.
2	Traverse path First insert travel	The first insertion is performed after changing the material bar. The traverse path of the First insert travel is the path from the starting switch in the loading magazine to the cut-off position in the working area of the lathe.
3	Traverse path Travel interval on	If the interval insert is active, an intermittent feed occurs in the area of Travel interval on.
4	Position draw off	In the position Position draw off the material gripper grabs the material bar.
5	Position rear limit	The maximum rear position, which the pusher can reach. The position Position rear limit is reached, when the remnant is removed or the pusher swings out.
6	Position storage	The position at which the short pusher takes on a new material bar. The pusher moves at high speed, and just before the position Position storage it brakes, takes the material bar with it and then accelerates again.
7	Limit pos. short pusher front position	The position at which the short pusher moves the material bar, so that the material gripper can grab the material bar.
8	Position open steady	During operation, the clamping sleeve must pass the steady. If the clamping device is in the Position open steady, the steady is opened to prevent damage.

9	Position close steady	During operation, the clamping sleeve must pass the steady. When the pusher passes the open steady and has reached the Position close steady, the steady closes.
10	Pos. reverse rotation return	When returning from the lathe's spindle, the pusher moves from the position Pos. reverse rotation return at high speed.
11	Position front limit	The maximum front position, which the pusher can reach. The clamping sleeve is just in front of the collet of the lathe. Using the value Position front limit and the value Part length 1 it is calculated when the last part is pushed.

## 1.3 Technical data

### Technical data of the loading magazine

Characteristic	Unit	Value
Material flow in the guide channel	mm	3 - 38
Bar length	mm	2200 / 3200 / 3800 / 4200 / 4775 / 5300 / 6200
Maximum feed force	N	550
Feed speed	mm/s	520
Feed speed	mm/s	1000
Return speed	mm/s	2000
Maximum remnant length	mm	450
Weight <sup>3</sup> Length version 2200	kg	550
Weight <sup>3</sup> Length version 3200	kg	750
Weight <sup>3</sup> Length version 3800	kg	900
Weight <sup>3</sup> Length version 4200	kg	1000
Weight <sup>3</sup> Length version 4775	kg	1100
Weight <sup>3</sup> Length version 5300	kg	1250
Weight <sup>3</sup> Length version 6200	kg	1500

Characteristic	Unit	Value
Oil tank level	l	80
Supply of compressed air	bar	6 - 10
Compressed air consumed per loading process	l	approx. 10
Compressed air consumed per double stroke of the steady	l	approx. 0.5
Noise emission during the bar change	dB(A)	48 + / - 5
Operating voltage <sup>1, 4</sup>	V	200 / 400 / other types
Power requirement	KW	2
Nominal frequency <sup>2, 5</sup>	Hz	50 / 60
Control voltage	V	24

1) According to DIN EN 60204 (VDE 0113) the continuous operating voltage must lie within 100 % ± 10% of the mains voltage.

2) According to DIN EN 60204 (VDE 0113) the frequency must be between 0.99 and 1.01 of the nominal frequency.

3) Empty, without equipment and without transport pallets.

4) The operating voltage applicable for your product can be seen on the circuit diagram. ➔ *“Other applicable documents” on page 5.*

5) The product is designed for a nominal frequency of 50 Hz and 60 Hz.

### Operating conditions

Characteristic	Unit	Value
Surrounding temperature	°C	+ 15 - + 40
Air humidity, non-condensing	%	30 - 75
Altitude about sea level	m	up to 1000

### Storage conditions

Characteristic	Unit	Value
Surrounding temperature	°C	- 20 - + 65

The loading magazine is only allowed to be stored in dry rooms.

### Lubricant

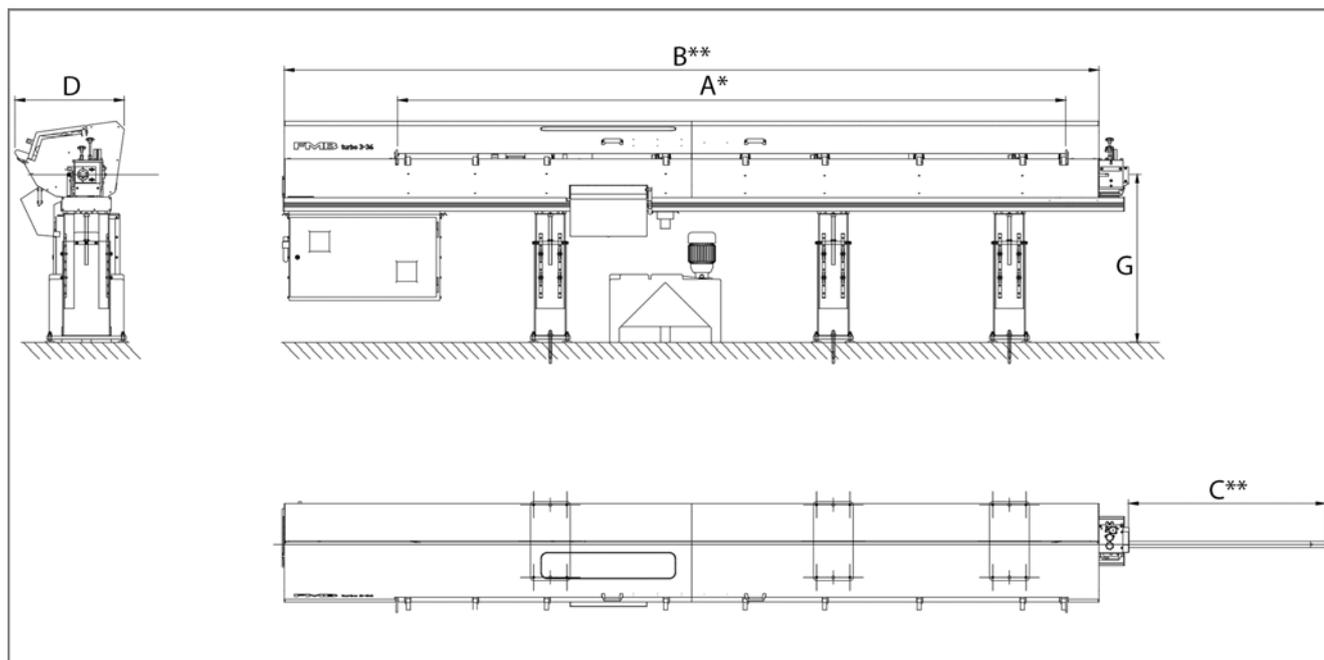
The lubricant used must comply with one of the following standards.

- DIN 51 517-2 CL 150,
- DIN 51 506 VBL 150,
- DIN ISO 3448 ISO VG 150.

The following lubricants are recommended for use in the loading magazine:

Manufacturer	Type
Aral	Motanol HE 150
Mobil / Esso	Vacuoline 128
Shell	Morlina 150

## Dimensions of the loading magazine



\*Dimension A: Material bar length; \*\*Dimensions B and C: Depending on the pusher

Pusher length	1466	1666	1866
	B1	B2	B3
	C1	C2	C3

Loading magazine length	Dimensions in mm								
	A	B1	B2	B3	D	C1	C2	C3	G***
2200	2200	3285	3485	3685	690	1278	1478	1678	760 - 1440 set to the spindle height
3200	3200	4285	4485	4685					
3800	3800	4885	5085	5285					

Loading magazine length	Dimensions in mm									
4200	4200	5285	5485	5685						
4775	4775	5860	6060	6260						
5300	5300	6385	6585	6785						
6200	6200	7285	7485	7685						

\*\*\*On loading magazines with a shifting device this value increases by 30 mm (790 mm - 1470 mm).

## 2 Safety

### 2.1 Safety measures

#### Personal safety equipment

The operator of the loading magazine must provide the following safety equipment and ensure they are used.

- Safety shoes
- Ear protection
- Safety gloves
- Eye protection
- Skin protection

### 2.2 Safety equipment

#### Emergency stop device

There is an emergency stop device on the loading magazine which complies with DIN EN 60204 (VDE 0113). The emergency stop button is attached to the control panel → *“Press the emergency stop button” on page 47.*

When the emergency stop button is pressed, the power is shut off for the safety-relevant PLC outputs. In addition, the power supply for the drive motor is shut off. The drive motor and thereby the pusher cannot perform any more movements. The pressurization of all pneumatic valves is interrupted. The pneumatic valves go to their original position. An error message appears on the control panel of the loading magazine.

The emergency stop signal is transmitted to the lathe and has to be processed there in accordance with the regulations.

If the emergency stop button of the lathe is pressed, the emergency stop signal is forwarded to the loading magazine and also triggers an emergency stop there.

#### Lock

The cover of the loading magazine and the lid of the steady are monitored by the lock. In open position, the lock prevents the loading magazine operating. If the lock reports an "open" position, there is no power at certain PLC outputs and the drive has been securely stopped. The lock helps ensure the loading magazine operates safely.

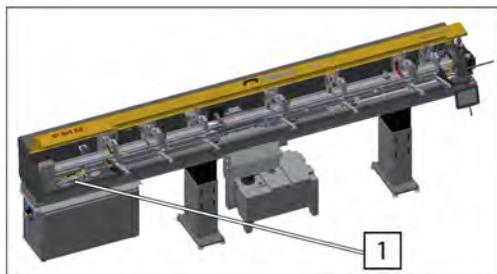
#### Safety door of the lathe

If the safety door of the lathe is opened during operation, the loading magazines switches to a secure standstill. It is not possible to move the pusher of the loading magazine if the safety door of the lathe is open. A risk to people due to the pusher of the loading magazine being in the working area of the lathe is therefore excluded.

#### Working on the guide channel

The guide channel is divided into the front guide channel and the rear guide channel. Both parts can be opened either separately or together. Safety bolts are attached to the bearing brackets. They must be used when working on an open guide channel to secure the guide channel. → *“Secure the guide channel with safety bolts” on page 76.*

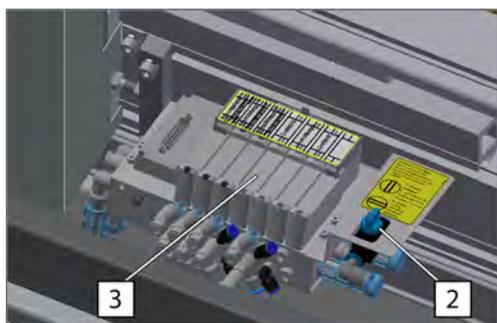
**Valve block**



The valve block is in position **1** on the loading magazine.

On the valve block, all valves are centrally supplied with compressed air. The compressed air for all valves can be shut off centrally at the stop valve **2**.

After shutting off the compressed air, it is possible to store compressed air in the individual pneumatic cylinders. This can cause unforeseen movements of individual components of the loading magazine. The pneumatic cylinders can be vented separately via the valve **3** after shutting off the supply of compressed air.



This is the case in the event of certain repair work and with troubleshooting. The valve block is only allowed to be operated by personnel qualified to use it. In the event of questions please contact FMB. → "Service contact details" on page 111.

## 3 Transport

### 3.1 Prepare for transportation

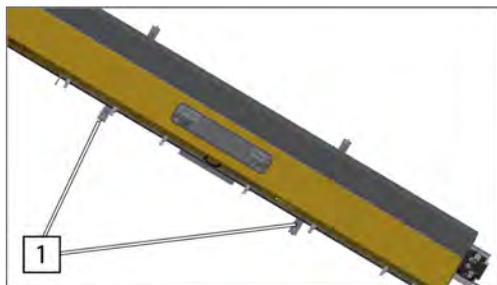
Prepare the loading magazine for transportation

**i** After raising the loading magazine, the pins extending out of the floor must be detached at ground level using suitable means, or removed from the floor.

**i** The loading magazine must be empty.

1. ➤ Completely remove any material bars. ➔ "Remove the material bar from the loading magazine" on page 69 or ➔ "Draw off and eject the remnant" on page 69.
2. ➤ Press the  button.
3. ➤ Access **SETUP**.
4. ➤ Move the pusher right to the back using the  button.
5. ➤ Leave the loading magazine at a standstill for at least 8 hours, to let the oil out.
6. ➤ Empty the oil tank of the loading magazine. ➔ "Empty the oil tank of the loading magazine" on page 105.
7. ➤ Turn off the main switch of the lathe.
8. ➤ Interrupt the electrical connection to the lathe (detach the plug-in connection).
9. ➤ Disconnect all the electrical connections from the loading magazine to the control cabinet.
10. ➤ Remove the plug for the oil pump on the control cabinet.
11. ➤ Dispose of the oil in accordance with the legal provisions.
12. ➤ Disconnect the connecting hoses for the oil feed and oil outlet.
13. ➤ Secure separate oil hose connections from losing residual oil.  
**i** The oil tank must be transported separately.
14. ➤ Depressurise the compressed air line to the loading magazine.
15. ➤ Switch off the supply of compressed air. ➔ "Switch the supply of compressed air on/off" on page 105.  
➔ The loading magazine is vented.
16. ➤ Secure the control cabinet to the beam ➔ "Remove the control cabinet from / attach the control cabinet to the loading magazine" on page 34.
17. ➤ Loosen the anchors on the floor.  
➔ The loading magazine is ready for transportation.

**Transport beam**



Two transport beams **1** have to be attached to the loading magazine. The attachment point for the transport beams **1** is between the outer supports on the underside of the loading magazine.

**Assembling the transport beams**



**Falling transport beams**

Personal injury due to squashing and impact by the falling transport beams.

If the raising of the loading magazine is not done by the transport beam, there is a risk that it might fall down if mounted improperly and hit people.

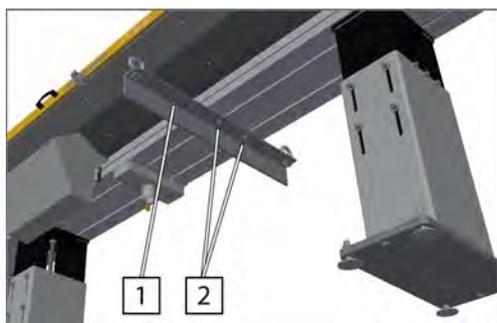
- Do not stay in the danger area.
- Only install transport beams for the purpose of crane transportation and then remove them directly.
- Observe the description about the assembly of transport beams in the operating instructions.



**Protruding transport beams**

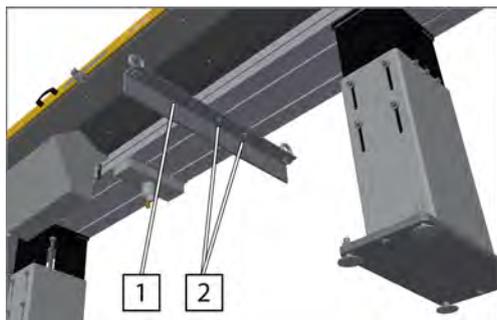
Personal injury because of impact due to protruding transport beams.

- Remove the transport beams after the loading magazine has been transported.



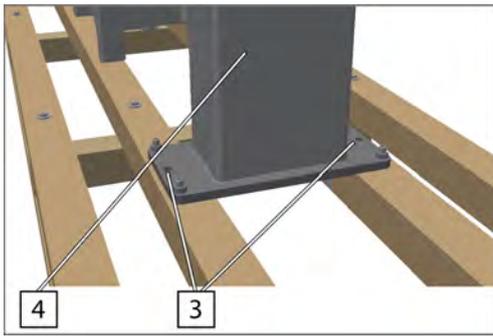
1. ➤ Position the **1** transport beam.
2. ➤ Insert and tighten **2** the screws.
3. ➤ Assemble the second transport beam in the same way.

**Remove the transport beam**

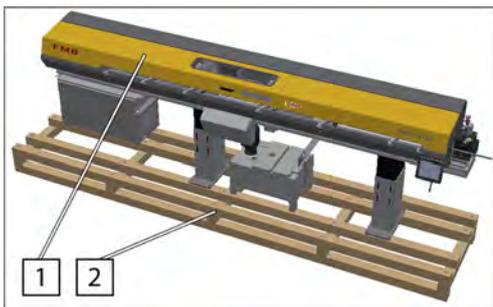


1. ➤ Loosen and remove the screws **2**.
2. ➤ Remove the transport beam **1**.
3. ➤ Remove the second transport beam in the same way.

## Detach the loading magazine from the transport pallet



1. Loosen and remove the screws in the attachment holes **3** of the support **4**.
2. Loosen the rest of the supports in the same way from the transport pallet.



3. Raise the loading magazine **1** from the transport pallet using a crane **2** and place it down safely → "Transport the loading magazine with a crane" on page 21.
4. Detach the oil tank from the transport pallet.
5. Lift the oil tank off the transport pallet using suitable hoisting gear.

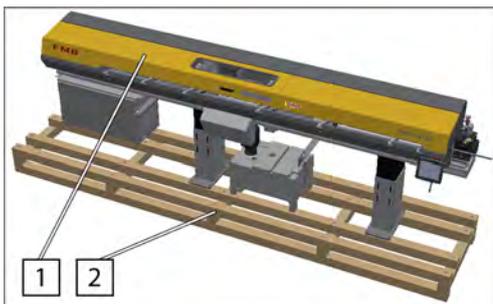
## Attach the loading magazine to the transport pallet

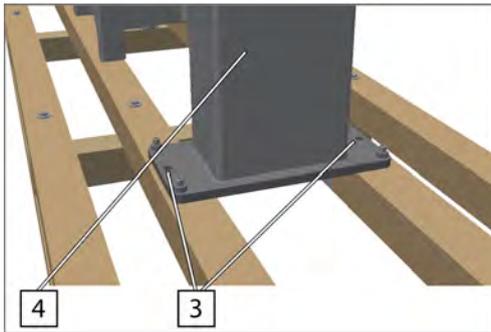
**i** Attaching the loading magazine to the transport pallet is only intended to secure it from slipping or to raise the loading magazine and transport pallet over the transport beams of the loading magazine. For transportation, the loading magazine has to be additionally secured. The attachment to the transport pallet is not sufficient.

**i** To attach the loading magazine to the transport pallet, the transport pallet is drilled at the attachment point. The loading magazine is screwed to the transport pallet using M 16 x 150 hexagonal screw and M 16 self-locking nuts through the drilled holes. To increase the contact surface, all screws and all nuts have 17 diameter washers underneath them.

**i** The oil tank is also placed on the transport pallets for transportation and has to be secured against slipping.

1. Place the oil tank on the transport pallet using suitable hoisting gear.
2. Secure the oil tank against slipping.
3. Raise the loading magazine **1** onto the transport pallet with a crane **2**. → "Transport the loading magazine with a crane" on page 21.





4. → Drill through the attachment holes in the transport pallet [3].
5. → Insert the screws and washers through the attachment holes [3] of the support [4].
6. → Attach and tighten the washers and nuts from the other side.
7. → Attach the rest of the supports in the same way to the transport pallet.

## 3.2 Transporting the product

Transport the loading magazine with a crane

If the loading magazine is hoisted with the transport pallet, it has to be ensured that the attachment screws of the pallet are designed in such a way to prevent the pallet coming loose from the loading magazine.

**⚠ DANGER**

### Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

- Do not stay in the danger area.
- Use hoisting equipment suitable for the weight of the loading magazine.
- Observe the weight of the loading magazine and, where applicable, the transport pallet in the technical data.
- Only hoist the loading magazine using a crane via the transport beams.
- Observe the description on hoisting the loading magazine in the operating instructions.

**⚠ DANGER**

### Falling transport pallets / Loose loading magazine

Personal injury due to squashing and impact as a result of a falling transport pallet.

If the loading magazine is secured insufficiently or incorrectly to the transport pallet, this may come loose. The transport pallet may fall down. The loading magazine may be knocked over and fall down.

- Do not stay in the danger area.
- Observe the description about the correct attachment of the loading magazine to the transport pallet in the operating instructions.

**⚠ DANGER**

### Falling control cabinet

Personal injury due to squashing and impact by the falling control cabinet.

- Do not stay in the danger area.
- Observe the description on securing the control cabinet in the operating instructions.

**⚠ DANGER**



### Falling oil tank

Personal injury due to squashing and impact by the falling oil tank.

- Do not stay in the danger area.
- Secure the oil tank on the transport pallet against slipping.

1. ➤ Assembling the transport beams ➔ *“Assembling the transport beams” on page 19.*
2. ➤ Attach suitable hoisting equipment to all four eyebolts 1 of the transport beams.
3. ➤ Hoist the loading magazine and set it down securely.
4. ➤ Remove the hoisting equipment on the four eyebolts 1 of the transport beams.
5. ➤ Remove the transport beams again after the loading magazine has been set down ➔ *“Remove the transport beam” on page 19.*

Transport the loading magazine with a fork-lift truck

**⚠ DANGER**

### Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

- Do not stay in the danger area.
- Only hoist the loading magazine on a transport pallet using a fork-lift truck.
- Observe the description on the correct attachment of the loading magazine to the transport pallet in the operating instructions.
- Pay attention to the centre of gravity when hoisting with the fork-lift truck.
- Observe the weight of the loading magazine and, where applicable, the transport pallet in the technical data.

**⚠ DANGER**

### Falling transport pallets / Loose loading magazine

Personal injury due to squashing and impact as a result of a falling transport pallet.

If the loading magazine is secured insufficiently or incorrectly to the transport palette, this may come loose. The transport pallet may fall down. The loading magazine may be knocked over and fall down.

- Do not stay in the danger area.
- Observe the description about the correct attachment of the loading magazine to the transport pallet in the operating instructions.

**⚠ DANGER**
**Falling control cabinet**

Personal injury due to squashing and impact by the falling control cabinet.

- Do not stay in the danger area.
- Observe the description on securing the control cabinet in the operating instructions.

**⚠ DANGER**
**Falling oil tank**

Personal injury due to squashing and impact by the falling oil tank.

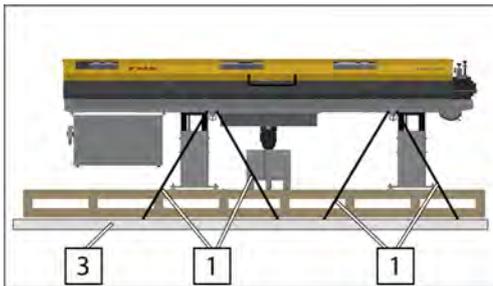
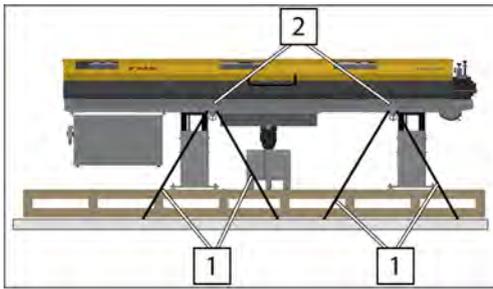
- Do not stay in the danger area.
  - Secure the oil tank on the transport pallet against slipping.
1. **▶** Attach the loading magazine to a transport pallet *▶ "Attach the loading magazine to the transport pallet" on page 20.*
  2. **▶** Calculate the centre of gravity of the load.
  3. **▶** Place the forks of the fork-lift truck under the centre of gravity of the load.
  4. **▶** Hoist the transport pallet with the loading magazine and set it down securely.
  5. **▶** Detach the loading magazine from the transport pallet *▶ "Detach the loading magazine from the transport pallet" on page 20.*

Transport the loading magazine with means of transportation



When transporting the loading magazine with means of transportation such as a truck, it is necessary to attach the loading magazine to a transport pallet *▶ "Attach the loading magazine to the transport pallet" on page 20.* The unit consisting of the transport pallet and the loading magazine must also be secured via the transport beams of the loading magazine to the floor of the means of transport, strapped diagonally. *▶ "Attach the loading magazine to the means of transport" on page 24.*

## Attach the loading magazine to the means of transport



1. Attach the loading magazine to a transport pallet → *“Attach the loading magazine to the transport pallet” on page 20.*
2. Attach suitable fasteners 1 to the end stop of the transport beams 2.
3. Raise the loading magazine and the transport pallet with a crane or fork-lift truck onto the means of transport → *“Transport the loading magazine with a crane” on page 21 or “Transport the loading magazine with a fork-lift truck” on page 22.*
4. Strap the loading magazine diagonally using suitable fasteners 1 to the floor of the means of transport 3.
5. Attach the opposite side of the loading magazine in the same way.

## 4 Assembly and start-up

### 4.1 Prepare for assembly

#### Assembly requirements

**NOTICE**

#### Damage to the floor

The floor on which the loading magazine is placed, must be designed to bear the loads. Non observance can lead to material damage.

- Have the suitability of the floor checked by an expert.

**NOTICE**

#### Damage to wires in the floor

When selecting the place to set the loading magazine down, you must make sure that there are no wires in the floor in the area under the loading magazine. They could be damaged when securing the loading magazine.

- Have the suitability of the installation location checked by an expert.

#### Delivery state

The loading magazine and all add-on parts and equipment are delivered together on a transport pallet. The whole delivery is secured by a protective film against severe contamination.

- The loading magazine is screwed to the transport pallet.
- The oil tank is located on the transport pallet and is secured against slipping.
- The add-on set for attaching the loading magazine to the floor is packed and stored in the remnant bin.
- The adapter set is packed and stored in the remnant bin.
- Depending on the equipment, further equipment parts such as the telescopic tube set, steady, lathe, capacity adjustment set or lacquered parts are also supplied. They are all packed on the carton and secured against slipping on the transport pallet.

#### Unpacking the product

#### Check the delivery:

1. ➤ Remove the protective film.
2. ➤ Remove the add-on parts and equipment from the transport pallet.
3. ➤ Take the add-on parts and equipment out of the remnant bin.
4. ➤ Unpack the add-on parts and equipment.
5. ➤ Check the delivery to make sure it is complete.

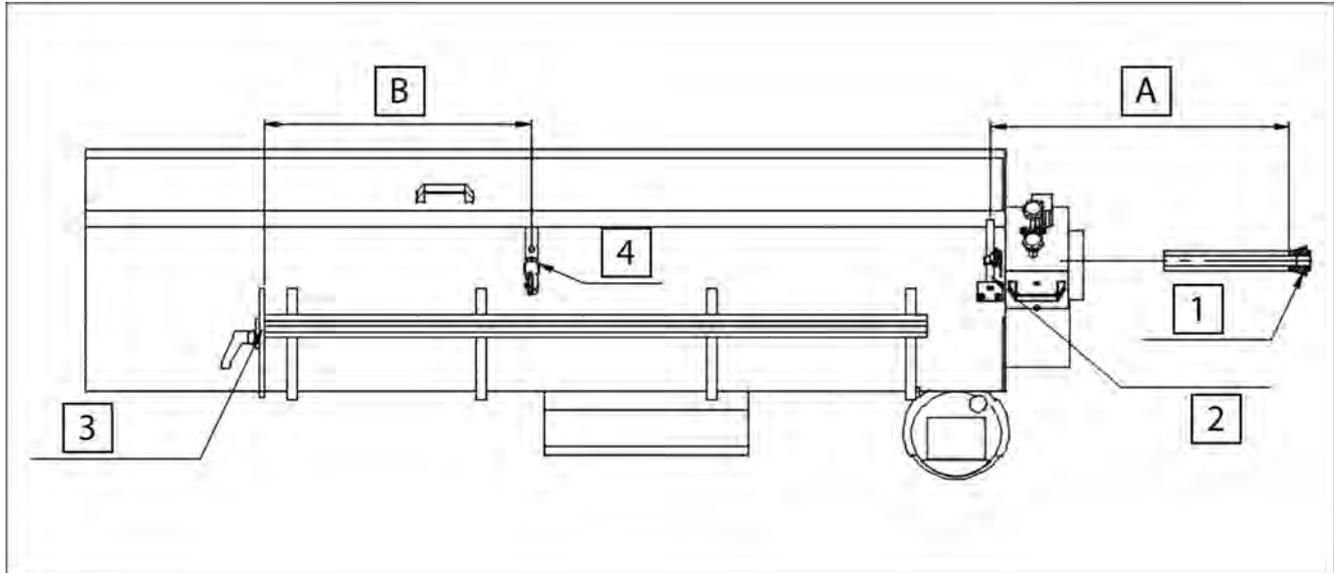
#### Detach the delivery from the transport pallet:

1. ➤ Detach the oil tank from the transport pallet.
2. ➤ Lift the oil tank off the transport pallet using suitable hoisting gear.

3. → Detach the loading magazine from the transport pallet.  
 ↗ "Detach the loading magazine from the transport pallet" on page 20.

## 4.2 Aligning

Calculate the distance of the loading magazine from the lathe



Dimension **A**: Lathe collet **1** to the starting switch of the loading magazine **2**.

Dimension **B**: Position of the loading magazine support **3** up to the material gripper of the loading magazine **4**.

The minimum distance of the loading magazine to the lathe is calculated by dimension **A**. The dimension **A** must be greater than dimension **B**. Depending on that, the loading magazine must be as close as possible to the lathe.

### Attachment to lathes with fixed headstock:

1. → Set up the loading magazine on the lathe. ↗ "Setting up the loading magazine" on page 27.
2. → Calculate dimension **A** with a tape measure.
3. → Calculate dimension **B** with a tape measure.

### Attachment to lathes with moving headstock:

- Calculate the distance from the loading magazine to the lathe using the order-specific adapter diagram.

## Setting up the loading magazine

**⚠ DANGER**

### Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

The loading magazine has a high centre of gravity. When aligning the loading magazine there is a danger of it tipping over.

- Do not stay in the danger area.
- Observe the description on aligning and setting up the loading magazine in the operating instructions.

**⚠ DANGER**

### Moving the whole loading magazine during set-up

Personal injury due to squashing or impact due to moving the whole loading magazine.

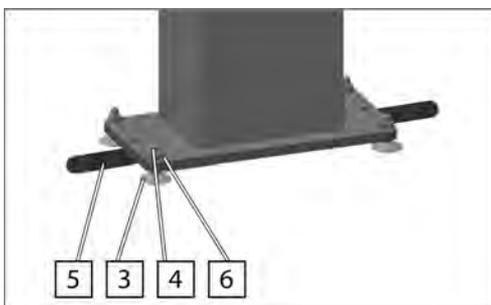
When setting up and aligning the loading magazine, the whole loading magazine has to be moved. People may be struck by the loading magazine or become stuck between the loading magazine and the lathe.

- Do not stay in the danger area.

For alignment, the loading magazine with supports is placed on round material bars (diameter 18 mm - 22 mm).



1. Position the round material bars **1** so that the loading magazine is as close as possible to the lathe.
2. Hoist the loading magazine using suitable equipment and together with the supports **2** place it on the round material bars **1**.
3. Align the middle of the loading magazine roughly so that the side faces the lathe spindle.
4. Calculate the distance between the loading magazine and the lathe. ➔ *“Calculate the distance of the loading magazine from the lathe” on page 26.*
5. Move the loading magazine along the round material bar and calculate the distance to the lathe.
6. Position the foot plates **3** under the set screws **4**.
7. Turn the set screws **4** to the right, until the round material bars **5** are free.
8. Tighten the **6** nuts.
9. Remove the **5** round material bars.



## 4.3 Electrical connection

### Electrical connection of the loading magazine and lathe

The electrical connection between the loading magazine and the lathe is shown in the order-specific electrical documents. The order-specific electrical documents are contained in the technical documentation of the product. The configuration of the plug and the operating voltage of the loading magazine are determined by the lathe. The configuration of the plug is done by FMB at the fac-

tory and is completed upon delivery. The contacts are configured according to the table below and have to be checked when starting up the loading magazine. If the contacts are not configured as described in the tables, please contact FMB.

- Contacts from the loading magazine to the lathe: ➔ *“Contacts from the loading magazine to the lathe” on page 28*
- Contacts from the lathe to the loading magazine: ➔ *“Contacts from the lathe to the loading magazine” on page 28*

## Contacts from the loading magazine to the lathe

Name	Explanation
-K30	Contact closed >> No fault reported by the loading magazine Contact open >> The loading magazine reports a fault In the event of a fault, the spindle of the lathe can no longer turn
-K1	The material bar is pushed into the lathe or Input release, Program - Start This signal is emitted, depending on the lathe control system, as an impulse or permanent contact.
-K9	This signal indicates to the lathe that the material bar has been processed. This signal is emitted, depending on the lathe control system, as an opening or closing contact.
-K91 (optional)	When working with two different part lengths, this signal is emitted when the end of the longer part <b>Part length 1</b> is reached.
-K90	Contact closed >> The loading magazine is in automatic mode
-K44	This signal is emitted after the execution of the part length feed and continues until the moving signal (collet open) is removed. The signal is emitted in the following cases: Operating mode <b>Part length internal</b> , <b>Part length external</b> and <b>Collet open</b> , fixed speed.
Loading magazine emergency stop	Potential-free contact of the loading magazine. This contact is to be included in the emergency-stop circuit of the lathe.

## Contacts from the lathe to the loading magazine

Lathe signal	Lathe action
Collet open	The feed equipment of the loading magazine has been switched on.
End of cycle, start bar change	On lathes with a program skip in the bar starting program, the contact must be queued in front of "collet open". Contact triggers a bar change on the loading magazine.
The lathe is ready for operation, automatic mode approved	The loading magazine can be switched to automatic mode (for this to happen, this contact must be active).
Loading magazine on (option)	Contact starts the automatic mode of the loading magazine.

Lathe signal	Lathe action
Safety door closed	The feed movement through the loading magazine is only executed if this contact is active.
Follow-up with sub-spindle (optional)	M command from the lathe. If this signal is emitted before the collet is opened (a push command), the next push is converted from Part length internal, and Part length external, to Part follow-up with sub-spindle.
Lathe emergency stop	Potential-free contact of the lathe. This contact is included in the emergency-stop circuit of the loading magazine.

## 4.4 Assembly

Establish the power supply to the loading magazine

**⚠ DANGER**

**Live components of the control cabinet**

**Personal injury by electrical shock due to contact with live components of the control cabinet.**

This work is only allowed to be performed by a qualified electrician.

- Turn off the machine tool before starting work on the main switch.

**⚠ DANGER**

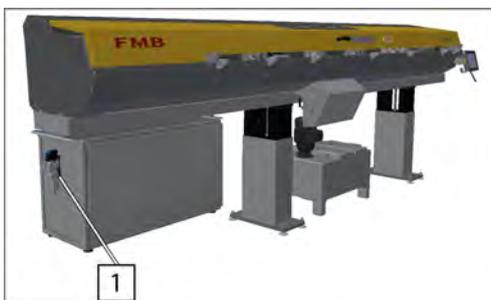
**Damaged wires or plugs**

**Personal injury by electric shock due to damaged wires or plug-in connections.**

- Perform a visual check of wires and plug-in connections for damage before inserting them into the control cabinet.

The main power supply of the loading magazine is connected to the loading magazine and attached to the front of the loading magazine.

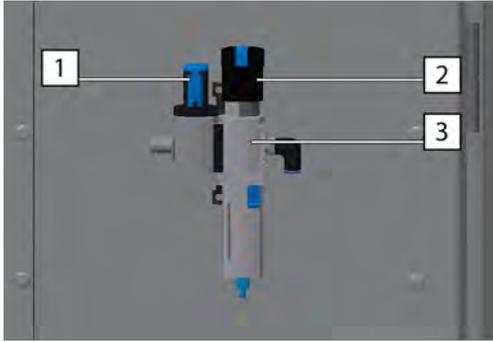
1. Turn off the machine tool before starting work on the main switch.
2. Check the electrical connection of the loading magazine and lathe. → "Electrical connection of the loading magazine and lathe" on page 27
3. Insert the main power supply cable of the loading magazine into the control cabinet of the lathe.
4. Check the input voltage of the loading magazine.
5. Insert the connecting pipe for the supply of compressed air of the loading magazine into the maintenance unit 1.



Set the supply of compressed air



Values for the supply of compressed air: → "Technical data of the loading magazine" on page 12.



1. ➔ Switch off the supply of compressed air on/off at the knob [1].
2. ➔ Set the supply of compressed air at the control unit [2].
3. ➔ Check the compressed air supply on the display [3].

## Aligning the loading magazine

**⚠ DANGER**

### Falling loading magazine

Personal injury due to squashing and impact by the falling loading magazine.

The loading magazine has a high centre of gravity. When aligning the loading magazine there is a danger of it tipping over.

- Do not stay in the danger area.
- Observe the description on aligning and setting up the loading magazine in the operating instructions.

**⚠ DANGER**

### Moving pusher without protective equipment

Personal injury due to squashing and impact because of work on an unsecured pusher.

When aligning the loading magazine, it is necessary for technical reasons to move the pusher without the intended protective equipment. The danger area is not covered during this process. The moving pusher may catch extremities or people.

- Do not stay in the danger area.

**⚠ CAUTION**

### Sharp knives of the material gripper

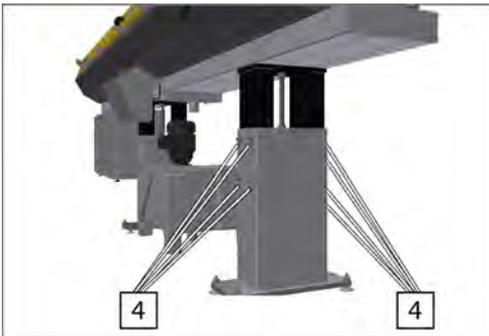
Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

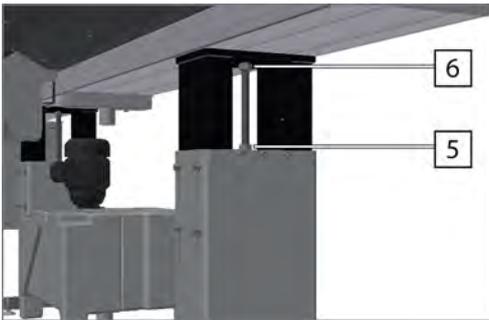
- Wear safety gloves.

➔ The centering hole on the pusher of the loading magazine must align with the lathe spindle. Set and verify the alignment with an optical alignment aid. In the event of questions about this please contact FMB. ➔ *“Service contact details” on page 111.*

Correcting the height (in general):



1. ➤ Loosen the clamping screws [4].

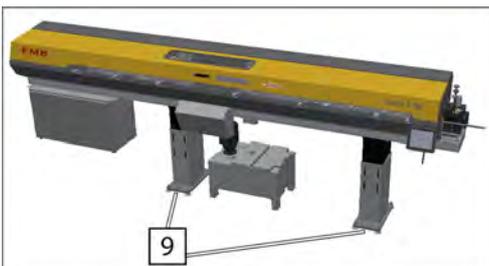


2. ➤ Loosen the lock nuts [5] of the threaded spindles [6].
3. ➤ Correct the height of the loading magazine with the threaded spindles [6].
4. ➤ Tighten the lock nuts [5] of the threaded spindles [6].
5. ➤ Tighten the clamping screws [4].



Correcting the position:

1. ➤ Loosen the lock nuts [7] of the threaded pins [8].
2. ➤ Correct the position of the loading magazine by adjusting the threaded pins [8].
3. ➤ Tighten the lock nuts [7] of the threaded pins [8].



Correcting the side position:

1. ➤ Apply the lever (e.g. crowbar) at the lifting points [9] and correct the side position.
2. ➤ Remove the optical alignment aids again.

### Attach the loading magazine to the floor

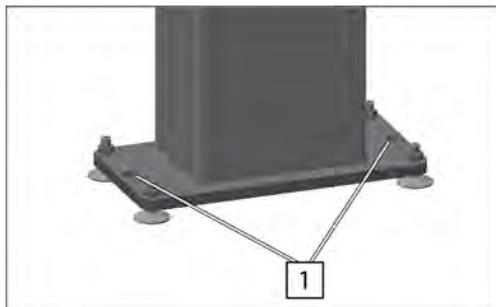


*The number of attachment points to be used depends on the condition of the floor and the equipment of the loading magazine. In the event of uncertainty, please consult FMB.*



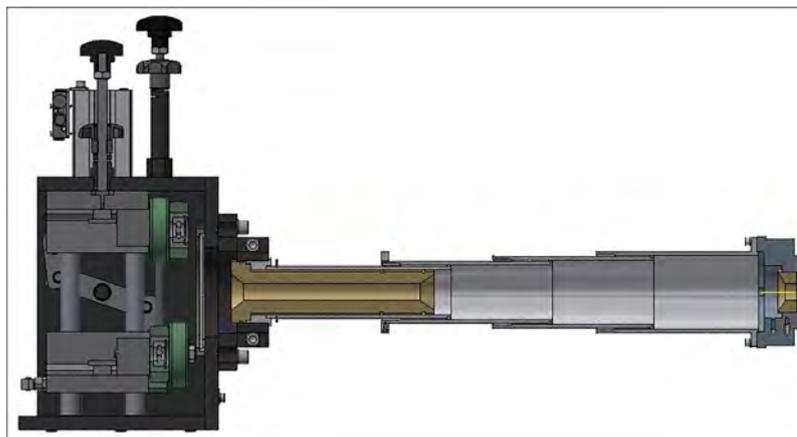
*To attach the loading magazine to the floor, M 16 drop-in anchors or adhesive anchors with a minimum length of 120 mm are used.*

1. ➤ Aligning the loading magazine ➔ "Aligning the loading magazine" on page 30.



Telescopic tube

2. ➤ Drill the floor holes through the attachment points 1.
3. ➤ Fix attachment aids to the floor hole.
4. ➤ Screw the nuts to the attachment aid and tighten.



For lathes with a moving headstock, the telescopic tube bridges the distance between the front end of the loading magazine and the spindle end of the lathe. It serves as a protective cover and prevents rotating parts coming out. The telescopic tube moves with the headstock of the lathe.

## Assembling the telescopic tube

**⚠ DANGER**

**Moving components of the loading magazine and the machine tool**  
**Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool.**

**When working on the unsecured interface (with the guide or telescopic tube detached) between the loading magazine and the machine tool, the extremities may become caught or stuck in the moving components of the loading magazine or machine tool.**

- Turn off the machine tool before starting work on the main switch.

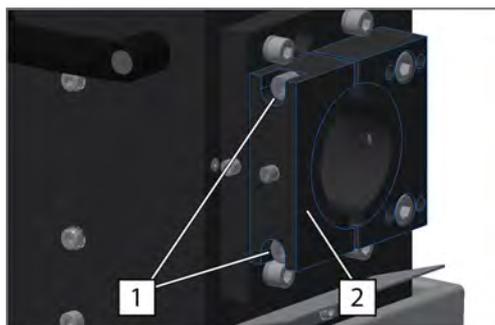
**⚠ CAUTION**

**Falling extension parts**

**Personal injury due to squashing and impact by the falling extension parts.**

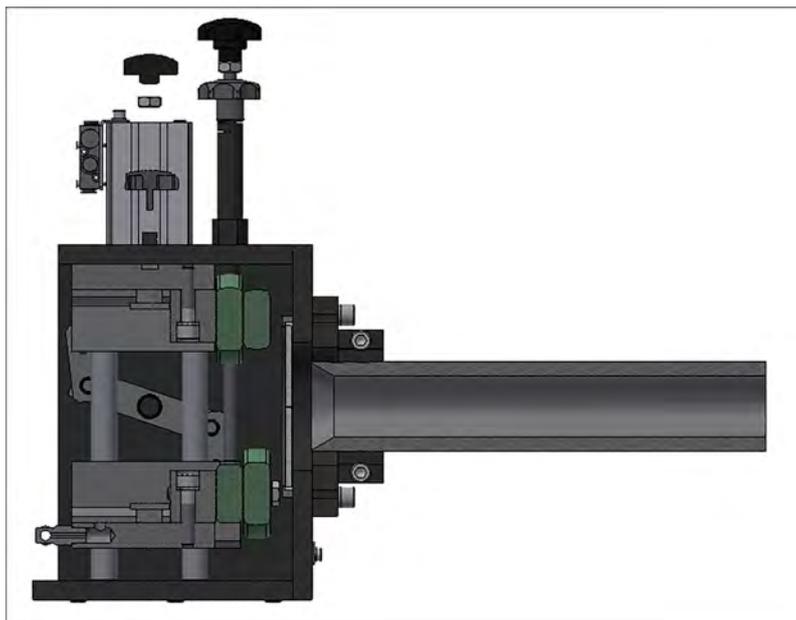
**When setting up the loading magazine, various extension parts have to be assembled at the interfaces between the loading magazine and the machine tool. They might fall down and hit body extremities.**

- Raise and secure any add-on parts with suitable hoisting equipment.



Guide tube

1. ➤ Loosen the screws **1**.  
➔ The clamping piece **2** is detached.
2. ➤ Push the telescopic tube into the **2** clamping piece **2** to the depth of the clamping piece.
3. ➤ Tighten the **1** screws.



For lathes with a fixed headstock, the guide tube bridges the distance between the front end of the loading magazine and the spindle end of the lathe. It serves as a protective cover and prevents rotating parts coming out.

### Assembling the guide tube

**⚠ DANGER**

**Moving components of the loading magazine and the machine tool**  
**Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool.**

When working on the unsecured interface (with the guide or telescopic tube detached) between the loading magazine and the machine tool, the extremities may become caught or stuck in the moving components of the loading magazine or machine tool.

- Turn off the machine tool before starting work on the main switch.

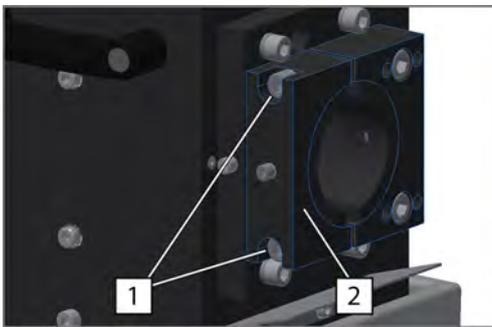
**⚠ CAUTION**

### Falling extension parts

Personal injury due to squashing and impact by the falling extension parts.

When setting up the loading magazine, various extension parts have to be assembled at the interfaces between the loading magazine and the machine tool. They might fall down and hit body extremities.

- Raise and secure any add-on parts with suitable hoisting equipment.
1. → Calculate the distance between the loading magazine and the lathe. → *“Calculate the distance of the loading magazine from the lathe” on page 26.*
  2. → Adjust the length of the guide tube.
  3. → Loosen the screws **1**.
    - The clamping piece **2** is detached.
  4. → Push the guide tube into the **2** clamping piece **2** to the depth of the clamping piece.
  5. → Tighten the **1** screws.



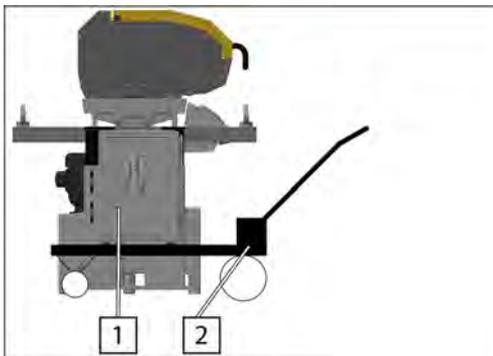
Remove the control cabinet from / attach the control cabinet to the loading magazine

**⚠ CAUTION**

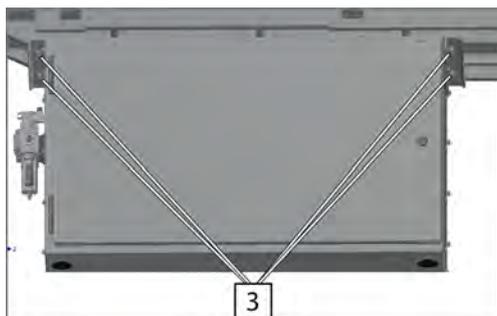
### Falling control cabinet

Personal injury due to squashing and impact by the falling control cabinet.

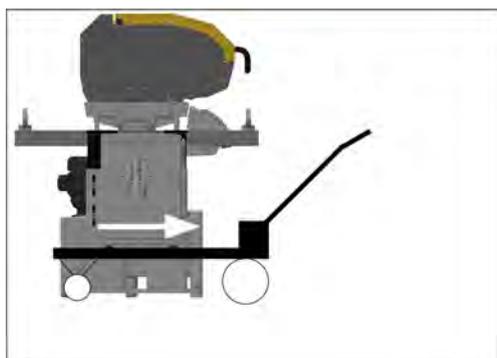
- Observe the description on removing and fastening the control cabinet from the loading magazine in the operating instructions.



1. → Support the control cabinet **1** using suitable hoisting equipment **2**.



2. ➤ Loosen the screws **3**.



3. ➤ Shift the control cabinet in the direction indicated by the arrow and place it on the hoisting equipment.

4. ➤ Lower the control cabinet and place it on the floor.

5. ➤ Attach the control cabinet to the loading magazine in reverse order.

**Set up and connect the oil tank**



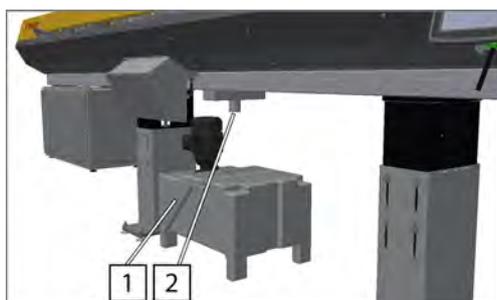
**Damaged wires or plugs**

**Personal injury by electric shock due to damaged wires or plug-in connections.**

– Perform a visual check of wires and plug-in connections for damage before inserting them into the control cabinet.

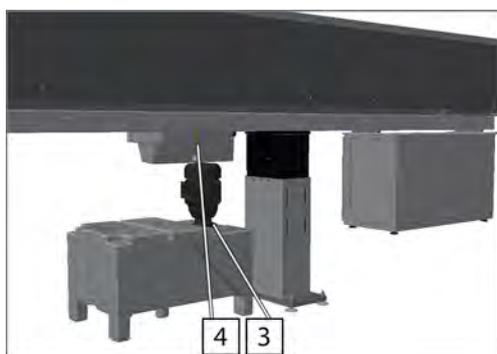
1. ➤ Turn off the machine tool before starting work on the main switch.

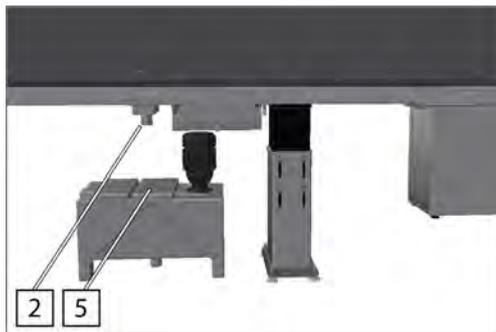
2. ➤ Place the oil tank **1** below the oil return pipe using suitable hoisting equipment **2**.



3. ➤ Connect the pump outlet **3** and the oil feed **4** with the oil feed line.

4. ➤ Secure the oil feed line outlet **3** and the oil feed **4** with tube clips.





5. → Guide the oil return line to the oil return hole **5**.
6. → Insert the remaining end of the oil return tube onto the oil return outlet **2**.
7. → Secure the oil return line onto the oil return outlet **2** using a tube clip.
8. → Insert the plug of the oil pump on the control cabinet (the socket is located outside the control cabinet) of the loading magazine.
9. → Fill the oil tank. → *“Fill the oil tank of the loading magazine” on page 104.*

## 4.5 Adjustments

### Positional values to be set

During start-up, positional values have to be set once for the parameter settings. This concerns certain positions, which can only be calculated from the perspective of the whole system (the loading magazine installed on a lathe).

The following positional values have to be set:

- **First insert travel**
- **Position front limit**

### Set the value for First insert travel

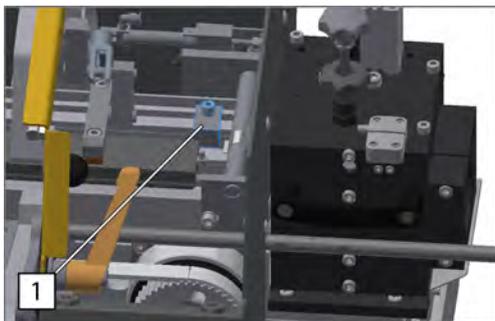
1. → Load a short material bar (approx. 1 m) → *“Draw off remnant, eject it and draw on the new material bar” on page 71.*
2. → Press the **■** button.
3. → Access **SETUP**.
4. → Move the end of the material bar on the lathe side to the starting switch using the **▶** button.
5. → Check and note the current position on the control panel.
6. → **On lathes with a moving headstock:** Move the end of the material bar on the lathe side through the collet of the lathe right up to the lathe guide sleeve using the **▶** button.  
*ⓘ The position “just before the guide sleeve” has to be clarified, if necessary with FMB or with the lathe manufacturer.*
7. → **On lathes with a moving headstock:** Move the end of the material bar on the lathe side through the collet of the lathe up to the cut-off position using the **▶** button.
8. → Check and note the current position on the control panel.
9. → Deduct the first position from the second position.
10. → *ⓘ The result is the value for the **First insert travel**.*
11. → Press the **■** button.
12. → **“SETTINGS → Service settings → Position”**
13. → Click on the field **First insert travel**.  
→ An input window opens.

14. Enter the value for **First insert travel**.
  - ➔ The value for **First insert travel** has been set.

### Set the value for Position front limit

1. **Only for lathes with a moving headstock:** Move the headstock of the spindle towards the guide sleeve to the end position.
2. Close the collet of the lathe.
3. Press the  button.
4. Access **SETUP**.
5. Move the pusher with the clamping sleeve towards the lathe using the  button, until the clamping sleeve of the loading magazine is queued on the collet of the lath.
6. Press the  button.
7. "**SETTINGS** → *Service settings* → **Position**"
8. Click on the field **Position front limit**.
  - ➔ An input window opens.
9. Enter the recorded value, minus the safety distance of 5 mm for **Position front limit**.
  - ➔ The value for **Position front limit** has been set.
10. Set the mechanical stop for the pusher to the calculated value for the **Position front limit** ➔ "*Set the stop for the pusher*" on page 37.

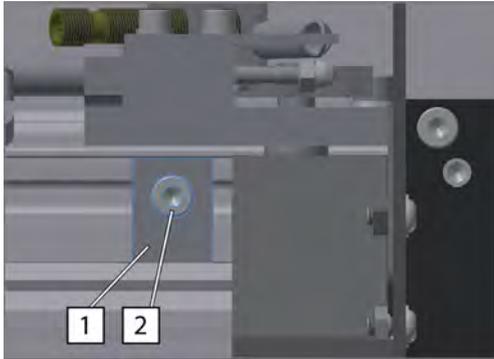
### Set the stop for the pusher



The stop 1 for the pusher is located on the front end of the loading magazine and is accessible if the cover is open.

**Prerequisite:** The positional value for the **Position front limit** must be set. ➔ "*Set the value for Position front limit*" on page 37.

1. Press the  button.
2. Access **SETUP**.
3. The positional value calculated for the **Position front limit** is moved to using the  button.
4. Press the emergency stop button. ➔ "*Press the emergency stop button*" on page 47.
5. Switch off the supply of compressed air. ➔ "*Switch the supply of compressed air on/off*" on page 105



6. ➤ Where necessary, obtain release from the lathe to open the cover.
7. ➤ Open the cover.
8. ➤ Loosen the screw **2**.
9. ➤ Push the stop **1** onto the carriage of the pusher.
10. ➤ Tighten the **2** screw.
11. ➤ Close the cover.
12. ➤ Switch on the compressed air supply. ➔ “Switch the supply of compressed air on/off” on page 105
13. ➤ Unlock the emergency stop button. ➔ “Make the loading magazine ready for operation after the emergency stop” on page 47
14. ➤ Acknowledge the error message by pressing the **CLR** button.

## 4.6 Settings

### Distanceview

Distanceview is a display on the control panel, which is active after a pre-set time and is ended by pressing the touchscreen. On the Distanceview display, only the information relevant for production is shown on an enlarged display. This makes it possible to see the current statuses of the loading magazine, even from a distance.

### Set the Distanceview



*The display Distanceview is active, if the touchscreen is not pressed within the pre-set time. The time is set in seconds. If the time has been set to "0", the function is deactivated.*

1. ➤ Press the **☰** button.
2. ➤ “**SETTINGS** → **System settings**”
3. ➤ Click on the field **TIME DISTANCEVIEW**.
  - ➔ An input field opens.
4. ➤ Enter the value for the activation of the display.
  - ➔ Distanceview has been set and is active after the expiry of the entered time.

### Set the date and time

1. ➤ Press the **☰** button.
2. ➤ “**SETTINGS** → **System settings**”
3. ➤ Click on the field **SET DATE**.
  - ➔ An input field opens.
4. ➤ Enter the current date.
5. ➤ Click on the field **SET TIME**.
  - ➔ An input field opens.
6. ➤ Enter the current time.

## Changing language settings

1. → Press the  button.
2. → "SETTINGS → System settings"
3. → Click on the respective language.

## Set the unit of measure

1. → Press the  button.
2. → "SETTINGS → System settings"
3. → Click on the respective unit of measure in the field UNIT OF MEASURE.
  - ➔ The status display on the button turns green. The unit of measure has been set.

## Set the oil feed



*The setting of the oil feed must be done during operation for rotating material bars.*

1. → Set the ball value on the oil pump to "off".
2. → Open the ball valve slowly, until the material bar runs slowly.
  - ➔ The oil feed has been set.

## Set the Position oilpump on / Position oilpump off



*The oil pump keeps the oil flowing in the guide channel. The flow of oil is necessary to guide the material bar optimally in the guide channel of the loading magazine. If the end of the material bar is in the transition section from the guide channel to the spindle of the lathe, the oil pump can be switched off. This prevents oil getting into the working area of the lathe.*

1. → Press the  button.
2. → "SETTINGS → Basic settings → Parameter"
3. → Click on the field Position oilpump on.
  - ➔ An input field opens.
4. → Enter the value for Position oilpump on.
5. → Click on the field Position oilpump off.
  - ➔ An input field opens.
6. → Enter the value for Position oilpump off.

## 4.7 Pre-set parameters

### Enter the Pusher length



*Information about Pusher length: ➔ "Positions and traverse paths" on page 11.*



*This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.
2. "SETTINGS → Service settings → Position"
3. Click on the field Pusher length.
  - ➔ An input field opens.
4. Enter the value for Pusher length.

#### Enter the Position storage



*Information about Position storage: ➔ "Positions and traverse paths" on page 11.*



*This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.
2. "SETTINGS → Service settings → Position"
3. Click on the field Position storage.
  - ➔ An input field opens.
4. Enter the value for Position storage.

#### Enter the Acceleration Short pusher forward



*The value Acceleration Short pusher forward describes the speed at which the short pusher accelerates to the value Speed Short pusher forward.*



*This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.
2. "SETTINGS → Service settings → Speed"
3. Scroll to the next page using the button.
4. Click on the field Acceleration Short pusher forward.
  - ➔ An input field opens.
5. Enter the value for Acceleration Short pusher forward.

#### Enter the Speed Short pusher forward



*The value Speed Short pusher forward describes the speed with which the short pusher moves to the value Position storage to take the material bar and push it into the area of the material gripper.*

1. Press the button.
2. "SETTINGS → Service settings → Speed"
3. Scroll to the next page using the button.

4.  Click on the field **Speed Short pusher forward**.  
 ➔ An input field opens.
5.  Enter the value for Speed Short pusher forward.

**Enter the Limit pos. short pusher front**

**i** For information about **Limit pos. short pusher front** please see:  
 ➔ “Positions and traverse paths” on page 11.

1.  Press the  button.
2.  “**SETTINGS** → **Service settings** → **Position**”
3.  Click on the field **Limit pos. short pusher front**.  
 ➔ An input field opens.
4.  Enter the value for Limit pos. short pusher front.

**Enter the Acceleration First insert low**

**i** The value **Acceleration First insert low** describes the negative acceleration at which the pusher brakes to the **Speed First insert low**, before the spindle of the machine tool is passed.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1.  Press the  button.
2.  “**SETTINGS** → **Service settings** → **Speed**”
3.  Scroll to the next page using the  button.
4.  Click on the field **Acceleration First insert low**.  
 ➔ An input field opens.
5.  Enter the value for Acceleration First insert low.

**Enter the Speed First insert low**

**i** The value **Speed First insert low** describes the speed at which the pusher moves to the **Position front limit**.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1.  Press the  button.
2.  “**SETTINGS** → **Service settings** → **Speed**”
3.  Scroll to the next page using the  button.
4.  Click on the field **Speed First insert low**.  
 ➔ An input field opens.
5.  Enter the value for Speed First insert low.

## Enter the Position open steady

**i** Information about **Position open steady**: ➔ “Positions and traverse paths” on page 11.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. ➔ Press the  button.
2. ➔ “**SETTINGS** → **Service settings** → **Position**”
3. ➔ Scroll to page 2 using the  button.
4. ➔ Click on the field **Position open steady**.
  - ➔ An input field opens.
5. ➔ Enter the value for Position open steady.

## Enter the Position close steady

**i** Information about **Position close steady**: ➔ “Positions and traverse paths” on page 11.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. ➔ Press the  button.
2. ➔ “**SETTINGS** → **Service settings** → **Position**”
3. ➔ Scroll to page 2 using the  button.
4. ➔ Click on the field **Position close steady**.
  - ➔ An input field opens.
5. ➔ Enter the value for Position close steady.

## Enter the Pos. open steady lathe

**i** If a lathe steady is installed, the clamping sleeve must pass the lathe steady during operation. If the clamping device is in the **Pos. open steady lathe**, the lathe steady is opened to prevent damage.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. ➔ Press the  button.
2. ➔ “**SETTINGS** → **Service settings** → **Position**”
3. ➔ Click on the field **Pos. open steady lathe**.
  - ➔ An input field opens.
4. ➔ Enter the value for Pos. open steady lathe.

## Enter the Feed force for breaking function

**i** The value **Feed force for breaking function** describes the force with which the pusher is held in position during the processing, so that it is not pushed back by the forces generated by the machine tool.



*This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.
2. “**SETTINGS** → **Service settings** → **Feed**”
3. Click on the field **Feed force for breaking function**.  
 ➔ An input field opens.
4. Enter the value for Feed force for breaking function.

**Enter the Acceleration Return from spindle**



*The value **Acceleration Return from spindle** return acceleration from the spindle describes the acceleration with which the pusher accelerates when returning from the tool machine spindle to reach the value **Speed Return from spindle**.*



*This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.
2. “**SETTINGS** → **Service settings** → **Speed**”
3. Click on the field **Acceleration Return from spindle**.  
 ➔ An input field opens.
4. Enter the value for Acceleration Return from spindle.

**Enter the Speed Return from spindle**



*The value **Speed Return from spindle** describes the slower of the two speeds of the pusher when retracting. This is used if the pusher is in the area of the machine tool spindle.*



*This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.
2. “**SETTINGS** → **Service settings** → **Speed**”
3. Click on the field **Speed Return from spindle**.  
 ➔ An input field opens.
4. Enter the value for Speed Return from spindle.

**Enter the Pos. reverse rotation return**



*At the **Pos. reverse rotation return** position the speed of the pusher when returning out of the machine tool spindle is switched from **Speed Return from spindle** to the higher **Speed Return high**.*



*This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.

2. → “**SETTINGS** → **Service settings** → **Position**”
3. → Click on the field **Pos. reverse rotation return**.
  - ➔ An input field opens.
4. → Enter the value for Pos. reverse rotation return.

## Enter the Acceleration Return high

**i** The value **Acceleration Return high** describes the acceleration with which the pusher accelerates when returning from the machine tool spindle, from the value **Speed Return from spindle** to the value **Speed Return high**.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. → Press the **≡** button.
2. → “**SETTINGS** → **Basic settings** → **Parameter**”
3. → Click on the field **Acceleration Return high**.
  - ➔ An input field opens.
4. → Enter the value for Acceleration Return high.

## Enter the Speed Return high

**i** The value **Speed Return high** describes the faster of the two speeds of the pusher when retracting. This is used if the pusher is no longer in the area of the machine tool spindle.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. → Press the **≡** button.
2. → “**SETTINGS** → **Service settings** → **Speed**”
3. → Click on the field **Speed Return high**.
  - ➔ An input field opens.
4. → Enter the value for Speed Return high.

## Enter the Position rear limit

**i** **Information about Position rear limit:** ➔ “Positions and traverse paths” on page 11.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. → Press the **≡** button.
2. → “**SETTINGS** → **Service settings** → **Position**”
3. → Click on the field **Position rear limit**.
  - ➔ An input field opens.
4. → Enter the value for Position rear limit.

## Enter the Position draw off

**i** Information about **Position draw off**: ➔ “Positions and traverse paths” on page 11.

**i** This value is pre-set by the FMB. If necessary, the value can be adjusted.

1. ➔ Press the  button.
2. ➔ “**SETTINGS** → **Service settings** → **Position**”
3. ➔ Click on the field **Position draw off**.
  - ➔ An input field opens.
4. ➔ Enter the value for Position draw off.

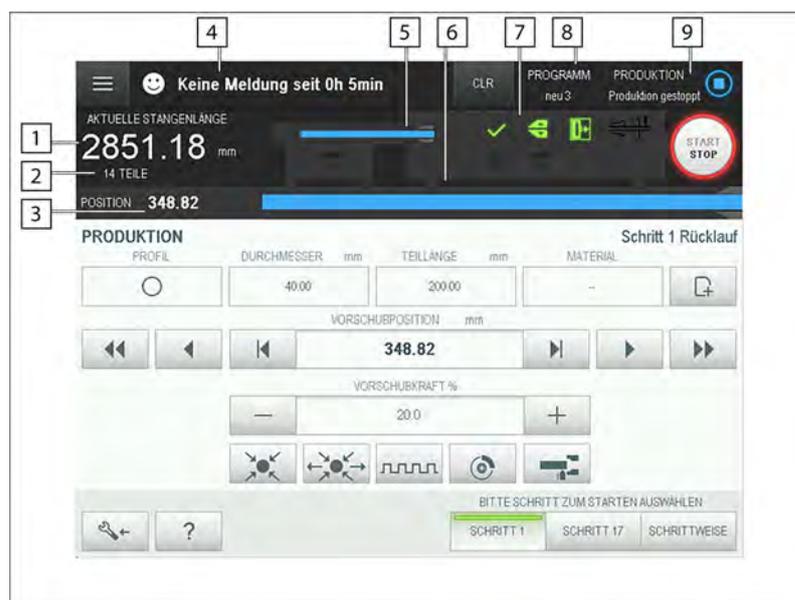
## 5 Control panel

### 5.1 Control panel, general

#### Layout

The operating panel has a touchscreen, which is operated by touching it with a finger.

The upper, darker area of the screen provides information about the current statuses of the loading magazine and is visible in every menu. On the lower part of the screen the different menus are shown.



1	Display of the current material bar length
2	Number of possible parts
3	Display of the current position
4	Fault message display
5	Visualization of the current material bar length
6	Visualization of the current material bar length (enlarged image)
7	Display of the current status
8	Display of the loaded program
9	Product status (automatic mode)

## 6 Operation

### 6.1 Basic functions

Press the emergency stop button



*The emergency stop button is located on the control panel. Pressing the emergency-stop button switches the outputs of the PLC output card off and sets the drive to a secure stop. An error message appears on the display of the control panel.*



➔ Press the emergency stop button **1**.

➔ The loading magazine stops.

Make the loading magazine ready for operation after the emergency stop



**1.** ➔ Unlock the emergency stop button **1**.

**2.** ➔ Where necessary, cancel the emergency stop on the lathe.

➔ The loading magazine is ready for operation

Switch on the loading magazine

➔ Turn on the main switch of the lathe.

➔ The loading magazine is ready for operation.

Switch off the loading magazine



*During active production, the production can be stopped after the end of the lathe's cycle, and the whole system can be switched off. When the system is switched on again, the processing is continued from the same place.*

➔ Turn off the main switch of the lathe.

➔ The loading magazine is switched off.

Parts counter

The parts counter counts the number of parts produced. If a target value is reached, the parts counter stops the production. Product can only be restarted if the actual value has been reset. The target value of the parts counter can be adjusted ➔ "Set the parts counter" on page 48.

## Set the parts counter

**i** Once the target value has been reached, the parts counter stops production.

**i** Production can only be restarted, if the actual value of the parts counter has been reset → “Reset the actual value of the parts counter” on page 48.

**i** Entering **Parts counter Desired** = "0" deactivates the parts counter.

1. Press the  button.
2. “**SETTINGS** → **Basic settings** → **Parts counter**”
3. Click on the field **Parts counter Desired**.
  - An input field opens.
4. Enter the value for the target number of units.
  - The parts counter is activated with the entered target quantity.

## Reset the actual value of the parts counter

1. Press the  button.
2. “**SETTINGS** → **Basic settings** → **Parts counter**”
3. Click on the field **Reset parts counter**.
  - The parts counter is reset.

## 6.2 Overview of selections

### Selections

Selections are available for the functions and components of the loading magazine with several respective selection options. They can be selected if required to adjust the operation of the loading magazine.

### Part follow-up

Selection	Selection option	Description
Part follow-up	Collet open, fixed speed	Push to the stop.
	Part length internal	Push without stop to the specified position.
	Part length external (optional)	Like Part length internal. Feed values are, however, provided by the lathe.
	Part length internal+w/o tension	Push without stop to the specified position. Once the push command has been removed, the system is depressurized.
	Part length external+w/o tension (optional)	Like Part length internal. Feed values are, however, provided by the lathe. Once the push command has been removed, the system is depressurized.

## Remnant gripper

**i** Depending on the diameter and length of the remnant, the remnant does not fall on the remnant flap. In this case the pusher can also feed the remnant.

Selection	Selection option	Description
Remnant gripper	Standard	The remnant is removed and falls onto the remnant flap.
	Push forward	The remnant is removed and pushed forward by the pusher onto the remnant flap. Caution: In this operating mode the max. remnant length is 480 mm.

## With / without gripper

**i** The selection *With / without gripper* allows the remnant to be removed from the working area of the lathe. For this purpose there are several operating modes available.

Selection	Selection option	Description
With / without gripper	with gripper	The material bar is clamped in a clamping sleeve on the loading magazine side. The remnant must be removed from the lathe side.
	without gripper	The material bar is moved by a centering sleeve on the loading magazine side. The material bar sits loosely in the centering sleeve. The remnant is pushed by the lathe spindle and removed from the working area of the lathe.
	without gripper with press upon	The material bar is clamped in a clamping sleeve on the loading magazine side. The remnant must be removed from the lathe side.
	with gripper with press upon + bar change	The material bar is clamped in a clamping sleeve on the loading magazine side. The remnant must be removed from the lathe side. During the processing of the last part a new material bar is loaded.

## Interval insert

**i** The interval insert improves the insertion of multi-sided material in the collet.

Selection	Selection option	Description
Interval insert	without return	Intermittent feed of short strokes.

Selection	Selection option	Description
	with return	Intermittent feed of short forward and backward strokes (recommended setting).

## Steady

Selection	Selection option	Description
Steady	Roller steady	During processing the roller steady is closed. When the pusher moves the roller steady is opened. As soon as the pusher is in the area of the roller steady, the roller steady closes and supports the pusher.
	Jaw steady	During processing the jaw steady is closed. When the pusher moves the jaw steady opens. As soon as the pusher is in the area of the jaw steady, the jaw steady remains open.
	Roller steady open at pusher	During processing the roller steady is closed. When the pusher moves the roller steady is opened. As soon as the pusher is in the area of the roller steady, the roller steady remains open.
	Jaw steady closed when pushing	During processing the jaw steady is closed. When the pusher moves the jaw steady opens. As soon as the pusher is in the area of the jaw steady, the jaw steady closes and supports the pusher.

## Steady lathe



*The lathe steady is located on the headstock of the lathe.*

Selection	Selection option	Description
Steady lathe	Roller steady	The steady is designed as a roller steady.
	Jaw steady	The steady is designed as a jaw steady.
	Jaw steady closed when pushing	for positioning

## First insert

Selection	Selection option	Description
First insert	Standard	The pusher moves to the First insert travel position.

Selection	Selection option	Description
	To stop	The pusher moves to the First insert travel position and then goes on to a stop in the lathe.

#### Draw on bar

Selection	Selection option	Description
Draw on bar	without first insert	The material bar is loaded and pressed.
	with first insert	The material bar is loaded and pressed. Then the pusher moves to the position end First insert.

#### Separation

Selection	Selection option	Description
Separation	with channel opened (standard)	The material bar is separated if the guide channel is open and rolls directly into the guide channel.
	with channel closed (special)	The material bar is separated if the guide channel is closed and is queued in the guide channel, until it opens and then rolls inside.

## 6.3 Edit and manage programs

### Program

Processing parameters are saved in the programs, which are valid for particular processing. During production, the program parameters of the loaded program are consulted.

For the creation of programs, a particular selection of program parameters is available, which can be set in the program editor. They are described under "Edit and manage programs".

➔ *Chapter 6.3 "Edit and manage programs" on page 51.*

In addition to the program parameters, general processing settings can be made which are not, however, saved in the programs. They are described under "Processing settings".

➔ *Chapter 6.4 "Processing settings" on page 56.*

### Create new program

1. ➤ Press the  button.
2. ➤ "**PROGRAM** → **NEW**"  
➔ **PROGRAM EDITOR** opens.
3. ➤ Enter the program parameters.
4. ➤ Scroll to page 2 using the  button.

5.  Press the  button.
6.  Give the program a name.
7.  Press the **NEW** button.
  - ➔ A new program is created.

## Edit program

1.  Press the  button.
2.  Select **PROGRAM**.
3.  Click on the program to be edited in the list.
  - ➔ The selected program is marked blue.
4.  Press **Edit**.
5.  Enter the program parameters.
6.  Press the  button.
7.  Press the **Overwrite** button.
  - ➔ The changes are saved.

## Load program



*To use a program in automatic mode, it must be loaded.*

1.  Press the  button.
2.  Select **PROGRAM**.
3.  Click on the corresponding program in the list.
  - ➔ The selected program is marked blue.
4.  Press **Open and load**.
  - ➔ The selected program is loaded and is used in automatic mode.

## Enter the profile of the material bar

1.  Open the program in Progradeditor. ➔ *“Create new program” on page 51 or ➔ “Edit program” on page 52.*
2.  Click on the field **Profile**.
  - ➔ A list of profiles opens.
3.  Click on the profile to be processed.
4.  Save changes with the  button.

## Enter the material to be processed

1.  Open the program in Progradeditor. ➔ *“Create new program” on page 51 or ➔ “Edit program” on page 52.*
2.  Click on the field **Material**.
  - ➔ An input field opens.

3.  Enter the material to be processed.
4.  Save changes with the  button.

**Enter the diameter of the material bar to be processed**

1.  Open the program in Progeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2.  Click on the field **Diameter**.
  - ➔ An input field opens.
3.  Enter the diameter to be processed.
4.  Save changes with the  button.

**Enter the Part length**

**i** *The length dimension of the part to be produced is recorded under **Part length**. This is used by the control unit to automatically calculate the possible number of parts to be manufactured.*

*The length dimension of the part to be produced currently has to be adjusted.*

1.  Open the program in Progeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2.  Click on the field **Part length 1**.
  - ➔ An input field opens.
3.  Enter the part length.
4.  Save changes with the  button.

**Enter the Feed force for part follow-up**

**i** *The **Feed force for part follow-up** is the force with which the pusher moves the material bar.*

*This setting is also editable during production.*

1.  Open the program in Progeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2.  Click on the field **Feed force**.
  - ➔ An input field opens.
3.  Enter the feed force.
4.  Save changes with the  button.

**Enter the Speed for part follow-up**

**i** *The **Speed for part follow-up** is the speed with which the pusher moves the material bar.*

1.  Open the program in Progeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.

2. Click on the field **Speed**.
  - ➔ An input field opens.
3. Enter the speed.
4. Save changes with the  button.

## Enter the feed of the material bar



*The pusher moves the material bar once per turned part by the set value in the working area of the lathe. The material bar is moved directly to the cut-off position.*

1. Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2. Click on the field **Feed 1**.
  - ➔ An input field opens.
3. Enter the feed of the material bar.
4. Save changes with the  button.

## Enter the Acceleration Part follow-up



*The **Acceleration Part follow-up** is the acceleration with which the pusher moves the material bar.*

1. Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2. Click on the field **Acceleration**.
  - ➔ An input field opens.
3. Enter the acceleration.
4. Save changes with the  button.

## Set the Selection option Part follow-up

1. Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2. Scroll to page 2 using the  button.
3. Click on the field **Part follow-up**.
  - ➔ A selection window opens.
4. Click on the selection option.
  - ➔ The chosen selection option is shown in the field.
5. Save changes with the  button.

## Set the Selection option First insert

1. Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2. Scroll to page 2 using the  button.

3.  Click on the field **First insert**.
  - ➔ A selection window opens.
4.  Click on the selection option.
  - ➔ The chosen selection option is shown in the field.
5.  Save changes with the  button.

### Enter the Feed force for first insert

**i** *Feed force for first insert is the force with which the pusher moves a new material bar into the working area of the lathe.*

**i** *This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1.  Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2.  Scroll to page 3 using the  button.
3.  Click on the field **Feed force for first insert**.
  - ➔ An input field opens.
4.  Enter Feed force for first insert.
5.  Save changes with the  button.

### Enter the Feed force for press upon

**i** *The Feed force for press upon is the force with which the pusher presses the material bar against the clamping device.*

**i** *This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1.  Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2.  Scroll to page 3 using the  button.
3.  Click on the field **Feed force for press upon**.
  - ➔ An input field opens.
4.  Enter Feed force for press upon.
5.  Save changes with the  button.

### Enter the Extension first insert

**i** *This function allows the extension of the First insert travel. The entered value is added to the First insert travel path.*

**i** *This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.*

1.  Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2.  Scroll to page 3 using the  button.

3. Click on the field **Extension first insert**.  
 ➔ An input field opens.
4. Enter Extension first insert.
5. Save changes with the button.

## Enter the Speed sub-spindle

1. Open the program in Progradeditor. ➔ *“Create new program” on page 51 or “Edit program” on page 52.*
2. Scroll to page 3 using the button.
3. Click on the field **Speed sub-spindle**.  
 ➔ An input field opens.
4. Enter Speed sub-spindle.
5. Save changes with the button.

## Enter the Feed force for sub-spindle

1. Open the program in Progradeditor. ➔ *“Create new program” on page 51 or “Edit program” on page 52.*
2. Scroll to page 3 using the button.
3. Click on the field **Feed force for sub-spindle**.  
 ➔ An input field opens.
4. Enter Feed force for sub-spindle.
5. Save changes with the button.

## 6.4 Processing settings

### Enter the selection option

1. Press the button.
2. **“SETTINGS → Basic settings → Selection option”**
3. Click on the field with the corresponding selection.  
 ➔ A selection window opens.
4. Click on the selection option.  
 ➔ The chosen selection option is shown in the field.

### Enter the Acceleration First insert

**i** *Acceleration First insert is the acceleration with which the pusher moves a new material bar into the working area of the lathe.*

**i** *This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. Press the button.
2. **“SETTINGS → Service settings → SPEED”**

3. → Scroll to page 2 using the  button.
4. → Click on the field **Acceleration First insert**.
  - ➔ An input field opens.
5. → Enter the value for Acceleration First insert.

### Enter the Speed First insert

**i** *Speed First insert is the speed with which the pusher moves a new material bar into the working area of the lathe.*

**i** *This value is pre-set by the FMB. If necessary, the value can be adjusted.*

1. → Press the  button.
2. → “**SETTINGS** → *Service settings* → **SPEED**”
3. → Scroll to page 2 using the  button.
4. → Click on the field **Speed First insert**.
  - ➔ An input field opens.
5. → Enter the value for Speed First insert.

### Enter the Correct. value after auto / door start

**i** *This function balances out minor position changes to the pusher, which may occur if the system is depressurized.*

*When the material bar is clamped by the lathe collet, there may be a slight distortion, which is caused by the feed force of the pusher. If the system is switched from automatic to manual operation, or the working area of the lathe is opened, the drive of the loading magazine switches off. The pressure on the pusher reduces and the distortion disappears. This causes a slight change in position of the pusher, which can then be corrected by the entered value.*

**i** *This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.*

1. → Press the  button.
2. → “**SETTINGS** → *Basic settings* → **Parameter**”
3. → Click on the field **Correct. value after auto / door start**.
  - ➔ An input field opens.
4. → Enter the value for Correct. value after auto / door start.

### Enter the Max. bar return

**i** *If the material bar is clamped by the lathe collet, the pusher may be pressed back. This function reports a fault if the pusher is pressed back by more than the set value.*

**i** *This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.*

1. Press the  button.
2. "SETTINGS → Basic settings → Parameter"
3. Scroll to page 2 using the  button.
4. Click on the field Max. bar return.
  - ➔ An input field opens.
5. Enter the value for Max. bar return.

## Enter the Max. part length follow-up

**i** This function monitors the insert travel when pushing the material bar. If the set value is exceeded when pushing the part length, the loading magazine reports a fault.

**i** This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the  button.
2. "SETTINGS → Basic settings → Parameter"
3. Click on the field Max. part length follow-up.
  - ➔ An input field opens.
4. Enter the value for Max. part length follow-up.

## Enter the Min. part length follow-up

**i** This function monitors the insert travel when pushing the material bar. If the set value is not reached when moving the part length, the loading magazine reports a fault.

**i** This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the  button.
2. "SETTINGS → Basic settings → Parameter"
3. Click on the field Min. part length follow-up.
  - ➔ An input field opens.
4. Enter the value for Min. part length follow-up.

## Enter the Collet open delay

**i** This function delays the pushing of the material bar by the set value.

**i** This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.

1. Press the  button.
2. "SETTINGS → Basic settings → Parameter"
3. Click on the field Collet open delay.
  - ➔ An input field opens.

4.  Enter the value for Collet open delay .

#### Enter the Collet close delay

**i** *This function delays the return of the material bar after being pushed by the set value. The pressure on the material bar is therefore maintained for longer.*

**i** *This value is set to "0" (off) by FMB. If necessary, the value can be adjusted.*

1.  Press the  button.
2.  "SETTINGS → Basic settings → Parameter"
3.  Click on the field Collet close delay.  
  - ➔ An input field opens.
4.  Enter the value for Collet close delay.

#### Enter the Feed force for part follow-up with sub-spindle

1.  Press the  button.
2.  "SETTINGS → Service settings → Feed"
3.  Click on the field Feed force for part follow-up with sub-spindle.  
  - ➔ An input field opens.
4.  Enter the value for Feed force for part follow-up with sub-spindle.

#### Enter the Speed for part follow-up sub-spindle

1.  Press the  button.
2.  "SETTINGS → Service settings → Speed"
3.  Click on the field Speed for part follow-up sub-spindle.  
  - ➔ An input field opens.
4.  Enter the value for Speed for part follow-up sub-spindle.

#### Switch on/off the headstock position determination

**i** *This function is optional and is only available if the shaft encoder - B4 is installed.*

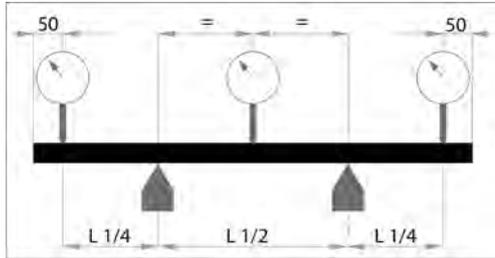
1.  Press the  button.
2.  "SETTINGS → Service settings → Mode"
3.  Click on the field Rotary encoder -B4.  
  - ➔ A selection window opens.

4. Click on the selection option.

➔ The chosen selection option is shown in the field.

## 6.5 Clamp material bars

### Requirements on the material bars



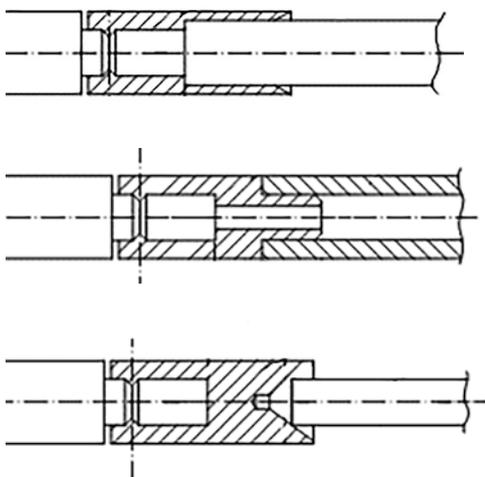
The smooth running of the material bar depends on the material and the precise geometric shape. Straightness, roundness and imbalance are key for the possible speed. The importance of the straightness increases as the diameter gets bigger. In general, a deviation in the straightness of more than 0.5 mm / m has a negative effect on the smooth running.

When measuring the straightness of the material bar proceed as shown in the following diagram. For the measurement, the material bar is rotated four times by 90°.

Requirements:

- The start of the material bar (on the lathe side) must be burr-free.
- The end of the material bar (on the loading magazine side) must not be bent or deformed.
- The material bar must be free of dirt.
- Bars with multiple sides must not have any circumferential chamfers on the lathe side.
- Material bars with a circular cross-section, whose diameter is closer to the pusher diameter, must be chamfered so that they can be inserted easier into the clamping sleeve.

### Clamping device



A clamping device is attached to the pusher to guide the end of the material bar. Depending on the application, either a clamping sleeve, a centering sleeve or a clamping mandrel is necessary. The size of the clamping device depends on the diameter of the material bar to be processed.

**Clamping sleeve:** Material bars are pushed into the clamping sleeve and clamped by a frictional connection to the external diameter.

**Clamping mandrel:** Raw material is pushed to the clamping mandrel and clamped on the inner diameter by a frictional connection.

**Centering sleeve:** Material bars are pushed onto the disc of the centering sleeve and moved without voltage. The end of the material bar on the side of the loading magazine must have a centric chamfer. The chamfer must have minimum dimensions of 20% of the material bar diameter x 45° and a run-out accuracy of < 0.1 mm.

Change the clamping device

 **WARNING**

**Falling material bar**

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

 **CAUTION**

**Sharp knives of the material gripper**

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

 **CAUTION**

**Driven guide channel cover**

Personal injury due to squashing and impact by the closing of the guide channel cover.

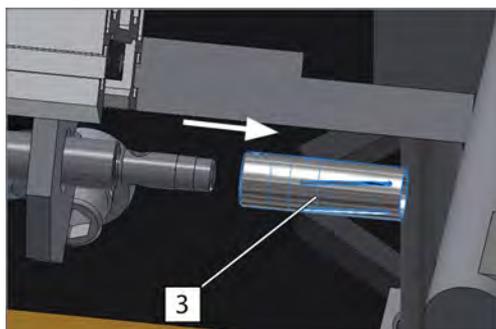
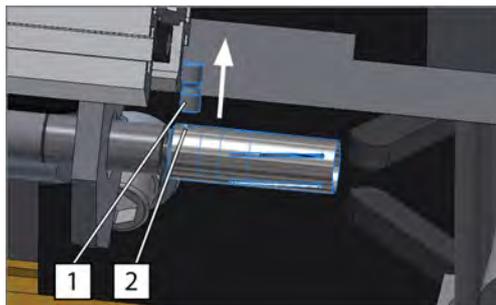
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.

Clamping devices with a diameter < 25 mm are attached to the bearing insert with a cross pin.

Clamping devices with a diameter of 25 mm and above are attached to the bearing insert with three setscrews.

1.  Press the  button.
2.  Access **SETUP**.
3.  Move the pusher right to the back using the  button.
4.  Swing out the pusher with the  button.
5.  Press the emergency stop button. → *“Press the emergency stop button” on page 47.*
6.  Switch off the supply of compressed air. → *“Switch the supply of compressed air on/off” on page 105*
7.  Where necessary, obtain release from the lathe to open the cover.
8.  Open the cover.
9.  Secure the rear guide channel with safety bolts. → *“Secure the guide channel with safety bolts” on page 76*



10. Push the cross pin **1** out of the hole in the direction indicated by the arrow **2**.

11. Pull the clamping device **3** in the direction indicated by the arrow and take it out.

12. Raise and attach the clamping device in reverse order.

13. Remove the safety bolts in the guide channel.

14. Close the cover.

15. Switch on the compressed air supply. → "Switch the supply of compressed air on/off" on page 105

16. Unlock the emergency stop button. → "Make the loading magazine ready for operation after the emergency stop" on page 47

17. Swing in the pusher using the  button.

18. Acknowledge the error message by pressing the  button.

### Clamping device with a diameter of 25 mm and greater:

1. Press the  button.

2. Access **SETUP**.

3. Move the pusher right to the back using the  button.

4. Swing out the pusher with the  button.

5. Press the emergency stop button. → "Press the emergency stop button" on page 47.

6. Switch off the supply of compressed air. → "Switch the supply of compressed air on/off" on page 105

7. Where necessary, obtain release from the lathe to open the cover.

8. Open the cover.

9. Secure the rear guide channel with safety bolts. → "Secure the guide channel with safety bolts" on page 76

10. Loosen the threaded pins **1** (3 pieces).

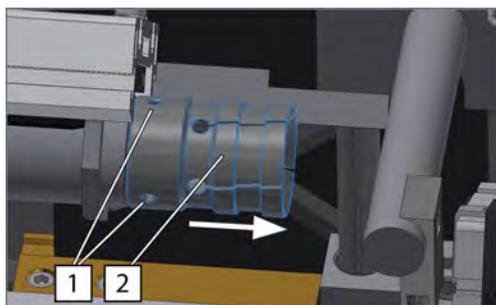
11. Pull the clamping device **2** in the direction indicated by the arrow and take it out.

12. Raise and attach the clamping device in reverse order.

13. Remove the safety bolts in the guide channel.

14. Close the cover.

15. Switch on the compressed air supply. → "Switch the supply of compressed air on/off" on page 105



16. ▶ Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
17. ▶ Swing the pusher in using the  button.
18. ▶ Acknowledge the error message by pressing the  button.

**The material bar diameter is greater than the inner diameter of the clamping sleeve**

To clamp material bars with a diameter which is greater than the inner diameter of the clamping sleeve, the end of the material bar has to be rotated. This is necessary, for example, to make full use of the nominal diameter of the capacity adjustment set.

Here the following applies:

- The diameter of the chamfer must be adjusted to the inner diameter of the clamping sleeve.
- The length of the chamfer must be adjusted to the clamping width of the clamping sleeves (the material bar must be moved up to the stop in the clamping sleeve).
- The chamfer must have a concentricity of < 0.1 mm.

## 6.6 Feed material bars

### Push the part several times

The functions push part once, push part twice, and push part three times, allow the multiple pushing of the material bar within one processing cycle of the lathe. By entering the corresponding feed values, the material bar can be pushed up to three times in different positions.

- Push part once: ➔ *“Set push part once:” on page 63*
- Push part twice: ➔ *“Set push part twice” on page 64*
- Push part three times: ➔ *“Set push part three times” on page 64*

### Set push part once:



*The pusher moves the material bar once per turned part in the working area of the lathe. The material bar is moved directly to the cut-off position.*

1. ▶ Open the program in Progradeditor. ➔ *“Create new program” on page 51 or “Edit program” on page 52.*
2. ▶ Set the option **Part follow-up** to selection option **Part length internal**. ➔ *“Set the Selection option Part follow-up” on page 54 or “Enter the selection option” on page 56.*
3. ▶ Click on the field **Feed 1**.
  - ➔ An input field opens.
4. ▶ Enter the length of the first processing.
5. ▶ Scroll to the next page using the  button.
6. ▶ Save changes.

## Set push part twice



The pusher moves the material bar twice per turned part in the working area of the lathe. The material bar is moved to **Feed 1** for the first processing. Then the material bar is moved to **Feed 2** for the second processing. The material bar is cut off at **Feed 2**.

1. Open the program in Progradeditor. → “Create new program” on page 51 or → “Edit program” on page 52.
2. Set the option **Part follow-up** to selection option **Part length internal**. → “Set the Selection option Part follow-up” on page 54 or → “Enter the selection option” on page 56.
3. Click on the field **Feed 1**.
  - An input field opens.
4. Enter the length of the first processing.
5. Scroll to the next page using the  button.
6. Click on the field **Feed 2**.
  - An input field opens.
7. Enter the length of the second processing.
8. Save changes.

## Set push part three times



The pusher moves the material bar three times per turned part in the working area of the lathe. The material bar is moved to **Feed 1** for the first processing. Then the material bar is moved to **Feed 2** for the second processing. Then the material bar is moved to **Feed 3** for the third processing. The material bar is cut off at **Feed 3**.

1. Open the program in Progradeditor. → “Create new program” on page 51 or → “Edit program” on page 52.
2. Set the option **Part follow-up** to selection option **Part length internal**. → “Set the Selection option Part follow-up” on page 54 or → “Enter the selection option” on page 56.
3. Click on the field **Feed 1**.
  - An input field opens.
4. Enter the length of the first processing.
5. Scroll to the next page using the  button.
6. Click on the field **Feed 2**.
  - An input field opens.
7. Enter the length of the second processing.
8. Click on the field **Feed 3**.
  - An input field opens.
9. Enter the length of the third processing.
10. Save changes.

## Push the material bar with the sub-spindle of the lathe

**i** *If the lathe sends a signal for the sub-spindle to the loading magazine, the saved values for speed and feeding force are automatically used when pushing with the sub-spindle.*

*If the lathe sends no signal for the sub-spindle to the loading magazine, the saved values are automatically used when pushing with the sub-spindle for speed and feeding force, which are also used for standard pushing. It may be necessary to adjust these values when working with the sub-spindle.*

**i** *All the settings for working with the sub-spindle are set in a program.*

1. **1.** Enter the values for **Feed force for sub-spindle** and **Speed sub-spindle**. ➔ “Enter the Feed force for sub-spindle” on page 56 and ➔ “Enter the Speed sub-spindle” on page 56.
2. **2.** Set the option **Part follow-up** to selection option **Collet open, fixed speed**.

## Process two different part lengths

**i** *This function is available as an option.*

**i** *This function means it is possible to process two different long parts. The second part length can be used to process shorter parts from the remnant. Once the remnant is too short for the first part length, the second part length is pushed.*

**i** *With the fields **Feed 2 part 2** and **Feed 3 part 2** the parts of the second part length can also be pushed several times.*

1. **1.** Open the program in Progradeditor. ➔ “Create new program” on page 51 or ➔ “Edit program” on page 52.
2. **2.** Scroll to the next page using the  button.
3. **3.** Click on the field **Feed 1 part 2**.  
➔ An input field opens.
4. **4.** Enter the value for the shorter part.
5. **5.** Save changes.

## Interval insert

The interval insert improves the insertion of multi-sided material into the lathe collet. During the first insert, the pusher performed intervals of short forward and backward strokes. The interval insert can be adjusted ➔ “Set the Interval insert” on page 65.

## Set the Interval insert

**i** *The value **Travel interval on** determines the length of the intermittent movement.*

**i** *The intermittent movement is set for the time of the forward and backward stroke.*

Length of the intermittent movement:

1. Press the button.
2. “**SETTINGS** → **Service settings** → **Position**”
3. Click on the field **Travel interval on**.
  - ➔ An input field opens.
4. Enter the value for **Travel interval on**.

Set the speed:

1. Press the button.
2. “**SETTINGS** → **Basic settings** → **Selection option**”
3. Click on the field **Time on**.
  - ➔ A selection window opens.
4. Enter the value for **Time on**.
5. Click on the field **Time off**.
  - ➔ A selection window opens.
6. Enter the value for **Time off**.

Set the interval insert selection:

1. Press the button.
2. “**SETTINGS** → **Basic settings** → **Selection option**”
3. Click on the field **Interval insert**.
  - ➔ A selection window opens.
4. Click on the selection option.
  - ➔ The chosen selection option is shown in the field.

### Switching Interval insert on/off

1. Open the program in Progradeditor. ➔ “*Create new program*” on page 51 or ➔ “*Edit program*” on page 52.
2. Click on the field **Interval insert**.
  - ➔ A selection window opens.
3. Select a corresponding value.
  - ➔ The selection is shown in the field.
4. Scroll to the next page using the button.
5. Save changes.

## 6.7 Processing phase

### Load the lateral material storage

**WARNING**

#### High weight of the material bar

Physical overloading when raising the material bar by a high weight.

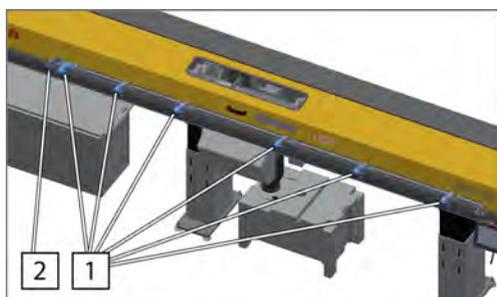
- Observe the weight of the material bar.
- Use suitable hoisting equipment.

**WARNING**

#### High weight of the material bar

Danger of squashing limbs when putting down the material bar.

- Observe the weight of the material bar.
- Use suitable hoisting equipment.



1. → Store the material bar on the lateral material storage [1].
2. → Move the material bar to the material stop [2].

### Production



*During production the automatic mode is active. The loading magazine works at the same speed as the lathe. The program flow is completed taking into account the set values.*

Automatic mode can be started in two stages of the program flow. This requires the following conditions:

- Step 1: A remnant is in the material gripper.
- Step 17: A material bar is drawn onto the clamping device and is located in the lathe, at the cut-off position.

If the requirements for automatic mode have been met, they can be established by the following procedure:

- Remove remnant, eject it and draw on the new material bar  
 → "Draw off remnant, eject it and draw on the new material bar" on page 71.

### Start/stop production

1. → Observe the prerequisites for automatic mode → "Production" on page 67.
2. → Press the button.
3. → Access **PRODUCTION**.
4. → If so, then: press the button.  
 If so, then: press the button.
5. → Start/stop production with the button.

## Work flow for production (automatic mode)

Step	Action	Description	Position
1	Return	The pusher moves with the remnant from the lathe spindle into the area of the material gripper.	From the position: Pos. reverse rotation return at high speed End: Position draw off
2	The material gripper closes	The material gripper closes and grabs the remnant.	-
3	Remove the remnant	The pusher moves back again. The remnant is removed from the pusher.	End: Position rear limit
4	Open the guide channel and material gripper	The guide channel opens. The material gripper opens. The remnant falls on the remnant flap.	-
5	The remnant flap opens	The remnant flap opens. The remnant falls into the remnant bin.	-
6	Close the remnant flap and material gripper	The remnant flap closes. The material gripper closes.	-
7	The pusher swings out	The pusher swings out of the guide channel. The separation device moves down. A material bar rolls from the lateral material storage onto the separation device.	-
8	Separate the material bars	The separation device moves up. The material bar falls into the open guide channel.	-
9	Short pusher forward	The guide channel closes. The short pusher moves the material bars forward.	End: Limit pos. short pusher front
10	Short pusher return	The material bar remains in position. The short pusher moves back.	End: Position rear limit
11	The pusher swings in	The pusher swings into the guide channel. The material gripper closes and grabs the remnant.	-
12	Press upon the material bar	The pusher moves forward. The material bar is pressed onto the pusher.	End: Position draw off
13	The material gripper opens	The material gripper opens.	-
14	First insert	The pusher moves the material bar into the working area of the lathe.	End: First insert travel

Step	Action	Description	Position
15	Start the processing by the lathe	The loading magazine reports "End of bar change – program start" on the lathe. The collet of the lathe closes. The processing begins.	-
16	Cut off the part.	The processed part is cut off. The collet of the lathe opens.	-
17	The material bar is processed	The pusher moves the material bar until the end of the material bar is reached.	End: Position front limit - Part length 1
18	Insert the last part	The pusher moves the material bar for the last time.	-
19	Processing the last part	The lathe operates the last part.	-
20	Start the bar change	A transfer time switch into step 1 is activated	-

### Draw off and eject the remnant



*The remnant is removed from the clamping sleeve and is ejected into the remnant bin.*

1. → Press the button.

2. → Access **SETUP**.

3. → Press the button.

- ➔ The status display on the button turns green during the action. Once the action has been completed, the status display on the button is switched off. The remnant lies in the remnant bin.

### Remove the material bar from the loading magazine



*This action is suitable for material bars, which cannot be removed from the remnant bin due to their length. When the action is performed, the material bar is removed from the clamping sleeve and placed in the guide channel. The material bar can then be removed from the guide channel.*

#### **WARNING**

#### High weight of the material bar

Physical overloading when raising the material bar by a high weight.

- Observe the weight of the material bar.
- Use suitable hoisting equipment.

 **CAUTION**

## Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

When working on the opened guide channel, the driven guide channel cover may squash extremities.

- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.

 **CAUTION**

## Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

1. Press the  button.
2. Access **SETUP**.
3. Press the  button.
  - ➔ The status display on the button turns green during the action. Once the action has been completed, the status display on the button is switched off. The material bar is removed from the clamping device and lies in the guide channel.
4. Push the material out of the range of the material gripper with the  button.
5. Move the pusher by pressing the button  to **Position rear limit**.
6. Swing out the pusher with the  button.
7. Open the guide channel with the  button.
8. Press the emergency stop button on the loading magazine.
9. Close the compressed air stop valve at the loading magazine.
  - ➔ The system is vented.
10. Where necessary, obtain release from the lathe to open the cover.
11. Open the cover.
12. Secure the guide channel with safety bolts.
13. If the material bar reaches into the working area of the lathe: pull the material bar by hand towards the loading magazine, until the material bar is full on the loading magazine.
14. Remove the material bar from the loading magazine via the lateral material storage.
15. Remove the safety bolts in the guide channel.
16. Close the cover.
17. Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*

18. ▶ Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
19. ▶ Swing the pusher in using the  button.
20. ▶ Close the guide channel with the  button.
21. ▶ Acknowledge the error message by pressing the  button.

**Draw off remnant, eject it and draw on the new material bar**

**i** *When executing the action, the remnant is removed from the clamping sleeve, ejected into the remnant bin and then a new material bar is loaded from the lateral material storage and drawn onto the clamping device.*

**i** *With this action, a first insert can be performed after the new bar has been drawn in. For this purpose, select the desired operating mode.*

There must be a material bar in the lateral material storage.

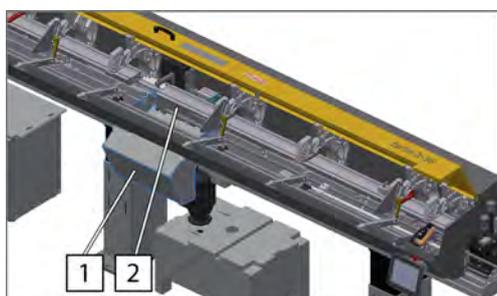
1. ▶ Press the  button.
2. ▶ Access **SETUP**.
3. ▶ Press the  button.

➔ The status display on the button turns green during the action. Once the action has been completed, the status display on the button is switched off.

Without first insert: The remnant is located in the remnant bin. The new material bar is drawn in and is in the working room of the lathe.

With first insert: The remnant is located in the remnant bin. The new material bar is drawn in and is in the working room of the lathe.

**Remnant bin**



The remnant bin is located **1** under the loading magazine and is accessed from the front. When the remnant flap **2** opens, the remnant lying on it falls down into the remnant bin and can be removed.

## Remove of the remnant

### WARNING

#### Driven remnant flap

Personal injury due to squashing, impact or striking by the driven remnant flap.

When removing the remnant, the operator has to reach down into the remnant bin. If the operator reaches up, his/her hand would be in the area of the driven remnant flap.

- When removing the remnants in the remnant bin, do not reach upwards.

### CAUTION

#### Further ejection of remnants in the remnant bin

Personal injury due to squashing and impact as a result of addition residual ejection.

When removing a remnant from the remnant bin, there may be a further ejection of remnants. The remnant may hit extremities in the remnant bin.

- Do not reach into the remnant bin during the bar change.
- When removing a remnant, observe the current operating conditions of the loading magazine.



Switch the steady on/off as a insertion aid

→ Remove remnant from the remnant bin 1.

1. → Press the  button.

2. → Access **PRODUCTION**.

Switch on:

1. → Press the  button.

- ➔ The status display on the button turns green. The steady function as an insertion aid is switched on.

Switch off:

1. → Press the  button.

- ➔ The status display on the button is off. The steady function as an insertion aid is switched off.

## Switching Steady on/off

1. → Press the  button.

2. → Access **PRODUCTION** or **SETUP**.

Switch on:

1. Press the  button.
  - ➔ The status display on the button turns green. The steady is switched on.

Switch off:

1. Press the  button.
  - ➔ The status display on the button is off. The steady is switched off.

### Switching Steady lathe on/off

1. Press the  button.
2. Access **PRODUCTION**.

Switch on:

1. Press the  button.
  - ➔ The status display on the button turns green. The lathe steady is switched on.

Switch off:

1. Press the  button.
  - ➔ The status display on the button is off. The lathe steady is switched off.

### Switching Interval insert on/off

1. Press the  button.
2. Access **PRODUCTION**.

Switch on:

1. Press the  button.
  - ➔ The status display on the button turns green. The interval insert is switched on.

Switch off:

1. Press the  button.
  - ➔ The status display on the button is off. The interval insert is switched off.

### Switching Brake function on/off

1. Press the  button.
2. Access **PRODUCTION**.

Switch on:

1. Press the  button.
  - ➔ The status display on the button turns green. The brake function is switched on.

Switch off:

1. Press the  button.

➔ The status display on the button is off. The brake function is switched off.

## Switching Oil pump on/off

1. Press the  button.

2. Access **SETUP**.

Switch on:

1. Press the  button.

➔ The status display on the button turns green. The oil pump is switched on.

Switch off:

1. Press the  button.

➔ The status display on the button is off. The oil pump is switched off.

## Eject the remnant

1. Press the  button.

2. Access **SETUP**.

1. Press and hold the  button.

➔ The status display on the button turns green. The remnant flap is opened. The remnant falls down into the remnant bin.

3. Release the  button.

➔ The status display on the button is off. The remnant flap is closed.

## Separate the material bar

1. Press the  button.

2. Access **SETUP**.

1. Press and hold the  button.

➔ The status display on the button turns green. The material bar is separated.

3. Release the  button.

➔ The status display on the button is off. The separation is ended.

## Close/open the material gripper

1. Press the  button.

2. Access **SETUP**.

Close:

1. Press the  button.
  - ➔ The status display on the button turns green. The material gripper is closed.

Open:

1. Press the  button.
  - ➔ The status display on the button is off. The material gripper is opened.

### Open/close the guide channel

1. Press the  button.

2. Access **SETUP**.

Open:

1. Press the  button.
  - ➔ The status display on the button turns green. The front guide channel is opened.

Close:

1. Press the  button.
  - ➔ The status display on the button is off. The guide channel is closed.

### Swing the pusher out/in

1. Press the  button.

2. Access **SETUP**.

Swing out:

1. Press the  button.
  - ➔ The status display on the button turns green. The pusher has been swung out.

Switch off:

1. Press the  button.
  - ➔ The status display on the button is off. The pusher has been swung in.

## 7 Capacity adjustment

### 7.1 General capacity adjustment

#### Capacity adjustment set

The loading magazine can process material bars of different diameters. Certain components of the loading magazine can be adjusted to the material bar diameter to be processed, to improve the guide of the material bar. These components are consolidated in a capacity adjustment set and can be exchanged if needed.

In the event of questions about the choice of the right capacity adjustment set, please contact FMB. → *“Service contact details” on page 111.*

The capacity adjustment set includes:

- A pusher with a short pusher and flag
- Inserts of the guide channel
- Lifting plates

Depending on the extension version and the type of lathe, further adjustments may be necessary during adjustment to other diameters. For information about this see the extension-specific adapter set diagram. → *“Other applicable documents” on page 5.*

#### Move to the conversion position



*When the conversion position has been moved to, the front and rear guide channel is opened and the pusher swings out.*

1. → Press the  button.

2. → Access **SETUP**.

1. → Press the  button.

- ➔ The status display on the button turns green. The conversion position is moved to (duration approx. 10s).

### 7.2 Guide channel

#### Secure the guide channel with safety bolts



**WARNING**

#### Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.



**CAUTION**

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

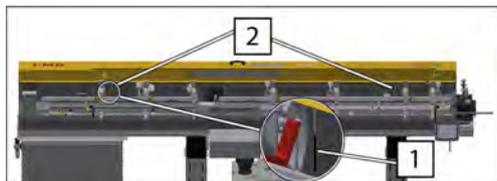
**⚠ CAUTION**

**Driven guide channel cover**

**Personal injury due to squashing and impact by the closing of the guide channel cover.**

**When working on the opened guide channel, the driven guide channel cover may squash extremities.**

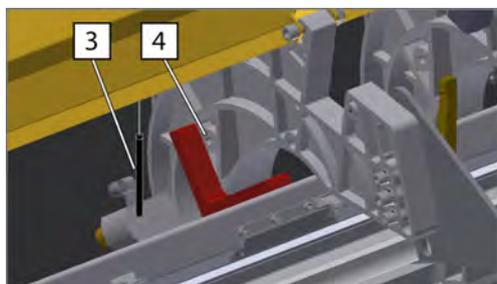
- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



The safety bolts **1** are attached to a chain on the loading magazine and are in the position **2**. The guide channel can open at the front, at the back or at the front and back. The safety bolts must secure the respective open position when working on the open guide channel (front only, rear only or front and rear).

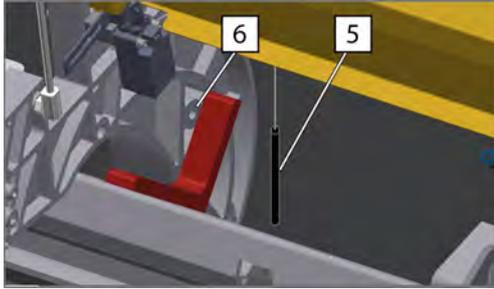
**Guide channel, front:**

- 1.** Press the  button.
- 2.** Press **SETUP**.
- 3.** Open the front guide channel with the  button.
- 4.** Press the emergency stop button. ➔ *“Press the emergency stop button” on page 47.*
- 5.** Switch off the supply of compressed air. ➔ *“Switch the supply of compressed air on/off” on page 105*
- 6.** Where necessary, obtain release from the lathe to open the cover.
- 7.** Open the cover.
- 8.** Insert the safety bolt **3** into the hole **4**.
  - ➔ The guide channel is secured by a safety bolt at the front.
- 9.** After finishing work on the guide channel, remove the safety bolt **3** from the hole **4**.
- 10.** Close the cover.
- 11.** Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*
- 12.** Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
- 13.** Close the front guide channel with the  button.
- 14.** Acknowledge the error message by pressing the  button.



**Guide channel, rear**

- 1.** Press the  button.
- 2.** Press **SETUP**.
- 3.** Open the front guide channel with the  button (swing out the pusher).
- 4.** Press the emergency stop button. ➔ *“Press the emergency stop button” on page 47.*



5. ➤ Switch off the supply of compressed air. ➔ *“Switch the supply of compressed air on/off” on page 105*
6. ➤ Where necessary, obtain release from the lathe to open the cover.
7. ➤ Open the cover.
8. ➤ Insert the safety bolt [5] into the hole [6].
  - ➔ The rear guide channel is secured by a safety bolt.
9. ➤ After finishing work on the guide channel, remove the safety bolt [5] from the hole [6].
10. ➤ Close the cover.
11. ➤ Close the rear guide channel with the  button (swing in the pusher).
12. ➤ Acknowledge the error message by pressing the  button.

## Pusher

The pusher is driven by the drive motor and moves the material bar into the working area of the lathe. The diameter of the pusher depends on the diameter of the material to be processed and must be changed when processing different material thicknesses.

Depending on the spindle diameter of the lathe, it may be necessary for the spindle diameter to also be adjusted. In the event of questions about this please contact FMB. ➔ *“Service contact details” on page 111*

## Exchange the pusher and lifting plates

 **WARNING**

### Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

 **CAUTION**

### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

 **CAUTION**

### Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

When working on the opened guide channel, the driven guide channel cover may squash extremities.

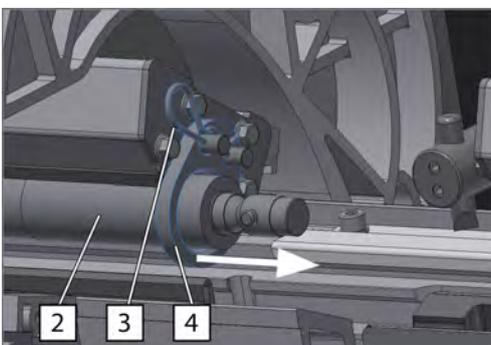
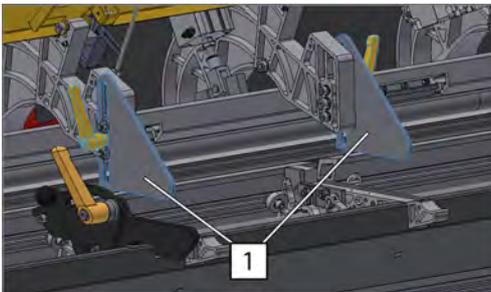
- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.



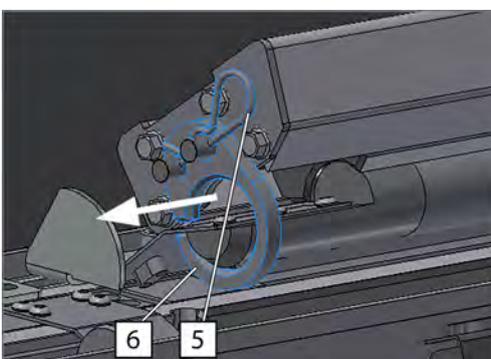
A second person is required to exchange the pusher, to support the work.

**Removal:**

1. ➤ Press the button.
2. ➤ Press **SETUP**.
3. ➤ Move to the conversion position by pressing the button. ➤ “Move to the conversion position” on page 76.
4. ➤ Press the emergency stop button. ➤ “Press the emergency stop button” on page 47.
5. ➤ Switch off the supply of compressed air. ➤ “Switch the supply of compressed air on/off” on page 105
6. ➤ Where necessary, obtain release from the lathe to open the cover.
7. ➤ Open the cover.
8. ➤ Secure the front and rear guide channel with safety bolts. ➤ “Secure the guide channel with safety bolts” on page 76.
9. ➤ Set the holding-down device **1** in the area of the pusher to the highest position. ➤ “Set the height of the holding-down device” on page 97.

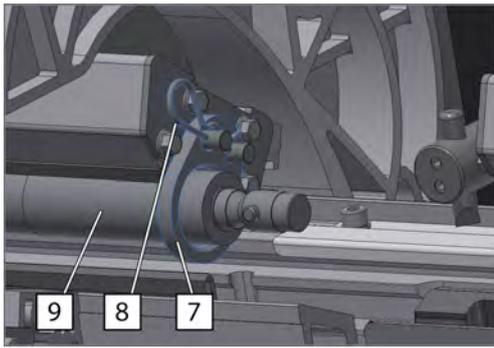


10. ➤ Hold the pusher **2** (second person).
11. ➤ Remove the safety device **3**.
12. ➤ Remove the lifting plate (front) **4** in the direction indicated by the arrow.

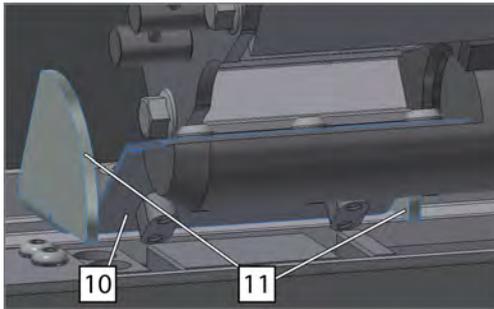


13. ➤ Remove the safety device **5**.
14. ➤ Remove the lifting plate (rear) **6** in the direction indicated by the arrow.
15. ➤ Remove the pusher (second person).

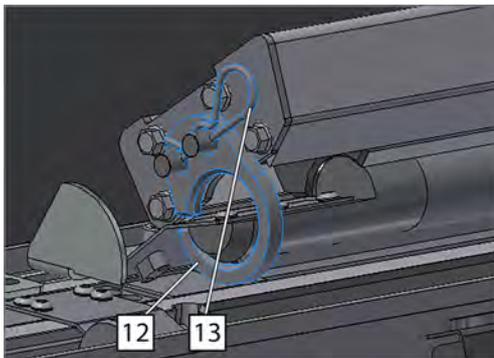
**Installation:**



1. ➤ Insert the lifting plate (front) [7].
2. ➤ Insert the [8] safety device.
3. ➤ Insert the pusher [9] with the front end going into the lifting plate (front) [7] (second person).



4. ➤ Insert the rear end of the pusher with the flag [10] into the guide [11] and hold it (second person).



5. ➤ Insert the lifting plate (rear) [12].
6. ➤ Insert the [13] safety device.
  - ➔ The pusher has been installed.
7. ➤ Remove the safety bolts in the guide channel.
8. ➤ Close the cover.
9. ➤ Switch on the compressed air supply. ➔ "Switch the supply of compressed air on/off" on page 105
10. ➤ Unlock the emergency stop button. ➔ "Make the loading magazine ready for operation after the emergency stop" on page 47
11. ➤ Swing the pusher in using the  button.
12. ➤ Close the guide channel with the  button.
13. ➤ Acknowledge the error message by pressing the  button.

## Change flag



When changing the pusher, the flag from the old pusher is mounted onto the new pusher.



1. ➤ Detach the pusher. ➔ "Exchange the pusher and lifting plates" on page 78.
2. ➤ Loosen and remove the screws [1] in the flag.
3. ➤ Remove the flag.
4. ➤ Attach the flag in reverse order.
5. ➤ Insert the pusher. ➔ "Exchange the pusher and lifting plates" on page 78.

Change the insert of the top rear guide channel

**WARNING**

**Falling material bar**

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

**CAUTION**

**Sharp knives of the material gripper**

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

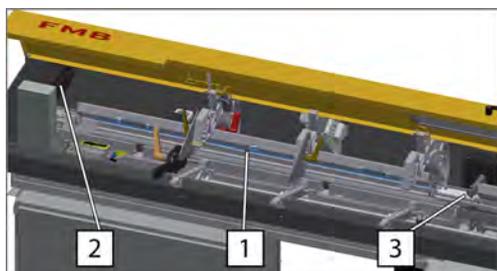
**CAUTION**

**Driven guide channel cover**

Personal injury due to squashing and impact by the closing of the guide channel cover.

When working on the opened guide channel, the driven guide channel cover may squash extremities.

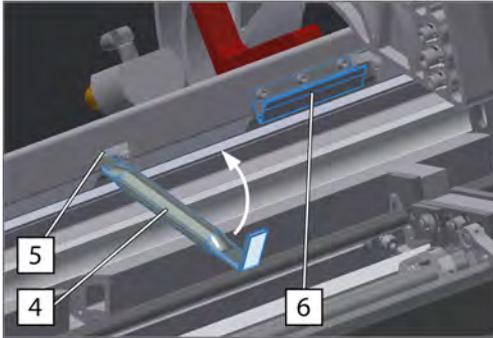
- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.



The top rear guide channel insert **1** is located in the area between the drive motor **2** and the material gripper **3**

To change the top rear guide channel insert, the pusher must be removed. → "Exchange the pusher and lifting plates" on page 78.

1. Press the  button.
2. Press **SETUP**.
3. Move to the conversion position by pressing the  button. → "Move to the conversion position" on page 76.
4. Press the emergency stop button. → "Press the emergency stop button" on page 47.
5. Switch off the supply of compressed air. → "Switch the supply of compressed air on/off" on page 105
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the front and rear guide channel with safety bolts. → "Secure the guide channel with safety bolts" on page 76



9. Place the insertion tool **4** with the short bend into the recess **5** in the upper guide channel.
10. Press and hold the insert safeguard **6** and move the insert tool **4** in the direction indicated by the arrow.
  - ➔ The insert is now detached.
11. Remove the insert tool.
12. Remove the insert.
13. Place the new insert into the upper rear guide channel and press in firmly by hand.
14. Remove the safety bolts in the guide channel.
15. Close the cover.
16. Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*
17. Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
18. Swing the pusher in using the  button.
19. Close the guide channel with the  button.
20. Acknowledge the error message by pressing the  button.

## Change the insert of the bottom rear guide channel

### WARNING

#### Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

### CAUTION

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

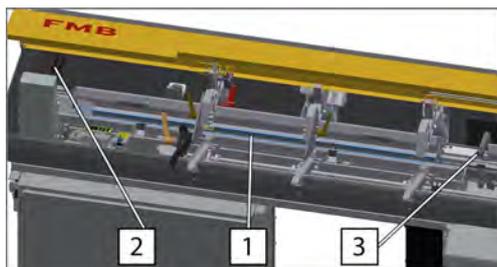
### CAUTION

#### Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

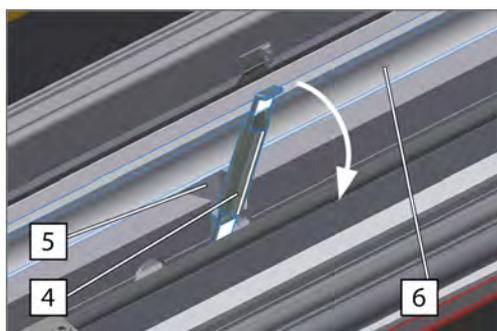
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.



The bottom rear guide channel insert **1** is located in the area between the drive motor **2** and the remnant bin **3**. The insert consists of several parts. The change is described using the example of one part of the insert, but has to be done for all the parts.

1. ▶ Press the  button.
2. ▶ Press **SETUP**.
3. ▶ Move to the conversion position by pressing the  button.  
➔ *“Move to the conversion position” on page 76.*
4. ▶ Press the emergency stop button. ➔ *“Press the emergency stop button” on page 47.*
5. ▶ Switch off the supply of compressed air. ➔ *“Switch the supply of compressed air on/off” on page 105*
6. ▶ Where necessary, obtain release from the lathe to open the cover.
7. ▶ Open the cover.
8. ▶ Secure the front and rear guide channel with safety bolts.  
➔ *“Secure the guide channel with safety bolts” on page 76*
9. ▶ Place the insertion tool **4** with the long bend into the recess **5** in the lower guide channel.
10. ▶ Move the insert tool **4** in the direction indicated by the arrow.  
➔ The insert is now detached.
11. ▶ Remove the insert.
12. ▶ Remove the insert tool.
13. ▶ Place the new insert into the bottom rear guide channel and press in firmly by hand.
14. ▶ Remove the safety bolts in the guide channel.
15. ▶ Close the cover.
16. ▶ Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*
17. ▶ Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
18. ▶ Swing the pusher in using the  button.
19. ▶ Close the guide channel with the  button.
20. ▶ Acknowledge the error message by pressing the  button.



## Change the insert of the top front guide channel

### ⚠ WARNING

#### Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

### ⚠ CAUTION

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

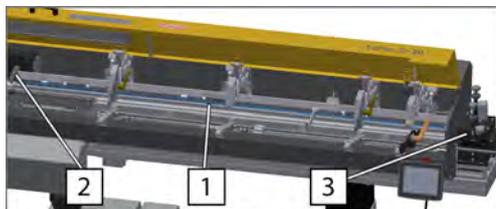
### ⚠ CAUTION

#### Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

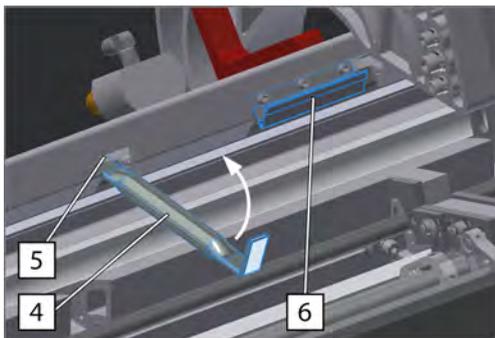
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.



The top front guide channel insert **1** is located in the area between the drive motor **2** and the steady **3**. The insert consists of several parts. The change is described using the example of one part of the insert, but has to be done for all the parts.

1. Press the  button.
2. Press **SETUP**.
3. Move to the conversion position by pressing the  button.   
➔ "Move to the conversion position" on page 76.
4. Press the emergency stop button. ➔ "Press the emergency stop button" on page 47.
5. Switch off the supply of compressed air. ➔ "Switch the supply of compressed air on/off" on page 105
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the front and rear guide channel with safety bolts.   
➔ "Secure the guide channel with safety bolts" on page 76



9. Place the insertion tool **4** with the short bend into the recess **5** in the upper guide channel.
10. Press and hold the insert safeguard **6** and move the insert tool **4** in the direction indicated by the arrow.
  - ➔ The insert is now detached.
11. Remove the insert tool.
12. Remove the insert.
13. Place the new insert into the top front guide channel and press in firmly by hand.
14. Remove the safety bolts in the guide channel.
15. Close the cover.
16. Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*
17. Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
18. Swing the pusher in using the  button.
19. Close the guide channel with the  button.
20. Acknowledge the error message by pressing the  button.

### Change the remnant flap insert

 **WARNING**

#### Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

 **CAUTION**

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

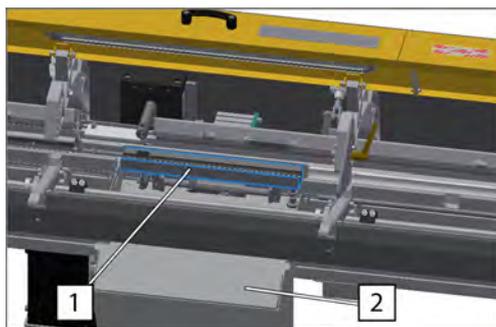
 **CAUTION**

#### Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

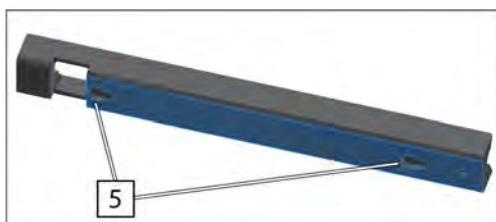
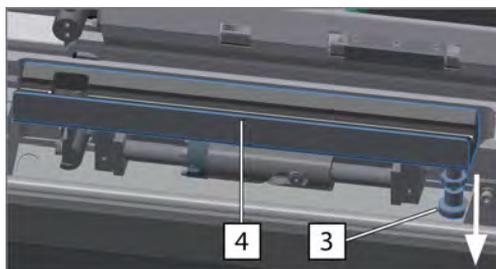
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.



The remnant flap insert **1** is located in the guide channel at the height of the remnant bin **2**.

1. Press the  button.
2. Press **SETUP**.
3. Move to the conversion position by pressing the  button.  
➔ "Move to the conversion position" on page 76.
4. Press the emergency stop button. ➔ "Press the emergency stop button" on page 47.
5. Switch off the supply of compressed air. ➔ "Switch the supply of compressed air on/off" on page 105
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the front and rear guide channel with safety bolts.  
➔ "Secure the guide channel with safety bolts" on page 76
9. Pull and hold the insert safeguard **3** in the direction indicated by the arrow.
10. Push the remnant flap insert **4** towards the insert safeguard and remove it from above.



11. Place the new remnant flap insert with the holes **5** on the insert pegs in the guide channel.
12. Push the remnant flap insert towards the material gripper until the insert safeguard **3** locks into place.
13. Remove the safety bolts in the guide channel.
14. Close the cover.
15. Switch on the compressed air supply. ➔ "Switch the supply of compressed air on/off" on page 105
16. Unlock the emergency stop button. ➔ "Make the loading magazine ready for operation after the emergency stop" on page 47
17. Swing the pusher in using the  button.
18. Close the guide channel with the  button.
19. Acknowledge the error message by pressing the **CLR** button.

## Change the insert of the bottom front guide channel

### WARNING

#### Falling material bar

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

### CAUTION

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.

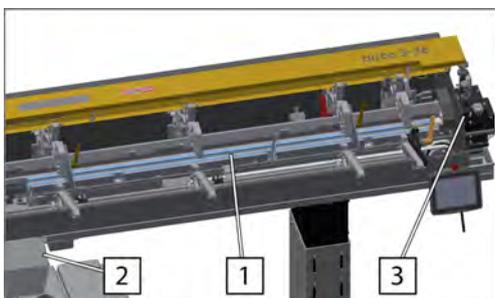
### CAUTION

#### Driven guide channel cover

Personal injury due to squashing and impact by the closing of the guide channel cover.

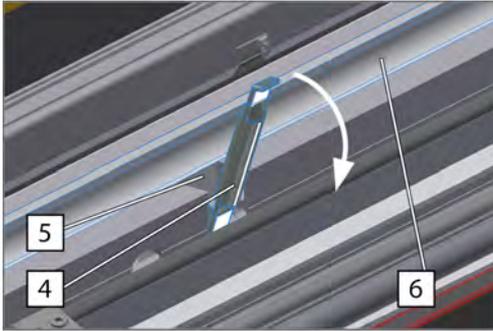
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.



The bottom front guide channel insert **1** is located in the area between the remnant bin **2** and the steady **3**. The insert consists of several parts. The change is described using the example of one part of the insert, but has to be done for all the parts.

1.  Press the  button.
2.  Press **SETUP**.
3.  Move to the conversion position by pressing the  button.  
➔ "Move to the conversion position" on page 76.
4.  Press the emergency stop button. ➔ "Press the emergency stop button" on page 47.
5.  Switch off the supply of compressed air. ➔ "Switch the supply of compressed air on/off" on page 105
6.  Where necessary, obtain release from the lathe to open the cover.
7.  Open the cover.
8.  Secure the front and rear guide channel with safety bolts.  
➔ "Secure the guide channel with safety bolts" on page 76



9. Place the insertion tool **4** with the long bend into the recess **5** in the lower guide channel.
10. Move the insert tool **4** in the direction indicated by the arrow.
  - ➔ The insert is now detached.
11. Remove the insert.
12. Remove the insert tool.
13. Place the new insert into the bottom front guide channel and press in firmly by hand.
14. Remove the safety bolts in the guide channel.
15. Close the cover.
16. Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*
17. Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
18. Swing the pusher in using the  button.
19. Close the guide channel with the  button.
20. Acknowledge the error message by pressing the  button.

## 7.3 Reduction

Attach/detach the reduction insert of the telescopic tube

 **DANGER**

Moving components of the loading magazine and the machine tool  
 Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool.

When working on the unsecured interface (with the guide or telescopic tube detached) between the loading magazine and the machine tool, the extremities may become caught or stuck in the moving components of the loading magazine or machine tool.

- Turn off the machine tool before starting work on the main switch.

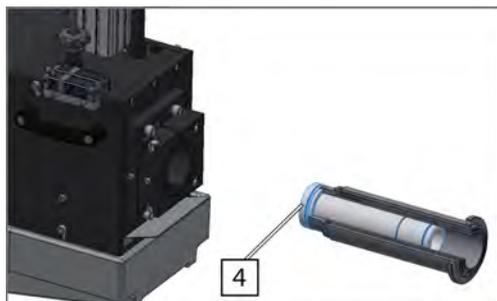
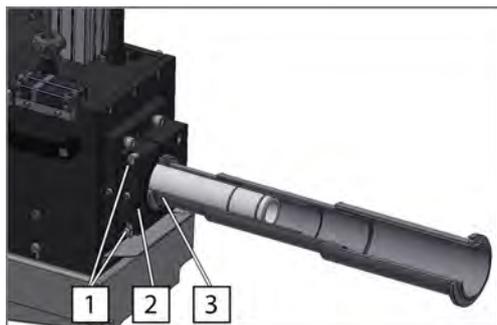
**i**

*The reduction insert of the telescopic tube is related to the diameter and is changed when converting the loading magazine to a different diameter. The reduction insert of the telescopic tube is part of the capacity adjustment set.*

There must be sufficient space between the lathe and loading magazine to remove the reduction insert from the telescopic tube. This can be achieved by moving the headstock of the lathe or by shifting the loading magazine with the shifting device (optional).

Removal

1. Press the emergency stop button. ➔ *“Press the emergency stop button” on page 47.*
2. Switch off the supply of compressed air. ➔ *“Switch the supply of compressed air on/off” on page 105*



3. ➤ Loosen the screws 1.
  - ➔ The clamping piece 2 is detached.
4. ➤ Push the telescopic tube 3 towards the lathe.
5. ➤ Remove the reduction insert 4 by hand from the telescopic tube 3.

#### Installation

1. ➤ Move the reduction insert 4 up to the end stop in the telescopic tube 3.
2. ➤ Reattach the telescopic tube to the loading magazine.
  - ➔ "Assembling the telescopic tube" on page 32
3. ➤ Switch on the compressed air supply. ➔ "Switch the supply of compressed air on/off" on page 105
4. ➤ Unlock the emergency stop button. ➔ "Make the loading magazine ready for operation after the emergency stop" on page 47
5. ➤ Acknowledge the error message by pressing the CLR button.

#### Install/remove the reduction shells

**⚠ DANGER**

Moving components of the loading magazine and the machine tool

Personal injury due to squashing, impact or striking by movements of the loading magazine and the machine tool.

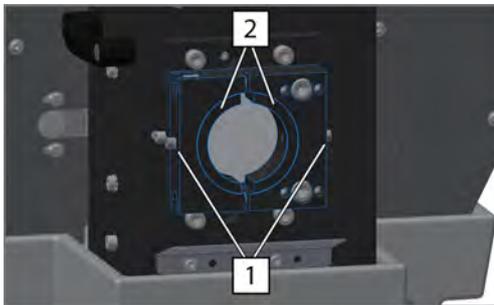
When working on the unsecured interface (with the guide or telescopic tube detached) between the loading magazine and the machine tool, the extremities may become caught or stuck in the moving components of the loading magazine or machine tool.

- Turn off the machine tool before starting work on the main switch.

**i**

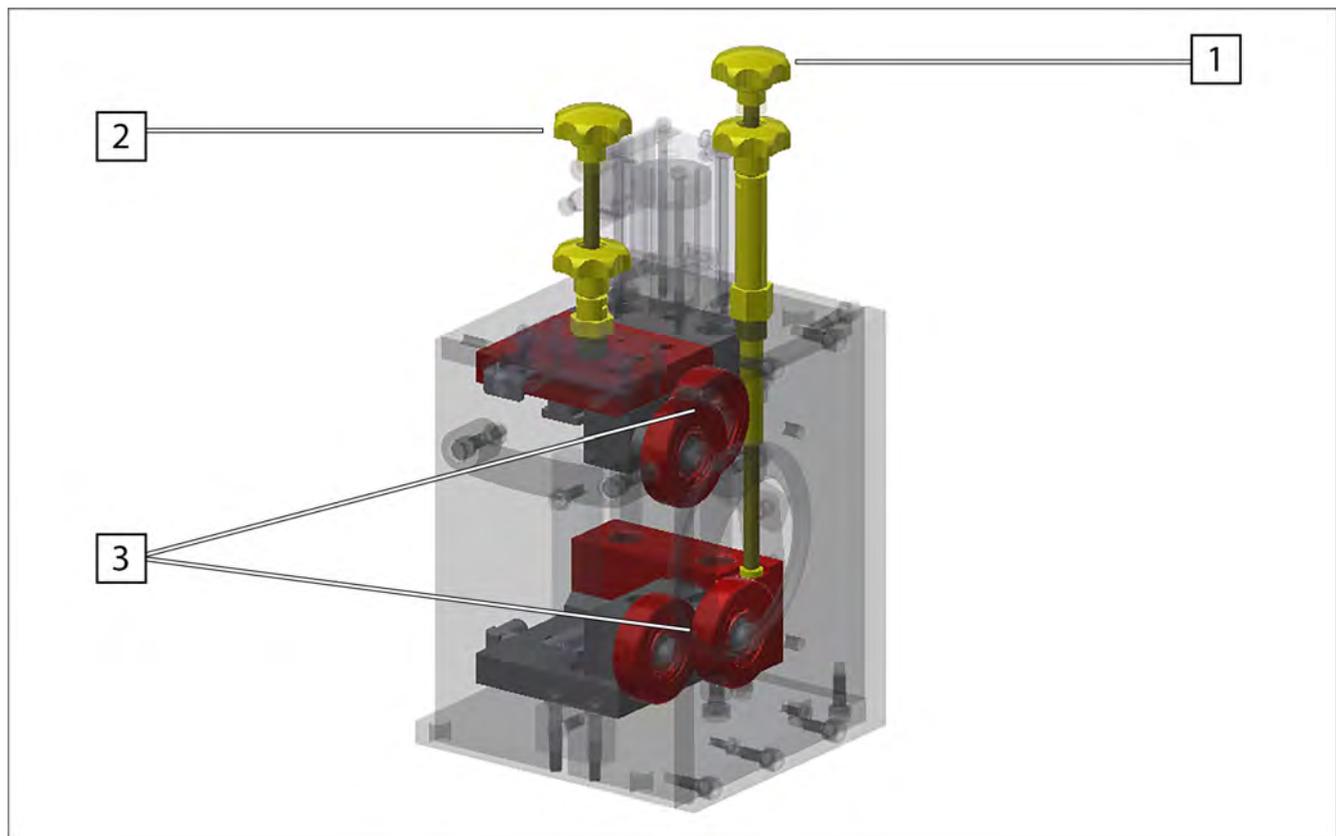
The diameter of the clamping piece can vary. If the reduction shells are installed, guide and telescopic tubes with an outer diameter of 70 mm are attached. If the reduction shells are not installed, guide and telescopic tubes with an outer diameter of 90 mm are attached.

1. ➔ Press the emergency stop button. ➔ *“Press the emergency stop button” on page 47.*
2. ➔ Switch off the supply of compressed air. ➔ *“Switch the supply of compressed air on/off” on page 105*
3. ➔ Loosen and remove the screws [1].
4. ➔ Remove the reduction shells [2].
5. ➔ Attach the reduction shells in reverse order.
6. ➔ Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*
7. ➔ Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
8. ➔ Acknowledge the error message by pressing the  button.



## 7.4 Steady

### Steady



The steady moves the material bar during processing. For this purpose, the material guide of the steady can be equipped with jaws (jaw steady) or rollers (roller steady). To guide the material bar the steady is closed. In open condition, the material bar and pusher can pass.

The open and closed position can be adjusted via the end stops. When closing, the steady moves to the desired material bar diameter and guides the material bar. When opening, the steady

moves the material guide apart so that the pusher can pass. The end stop **1** limits the material guide **3** when being closed. The end stop **2** limits the material guide **3** when being opened  
 ➔ *“Adjust the steady to the material bar diameter” on page 91.*

The steady can also be set so that the material guide can be adjusted to the current material thickness when closed. For this purpose, the pressure is reduced at the pressure control valve of the steady. With the right setting, the material guide can adjust itself automatically. In this case the steady opens and closes to the maximum. When closing, the steady stops as soon as the material guide **3** reaches the surface of the material bar. The material bar is then guided without excessive wear. The stop screws **1** and **2** are completely screwed back and have no function .

**Moveable steady**

On some lathes with a moving headstock, it is possible to install a moveable steady. The moveable steady is attached to the headstock of the lathe and improves the vibrational and guiding characteristics of the material bar.

Extensions have to be clarified in advance with FMB. ➔ *“Service contact details” on page 111.*

**Adjust the steady to the material bar diameter**

**i** *The steady can be used as a roller steady or a jaw steady. Depending on the application, rollers or jaws have to be installed to guide the material.*

The path of the rollers when the steady is closed is set with the stop screws **2**.

The path of the rollers when the steady is opened is set with the stop screws **4**. This is only necessary in the event of pusher vibrations ➔ *“Guide the pusher with the steady” on page 92.* In all other cases, the stop screw **4** is screwed completely down, so that the steady opens fully in open position.



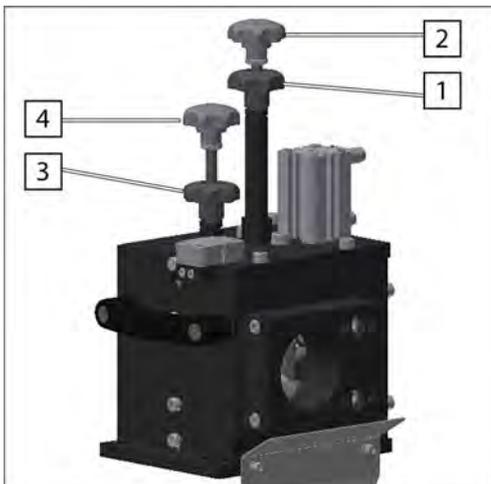
1. ➔ Press the button.
2. ➔ Press **SETUP**.
3. ➔ Close the steady by pressing the button.
  - ➔ The status display on the button turns green. The steady is closed.
4. ➔ Loosen the lock nut **3**.
5. ➔ Turn the stop screw **4** to the left, until stop screw **4** can be removed.
6. ➔ Open the steady with the button.
  - ➔ The status display on the button is off. The steady is open.
7. ➔ Turn the stop screw **4** to the right, until you feel resistance.
8. ➔ Loosen the lock nut **3**
  - ➔ The end stop for the open position is set
9. ➔ Loosen the lock nut **1**.

10. Turn the stop screw **2** to the left, until stop screw **2** can be removed.
11. Move the material bar into the lathe with the  button.
12. Clamp the material bar in the lathe.
13. Close the steady by pressing the  button.
  - ➔ The status display on the button turns green. The steady is closed.
14. Turn the stop screw **2** to the right, until you feel resistance.
  - ➔ The stop screw **2** is touching the end stop.
15. Open the steady with the  button.
  - ➔ The status display on the button is off. The steady is open.
16. Turn the stop screw **2** two revolutions to the right.
17. Tighten the lock nut **1**.
  - ➔ The end stop for the closed position is set.
18. **When used as a roller steady:** set selection **Steady**, Selection option **Roller steady**. ➔ "Enter the selection option" on page 56.
19. **When used as a jaw steady:** set selection **Steady**, Selection option **Jaw steady**. ➔ "Enter the selection option" on page 56.

## Guide the pusher with the steady



*In the event of vibrations of the pusher, the steady can be set so that it guides the pusher in open position.*

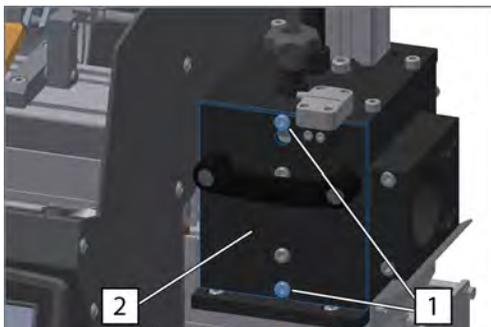


1. Press the  button.
2. Press **SETUP**.
3. Close the steady by pressing the  button.
  - ➔ The status display on the button turns green. The steady is closed.
4. Loosen the lock nut **3**.
5. Turn the stop screw **4** to the left, until stop screw **4** can be removed.
6. Open the steady with the  button.
  - ➔ The status display on the button is off. The steady is open.
7. Move the pusher into the lathe with the  button, until the pusher is in the area of the steady.
8. Loosen the lock nut **1**.
9. Turn the stop screw **2** to the left, until stop screw **2** can be removed.
10. Close the steady by pressing the  button.
  - ➔ The status display on the button turns green. The steady is closed.

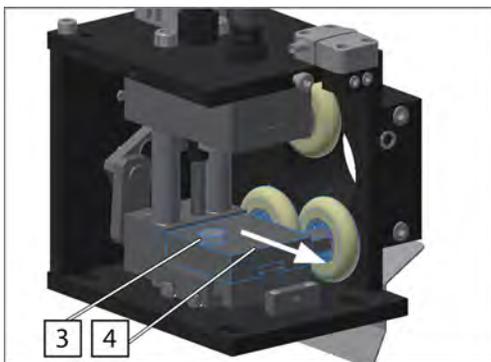
11. Turn the stop screw **4** to the right, until you feel resistance.
12. Turn the stop screw **4** two revolutions to the left.
13. Tighten the lock nut **3**.
  - ➔ The end stop for the open position is set
14. **When used as a roller steady:** set selection **Steady**, Selection option **Roller steady**. ➔ *“Enter the selection option” on page 56.*
15. **When used as a jaw steady:** set selection **Steady**, Selection option **Jaw steady**. ➔ *“Enter the selection option” on page 56.*

**Attach/detach the rollers of the steady**

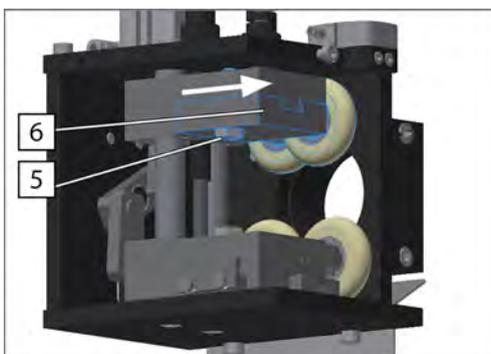
1. Press the emergency stop button. ➔ *“Press the emergency stop button” on page 47.*
2. Switch off the supply of compressed air. ➔ *“Switch the supply of compressed air on/off” on page 105*
3. Loosen the screws **1**.
4. Remove the lid **2**.

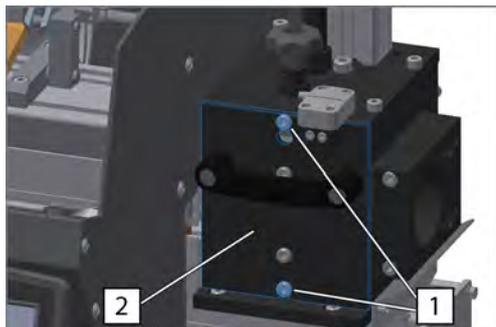


5. Loosen and remove the screw **3**.
6. Remove the roller holder **4** in the direction indicated by the arrow.



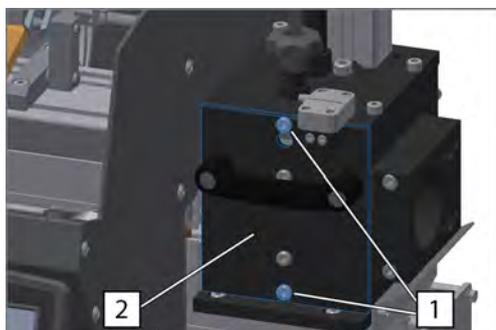
7. Loosen and remove the screw **5**.
8. Remove the roller holder **6** in the direction indicated by the arrow.
9. Attach the rollers in reverse order.





10. Attach the lid **2**.
11. Tighten the **1** screws.
12. Switch on the compressed air supply. → *“Switch the supply of compressed air on/off” on page 105*
13. Unlock the emergency stop button. → *“Make the loading magazine ready for operation after the emergency stop” on page 47*
14. Acknowledge the error message by pressing the **CLR** button.

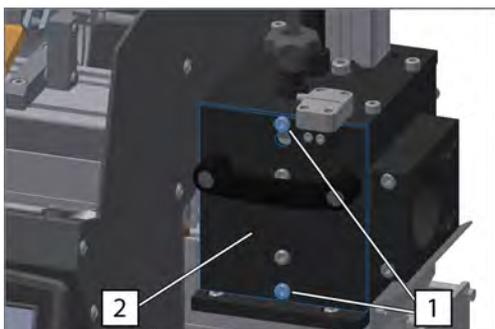
## Attach/remove the jaws of the steady



1. Press the emergency stop button. → *“Press the emergency stop button” on page 47.*
2. Switch off the supply of compressed air. → *“Switch the supply of compressed air on/off” on page 105*
3. Loosen the screws **1**.
4. Remove the lid **2**.



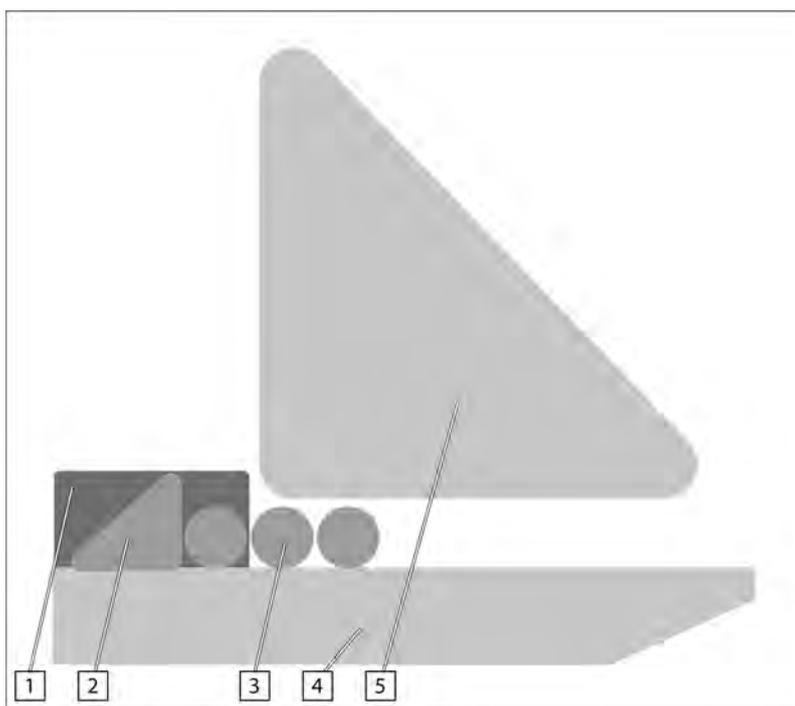
5. Push the jaws **3** in the direction indicated by the arrow and remove them.
6. Remove the upper jaw of the steady in the same way.
7. Attach the jaws in reverse order.



- 8. Attach the lid 2.
- 9. Tighten the 1 screws.
- 10. Switch on the compressed air supply. → "Switch the supply of compressed air on/off" on page 105
- 11. Unlock the emergency stop button. → "Make the loading magazine ready for operation after the emergency stop" on page 47
- 12. Acknowledge the error message by pressing the CLR button.

## 7.5 Separating device

### Separation device, general



<span style="border: 1px solid black; padding: 0 2px;">1</span>	Ejectors	<span style="border: 1px solid black; padding: 0 2px;">4</span>	Lateral material storage
<span style="border: 1px solid black; padding: 0 2px;">2</span>	End stop of the ejectors	<span style="border: 1px solid black; padding: 0 2px;">5</span>	Holding-down device
<span style="border: 1px solid black; padding: 0 2px;">3</span>	Material bar		

Thanks to the separation device of the loading magazine, the material bars are stocked and separated for the bar change.

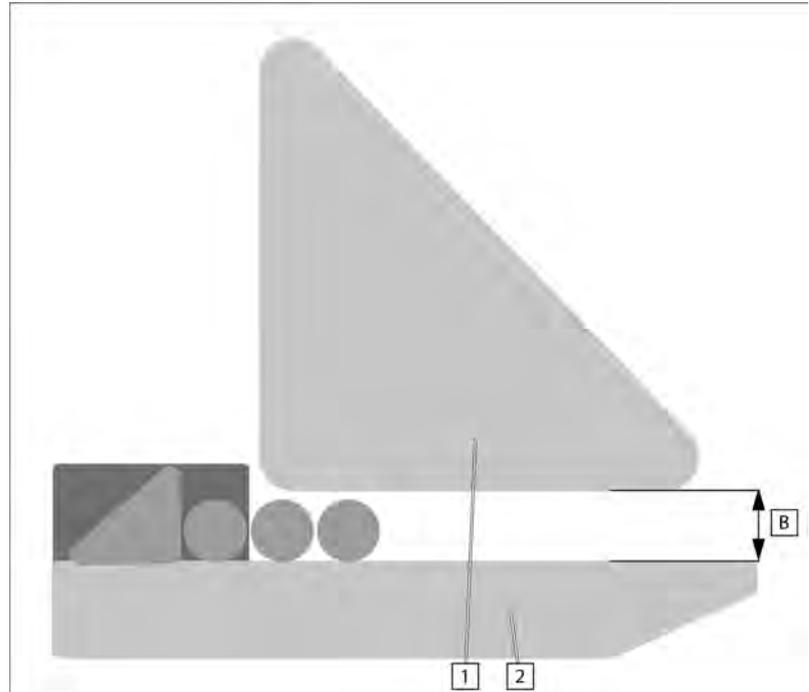
The separation device consists of the lateral material storage, the ejectors, the end stop of the ejectors and the holding-down device.

The material bars are kept in the lateral material storage. Thanks to the angle of the lateral material storage, the material bars slide towards the guide channel. The holding-down device limits the height of the lateral material storage, so that the material bars do not roll over each other. The end stop of the ejectors is set up so that only one material bar lies on the ejectors. The ejectors move up and lift a material bar into the guide channel.

To adjust the separation device to the respective material bar diameter, the following components have to be set.

- The height of the holding-down device
- End stop of the ejectors

### The height of the holding-down device



The holding-down devices are set via the dimension  $\boxed{B}$ . The dimension  $\boxed{B}$  is measured from the lower edge of the holding-down device  $\boxed{1}$  to the storage area of the lateral material storage  $\boxed{2}$ .

For the dimension  $\boxed{B}$  the following applies:

- The diameter of the current material bar to be processed + 1 mm.

Set the height of the holding-down device



**Falling material bar**

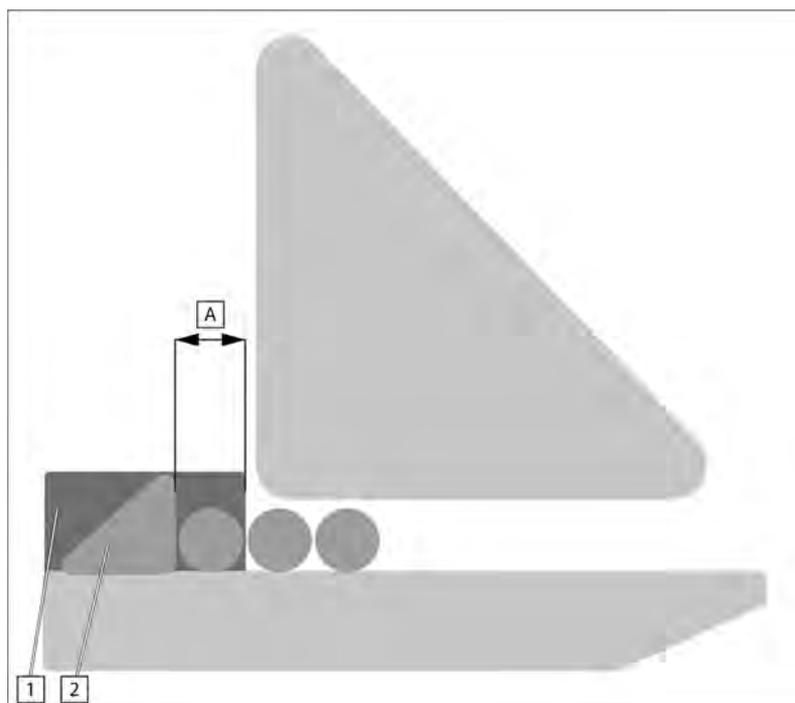
Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

1. ➤ Press the emergency stop button. ➔ *“Press the emergency stop button” on page 47.*
2. ➤ Switch off the supply of compressed air. ➔ *“Switch the supply of compressed air on/off” on page 105*
3. ➤ Where necessary, obtain release from the lathe to open the cover.
4. ➤ Open the cover.
5. ➤ Loosen the tapper spanner 1.
6. ➤ Move the holding-down device 2 to the desired height.
7. ➤ Close the tapper spanner 1.
8. ➤ Set the rest of the holding-down devices in the same way.
9. ➤ Close the cover.
10. ➤ Switch on the compressed air supply. ➔ *“Switch the supply of compressed air on/off” on page 105*
11. ➤ Unlock the emergency stop button. ➔ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
12. ➤ Acknowledge the error message by pressing the CLR button.



**End stop of the ejectors**

The end stop of the ejectors is set by the dimension  $\boxed{A}$ . The dimension  $\boxed{A}$  is measured from the front edge of the ejectors  $\boxed{1}$  to the front edge of the end stop of the ejectors  $\boxed{2}$ .

For the dimension  $\boxed{A}$  the following applies:

- The diameter of the current material bar to be processed.

Set the end stop of the ejectors

**WARNING**

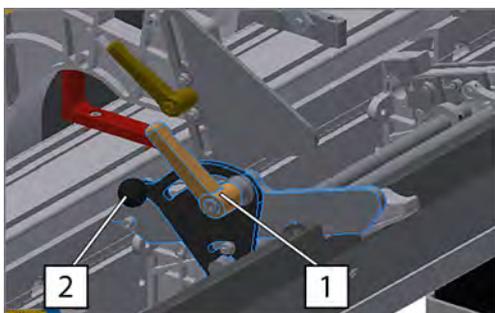
**Falling material bar**

Personal injury due to squashing and impact as a result of a falling material bar.

Material bars which are located on the lateral material storage, may fall down during conversion work.

- Before conversion work, remove the material bars from the lateral material storage.

1. Press the emergency stop button. → *“Press the emergency stop button” on page 47.*
2. Switch off the supply of compressed air. → *“Switch the supply of compressed air on/off” on page 105*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Loosen the tapper spanner **1**.
6. Move the handle **2** in the direction indicated by the arrow to set the desired distance.
7. Close the tapper spanner **1**.
8. Close the cover.
9. Switch on the compressed air supply. → *“Switch the supply of compressed air on/off” on page 105*
10. Unlock the emergency stop button. → *“Make the loading magazine ready for operation after the emergency stop” on page 47*
11. Acknowledge the error message by pressing the **CLR** button.



## 8 Maintenance

### 8.1 Maintenance actions

#### Maintenance plan

Chap.	Task to perform	Every 6 months	Every 36 months	If necessary	Page
	Check the drive belt	X			100
	Check the synchronizing unit belt	X			101
	Replace the relay insert in the control cabinet		X		101
	Check the blades of the material gripper	X			102
	Check the lubricant in the oil tank			X	104

#### Check the drive belt

**CAUTION**

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.



*Condition of the drive belt:*

*If the drive belt has cracks or is missing teeth, it must be replaced. Contact FMB. → "Service contact details" on page 111.*

1. → Press the emergency stop button. → "Press the emergency stop button" on page 47.
2. → Switch off the supply of compressed air. → "Switch the supply of compressed air on/off" on page 105
3. → Where necessary, obtain release from the lathe to open the cover.
4. → Open the cover.
5. → Check the condition: Check the drive belt visually for missing teeth.
6. → Close the cover.
7. → Switch on the compressed air supply. → "Switch the supply of compressed air on/off" on page 105

8.  Unlock the emergency stop button. *➔ "Make the loading magazine ready for operation after the emergency stop" on page 47*
9.  Acknowledge the error message by pressing the  button.

### Check the synchronizing unit belt

 **CAUTION**

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- Wear safety gloves.



*Condition of the synchronizing unit belt:*

*If the synchronizing unit belt has cracks or is missing teeth, the synchronizing unit belt must be replaced. Contact FMB. ➔ "Service contact details" on page 111.*

1.  Press the emergency stop button. *➔ "Press the emergency stop button" on page 47.*
2.  Switch off the supply of compressed air. *➔ "Switch the supply of compressed air on/off" on page 105*
3.  Where necessary, obtain release from the lathe to open the cover.
4.  Open the cover.
5.  Check the condition: Check the synchronizing unit belt visually for cracks and missing teeth.
6.  Close the cover.
7.  Switch on the compressed air supply. *➔ "Switch the supply of compressed air on/off" on page 105*
8.  Unlock the emergency stop button. *➔ "Make the loading magazine ready for operation after the emergency stop" on page 47*
9.  Acknowledge the error message by pressing the  button.

### Replace the relay insert in the control cabinet

 **DANGER**

#### Live components of the control cabinet

Personal injury by electrical shock due to contact with live components of the control cabinet.

This work is only allowed to be performed by a qualified electrician.

- Turn off the machine tool before starting work on the main switch.



*The relay insert for changing signals with the lathe must be replaced regularly. In the event of uncertainty, please contact FMB. ➔ "Service contact details" on page 111.*

1. Turn off the machine tool before starting work on the main switch.
2. Disconnect the relay insert in the control cabinet of the loading magazine.
3. Insert the new relay insert in the control cabinet of the loading magazine.

## Check the blades of the material gripper

### CAUTION

#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

– Wear safety gloves.

1. Press the emergency stop button. → *“Press the emergency stop button” on page 47.*
2. Switch off the supply of compressed air. → *“Switch the supply of compressed air on/off” on page 105*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Check the material gripper visually for breaks.
6. If the blades of the material gripper break off, the blades of the material gripper must be replaced. → *“Replace the blades of the material gripper” on page 102.*
7. Close the cover.
8. Switch on the compressed air supply. → *“Switch the supply of compressed air on/off” on page 105*
9. Unlock the emergency stop button. → *“Make the loading magazine ready for operation after the emergency stop” on page 47*
10. Acknowledge the error message by pressing the  button.

## Replace the blades of the material gripper

### CAUTION

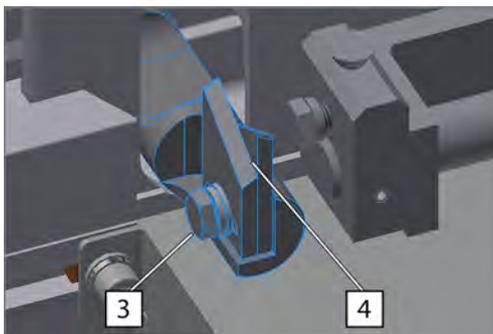
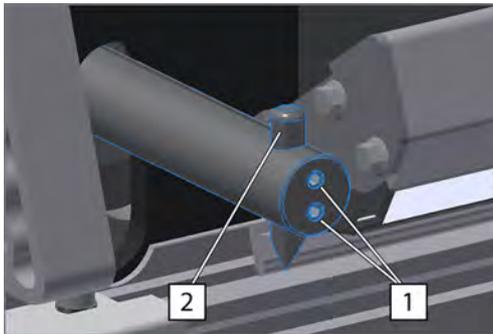
#### Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

– Wear safety gloves.

1. Press the emergency stop button. → *“Press the emergency stop button” on page 47.*
2. Switch off the supply of compressed air. → *“Switch the supply of compressed air on/off” on page 105*



3. ➤ Where necessary, obtain release from the lathe to open the cover.
4. ➤ Open the cover.
5. ➤ Loosen the screws **1**.
6. ➤ Changing the blades **2**.
7. ➤ Tighten the **1** screws.
8. ➤ Loosen and remove the screw **3**.
9. ➤ Replace the lower blade (2 parts) **4**.
10. ➤ Insert screw **3** and tighten hand-tight.
11. ➤ Close the cover.
12. ➤ Switch on the compressed air supply. ➤ *“Switch the supply of compressed air on/off” on page 105*
13. ➤ Unlock the emergency stop button. ➤ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
14. ➤ Acknowledge the error message by pressing the **CLR** button.
15. ➤ Press the **☰** button.
16. ➤ Press **SETUP**.
17. ➤ Close the material gripper with the **+** button.
18. ➤ Press the emergency stop button. ➤ *“Press the emergency stop button” on page 47.*
19. ➤ Switch off the supply of compressed air. ➤ *“Switch the supply of compressed air on/off” on page 105*
20. ➤ Where necessary, obtain release from the lathe to open the cover.
21. ➤ Open the cover.
22. ➤ Check whether the material gripper is aligned with the pusher.
23. ➤ Correct the alignment of the pusher and the material gripper, where applicable using the lower blade.
24. ➤ Tighten the **3** screw.
25. ➤ Close the cover.
26. ➤ Switch on the compressed air supply. ➤ *“Switch the supply of compressed air on/off” on page 105*
27. ➤ Unlock the emergency stop button. ➤ *“Make the loading magazine ready for operation after the emergency stop” on page 47*
28. ➤ Acknowledge the error message by pressing the **CLR** button.

## Check the lubricant in the oil tank

**⚠ WARNING**

### Leaking fuel

Personal injuries due to slipping on leaking fuel.

Leaking fuel causes a slipping hazard in the working area.

- Remove leaking fuel immediately.
- Observe the description in the operating instructions about filling / emptying the oil tank.
- Only fill fuel in the intended containers.

1. Check the lubricant in the oil tank for the formation of foam.
2. Check the lubricant in the oil tank for severe contamination.
3. If the lubricant forms foam in the oil tank, or is severely contaminated, the lubricant in the oil tank must be replaced.  
 ➔ "Empty the oil tank of the loading magazine" on page 105.

## Fill the oil tank of the loading magazine

**⚠ WARNING**

### Leaking fuel

Personal injuries due to slipping on leaking fuel.

Leaking fuel causes a slipping hazard in the working area.

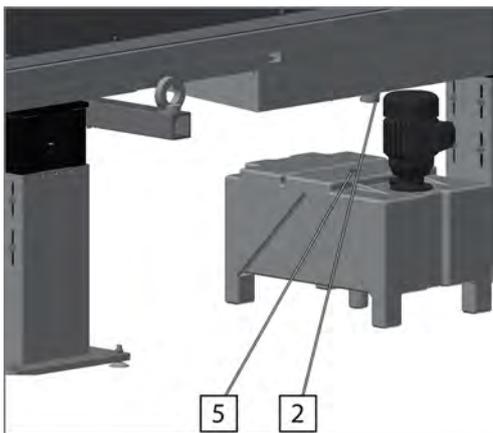
- Remove leaking fuel immediately.
- Observe the description in the operating instructions about filling / emptying the oil tank.
- Only fill fuel in the intended containers.



*Observe the oil tank level.*



*Observe the stated types of oil.*



1. Pull the oil return line out of the oil return hole [5].
2. Fill the stated quantity of oil into the oil return hole [5].
3. Guide the oil return line to the oil return hole [5].

Empty the oil tank of the loading magazine

**! WARNING**

**Leaking fuel**

Personal injuries due to slipping on leaking fuel.

Leaking fuel causes a slipping hazard in the working area.

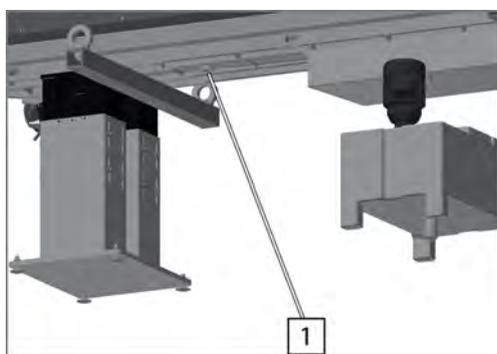
- Remove leaking fuel immediately.
- Observe the description in the operating instructions about filling / emptying the oil tank.
- Only fill fuel in the intended containers.

**i**

Observe the oil tank level. → "Technical data of the loading magazine" on page 12.

**i**

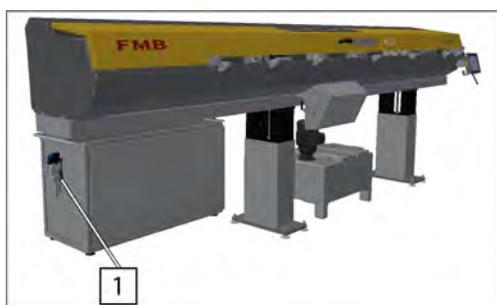
Before the next operation of the loading magazine, the oil tank of the loading magazine must be refilled. → "Fill the oil tank of the loading magazine" on page 104.



1. → Prepare a suitable container with sufficient capacity to collect the oil.
2. → Loosen the tube clip on the oil feed **1**.
3. → Remove the oil feed line on the oil feed **1**.
4. → Guide the end of the removed oil feed line into the container provided.
5. → Switch on the oil pump.
6. → Allow the whole content of the oil tank to pour into the container provided.
7. → Switch off the oil pump.
8. → Insert the oil feed line onto the oil feed **1**.
9. → Tighten the tube clip on the oil feed **1**.

Switch the supply of compressed air on/off

The supply of compressed air is switched on/off at the maintenance unit **1**.

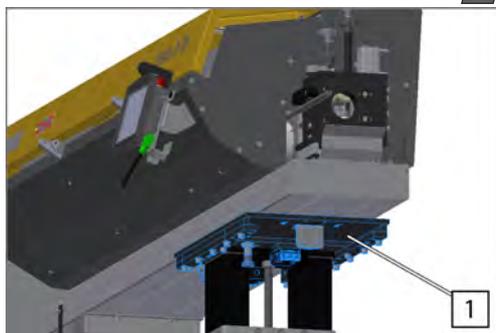




➔ Switch off the supply of compressed air on/off at the knob **2**.

## 8.2 Auxiliary equipment

### Shifting the loading magazine



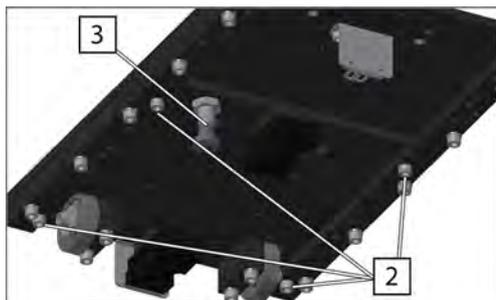
**i**

*This function is available as an option.*

The shifting device **1** is located between the support and the beam of the loading magazine. The procedure is described using the example of a support. To shift the loading magazine, the shifting device must be activated on each support.

**i**

*The screws **2** must be used in alternating positions depending on the shifting positions. Several drill holes are intended for this.*



1. ➔ Press the emergency stop button. ➔ "Press the emergency stop button" on page 47.
2. ➔ Switch off the supply of compressed air. ➔ "Switch the supply of compressed air on/off" on page 105
3. ➔ Loosen and remove the screws **2**.
4. ➔ Pull and hold the locking pin **3**.
5. ➔ Shift the loading magazine up to the stop.
6. ➔ Release the locking pin **3**.
7. ➔ Insert and tighten **2** the screws.
9. ➔ Switch on the compressed air supply. ➔ "Switch the supply of compressed air on/off" on page 105
10. ➔ Unlock the emergency stop button. ➔ "Make the loading magazine ready for operation after the emergency stop" on page 47
11. ➔ Acknowledge the error message by pressing the **CLR** button.

## 9 Faults

### 9.1 Fault messages

#### Display the current fault message

The current fault message is shown in the upper area of the control panel.

#### Delete the current fault message

➔ Press the  button.

#### Display of pending fault messages in the fault list

1. ➔ Press the  button.
2. ➔ “*DIAGNOSIS* → *Fault list*”

#### Delete fault messages in the fault list

1. ➔ Press the  button.
2. ➔ “*DIAGNOSIS* → *Fault list*”

Delete an error message:

1. ➔ Click on error message.
2. ➔ Delete the error message with the  button.

Delete all error message:

1. ➔ Click on error message.
2. ➔ Delete the error message with the  button.

#### Access the fault history

1. ➔ Press the  button.
2. ➔ “*DIAGNOSIS* → *Fault list*”
3. ➔ Press the  button.

#### Display the position of the current fault on the loading magazine

1. ➔ Press the  button.
2. ➔ “*DIAGNOSIS* → *Fault list*”
3. ➔ Press the  button.

### 9.2 Fault table

#### Fault message and possible cause

Fault message of the loading magazine	Possible cause	Switch / position
Axis 1 fault, code: xx	The servo drive issues a fault message.	

Fault message of the loading magazine	Possible cause	Switch / position
Starting switch -B7 not in home position -KK5/B7	The starting switch is not back in its home position. <ul style="list-style-type: none"> <li>■ Air flow disrupted</li> <li>■ Solenoid valve -KK5 not working</li> </ul>	Starting switch not in the home position. Switch -B7 not actuated.
Press upon not correct; Pos. material draw-off not reached	The clamping sleeve was not pressed, or not pressed completely, onto the material bar. <ul style="list-style-type: none"> <li>■ Feed force for press upon too low.</li> <li>■ Incorrect clamping sleeve.</li> <li>■ New clamping sleeve.</li> </ul>	The position Position draw off was not reached.
Guide channel not closed; Check guide channel - KK01/B6/B26/B28	The guide channel is not closed. <ul style="list-style-type: none"> <li>■ Solenoid valve -KK01 not working.</li> <li>■ Air flow disrupted.</li> </ul>	Switch -B6 or -B26 not actuated.
Opening – closing of guide channel not correct -KK1/ KK01/B5/B6/B26/B28	Guide channel not opened or closed correctly. <ul style="list-style-type: none"> <li>■ Solenoid valve -KK1 or -KK01 not working.</li> <li>■ Air flow disrupted.</li> </ul>	Switch -B5, -B6 or -B26 not actuated.
No stop in the lathe	Warning selection First insert To stop set! The material bar was not stopped by an end stop in the working area of the lathe.	
No return of remnant -B13	Remnant remains in the lathe. The material gripper did not grab any remnant when removing the remnant. <ul style="list-style-type: none"> <li>■ The lathe collet does not open correctly.</li> </ul> The remnant fell out when when returning from the clamping sleeve. The material gripper did not grab any remnant when removing the remnant. <ul style="list-style-type: none"> <li>■ Clamping sleeve pressure too low.</li> </ul>	Switch -B13 was actuated.
No new bar in guide channel -B13	The material gripper does not grab any material bars when drawing on <ul style="list-style-type: none"> <li>■ No material bar was loaded from the lateral material storage.</li> </ul>	Switch -B13 was actuated.
No air pressure! -B11 Check air pressure min. 5 bar	The compressed air is too low, or is lacking, on the maintenance unit. <ul style="list-style-type: none"> <li>■ Air supply disturbed</li> </ul>	Switch -B11 not actuated.
Magazine not in start position; Start position step 1,15,17 or 19	The loading magazine is not in one of the possible starting positions: step 1, step 15, step 17 or step 19.	
Motor protection -F1 tripped! -M1/F1 Check -M1, switch -F1 on	The drive motor of the loading magazine was overloaded.	Motor protection switch - F1 was triggered.

Fault message of the loading magazine	Possible cause	Switch / position
Motor protection -F2 tripped! -M2/F2 Check -M2, switch -F2 on	The motor of the oil pump was blocked or overloaded.	Motor protection switch - F2 was triggered.
Neg.software end position was overrun. Release with manual forward function	The negative software stop was overrun.	
Emergency Stop lathe	The emergency stop button of the lathe was actuated.	
Emergency Stop loading magazine -S69	The emergency stop on the loading magazine was actuated.	
Pos.software end position was overrun. Release with manual return function	The positive software stop was overridden.	
Relay tumbler -K225	Malfunction of the channel lock module. Relay -K225 not working.	
Remnant jammed in clamping sleeve -B13	<p>The remnant was not correctly extracted from the clamping sleeve and is still in the gripping area. The material gripper closes to check the remnant ejection and then grabs the available remnant.</p> <ul style="list-style-type: none"> <li>■ The clamping sleeve pressure is not right.</li> <li>■ The blades of the material gripper are worn.</li> <li>■ The pressure of the material gripper is too low.</li> </ul> <p>The remnant did not fall correctly into the remnant bin and is still in the gripping area. The material gripper closes to check the remnant ejection and then grabs the remaining remnant.</p> <ul style="list-style-type: none"> <li>■ The remnant flap has been lubricated. The residue remains stuck on the remnant flap.</li> </ul>	Switch -B13 was not actuated.
Remnant flap not closed - KK010/B17	<p>The remnant flap does not close.</p> <ul style="list-style-type: none"> <li>■ Solenoid valve -KK010 does not switch.</li> <li>■ Air flow disrupted.</li> </ul>	Switch -B17 not actuated.
Pushing signal not ok; Check signal from lathe	<p>The signal "collet open" is transferred by the lathe in an unstable way to the loading magazine (the signal bounces).</p> <ul style="list-style-type: none"> <li>■ Defect connection</li> <li>■ Relay worn (on the lathe side)</li> </ul>	
Signal sliding-fixed head-stock lathe mode does not match shifting device - B71/B76	The external signal of the machine tool (long or short turning mode) does not agree with the position of the shifting device.	
Collet in the lathe closed	Warning selection Draw on bar with first insert set!	

Fault message of the loading magazine	Possible cause	Switch / position
	<p>The collet of the lathe is not open. First insert cannot be performed.</p> <p>The collet position signal is not available in manual mode.</p>	
Collet closed too long	Collet monitoring time expired.	
Collet opened too long	Collet monitoring time expired.	
Bar has been pushed back	<p>Warning Max. bar return active.</p> <p>The material bar was moved back past the set value when closing the collet.</p> <ul style="list-style-type: none"> <li>■ Lathe clamping system not OK.</li> </ul>	
Part follow-up too short	<p>Warning Min. part length follow-up active.</p> <p>The entered value was not reached by pushing the material bar.</p> <ul style="list-style-type: none"> <li>■ Feeding force too low.</li> <li>■ The collet signal is instable.</li> </ul>	
Part follow-up too long	<p>Warning Max. part length follow-up active.</p> <p>The entered value was not exceeded by pushing the material bar.</p> <ul style="list-style-type: none"> <li>■ End stop in the lathe not exceeded.</li> </ul>	
Cover not closed - B76/B77/B78/B79/K20/K21	The cover (of the guide channel) or the lid of the steady, is not closed.	Switch -B71, -B76, -B77, -B78 or -B79 not actuated.
Shifting device -B71/B76	The shifting device is in a non-permitted position.	Switch -B71 and -B76 not actuated.
Pusher not swung in correctly -KK08/B23	<p>Pusher incorrectly swung in.</p> <ul style="list-style-type: none"> <li>■ Solenoid valve -KK08 does not switch.</li> <li>■ Air flow disrupted.</li> </ul>	Switch -B23 does not switch.
Pusher out of position	<p>Warning Part length internal or Part length external active.</p> <p>The pusher was moved during the processing.</p> <ul style="list-style-type: none"> <li>■ Vibrations to the material bar.</li> <li>■ Lathe clamping system not OK.</li> <li>■ Brake not switched on.</li> <li>■ Braking force too low.</li> </ul>	
Z-axis collision	The entered value for shaft encoder B4 was not met.	
Monitoring time motor expired	<p>The moving signal is constantly on. The motor pushes against resistance.</p> <ul style="list-style-type: none"> <li>■ Problem with the work flow of the lathe.</li> </ul>	

Fault message of the loading magazine	Possible cause	Switch / position
Monitoring time bar change expired; Fault at bar change	The bar change was unable to be performed correctly. Monitoring time expired.	

### 9.3 Service

#### Service contact details

Service telephone no.	+49 9392 801 801
Telephone no. of the headquarters	+49 9392 801 0
Fax	+49 9392 801 220
Email	info@fmb-machinery.de

### 9.4 Technical problems

#### Behavior of the loading magazine in the event of a power failure

In the event of a power failure, the operation of the loading magazine is interrupted. The pressurisation of the pneumatic valves is interrupted. All parameters are saved and are available again once the power supply is reestablished.

#### Material bar stuck in the guide channel

It may be the case that the material bar does not lie completely in the guide channel when the guide channel is closed, and becomes stuck. This is caused by the usually bad material quality or an incorrect setting of the separation device. The correct procedure to loosen a stuck material bar depends on different factors. If the material bar is stuck, please contact FMB. ➔ *“Service contact details” on page 111.*



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## Ersatzteilliste Spare parts list

**turbo 3-36** Serie 6

Rückmeldenummer ab: 1963017

FMB zeichnet sich durch die Umsetzung kundenspezifischer Wünsche aus. Deshalb sind viele Standard-Baugruppen durch individuelle Anpassungen oder drehmaschinenbezogen modifiziert. Abweichende Ersatzteile für Anbauten oder Umbauten müssen daher über unseren Ersatzteilvertrieb ermittelt werden.

## **Achtung !    Angaben für Ersatzteilbestellung:**

- **Magazintyp**
- **Magazinnummer**
- **Baujahr**
- **Bezeichnung**
- **Ident-Nummer**

FMB is characterized by the implementation of customer-specific requirements. Therefore, many standard modules are modified by individual adjustments or lathes related. Differing parts for attaching or modifications must therefore be determined from our spare parts sales.

## **Attention !    Data for spare parts orders:**

- **Magazine type**
- **Magazine No.**
- **Year of construction**
- **Designation**
- **Ident No.**

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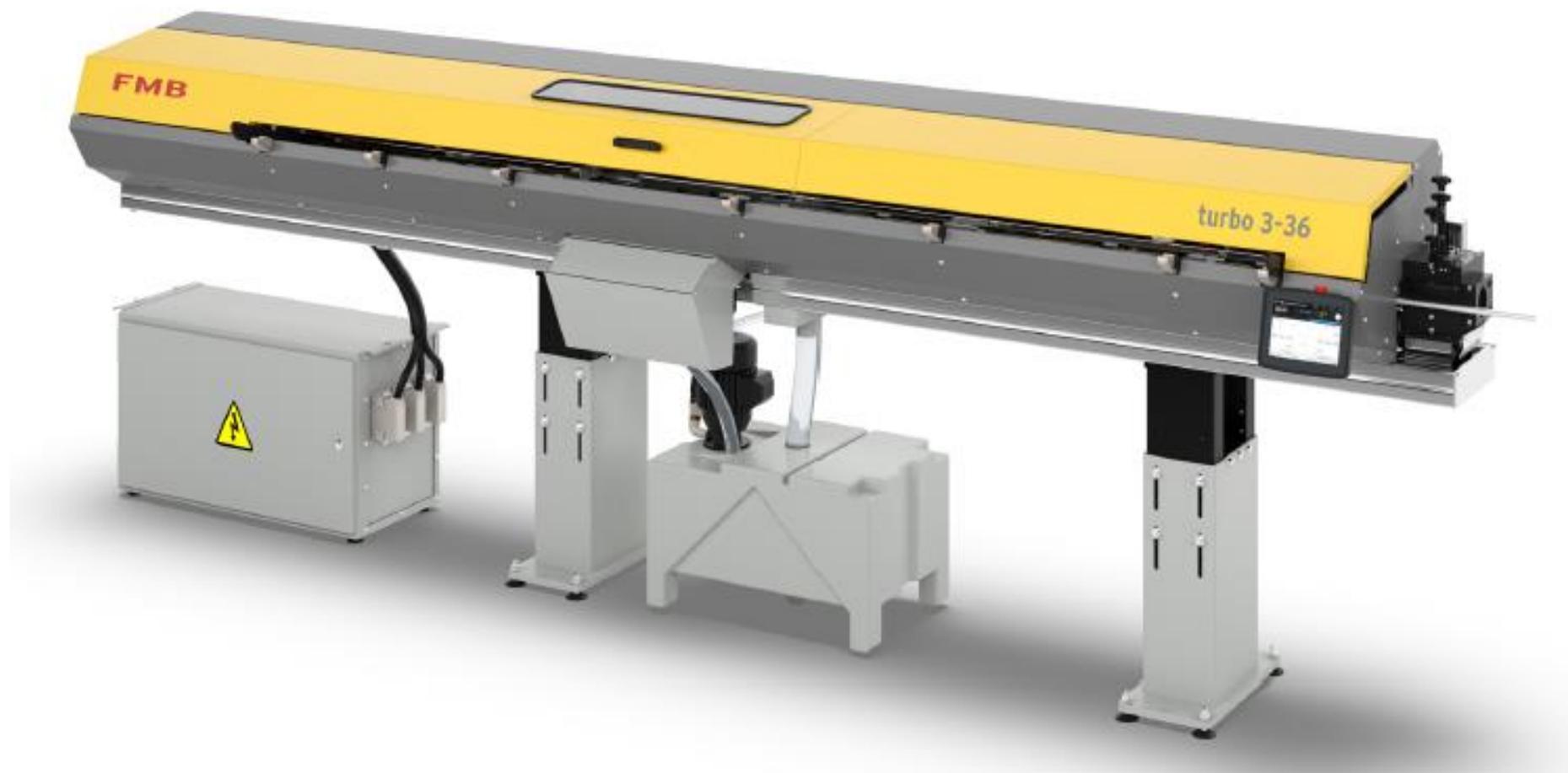
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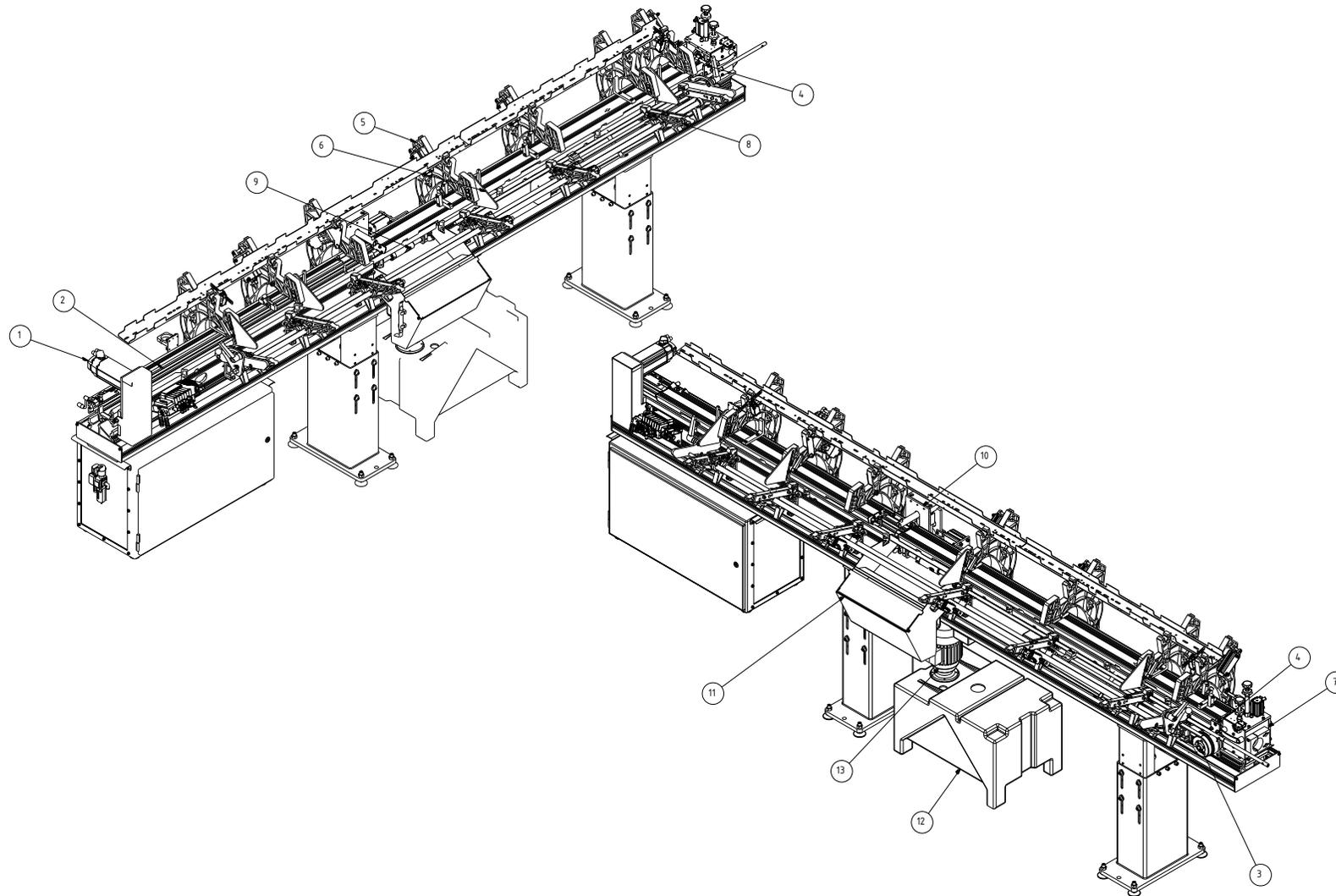
**FMB turbo 3-36**

Abbildung / Drawing Variante A;D



**Grundaufbau / Basic construction**

Abbildung Variante / Drawing Variant A;D

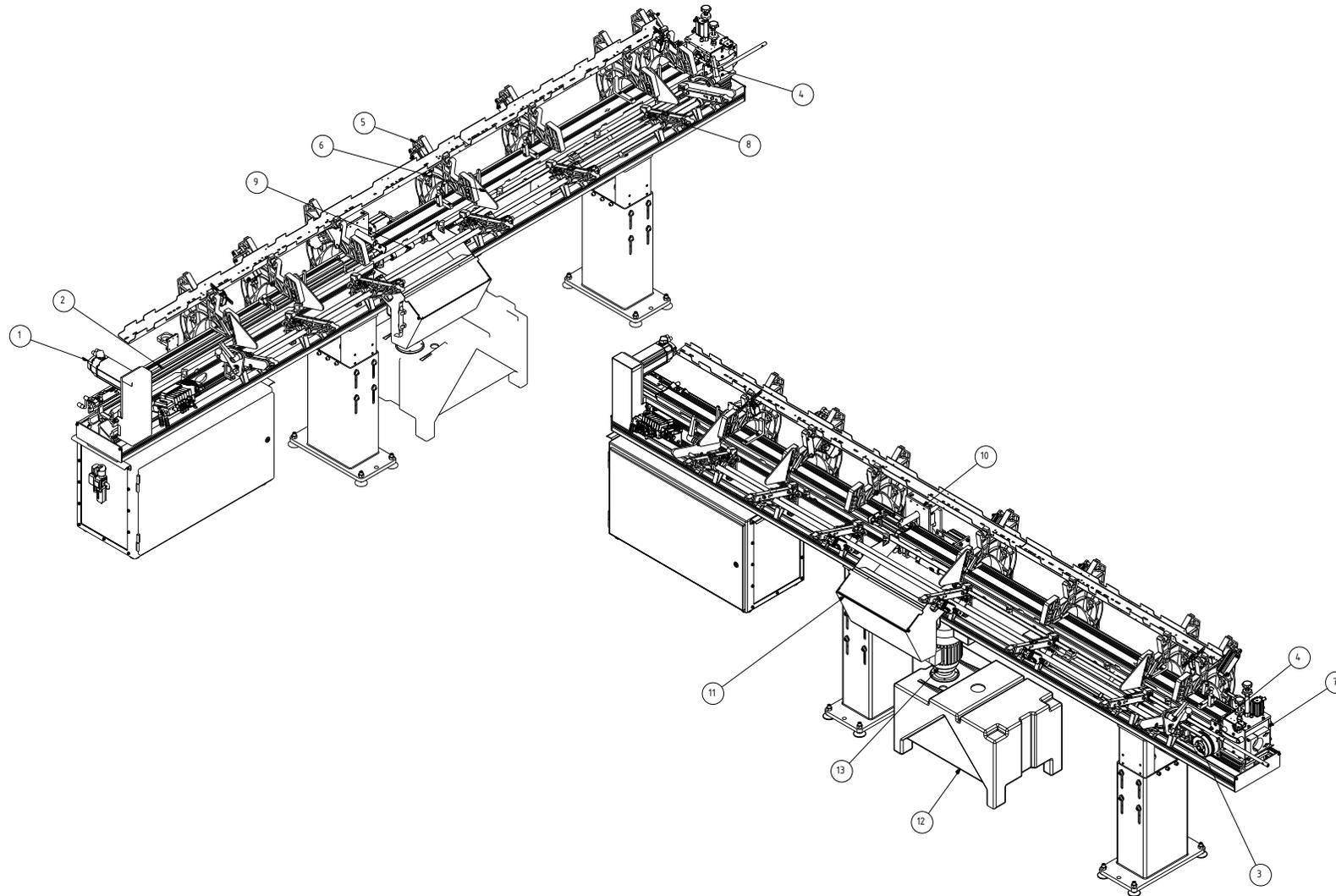


**Grundaufbau / Basic construction**

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100044100	Antrieb	Drive	
2	2055-658 2056-138 -	Zahnriemen 2200 VST 1466 VST 1666 VST 1866	Toothed belt 2200 Pusher 1466 Pusher 1666 Pusher 1866	
	2051-751 2052-230 2075-746	Zahnriemen 3200 VST 1466 VST 1666 VST 1866	Toothed belt 3200 Pusher 1466 Pusher 1666 Pusher 1866	
	2053-514 2054-680 2052-016	Zahnriemen 3800 VST 1466 VST 1666 VST 1866	Toothed belt 3800 Pusher 1466 Pusher 1666 Pusher 1866	
	2052-016 2052-853 2080-880	Zahnriemen 4200 VST 1466 VST 1666 VST 1866	Toothed belt 4200 Pusher 1466 Pusher 1666 Pusher 1866	
	2060-232 2060-285 -	Zahnriemen 4775 VST 1466 VST 1666 VST 1866	Toothed belt 4775 Pusher 1466 Pusher 1666 Pusher 1866	
	2060-047 2073-508 -	Zahnriemen 6200 VST 1466 VST 1666 VST 1866	Toothed belt 6200 Pusher 1466 Pusher 1666 Pusher 1866	
	100069790 100070092 -	Zahnriemen 7400 Vst 1466 Vst 1666 Vst 1866	Toothed belt 7400 Pusher 1466 Pusher 1666 Pusher 1866	

**Grundaufbau / Basic construction**

Abbildung Variante / Drawing Variant A;D

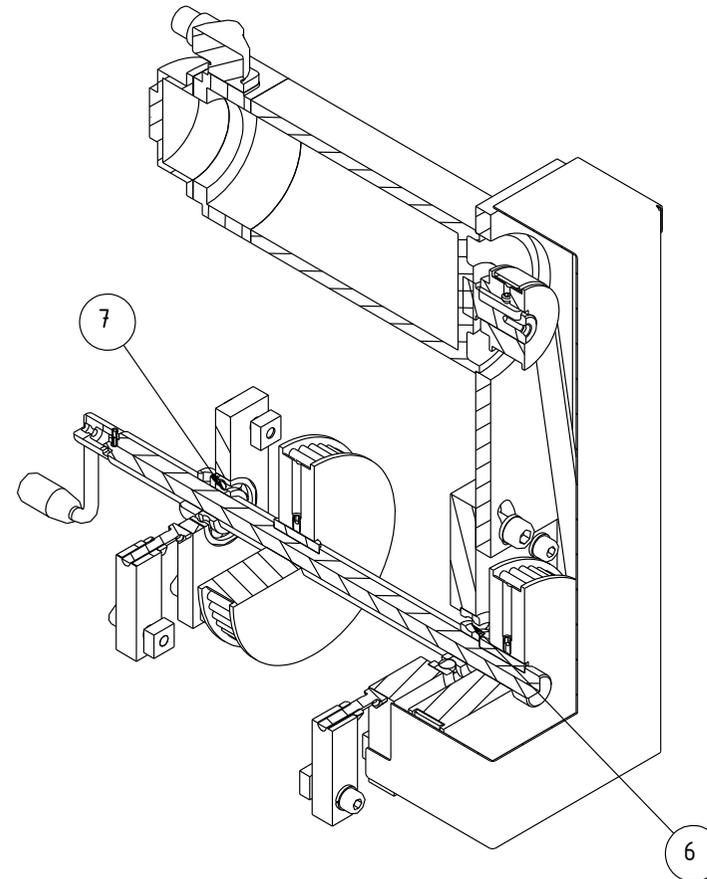
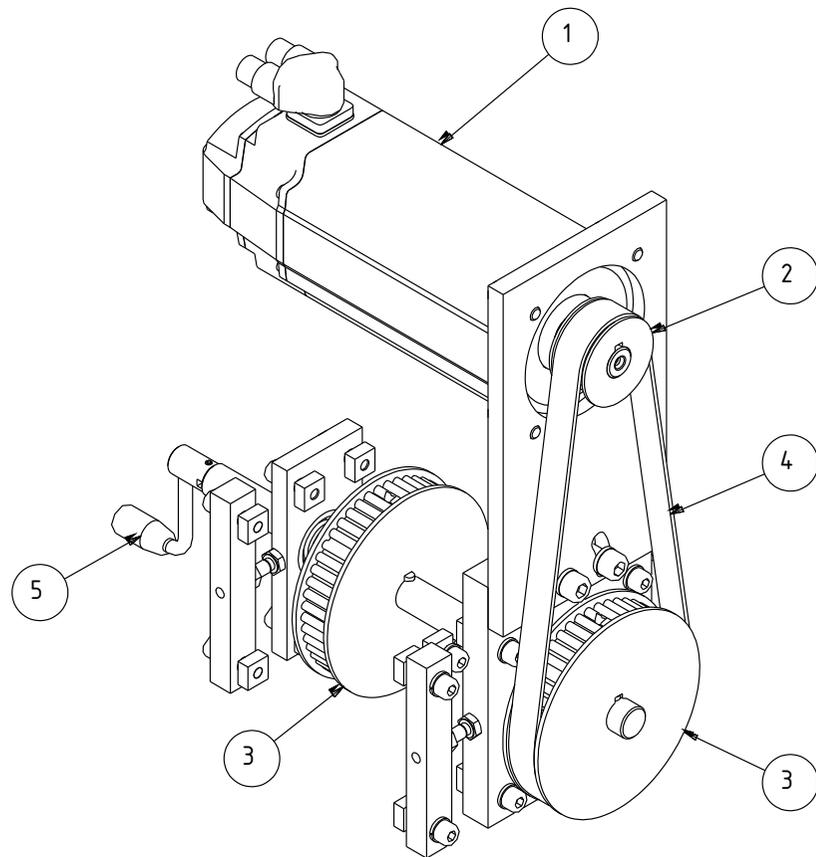


**Grundaufbau / Basic construction**

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
3	2051-648	Lager vorne	Bearing front	
4	2056-684 2056-809	Anfahrschalter Variante A;D Anfahrschalter Variante B;C	Starting switch Variant A;D Starting switch Variant B;C	
5	längenabhängig dependent on length	Kanalöffner	Channel opener	
6	2055-060	Niederhalter	Holding-down device	
7	100045605 100049399	Lünette A;D Lünette B;C	Steady A;D Steady B;C	
8	längenabhängig dependent on length	Seitliche Auflage A;D Seitliche Auflage B;C	Lateral material storage A;D Lateral material storage B;C	
9	100072011 100083025 100083017 100083051 100082121 100083047 100083049 100082926	Reststückklappe Variante A;D 400 Reststückklappe Variante A;D 600 Reststückklappe Variante A;D 800 Reststückklappe Variante A;D 1100 Reststückklappe Variante B;C 400 Reststückklappe Variante B;C 600 Reststückklappe Variante B;C 800 Reststückklappe Variante B;C 1100	Remnant flap Variant A;D 400 Remnant flap Variant A;D 600 Remnant flap Variant A;D 800 Remnant flap Variant A;D 1100 Remnant flap Variant B;C 400 Remnant flap Variant B;C 600 Remnant flap Variant B;C 800 Remnant flap Variant B;C 1100	
10	2074-975 2074-493	Greifer Variante A;D Greifer Variante B;C	Gripper Variant A;D Gripper Variant B;C	
11	100049340 100081472 100049992 100069816	Reststückbehälter 400 kpl. Reststückbehälter 600 kpl. Reststückbehälter 800 kpl. Reststückbehälter 1100 kpl.	Remnant bin 400 compl. Remnant bin 600 compl. Remnant bin 800 compl. Remnant bin 1100 compl.	
12	2035-428	Ölbehälter	Oil reservoir	
13	2041-038	Tauchpumpe	Submerged pump	

**Antrieb / Drive**

1000044100



**Antrieb / Drive**

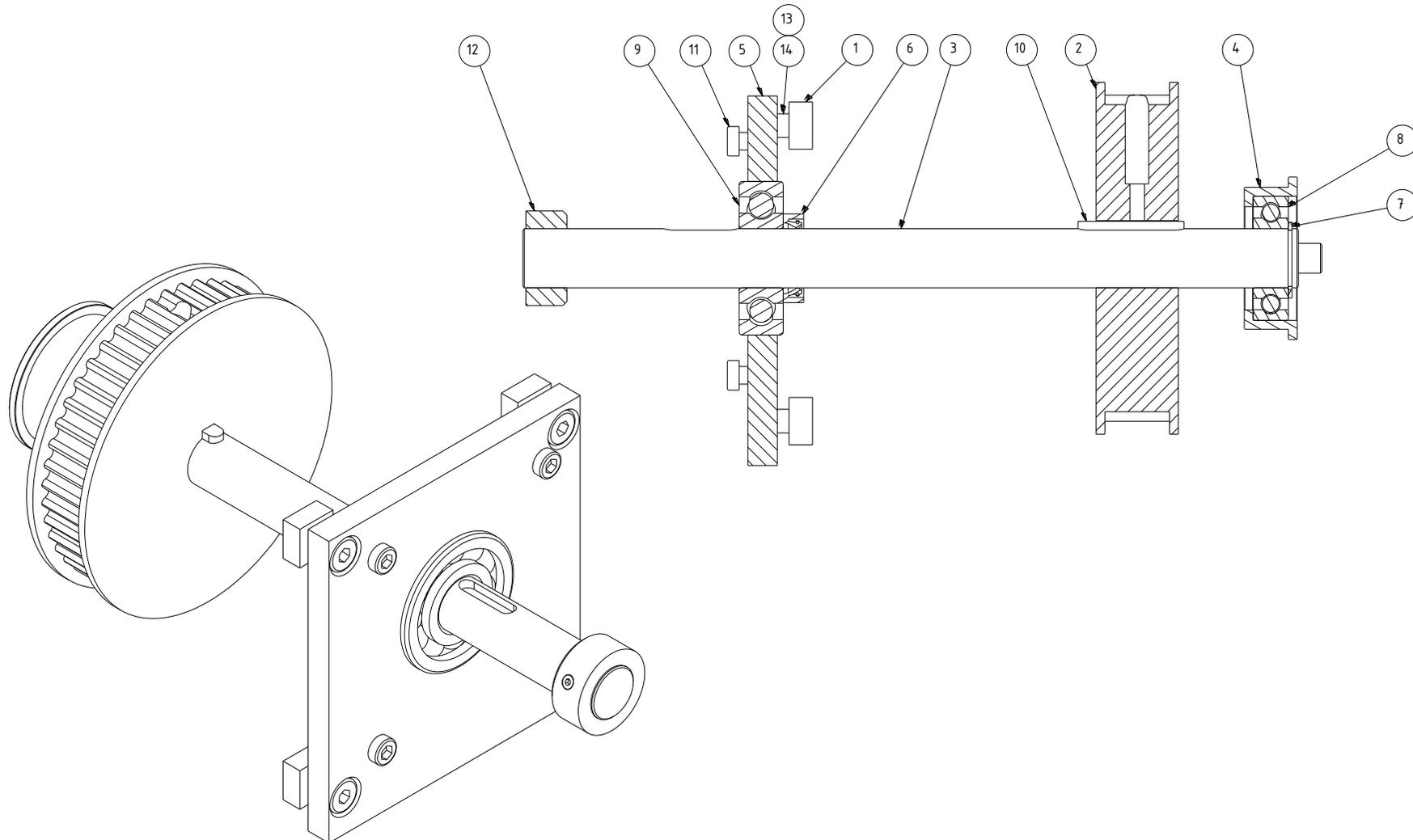
1000044100

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	200004100	Servomotor	Servomotor	
	200006125	Servomotor mit Bremse	Servomotor with brake	-M1 (Option)
2	2034-836	Synchrone Scheibe z=20	Synchronized disk Z=20	
3	2034-844	Zahnscheibe Z 48-8M 20	Synchronized disk Z=48	
4	2047-772	Zahnriemen	Toothed belt	
5	2050-793	Gerätekurbel	Hand crank	
6	1095-641	Rillenkugellager 20x52x15	Grooved ball bearing 20x52x15	DIN 625
7	0469-238	Rillenkugellager 20x42x12	Grooved ball bearing 20x42x12	DIN 625

**Lager vorne / Bearing front**

2051-118 (\*ohne Synchronisierung / without synchronized device)

2051-648 (mit Synchronisierung / with synchronized device) Zeichnung / Drawing



## Lager vorne / Bearing front

2051-118 (\*ohne Synchroneinrichtung / without synchronized device)

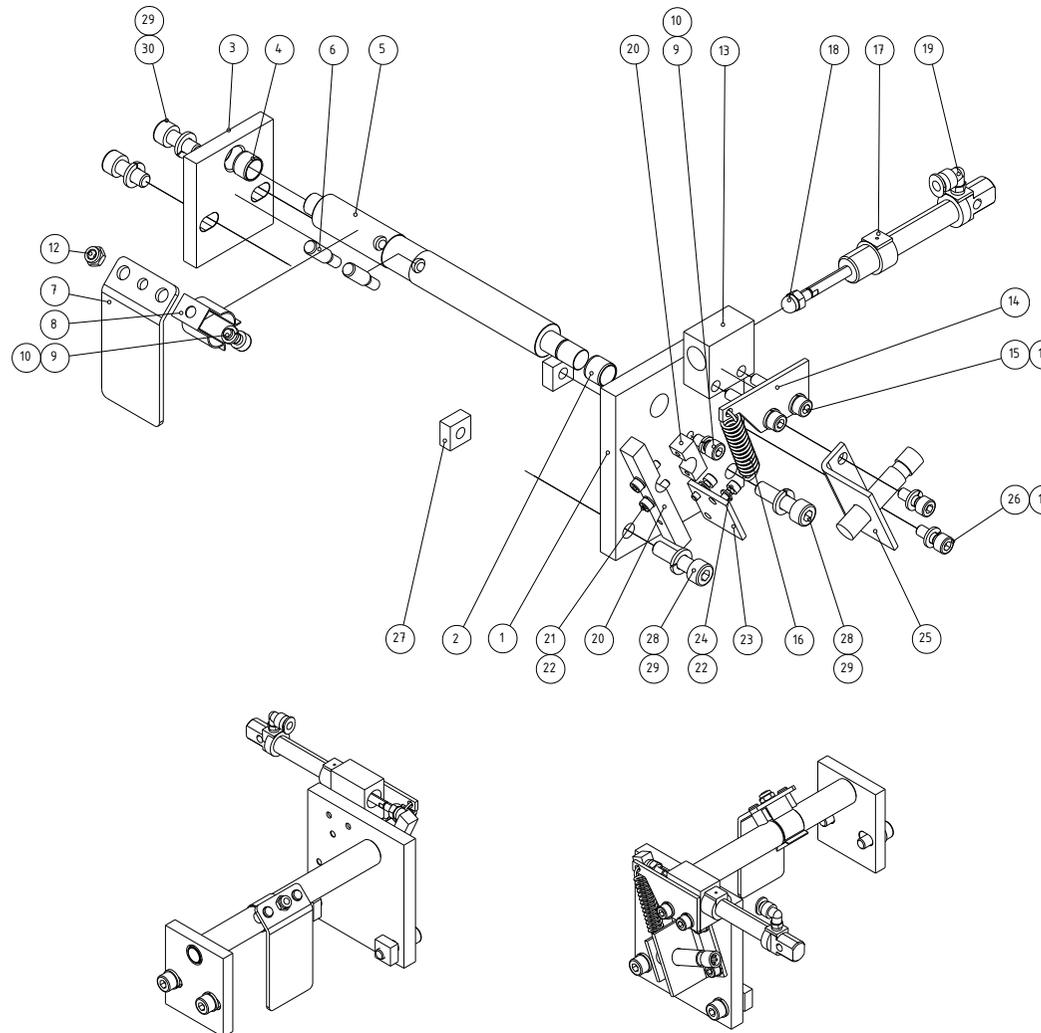
2051-648 (mit Synchroneinrichtung / with synchronized device)

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2001-188	Vierkantsmutter M8 - 16x16x8	Square nut M8 - 16x16x8	
2	2050-925	Zahnscheibe Z44	Toothed disk Z44	
3	2050-926	Welle	Shaft	
4	2051-272	Einsatz für Kugellager	Insert for ball bearing	
5	2051-351	Grundplatte	Base plate	
6	2029-202	Radial-Wellendichtring	Rotary shaft seal	DIN 3760
7	0024-694	Sicherungsring A20x1,2	Retaining ring A20x1,2	DIN 471
8	0469-238	Rillenkugellager 20x42x12	Grooved ball bearing 20x42x12	DIN 625
9	1095-641	Rillenkugellager 20x52x15	Grooved ball bearing 20x52x15	DIN 625
10	0096-245	Passfeder 6x6x36	Feather key 6x6x36	DIN 6885
11	0313-025	Zylinderschraube M6x12	Cheese head screw M6x12	DIN 7984
12	1112-554	Stellring A20,2 +0,1	Adjusting ring A20,2 +0,1	DIN 705
13	2000-387	Federring A8	Spring washer A8	DIN 7980
14	2000-373	Zylinderschraube M8x16	Cheese head screw M8x16	DIN 7984
	*2051-655	Deckel	Top	

**Anfahrschalter komplett / Starting switch complete**

Variante / Variant A;D: 2056-684 (Zeichnung/Drawing)

Variante / Variant B;C: 2056-809



## Anfahrschalter komplett / Starting switch complete

Variante / Variant A;D 2056-684

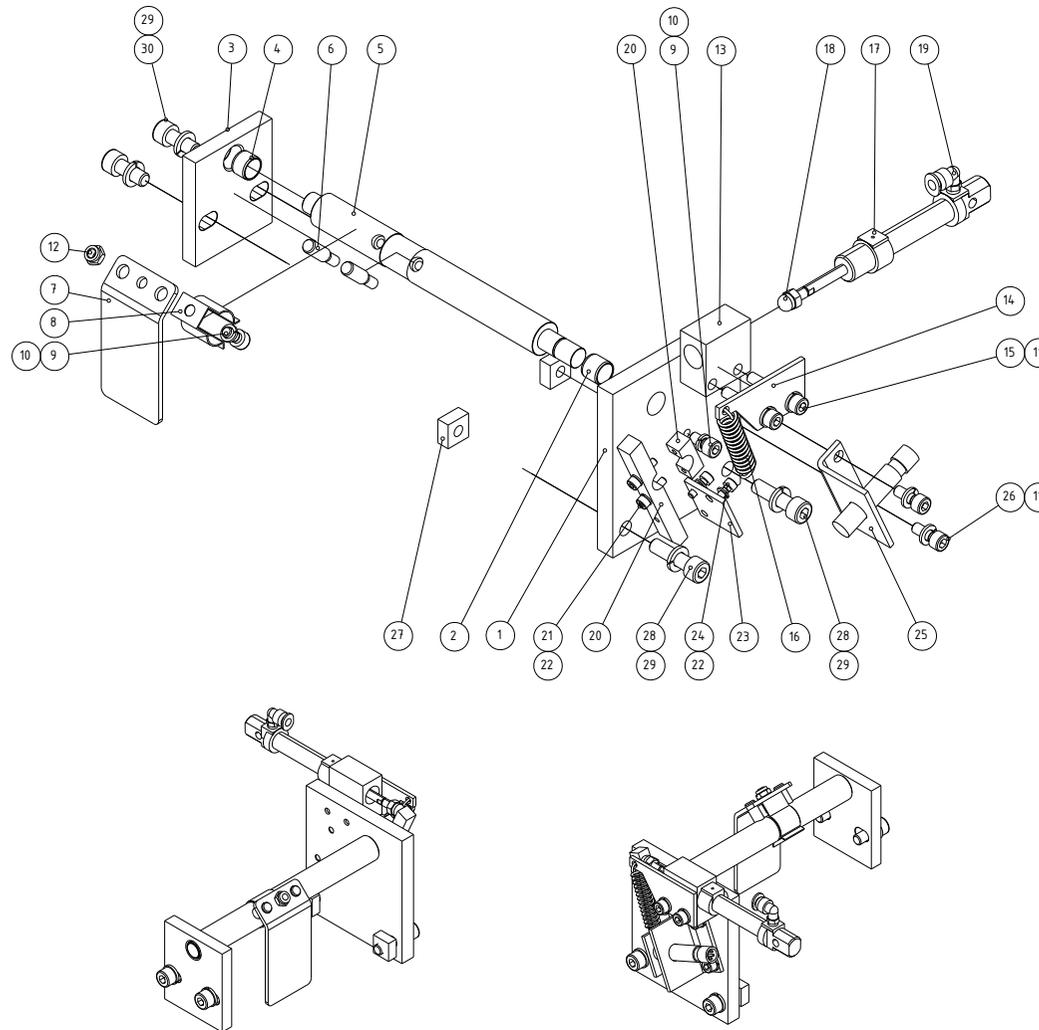
Variante / Variant B;C 2056-809

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2056-804	Platte für Anschlagfahne	Plate for flag	
2	2014-314	Glycodur-Buchse 12x14x12	Glycodur bush 12x14x12	
3	2051-352	Lager für Anschlagfahne	Bearing for flag	
4	2023-088	Glycodur-Buchse 12x14x10	Glycodur bush 12x14x10	
5	2056-679	Welle	Shaft	
6	2056-681	Führungsbolzen	Bolt	
7	2056-680	Anfahrschalterfahne	Flag for starting switch	
8	2051-671	Federklammer D20	Spring anchor D20	
9	0302-376	Zylinderschraube M6x12	Cheese head screw M6x12	ISO 4762 - 8-8
10	0314-552	Federring A6	Spring washer A6	DIN 7980
11	0292-842	Federring B6	Spring washer B6	DIN 127
12	0610-259	Sechskantmutter M6	Hexagonal nut M6	DIN 985
13	2019-840	Zylinderflansch	Cylinder flange	
14	2027-034	Federlasche	Spring shackle	
15	0355-119	Zylinderschraube M6x35	Cheese head screw M6x35	DIN 912 - 8-8
16	2027-033	Zugfeder 1,6x12x43x14	Tension spring 1,6x12x43x14	
17	2030-646	Zylinder	Cylinder	
18	0501-476	Hutmutter M6	Nut M6	DIN 1587
19	2038-348	Steckverschraubung QSML-B-M5-6	Plug-in screwing QSML-B-M5-6	
20	2016-784	Fahne	Flag	
21	2000-353	Zylinderschraube M4x16	Cheese head screw M4x16	DIN 912
22	0292-788	Federring B4	Spring washer B4	DIN 127
23	2027-038	Schaltfahne	Flag	

**Anfahrshalter komplett / Starting switch complete**

Variante / Variant A;D 2056-684 (Zeichnung/Drawing)

Variante / Variant B;C 2056-809



## Anfahrshalter komplett / Starting switch complete

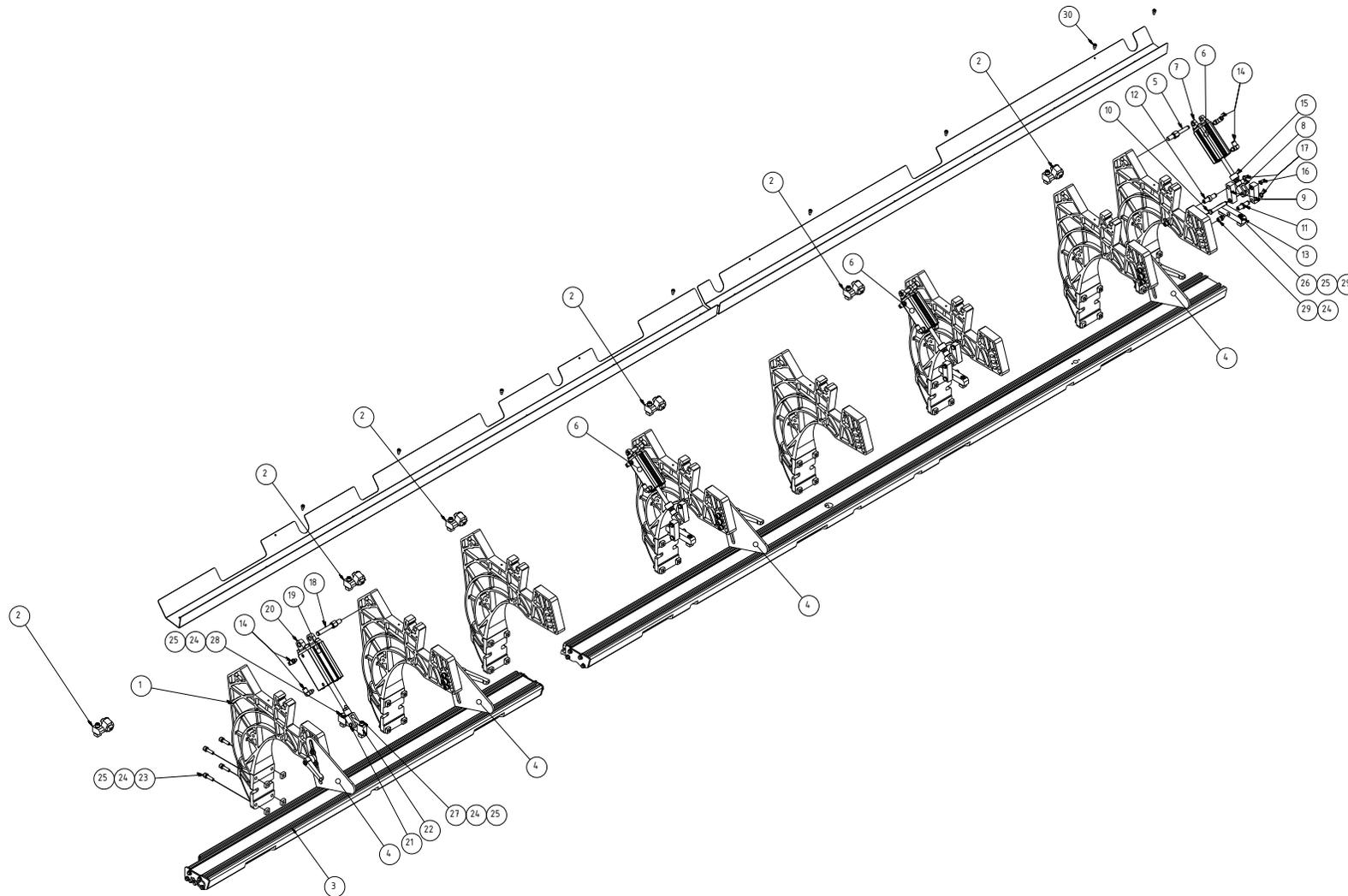
Variante / Variant A;D 2056-684

Variante / Variant B;C 2056-809

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
24	2000-353	Zylinderschraube M4x16	Cheese head screw M4x16	DIN 912 - 8-8
25	2016-793	Winkel	Angle	
26	0302-384	Zylinderschraube M6x16	Cheese head screw M6x16	DIN 912
27	2001-188	Vierkantmutter M8 - 16x16x 8	Square nut M8 - 16x16x 8	
28	0302-678	Zylinderschraube M8x30	Cheese head screw M8x30	DIN 912
29	0292-869	Federring B8	Spring washer B8	DIN 127
30	0302-619	Zylinderschraube M8x20	Cheese head screw M8x20	DIN 912

**Kanalöffner / Channel opener**

Zeichnung Variante / Drawing Variant A;D

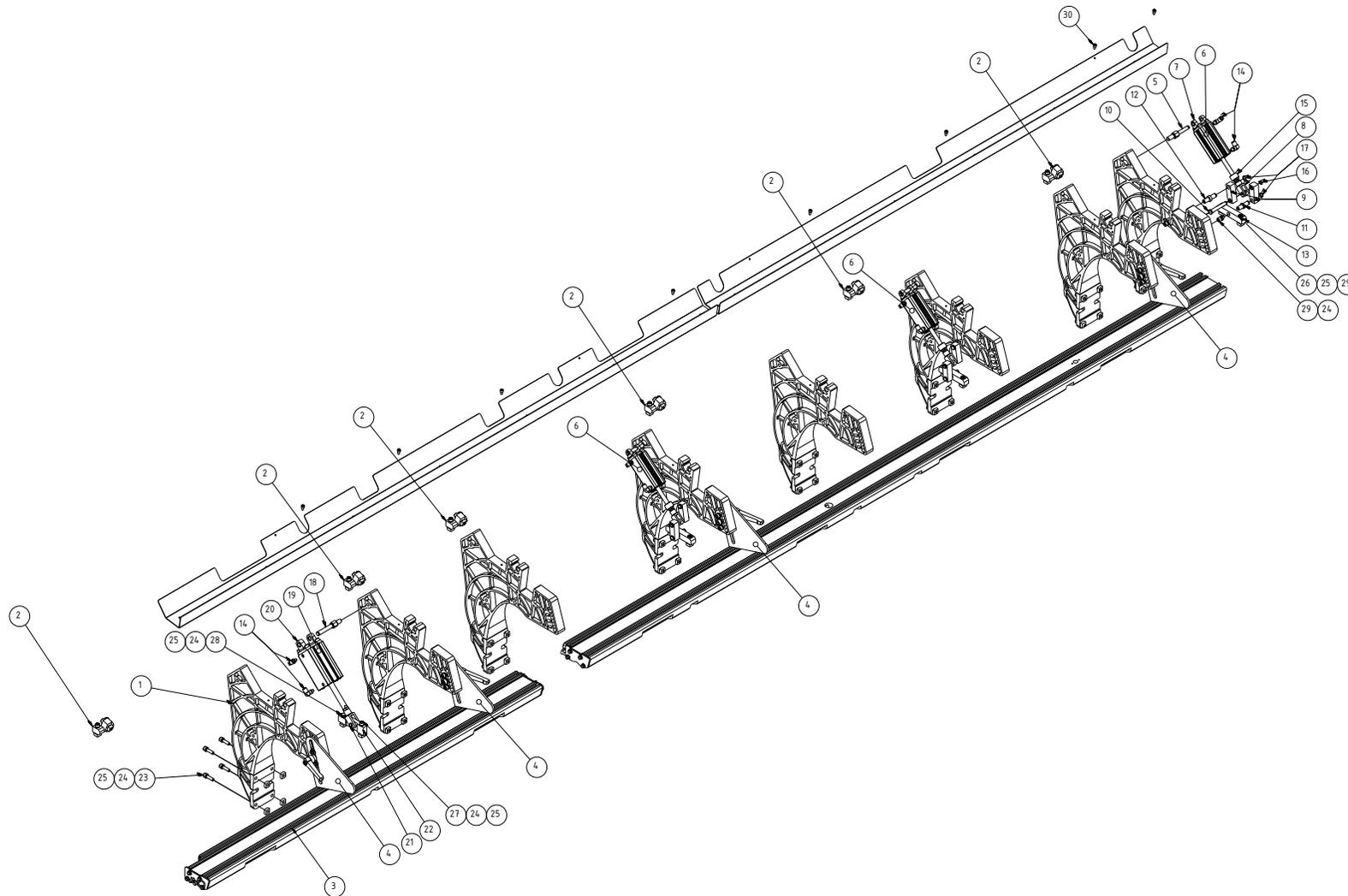


## Kanalöffner / Channel opener

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2051-372	Lagerbock	Bearing block	
2	2050-770	Scharnier	Hinge	
3	2051-812 2050-956	Kanaldeckel hinten A;D komplett Kanaldeckel hinten B;C komplett	Cover rear A;D complete Cover rear B;C complete	
4	2055-060	Niederhalter komplett	Holding down device complete	
5	2050-662	Achsbolzen für Zylinderbefestigung	Bolt	
6	2055-058	Zylinder	Cylinder	
7	2056-579	Schwenkflansch	Flange	
8	2001-382	Gabelkopf	Fork head	
9	2050-763	Kniehebellasche	Bracket	
10	2050-765	Drehgelenkbolzen	Bolt	
11	2035-200	Achsbolzen	Bolt	
12	2055-760	Achsbolzen	Bolt	
13	2050-764	Schließleiste	Locking strip	
14	2038-346	Steckverschraubung	Plug-in screwing	
15	2052-602	Buchse 25x12,2x16	Bush 25x12,2x16	
16	0024-635	Sicherungsring 10x1,0	Retaining ring 10x1,0	DIN 471
17	0026-638	Sicherungsring 12x1,0	Retaining ring 12x1,0	DIN 471
18	2052-599	Achsbolzen	Bolt	
19	2055-059	Zylinder	Cylinder	
20	2035-479	Schwenkflansch	Slewing flange	

**Kanalöffner / Channel opener**

Zeichnung Variante / Drawing Variant A;D

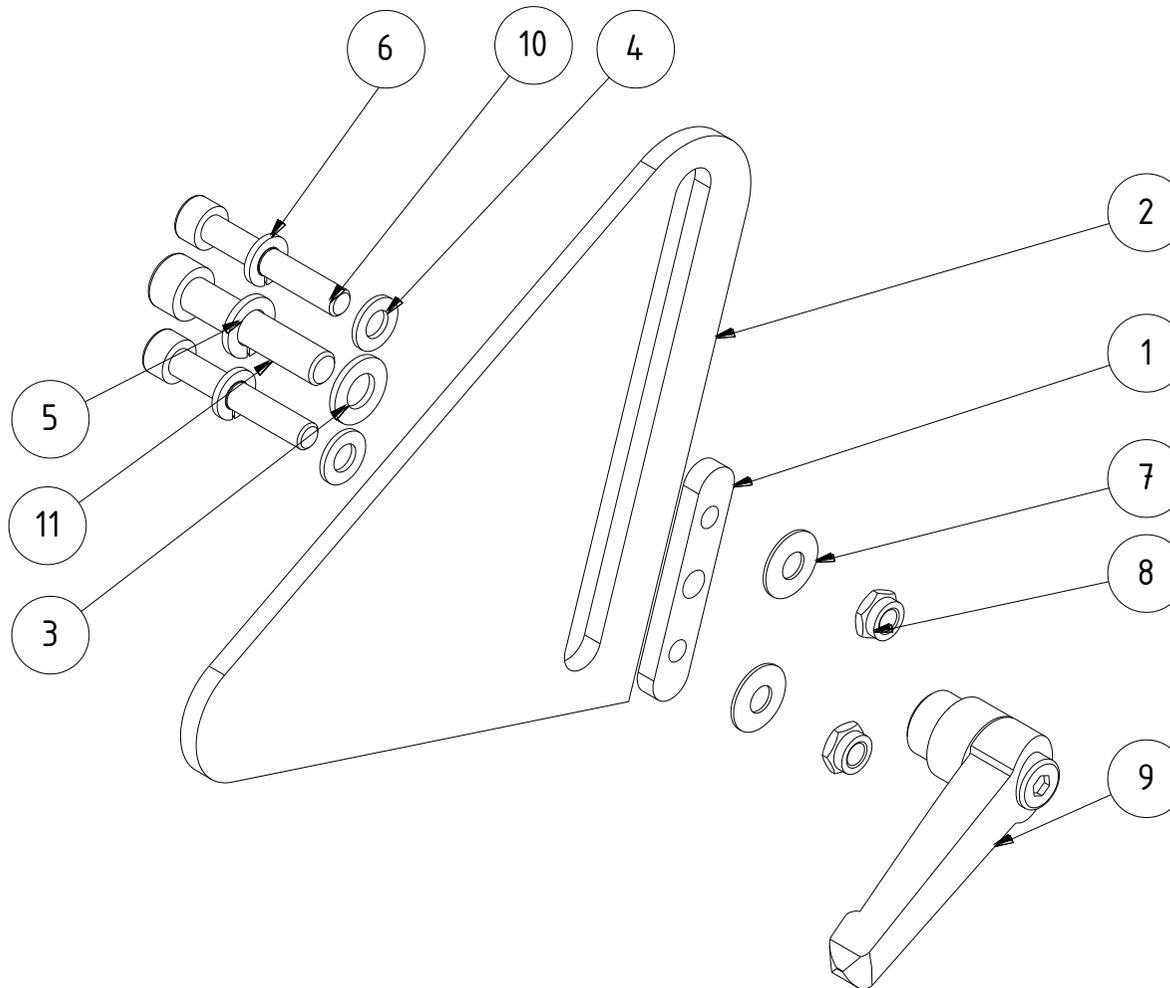


## Kanalöffner / Channel opener

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
21	2012-991	Gelenkkopf	Joint head	
22	100071192	Leiste für Zylinder	Strip for cylinder	
23	0302-678	Zylinderschraube M8x 30	Cheese head screw M8x30	ISO 4762-8-8
24	0292-869	Federring B 8	Spring washer B 8	DIN 127
25	2001-188	Vierkantmutter M8 - 16x16x8	Square nut M8 - 16x16x8	
26	0387-320	Zylinderschraube M8x25	Cheese head screw M8x25	ISO 4762-8-8
27	2000-360	Zylinderschraube M8x45	Cheese head screw M8x45	DIN 912
28	nicht vorhanden not existend			
29	0302-597	Zylinderschraube M8x16	Cheese head screw M8x16	DIN 912
30	0302-368	Zylinderschraube M6x10	Cheese head screw M6x10	DIN 912
	2055-054	Sicherungsbolzen	Bolt	
	2011-646	Kugelmutter	Ball chain	
	2011-647	Schließe 3.6 mm für Kugelmutter	Closer 3.6 mm for ball chain	
	2011-648	Ring 16 mm	Ring 16 mm	

**Niederhalter / Holding-down device**

2055-060



**Niederhalter / Holding-down device**

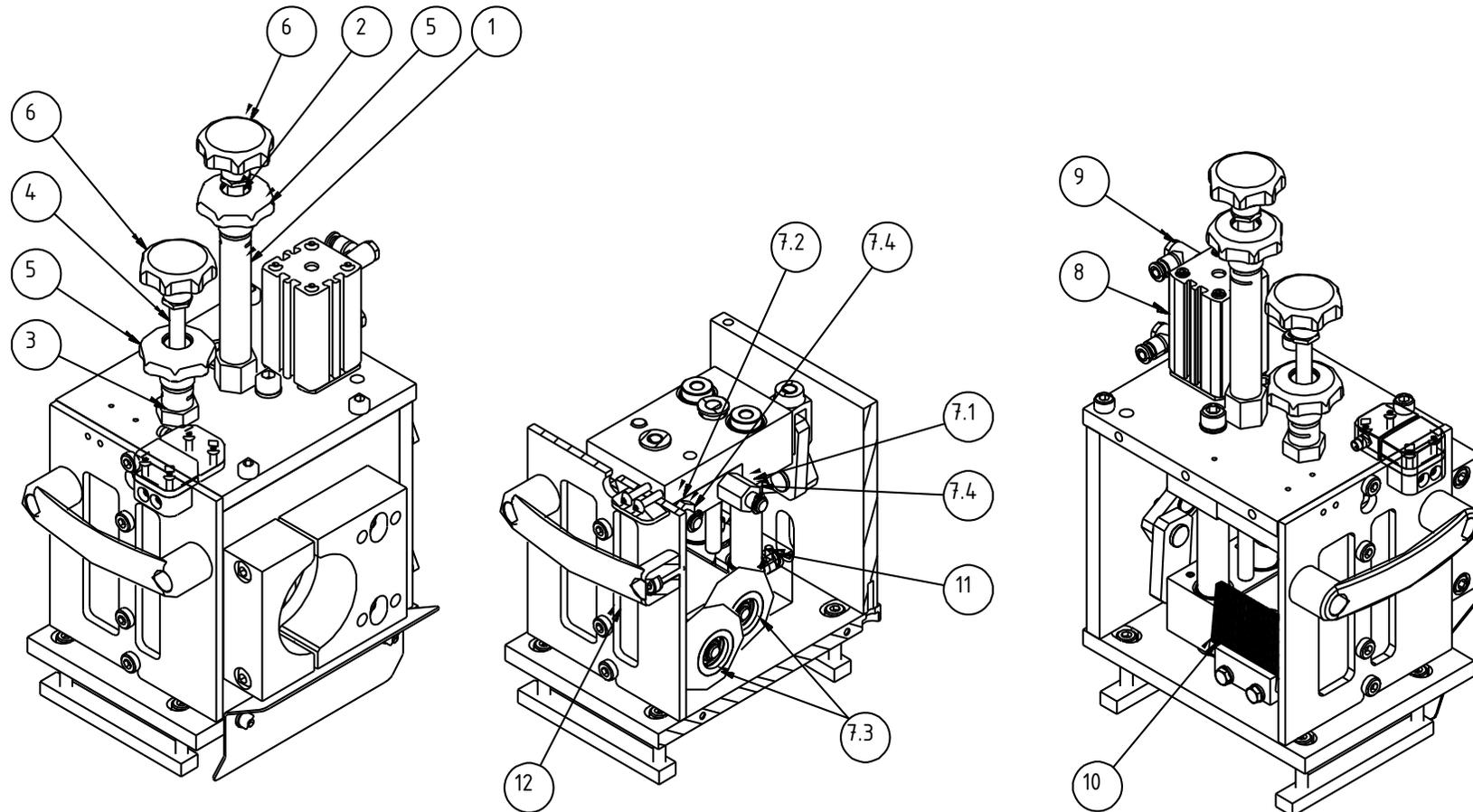
2055-060

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2054-726	Niederhalterführung	Guidance for holding-down device	
2	2055-825	Niederhalter	Holding-down device	
3	2000-403	Scheibe A10,5	Washer A10,5	DIN 125
4	0292-362	Scheibe A8,4	Washer A8,4	DIN 125
5	0292-877	Federring B10	Spring washer B10	DIN 127
6	0292-869	Federring B8	Spring washer B8	DIN 7980
7	2055-759	Tellerfeder 8,2x20 x1	Cup spring 8,2x20x1	DIN 2093
8	0666-998	Sechskantmutter M8	Hexagonal nut M8	DIN 985
9	2054-483	Klemmhebel	Clamping lever	
10	0302-716	Zylinderschraube M8x50	Cheese head screw M8x50	ISO 4762
11	4000-725	Zylinderschraube M10x50	Cheese head screw M10x50	ISO 4762

**Lünette / Steady rest**

Variante / Variant: A;D 100045605 (Zeichnung/Drawing)

Variante / Variant: B;C 100049399



## Lünette / Steady rest

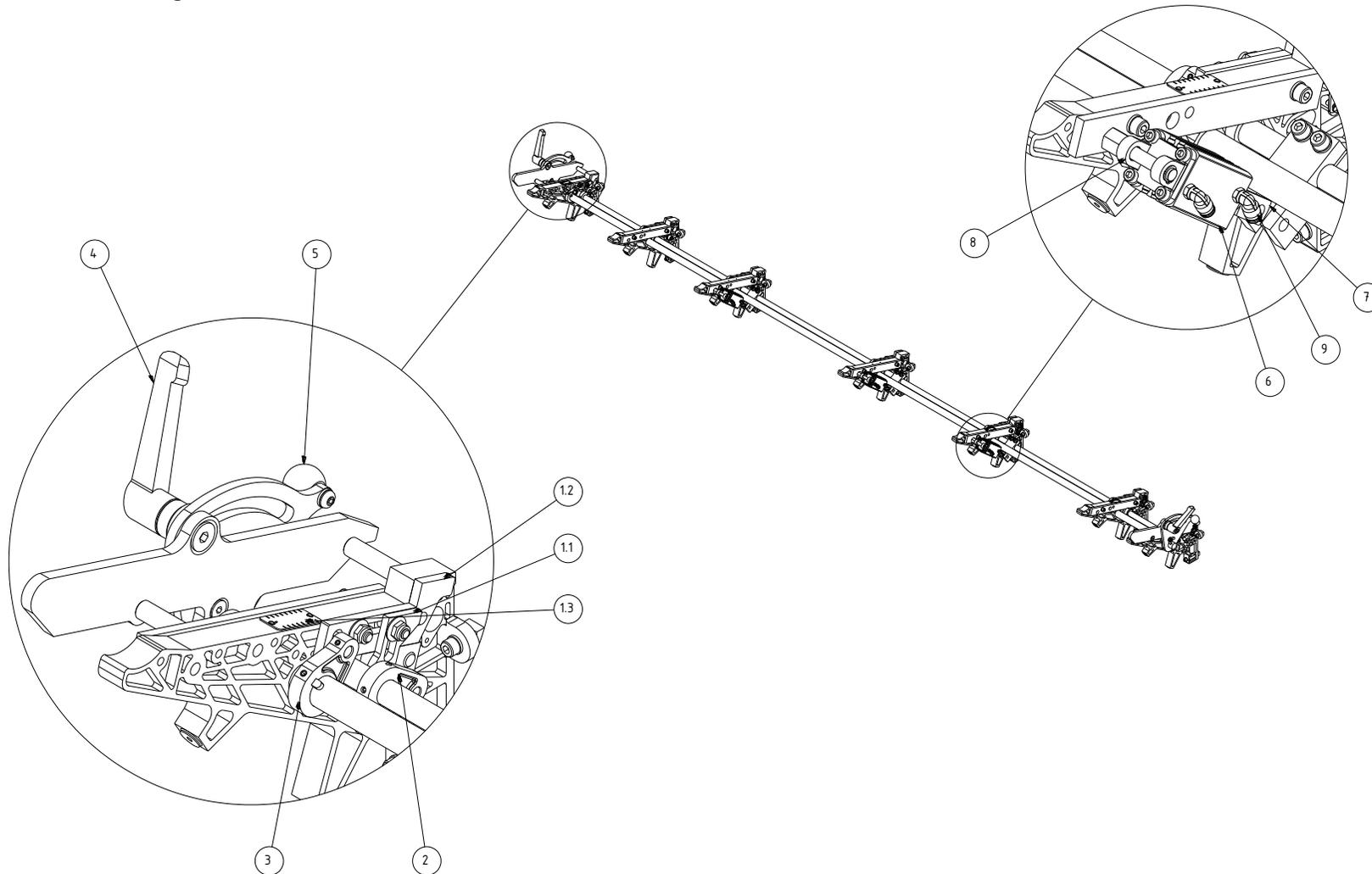
Variante / Variant: A;D 100045605

Variante / Variant: B;C 100049399

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100045771	Aufnahme, lang	Receiver, long	
2	100045795	Gewindestange M10x305	Threaded rod M10x305	
3	100021899	Aufnahme, kurz	Receiver, short	
4	100045857	Gewindestange M10x130	Threaded rod M10x130	
5	100021891	Sterngriff	Star grip	
6	2013-119	Sterngriff	Star grip	
7	2050-706	Rolleneinsatz komplett bestehend aus:	Roller insert complete consisting of:	
7.1	2049-164	Rollenbolzen lang	Roller holder, long	
7.2	2049-163	Rollenbolzen kurz	Roller holder, short	
7.3	2049-147	Rolle	Roller	
7.4	0024-635	Sicherungsring 10x1	Retaining ring 10x1	DIN471
8	2055-066	Zylinder	Cylinder	
9	2044-441	Drosselrückschlagventil	One-way restrictor	
10	2044-459	Bürste 70mm	Brush 70mm	
11	2030-853	Steckverschraubung	Plug-in screwing	
12	100063784	Makrolonscheibe	Macrolon plate	

**Seitliche Materialauflage / Lateral material storage**

Zeichnung Variante / Drawing Variant A;D



**Seitliche Materialauflage / Lateral material storage**

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2054-875 2054-876	Auflagebock vormontiert mit Anschlag A;D Auflagebock vormontiert mit Anschlag B;C bestehend aus:	Bearing support premounted with stop A;D Bearing support premounted with stop B;C Consisting of:	
1.1	2050-881	Stößel an Vereinzelung	Tappet on separation	
1.2	2055-919	Anschlag der Vereinzelung	Stop of separation	
1.3	2055-067	Skala	Scale	
2	10050779	Hebel komplett	Lever complete	
3	2054-571	Hebel D25 komplett sv	Lever D25 complete, side reversed	
4	2053-377	Klemmhebel	Clamping lever	
5	2041-158	Kugelknopf	Ball lever	
6	2055-066	Zylinder	Cylinder	
7	2001-382	Gabelkopf	Fork head	
8	2056-579	Schwenkflansch	Slewing flange	
9	2038-346	Steckverschraubung	Plug-in screwing	

**Reststückklappe / Remnant flap**

Variante / Variant A;D: 100072011 (Zeichnung/Drawing)

Variante / Variant B;C: 100082121

Variante / Variant A;D 6200: 100083017

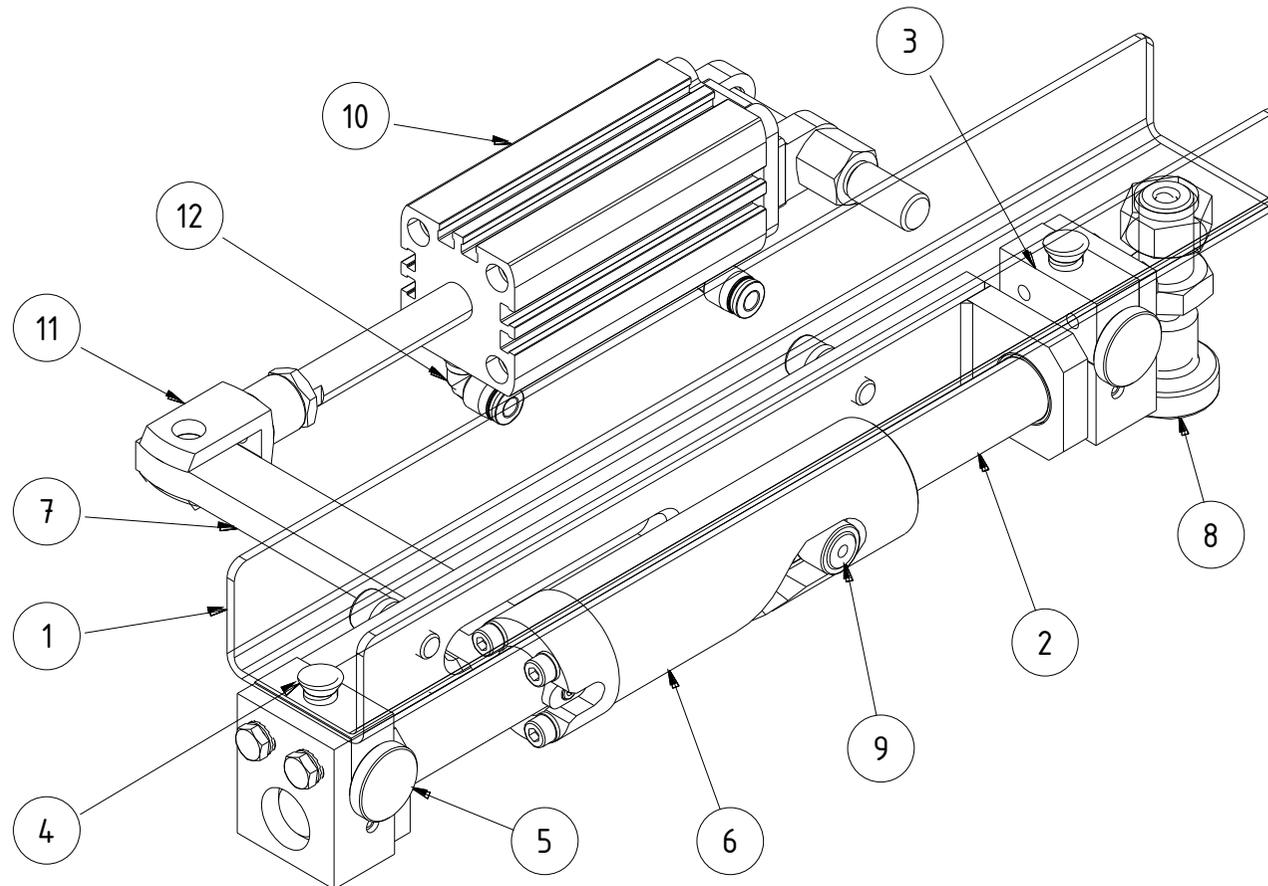
Variante / Variant B;C 6200: 100083049

Variante / Variant A;D 4775: 100083025

Variante / Variant B;C 4775: 100083047

Variante / Variant A;D 7400: 100083051

Variante / Variant B;C 7400: 100082926



**Reststückklappe / Remnant flap**

Variante / Variant A;D: 100072011

Variante / Variant B;C: 100082121

Variante / Variant A;D 6200: 100083017

Variante / Variant B;C 6200: 100083049

Variante / Variant A;D 4775: 100083025

Variante / Variant B;C 4775: 100083047

Variante / Variant A;D 7400: 100083051

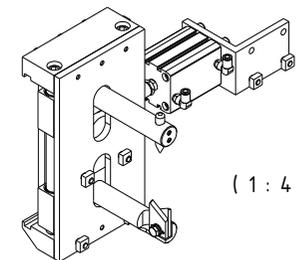
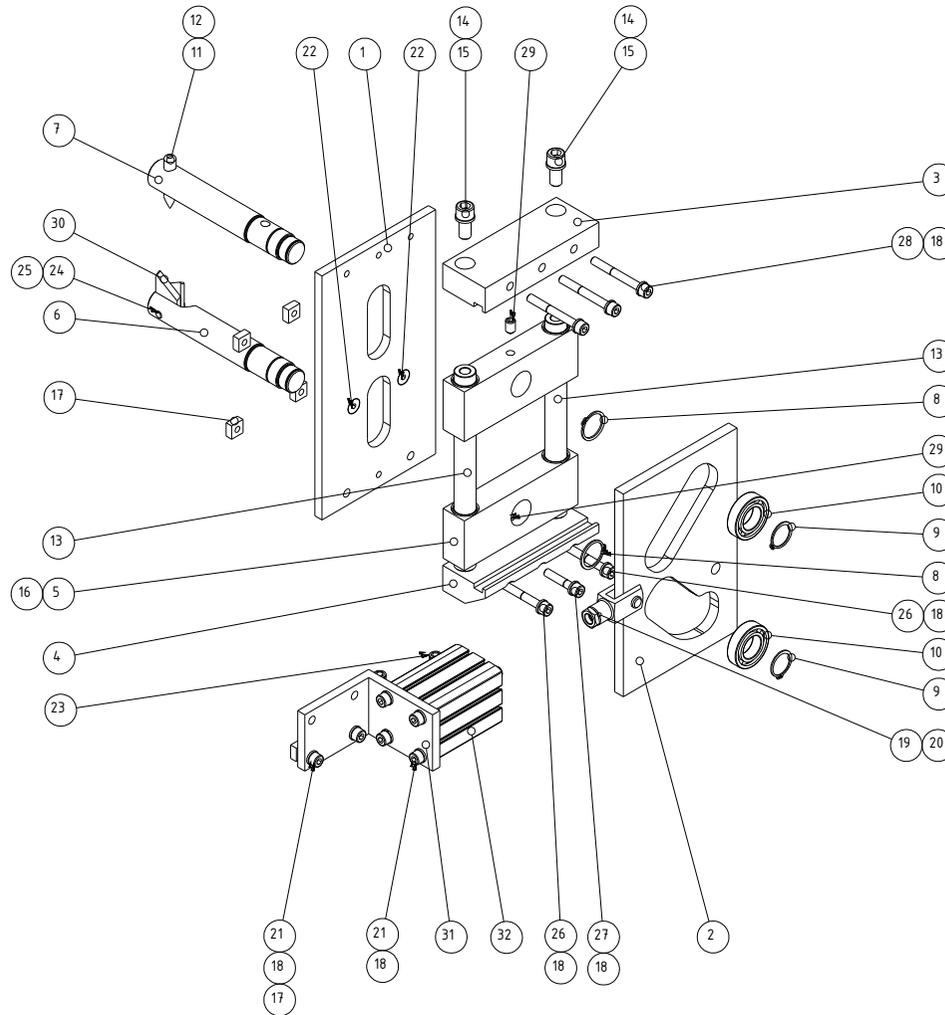
Variante / Variant B;C 7400: 100082926

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100070996 100083023 1000083013 100082985	Rinne 400 Rinne 600 Rinne 800 Rinne 1100	Groove 400 Groove 600 Groove 800 Groove 1100	
2	2052-935 2060-236 2060-193 100082987	Welle 400 Welle 600 Welle 800 Welle 1100	Shaft 400 Shaft 600 Shaft 800 Shaft 1100	
3	100072032	Verstellklotz	Adjusting block	
4	100072033	Kegelsicherung	Taper lock	
5	100071214	Rändelschraube	Knurled thumb srew	
6	2051-796 2050-670	Schiebehülse A;D Schiebehülse B;C	Sliding sleeve A;D Sliding sleeve B;C	
7	2050-669	Mitnehmer	Carrier	
8	2050-673	Rastbolzen	Stop bolt	
9	2050-672	Kurvenrolle	Cam roller	
10	2056-577 2058-185	Zylinder 400 Zylinder 600/800/1100	Cylinder 400 Cylinder 600/800/1100	
11	2001-382 2060-959	Gabelkopf 400 Gabelkopf verlängert 600/800/1100	Fork head 400 Fork head extended 600/800/1100	
12	2038-346	Steckverschraubung	Plug-in screwing	

## Greifer / Gripper

Variante / Variant A;D: 2074-975

Variante / Variant B;C: 2074-493



( 1 : 4 )

## Greifer / Gripper

Variante / Variant A;D: 2074-975

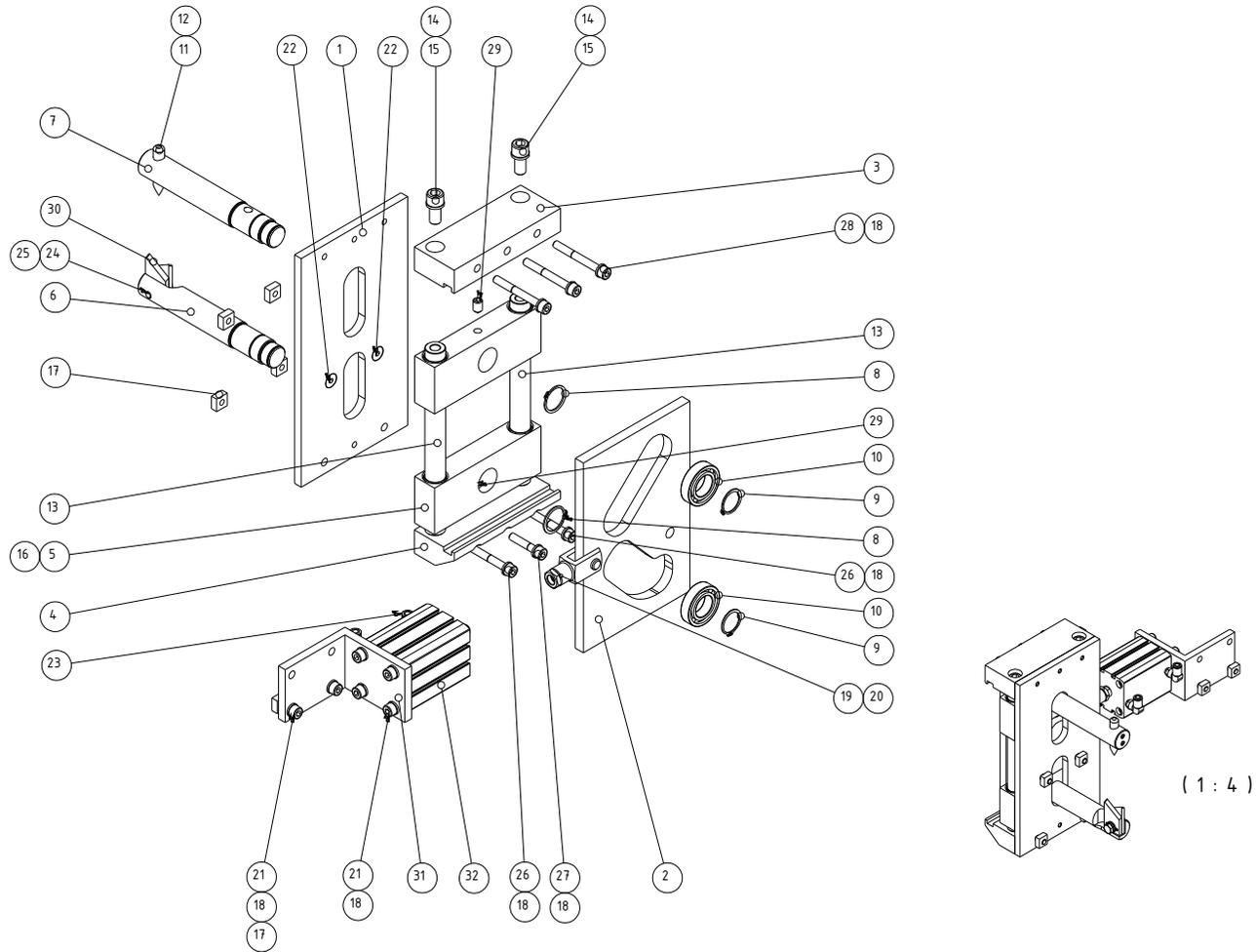
Variante / Variant B;C: 2074-493

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2050-948	Grundplatte	Base plate	
2	2050-946	Kulissenplatte	Guide plate	
3	2054-253	Führungsleiste oben	Guide gib, top	
4	2050-947	Führungsleiste unten	Guide gib bottom	
5	2050-412	Halter für Greiferarm	Holder for gripper arm	
6	2051-480	Greiferarm unten	Gripper arm, bottom	
7	2051-479	Greiferarm oben	Gripper arm, top	
8	2050-415	Sicherungsring A28	Retaining ring A28	DIN 471
9	2000-510	Sicherungsring A25	Retaining ring A25	DIN 471
10	2027-118	Rillenkugellager 25x47x12	Grooved ball bearing 25x47x12	DIN 625
11	1324-063	Messer oben	Blade, top	
12	0304-050	Gewindestift M8x10	Set screw M8x10	DIN 916 - 45 H
13	2050-949	Führungsstange	Guide bar	
14	2037-505	Scheibe 12	Washer 12	DIN 25201
15	2043-639	Zylinderschraube M12x25	Cheese head screw M12x25	DIN 912 - 10.9
16	2050-416	Glycodur-Buchse 22x25x30	Glycodur bush 22x25x30	
17	2001-188	Vierkantmutter M8 - 16x16x8	Square nut M8 - 16x16x8	
18	0292-869	Federring B8	Spring washer B8	DIN 127
19	2000-016	Gabelkopf	Fork head	
20	2004-949	Sechskantmutter M10x1,25	Hexagonal nut M10x1,25	DIN 934
21	0387-320	Zylinderschraube M8x25	Cheese head screw M8x25	ISO 4762 - 8-8
22	0305-979	Senkschraube M8x20	Countersunk screw M8x20	DIN 933
23	2038-346	Steckverschraubung	Plug-in screwing	

**Greifer / Gripper**

Variante / Variant A;D: 2074-975

Variante / Variant B;C: 2074-493



## Greifer / Gripper

Variante / Variant A;D: 2074-975

Variante / Variant B;C: 2074-493

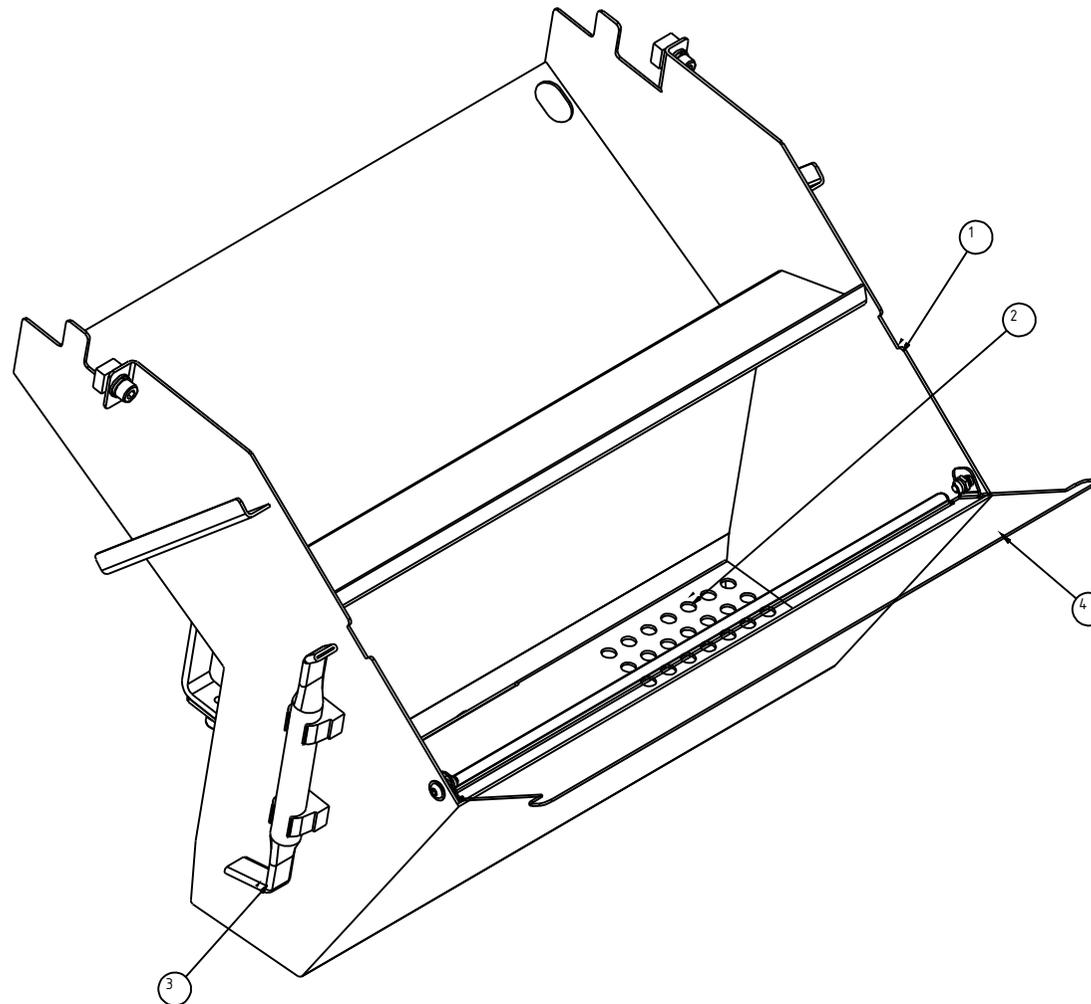
Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
24	2000-364	Sechskantschraube M8x25	Hexagonal screw M8x25	DIN 933 8-8
25	0292-362	Scheibe A8,4 ST	Washer A8,4 ST DIN 125	DIN 125
26	2001-128	Zylinderschraube M8x55	Cheese head screw M8x55	ISO 4762
27	0302-694	Zylinderschraube M8x40	Cheese head screw M8x40	DIN 912 - 8-8
28	0302-740	Zylinderschraube M8x70	Cheese head screw M8x70	DIN 912 - 8-8
29	2052-391	Gewindestift M10x16	Set screw M10x16	DIN 914
30	1324-055	Messer, unten	Blade, bottom	
31	2074-494	Haltewinkel	Angle	
32	2058-131	Zylinder	Cylinder	

**Reststückbehälter komplett / Remnant bin complete**

Variante / Variant 2200/3200/3800/4200: 100049340

Variante / Variant 6200 / 4200 mit 800 mm Reststücklänge; with 800 mm remnant length: 100049992

Variante / Variant 4775 mit 600 mm Reststücklänge; with 600 mm remnant length. 100081472



## Reststückbehälter komplett / Remnant bin complete

Variante / Variant 2200/3200/3800/4200: 100049340

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2050-732	Reststückbehälter	Remnant bin	
2	2050-733	Abtropfblech	Drip plate	
3	2051-669	Einlagenwerkzeug komplett	Insert tool complete	
4	100045693	Deckel	Cover	

Variante / Variant 4775 mit 600 mm Reststücklänge; with 600 mm remnant length: 100081472

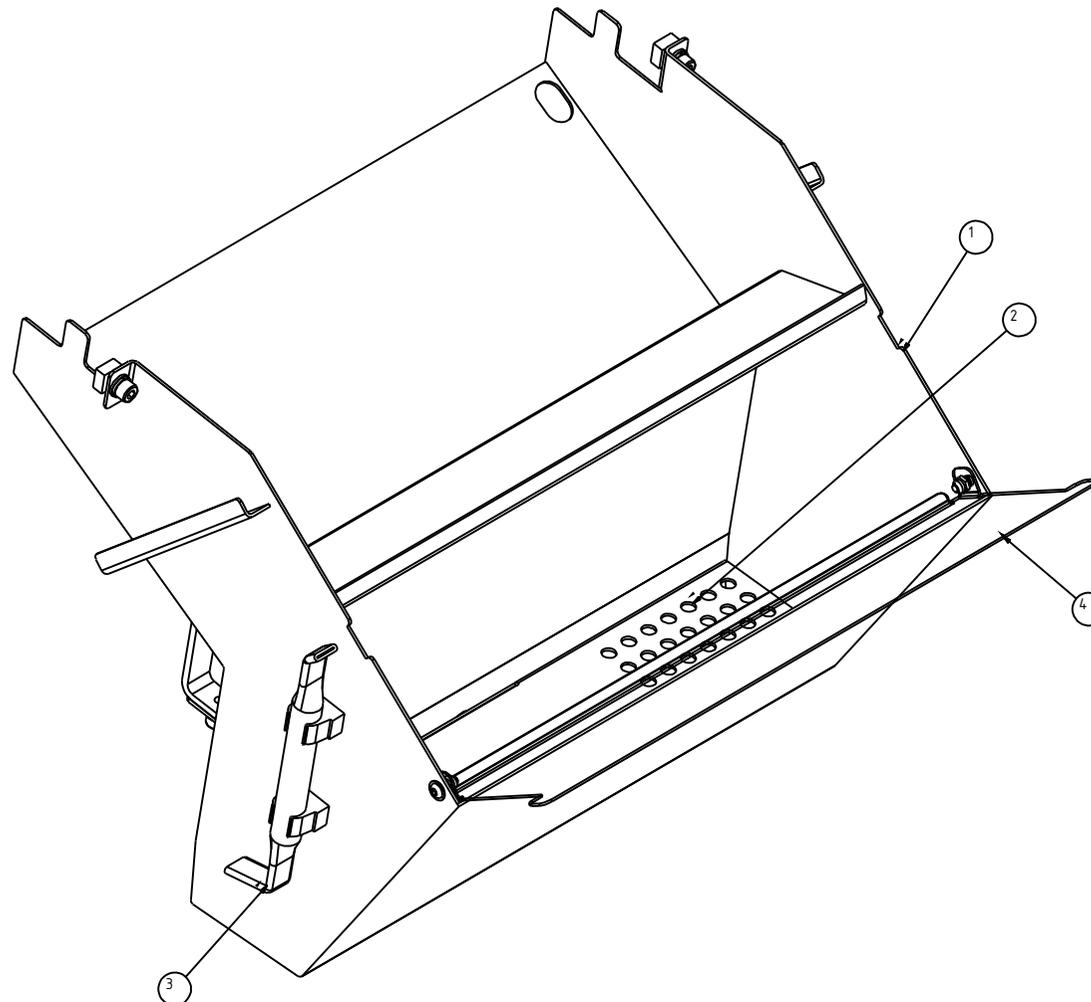
Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2069-916	Reststückbehälter	Remnant bin	
2	2060-292	Abtropfblech	Drip plate	
3	2051-669	Einlagenwerkzeug komplett	Insert tool complete	
4	100081479	Deckel	Cover	

**Reststückbehälter komplett / Remnant bin complete**

Variante / Variant 2200/3200/3800/4200: 100049340

Variante / Variant 6200 / 4200 mit 800 mm Reststücklänge; with 800 mm remnant length: 100049992

Variante / Variant 4775 mit 600 mm Reststücklänge; with 600 mm remnant length. 100081472



## Reststückbehälter komplett / Remnant bin complete

Variante / Variant 6200: 100049992

Variante / Variant 4200 mit 800 mm Reststücklänge; with 800 mm remnant length:

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2060-373	Reststückbehälter	Remnant bin	
2	2050-374	Abtropfblech	Drip plate	
3	2051-669	Einlagenwerkzeug komplett	Insert tool complete	
4	100049996	Deckel	Cover	

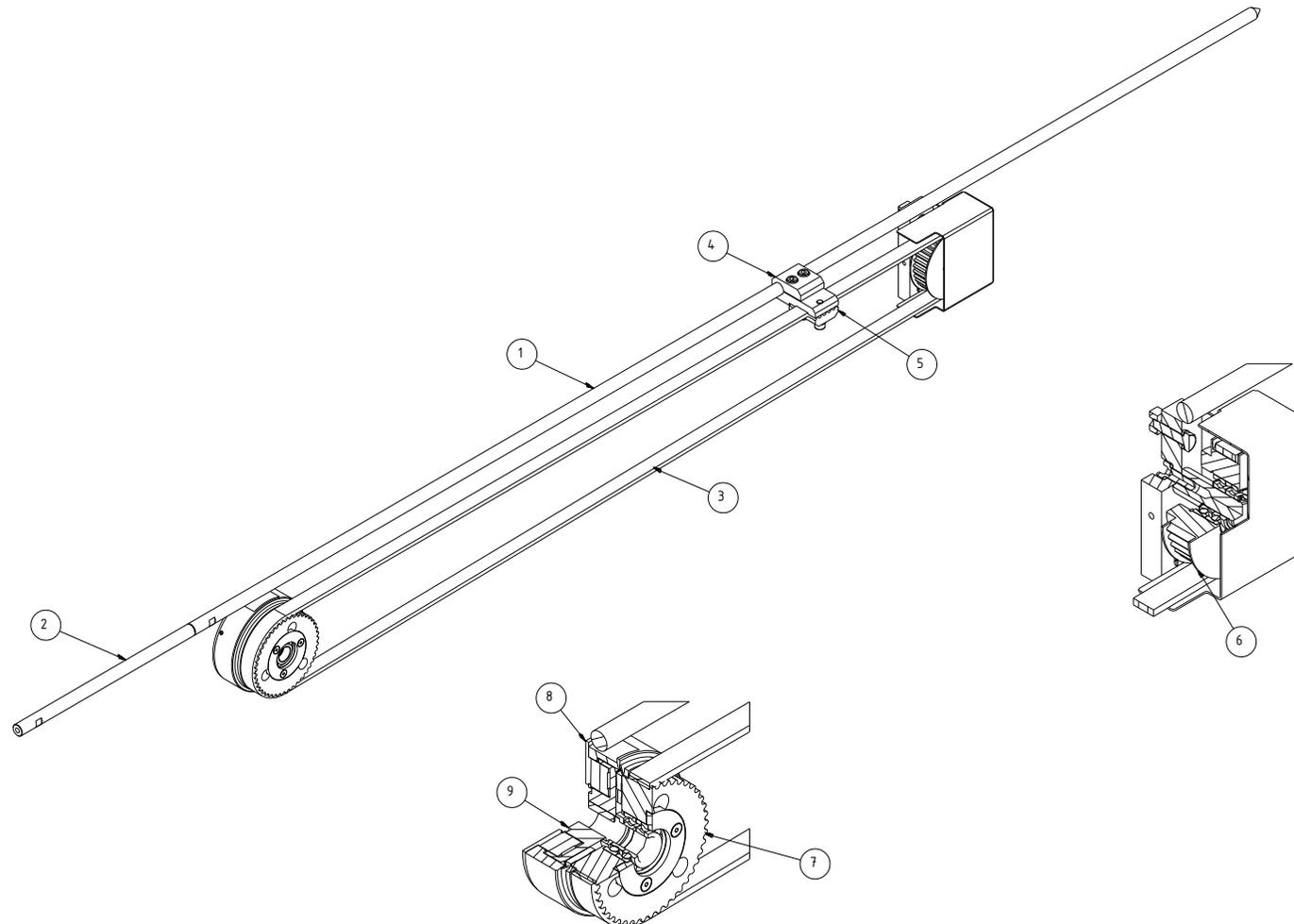
Variante / Variant 7400 mit 1100 mm Reststücklänge; with 1100 mm remnant length: 1000069816

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2061-478	Reststückbehälter	Remnant bin	
2	2050-733 2061-479	Abtropfblech Nacharbeit Abtropfblech	Drip plate Rework drip plate	
3	2051-669	Einlagenwerkzeug komplett	Insert tool complete	
4	100069805	Deckel	Cover	

**Synchroneinrichtung / Synchronized device**

Variante / Variant 2200: 2055-651

Variante / Variant 3200/3800/4200/6200: 100045448



## Synchroneinrichtung / Synchronized device

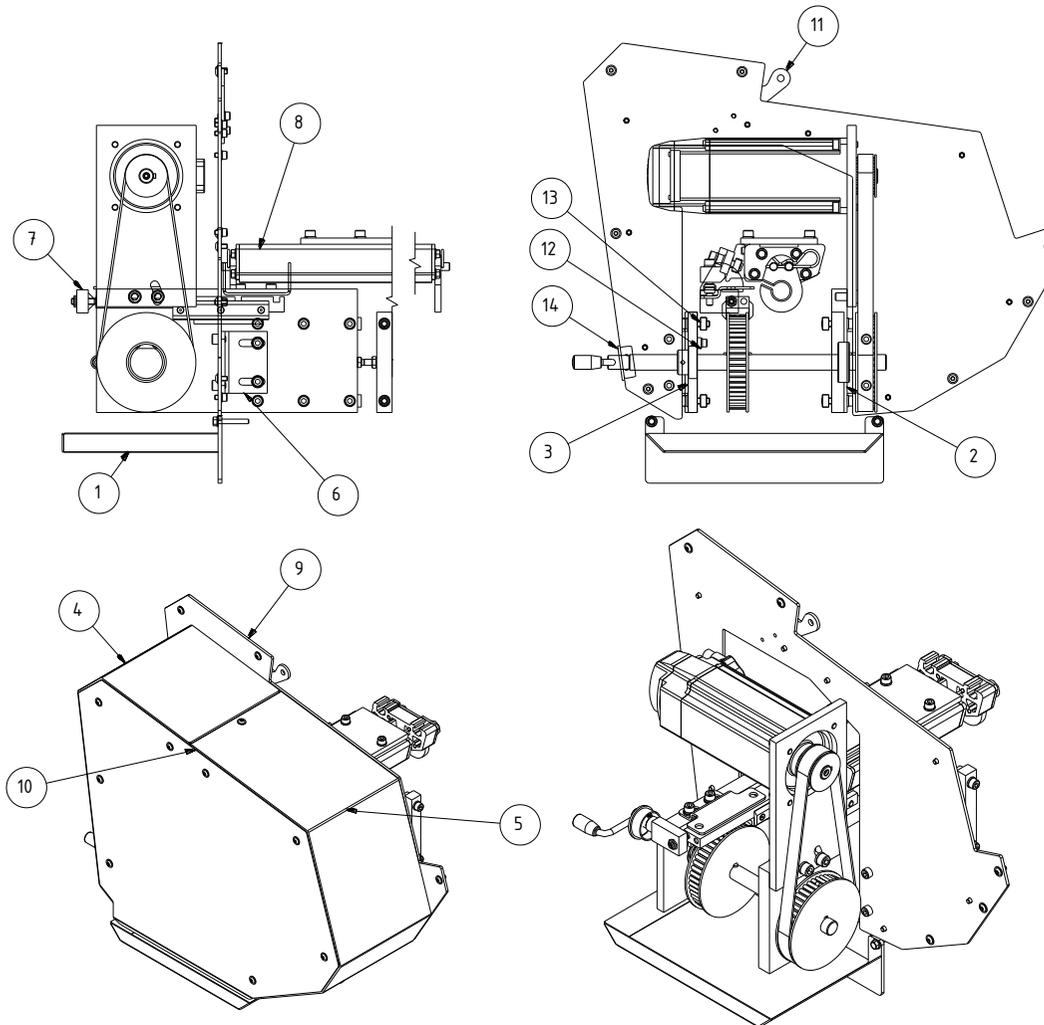
Variante / Variant 2200: 2055-651

Variante / Variant 3200/3800/4200/6200: 100045448

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2030-195	Synchronstange	Synchronized bar	
2	100045171	Verlängerung Synchronstange (3200/3800/4200/6200)	Extension Synchronized bar (3200/3800/4200/6200)	
3	100044095 2055-742	Zahnriemen (3200/3800/4200/6200) Zahnriemen (2200)	Toothed belt (3200/3800/4200/6200) Toothed belt (2200)	
4	2051-605	Mitnehmer für Synchronstange	Carrier for synchronized bar	
5	2035-080	Spannplatte	Clamping plate	
6	100044200 2050-904	Umlenkrad komplett (3200/3800/4200/6200) Umlenkrad komplett (2200)	Deflection wheel complete (3200/3800/4200/6200) Deflection wheel complete (2200)	
7	2055-542 2050-903	Zahnscheibe Z44 (3200/3800/4200/6200) Zahnscheibe Z38 (2200)	Toothed disk Z44 (3200/3800/4200/6200) Toothed disk Z38 (2200)	
8	2000-197	Magnetteil Gr. 10	Magnetic part	
9	2000-195	Rotor Gr. 10	Rotor	

## Umbausatz – Vorschubstange 1666 / Retrofit kit – Pusher 1666

Variante A;D	200005166 – 2200	100049521 – 3200	200005167 – 3800	200005168 – 4200	200005169 – 6200	20007340 – 7400
Variante B;C	200005175 – 2200	200005176 – 3200	200005177 – 3800	200005178 – 4200	200005179 – 6200	20007952 – 7400



## Umbausatz – Vorschubstange 1666 / Retrofit kit – Pusher 1666

Variante A;D	200005166 – 2200	100049521 – 3200	200005167 – 3800	200005168 – 4200	200005169 – 6200	20007340 – 7400
Variante B;C	200005175 – 2200	200005176 – 3200	200005177 – 3800	200005178 – 4200	200005179 – 6200	20007952 – 7400

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2054-385	Deckel mit Wanne	Top with basin	
2	2068-888	Platte Vorderseite A;D	Plate front A;D	
	2068-886	Platte Vorderseite B;C	Plate front B;C	
3	2054-380	Platte Rückseite	Plate rear	
4	2056-002	Abdeckblech Rückseite	Sheet rear	
5	2056-003	Abdeckblech Vorderseite	Sheet front	
6	2054-376	Haltewinkel 40x 60x80	Angle 40x60x80	
7	2054-382	Anschlag für Schlitten	Stop for carriage	
8	2054-615	Kanaldeckel verlängert A;D	Cover extended A;D	
	2054-616	Kanaldeckel verlängert B;C	Cover extended B;C	
9	2068-889	Stirnblech hinten	Sheet rear	
10	2074-376	Stirnblech hinten A;D	Sheet rear A;D	
	2074-377	Stirnblech hinten B;C	Sheet rear B;C	
11	2054-386	Haltelasche	Bracket	
12	2055-995	Leiste 5x14x40	Gib 5x14x40	
13	2054-564	Nutenstein M8/3x - 8x16x150	Tenon block M8/3x - 8x16x150	
14	2044-508	Verschlussstopfen D40	Stopples D40	
15	2056-138	Zahnriemen (2200)	Toothed belt (2200)	
	2052-230	Zahnriemen (3200)	Toothed belt (3200)	
	2054-680	Zahnriemen (3800)	Toothed belt (3800)	
	2052-853	Zahnriemen (4200)	Toothed belt (4200)	
	2073-508	Zahnriemen (6200)	Toothed belt (6200)	
	100070092	Zahnriemen (7400)	Toothed belt (7400)	

## Umbausatz – Vorschubstange 1866 / Retrofit kit – Pusher 1866

Variante A;D (1866)

100049618 – 3200

200005180 – 3800

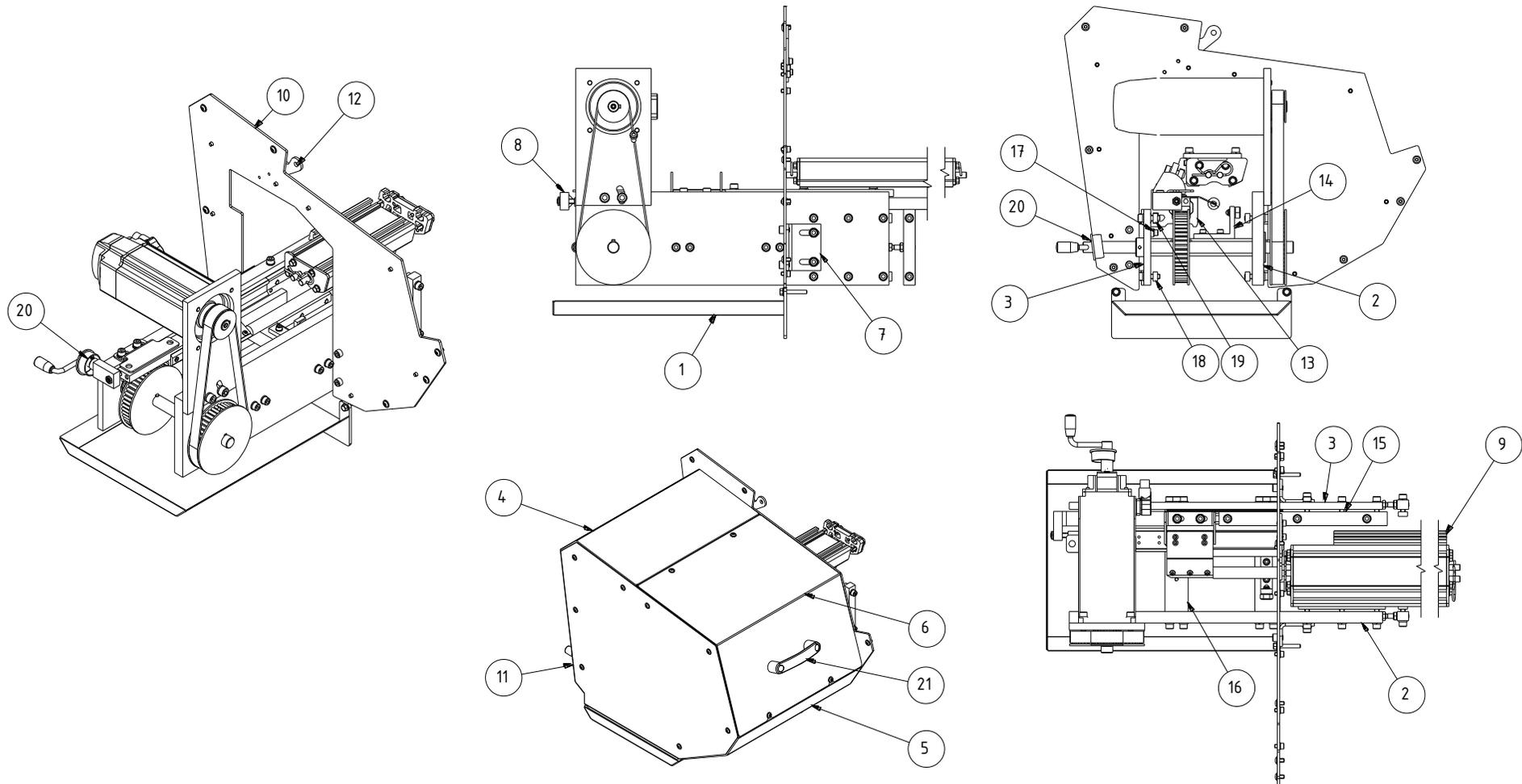
200005181 – 4200

Variante B;C (1866)

200005182 – 3200

200005183 – 3800

200005184 – 4200

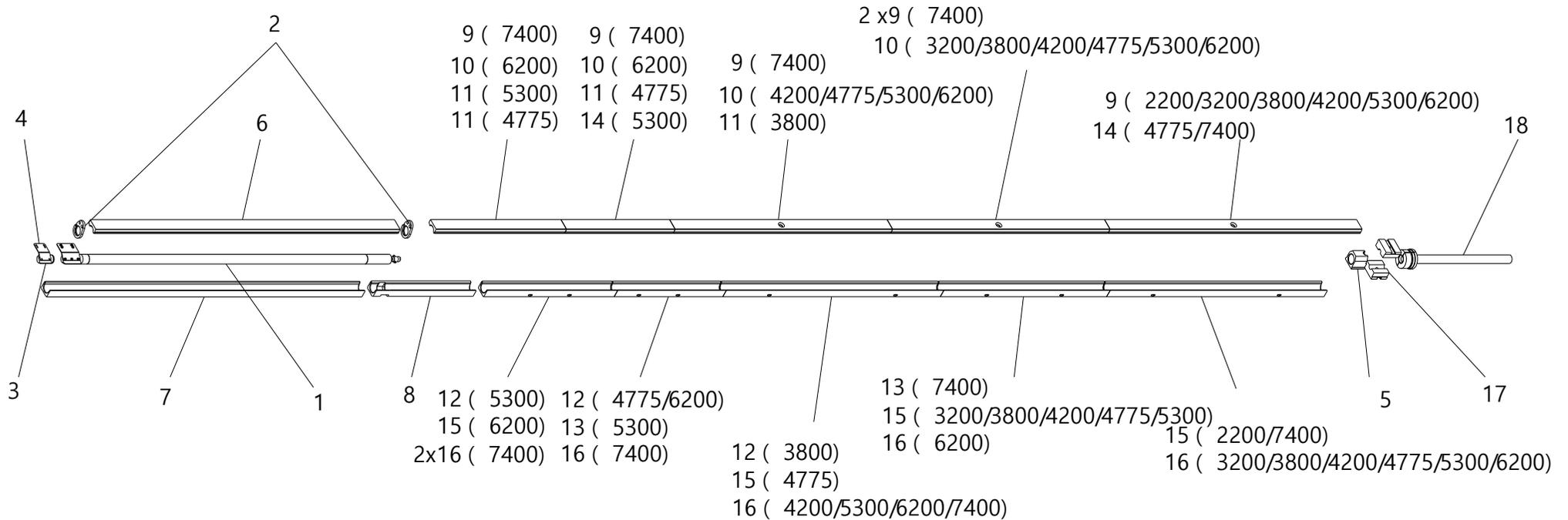


## Umbausatz – Vorschubstange 1866 / Retrofit kit – Pusher 1866

Variante A;D (1866) 100049618 – 3200 200005180 – 3800 200005181 – 4200  
 Variante B;C (1866) 200005182 – 3200 200005183 – 3800 200005184 – 4200

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2073-374	Deckel mit Wanne	Top with basin	
2	2075-738 2073-376	Platte Vorderseite A;D Platte Vorderseite B;C	Plate front A;D Plate front B;C	
3	2073-375	Platte Rückseite	Plate rear	
4	2075-748 2073-383	Abdeckblech Rückseite A;D Abdeckblech Rückseite B;C	Sheet rear A;D Sheet rear B;C	
5	2073-385	Abdeckblech Vorderseite	Sheet front	
6	2073-384	Abdeckblech Deckel	Sheet for top	
7	2054-376	Haltewinkel 40x 60x80	Angle 40x60x80	
8	2073-380	Anschlag für Schlitten	Stop for carriage	
9	2075-740 2073-393	Kanaldeckel verlängert A;D Kanaldeckel verlängert B;C	Cover extended A;D Cover extended B;C	
10	2068-889	Stirnblech hinten	Sheet rear	
11	2074-376 2074-373	Stirnblech hinten A;D Stirnblech hinten B;C	Sheet rear A;D Sheet rear B;C	
12	2054-386	Halteflasche	Bracket	
13	2073-381	Schlitten Führung	Carriage Guidance	
14	2075-957	Haltewinkel für Einlage	Retaining angle for insert	
15	2073-382	Spannleiste 25x12x285	Tension gib 25x12x285	
16	2073-377	Distanz Antrieb	Distance drive	
17	2055-995	Leiste 5x14x40	Gib 5x14x40	
18	2054-564	Nutenstein M8/3x - 8x16x150	Tenon block M8/3x - 8x16x150	
19	2073-378	Nutenstein M8/3x - 8x16x375	Tenon block M8/3x - 8x16x375	
20	2044-508	Verschlussstopfen D40	Stopples D40	
21	2006-974	Bügelgriff	Bow handle	
	2075-746	Zahnriemen (3200)	Toothed belt (3200)	
	2052-016	Zahnriemen (3800)	Toothed belt (3800)	
	2080-880	Zahnriemen (4200)	Toothed belt (4200)	

**Umrüstsätze / Capacity adjustment sets**  
**Abbildung / Drawing**



**Hinweis:**

Die Materialführungen (17) und das Führungsrohr / Teleskoprohr (18) sind materialabhängig und nicht im Umrüstsatz enthalten.

**Note:**

The guide jaws (17) and the guide tube / telescopic tube (18) are depending on material and not included in the capacity adjustment set.

## Umrüstsätze / Capacity adjustment sets

Pos.	Bezeichnung Designation
1	Vorschubstange Pusher
2	Hubplatte Lifting plate
3	Schieber Short pusher
4	Fahne Schieber Flag short pusher
5	Führungsbuchse Guide bush
6	Einlage hinten oben 1400 Insert rear top 1400

Pos.	Bezeichnung Designation
7	Einlage hinten unten 1450 / 1650 Insert rear bottom 1450 / 1650
8	Einlage unten (Reststückklappe) Insert bottom (remnant flap)
9	Einlage vorne oben 1160 Insert front top 1160
10	Einlage vorne oben 1000 Insert front top 1000
11	Einlage vorne oben 600 Insert front top 600
12	Einlage vorne unten 600 Insert front bottom 600

Pos.	Bezeichnung Designation
13	Einlage vorne unten 500 Insert front bottom 500
14	Einlage vorne oben 500 Insert front top 500
15	Einlage vorne unten 765 Insert front bottom 765
16	Einlage vorne unten 1000 Insert front bottom 1000
17	Materialführung Guide jaw
18	Führungsrohr/Teleskoprohr Guide tube/telescopic tube

**\*Hinweis:**

Die Materialführungen (17) und das Führungsrohr / Teleskoprohr (18) sind materialabhängig und nicht im Umrüstsatz enthalten.

**\*Note:**

The guide jaws (17) and the guide tube / telescopic tube (18) are depending on material and not included in the capacity adjustment set.

**Umrüstsätze 1466 / Capacity adjustment sets 1466**

Umrüstsatz komplett Capacity adjustment set complete	2200	3200	3800	4200	4200 Reststücklänge remant length 800 mm	5300	6200	7400
D07/1466 AD	2055-795	2051-911	2054-096	2053-186		-	-	
D07/1466 BC	2055-796	2051-912	2054-107	2052-275	2066-308	-	2067-393	
D10/1466	2055-797	2051-913	2054-097	2052-276	2066-309	-	2063-716	
D12/1466	2055-798	2051-914	2054-098	2052-277	2066-310	-	-	
D13/1466	2055-799	2051-915	2054-099	2052-278	2066-311	-	2064-944	
D15/1466	2055-800	2051-916	2054-100	2052-279	2066-312	-	2060-286	
D16/1466	2055-801	2051-917	2054-101	2052-280	2066-313	-	-	
D18/1466	2055-802	2051-918	2054-102	2052-281	2066-314	-	-	
D20/1466	2055-803	2051-919	2054-103	2052-282	2066-315	-	-	
D22/1466	2055-804	2051-920	2054-104	2052-283	2066-316	-	2060-287	
D23/1466	2055-805	-	2062-002	-	2066-317	-	-	
D25/1466	2055-806	2051-824	2054-108	2052-300	2066-318	-	2066-771	
D26/1466	2055-807	2051-825	2054-109	2052-301	2066-319	-	2062-739	
D27/1466	2056-460	2056-461	2056-400	2056-462	2066-320	-	-	
D28/1466	2055-808	2051-826	2054-110	2052-302	2066-321	-	-	200007954
D30/1466	2055-809	2051-827	2054-111	2052-303	2066-322	-	-	
D32/1466	2055-810	2051-828	2054-112	2052-304	2066-323	2057-929	2061-741	
D34/1466	2055-811	2051-829	2054-113	2052-305	2066-324	-	-	
D36/1466	2055-812	2051-830	2054-114	2052-306	2066-325	-	2060-195	
D38/1466	2060-490	2060-491	2060-492	2060-493	2066-326	-	-	200007338

**Umrüstsätze 1666 / Capacity adjustment sets 1666**

Umrüstsatz komplett Capacity adjustment set complete	2200	3200	3800	4200	4775	5300	6200	7400
D07/1666 AD	2056-144	2057-278	2057-280	2057-282	-	-	-	
D07/1666 BC	2056-145	2057-279	2057-281	2057-283	-	-	-	
D10/1666	2056-146	2052-057	2054-115	2054-070	-	-	-	
D12/1666	2056-147	2052-058	2054-116	2054-071	-	-	-	
D13/1666	2056-148	2052-059	2054-117	2054-072	-	-	-	
D15/1666	2056-149	2052-060	2054-118	2054-073	-	-	-	
D16/1666	2056-150	2052-143	2054-119	2054-074	-	-	-	
D18/1666	2056-151	2052-144	2054-120	2054-075	-	-	-	
D20/1666	2056-152	2052-145	2054-121	2054-076	2060-259	-	-	
D22/1666	2056-153	2052-146	2054-122	2054-077	-	-	-	
D23/1666	2056-154	2069-749	2049-735	2069-736	-	-	-	
D25/1666	2056-155	2052-147	2054-123	2054-078	-	-	-	
D26/1666	2056-156	2052-148	2054-124	2054-079	-	-	-	
D28/1666	2056-157	2052-149	2054-125	2054-080	-	-	-	200007956
D30/1666	2056-158	2052-150	2054-126	2054-081	-	-	-	
D32/1666	2056-159	2052-151	2054-127	2054-082	2071-084	-	-	
D34/1666	2056-160	2052-152	2054-128	2054-083	-	-	2073-366	
D36/1666	2056-161	2052-153	2054-129	2054-084	2060-260	-	-	
D38/1666	2062-377	2062-379	2062-380	2062-381	-	-	-	200007341

**Umrüstsätze 1866 / Capacity adjustment sets 1866**

Umrüstsatz komplett Capacity adjustment set complete	2200	3200	3800	4200	4775	5300	6200
D07/1866 AD	-	-	-	-	-	-	-
D07/1866 BC	-	-	-	-	-	-	-
D10/1866	-	-	-	-	-	-	-
D12/1866	200010524	-	200010525	-	-	-	200008302
D13/1866	-	-	-	-	-	-	-
D15/1866	-	2075-787	-	-	-	-	-
D16/1866	-	-	-	-	-	-	-
D18/1866	-	-	-	-	-	-	-
D20/1866	-	-	-	-	2073-410	-	-
D22/1866	-	-	-	-	-	-	-
D23/1866	-	-	-	-	-	-	-
D25/1866	-	2075-788	-	-	-	-	-
D26/1866	-	-	-	-	-	-	-
D28/1866	-	-	-	-	-	-	-
D30/1866	-	-	-	-	-	-	-
D32/1866	-	2075-789	-	-	-	-	-
D34/1866	-	-	-	-	2073-409	-	-
D36/1866	-	-	-	-	2074-349	-	-
D38/1866	-	-	-	-	-	-	-

**Materialführungen / Material guide jaws**

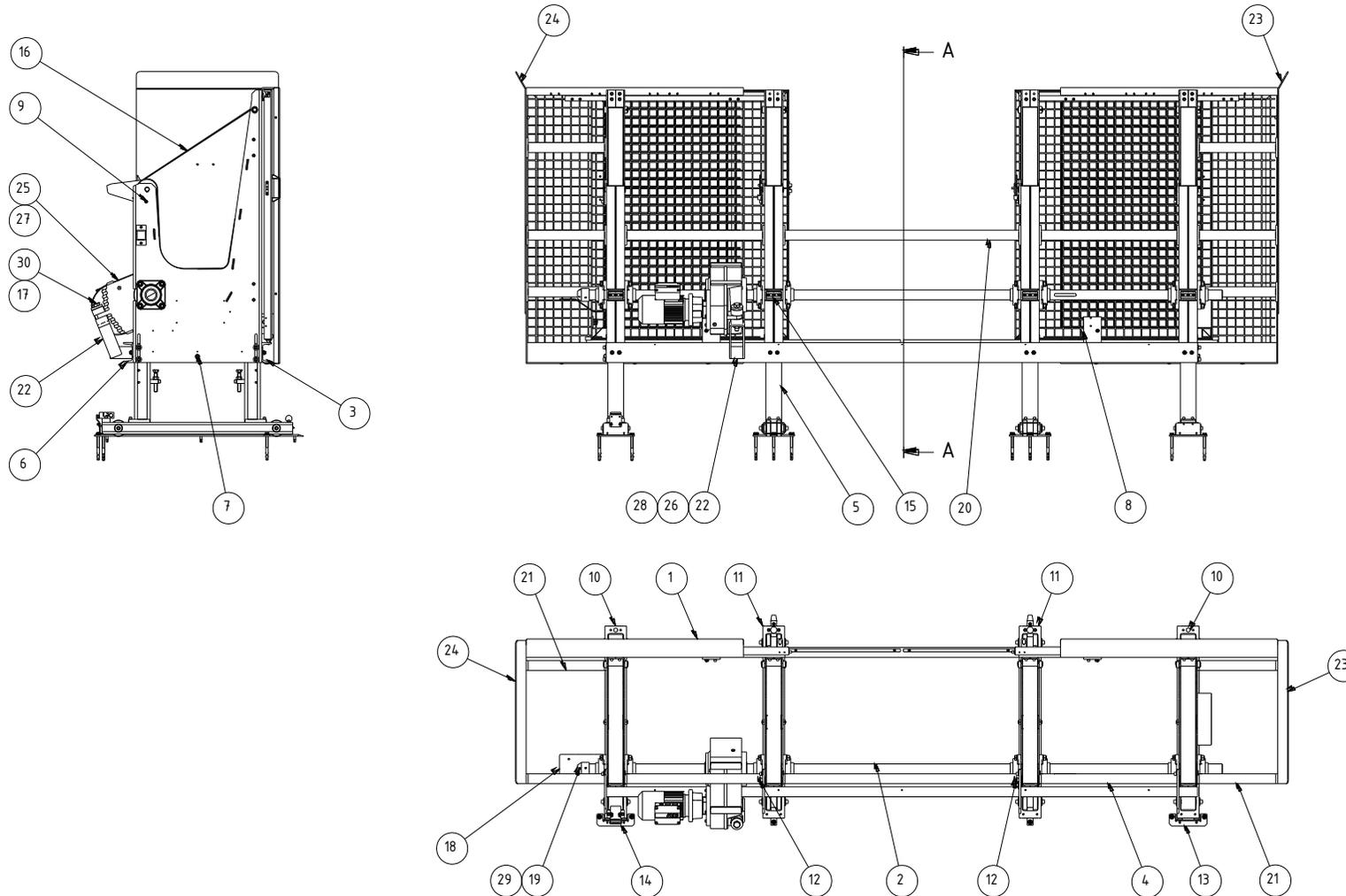
Einsetzbar in Usable in turbo	Materialführung Guide jaw	Ident-Nr. Ident-No.	zu verarbeitender Materialdurchmesser Diameter of material to be machined
26/36	D07	2021-764	3 - 6 mm
26/36	D10	2021-765	6 - 9 mm
26/36	D12	2053-000	9 - 11 mm
26/36	D13	2053-195	11 - 12 mm
26/36	D15	2021-766	12 - 14 mm
26/36	D16	2027-704	14 - 15 mm
26/36	D18	2044-040	15 - 17 mm
26/36	D20	2021-767	17 - 19 mm
26/36	D22	2027-705	19 - 21 mm
26/36	D25	2021-768	21 - 24 mm
26/36	D26	2053-196	24 - 25 mm
26/36	D28	2030-119	25 - 27 mm
36	D30	2021-769	27 - 29 mm
36	D32	2023-714	29 - 31 mm
36	D34	2024-758	31 - 33 mm
36	D35	2021-770	33 - 34 mm
36	D36	2024-970	34 - 35 mm
36	D37	2053-911	35 - 36 mm
36	D38	2060-512	36 - 37 mm

**Führungsrohr / Guide tube**

	<b>Führungsrohr kpl. Guide tube compl.</b>	<b>Führungsrohr Guide tube</b>	<b>Reduzierhülse Reducing sleeve</b>	<b>Gewindestift Set screw</b>	<b>Hülse Sleeve</b>
<b>Ø</b>	<b>Ident Nr. Ident-No</b>	<b>Stück/Piece 1</b>	<b>Stück/Piece 1</b>	<b>Stück/Piece 2</b>	<b>Stück/Piece 1</b>
<b>D07</b>	2058-204	2005-331	2057-442	0497-738	2014-915
<b>D10</b>	2058-205	2005-330	2057-442	0497-738	2014-915
<b>D12</b>	2058-206	2005-329	2057-442	0497-738	2005-682
<b>D13</b>	2058-207	2030-949	2057-442	0497-738	2005-682
<b>D15</b>	2058-208	2005-328	2057-442	0497-738	2005-682
<b>D16</b>	2058-209	2034-991	2057-442	0497-738	2005-682
<b>D18</b>	2058-210	2006-127	2057-442	-	-
<b>D20</b>	2058-211	2005-326	2057-442	-	-
<b>D22</b>	2058-212	2020-085	2057-442	-	-
<b>D25</b>	2058-213	2005-327	2057-442	-	-
<b>D26</b>	2058-214	2014-022	2057-442		
<b>D28</b>	2054-525	2054-469	2014-509	0304-050	-
<b>D30</b>	2054-960	2054-719	2014-509	0304-050	
<b>D32</b>	2054-526	2054-470	2014-509	0304-050	-
<b>D34</b>	2054-527	2054-471	2014-509	0304-050	-
<b>D36</b>	2054-528	2054-472	2014-509	0304-050	-
<b>D38</b>	2056-564	2056-448	2014-509	0304-050	-

**Bündellader / Bundle loader (Option)**

(3200) 2060-670; (3800) 2061-705; (4200) 2061-706; (4775) 2075-450; (6200) 2061-734



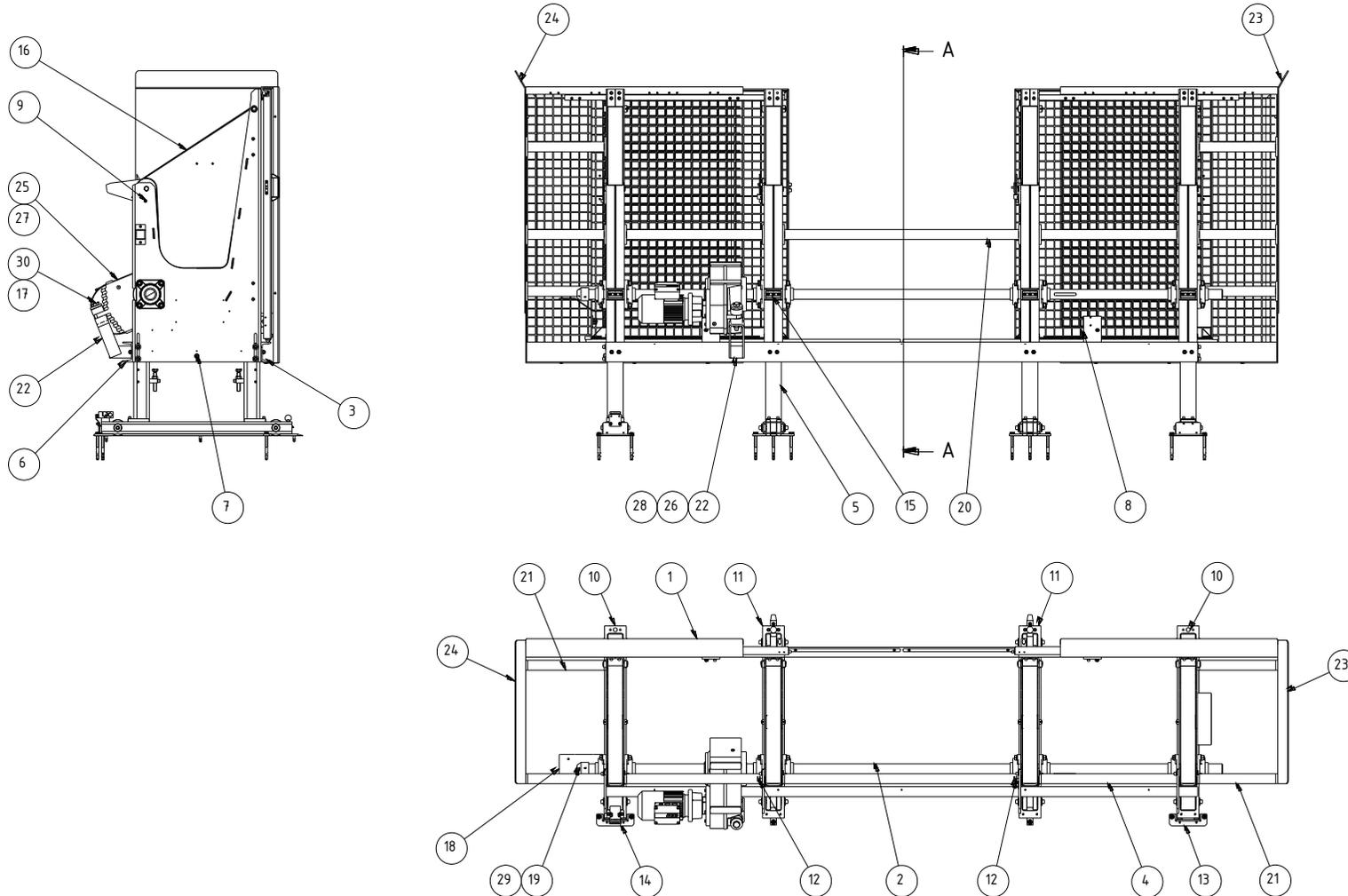
## Bündellader / Bundle loader (Option)

(3200) 2060-670; (3800) 2061-705; (4200) 2061-706; (4775) 2075-450; (6200) 2061-734

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	längenabhängig dependent on length	Schutzgitter mit Schiebetür	Protective grating	
2	längenabhängig dependent on length	Welle	Shaft	
3	längenabhängig dependent on length	U-Träger, vorne unten	Beam, front bottom	
4	längenabhängig dependent on length	Querträger	Beam	
5	längenabhängig dependent on length	Bündelfuß komplett	Foot for bundle loader complete	
6	längenabhängig dependent on length	U-Träger, hinten unten	Beam, rear bottom	
7	2060-340	Gurtbandspanner	Tension for belt	
8	2061-848	Befestigung für Sicherheitsschalter	Fixing for safety switch	
9	2062-005	Rahmen, komplett	Frame, complete	
10	2062-023	Rollenträger, komplett	Roller carrier, complete	
11	2062-024	Rollenträger mit Führung, komplett	Roller carrier with guide, complete	
12	2062-051	Materialabfrage, komplett	Material enquiry, complete	
13	2065-970	Anschlag, komplett	Stop, complete	
14	2065-971	Befestigung für Schalter	Fixing for switch	
15	2010-580	Klemmstück	Clamping piece	
16	2012-311	Gurtband	Belt	
17	2060-386	Scheibe für Motorstütze	Disk for motor holder	
18	2060-385	Halteblech	Retaining sheet	
19	2060-384	Reduzierhülse	Reducing sleeve	
20	2061-710	Querträger 1205	Beam 1205	
21	2061-707	Querträger 407	Beam 407	
22	2063-906	Motorstütze	Motor holder	
23	2061-850	Anschlagblech, links	Sheet left	

**Bündellader / Bundle loader (Option)**

(3200) 2060-670; (3800) 2061-705; (4200) 2061-706; (4775) 2075-450; (6200) 2061-734



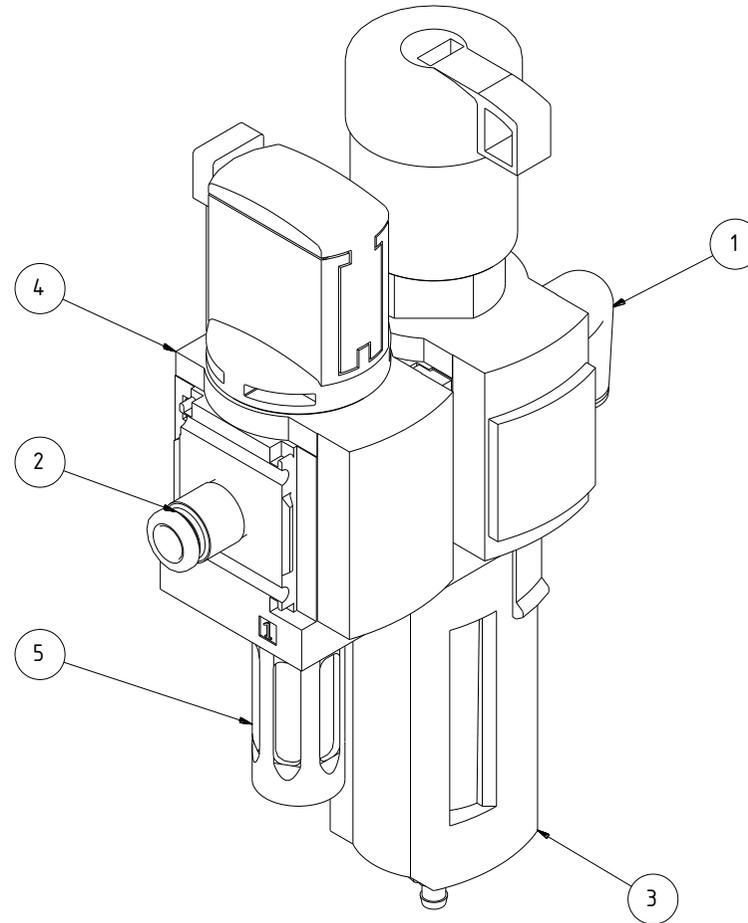
**Bündellader / Bundle loader (Option)**

(3200) 2060-670; (3800) 2061-705; (4200) 2061-706; (4775) 2075-450; (6200) 2061-734

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
24	2061-851	Anschlagblech rechts	Sheet right	
25	2062-690	Motor FA77/G AR71 DT71D6/BMG	Motor FA77/G AR71 DT71D6/BMG	SEW
	2068-421	ab RM-Nr. 978143 Motor FA77/G DRE71 M6BE05	from RM-No. 978143 Motor FA77/G DRE71 M6BE05	SEW
26	4000-373	Federring B20	Spring washer B20	DIN 127
27	2060-379	Passfeder A14x9x110	Feather key A14x9x110	DIN 6885
28	2030-104	Zylinderschraube M20x30	Cheese head screw M20x30	DIN 912
29	0304-034	Gewindestift M6x10	Threaded pin M6x10	DIN 916
30	2060-382	Sechskantschraube M20x130	Hexagonal head screw M20x130	DIN 931

**Wartungseinheit / Maintenance unit**

200005229



**Wartungseinheit / Maintenance unit**

200005229

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2067-008	Steckverschraubung	Plug-in screwing	
2	2068-343	Steckverschraubung	Plug-in screwing	
3	2079-894	Filter-Regelventil	Filter-regulator unit	
4	200004160	Einschaltventil	On/Off valve	
5	2074-205	Schalldämpfer	Silencer	

## Pneumatikplan / Pneumatic diagram

Betriebsmittelkennzeichnung / Equipment marking

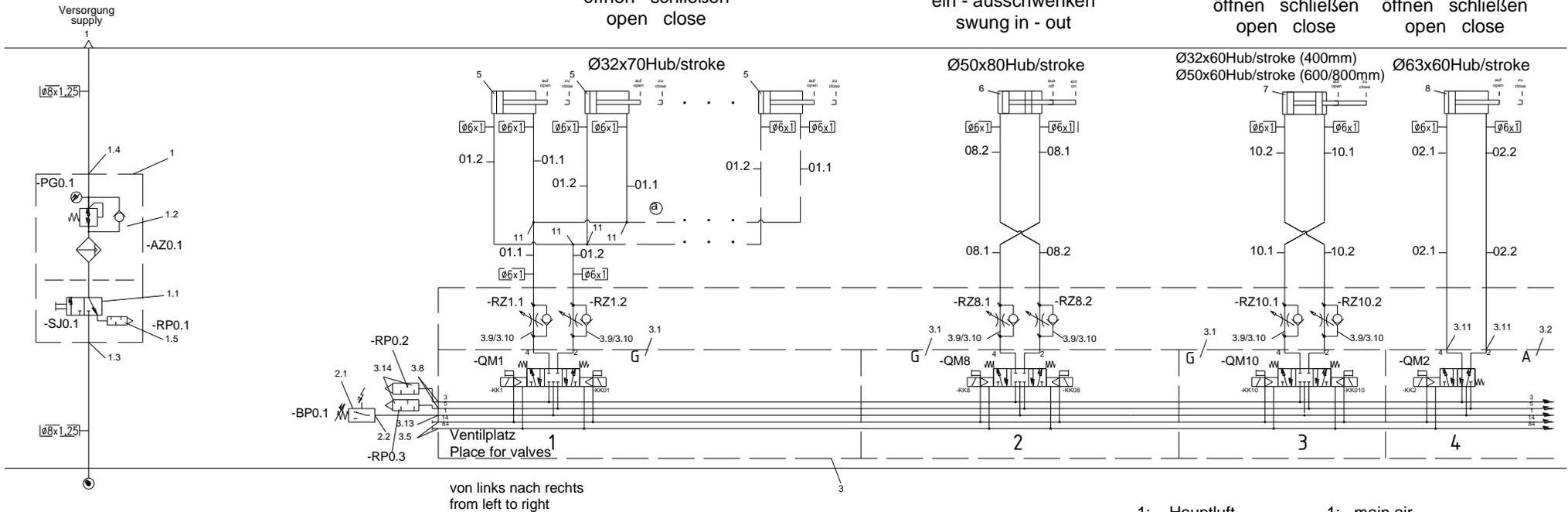
Kennzeichnung Marking	Bezeichnung	Designation
AZ	Wartungseinheit	Maintenance unit
MM	Pneumatikzylinder, Pneumatikmotor	Pneumatic cylinder, pneumatic motor
BG	Näherungsschalter, Endschalter	Proximity switch, limit switch
PG	Anzeigeninstrument, Manometer	Indicator, manometer
BP	Druckschalter	Pressure switch
QM	Wegeventil, Schnellentlüftungsventil	Directional control valve, quick exhaust valve
GQ	Druckluftquelle, Kompressor	Pneumatic source, compressor
QN	Druckreduzierventil	Pressure reduction valve
GS	Druckluftöler	Pneumatik oiler
RP	Schalldämpfer	Silencer
HQ	Filter	Filter
RZ	Drossel-Rückschlagventil	One-way restrictor
KH	Signalverknüpfung	Signal connecting
SJ	Handbetätigtes Ventil	Manual ventill

**-MM1**  
**Führungskanal**  
**Guide channel**  
 öffnen schließen  
 open close

**-MM8**  
**Vorschubstange**  
**Pusher**  
 ein - ausschwenken  
 swing in - out

**-MM10**  
**Reststückklappe**  
**Remnant flap**  
 öffnen schließen  
 open close

**-MM2**  
**Greifer**  
**Gripper**  
 öffnen schließen  
 open close



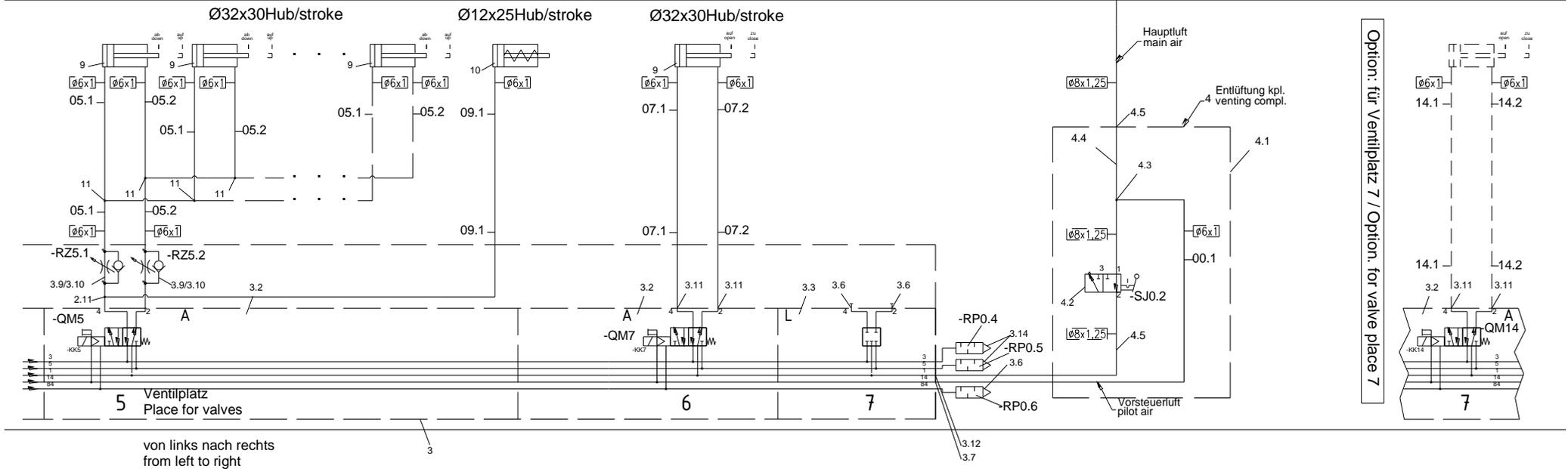
- |                  |                         |
|------------------|-------------------------|
| 1: Hauptluft     | 1: main air             |
| 3/5: Abluft      | 3/5: air exhaust        |
| 14: Steuerzuluft | 14: control air supply  |
| 84: Steuerabluft | 84: control air exhaust |

**-MM5**  
**Vereinzelung**  
**Separation**  
 auf ab  
 up down

**-MM9**  
**Anfahrshalter**  
**Starting switch**

**-MM7**  
**Lünette**  
**Steady rest**  
 öffnen schließen  
 open close

**-MM14**  
**Lünette Drehmaschine**  
**Steady lathe**  
 öffnen schließen  
 open close



1: Hauptluft  
 3/5: Abluft  
 14: Steuerzuluft extern  
 84: Steuerabluft

1: main air  
 3/5: air exhaust  
 14: control air supply external  
 84: control air exhaust

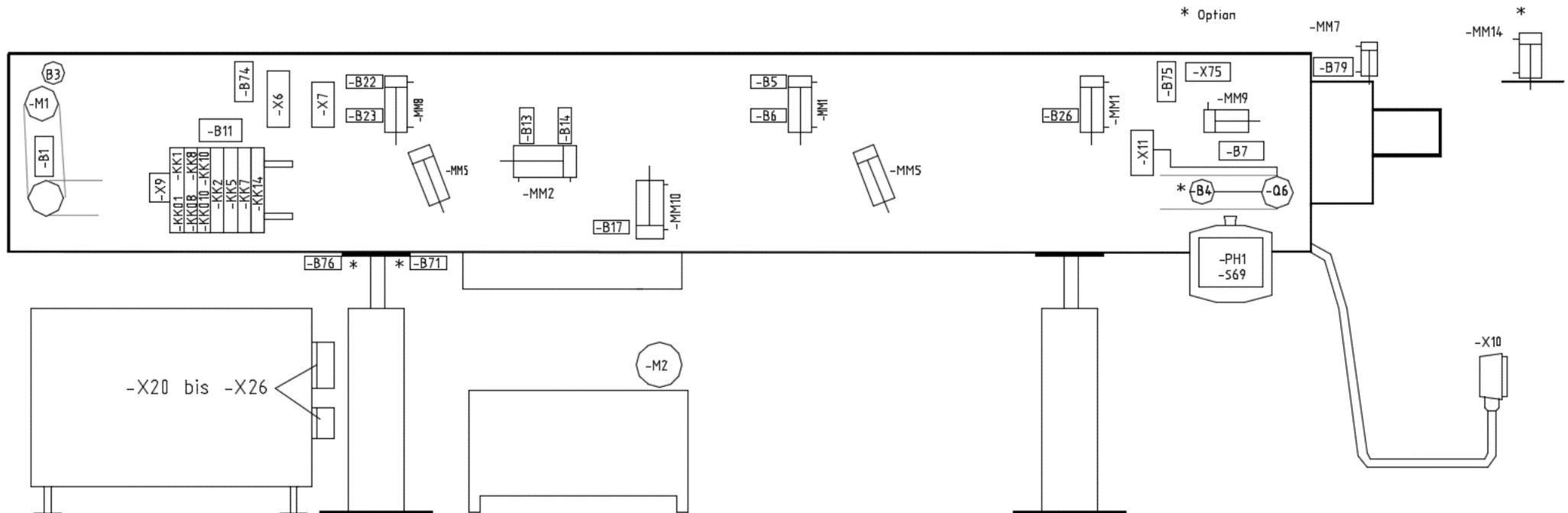
**Pneumatikteile / Pneumatic parts**

Pos. Item	Ident-Nr. Ident no	Bezeichnung/Typ	Designation/Type	
1	200005229	Wartungseinheit komplett bestehend aus:	Maintenance unit complete consisting of:	
1.1	200004160	Einschaltventil	Switch on valve	
1.2	2079-894	Filter-Regelventil	Filter-regulator valve	
1.3	2068-343	Steckverschraubung	Plug-in screwing	
1.4	2067-008	Steckverschraubung	Plug-in screwing	
1.5	2074-205	Schalldämpfer	Silencer	
2	100049628	Druckschalter komplett bestehend aus:	Pressure switch complete consisting of:	
2.1	2058-325	Druckschalter	Pressure switch	
2.2	2068-343	Steckverschraubung	Plug-in screwing	
3	100048759	Ventilinsel 7-fach	Valve terminal 7-fold	
3.1	100042337	Magnetventil 5/3	Solenoid valve 5/3	
3.2	2080-203	Magnetventil 5/2	Solenoid valve 5/2	
3.3	2079-423	Abdeckplatte	Cover plate	
3.5	2079-425	Blindstopfen	Filler plug	
3.6	2080-293	Schalldämpfer	Silencer	
3.7	100024932	Steckverschraubung	Plug-in screwing	
3.8	100008518	L-Verschraubung	L-screwing	
3.9	2057-797	Drosselrückschlagventil	One-way restrictor	
3.10	2080-257	Dichtscheibe	Joint disc	
3.11	2057-830	Steckverschraubung	Plug-in screwing	
3.12	2068-343	Steckverschraubung	Plug-in screwing	
3.13	2057-833	Steckverschraubung	Plug-in screwing	
3.14	2001-420	Schalldämpfer	Silencer	

**Pneumatikteile / Pneumatic parts**

Pos. Item	Ident-Nr. Ident no	Bezeichnung/Typ	Designation/Type	
4	100048698	Entlüftung komplett bestehend aus:	Venting complete consisting of:	
4.1	100047929	Halteblech	Sheet	
4.2	100046626	Absperrventil	Shut-off valve	
4.3	2049-120	Steckverbindung	Plug-in connector	
4.4	2058-876	Steckhülse	Plug-in sleeve	
4.5	2057-799	Steckverbindung	Plug-in connector	
5	2055-058	Zylinder (Führungskanal)	Cylinder (Führungskanal)	MM1
6	2055-059	Zylinder (Vorschubstange)	Cylinder (Pusher)	MM8
7	2056-577	Zylinder (Reststückklappe 400 mm)	Cylinder (Remnant flap 400 mm)	MM10
	2058-185	Zylinder (Reststückklappe 600/800/1100 mm)	Cylinder (Remnant flap 600/800/1100 mm)	MM10
8	2058-131	Zylinder (Greifer)	Cylinder (Gripper)	MM2
9	2055-066	Zylinder (Lünette)	Cylinder (Steady rest)	MM7
		Zylinder (Vereinzelung)	Cylinder (Separation)	MM5
10	2030-646	Zylinder (Anfahrshalter)	Cylinder (Starting switch)	MM9

**Elektroteile / Electrical parts**  
**Lademagazin / Loading magazine**



**Elektroteile / Electrical spare parts**  
**Lademagazin / Loading magazine**

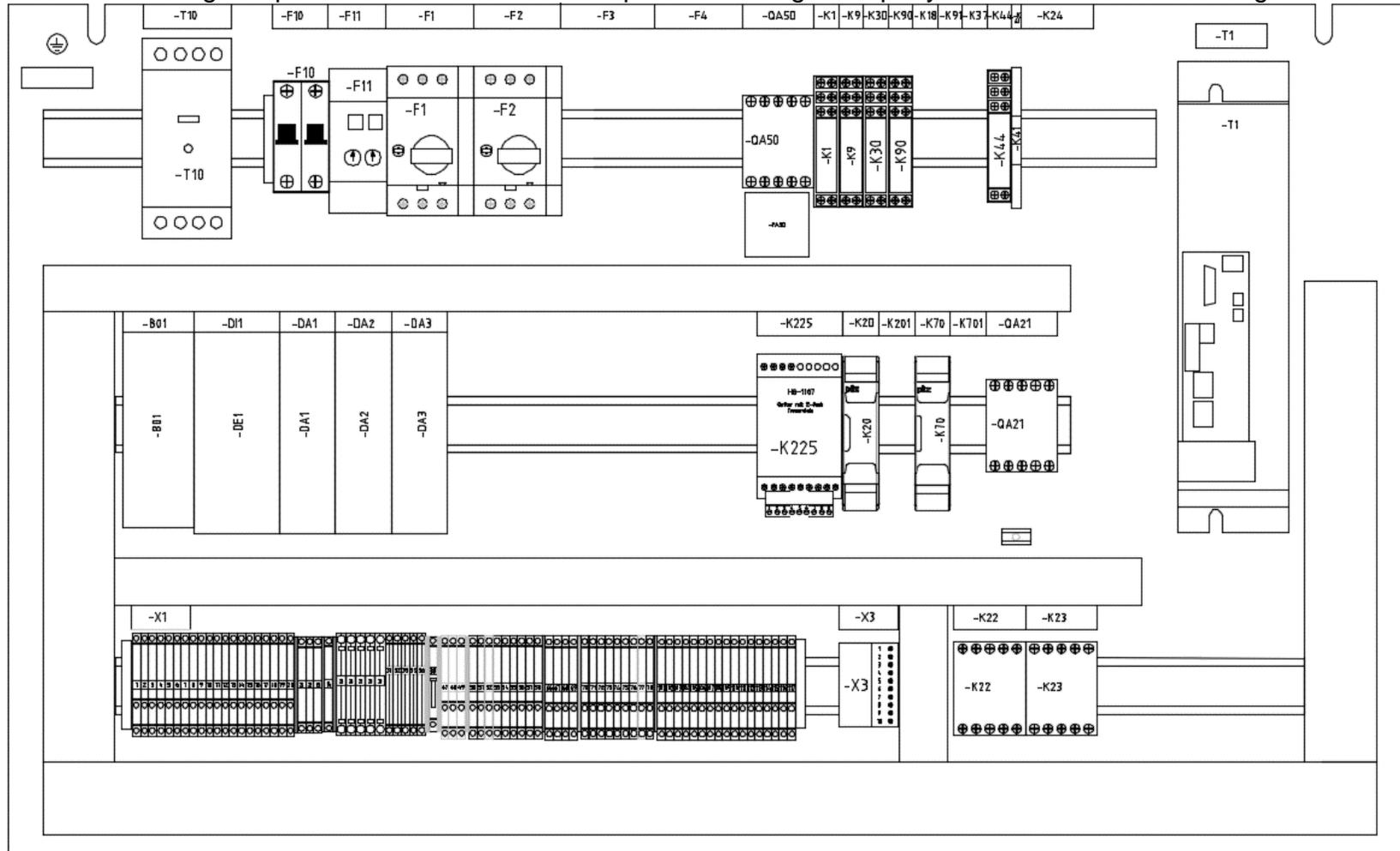
Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
2018-648	Näherungsschalter	Proximity switch	-B1
2023-003	Näherungsschalter	Proximity switch	-B7
2035-221	Näherungsschalter	Proximity switch	-B5,-B6,-B13,-B14,-B17,-B22,-B23
2079-304	Näherungsschalter	Proximity switch	-B26
100049628	Druckschalter 0,5-8 bar	Pressure switch 0,5-8 bar	-B11
2042-872	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für/for-B1,-B17
2042-579	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für/for-B7
2042-582	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für/for -B5,-B6,-B13,-B14, -B17,-B22,-B23
2063-956	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für/for-B74
2063-957	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für/for-B75, -B79
200003132	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für/for-B75
200004724	Sensorleitung mit Stecker M12 auf M8	Sensor lead with plug M12 to M8	für/for-B79
2071-113	Sensorleitung mit Stecker M12 auf M8	Sensor lead with plug M12 to M8	für/for-B26
200004725	Y-Verteiler	Y-Verteiler	für/for-X75
2043-173	Verschlusskappe Port M12	Sealing cap Port M12	X6 Steckplatz/place 5 X7 Steckplatz/place 1/4
200005144	Stecker mit Leitung für Druckschalter	Plug with lead for pressure switch	an/on -B11
200004100	Servomotor mit Geber	Servomotor with encoder	-M1 mit/with -B3
200006125	Servomotor mit Geber und Bremse	Servomotor with encoder and brake	-M1 mit/with -B3 (Option)
2070-052	Drehgeber (Option)	Encoder (option)	-B4
2041-038	Ölförderpumpe	Oil feed pump	-M2
1099-051	Magnetkupplung	Magnetic clutch	-Q6

**Lademagazin / Loading magazine**

Ident-Nr. Ident. No.	Bezeichnung	Designation	Kommentar Remarks
2063-973	Aktor-Sensor-Box 4-fach mit 24 poligem Stecker	Aktor-Sensor-Box 4-fold with plug 24 pol.	X7
2079-776	Anschlussleitung kpl. für Ventilblock 25pol.	Lead complete for valve block 25pol.	X9
2042-920	Aktor-Sensor-Box mit 24 poligem Stecker	Aktor-Sensor-Box with plug 24 pol.	X6
2036-784	Funkenlöschglied	Protection relay	zu -Q6 / to -Q6
2063-952	Sicherheitsschalter T5C 236-02 Z-ST	Safety switch T5C 236-02 Z-ST	-B74,-B75
2063-953	Sicherheitsschalter T3C 236-02 Z-ST	Safety switch T3C 236-02 Z-ST	-B74,-B75
2068-440	Sicherheitsschalter AZ 16-03 zvk	Safety switch AZ 16-03 zvk	-B71,-B76
2051-354	Betätiger AZ 16-02 zvk / AZ 15/16-B1	Actuator AZ 16-02 zvk / AZ 15/16-B1	-B71,-B76
2069-653	Sicherheitssensor BNS260	Safety sensor BNS260	-B79
2069-654	Betätiger BPS 260-1	Actuator BPS 260-1	für/for -B79
2074-284	Distanzstück für Sicherheitssensor	Distance for Safety sensor	für/for -B79
200004101	Leistungskabel 5m	Power cable	between -T1 and -M1 zwischen -T1 und -M1
200004102	Geberkabel 5 m	Cable for encoder	between -T1 and -B3 zwischen -T1 und -B3
200004038	Profibus Leitung	Profibus lead	-WG10 (Option)

**Elektroteile / Electrical spare parts**  
**Schalttafel / Switch board**

Abbildung beispielhaft – siehe Elektroschaltplan! / Drawing exemplary – see electrical circuit diagram!

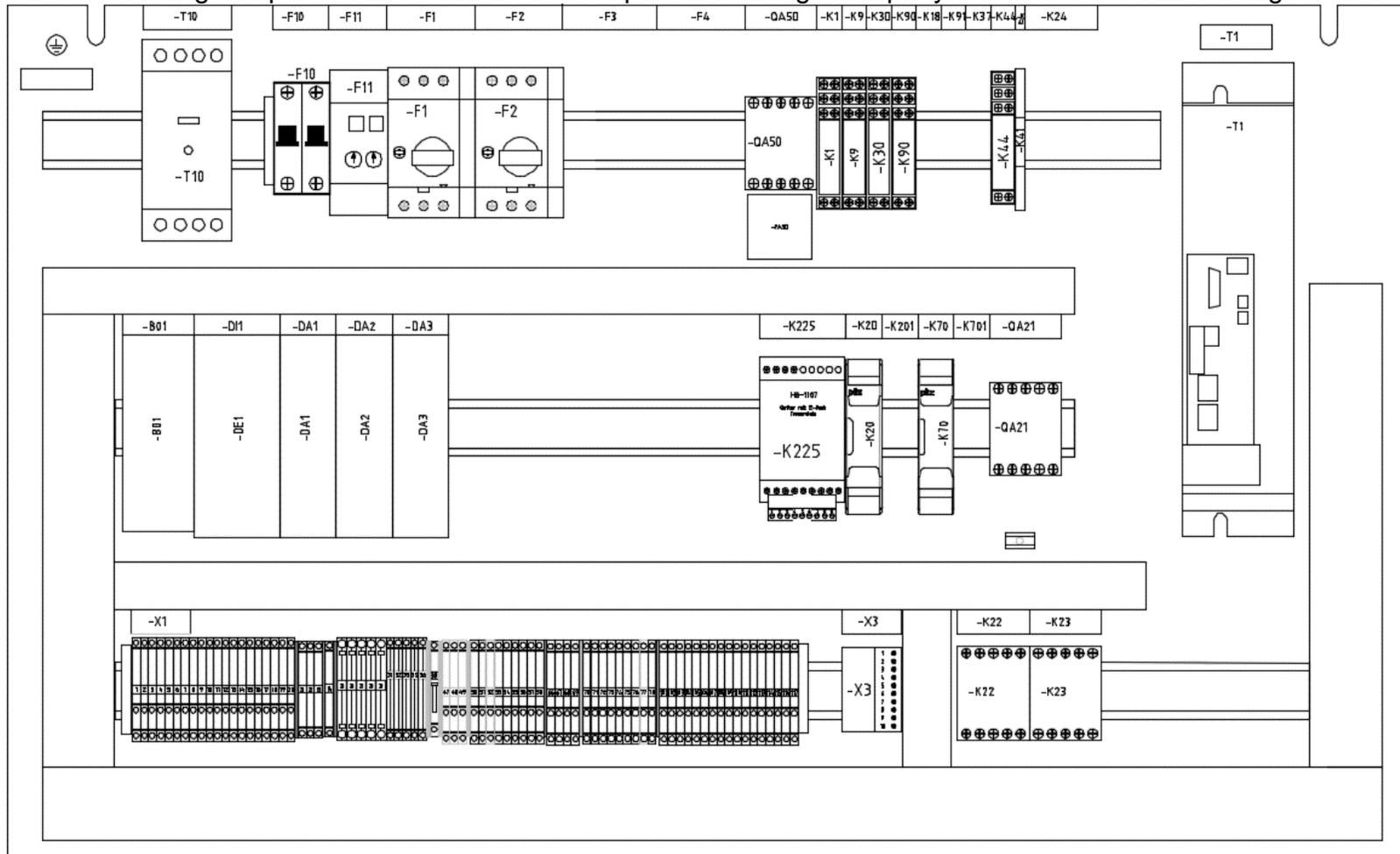


## Elektroteile / Electrical spare parts Schalttafel / Switch board

Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
200004090	Kompaktumrichter HCS01.1E	Compact converter HCS01.1E	-T1
200004091	Kompaktumrichter HCS01.1E Multi Ethernet	Compact converter HCS01.1E Multi Ethernet	-T1 (option)
200004092	Kompaktumrichter HCS01.1E Profibus	Compact converter HCS01.1E Profibus	-T1 (option)
200000735	Programm-Modul micro SD-Karte	Program module micro SD-card	für/for -T1
200004094	Sercos Buskoppler Interface	Sercos Buskoppler Interface	-BO1
200004095	Eingangskarte 32E Interface	Input card 32E Interface	-DI1
200004097	Ausgangskarte 16A Interface	Output card 16A Interface	-DA1
200004098	Ausgangskarte 8A Interface	Output card 8A Interface	-DA2; -DA3
2063-649	Ethernet-Kabel Sercos III 1 m	Ethernet-cable Sercos III 1 m	zwischen -T1 und -BO1 between -T1 and -BO1
2037-094	Schütz 24V DC 3H 1S DILEM-10-G	Contacteur 24V DC 3H 1S DILEM-10-G	auftragsbez.-K23,-K22 as per order -K23,-K22
2037-095	Schütz 24V DC 3H 1Ö DILEEM-01-G	Contacteur 24V DC 3H 1Ö DILEEM-01-G	-QA50; -QA21 auftragsbez.-K23,-K22 as per order -K23,-K22
2037-096	Hilfsschalterblock 22 DILEM	Auxiliary switch block 22 DILEM	auftragsbez.-K23,-K22 as per order -K23,-K22
2071-375* Pilz	Not-Aus Schaltgerät PNOZs4 C 24 VCD	Safety relay PNOZs4 C 24 VCD	-K20,-K70
200009625* Phoenix	Not-Aus Schaltgerät PSR-MC45	Safety relay PSR-MC45	(alternatives Bauteil/alternative component) -K20,-K70
2071-376	Sicherheitsrelais Erweiterungsgerät	Emergency-Stop extension device	-K201; K701
2049-124	Optokopplermodul 24V DC 2A	Opto-electronic coupler 24V DC 2A	-K41
2020-946	Relais 2WE 5A 40529024	Relay 2WE 5A 40529024	-K1,-K9,-K9.1,-K1.1,-K30, -K37, -K38,-K40, -K1M,-K1K

**Elektroteile / Electrical spare parts**  
**Schalttafel / Switch board**

Abbildung beispielhaft – siehe Elektroschaltplan! / Drawing exemplary – see electrical circuit diagram!



**Schalttafel / Switch board**

Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
2025-516	Relaisfassung 95.95.3	Casing for relay 95.95.3	für Relais for relay
2025-517	Modul mit LED und Freilaufdiode 99.80.9.024.90	Module with LED and recovery diode 99.80.9.024.90	für Relais for relay
2004-401	Hilfsschütz220V 3TH 8262 OAMO	Auxiliary contactor 3TH 8262 OAMO	auftragsbez. -K91 as per order -K91
2004-403	RC-Entstörglied 3TX 6406 OG	RC-screening unit 3TX 6406 OG	auftragsbez. -K91 as per order -K91
200004802	Modul Kanalzuhaltung	Module channel locking	-K225
0943-304	Sicherungsautomat 2x4A	Automatic cut-out 2x4A	-F10
2076-869	Elektronische Sicherung 1,2,4,6A	Electronic fuse 1,2,4,6A	-F11
0942-480	Sicherungsautomat 6A	Automatic cut-out 6A	auftragsbez.-F4 as per order -F4
2001-759	Motorschutzschalter 0,6-1A PKZM 0,6-1	Motor protection switch 0,6-1A PKZM 0,6-1	-F2 bei Betriebsspannung 400-460V -F2 for 400-460V machines
2001-854	Motorschutzschalter 1-1,6A PKZM 1-1,6	Motor protection switch 1-1,6A PKZM 1-1,6	-F2 bei Betriebsspannung 200-230V -F2 for 200-230V machines
2043-990	Motorschutzschalter 4-6,3A PKZM 0-6,3-T	Motor protection switch 4-6,3A PKZM 0-6,3-T	-F1
2003-292	Hilfsschalter	Auxiliary switch	für/for -F1, -F2
200002455	Netzteil 24V 5A	Power supply 24V 5A	-T10
2001-368	Motorentstörglied RC 3/022-400 BU	Motor screening unit RC 3/022-400 BU	-FA50
200004037	Profibus Adapter	Profibus adapter	-X40 (Option)

**Elektroteile / Electrical spare parts**  
**Bedientableau / Control panel**

Ident. Nr. Ident- no.	Bezeichnung	Designation	Kommentar Remarks
200004149	Bedientableau PH1 HGT835 mit Kabel 10 m	Control panel PH1 HGT835 with cable 10 m	-PH1
200004150	Bedientableau PH1 HGT835 mit Kabel 13,5 m	Control panel PH1 HGT835 with cable 13,5 m	-PH1

# turbo 3-36 standard edge

Btr.Spñ.: 3x200V~ 50/60Hz

Blatt-Nr.:	Inhalt	contents	contenu
1/1063	Zeichnungs-Aufstellung	index of plans	index des plans
1.1/1063	Zeichnungs-Aufstellung	index of plans	Index des planes
2/00	Kennzeichnung d.Betriebsmittel	marking of the electrical equipment	Repérage des matières consommables
3/1063	Schnittstelle Standard Edge	interface standard edge	Interface standard edge
4/00	Schnittstelle	interface	Interface
5/00	Erdung	grounding	Mise à la terre
6/01	Hauptstromkreis Motoren	main circuits motors	Circuits principaux des moteurs
7/00	Steuerspannung	control voltage	Tensions de commande
8/00	Steuerung	control	Commande
9/00	Not-Halt	emergency stop	Arrêt d'urgence
10/00	Überwachung Verkleidung	check covering	chèque couvrant
11/00	Überwachung Verkleidung	check covering	chèque couvrant
12/00	Eingangskarte KF10 IX200.0-7	input-card KF10 IX200.0-7	Plaque d'entrée KF10 IX200.0-7
13/00	Eingangskarte KF10 IX201.0-7	input-card KF10 IX201.0-7	Plaque d'entrée KF10 IX201.0-7
14/01	Eingangskarte KF11 IX202.0-7	input-card KF11 IX202.0-7	Plaque d'entrée KF11 IX202.0-7
15/03	Eingangskarte KF11 IX203.0-7	input-card KF11 IX203.0-7	Plaque d'entrée KF11 IX203.0-7
16/00	Ausgangskarte KF20 QX200.0-7	output-card KF20 QX200.0-7	Plaque de sortie KF20 Q200.0-7
17/03	Ausgangskarte KF20/KF21 QX201.0-7	output-card KF20/KF21 QX201.0-7	Plaque de sortie KF20/KF21 QX201.0-7
18/00	Ausgangskarte KF21 QX202.0-7	output-card KF21 QX202.0-7	Plaque de sortie KF21 Q202.0-7
19/00	Ausgangskarte KF22 QX203.0-7	output-card KF22 QX203.0-7	Plaque de sortie KF22 QX203.0-7
20/01	Synchronkupplung	synchronisation clutch	Accouplement synchronisation
21/00	Eingangskarte KF10/KF11 IX204.0-7	input-card KF10/KF11 IX204.0-7	Plaque d'entrée KF10/KF11 IX204.0-7
22/00	Ausgangskarte KF22 QX204.0-3	input-card KF22 QX204.0-3	Plaque d'entrée KF22 QX204.0-3
70/00	Schalttafel	switch board	Tableau de distribution

				Datum	17.05.22														
				Bearb	D.Beck	index of plans		<b>FMB</b> MASCHINENBAU	Zeichnungs Aufstellung	turbo 3-36 Serie 6									
				Gepr.	D.Beck	index des plans													
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.			Blatt 1/1063	10416_003	Blatt 1	Folge 1.1						

# turbo 3-36 standard edge

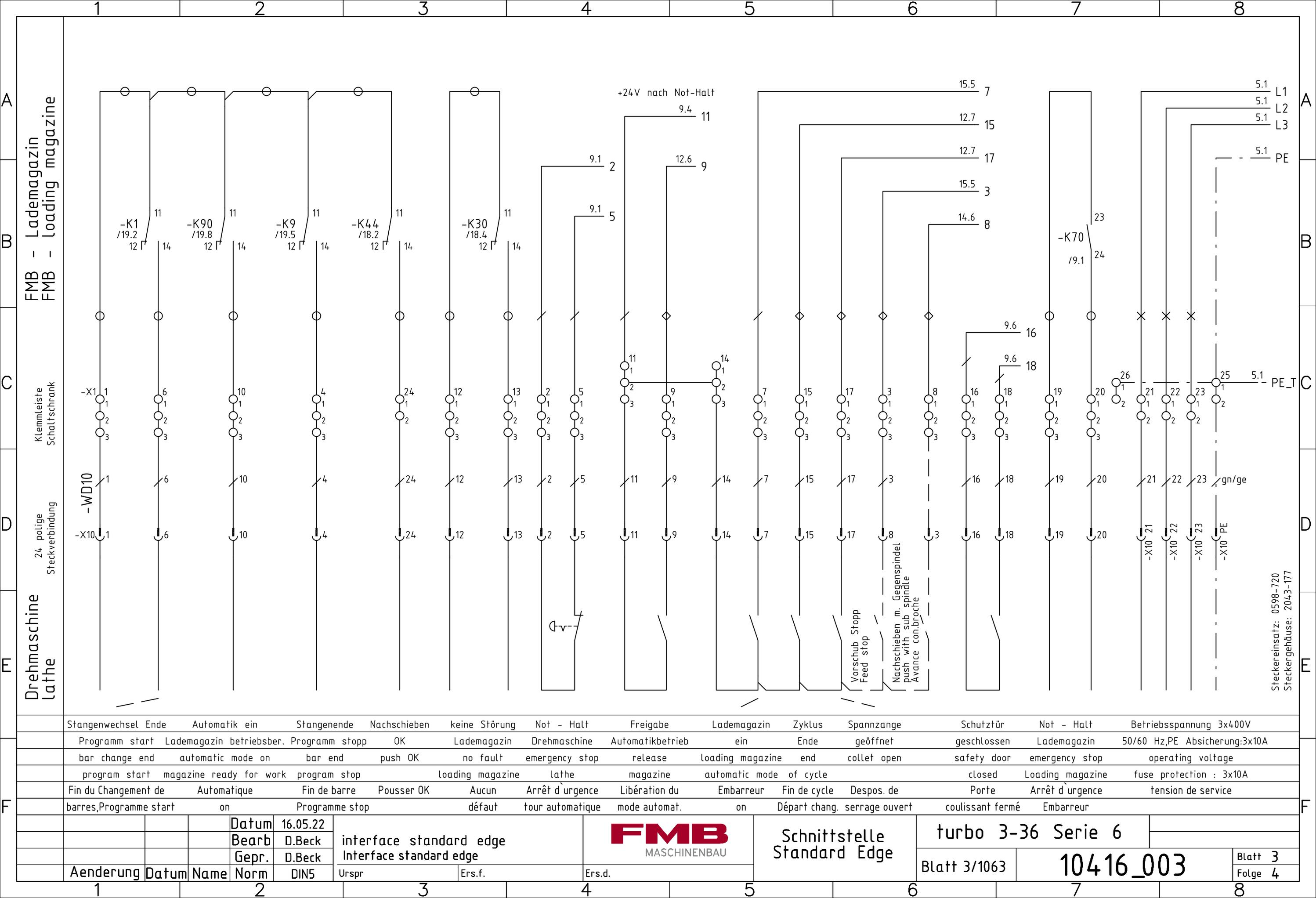
Btr.Spn.: 3x200V~ 50/60Hz

Klemmenanschlußplan / connection diagramm / Plan de raccord

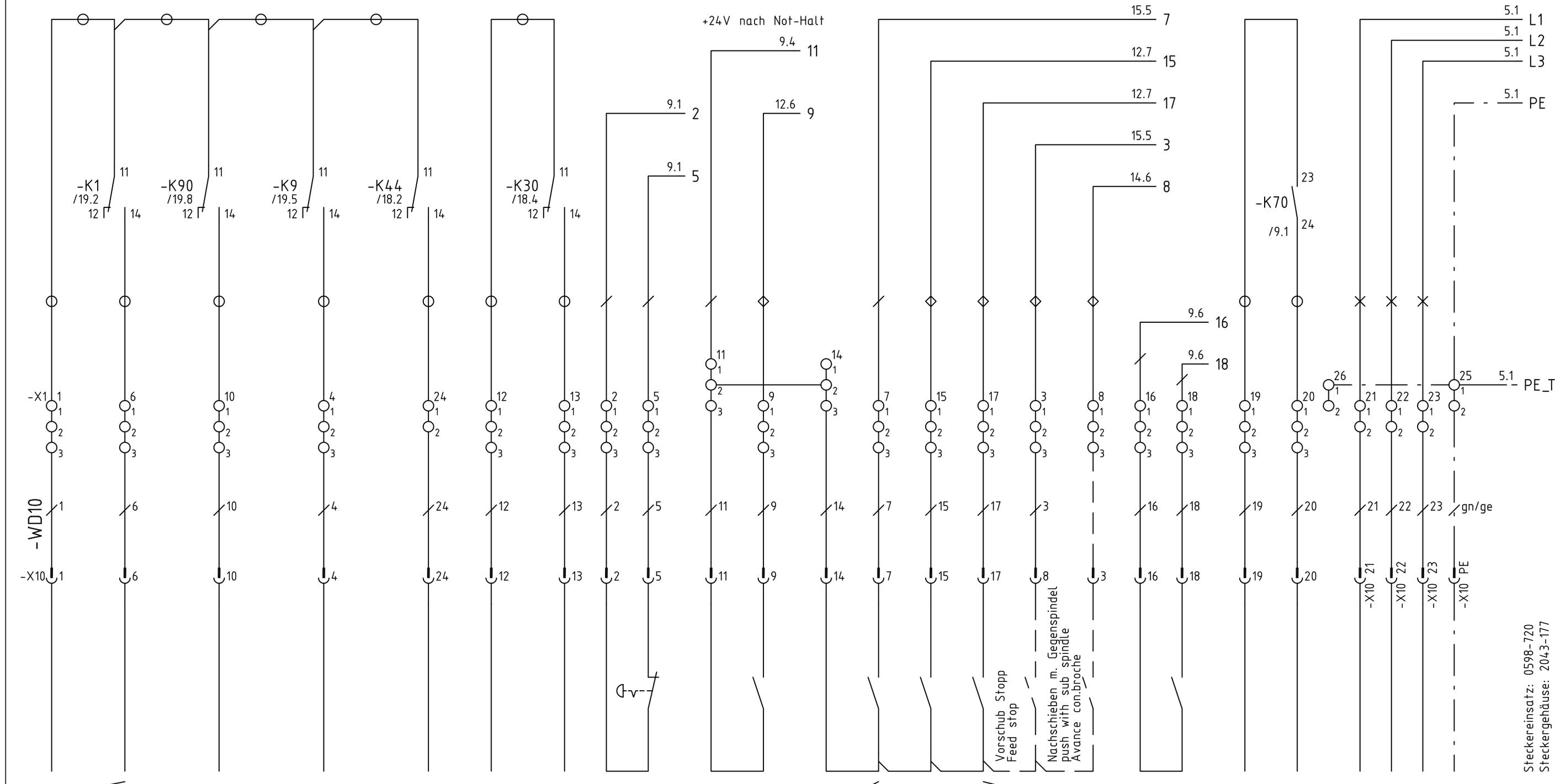
Blatt-Nr.:	Inhalt	contents	Contenu
40/00	X6 Schalter	X6 switch	X6 Interrupteur
41/00	X6 Schalter	X6 switch	X6 Interrupteur
42/00	X7 Schalter Sicherheit	switch safety	Interrupteur
43/00	X25 Schalter Verschiebeeinrichtung	Switch shifting device	Interrupteur
45/00	X9 Magnetventile	X9 solenoid valves	X9 Vannes
46/00	X9 Magnetventile	X9 solenoid valves	X9 Vannes
48/00	Geber -B4 / Umschaltung B/C	encoder -B4 / rotation B/C	Convertisseur -B4
49/00	Motoren	motors	Moteurs
51/00	PH1 Bedientableau	PH1 control panel	PH1 Tableau de commande
60/00	Geräteanordnung	device arrangement	Disposition des appareils

		Datum	16.05.22				Zeichnungs- Aufstellung	turbo 3-36 Serie 6			
		Bearb	D.Beck	index of plans							
		Gepr.	D.Beck	Index des planes							
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 1.1/1063	10416_003		Blatt 1.1 Folge 2
1	2	3	4	5	6	7	8				





Drehmaschine lathe  
 24 polige Steckverbindung  
 Klemmleiste Schaltschrank  
 FMB - Lademagazin  
 FMB - loading magazine

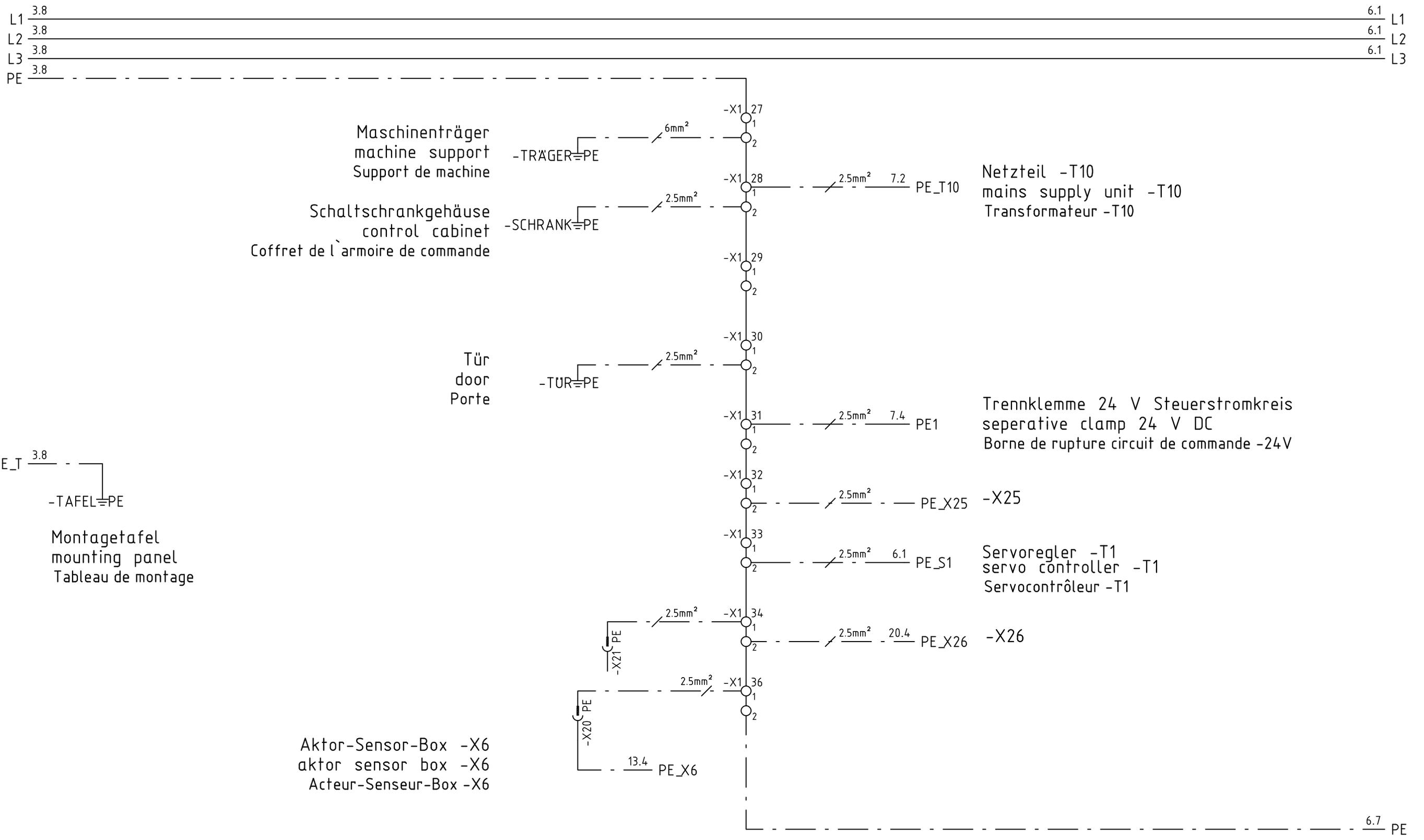


Stangenwechsel Ende	Automatik ein	Stangenende	Nachschieben	keine Störung	Not - Halt	Freigabe	Lademagazin	Zyklus	Spannzange	Schutztür	Not - Halt	Betriebsspannung 3x400V
Programm start	Lademagazin betriebsber.	Programm stopp	OK	Lademagazin	Drehmaschine	Automatikbetrieb	ein	Ende	geöffnet	geschlossen	Lademagazin	50/60 Hz, PE Absicherung: 3x10A
bar change end	automatic mode on	bar end	push OK	no fault	emergency stop	release	loading magazine	end	collet open	safety door	emergency stop	operating voltage
program start	magazine ready for work	program stop		loading magazine	lathe	magazine	automatic mode of cycle			closed	Loading magazine	fuse protection : 3x10A
Fin du Changement de barres, Programme start	Automatique on	Fin de barre Programme stop	Pousser OK	Aucun défaut	Arrêt d'urgence tour automatique	Libération du mode automat.	Embarreur on	Fin de cycle	Despos. de serrage ouvert	Porte coulissant fermé	Arrêt d'urgence Embarreur	tension de service

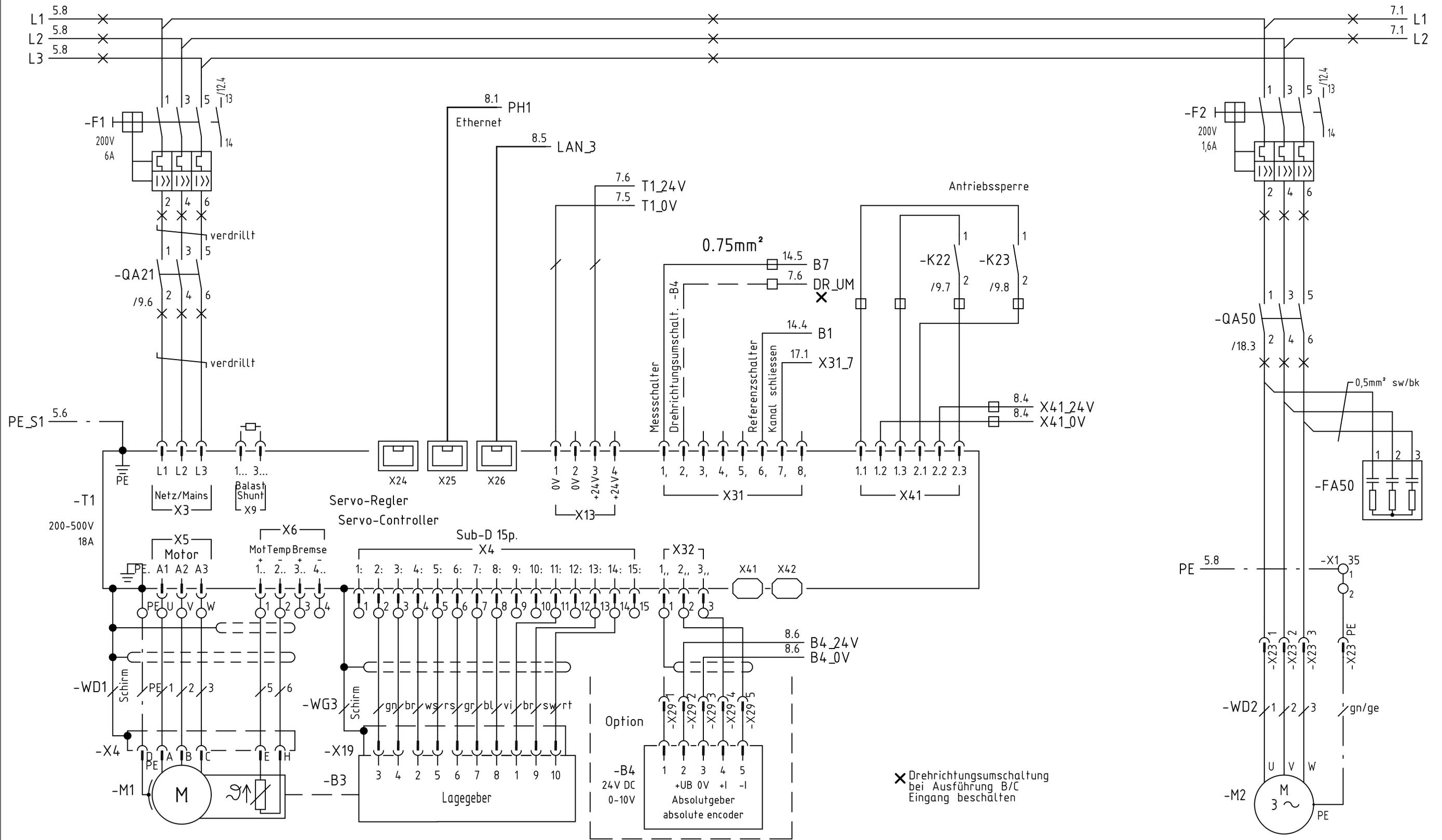
Aenderung		Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.			Schnittstelle Standard Edge		turbo 3-36 Serie 6		Blatt 3/1063		10416_003		Blatt 3 Folge 4	
1	2	3	4	5	6	7	8													

Steckereinsatz: 0598-720  
 Steckergehäuse: 2043-177





		Datum	16.05.22			<b>FMB</b> MASCHINENBAU	Erdung	turbo 3-36 Serie 6			
		Bearb	D.Beck	grounding Mise à la terre				Blatt 5/00		10416_003	
		Gepr.	D.Beck	Urspr		Ers.f.	Ers.d.			Folge 6	
Aenderung	Datum	Name	Norm	DIN5							



Antriebsmotor

Geber

Geber

Olpumpe

driving motor

encoder

Weg Spindelstockklünette

0,37KW 200-230V 1,6A

moteur d'entraînement

convertisseur

convertisseur

oil-pump

pompe à huile

Datum	02.06.22
Bearb	D.Beck
Gepr.	D.Beck

main circuits motors  
Circuits principaux des moteurs



Hauptstromkreis  
Motoren

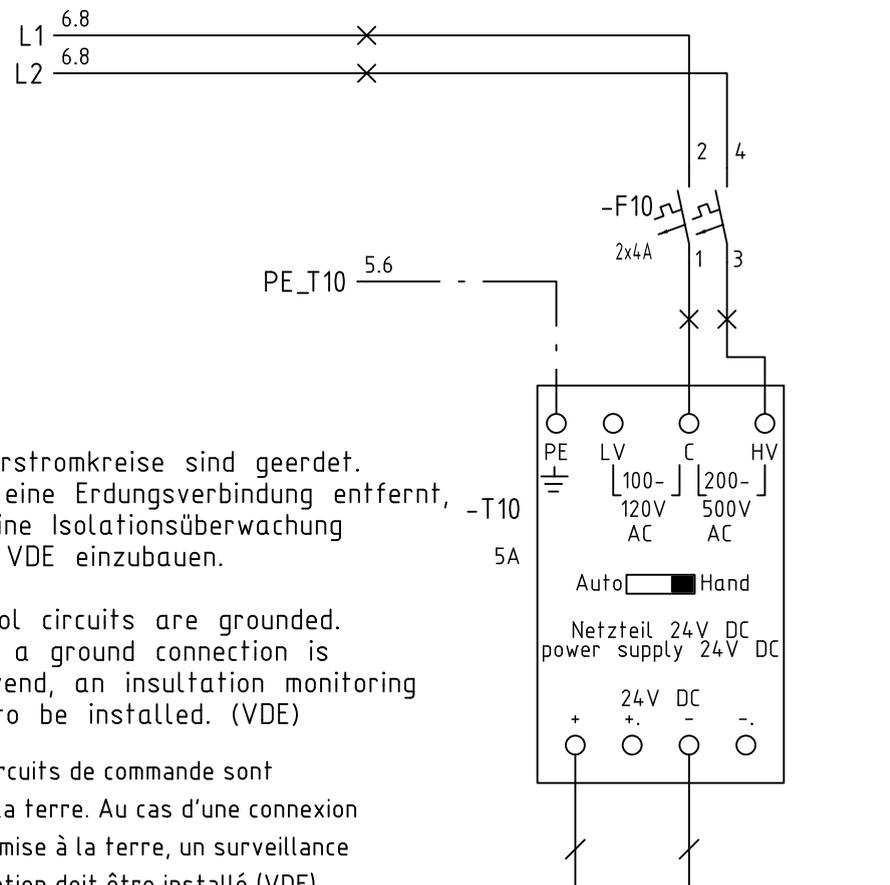
turbo 3-36 Serie 6

Blatt 6/01

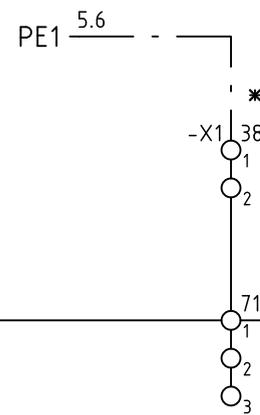
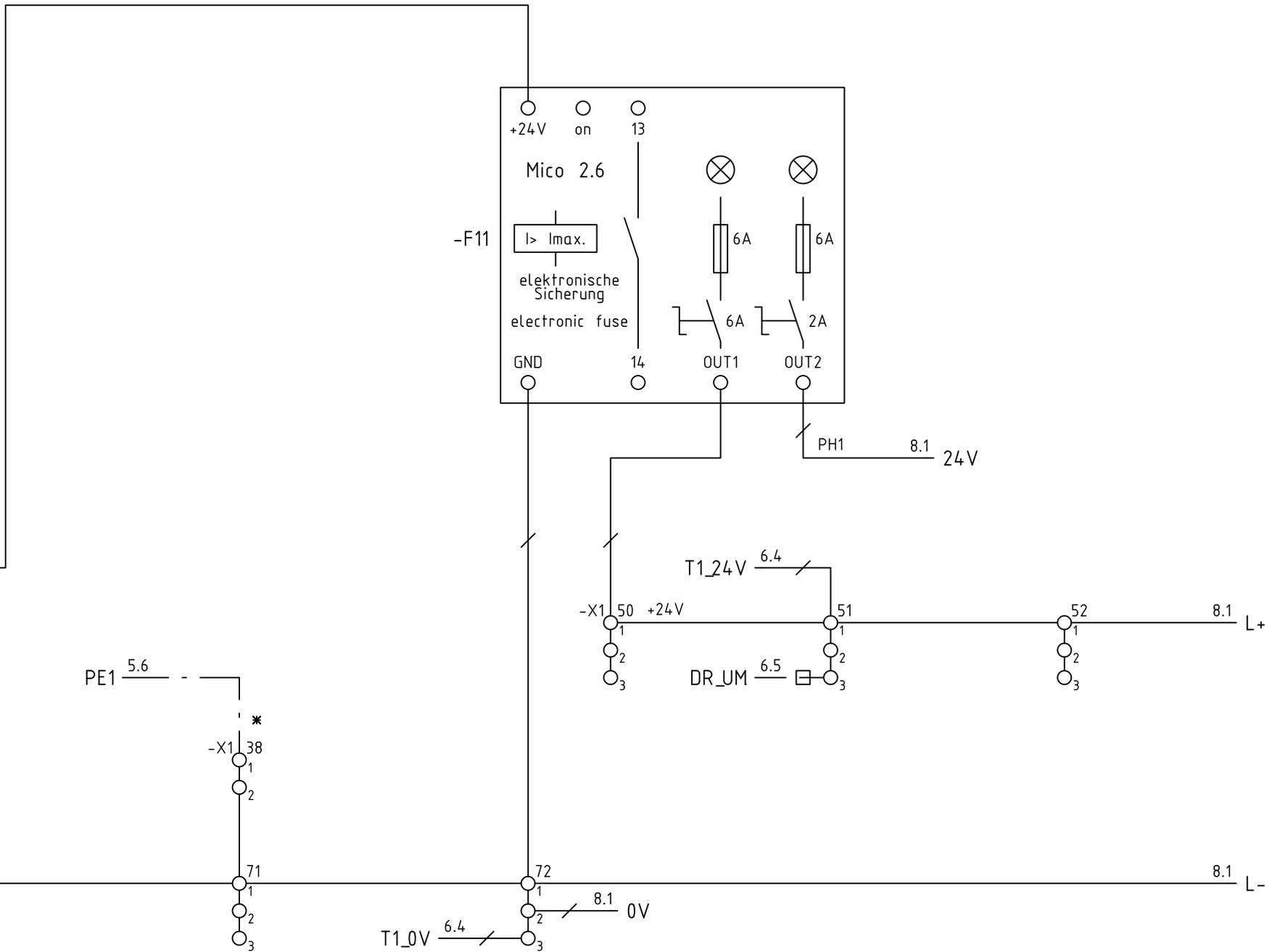
10416\_003

Blatt 6  
Folge 7

Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.
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- \* Steuerstromkreise sind geerdet. Wird eine Erdungsverbindung entfernt, ist eine Isolationsüberwachung nach VDE einzubauen.
- \* Control circuits are grounded. When a ground connection is removed, an insulation monitoring has to be installed. (VDE)
- \* Les circuits de commande sont mis à la terre. Au cas d'une connexion d'une mise à la terre, un surveillance d'isolation doit être installé (VDE)



Steuerspannung 24V-

-F11 OUT1

-F11 OUT2

24V DC für

24V für PH1

SPS / E- A-Karten

control voltage 24V DC

24V DC for Control / I / O 24V for control panel

Tension de commande 24V-

24V- for commande 24V- for tabelau de commande

Datum	16.05.22
Bearb	D.Beck
Gepr.	D.Beck

control voltage  
Tensions de commande



Steuerspannung

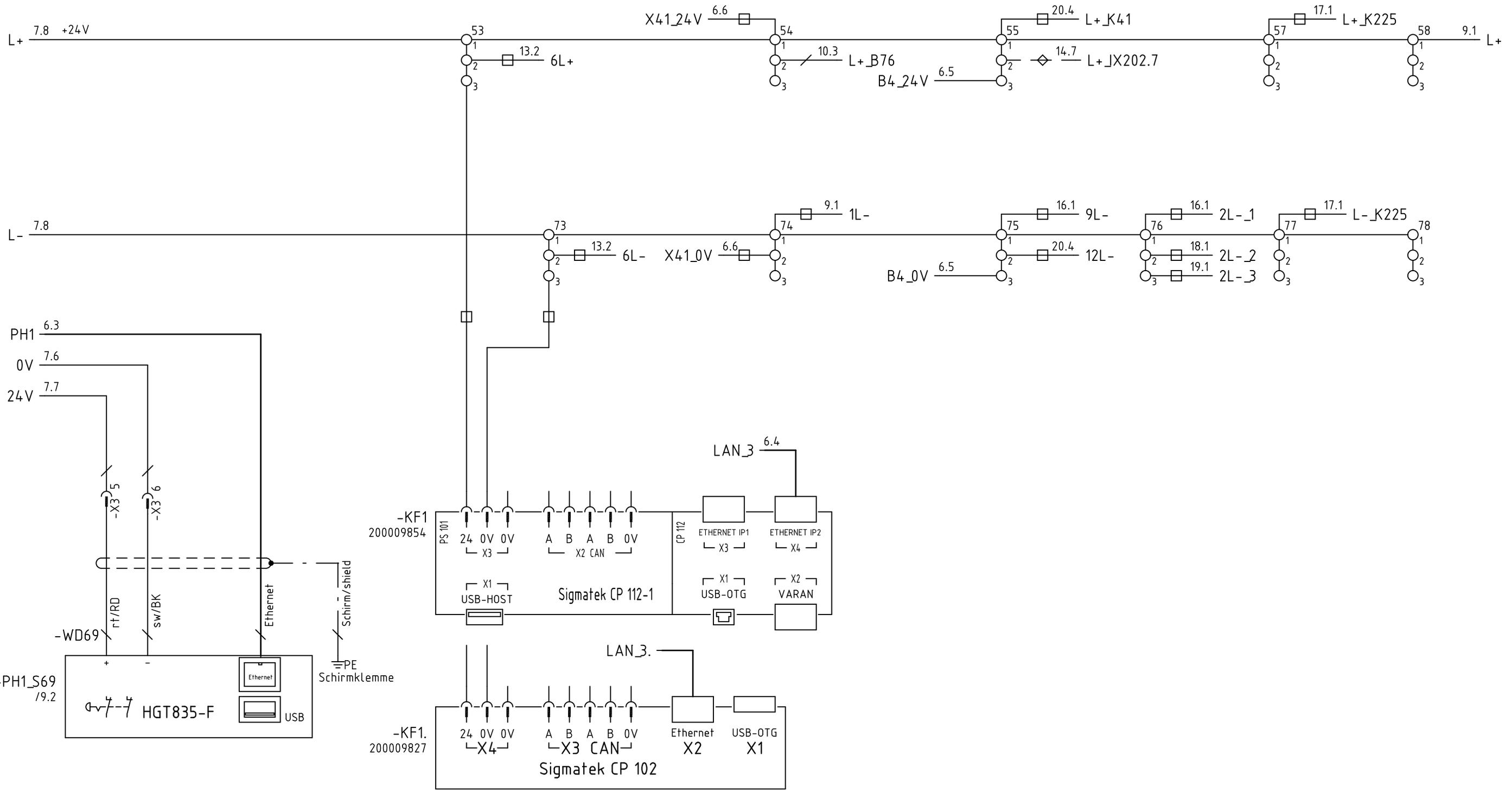
turbo 3-36 Serie 6

Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.
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Blatt 7/00

10416\_003

Blatt 7  
Folge 8



Bedientableau

TCP-Koppler

CP 112-1 alternativ CP 102

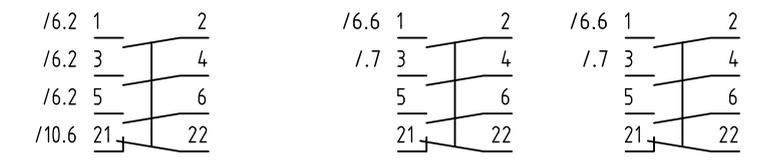
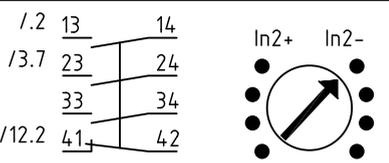
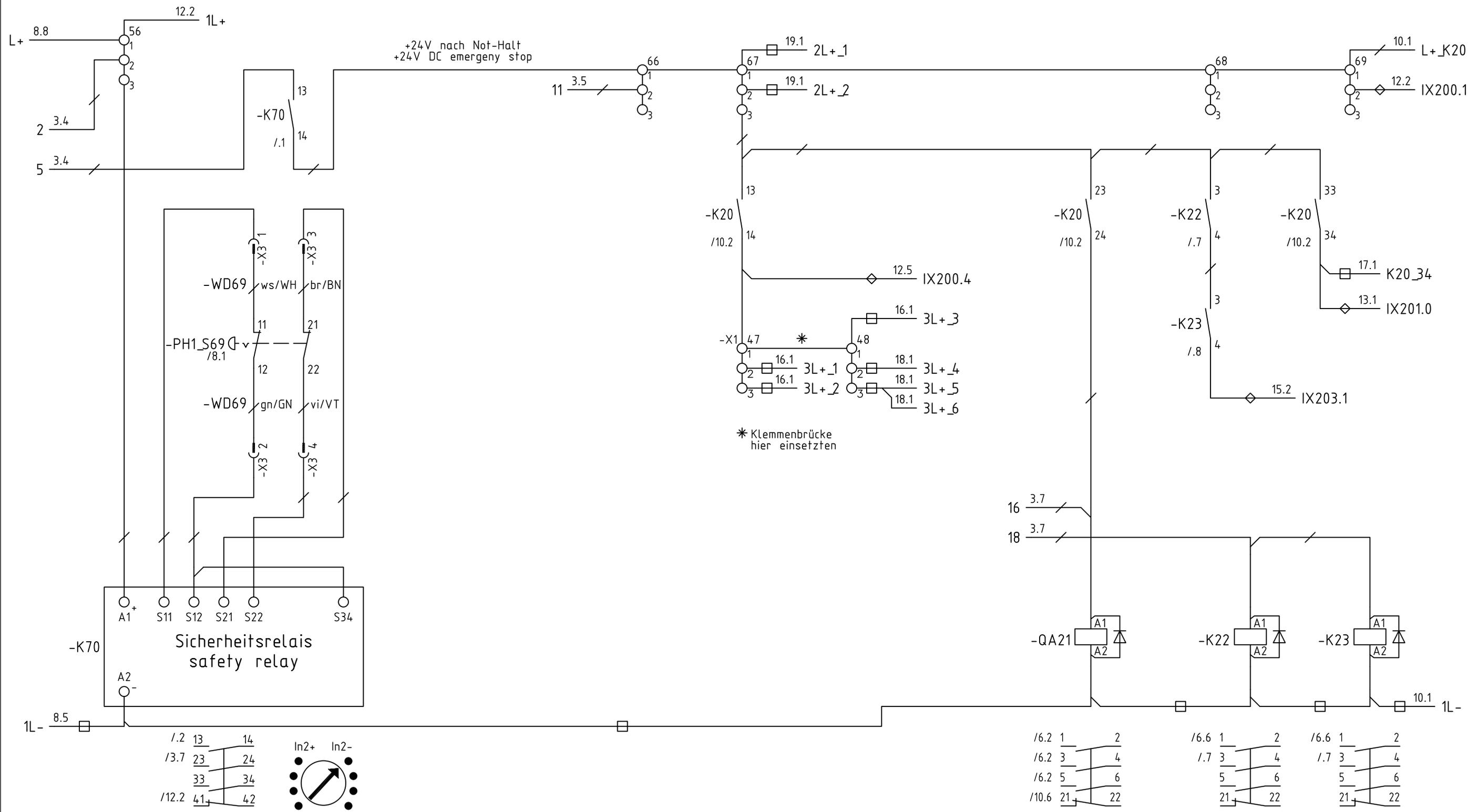
control panel

TCP-coupler

Tableau de commande

CP 112-1 or CP 102

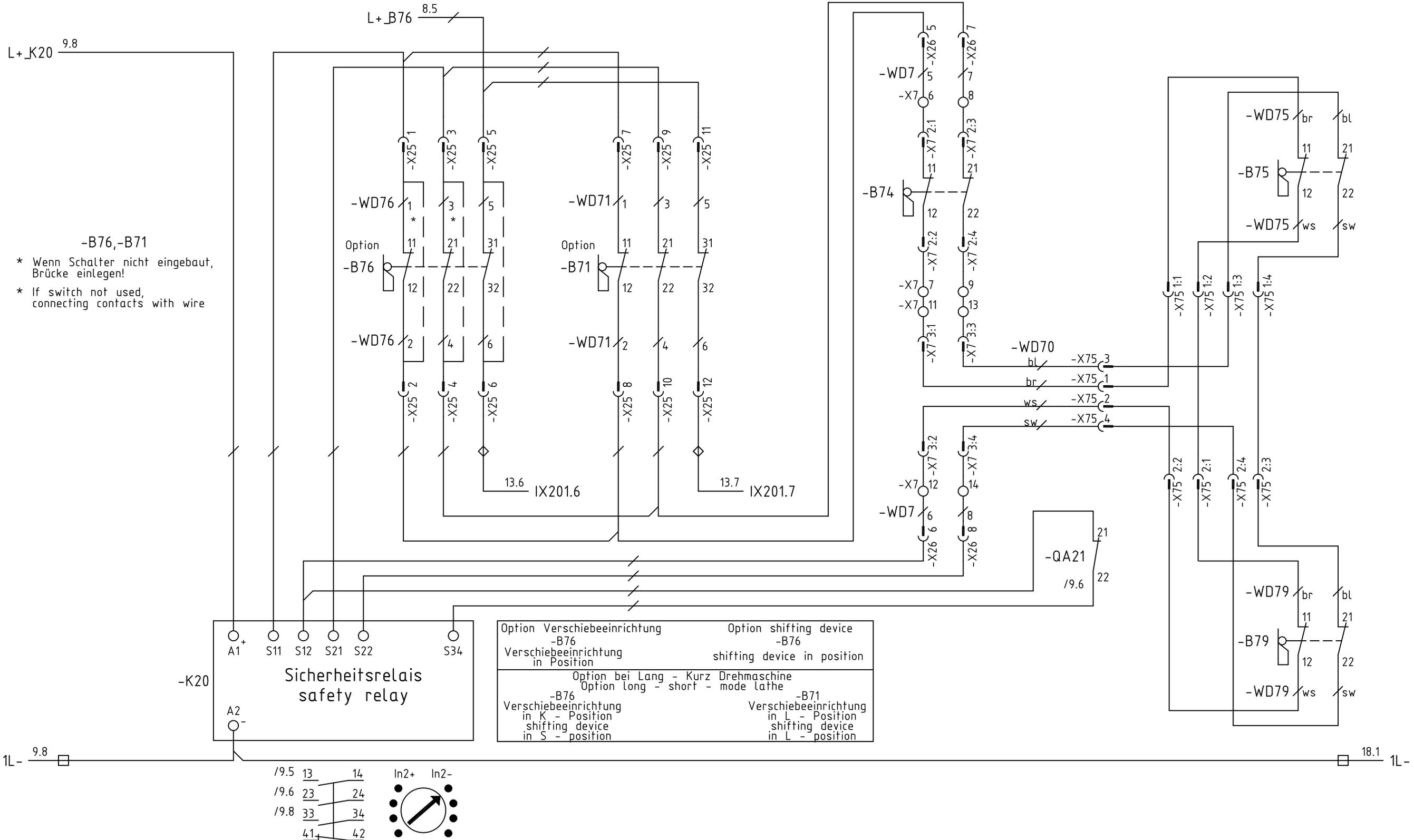
		Datum	02.06.22				Steuerung	turbo 3-36 Serie 6				
		Bearb.	D.Beck	control Commande				Blatt 8/00		10416_003		Blatt 8
		Gepr.	D.Beck	Urspr								Folge 9
Aenderung	Datum	Name	Norm	DIN5	Ers.f.	Ers.d.						



Not - Halt emergency stop Arrêt d'urgence	Freigabe Motor release motor Libération moteur	Antriebssperre 1 drive barrier 1 Barrière d'entraînement 1	Antriebssperre 2 drive barrier 2 Barrière d'entraînement 2
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	Datum 16.05.22		<b>FMB</b> MASCHINENBAU	Not-Halt	turbo 3-36 Serie 6		
	Bearb D.Beck	emergency stop					
	Gepr. D.Beck	Arrêt d'urgence					
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.
1	2	3	4	5	6	7	8

Blatt 9/00      **10416\_003**      Blatt 9  
Folge 10



-B76,-B71  
 \* Wenn Schalter nicht eingebaut,  
 Brücke einlegen!  
 \* If switch not used,  
 connecting contacts with wire

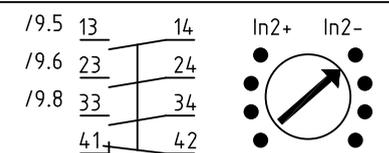
-K20

A1+ S11 S12 S21 S22 S34

A2-

**Sicherheitsrelais**  
 safety relay

Option Verschiebeeinrichtung -B76 Verschiebeeinrichtung in Position	Option shifting device -B76 shifting device in position
Option bei Lang - Kurz Drehmaschine -B76 Option long - short - mode lathe	-B71 Verschiebeeinrichtung in L - Position shifting device in L - position



Verkleidung geschlossen			Verkleidung geschlossen			Verkleidung geschlossen		Verkleidung an Lünette	
cover closed			cover closed			cover closed		cover on steady closed	
Carénage fermé			switch in the rear			switch in front			

Datum 16.05.22		check covering		<b>FMB</b> MASCHINENBAU	Überwachung Verkleidung	turbo 3-36 Serie 6		Blatt 10 Folge 11	
Bearb D.Beck		chèque couvrant				10416_003			
Gepr. D.Beck		Norm DIN5		Ers.d.		Blatt 10/00			
Aenderung Datum Name		Ers.f.		Ers.d.					



1 2 3 4 5 6 7 8

A

B

C

D

E

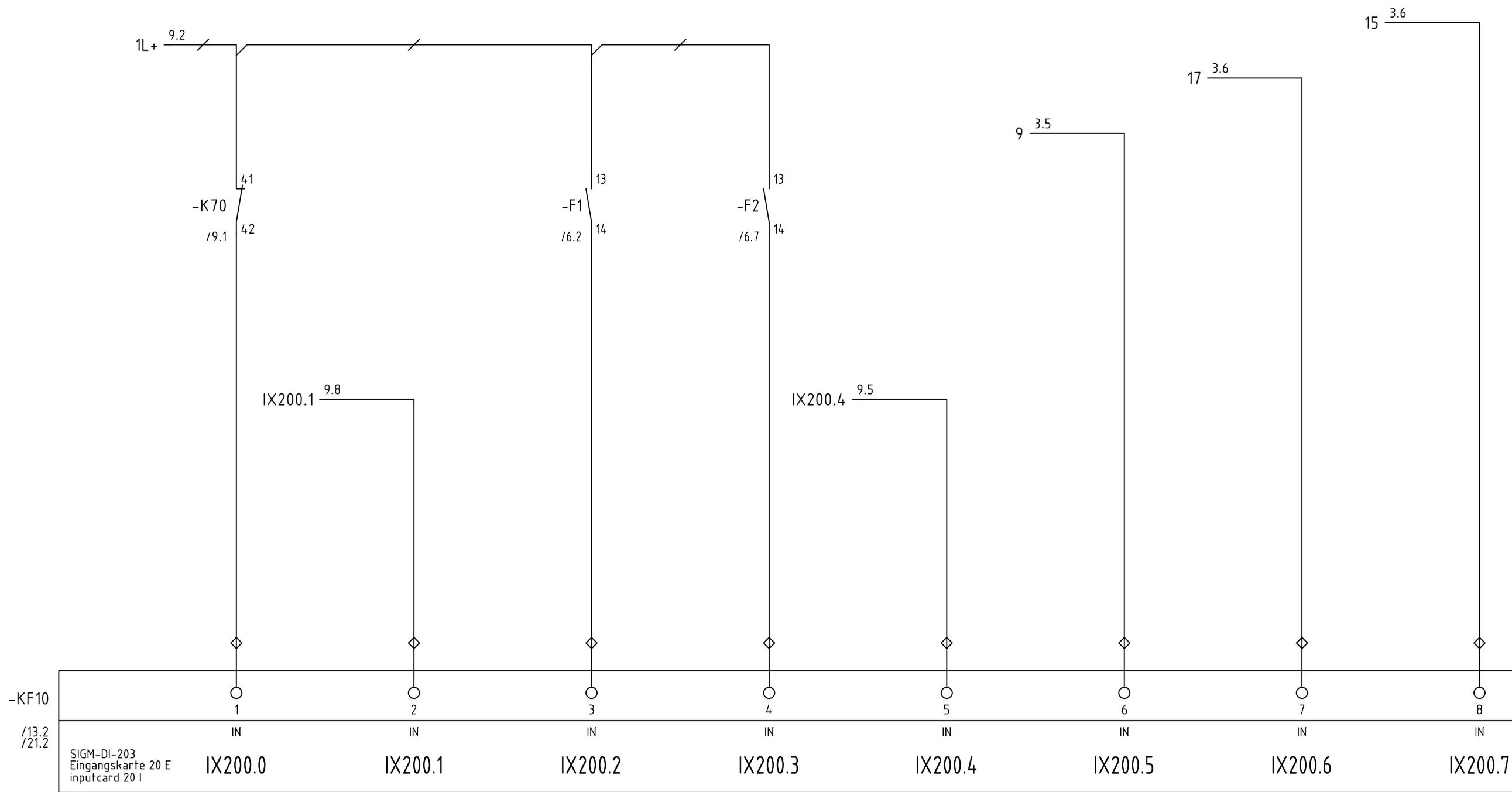
A

B

C

D

E



-KF10  
/13.2  
/21.2

1	2	3	4	5	6	7	8
IN							
IX200.0	IX200.1	IX200.2	IX200.3	IX200.4	IX200.5	IX200.6	IX200.7

Not - Halt	Not - Halt	Schutzschalter	Schutzschalter	Verkleidung	Freigabe	Spannzange	Zyklus Ende
Lademagazin	Lademagazin	Antriebsmotor M1	Ölpumpe M2	geschlossen	Automatikbetrieb	geöffnet	Stangenwechsel Start
emergency stop magazine	emergency stop	protective switch motor M1	protective switch oil-p.M2	cover closed	release magazine	collet opened	cycle end
Arrêt d'urgence Embarreur	Arrêt d'urgence	Disjoncteur moteur M1	Disjoncteur pompe M2	Carénage fermé	Libération du mode automat.	Pince de serrage ouvert	Fin de cycle

Datum	16.05.22
Bearb	D.Beck
Gepr.	D.Beck

input-card KF10 IX200.0-7  
Plaque d'entrée KF10 IX200.0-7



Eingangskarte  
KF10 IX200.0-7

turbo 3-36 Serie 6

Blatt 12/00

10416\_003

Blatt 12  
Folge 13

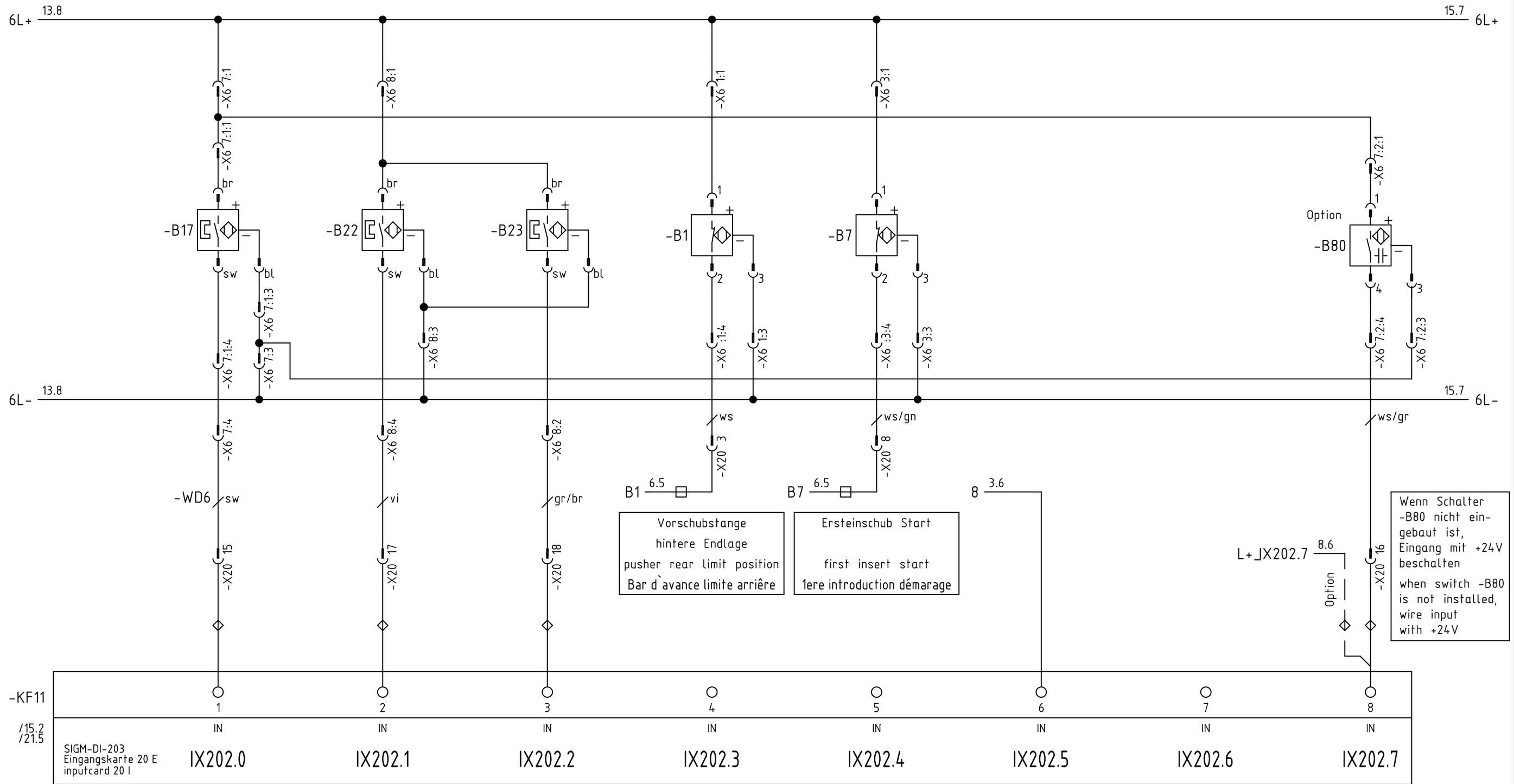
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.
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1 2 3 4 5 6 7 8

F

F





Vorschubstange  
hintere Endlage  
pusher rear limit position  
Bar d'avance limite arrière

Ersteinschub Start  
first insert start  
1ere introduction démarrage

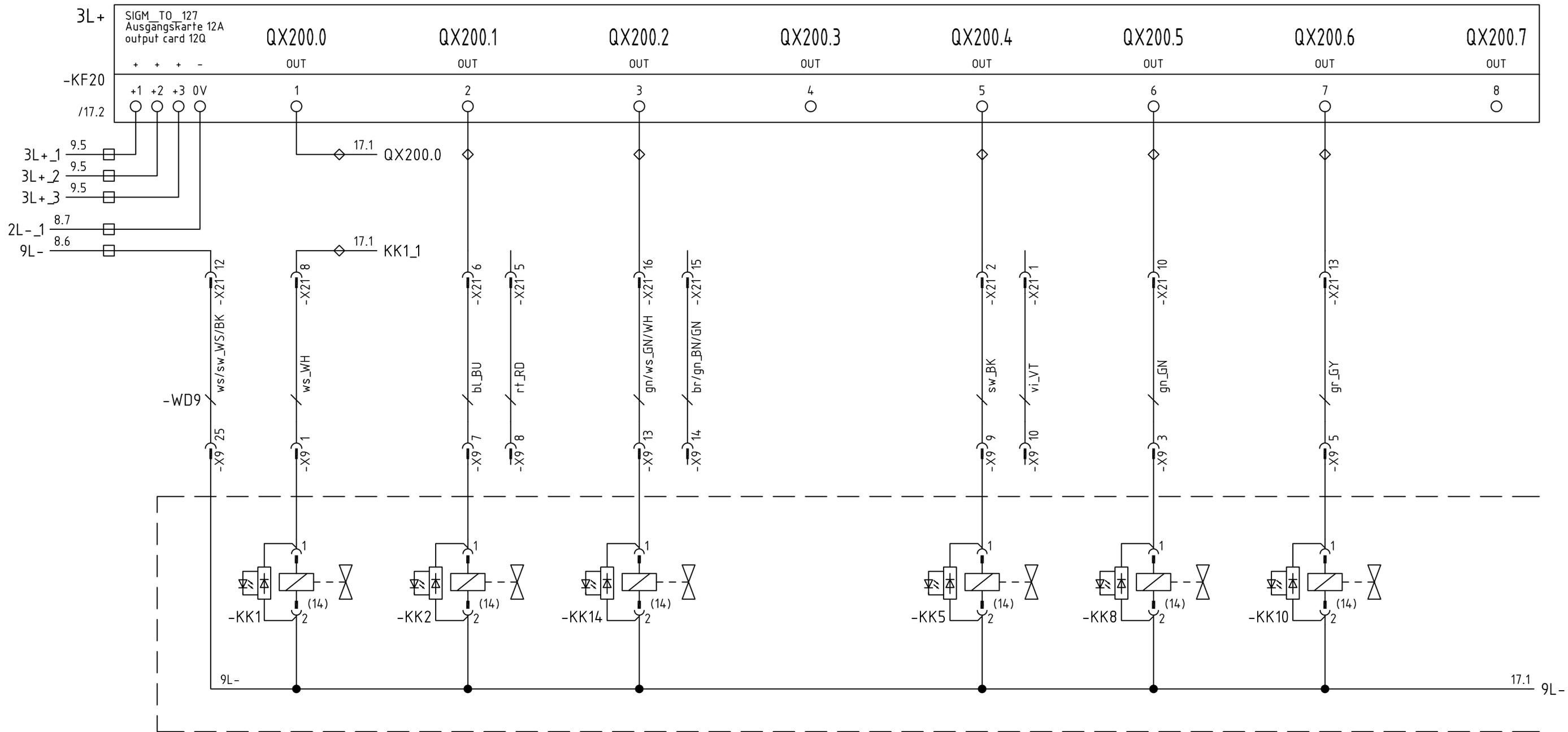
Wenn Schalter  
-B80 nicht ein-  
gebaut ist,  
Eingang mit +24V  
beschalten  
when switch -B80  
is not installed,  
wire input  
with +24V

-KF11	1	2	3	4	5	6	7	8
/15.2 /21.5	IN							
SIGM-DI-203 Eingangskarte 20 E inputcard 20 I	IX202.0	IX202.1	IX202.2	IX202.3	IX202.4	IX202.5	IX202.6	IX202.7

	Option	Option	Option	Option	Option	Option	Option
Reststückausfallklappe	Vorschubstange	Vorschubstange	Vorlauf	Rücklauf	Nachschieben	Material auf	
eingeschwenkt	ausgeschwenkt	im Kanal			mit Gegenspindel	Seitlicher-Auflage	
remnant flap swung in	pusher swung out	pusher in the channel	forward	backward	push with sub spindle	material on lateral storage	
Volet résidus rentré fermé	Barre d'avance sortie	Bar.d'avance rentrée,dans le canal	Avance	Retour	Introduction con.broche		

	Datum	16.05.22				Eingangskarte KF11 IX202.0-7	turbo 3-36 Serie 6			
	Bearb	D.Beck	input-card KF11 IX202.0-7							
	Gepr.	D.Beck	Plaque d'entrée KF11 IX202.0-7							
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 14/01	10416_003	

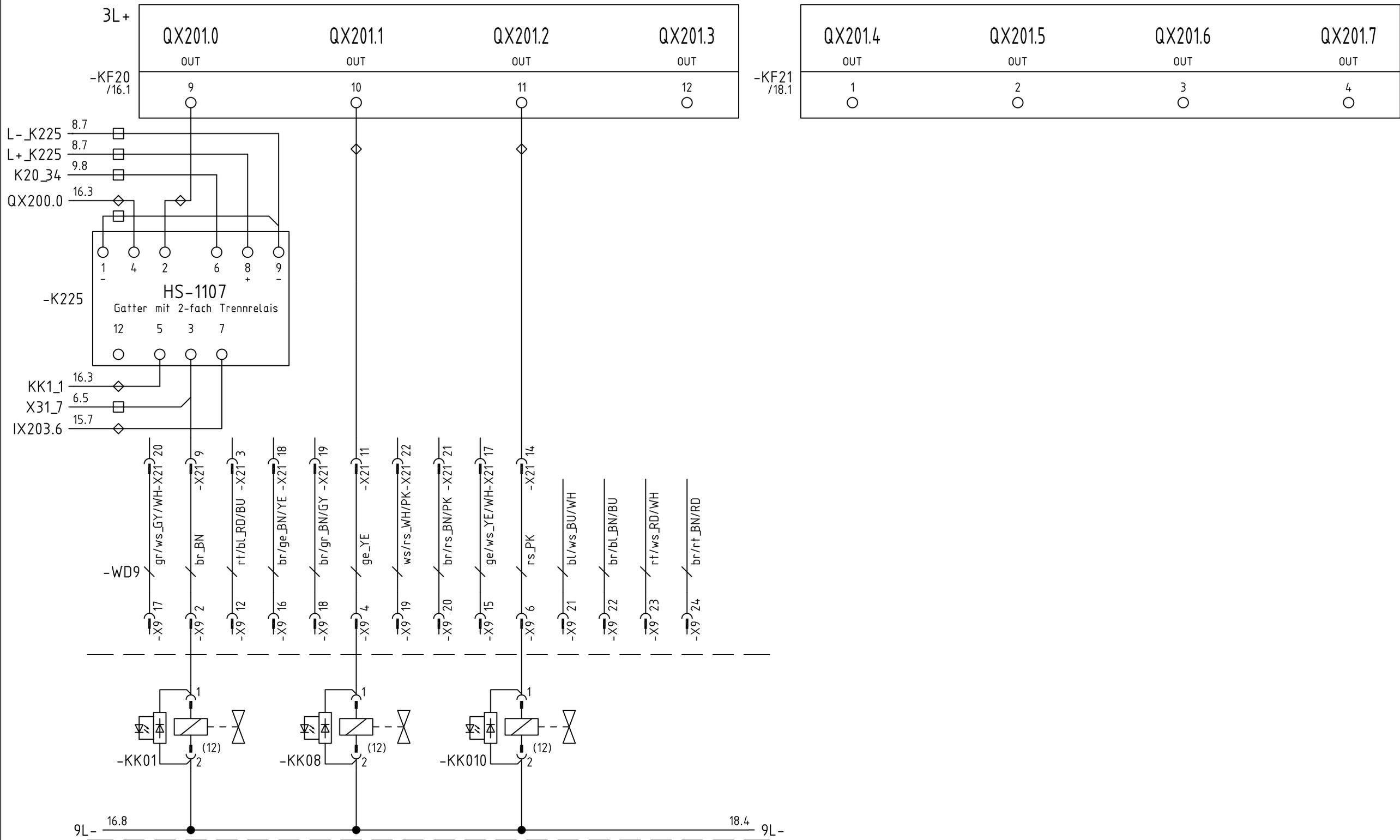




Option

Führungskanal öffnen guide channel open Ouvrir le canal guidage	Greifermesser schliessen gripper blades close Fermer les lames du preneur	Lünette Drehmaschine Spindelstocklünette steady lathe tour fixe	Reserve reserve reserve	Materialvereinzlung material separation Séparation le matériau	Vorschubstange ausschwenken pusher swing out Barre d'avance sortir	Reststückklappe ausschwenken remnant flap swing out volet des résidus sortir	Reserve reserve reserve
--	--	--	-------------------------------	--	---	---	-------------------------------

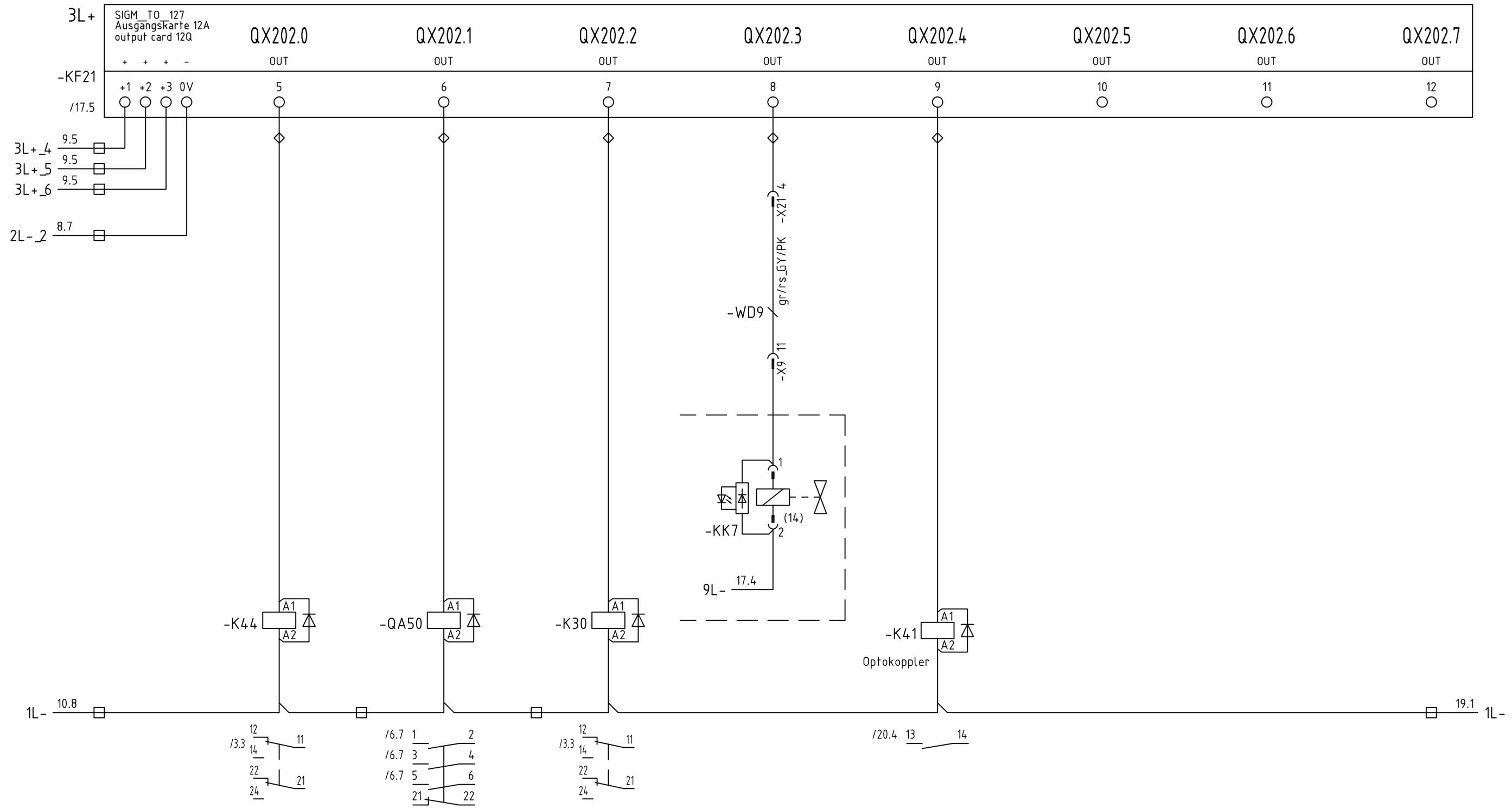
Datum	16.05.22	output-card KF20 QX200.0-7 Plaque de sortie KF20 Q200.0-7		Ausgangskarte KF20 QX200.0-7	turbo 3-36 Serie 6		Blatt 16 Folge 17
Bearb.	D.Beck				Blatt 16/00	10416_003	
Gepr.	D.Beck						
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.



Option

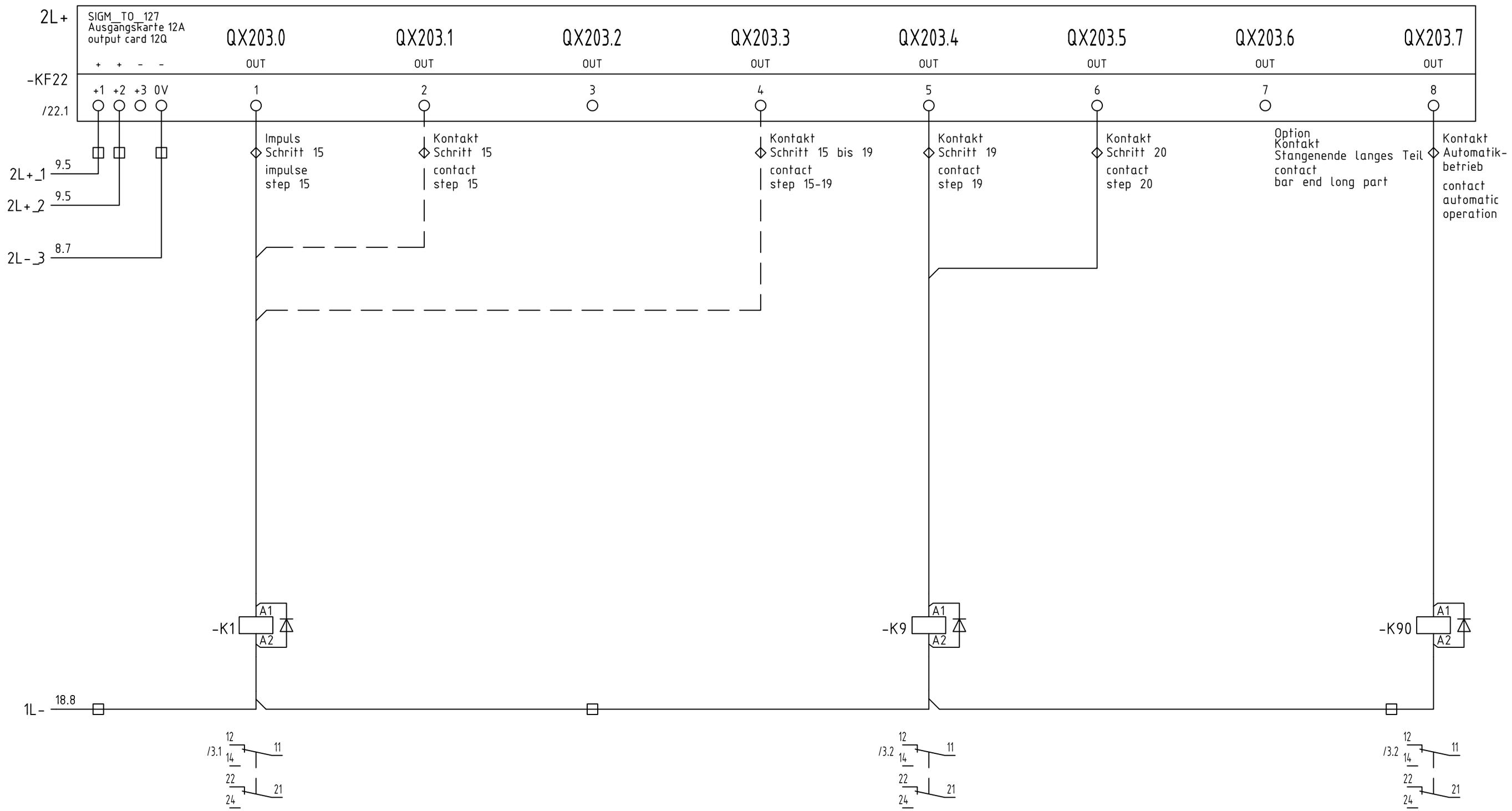
Führungskanal	Vorschubstange	Reststückklappe	Reserve	Olablaseinrichtung
schliessen	einschwenken	einschwenken		
guide channel close	pusher swing in	remnant flap swing in	reserve	oil discharge device
Fermer le canal de guidage	Rentrer la barre d'avance	Rentrer volet des résidus	reserve	installation de vidange d'huile

			Datum	16.05.22					
			Bearb	D.Beck	output-card KF20/KF21 QX201.0-7 Plaque de sortie KF20/KF21 QX201.0-7		Ausgangskarte KF20/KF21 QX201.0-7	turbo 3-36 Serie 6	
			Gepr.	D.Beck				Blatt 17/03	10416_003
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.		Folge 18



Option	Option
Nachschieben	Synchronkupplung
Ölpumpe	Lünette
Störung	
OK	
pushing OK	Synchronisation clutch
Inroduction OK	Accouplement synchronisation
oil-pump	Lunette
Pompe à huile	
fault	
Défaut	

Datum		16.05.22				Ausgangskarte		turbo 3-36 Serie 6			
Bearb		D.Beck				KF21 QX202.0-7		10416_003		Blatt 18	
Gepr.		D.Beck				Plaque de sortie KF21 Q202.0-7				Folge 19	
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 18/00			



Stangenwechsel Ende

Stangenende

Automatik Ein

Programm Start

Programm Stopp

bar change end, program start

bar end, Program stop

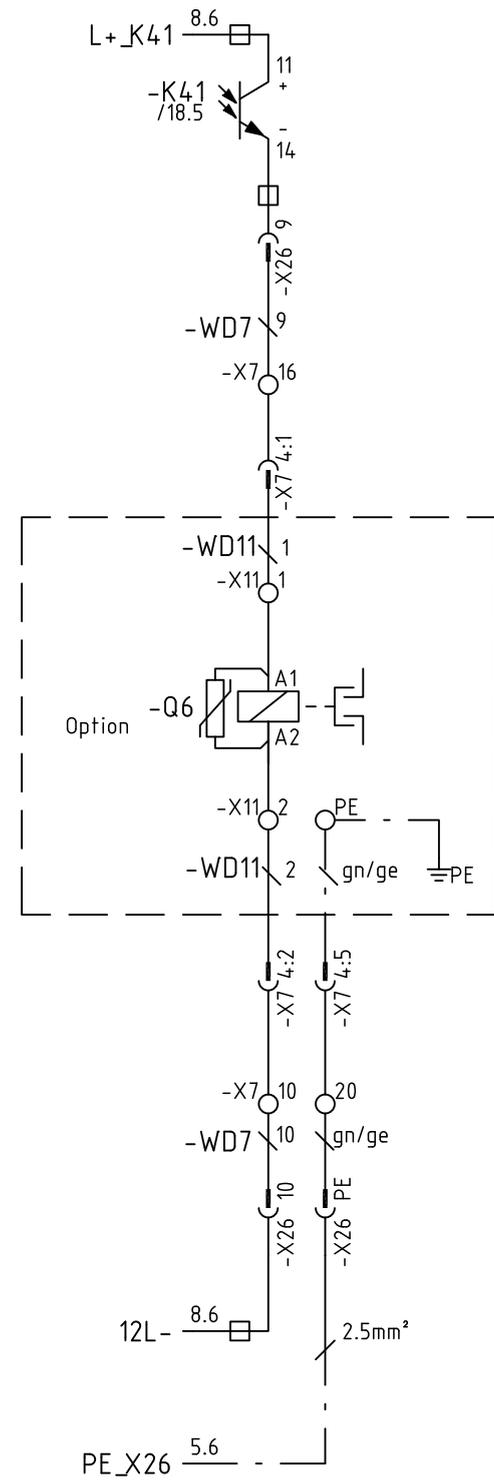
automatic on

Fin du changement de barres, Programme start

Fin de barre, Programme stop

Automatique on

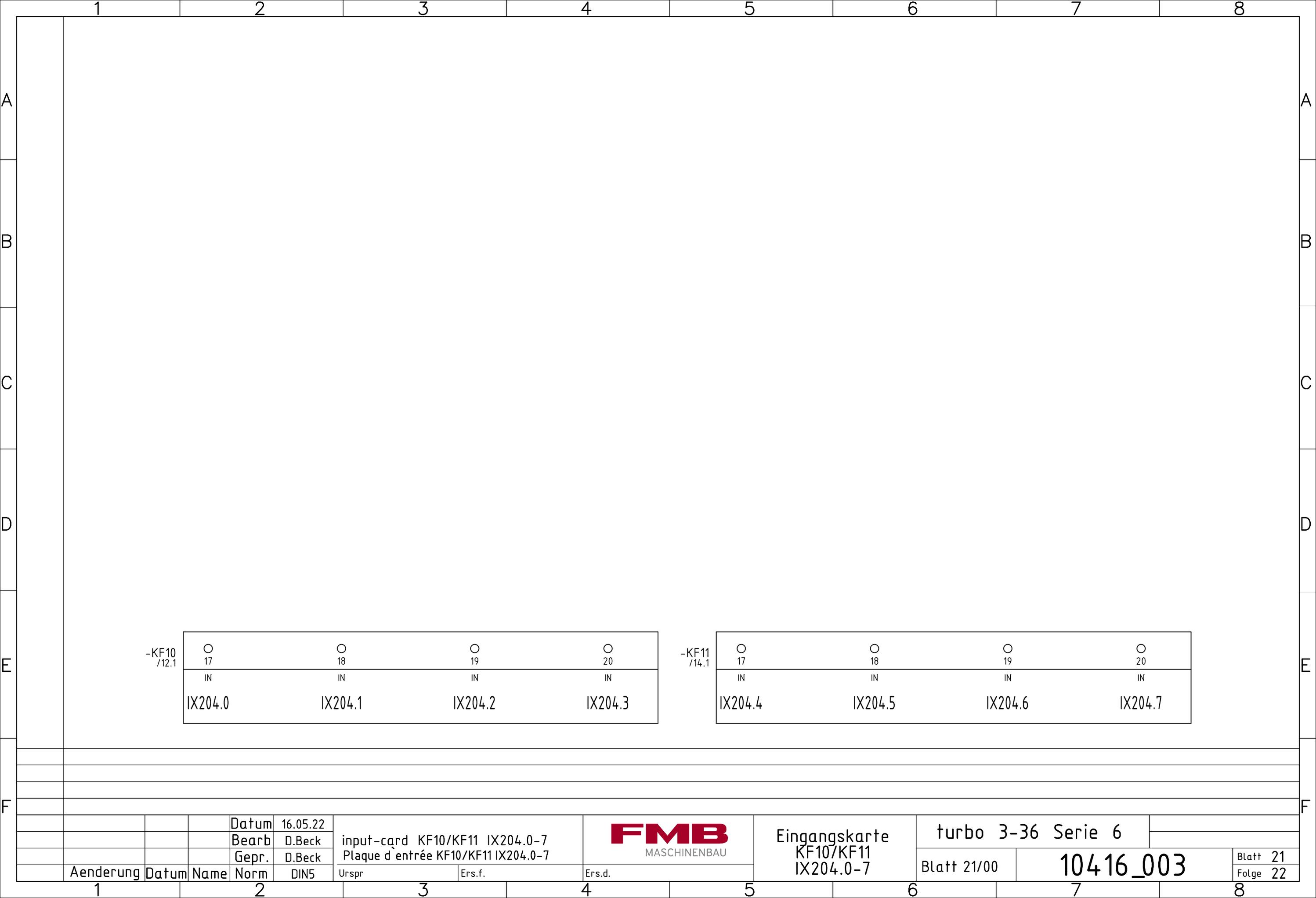
			Datum	16.05.22			Ausgangskarte	turbo 3-36 Serie 6			
			Bearb	D.Beck	output-card KF22 QX203.0-7			KF22 QX203.0-7			
			Gepr.	D.Beck	Plaque de sortie KF22 QX203.0-7						
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 19/00	10416_003	Blatt 19 Folge 20	



Synchronkupplung

synchronisation clutch  
accouplement synchronisation

		Datum	16.05.22				Synchronkupplung	turbo 3-36 Serie 6			
		Bearb	D.Beck	synchronisation clutch				Blatt 20/01	10416_003		Blatt 20
		Gepr.	D.Beck	Accouplement synchronisation							Folge 21
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.				



-KF10  
/12.1

○ 17	○ 18	○ 19	○ 20
IN	IN	IN	IN
IX204.0	IX204.1	IX204.2	IX204.3

-KF11  
/14.1

○ 17	○ 18	○ 19	○ 20
IN	IN	IN	IN
IX204.4	IX204.5	IX204.6	IX204.7

			Datum	16.05.22	input-card KF10/KF11 IX204.0-7		<b>FMB</b> MASCHINENBAU	Eingangskarte KF10/KF11 IX204.0-7	turbo 3-36 Serie 6			
			Bearb	D.Beck	Plaque d'entrée KF10/KF11 IX204.0-7							
			Gepr.	D.Beck					Blatt 21/00	10416_003		Blatt 21
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.					Folge 22

1 2 3 4 5 6 7 8

A

A

-KF22  
/19.1

QX204.0	QX204.1	QX204.2	QX204.3
OUT	OUT	OUT	OUT
9 ○	10 ○	11 ○	12 ○

B

B

C

C

D

D

E

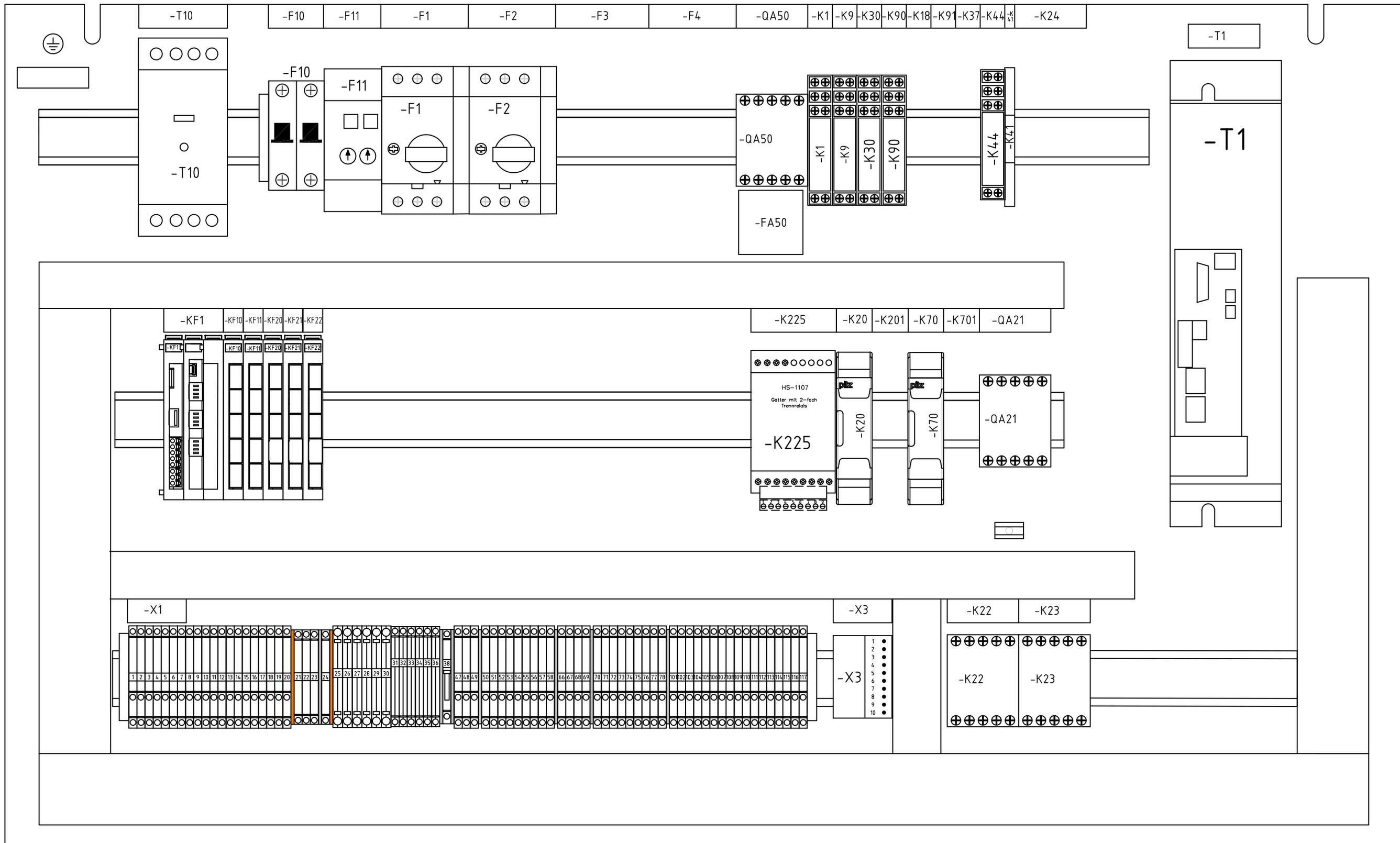
E

F

F

			Datum	16.05.22				Ausgangskarte		turbo 3-36 Serie 6			
			Bearb	D.Beck	input-card KF22 QX204.0-3				KF22 QX204.0-3				
			Gepr.	D.Beck	Plaque d'entrée KF22 QX204.0-3							Blatt 22	
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.			Blatt 22/00	10416_003		Blatt 22 Folge 70

1 2 3 4 5 6 7 8



		Datum	16.05.22				Schalttafel		turbo 3-36 Serie 6			
		Bearb.	D.Beck	switch board								
		Gepr.	D.Beck	Tableau de distribution								
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 70/00		10416_003		Blatt 70
1	2	3	4	5	6	7	8			Folge		