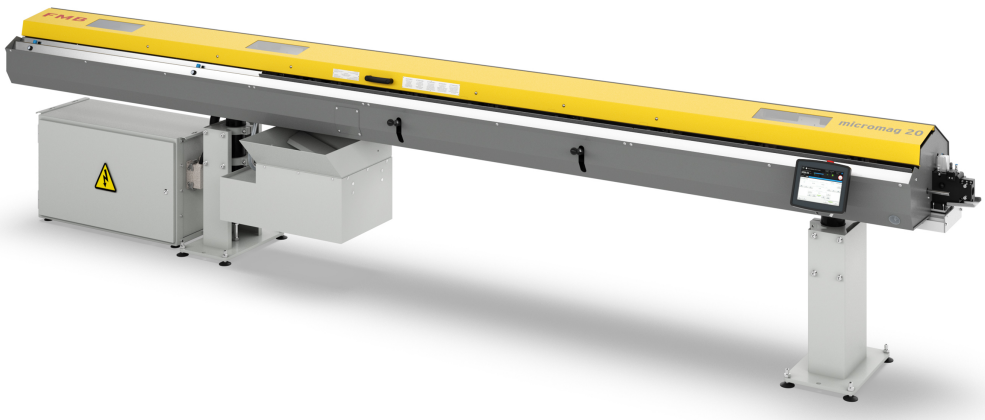
FMB
MASCHINENBAU

micromag 20

Operating instructions



Operating instructions

micromag 20, series 3

Confirmation number from: 1805926

Editorial deadline: 07.06.2021

FMB Maschinenbau
Paul-Hohe-Straße 1
97906 Faulbach
+49 9392 801 0

info@fmb-machinery.de
www.fmb-machinery.de

Operating instructions

1, 3, en_US

© 2021 FMB Maschinenbau.

Table of contents

1 General

1.1 Operating instructions

Product versions and special equipment

The operating instructions cover several versions of the described product. You can see which version of the product you have in the field "Type" on the name plate. ➚ *"Name plate" on page 8*.

The product versions differ with regards to the length of the loading magazine and therefore also with regards to the number of supports. In the chapters "Transport" and "Assembly" the respective product version is to be observed. Product versions over a certain length can be delivered in two pieces. Please find more precise information about the individual product versions from the respective dimension sheet. ➚ *"Other applicable documents" on page 5*.

The diagrams may vary from the actual product. The principle described does, however, apply to all versions.

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.

Special equipment with a greater scope is described in corresponding supplemental instructions, which can also be found in the technical documentation folder. The supplemental instructions are a supplement to the operating instructions, and are to be observed in connection with it. First familiarize yourself with the operating instructions, before you use the supplemental instructions.

Other applicable documents

The operating instructions are supplemented by the following documents, which are also kept in the technical documentation folder:

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

⚠ DANGER

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.

⚠ WARNING

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.

⚠ CAUTION

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.

NOTICE

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

→ These instructions require the user to take action.

Display text
Display text comprises terms or text which appear on the control panel of the product.
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 suppled, 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 11*.

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 55*.
- 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 11*.
- 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 20*.
- 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

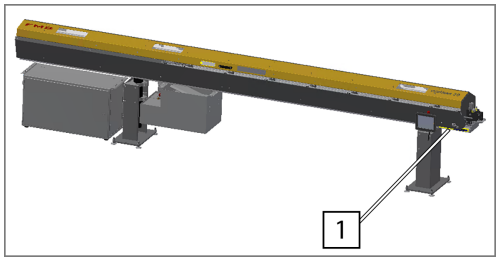
*Extensive qualification in the assembly and start up of FMB products. Qualification is done by FMB.

**Personnel who have received training for the product, 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.

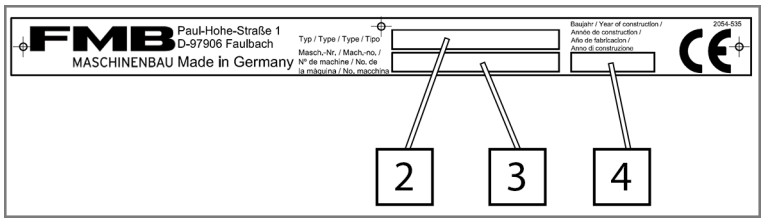
***Personnel who have received training in the respective area of responsibility, and have qualifications allowing them to perform the work correctly, to properly estimate risks and avoid hazards.

1.2 Information about the product

Name plate



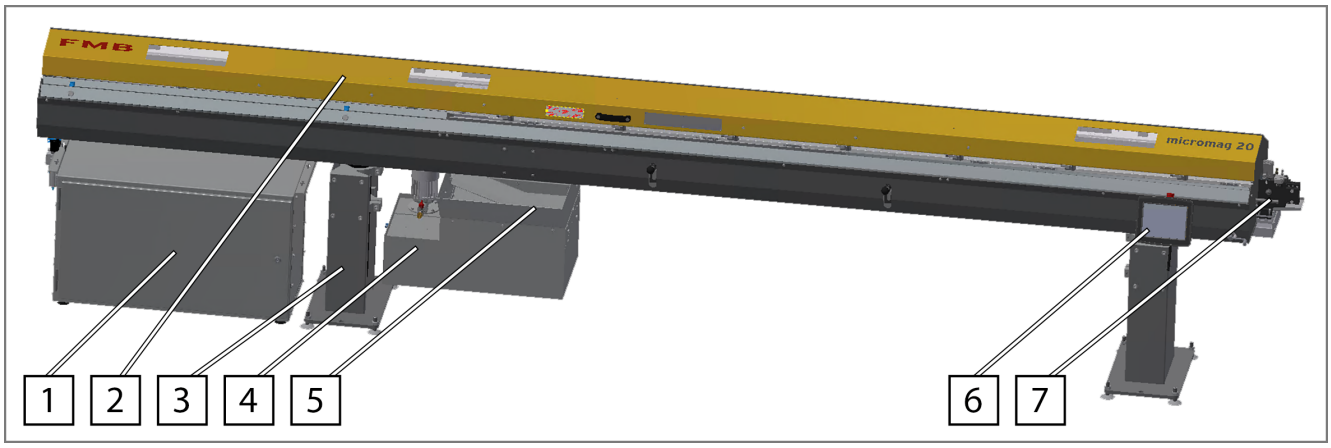
The name plate is attached to the loading magazine in the position 1.



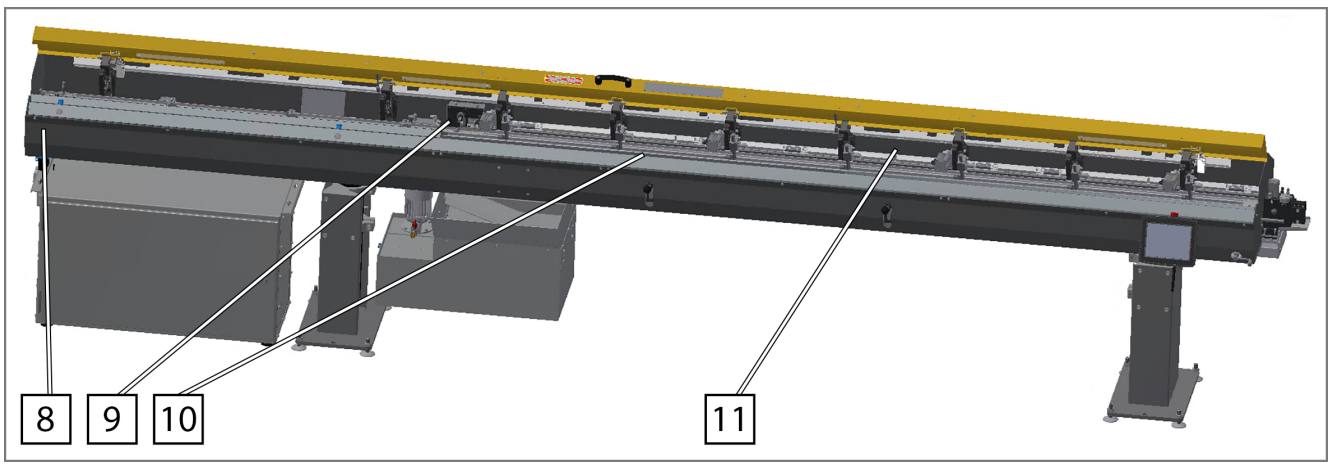
2	Types and lengths	3	Machine number
4	Year of construction		

The declaration of conformity (CE or UKCA) shall be added, if issued, to the name plate of the loading magazine.

Overview



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



8	Drive	9	Material gripper
10	Lateral material storage with integrated pilgrim step separation	11	Guide channel

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 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 DC gear motor with a drive chain. The reverse polarity protected connection is ensured by two different flat plugs. The shielded motor is operated via these voltage connections using an external control unit without position check.

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

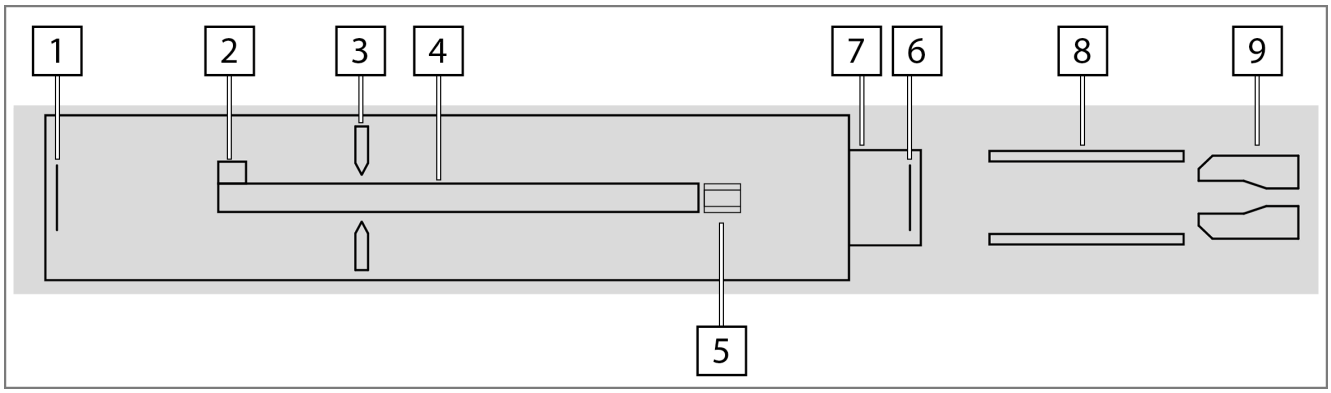
The synchronizing unit is only installed in loading magazines, which are intended for attaching to lathes with a moving headstock. The synchronizing unit ensures that the pusher of the loading magazine and the material bar also complete the traverse paths of the lathe headstock.

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.

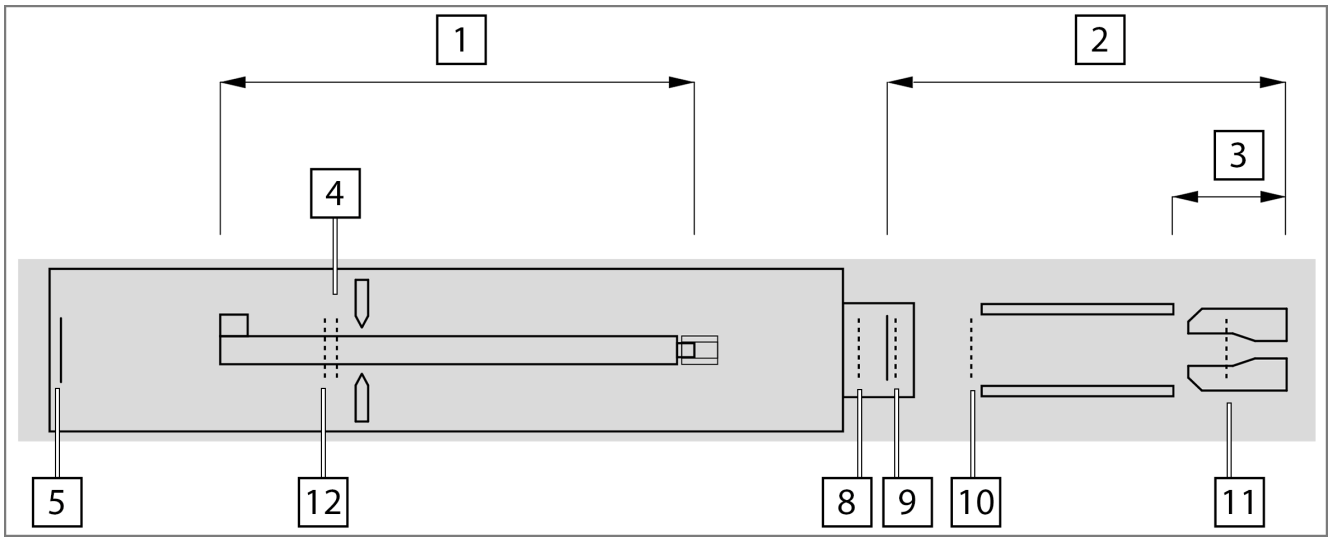
During the bar feed the drive of the loading magazine is switched on and the synchronization clutch is opened. The pusher is moved by the drive of the loading magazine. The material bar is pushed on.

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 Pusher length parameter is measured from the back edge of the pusher to the front edge of the bearing insert.
2	First insert travel traverse path	The first insertion is performed after the material bar is changed. The First insert travel traverse path is the path from the starting switch in the loading magazine to the cut-off position in the working area of the lathe.
3	Travel interval on traverse path	If the interval insert is active, an intermittent feed occurs in the area of Travel interval on.
4	Position draw off	In the Position draw off position, the material gripper grabs the material bar.
5	Position rear limit	The maximum rear position the pusher is able to reach. The Position rear limit position is reached when the remnant is removed.
8	Position open steady	During operation, the clamping sleeve must pass the steady. When the clamping device is in the Position open steady position, the steady opens 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 position, the steady closes.
10	Pos. reverse rotation return	When returning from the spindle of the lathe, the pusher moves from the Pos. reverse rotation return position at high speed.
11	Position front limit	The maximum front position the pusher is able to reach. The clamping sleeve is just in front of the collet of the lathe. The value Position front limit and the value Part length 1 are used to calculate when the last part is pushed.
12	Position press on	Up to this position, the clamping sleeve presses on the material bar.

1.3 Technical data

Technical data of the loading magazine

Characteristic	Unit	Value
Material flow in the guide channel	mm	23
Bar length	mm	1600 / 3200 / 3800 / 4200
Maximum feed force	N	320
Feed speed	mm/s	600

Characteristic	Unit	Value
Feed speed	mm/s	350
Return speed	mm/s	700
Maximum remnant length	mm	420
Weight [3] Length version 1600	kg	400
Weight [3] Length version 3200	kg	550
Weight [3] Length version 3800	kg	600
Weight [3] Length version 4200	kg	650
Oil tank level	l	50
Supply of compressed air	bar	6 - 10
Compressed air consumed per loading process	l	approx. 4
Compressed air consumed per double stroke of the steady	l	approx. 0.3
Noise emission during the bar change	dB(A)	48 + / - 5
Operating voltage [1, 4]	V	200 / 400 / other types
Power requirement	KW	1.5
Nominal frequency [2, 5]	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

Characteristic	Unit	Value
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

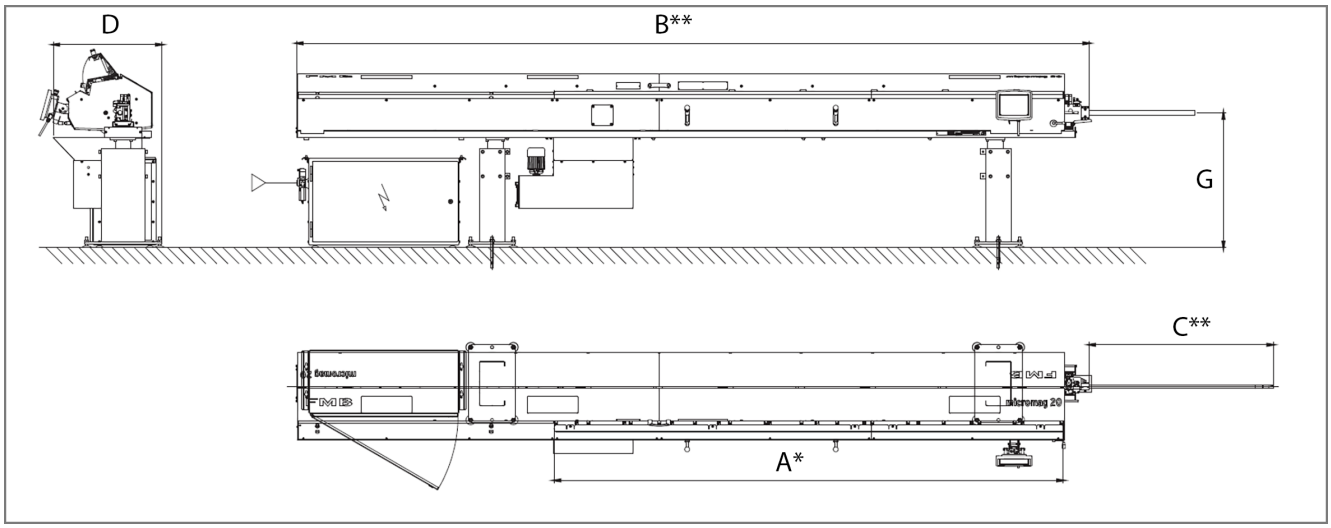
The lubricant used must comply with one of the following standards.

- DIN 51 517-2 CL 100,
- DIN 51 506 VBL 100,
- DIN ISO 3448 ISO VG 100.

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

Manufacturer	Type
Aral	Motanol HE 100
Mobil / Esso	VACTRA OIL HEAVY
	NUTO H 100
	DTE 27
Shell	Morlina 100

Dimensions of the loading magazine



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

Pusher length	1405	1655
	B1	B2
	C1	C2

Dimensions

Loading magazine length	Dimensions in mm						
	A	B1	B2	D	C1	C2	G
1600	1620	3415	3665	557	1165	1415	850 - 1250 set to the spindle height
3200	3220	5015	5265				
3800	3820	5615	5865				
4200	4220	6015	6295				

2 Safety

2.1 Safety measures

Personal safety equipment

The operator of the product 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 43*.

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 the pneumatic valves remains for the function "Open / close guide channel", so that the guide channel remains shut. The pressurization of the rest of the pneumatic valves is interrupted. They 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 machine tool and has to be processed there in accordance with DIN EN 23125.

If the emergency stop button of the machine tool 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 is shut down. The lock helps ensure the loading magazine operates safely.

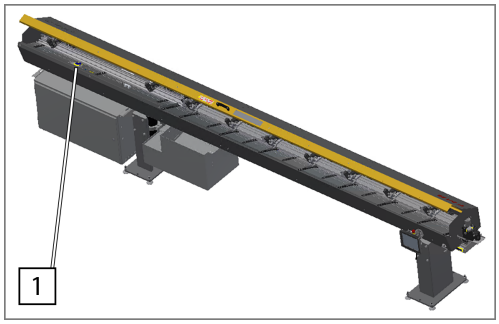
Safety door of the machine tool

If the safety door of the machine tool is opened during operation, the drive of the loading magazine is shut down. It is not possible to move the pusher of the loading magazine if the safety door of the machine tool is open. A risk to people due to the pusher of the loading magazine being in the working area of the machine tool is therefore excluded.

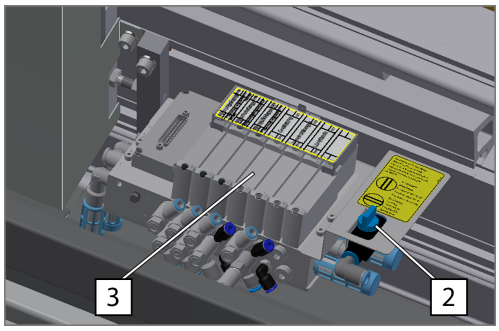
Working on the guide channel

When working on an open guide channel the open position of the front guide channel must be secured. To do so, locking bolts have to be inserted. ➚ *"Secure the guide channel with safety bolts" on page 73*.

Valve block



The valve block is in the 1 position 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 104*.

3 Transport

3.1 Prepare for transportation

Preparing the loading magazine for transportation

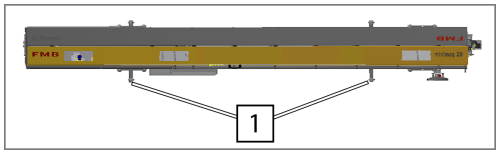
Once the loading magazine has been raised, the pins extending out of the floor must be detached at ground level or removed from the floor using suitable means.

1. Completely remove any material bars. ↗ *"Removing the material bar from the loading magazine" on page 66* or ↗ *"Draw off and eject the remnant" on page 66*.
2. Press the ☰ button.
3. Access SETUP.
4. Move the pusher all the way to the back using the ◂ button.
5. Deactivate pilgrim step separation. ↗ *"Activate / deactivate the pilgrim step separation" on page 60*.
6. Leave the loading magazine at a standstill for at least 8 hours to allow the oil to drain out.
7. Empty the oil tank of the loading magazine.
8. Turn off the main switch of the lathe.
9. Disconnect the power supply to the lathe (remove the connector).
10. Remove all the electrical connections from the loading magazine to the control cabinet.
11. Dispose of the oil / cooling lubricant in accordance with the legal provisions.
12. Depressurize the compressed air line to the loading magazine.
13. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 94*.

    ➡ The loading magazine is vented.
14. Fasten the control cabinet to the beam ↗ *"Remove the control cabinet from / attach the control cabinet to the loading magazine" on page 32*.
15. Loosen the anchors on the floor.

    ➡ The loading magazine is ready for transportation.

Transport beams



Two transport beams [1] have to be attached to the loading magazine. The attachment point for the transport beams [1] is on the underside of the loading magazine.

Assembling the transport beams

⚠ DANGER

Falling loading magazine

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

If the transport beams are attached improperly to the loading magazine, they might come loose or the screw connections might break.

- **Observe the description about the assembly of transport beams in the operating instructions.**

⚠ DANGER

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 danger that it might fall down if mounted improperly and hit people.

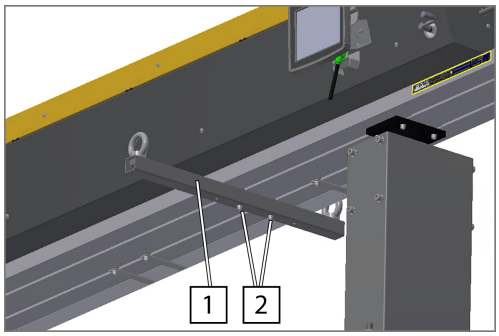
- **Do not stay in the danger area.**
- **Only install transport beams for the purpose of crane transportation and then remove them directly.**

⚠ CAUTION

Protruding transport beams

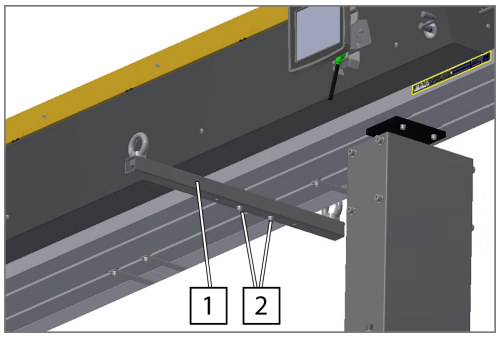
Personal injury because of impact due to protruding transport beams.

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



1. Position the [1] transport beams.
2. Insert and tighten [2] the screws.
3. Assemble the second transport beam in the same way.

Removing the transport beams



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

Angle of inclination of the load attachment gear

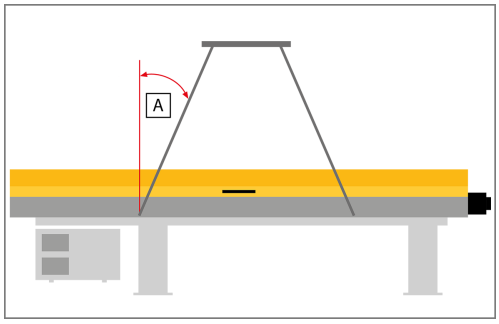
⚠ DANGER

Falling loading magazine

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

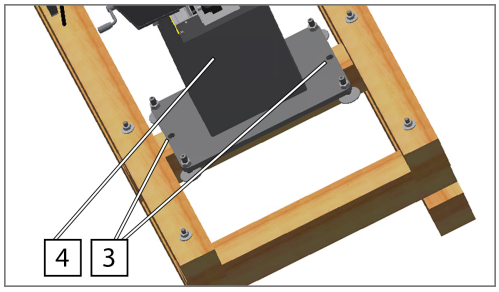
When lifting the loading magazine with the multi-chain load attachment gear, the specified maximum angle of the load attachment gear has to be observed. If this angle is exceeded, the attachments of the transport beams may break and the loading magazine could fall down.

- **Observe the specified maximum angle of inclination of the load attachment gear.**



When using the multi-chain load attachment gear, the load attachment gear has to be chosen so that it does not exceed the angle of inclination of A 40°. Greater angles of inclination generate transverse forces, which the attachment of the transport beams is not designed for.

Detach the loading magazine from the transport pallet



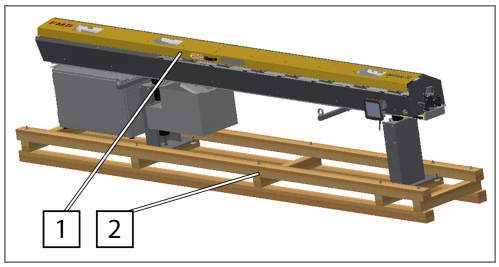
1. Secure the loading magazine to prevent tipping over.
2. Loosen and remove the screws in the attachment holes 3 of the support 4.
3. Loosen the rest of the supports from the transport pallet in the same way.
4. Using a crane, raise the loading magazine 1 from the transport pallet 2 and set down safely ↗ *"Transporting the loading magazine using the crane" on page 20*.

Attach the loading magazine to the transport pallet

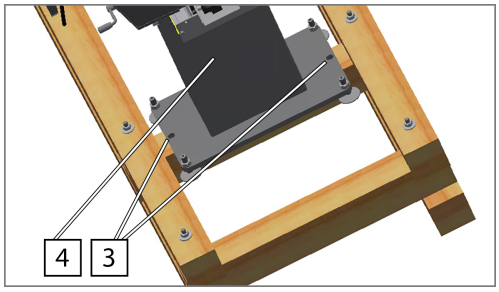
Fastening the loading magazine to the transport pallet serves only to prevent it from slipping or to raise the loading magazine and transport pallet over the transport beams of the loading magazine. For transportation, the loading magazine has to be additionally secured. Fastening it to the transport pallet is not sufficient.

The loading magazine must be fastened to the transport pallet using adequately dimensioned fasteners.

- Pay attention to the weight of the transport pallet in the technical data. ↗ *"Technical data of the loading magazine" on page 11*.



1. Raise the loading magazine [1] onto the transport pallet using a crane [2]. *“Transporting the loading magazine using the crane” on page 20*.
2. Secure the loading magazine to prevent tipping over.



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

3.2 Transporting the product

Transporting the loading magazine using the crane

If the loading magazine is hoisted with the transport pallet, it must be ensured that the attachment screws of the pallet are adequately dimensioned 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 palette, this may come loose. The transport pallet may fall down. The loading magazine may be knocked over and fall down.

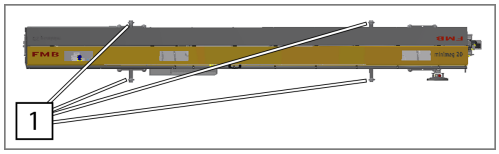
- **Do not stay in the danger area.**
- **Observe the description about the correct attachment of the loading magazine to the transport pallet in the operating instructions.**

⚠ 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.**



1. Assembling the transport beams ➚ *"Assembling the transport beams" on page 18*.
2. Fasten suitable hoists to all four eyebolts [1] of the transport beams.
3. Hoist the loading magazine and set it down securely.
4. Remove the hoists from the eyebolts [1] of the transport beams.
5. Remove the transport beams again after the loading magazine has been set down ➚ *"Removing the transport beams" on page 18*.

Transporting the loading magazine using the 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

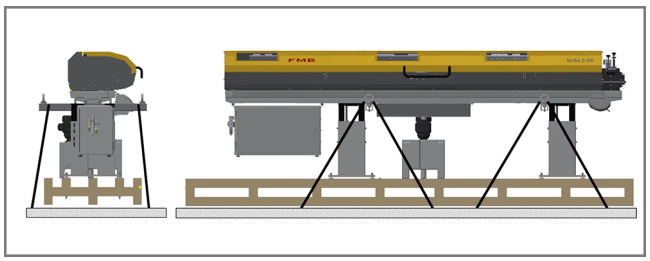
Falling control cabinet

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.**

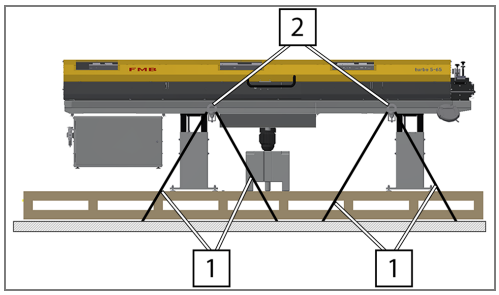
1. Fasten the loading magazine to a transport pallet ➚ *"Attach the loading magazine to the transport pallet" on page 19*.
2. Calculate the centre of gravity of the load.
3. Place the forks of the fork-lift truck beneath the centre of gravity of the load.
4. Hoist the transport pallet with the loading 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 19*.

Transport the loading magazine with means of transportation

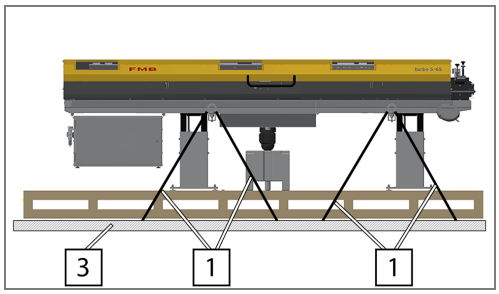


When transporting the loading magazine with means of transportation such as a truck, it is necessary to attach the loading magazine to a transport pallet ➚ *"Attach the loading magazine to the transport pallet" on page 19*. The unit consisting of the transport pallet and the loading magazine must also 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 22*.

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 19*.
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 ➚ *"Transporting the loading magazine using the crane" on page 20* or ➚ *"Transporting the loading magazine using the fork-lift truck" on page 21*.



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 product 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 product down, you must make sure that there are no wires in the floor in the area under the product. They could be damaged when securing the product.

- **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 entire consignment is covered with a protective film to prevent coarse contamination.

- The loading magazine is screwed to the transport pallet.
- The add-on set for fastening 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 to prevent them from 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 consignment from the transport pallet:

5. Detach the loading magazine from the transport pallet.
➚ *“Detach the loading magazine from the transport pallet” on page 19*.

4.2 Aligning

Calculate the distance of the loading magazine from the machine tool

Attachment to machine tools with fixed headstock:

1. Set up the loading magazine on the machine tool. ➚ *"Setting up the loading magazine" on page 25*.
2. Keep the distance between the loading magazine and the machine tool as small as possible.

Attachment to machine tools with moving headstock:

1. Set up the loading magazine on the machine tool. ➚ *"Setting up the loading magazine" on page 25*.
2. Calculate the distance from the loading magazine to the machine tool using the order-specific adapter diagram.
3. Adjust the distance.

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

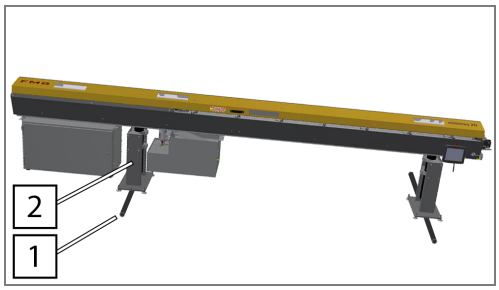
Moving the whole loading magazine during set-up

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

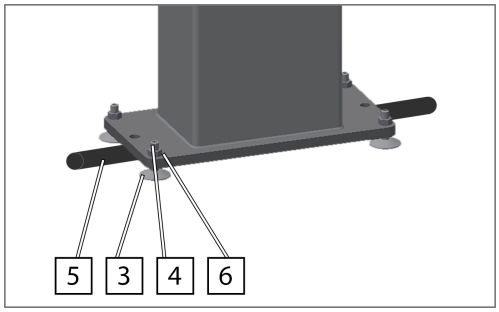
When setting up and aligning the loading magazine, the whole loading magazine has to be moved. People may be struck by the loading magazine or become stuck between the loading magazine and the lathe.

- **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 machine tool" on page 25*.



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 factory 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 machine tool" on page 26*
- Contacts from the lathe to the loading magazine: → *"Contacts from the machine tool to the loading magazine" on page 27*

Contacts from the loading magazine to the machine tool

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 tool machine can no longer turn
-K1	The material bar is pushed into the machine tool or Input release, Program - Start This signal is emitted, depending on the machine tool control system, as an impulse or permanent contact.
-K9	This signal indicates to the machine tool that the material bar has been processed. This signal is emitted, depending on the machine tool control system, as a normally-closed or normally-open contact.
-K91 (optional)	When working with two different part lengths, this signal is emitted when the end of the longer part Part length 1 is reached.
-K90	Contact closed >> The loading magazine is in automatic mode
Loading magazine emergency stop	Potential-free contact of the loading magazine. This contact is to be included in the emergency-stop circuit of the machine tool.

Contacts from the machine tool to the loading magazine

Signal of the machine tool	Loading magazine action
Collet open	The feed equipment of the loading magazine has been switched on.
End of cycle, start bar change	On machine tools 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 machine tool 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.
Safety door closed	The feed movement through the loading magazine is only executed if this contact is active.
Emergency stop of the machine tool	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

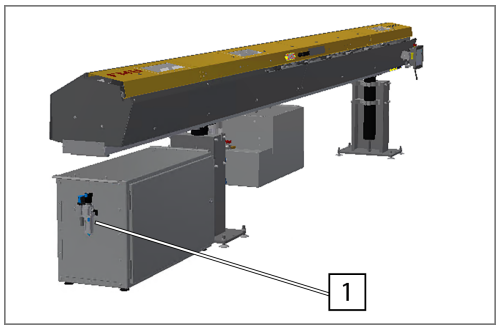
Damaged wires or plugs

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.

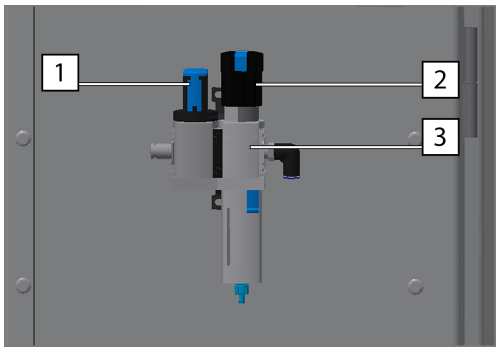
1. Turn off the machine tool before starting work on the main switch.
2. Check the electrical connection of the loading magazine and lathe. *“Electrical connection of the loading magazine and lathe” on page 26*



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].

Setting the supply of compressed air

Values for the supply of compressed air: ➚ "Technical data of the loading magazine" on page 11.



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

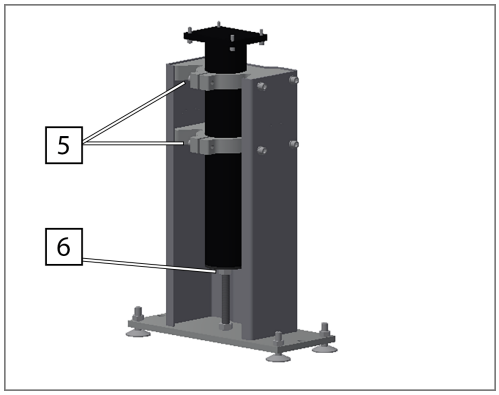
Cuts due to the sharp knives of the material gripper.

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

- **Wear safety gloves.**

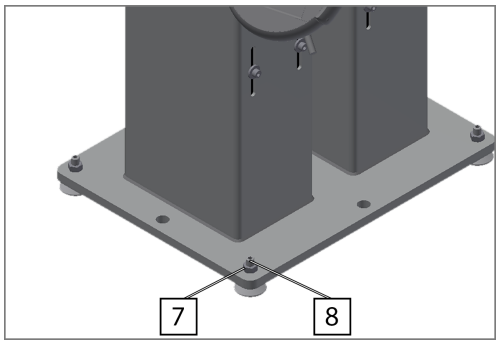
→ The centering hole on the pusher of the loading magazine must align with the lathe spindle. Set and verify the alignment with an optical alignment aid. In the event of questions about this please contact FMB. ↗ *"Service contact details" on page 104*.

Correcting the height (in general):



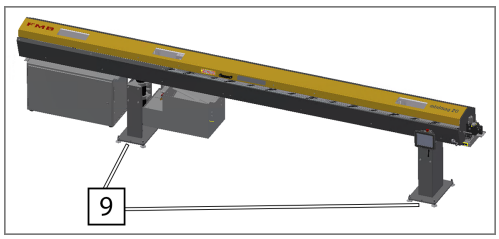
1. → Loosen the clamping screws [5].
2. → Correct the height of the loading magazine with the nuts [6].
3. → Tighten the clamping screws [5].

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 lateral position:



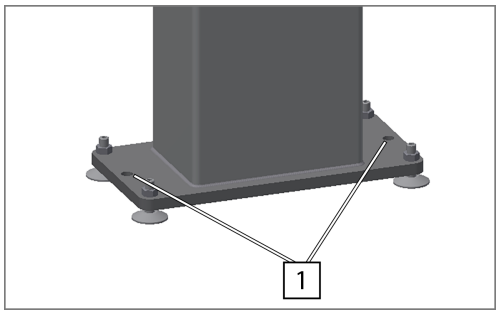
1. → Apply the lever (e.g. crowbar) at the lifting points [9] and correct the side position.
2. → Remove the optical alignment aids again.

Attaching 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.

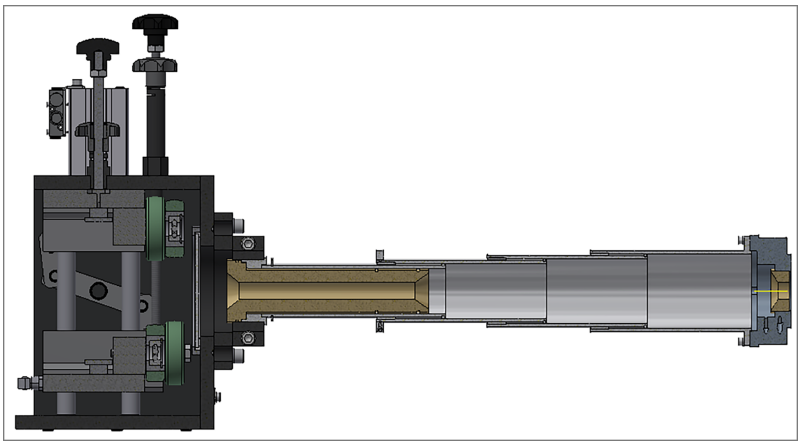
To attach the loading magazine to the floor, appropriately designed drop-in anchors or adhesive anchors must be used. In the event of uncertainty, please consult FMB.

1. → Aligning the loading magazine ↗ *"Aligning the loading magazine" on page 28*.



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.

Telescopic tube



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.**

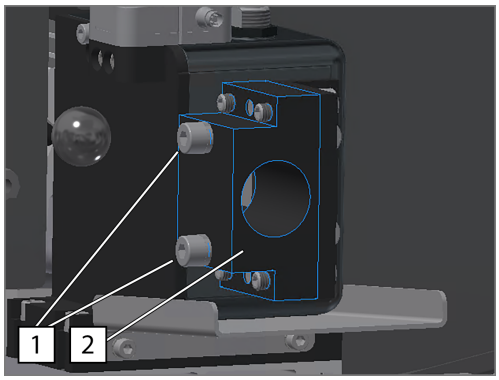
⚠ CAUTION

Falling extension parts

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

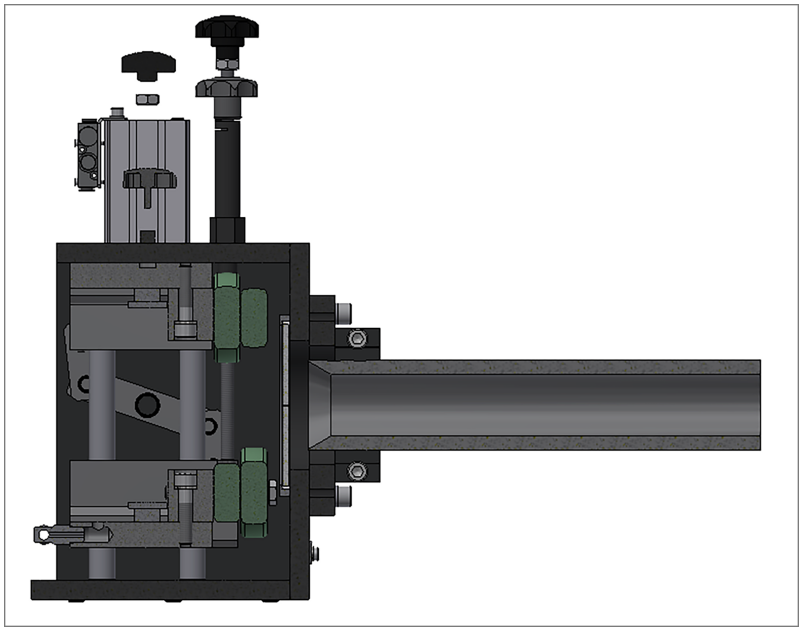
When setting up the loading magazine, various extension parts have to be assembled at the interfaces between the loading magazine and the machine tool. They might fall down and hit body extremities.

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



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.

Guide tube



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

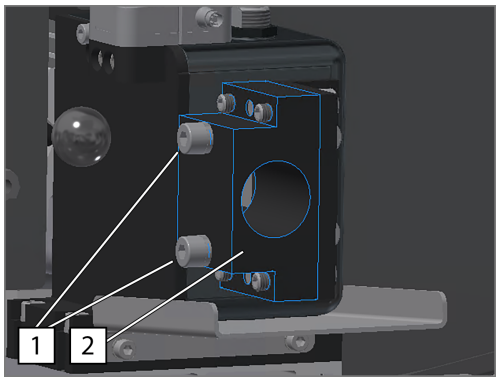
Falling extension parts

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 of the loading magazine and the lathe.
   ↗ *"Calculate the distance of the loading magazine from the machine tool" on page 25*.
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

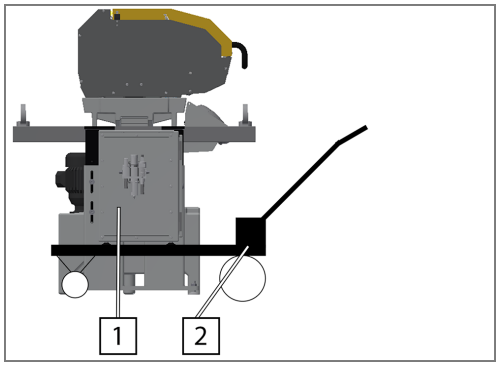
⚠ CAUTION

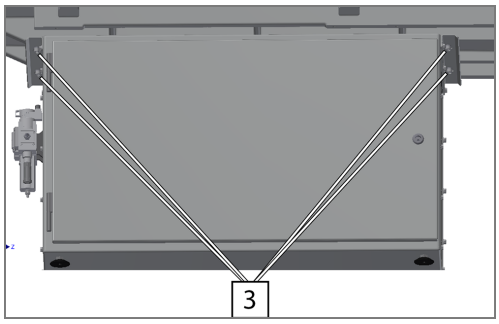
Falling control cabinet

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

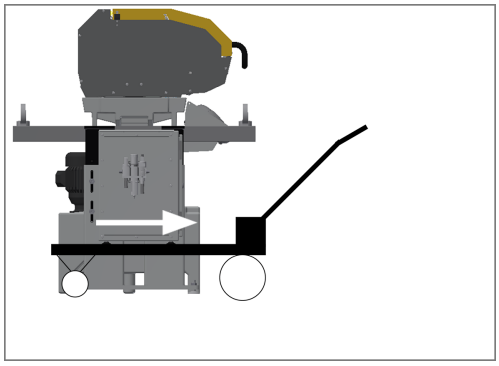
- **Observe the description on removing and fastening the control cabinet from the loading magazine in the operating instructions.**

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.

Fill the oil tank

Fill the oil tank. ↗ *"Filling the oil tank of the loading magazine" on page 93*.

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

To get a better view of the components of the loading magazine, the procedure described below can be used, even if the cover is open. The pusher then has to be moved manually using the crank handle. ↗ *"Move the drive with the crank handle" on page 97*.

1. Load a short material bar (approx. 1 m) ↗ *"Draw off remnant, eject it and draw on the new material bar" on page 68*.
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

To get a better view of the components of the loading magazine, the procedure described below can be used, even if the cover is open. The pusher then has to be moved manually using the crank handle. ↗ *"Move the drive with the crank handle" on page 97*.

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 lathe.
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.

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.

Setting 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 oil-pump 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 Speed First insert low

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

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 First insert low.

   ➥ An input field opens.
4. Enter the value for Speed First insert low.

Enter Position open steady

Information about Position open steady: ➚ "Positions and traverse paths" on page 10.

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 open steady.
   ➡ An input field opens.
4. Enter the value for Position open steady.

Enter Position close steady

Information about Position close steady: ➚ *"Positions and traverse paths" on page 10.*

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 close steady.
   ➡ An input field opens.
4. Enter the value for Position close steady.

Enter Pos. open steady lathe

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

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 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 → Basic settings → Parameter"*
3. Click on the field Pos. reverse rotation return.
   ➡ An input field opens.
4. Enter the value for Pos. reverse rotation return.

Enter the Speed Return high

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.

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 draw off

Information about Position draw off: ↗ "Positions and traverse paths" on page 10.

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.

Enter the Position press on

Information about Position press on: ➚ "Positions and traverse paths" on page 10.

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 press on.
   ➡ An input field opens.
4. Enter the value for Position press on.

Set the Collet Signal

This function is available as an option.

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

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Mode"*
3. Click on the field Collet Signal.
   ➡ A selection window opens.
4. Click on the respective selection.
   ➡ The chosen selection is shown in the field.

Set the Feed Stop Signal

This function is available as an option.

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

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Mode"*
3. Click on the field Feed Stop Signal.
   ➡ A selection window opens.
4. Click on the respective selection.
   ➡ The chosen selection is shown in the field.

Set the Oil discharge time on

This function is available as an option.

1. Press the ☰ button.
2. *'SETTINGS → Basic settings → Parameter"*

3. Click on the field Oil discharge time on.
   ➡ A selection window opens.
4. Enter the value for Oil discharge time on.

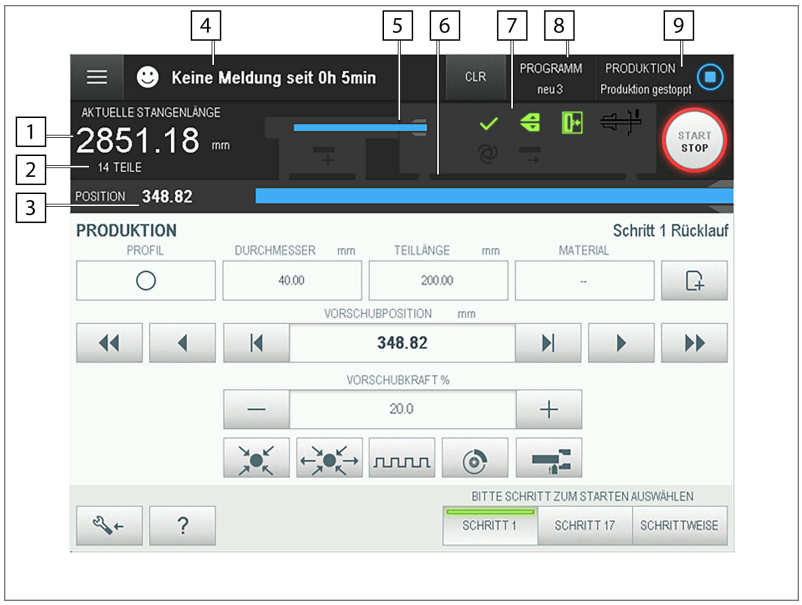
5 Control panel

5.1 Control panel, general

Layout

The control 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)

Navigation

The contents of the control panel are split into several main menus. In the main menus you can reach the corresponding content page directly or via the sub-menus.

The way to reach the respective action in the control panel is described via a menu pathway in the guidelines of these operating instructions. The menu pathway shows the way via the menus to the content page which the action is on.

Example: *"Main menu → Sub menu 1 → Sub menu 2"*

If you selected the last menu, you are directly on the content page on which the action occurs. The guidelines then indicate the field which should be worked on, or the button which should be pressed.

Example: Field Click on the example field.

Some pages contain more content that can be shown on one page of the control panel. In this case the described field or button may be on one of the following pages. To reach any following pages, you have to scroll through the content page. The fact that content may be located on following pages is not considered in the operating instructions.

Scroll through content pages: ➚ *"Scroll through content page" on page 42*.

Scroll through content page

Access the following page

→ Access the following pages with .

Access the previous page

→ Access the previous page with .

Explanation of symbols

In the main menus PRODUCTION and SETUP there is a help page, which provides explanations of the symbols used.

Explanation of symbols Main menu PRODUCTION

1. Press the button.
2. Press PRODUCTION.
3. Press the ? button.

Explanation of symbols Main menu SETUP

1. Press the button.
2. Press SETUP.
3. Press the ? button.

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. The drive of the loading magazine is shut down. 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 machine tool.

➡ The loading magazine is ready for operation

Switch on the loading magazine

→ Turn on the main switch of the machine tool.

➡ 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 machine tool'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 machine tool.

➡ 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 44*.

Set the parts counter

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

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 44.

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.

Remnant gripper

Selection	Selection option	Description
Remnant gripper		
	Standard	The remnant is removed and falls into the remnant bin.

With / without gripper

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

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

Steady

Selection	Selection option	Description
Steady		
	Jaw steady	During processing, the jaw steady closes. 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.
	Steady closed to -B7	The steady moves the material bar until the starting switch is reached. Then the steady opens.
	Jaw steady closed when pushing	During processing the jaw steady remains open. When the pusher moves the jaw steady closes.

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.
	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.

Loading magazine

This function is available as an option.

Selection	Selection option	Description
Loading magazine	On	Normal work flow with the loading magazine.
	Off (chucker mode)	The loading magazine is switched off (collet mode).

Push part in automatic mode

Selection	Selection option	Description
Push part in automatic mode		
	Off	Feed coupling opened. The pusher is taken out of the lathe.
	Electric coupling	Push the part in automatic mode with electric coupling (feed standard mode).
	Pneumatic coupling	Push the part in automatic mode with pneumatic coupling. The coupling force can be set.

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 47*.

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 52* .

Creating a 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.

Editing a 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 the program editor. ↗ *"Creating a new program" on page 48* or ↗ *"Editing a program" on page 48*.
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.

Entering the material to be processed

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
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 the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
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

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 the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
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

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 the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
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

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

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
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 the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
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.

Set the Selection option Part follow-up

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Part follow-up.
   ➥ A selection window opens.
3. Click on the selection option.
   ➥ The chosen selection option is shown in the field.
4. Save changes with the button.

Set the Selection option First insert

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field First insert.
   ➥ A selection window opens.
3. Click on the selection option.
   ➥ The chosen selection option is shown in the field.
4. Save changes with the button.

Enter Feed force for first insert

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

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

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Feed force for first insert.
   ➡ An input field opens.
3. Enter Feed force for first insert.
4. Save changes with the button.

Enter Feed force for press upon

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

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

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Feed force for press upon.
   ➡ An input field opens.
3. Enter Feed force for press upon.
4. Save changes with the button.

Enter Extension first insert

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

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

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.
2. Click on the field Extension first insert.
   ➡ An input field opens.
3. Enter Extension first insert.
4. Save changes with the button.

Enter Speed sub-spindle

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 48*.

2. Click on the field Speed sub-spindle.
   ➡ An input field opens.
3. Enter Speed sub-spindle.
4. Save changes with the button.

Enter Feed force for sub-spindle

1. Open the program in the program editor. ↗ *"Creating a new program" on page 48* or ↗ *"Editing a program" on page 48*.
2. Click on the field Feed force for sub-spindle.
   ➡ An input field opens.
3. Enter Feed force for sub-spindle.
4. 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 Speed First insert

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

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 First insert.
   ➡ An input field opens.
4. Enter the value for Speed First insert.

Enter the Max. bar return

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.

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. bar return.
   ➡ An input field opens.
4. Enter the value for Max. bar return.

Enter the Max. part length follow-up

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.

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

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.

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

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

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

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.

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

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

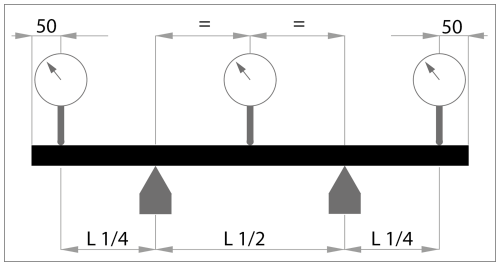
1. Press the ☰ button.
2. *'SETTINGS → Service settings → Mode"*
3. Click on the field Rotary encoder -B4.
   ➡ A selection window opens.

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.

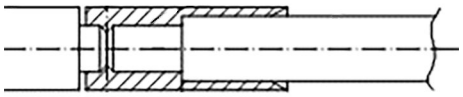
When measuring the straightness of the material bar proceed as shown in the following diagram. For the measurement, the material bar is rotated four times by 90°.

Requirements:

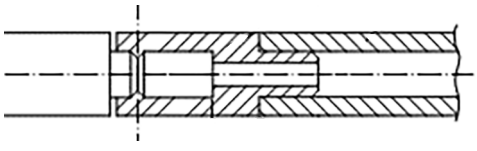
- The start of the material bar (on the lathe side) must be burr-free.
- The end of the material bar (on the loading magazine side) must not be bent or deformed.
- The material bar must be free of dirt.
- Bars with multiple sides must not have any circumferential chamfers on the lathe side.
- Material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

Clamping device

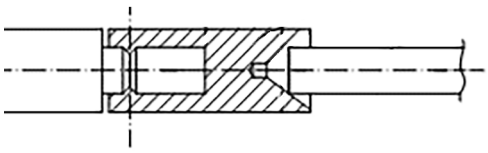
A clamping device is attached to the pusher to guide the end of the material bar. Depending on the application, either a clamping sleeve, a centering sleeve or a clamping mandrel is necessary. The size of the clamping device depends on the diameter of the material bar to be processed.



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 o 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.

Changing 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.

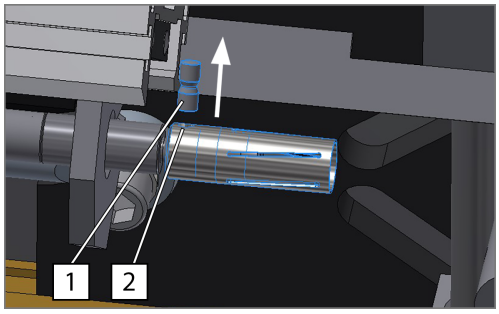
When working on the opened guide channel, the driven guide channel cover may squash extremities.

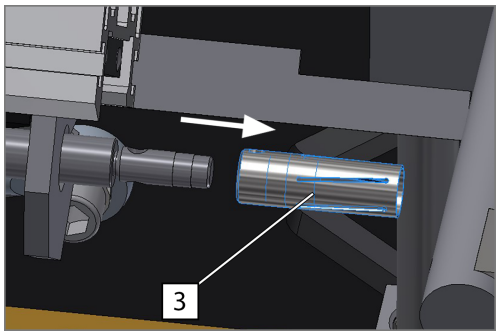
- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**

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

Clamping device with a diameter < 25 mm:

1. Press the ☰ button.
2. Access SETUP.
3. Move the pusher right to the back using the ◂ button.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the supply of compressed air. ↗ *"Switch the supply of compressed air on/off" on page 94*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the guide channel with safety bolts. ↗ *"Secure the guide channel with safety bolts" on page 73*
9. Push the cross pin [1] out of the hole in the direction indicated by the arrow [2].





10. Pull the clamping device [3] in the direction indicated by the arrow and take it out.
11. Raise and attach the clamping device in reverse order.
12. Remove the safety bolts in the guide channel.
13. Close the cover.
14. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 94*
15. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
16. Acknowledge the error message by pressing the CLR 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

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 the program editor. → *"Creating a new program" on page 48* or → *"Editing a program" on page 48*.
2. Set the option Part follow-up to selection option Part length internal. → *"Set the Selection option Part follow-up" on page 50* or → *"Enter the selection option" on page 52*.
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.

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

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.

All the settings for working with the sub-spindle have to be set in a program.

1. Enter the values for Feed force for sub-spindle and Speed sub-spindle. ↗ *"Enter Feed force for sub-spindle" on page 52* and ↗ *"Enter Speed sub-spindle" on page 51*.
2. Set the option Part follow-up to selection option Collet open, fixed speed.

Process two different part lengths

This function is available as an option.

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.

1. Open the program in the program editor. ↗ *"Creating a new program" on page 48* or ↗ *"Editing a program" on page 48*.
2. Scroll to the next page using the button.
3. Click on the field Feed 1 part 2.

   ➥ An input field opens.
4. Enter the value for the shorter part.
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 58*.

Set the Interval insert

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

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 Programeditor. ↗ *"Creating a new program" on page 48* or ↗ *"Editing a program" on page 48*.
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.

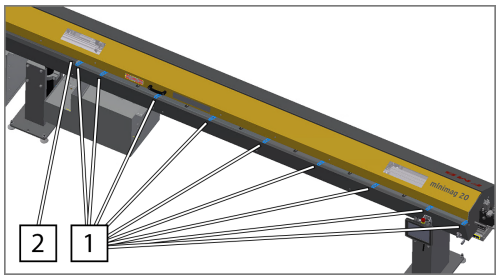
- **Observe the weight of the material bar.**
- **Use suitable hoisting equipment.**

⚠ 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.

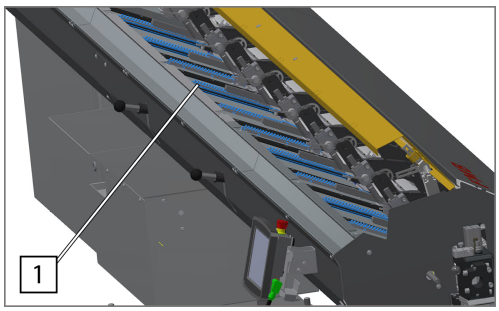
Report of the last material bar

This function is available as an option.

If a signal light is build into the loading magazine, the yellow light flashes as soon as the report is displayed on the control panel.

If the last material bar has been loaded from the lateral material storage into the guide channel during production (automatic mode), a yellow light flashes on the control panel, with the text Last bar. This notifies the operator that the lateral material storage is empty.

Pilgrim step separation



The pilgrim step separation is an extension to the separation device for material bars with a diameter of 0.8 mm to 4 mm. To use the function, the pilgrim step separation must be activated.

Due to the toothed shape of the material storage 1, when the pilgrim step separation is active, each material bar is recorded in a separate profile and moved by an intermittent movement. This ensures the process-reliable feeding of material bars into the open guide channel.

Activate the pilgrim step separation: → *"Activate / deactivate the pilgrim step separation" on page 60*.

Activate / deactivate the pilgrim step separation

Activating:

1. Set the holding-down device to the top position. → *"Setting the height of the holding-down device" on page 88*.
2. Attach the right capacity adjustment set. → *"Capacity adjustment set" on page 73*.
3. Pull and hold the safety lever 1 in the direction indicated by the arrow.
4. Push the pilgrim step separation with the safety lever up to the end stop.

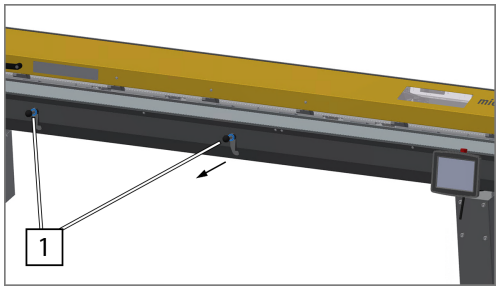
5. Release the safety lever.

➡ The pilgrim step separation is activated.

Deactivating:

1. Pull and hold the safety lever [1] in the direction indicated by the arrow.
2. Lower the pilgrim step separation with the safety lever up to the end stop.
3. Release the safety lever.

➡ The pilgrim step separation is deactivated.



Cycle the pilgrim step separation forwards / backwards

Move forward or backwards one cycle

1. Press the ☰ button.
2. Access SETUP or PRODUCTION.
3. Press the ⇧ or ⇩ 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.

Cycle forwards or backwards permanently

The pilgrim step separation performs cycles as long as the button is pressed. If the button is released, the pilgrim step separation completes the current cycle and stops. For immediate stop, the button has to be pressed again after being released. Then a reference run is necessary by pressing the button again.

1. Press the ☰ button.
2. Access SETUP or PRODUCTION.
3. Press and hold the ⇧ or ⇩ 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.

4. **Stop the cycle:** Release the ⇧ or ⇩ button.

➡ The pilgrim step separation ends the current cycle and stops. The status display on the button is turned off.

5. **Stop the cycle immediately:** Release the or and press it again.

   ➡ The pilgrim step separation stops immediately. The status display on the button is turned off. An error message is displayed.

Reference run performed for the pilgrim step separation

Each cycle of the pilgrim step separation has a defined starting and end position. If a cycle is ended immediately, without reaching the starting or end position, an error message is issued. A reference run of the pilgrim step separation has to be performed.

1. Press the button.
2. Access SETUP or PRODUCTION.
3. Acknowledge the error message by pressing the CLR button.
4. Press the or button.

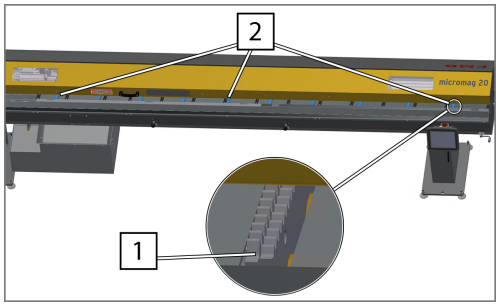
   ➡ The status display on the button turns green during the action. Once the action has been completed, the status display on the button is switched off. The reference run of the pilgrim step separation is completed.

Loading the lateral material storage (pilgrim step separation active)

The cycle motion of the pilgrim step separation has to be performed with the cover closed.

The cycle motion of the pilgrim step separation can be performed upon set-up and during production (automatic mode).

A light sensor is built into the pilgrim step separation, which detects if the last space of the pilgrim step separation is occupied with a material bar. If the last space of the pilgrim step separation is occupied, further forwards movement towards the guide channel is not possible.



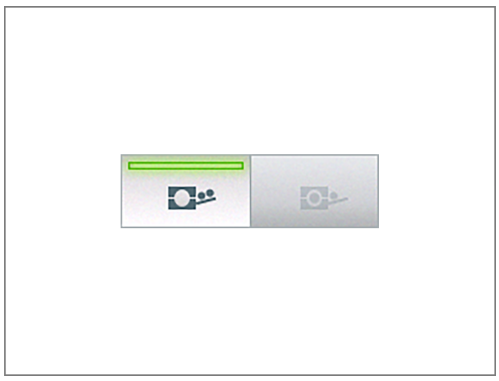
1. Place a material bar in the first loading space [1] of the pilgrim step separation [2].
2. Press the button.
3. Access SETUP or PRODUCTION.
4. Use the button to move the pilgrim step separation one step towards the guide channel (hold the button to trigger a permanent cycle).
5. Repeat steps 1 and 2 until the desired number of material bars has been inserted into the pilgrim step separation, or until the pilgrim step separation is fully loaded.

6. If the pilgrim step separation is not fully loaded: Use the button to move the first material bar up to the last space before the guide channel (hold the button to trigger a permanent cycle).

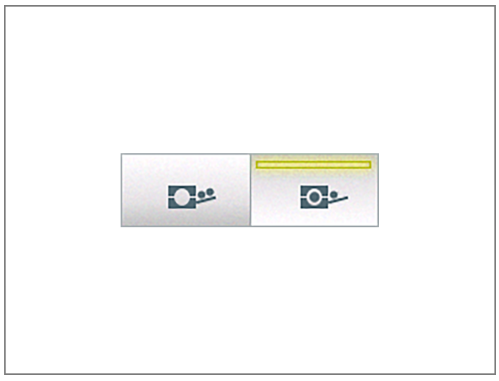
   ➡ The light sensor detects the material bar. The pilgrim step separation stops. The pilgrim step separation is ready for production.

Display of the material bar in the guide channel (pilgrim step separation)

If the pilgrim step separation is active, the control unit of the loading magazine uses a light sensor to register whether a material bar has been loaded into the guide channel.



If there is no material bar in the guide channel, this is indicated by the symbol "empty guide channel" together with a green status light.



If there is a material bar in the guide channel, this is indicated by the symbol "full guide channel" together with a yellow status light.

If a material bar is removed from the guide channel by hand, the control unit of the loading magazine does not detect it and continues to assume that there is still a material bar in the guide channel. In this case, the operator shall generate the status "No material bar in the guide channel" manually using the button.

Remove material bars from the guide channel. ➚ *"Confirm the action material bar removed from guide channel (pilgrim step separation)" on page 63*.

Confirm the action material bar removed from guide channel (pilgrim step separation)

This action is necessary if the material bar was removed by hand from the guide channel.

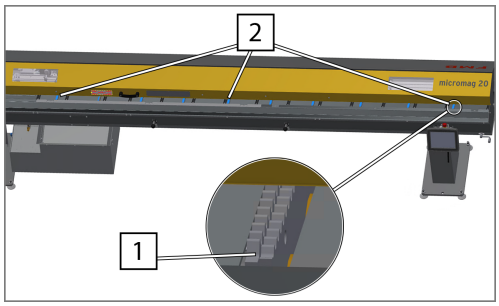
Prerequisite: The material bar was removed by hand from the guide channel.

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

Removing material bars from the lateral material storage (pilgrim step separation active)

The cycle motion of the pilgrim step separation can only be performed with the cover closed.

The cycle motion of the pilgrim step separation can be performed upon set-up and during production (automatic mode).



1. Press the ☰ button.
2. Access SETUP or PRODUCTION.
3. Use the button to move the pilgrim step separation one step outwards (hold the button to trigger a permanent cycle).
4. Remove a material from the first loading space [1] of the pilgrim step separation [2].
5. Repeat steps 3 and 4 until the desired number of material bars has been removed from the pilgrim step separation.

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 clamping sleeve.
- 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 not 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 68*.

Start/stop production

1. Observe the prerequisites for automatic mode ↗ *"Production" on page 64*.
2. Press the ☰ button.
3. Access PRODUCTION.
4. If there is a remnant in the clamping sleeve: press the S1 button.

   If a material bar is drawn onto the clamping device and is located in the cut-off position in the lathe, press the S17 button.
5. Start/stop production with the button.

Work flow for production (automatic mode)

Step	Description	Position
Step 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
Step 2 Return slowly	The pusher moves past the area of the material gripper at low speed.	From the position: Internal PLC value before Position draw off End: Position draw off
Step 3 Close gripper blades	The material gripper closes and grabs the remnant.	-
Step 4 Remove the remnant	The pusher moves back again. The remnant is removed from the pusher.	End: Position rear limit
Step 5 Open gripper blades	The material gripper opens. The remnant falls on the remnant slide.	-
Step 6 Close gripper blades	The material gripper closes. Check for remnant ejection.	-
Step 7 Open gripper blades	The material gripper opens.	-
Step 8 Guide channel open / separate material	The material bar falls into the open guide channel.	-
Step 9 Close guide channel / gripper blades	The material gripper closes. The guide channel closes. With active pilgrim step separation: The guide channel closes. The material gripper closes. Check for any material bar.	-
Step 10 Press	The pusher moves forward. The material bar is pressed onto the pusher.	End: Position press on
Step 11 Gripper blades closed	-	-
Step 12 Open gripper blades	The material gripper opens.	-
Step 13 Forward	The material bar is moved to the starting switch.	Start: First insert travel
Step 14 First insert	The pusher moves the material bar into the working area of the lathe.	End: First insert travel
Step 15 Start lathe	The loading magazine reports "End of bar change – program start" on the lathe. The collet of the lathe closes. The processing begins.	-

Step	Description	Position
Step 16 Material cut-off	The processed part is cut off. The collet of the lathe opens.	-
Step 17 Part production	The pusher moves the material bar until the end of the material bar is reached.	End: Position front limit - Part length 1
Step 18 Insert last part	The pusher moves the material bar for the last time.	-
Step 19 Machine last part	The lathe operates the last part.	-
Step 20 Stop lathe / start 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.

Removing 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. Open the guide channel with the button.
7. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
8. Switch off the supply of compressed air. ↗ *"Switch the supply of compressed air on/off" on page 94*
9. Where necessary, obtain release from the lathe to open the cover.
10. Open the cover.
11. Secure the guide channel with safety bolts. ↗ *"Secure the guide channel with safety bolts" on page 73*
12. 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 fully on the loading magazine.
13. Remove the material bar from the loading magazine via the lateral material storage.
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 94*
17. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
18. Close the guide channel with the button.
19. Acknowledge the error message by pressing the CLR button.
20. If the pilgrim step separation is active, confirm the action material bar removed from guide channel. ↗ *"Confirm the action material bar removed from guide channel (pilgrim step separation)" on page 63*.

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

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.

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.

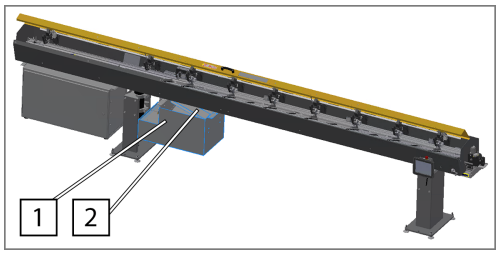
1. Press the button.
2. Access SETUP.
3. Press the button.

➡ 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. The remnant goes down, via the remnant slide 2, into the remnant bin and can be removed by the operator.

Removing the remnant

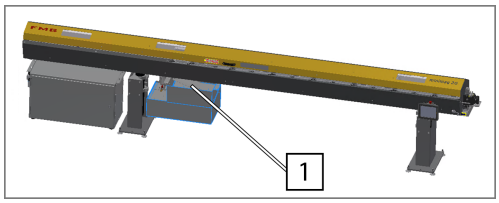
⚠ CAUTION

Further ejection of remnants into 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.**



→ Remove the remnant from the remnant bin 1.

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.

The steady as an insertion aid

If the steady is switched off or the selection option Steady closed to -B7 or Jaw steady closed when pushing is selected, the steady is not active at first insert. When using the steady as an insertion aid, the steady is always active at first insert.

Switch the steady on/off as a insertion aid

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

Switch on:

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

Switch off:

→ Press the button.
- ➡ The status display on the button is off. The steady function as an insertion aid 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 the brake function on/off

The brake function holds the pusher in position during the processing of the machine tool and prevents the pusher being pressed back.

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.

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.

Switch discharge material bar oil on / off

This function is available as an option.

1. Press the button.
2. Access SETUP.

Switch on:

→ Press the  button.

➡ The status display on the button turns green. The function discharging oil from the material bar is switched on.

Switch off:

→ Press the  button.

➡ The status display on the button is off. The function discharging oil from the material bar is switched off.

7 Conversion

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 104*.

The capacity adjustment set includes:

- A pusher with a flag
- Inserts of the guide channel

Depending on the extension version and the type of lathe, further adjustments may be necessary during conversion 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 guide channel is opened.

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

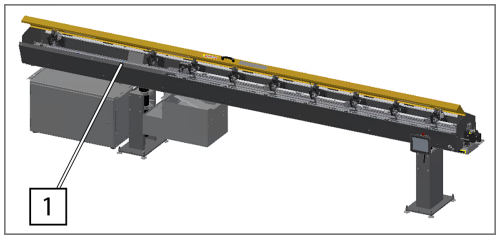
⚠ CAUTION

Driven guide channel cover

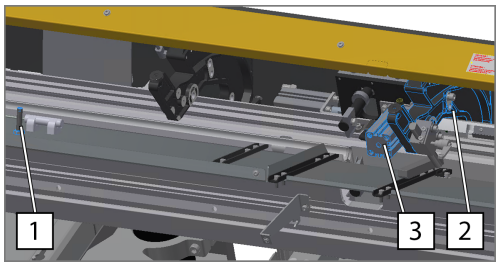
Personal injury due to squashing and impact by the closing of the guide channel cover.

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.**



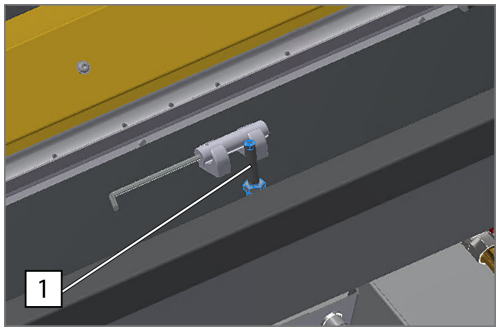
The safety bolt is in position 1 on the loading magazine, and can be reached when the cover is open.

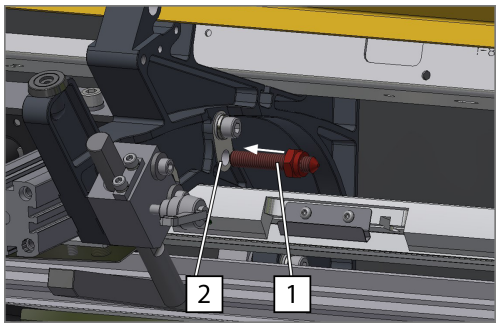


The safety bolt 1 must be used on a bearing bracket 2 on which a channel opener 3 is also installed (channel openers are only installed on every second bearing bracket). The front guide channel is only secured by the safety bolt on bearing brackets with channel openers.

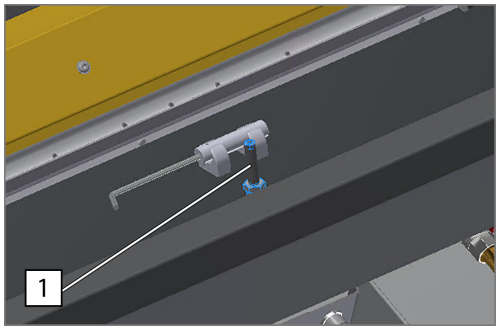
The safety bolt must be pushed with the long side into the intended hole up to the stop, to ensure the guide channel is secure.

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 43*.
5. Switch off the supply of compressed air. ↗ *"Switch the supply of compressed air on/off" on page 94*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Unscrew the safety bolt 1 from the bracket.





9. Push the safety bolt [1] (with the long side) into the hole up to the stop [2].
10. After finishing work on the guide channel, remove the safety bolt [1] from the hole [2].



11. Screw the safety bolt [1] into the bracket.
12. Close the cover.
13. Switch on the compressed air supply. *"Switch the supply of compressed air on/off" on page 94*
14. Unlock the emergency stop button. *"Make the loading magazine ready for operation after the emergency stop" on page 43*
15. Close the front guide channel with the button.
16. Acknowledge the error message by pressing the CLR 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 104*

Changing the pusher

⚠ 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

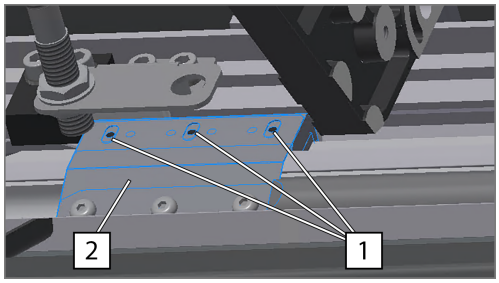
Cuts due to the sharp knives of the material gripper.

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

- **Wear safety gloves.**

1. Press the button.
2. Access SETUP.
3. Move the pusher right to the back using the button.

4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the supply of compressed air. ↗ *"Switch the supply of compressed air on/off" on page 94*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Secure the guide channel with safety bolts. ↗ *"Secure the guide channel with safety bolts" on page 73*

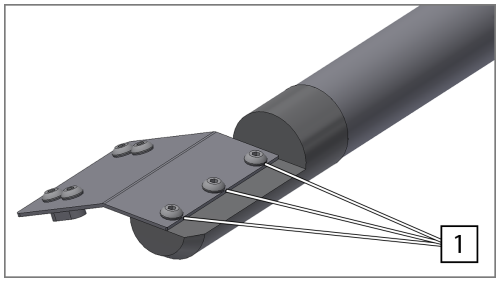


9. Loosen and remove the screws [1] in the flag [2].
10. Remove the pusher.
11. Install the pusher in reverse order.
12. Remove the safety bolts in the guide channel.
13. Close the cover.
14. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 94*
15. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
16. Acknowledge the error message by pressing the CLR button.

Changing the flag

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

1. Detach the pusher. ↗ *"Changing the pusher" on page 75*.



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. ↗ *"Changing the pusher" on page 75*.

Changing 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.**

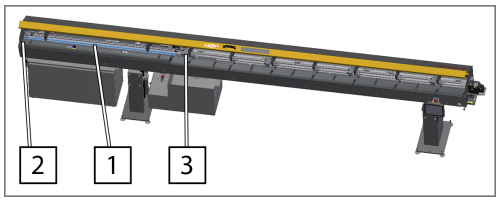
⚠ CAUTION

Driven guide channel cover

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

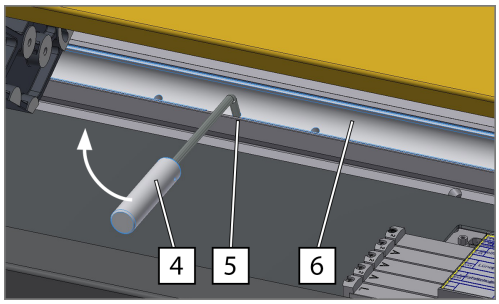
When working on the opened guide channel, the driven guide channel cover may squash extremities.

- **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 material gripper 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. Access SETUP.
3. Move the pusher right to the back using the ◂ button.
4. Press the ▫ button.
   - ➡ The status display on the button turns green. The front guide channel is opened.
5. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
6. Switch off the supply of compressed air. ↗ *"Switch the supply of compressed air on/off" on page 94*
7. Where necessary, obtain release from the lathe to open the cover.
8. Open the cover.
9. Secure the guide channel with safety bolts. ↗ *"Secure the guide channel with safety bolts" on page 73*



10. Place the insertion tool 4 into the hole 5 (middle hole) in the lower guide channel.
11. Move the insert tool 4 in the direction indicated by the arrow.
    - ➡ The insert is now detached.
12. Remove the insert 6 with 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 94*

17. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
18. Close the guide channel with the button.
19. Acknowledge the error message by pressing the CLR button.

Changing 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.**

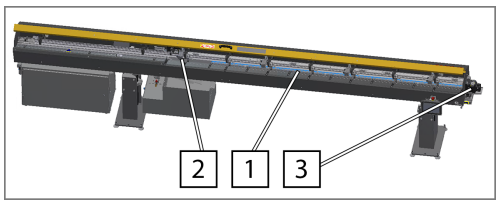
⚠ CAUTION

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.

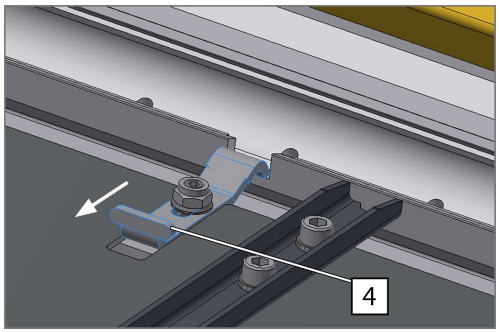
- **Insert the safety bolts when working on the open guide channel. Observe the description in the operating instructions.**



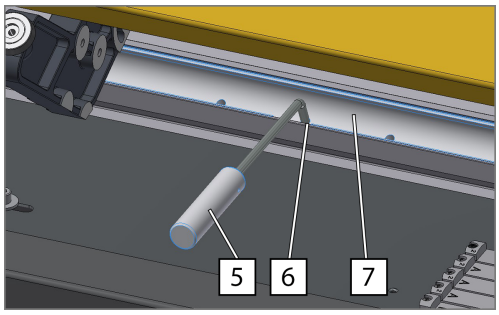
The bottom front guide channel insert 1 is located in the area between the material gripper 2 and the steady 3. The insert consists of several parts. The change is described using the example of one part of the insert, but has to be done for all the parts.

1. Press the button.
2. Access SETUP.
3. Move the pusher right to the back using the button.
4. Press the button.
   ➡ The status display on the button turns green. The front guide channel is opened.
5. Press the emergency stop button. *“Press the emergency stop button” on page 43*.
6. Switch off the supply of compressed air. *“Switch the supply of compressed air on/off” on page 94*
7. Where necessary, obtain release from the lathe to open the cover.

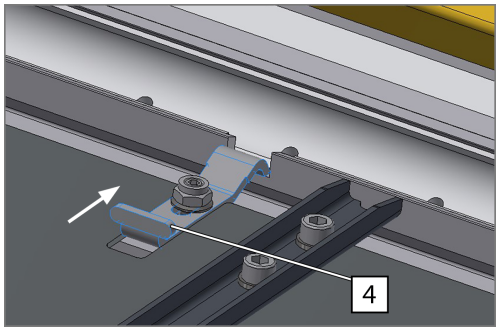
8. Open the cover.
9. Secure the guide channel with safety bolts. *"Secure the guide channel with safety bolts" on page 73*



10. Move the insert safeguard [4] in the direction indicated by the arrow up to the stop.
    ➥ The insert is now unlocked.



11. Place the insertion tool [5] into the hole [6] in the lower guide channel.
12. Remove the insert [7] with the insert tool.
13. Place the new insert into the bottom front guide channel and press in firmly by hand.



14. Move the insert safeguard [4] in the direction indicated by the arrow up to the stop.
    ➥ The insert is secured.
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 94*
18. Unlock the emergency stop button. *"Make the loading magazine ready for operation after the emergency stop" on page 43*
19. Close the guide channel with the button.
20. Acknowledge the error message by pressing the CLR button.

Assembling / disassembling the centering plate on the material gripper

⚠ CAUTION

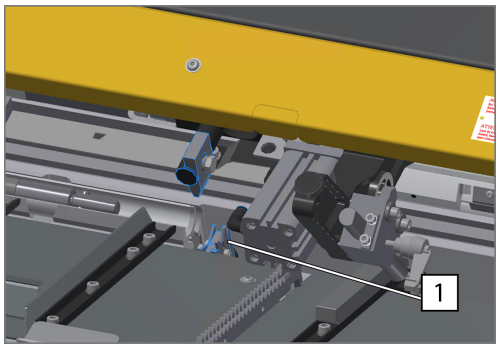
Sharp knives of the material gripper

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.

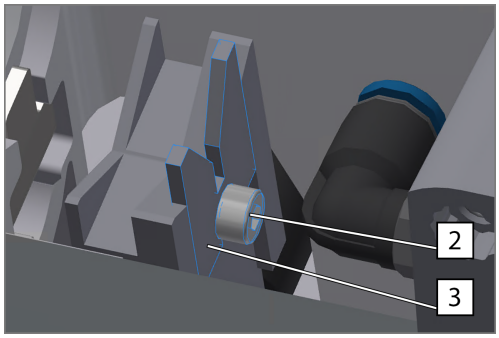
– **Wear safety gloves.**

The centering plate can be assembled on the material gripper when processing material bars with a diameter < 2 mm, to prevent the material bars being shorn off.



The centering plate [1] is assembled on the lower blade of the material gripper.

1. Press the emergency stop button. → *"Press the emergency stop button" on page 43*.
2. Switch off the supply of compressed air. → *"Switch the supply of compressed air on/off" on page 94*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.



5. Loosen and remove the screw [2].
6. Insert the centering plate [3].
7. Insert and tighten the screw [2].
8. Close the cover.
9. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 94*
10. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
11. Close the material gripper with the button  .
12. Press the emergency stop button. → *"Press the emergency stop button" on page 43*.
13. Switch off the supply of compressed air. → *"Switch the supply of compressed air on/off" on page 94*
14. Open the cover.
15. Check whether the material gripper is aligned with the pusher.
16. Correct the alignment of the pusher and the material gripper, where applicable using the lower blade.
17. Tighten the [2] screw.
18. Close the cover.
19. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 94*
20. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
21. Acknowledge the error message by pressing the CLR button.

Operating pressure of the material gripper

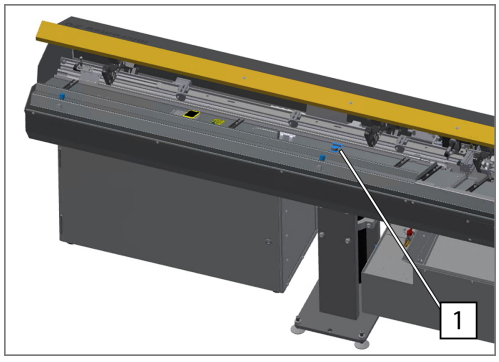
When processing material bars with small diameters, the operating pressure of the material gripper can be adjusted. This prevents the material bars being shorn off. For this purpose, the pressure regulator of the material gripper has to be switched on. Then the operating pressure of the material gripper can be set.

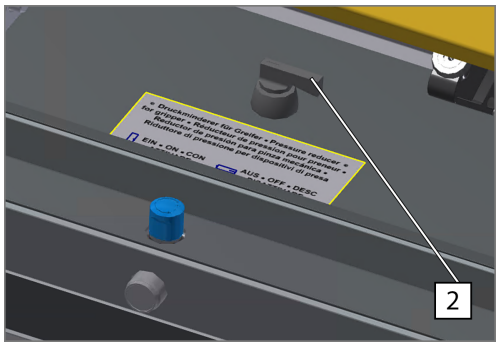
If the pressure regulator of the material gripper is switched off, the material gripper is supplied with the operating pressure that has been set for the whole loading magazine.

- Switching the pressure regulator of the material gripper on / off. ➚ *"Switching the pressure regulator of the material gripper on / off" on page 81*
- Setting the operating pressure of the material grabber. ➚ *"Setting the operating pressure of the material grabber" on page 81*

Switching the pressure regulator of the material gripper on / off

The switch for the pressure regulator of the material gripper is in the 1 position on the loading magazine.

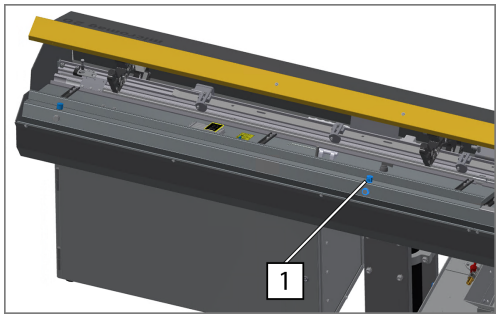


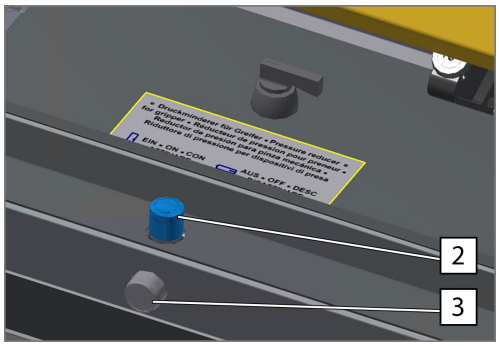


→ Switching the material gripper on /off using the 2 switch.

Setting the operating pressure of the material grabber

The operating pressure of the material gripper is set via the pressure regulator 1.





1. Setting the operating pressure of the material gripper at the control unit [2].
2. Check the operating pressure of the material gripper on the display [3].

Feed coupling

Electric coupling and pneumatic coupling are available for the power transmission from the drive motor to the pusher.

The electric coupling covers the standard applications. The operating force of the electric coupling can be set.

- Select feed coupling. *“Select feed coupling” on page 82*.
- Setting the operating force of the electric coupling. *“Enter the Feed force for part follow-up ” on page 49*.

The pneumatic coupling is suitable for processing material bars with small diameters. The operating pressure of the pneumatic coupling can be set precisely. This prevents the material bars being deformed during follow-up.

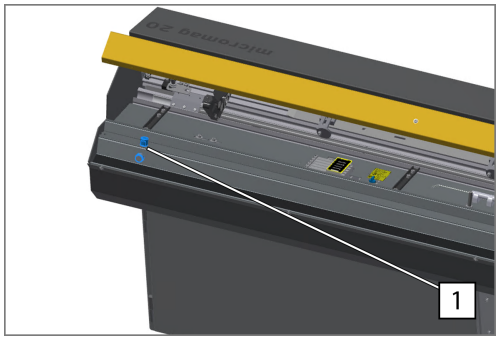
- Select feed coupling. *“Select feed coupling” on page 82*.
- Setting the operating pressure of the pneumatic coupling. *“Setting the operating pressure of the pneumatic coupling” on page 82*.

Select feed coupling

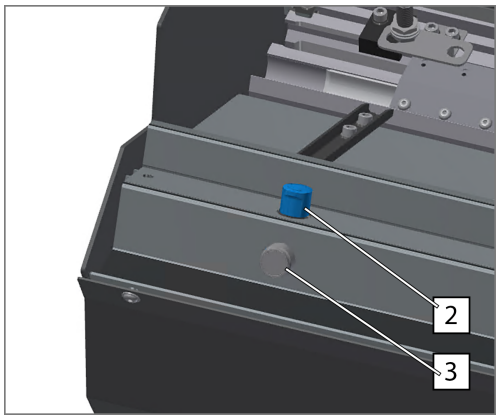
Choose the feed coupling by selecting Push part in automatic mode. *“Push part in automatic mode” on page 47*.

Setting the operating pressure of the pneumatic coupling

The operating pressure of the pneumatic coupling can only be checked on the display, if the pusher is manually moved forward, or if a pushing movement of the pusher occurs during production (automatic mode).



The operating pressure of the pneumatic coupling is set via the pressure regulator [1].



1. Setting the operating pressure of the pneumatic coupling at the control unit [2].
2. Checking the operating pressure of the pneumatic coupling on the display [3].

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.

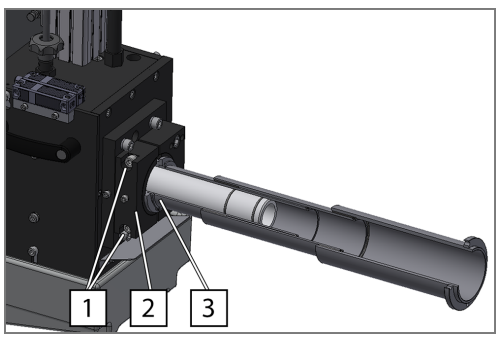
- **Turn off the machine tool before starting work on the main switch.**

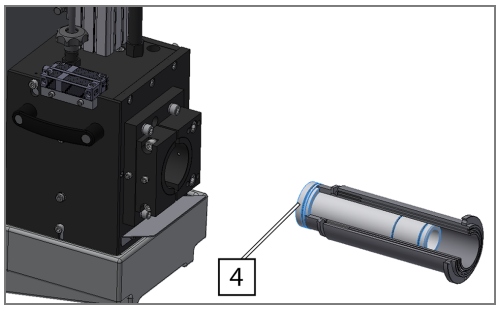
The reduction insert of the telescopic tube is related to the diameter and is changed when converting the loading magazine to a different diameter. The reduction insert of the telescopic tube is part of the capacity adjustment set.

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 43*.
2. Switch off the supply of compressed air. → *"Switch the supply of compressed air on/off" on page 94*
3. Loosen the screws [1].
   ➡ The clamping piece [2] is detached.
4. Push the telescopic tube [3] towards the lathe.





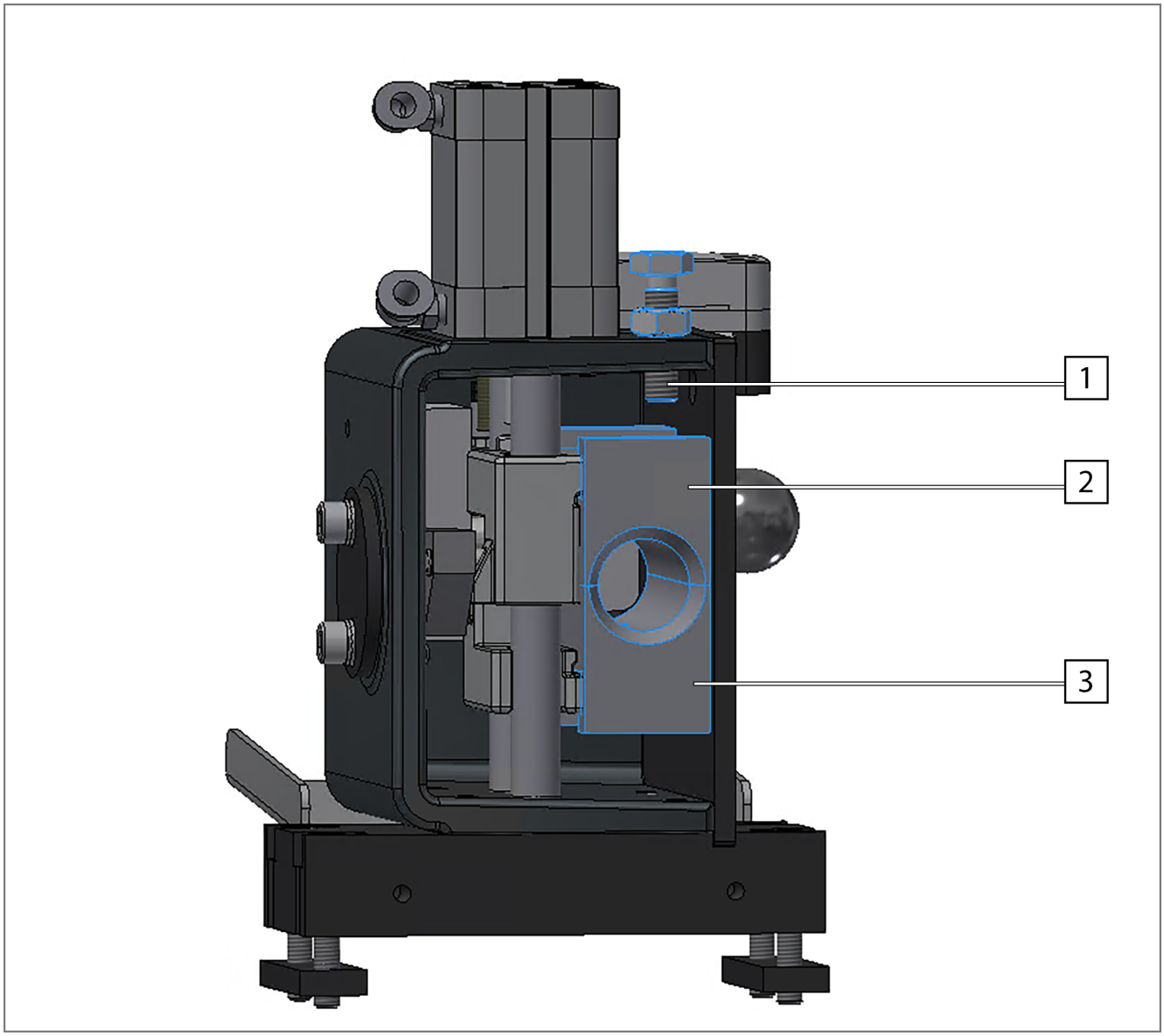
5. Remove the reduction insert [4] by hand from the telescopic tube [3].

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 30*
3. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 94*
4. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
5. Acknowledge the error message by pressing the CLR button.

7.4 Steady

Steady



The steady moves the material bar during processing. To guide the material bar, the steady is closed. In open condition, the material bar and pusher can pass.

The stop [1] limits the opening range of the jaws [2] and [3].

Adjustments to the material bar diameters to be processed are made by exchanging the jaws.

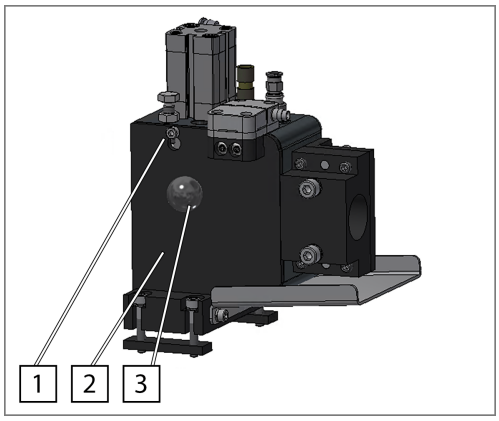
Moveable steady

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.

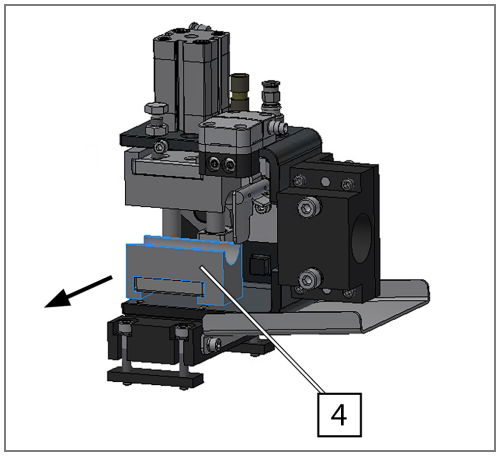
Extensions have to be clarified in advance with FMB. ➚ *"Service contact details" on page 104*.

Change the steady jaws

1. Press the emergency stop button. → *"Press the emergency stop button" on page 43*.
2. Switch off the supply of compressed air. → *"Switch the supply of compressed air on/off" on page 94*



3. Loosen the screw [1].
4. Hold the lid [2] by the handle [3] and push it up.
5. Remove the lid [2].



6. Remove the jaws [4] in the direction indicated by the arrow.
7. Remove the upper jaw of the steady in the same way.
8. Attach the jaws in reverse order.
9. Assemble the lid in reverse order.
10. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 94*
11. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
12. Acknowledge the error message by pressing the CLR button.

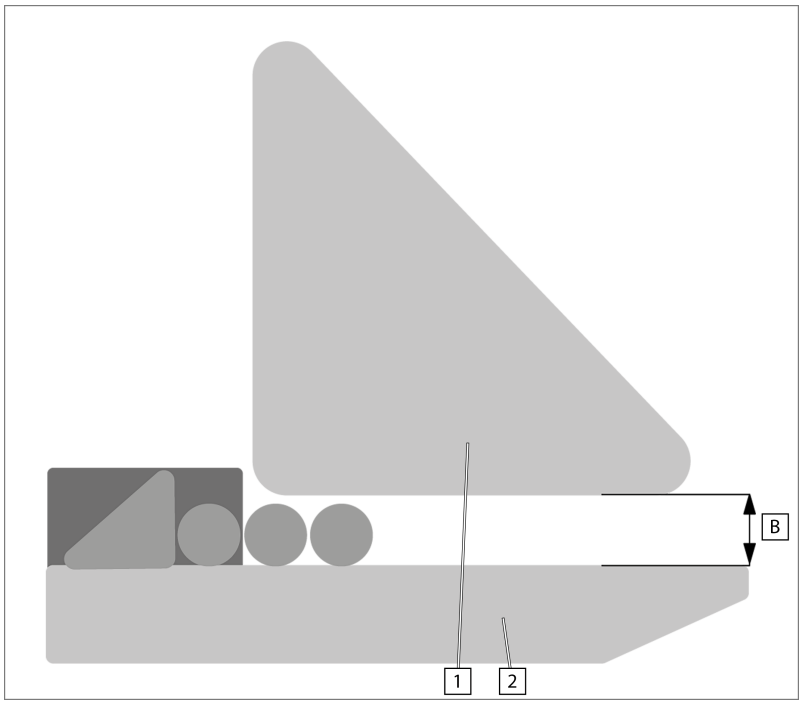
7.5 Separating device

Separation device, general

The material bars are supplied on the lateral material storage. The adjustable holding-down device limits the height of the lateral material storage, and thereby prevents the material bars rolling over each other.

When the guide channel opens, a material bar slides into the guide channel. A pre-stressed pressure plate prevents a second material bar also sliding into the guide channel.

The height of the holding-down device



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

For the dimension B the following applies:

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

Setting the height of the holding-down device

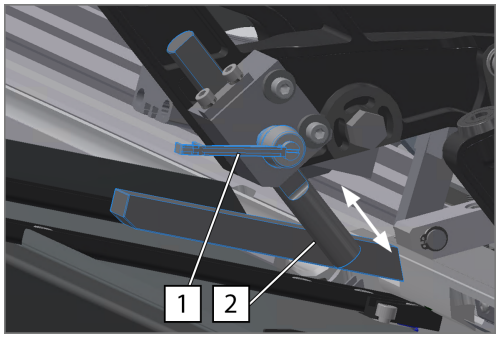
⚠ WARNING

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.**



1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
2. Switch off the supply of compressed air. ➚ *"Switch the supply of compressed air on/off" on page 94*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Loosen the clamping lever [1].
6. Move the holding-down device [2] to the desired height.
7. Close the clamping lever [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 94*
11. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
12. Acknowledge the error message by pressing the CLR button.

8 Maintenance

8.1 Maintenance actions

Maintenance plan

Chap.	Task to perform	Every month	Every 6 months	Every 36 months	If necessary	Page
	Check the drive chain		X			89
	Check the synchronizing unit chain		X			90
	Replace the relay insert in the control cabinet			X		91
	Check the blades of the material gripper		X			91
	Check the lubricant in the oil tank				X	93
	Check the air gap of the feed clutch	X				94
	Check the air gap of the synchronization clutch	X				95
	Check the light sensor of the pilgrim step separation for contamination				X	96

Check the drive chain

⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

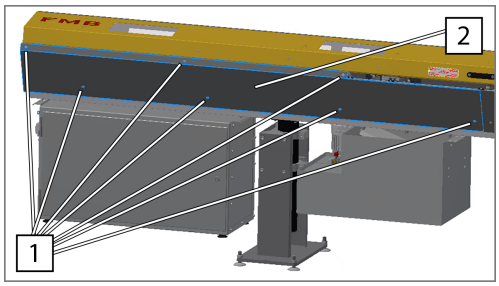
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

Condition of the drive chain:

In the event of damage to the drive chain or the gear wheels, or if the tension of the drive chain is too low, please contact FMB.
➚ *"Service contact details" on page 104.*

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43.*
2. Switch off the supply of compressed air. ➚ *"Switch the supply of compressed air on/off" on page 94*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.



5. Loosen and remove the screws [1].
6. Remove the cover [2].
7. Check the condition: Check the drive chain and gear wheels visually for damage.
8. Check the tension: Check the tension of the drive chain.
9. Insert the cover [2].
10. Insert and tighten [1] the screws.
11. Close the cover.
12. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 94*
13. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
14. Acknowledge the error message by pressing the CLR button.

Check the synchronizing unit chain

⚠ **CAUTION**

Sharp knives of the material gripper

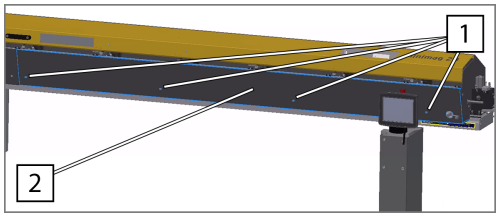
Cuts due to the sharp knives of the material gripper.

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:

In the event of damage to the chain or the gear wheels, or if the tension of the chain is too low, please contact FMB. ➚ "Service contact details" on page 104.



1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43.*
2. Switch off the supply of compressed air. ➚ *"Switch the supply of compressed air on/off" on page 94*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Loosen and remove the screws [1].
6. Remove the cover [2].
7. Check the condition: Check the chain and gear wheels of the synchronization unit visually for damage.
8. Check the tension: Check the tension of the chain.
9. Insert the cover [2].
10. Insert and tighten [1] the screws.
11. Close the cover.
12. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 94*

13. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*

14. Acknowledge the error message by pressing the CLR 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 104.*

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

⚠ DANGER

Moving components of the loading magazine and the tool machine with the cover open

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

During maintenance work on the loading magazine, there may be unexpected movements of the components of the loading magazine and the machine tool.

- **Turn off the machine tool at the main switch, before performing maintenance work. Observe the sequence of the working steps according to the descriptions listed below.**

⚠ 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 43.*
2. Switch off the supply of compressed air. → *"Switch the supply of compressed air on/off" on page 94*
3. Where necessary, obtain release from the lathe to open the cover.

4. Open the cover.
5. Turn off the machine tool at the main switch.
6. Check the material gripper visually for breaks.
7. If the blades of the material gripper break off, the blades of the material gripper must be replaced. → *"Replacing the blades of the material gripper" on page 92*.
8. Close the cover.
9. Turn on the machine tool at the main switch.
10. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 94*
11. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
12. Acknowledge the error message by pressing the CLR button.

Replacing the blades of the material gripper

⚠ CAUTION

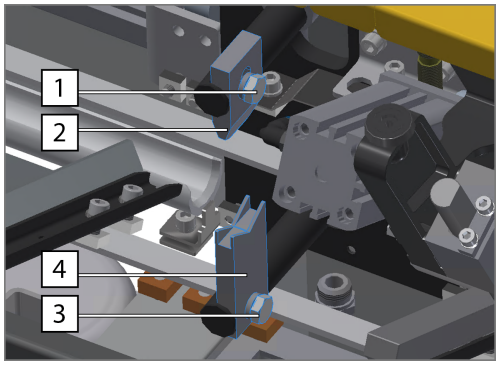
Sharp knives of the material gripper

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 43*.
2. Switch off the supply of compressed air. → *"Switch the supply of compressed air on/off" on page 94*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.



5. Loosen and remove the screw [1].
6. Change the upper blade [2].
7. Insert and tighten the screw [1].
8. Loosen and remove the screw [3].
9. Change the blade [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 94*
13. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
14. Acknowledge the error message by pressing the CLR button.
15. Close the material gripper with the button .

16. Press the emergency stop button. → *"Press the emergency stop button" on page 43*.
17. Switch off the supply of compressed air. → *"Switch the supply of compressed air on/off" on page 94*
18. Open the cover.
19. Check whether the material gripper is aligned with the pusher.
20. Correct the alignment of the pusher and the material gripper, where applicable using the lower blade.
21. Tighten the 3 screw.
22. Close the cover.
23. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 94*
24. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
25. 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. .

Filling 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.

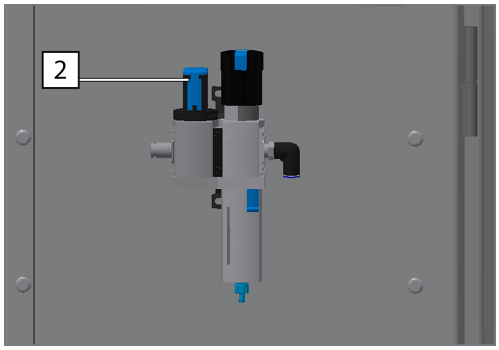
- **Remove leaking fuel immediately.**
- **Observe the description in the operating instructions about filling / emptying the oil tank.**
- **Only fill fuel in the intended containers.**

Observe the oil tank level.

Observe the stated types of oil.

→ Fill the stated quantity of oil from above into the oil tank.

Switch the supply of compressed air on/off



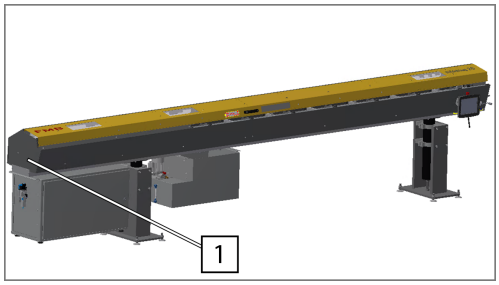
The supply of compressed air is switched on/off at the maintenance unit [1].

→ Switch the supply of compressed air on/off at the knob [2].

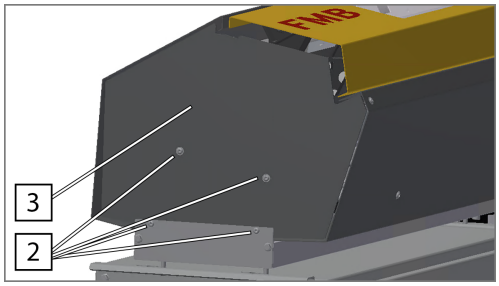
Check the air gap of the feed clutch

The air gap between the rotor and the anchor of the feed clutch must be at least 0.2 mm. If the air gap is greater than 0.2 mm, it must be readjusted by replacing the spacer washers. In the event of questions please contact FMB. ↗ "Service contact details" on page 104.

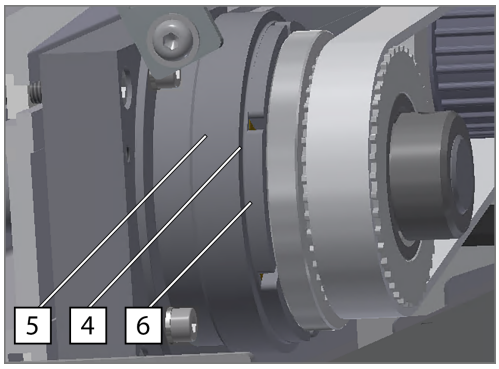
1. → Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43.*
2. → Switch off the supply of compressed air. ↗ *"Switch the supply of compressed air on/off" on page 94*



3. → The feed clutch is located in the [1] position behind the front plate.



4. → Loosen and remove the screws [2].
5. → Remove the front plate [3].

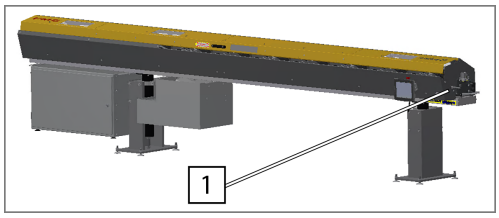


6. Check the air gap [4] between the rotor [5] and anchor [6].
7. Attach the front plate [3] in reverse order.
8. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 94*
9. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
10. Acknowledge the error message by pressing the CLR button.

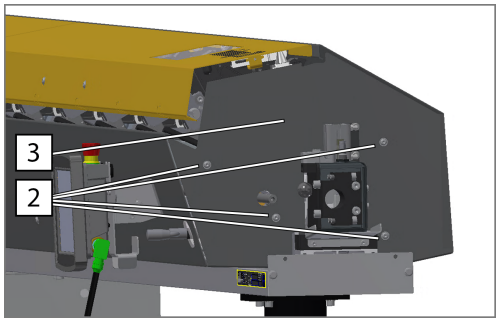
Check the air gap of the synchronization clutch

The air gap between the rotor and the anchor of the synchronization clutch must be at least 0.2 mm. If the air gap is greater than 0.2 mm, it must be readjusted by replacing the spacer washers. In the event of questions please contact FMB. *“Service contact details” on page 104.*

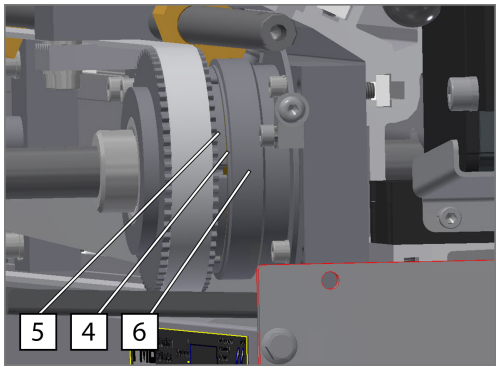
1. Press the emergency stop button. *“Press the emergency stop button” on page 43*.
2. Switch off the supply of compressed air. *“Switch the supply of compressed air on/off” on page 94*



3. The synchronization clutch is located in the [1] position behind the front plate.



4. Loosen and remove the screws [2].
5. Remove the front plate [3].



6. Check the air gap [4] between the rotor [5] and anchor [6].
7. Attach the front plate [3] in reverse order.
8. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 94*
9. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
10. Acknowledge the error message by pressing the CLR button.

Check the light sensor of the pilgrim step separation for contamination

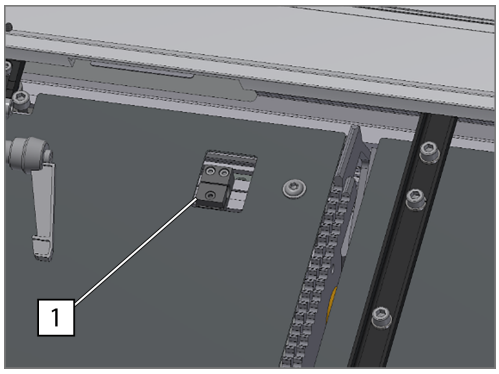
NOTICE

Damage to the light sensor due to improper cleaning

The light-sensitive optical fibre of the light sensor can be damaged by contaminated cloths or chemical cleaning agents. This could cause a malfunction or defect of the light sensor.

- **Only clean the light sensor with a clean, dry cloth.**
- **Do not use cleaning agents.**

If the light sensor of the pilgrim step separation is contaminated, it must be cleaned with a clean, dry cloth.



→ Check the light sensor of the pilgrim step separation [1] visually for contamination.

8.2 Auxiliary equipment

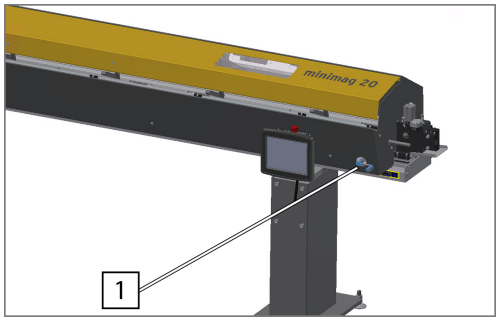
Shifting the loading magazine

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.

1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the supply of compressed air. ↗ *"Switch the supply of compressed air on/off" on page 94*
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.
8. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 94*
9. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
10. Acknowledge the error message by pressing the CLR button.

Crank handle



With the crank handle, the drive of the loading magazine can be moved in powerless condition for maintenance and service work, or be released in the event of an emergency.

The slot for the crank handle is in the [1] position on the loading magazine.

Move the drive with the crank handle: ➚ *"Move the drive with the crank handle" on page 97*.

Move the drive with the crank handle

⚠ WARNING

Hand crank moved by the drive of the loading magazine

Personal injury due to squashing and impact due to the crank handle used.

The crank handle also turns due to the push movement of the loading magazine while in operation, and may be flung off or strike people.

- **Remove the crank handle immediately after the pressing the loading magazine.**
- **Observe the procedure for moving the drive with the crank handle in the operating instructions.**

NOTICE

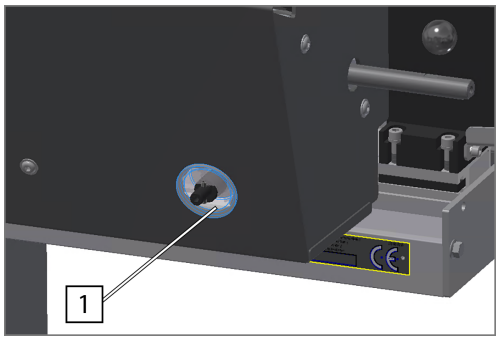
Loss of position of the PLC control unit

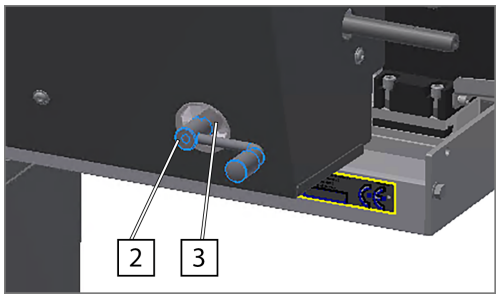
Damage to the loading magazine and the machine tool due to the loss of position of the PLC control unit.

If the drive of the loading magazine is moved with the crank handle, the position of the PLC control unit may be lost.

- **Perform a reference run after moving the drive with the crank handle.**

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
2. Switch off the supply of compressed air. ➚ *"Switch the supply of compressed air on/off" on page 94*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.
5. Remove the cover cap [1] (where necessary from inside using the auxiliary equipment).





6. Insert the crank handle [2] into position [3].
7. Operate the crank handle.
8. Remove the crank handle.
9. Insert the cover cap.
10. Close the cover.
11. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 94*
12. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
13. Acknowledge the error message by pressing the CLR button.
14. Perform a reference run. ➚ *"Performing a reference run" on page 98*.

Performing a reference run

If the drive of the loading magazine is moved manually in switched-off condition, it causes the position of the PLC control unit to be lost. In this case, a reference run must be performed.

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position diagnosis"*
3. Press the ◆ button.
4. Press the Reference run button.

   ➥ The status display on the button flashes yellow. The reference run is performed. The status display on the button turns green. The reference run is ended.

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 CLR 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 Quittieren button.

Delete all error message:

1. Click on error message.
2. Delete the error message with the Quittieren (Alle) button.

Access the fault history

1. Press the ☰ button.
2. *'DIAGNOSIS* → *Fault list"*
3. Press the Historie button.

Display the position of the current fault on the loading magazine

1. Press the ☰ button.
2. *'DIAGNOSIS* → *Fault list"*
3. Press the Störungshilfe 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.	
Starting switch -B7 not in home position -KK5/B7	The starting switch is not back in its home position. ■ Air flow disrupted ■ Solenoid valve -KK5 not working	Starting switch not in the home position. Switch -B7 not actuated.
Starting switch -B7 not in the home position -KK9/B7	The starting switch is not back in its home position. ■ Air flow disrupted ■ Solenoid valve -KK9 not working	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. ■ Feed force for press upon too low. ■ Incorrect clamping sleeve. ■ New clamping sleeve.	The position Position draw off was not reached.
Storage empty! No new bar reloaded -B80	There is no material bar in the lateral material storage.	Switch -B80 not actuated.
Diameter setting of channel -M3	The monitoring time has expired. The diameter setting was not performed. The desired value of the diameter setting channel does not agree with the actual value.	
Diameter setting of separation M4/B8	The monitoring time has expired. The diameter setting was not performed. The desired value of the diameter setting separation does not agree with the actual value.	
Motor speed controller not ready for operation -TA1/K3	Fault on the drive motor speed controller.	
Guide channel not closed; Check guide channel -KK01/B6/B26/B28	The guide channel is not closed. ■ Solenoid valve -KK01 not working. ■ Air flow disrupted.	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. ■ Solenoid valve -KK1 or -KK01 not working. ■ Air flow disrupted.	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.	

Fault message of the loading magazine	Possible cause	Switch / position
No return of remnant -B13	Remnant remains in the lathe. The material gripper did not grab any remnant when removing the remnant. ■ The lathe collet does not open correctly. The remnant fell out when when returning from the clamping sleeve. The material gripper did not grab any remnant when removing the remnant. ■ Clamping sleeve pressure too low.	Switch -B13 was actuated.
No new bar in guide channel -B13	The material gripper does not grab any material bars when drawing on ■ No material bar was loaded from the lateral material storage.	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. ■ Air supply disturbed	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.	
Material on the lateral storage -B80	Material bars are located in the lateral material storage.	Switch -B80 actuated.
Material bar loaded in test run	Test mode active. In test mode, there must be no material bars on the lateral material storage.	
Max fill level of the loading magazine lubricant container reached	The maximum fill level of the lubricant container was reached.	
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.
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.
Motor overload switch F3 triggered! check -M3/F3 -M3, activate F3	Drive motor of the pilgrim step separation was overloaded.	Motor protection switch - F3 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.	

Fault message of the loading magazine	Possible cause	Switch / position
Pilgrim step separation not in position / not empty - B83/B81/B82	The pilgrim step separation is not in position. ■ Pilgrim step separation was lowered. ■ Pilgrim step separation was raised without authorization. ■ The pilgrim step separation speed was interrupted.	
Pos.software end position was overrun. Release with manual return function	The positive software stop was overridden.	
Profibus/Profinet - No live signal from the lathe	The connection of Profibus / Profinet to the machine tool is defective.	
Relay tumbler -K225	Malfunction of the channel lock module. Relay -K225 not working.	
Remnant jammed in clamping sleeve -B13	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. ■ The clamping sleeve pressure is not right. ■ The blades of the material gripper are worn. ■ The pressure of the material gripper is too low. 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. ■ The remnant flap has been lubricated. The residue remains stuck on the remnant flap.	Switch -B13 was not actuated.
Remant flap not closed - KK010/B17	The remnant flap does not close. ■ Solenoid valve -KK010 does not switch. ■ Air flow disrupted.	Switch -B17 not actuated.
Pushing signal not ok; Check signal from lathe	The signal "collet open" is transferred by the lathe in an unstable way to the loading magazine (the signal bounces). ■ Defect connection ■ Relay worn (on the lathe side)	
Sensor of the pilgrim step separation support contaminated -B83	■ The light reflection for the stable detection of a material bar is not sufficient. ■ Sensor head (light guide) of switch B83 is damaged or dirty.	

Fault message of the loading magazine	Possible cause	Switch / position
Signal sliding-fixed headstock 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 selectionDraw on bar with first insert set! The collet of the lathe is not open. First insert cannot be performed. The collet position signal is not available in manual mode.	
Collet closed too long	Collet monitoring time expired.	
Collet opened too long	Collet monitoring time expired.	
Bar has been pushed back	Warning Max. bar return active. The material bar was moved back past the set value when closing the collet. ■ Lathe clamping system not OK.	
Part follow-up too short	Warning Min. part length follow-up active. The entered value was not reached by pushing the material bar. ■ Feeding force too low. ■ The collet signal is instable.	
Part follow-up too long	Warning Max. part length follow-up active. The entered value was not exceeded by pushing the material bar. ■ End stop in the lathe not exceeded.	
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	Pusher incorrectly swung in. ■ Solenoid valve -KK08 does not switch. ■ Air flow disrupted.	Switch -B23 does not switch.

Fault message of the loading magazine	Possible cause	Switch / position
Pusher out of position	Warning Part length internal or Part length external active. The pusher was moved during the processing. ■ Vibrations to the material bar. ■ Lathe clamping system not OK. ■ Brake not switched on. ■ Braking force too low.	
Z-axis collision	The entered value for rotary encoder B4 was not met.	
Monitoring time motor expired	The moving signal is constantly on. The motor pushes against resistance. ■ Problem with the lathe work flow.	
The monitoring time of motor -M3 pilgrim step separation has expired -B81	The motor did not end the single cycle after approx. 10 seconds.	Switch -B81 does not switch.
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 104*.

10 Index

U

FMB Maschinenbaugesellschaft mbH & Co. KG

Paul-Hohe-Straße 1

97906 Faulbach

Telefon: +49 9392 801 0
Service: +49 9392 801 801
Fax: +49 9392 801 220

Mail: info@fmb-machinery.de
Web: www.fmb-machinery.de

Ersatzteilliste
Spare parts list

FMB micromag 20 Serie 3

Rückmeldenummer ab: 1732284

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 order:

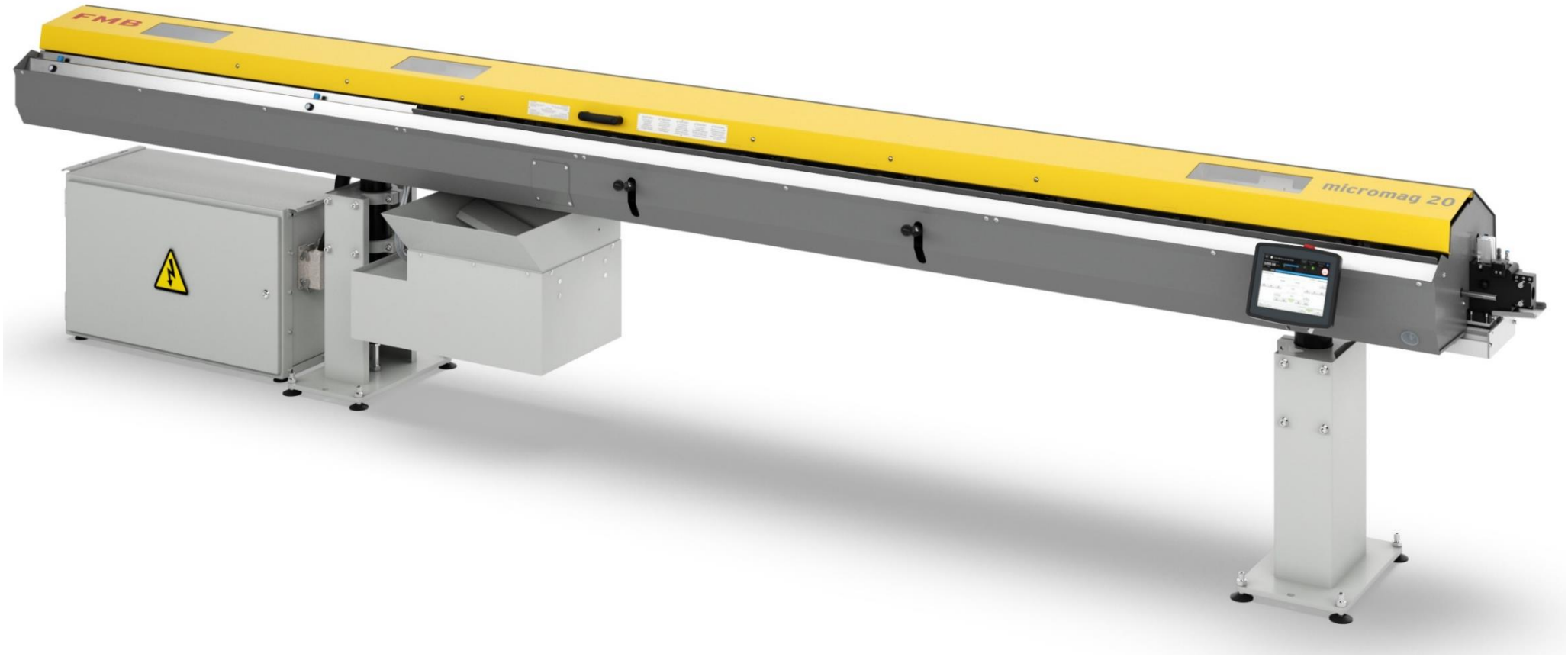
- **Magazine type**
- **Serial no.**
- **Year of construction**
- **Designation**
- **Ident no.**

Redaktionsschluss: 05.04.2023
Editorial deadline: 05.04.2023

Inhaltsverzeichnis
Contents

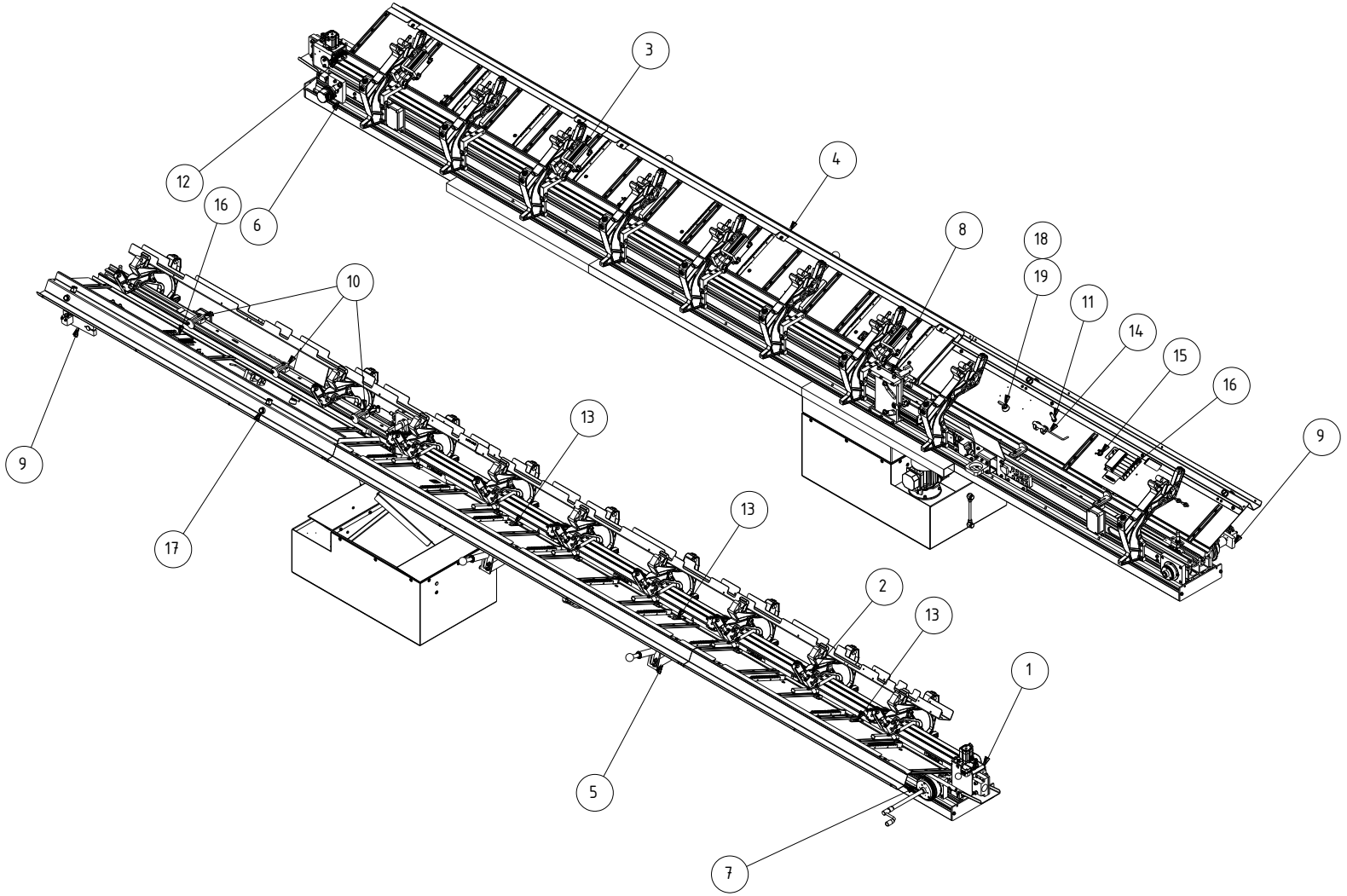
micromag 20

Abbildung Variante / Drawing Variant A;D



Grundaufbau / Basic construction

Abbildung Variante / Drawing Variant A;D

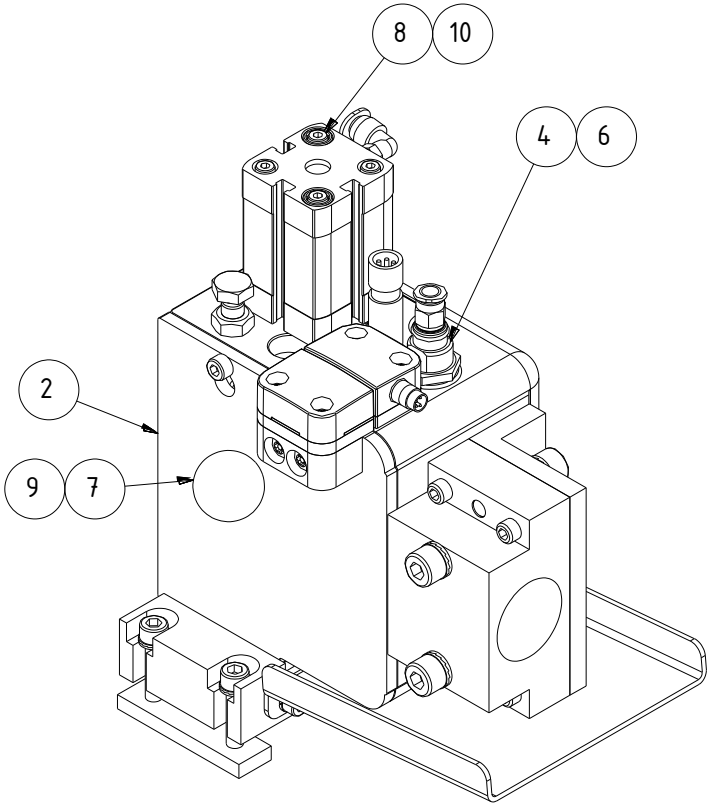


Grundaufbau / Basic construction

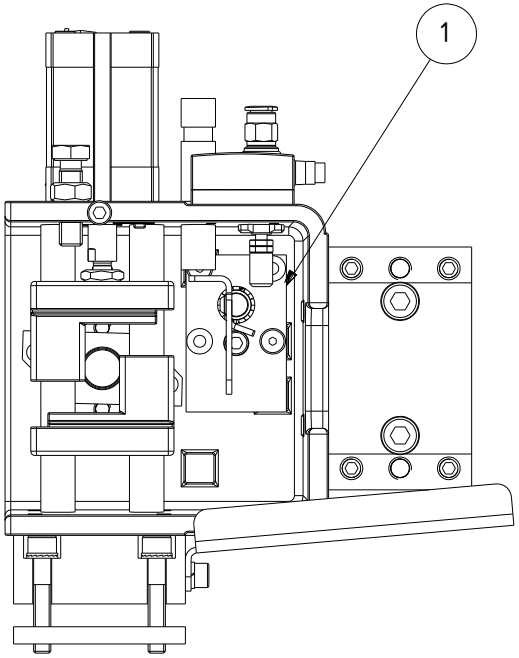
Pos. Item	Ident. Nr. Ident- no.	Bezeichnung	Designation	Kommentar Remarks
1	100048463 100049542	Lünette A;D Lünette B;C	Steady A;D Steady B;C	
2	längenabhängig dependent on length	Niederhalter	Holding down device	
3	längenabhängig dependent on length	Kanalöffner	Channel opener	
4	längenabhängig dependent on length	Seitliche Materialauflage kpl.	Lateral material storage compl.	
5	längenabhängig dependent on length	Pilgerschrittvereinzelung	Pilgrim step separation	
6	100056590 100072266*	Lager vorne	Bearing front	*Option: 48 Beladeplätze *Option: 48 loading spaces
7	2079-227	Synchroneinrichtung	Sychronized unit	
8	2072-994	Greifer kpl.	Gripper compl.	
9	100056112 100057487	Antrieb A;D Antrieb B;C	Drive A;D Drive B;C	
10	2057-851	Niederhalter Vorschubstange	Holding down device pusher	
11	2035-930	Bolzen	Bolt	
12	100049028	Bürste Kanaldeckel kpl.	Brush compl.	
13	2070-317	Einlagensicherung	Insert safety	
14	100049014	Einlagenwerkzeug kpl.	Insert tool compl.	
15	100051565	Entlüftung	Ventilation	
16	100045589	Ventilinsel 6-fach	Valve terminal 6-fold	
17	100056164	Druckregler kpl.	Pressure regulator compl.	
18	2063-643	Fronttafelventil	Front panel valve	
19	2044-157	Wahlschalter	Selector switch	

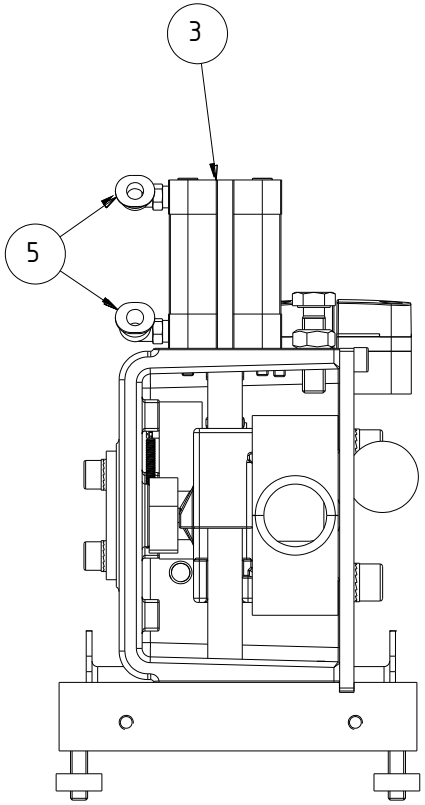
Lünette / Steady

Variante / Variant A;D: 100048463 (Zeichnung / Drawing)



Variante / Variant B;C: 100049542





Lünette / Steady

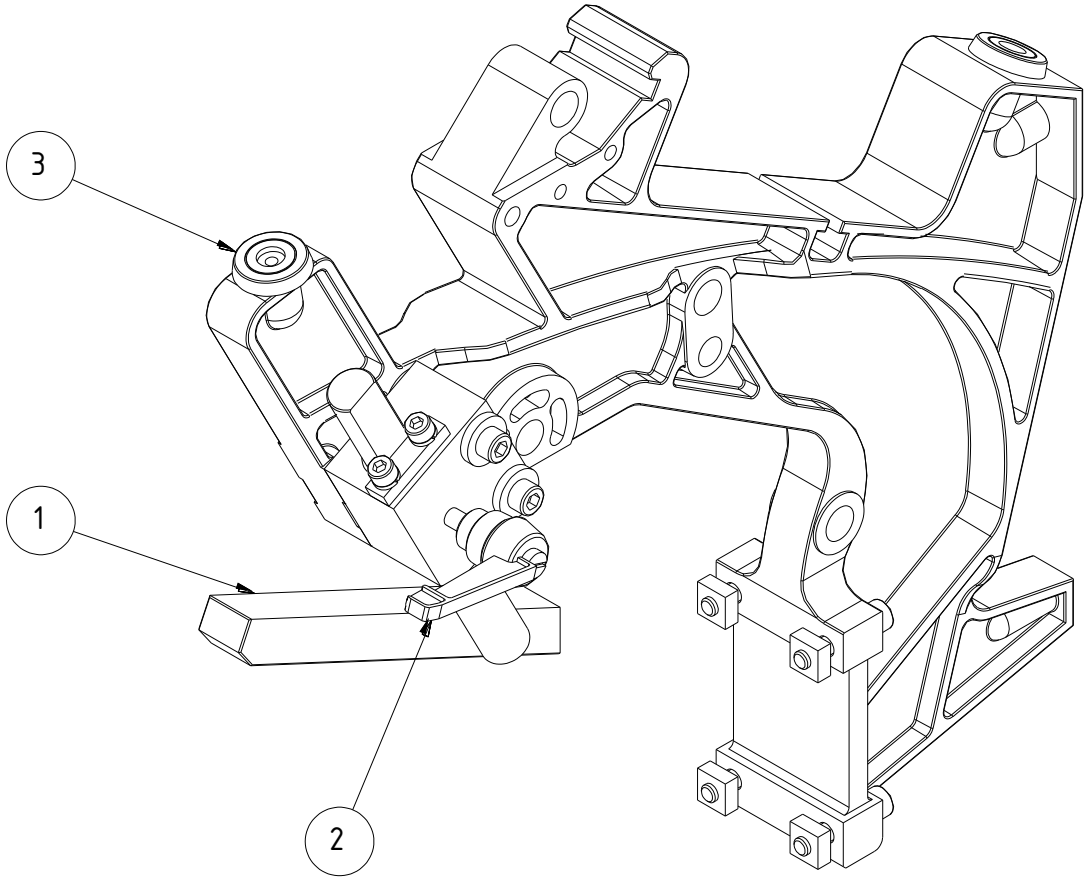
Variante / Variant A;D: 100048463

Variante / Variant B;C: 100049542

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2074-692 2074-693	Anfahrschalter A;D kpl. Anfahrschalter B;C kpl.	Starting switch A;D compl. Starting switch B;C compl.	
2	100048475 100049549	Deckel A;D Deckel B;C	Lid A;D Lid B;C	
3	2067-941	Zylinder	Cylinder	
4	2031-086	Zylinder	Cylinder	
5	2038-348	Steckverschraubung	Plug-in screwing	
6	2001-448	Steckverschraubung	Plug-in screwing	
7	2015-082	Kugelknopf	Ball knob	
8	1066-765	Zylinderschraube M4x65	Cheese head screw M4x65	DIN912
9	2017-198	Senkschraube M6x12	Countersunk screw M6x12	DIN7991
10	0314-536	Federring A4	Spring washer A4	DIN7980

Niederhalter / Holding-down device

Variante / variant 1600: 100052395
Variante / variant 1900: 2077-384
Variante / variant 3200: 100047802 (Zeichnung / Drawing)
Variante / variant 3800: 100050389
Variante / variant 4200: 100050854
Variante / variant 3200: 100079004 (Option: 48 Beladeplätze/Loading spaces)



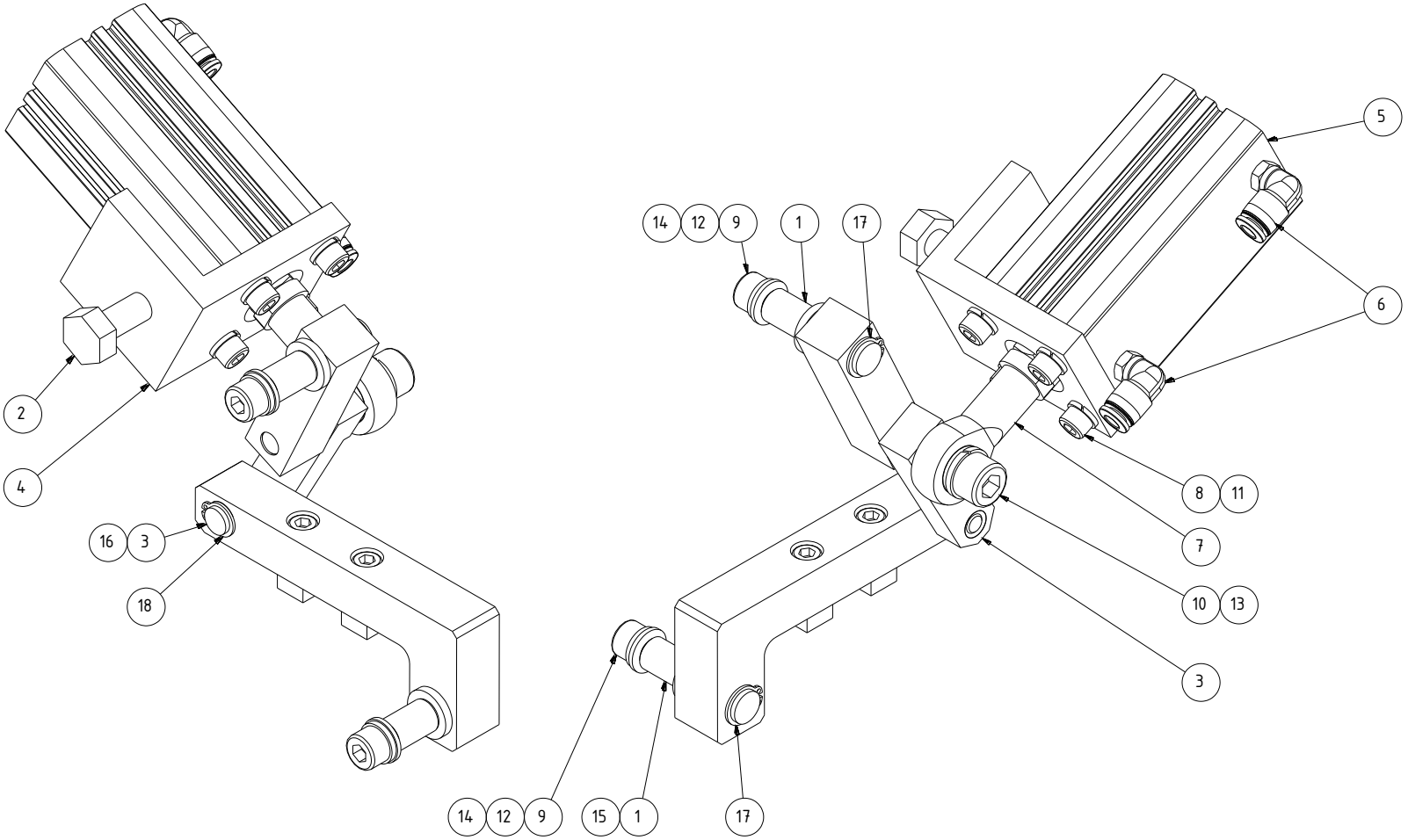
Niederhalter / Holding-down device

Variante / variant 1600: 100052395
Variante / variant 1900: 2077-384
Variante / variant 3200: 100047802
Variante / variant 3800: 100050389
Variante / variant 4200: 100050854
Variante / variant 3200: 100079004 (Option: 48 Beladeplätze/Loading spaces)

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2069-711 2072-969*	Niederhalter	Holding-down device	*Option: 48 Beladeplätze *Option: 48 loading spaces
2	2030-820	Klemmhebel	Lever	
3	2036-888	Gerätefuß	Vibration dumper	

Kanalöffner / Channel opener

Variante / variant 1600: 100052394
Variante / variant 3200: 100047962 (Zeichnung / Drawing)
Variante / variant 4200: 100050892
Variante / variant 1900: 2077-434
Variante / variant 3800: 100050404



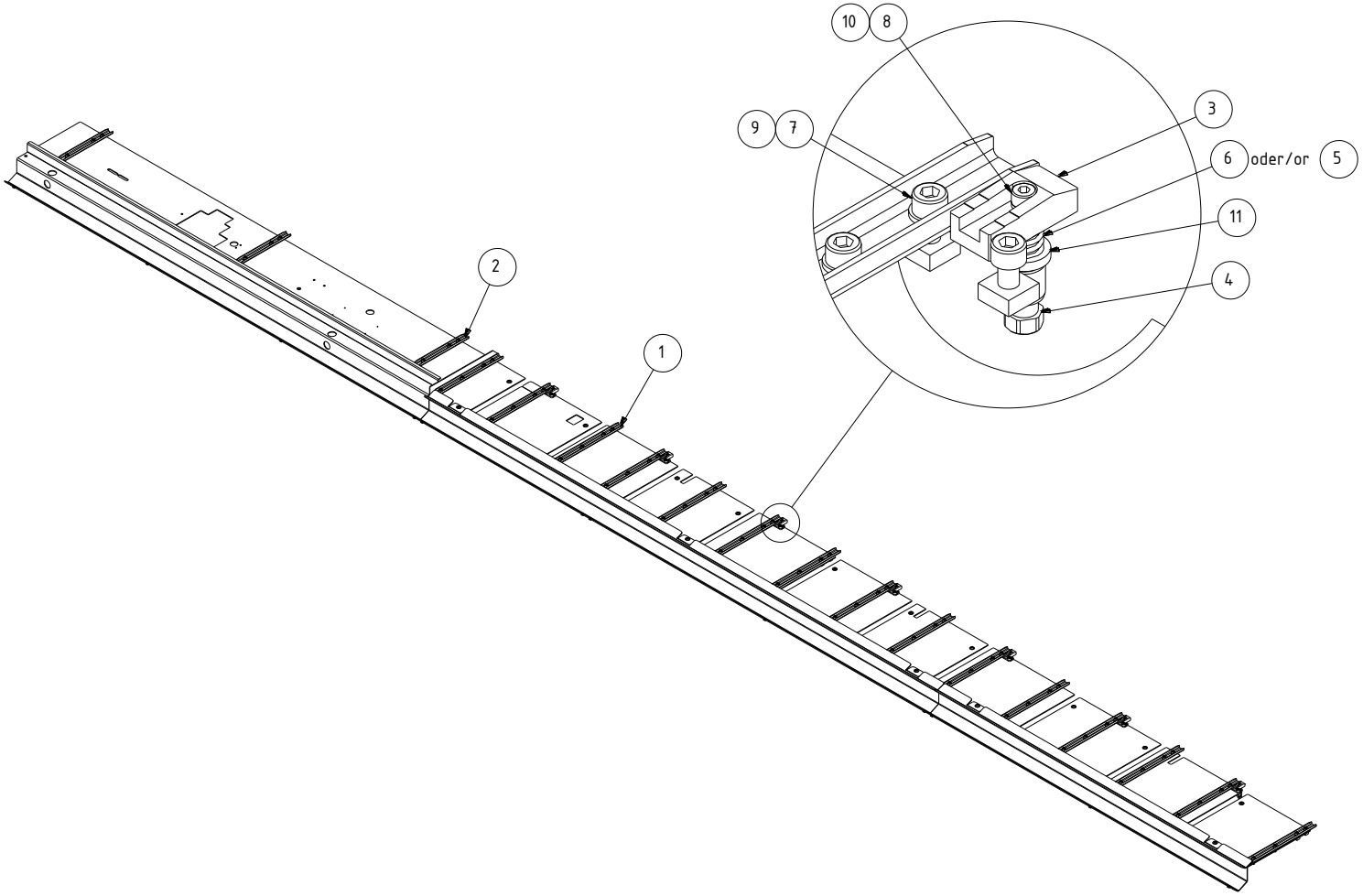
Kanalöffner / Channel opener

Variante / variant 1600: 100052394
Variante / variant 3200: 100047962
Variante / variant 4200: 100050892
Variante / variant 1900: 2077-434
Variante / variant 3800: 100050404

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2035-200	Achsbolzen	Bolt	
2	2035-202	Bolzen mit Kopf	Bolt	
3	2059-743	Hebel unten	Lever bottom	
4	2059-744	Winkel für Zylinder	Angle for cylinder	
5	2059-378	Zylinder	Cylinder	
6	2038-346	Steckverschraubung	Plug-in screwing	
7	2009-679	Gelenkkopf	Joint head	
8	0302-414	Zylinderschraube M6x25	Cheese head screw M6x25	DIN 912
9	0302-597	Zylinderschraube M8x16	Cheese head screw M8x16	DIN 912
10	0303-127	Zylinderschraube M10x50	Cheese head screw M10x50	DIN 912
11	0292-842	Federring B6	Spring washer B6	DIN 127
12	0292-869	Federring B8	Spring washer B8	DIN 127
13	0292-877	Federring B10	Spring washer B10	DIN 127
14	0292-362	Scheibe A 8,4	Washer 8.4	DIN 125
15	0611-409	Glycodurbuchse 12x14x20 F	Glycodur-Bush12x14x20 F	
16	2005-290	Glycodurbuchse 10x12x20 F	Glycodur-Bush 10x12x20 F	
17	0026-638	Sicherungsring A12x1,0	Retaining ring 12x1	DIN 471
18	0024-635	Sicherungsring A10x1,0	Retaining ring A10x1.0	DIN 471

Seitliche Auflage / Laterial storage

Zeichnung Variante / Drawing variant A;D 3200

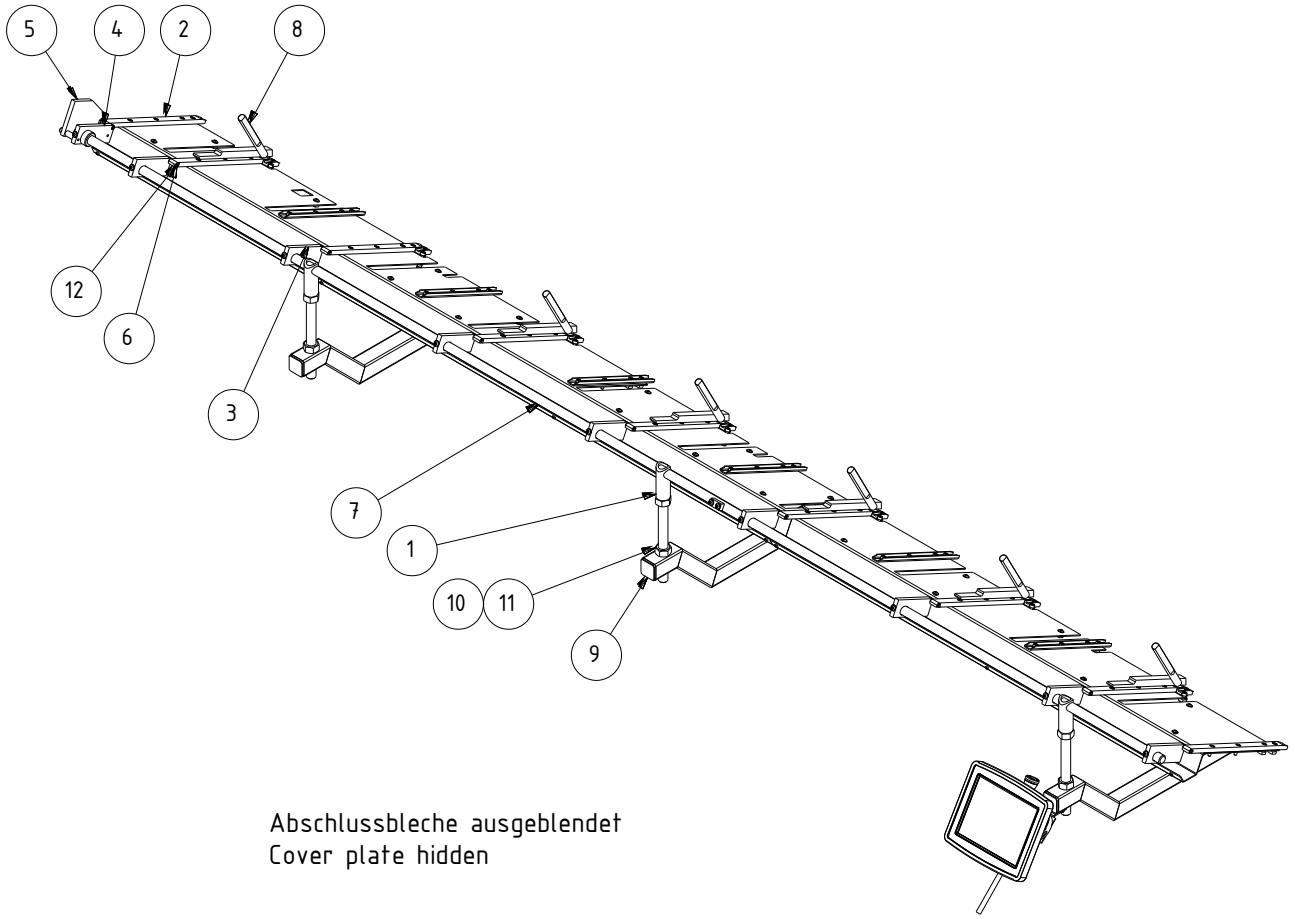


Seitliche Auflage / Lateral storage

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2070-233 2079-348*	Blechauflageleiste	Gib	*Option: 48/60 Beladeplätze *Option: 48/60 loading spaces
2	2073-347	Blechauflageleiste	Gib	
3	2077-260	Druckplatte f. Vereinzelung	Pressure plate	
4	2059-710	Bolzen	Bolt	
5	2059-711	Druckfeder D12200	Pressure spring D12200	
6	2069-708	Druckfeder D12400	Pressure spring D12400	
7	0302-384	Zylinderschraube M6x16	Cheese head screw M6x16	DIN 912
8	2000-333	Zylinderschraube M4x12	Cheese head screw M4x12	DIN 912
9	0292-842	Federring B6	Spring washer B6	DIN 127
10	0314-536	Federring A4	Spring washer A4	DIN 7980
11	2030-769	Bundbohrbuchse A8x16	Bush A8x16	DIN 172

Verlängerte Auflage / Extended storage (Option)

Zeichnung Variante / Drawing variant A;D 3200



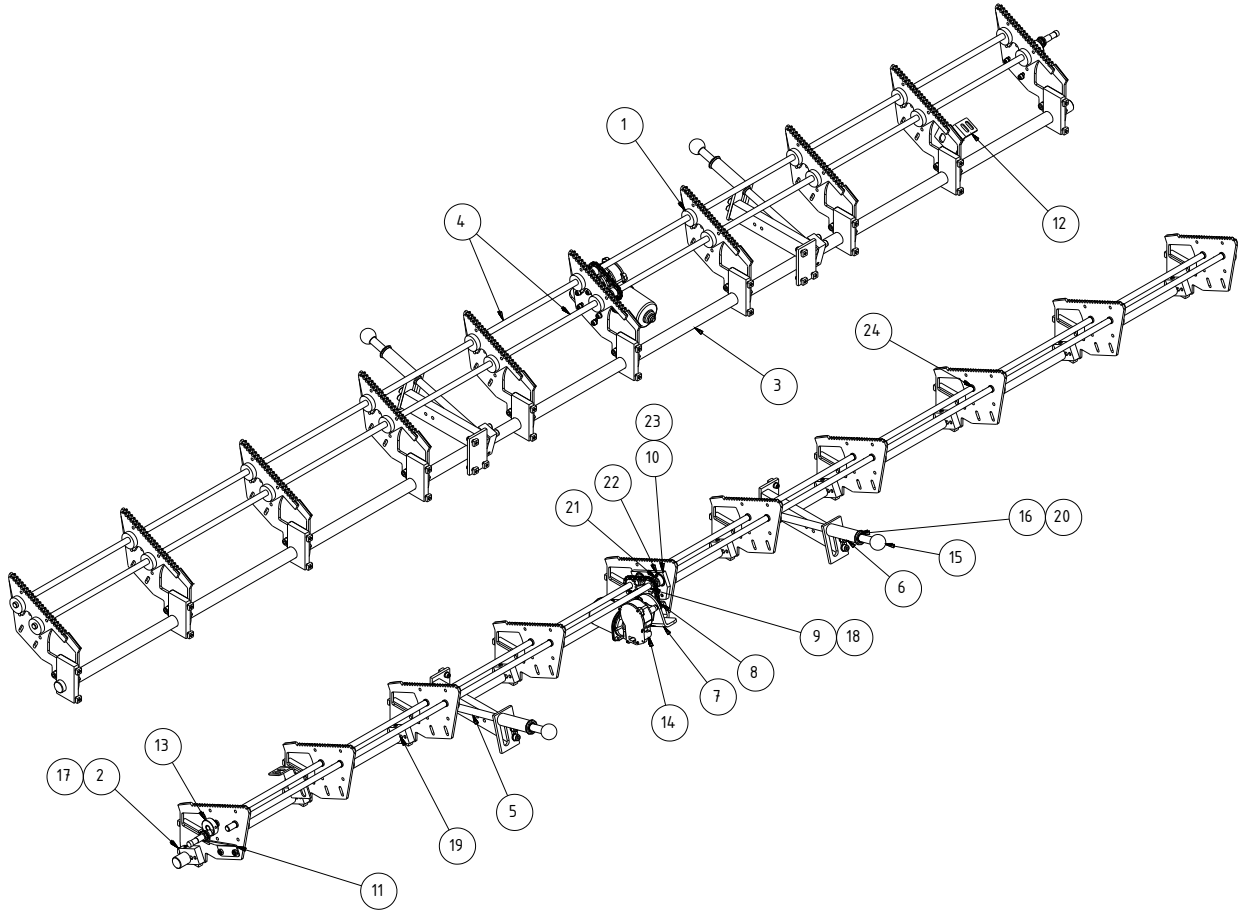
Abschlussbleche ausgeblendet
Cover plate hidden

Verlängerte Auflage / Extended storage (Option)

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100050060	Auflagerohr	Tube	
2	100071853	Auflageleiste	Gib	
3	100071902	Auflagenleiste außen	Gib outside	
4	100071905	Auflageleiste hinten	Gib rear	
5	100071908	Anschlag	Stop	
6	2067-783	Befestigungsbolzen	Mounting bolt	
7	2072-095	Welle D20/3210	Shaft D20/3210	
8	2072-969	Niederhalter	Holding down device	
9	100003957	Vierkantstopfen 40x40x3	Square plug 40x40x3	
10	2015-637	Vierkantmutter M20	Square nut M20	
11	0307-319	Sechskantmutter M20	Hexagon nut M20	DIN 934
12	0312-738	Sicherungsscheibe 4	Lock washer 4	DIN 6799

Pilgerschrittvereinzelung / Pilgrim step separation

Variante / variant 1600: 100061947
Variante / variant 1900: 100060451
Variante / variant 3200: 100055856 (Zeichnung / Drawing)
Variante / variant 3800: 100059285
Variante / variant 4200: 100062173
Variante / variant 3200: 100078875 (Option: 48 Beladeplätze/Loading spaces)
Variante / variant 3200: 100096536 (Option: 60 Beladeplätze/Loading spaces)



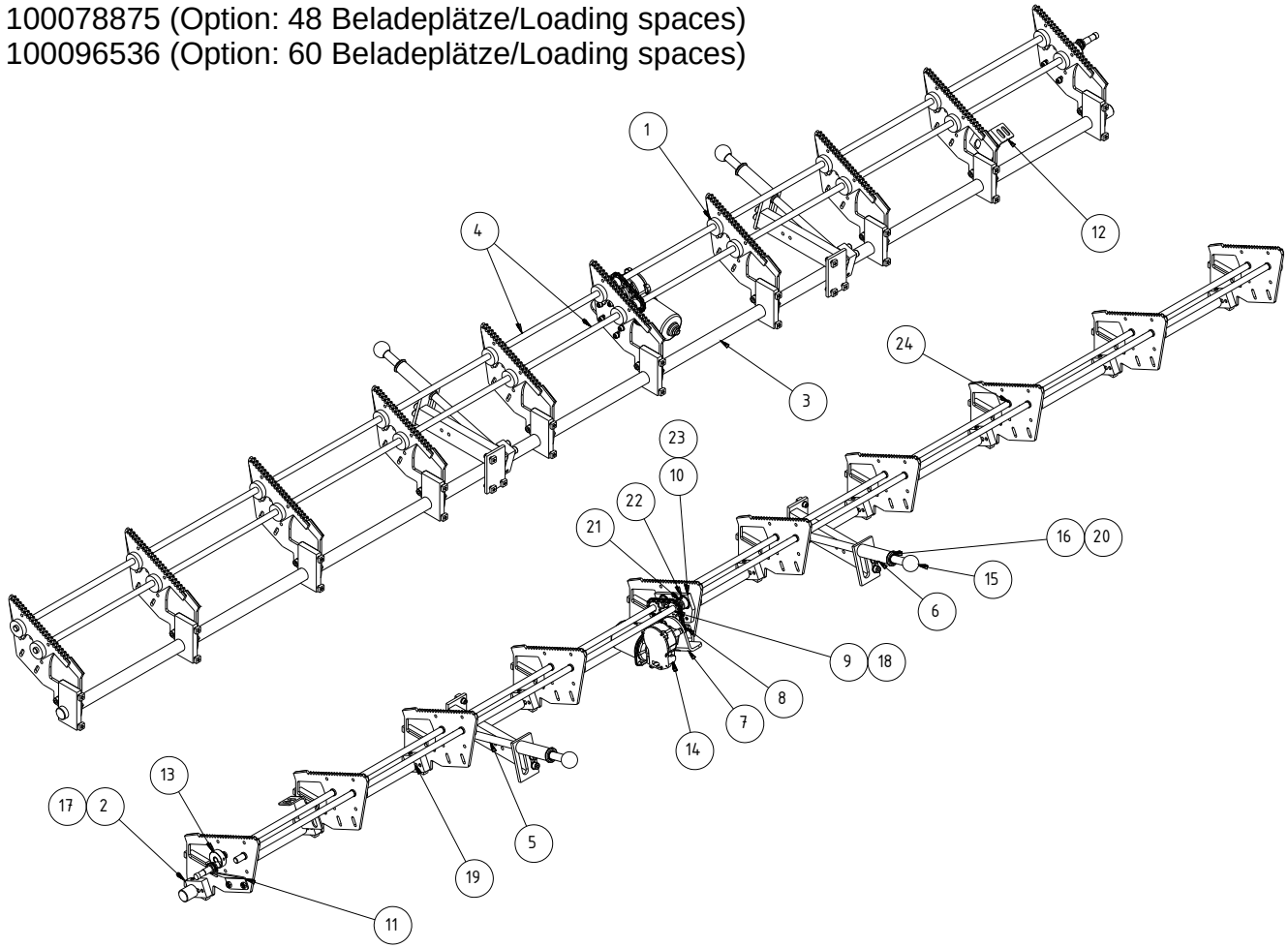
Pilgerschrittvereinzelung / Pilgrim step separation

Variante / variant 1600: 100061947
Variante / variant 1900: 100060451
Variante / variant 3200: 100055856 (Zeichnung / Drawing)
Variante / variant 3800: 100059285
Variante / variant 4200: 100062173
Variante / variant 3200: 100078875 (Option: 48 Beladeplätze/Loading spaces)
Variante / variant 3200: 100096536 (Option: 60 Beladeplätze/Loading spaces)

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2057-399 100097040*	Exzenterrad	Excentering wheel	*Option: 60 Beladeplätze *Option: 60 loading spaces
2	2057-687	Einstellplatte	Plate	
3	längenabhängig dependent on length	Schwenkwelle	Shaft	
4	längenabhängig dependent on length	Vereinzelungswelle D12	Shaft D12	
5	100056564 100071206*	Rastwelle	Shaft	*Option: 48/60 Beladeplätze *Option: 48/60 loading spaces
6	100056561 100071202*	Hülse	Sleeve	*Option: 48/60 Beladeplätze *Option: 48/60 loading spaces
7	2072-952	Halteblech für Motor	Plate for motor	
8	2063-567	Kettenrad Z=12	Chain wheel Z=12	
9	2057-867	Kettenrad Z=12	Chain wheel Z=12	
10	2063-624 2066-639*	Lager f. Vereinzelung	Bearing f. separation	*Option: 48/60 Beladeplätze *Option: 48/60 loading spaces
11	2072-911 2079-356* 2066-641**	Halter Näherungsschalter	Holder f. proximity switch	*Option: 48/60 loading spaces B;C **Option: 48/60 loading spaces A;D
12	2056-822	Halter Näherungsschalter	Holder f. proximity switch	
13	2063-627	Betätiger	Operating element	
14	2056-305	Gleichstrom Motor	Motor	

Pilgerschrittvereinzelung / Pilgrim step separation

Variante / variant 1600: 100061947
Variante / variant 1900: 100060451
Variante / variant 3200: 100055856 (Zeichnung / Drawing)
Variante / variant 3800: 100059285
Variante / variant 4200: 100062173
Variante / variant 3200: 100078875 (Option: 48 Beladeplätze/Loading spaces)
Variante / variant 3200: 100096536 (Option: 60 Beladeplätze/Loading spaces)



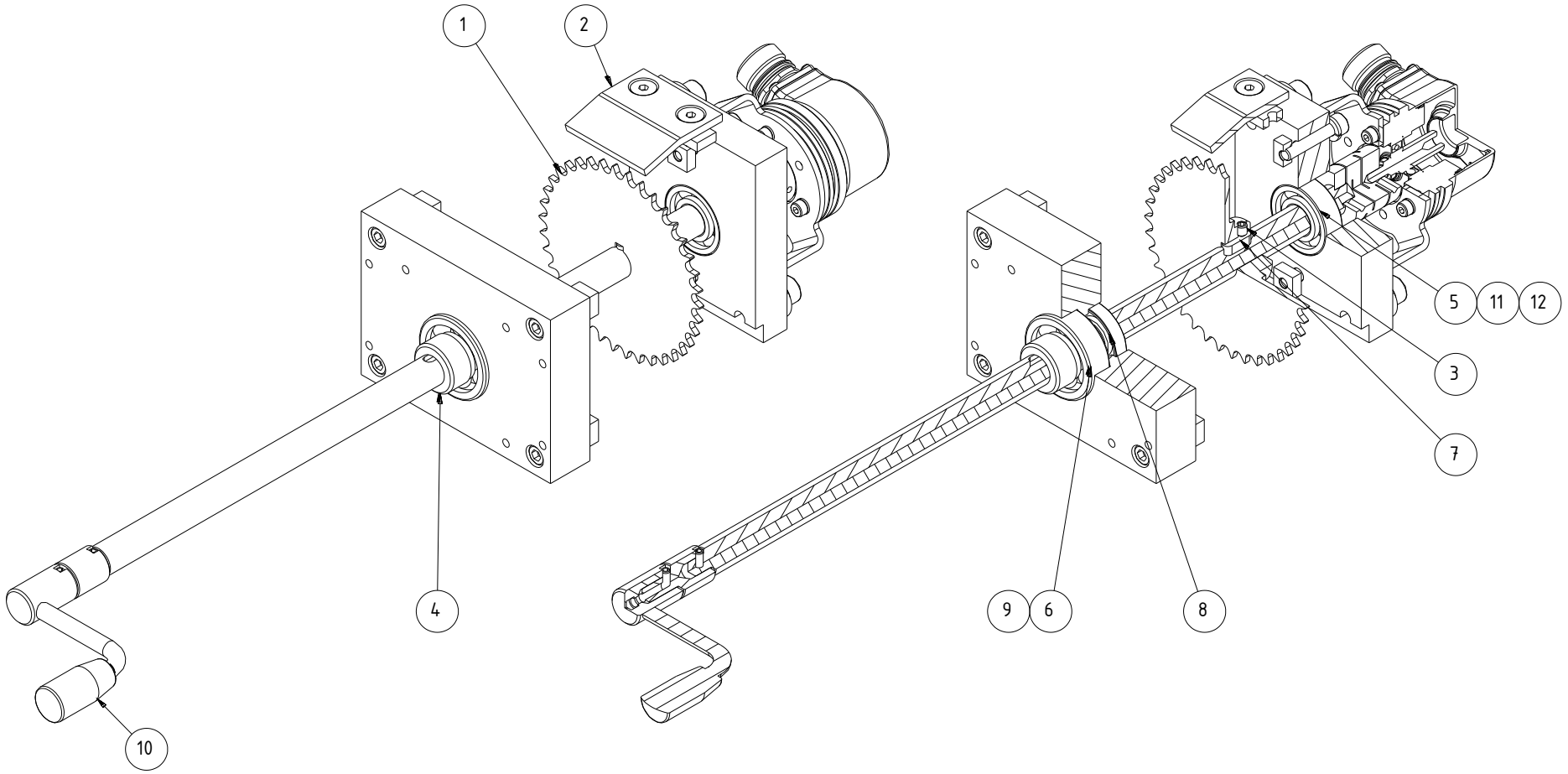
Pilgerschrittvereinzelung / Pilgrim step separation

Variante / variant 1600: 100061947
Variante / variant 1900: 100060451
Variante / variant 3200: 100055856 (Zeichnung / Drawing)
Variante / variant 3800: 100059285
Variante / variant 4200: 100062173
Variante / variant 3200: 100078875 (Option: 48 Beladeplätze/Loading spaces)
Variante / variant 3200: 100096536 (Option: 60 Beladeplätze/Loading spaces)

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
15	2041-158	Kugelknopf	Ball cock	
16	2056-823	Druckfeder	Pressure spring	
17	0304-050	Gewindestift M8x10	Threaded pin M8x10	DIN 916
18	2001-482	Passfeder A4x4x14	Feather key A4x4x14	DIN 6885
19	2051-040	Passfeder A8x7x16	Feather key A8x7x16	DIN 6885
20	2075-861	Sicherungsring 19x1	Retaining ring 19x1	DIN 472
21	2003-225	Stellring A 12	Adjusting ring A 12	DIN 705
22	2036-086	Rillenkugellager 12x28x8 - 6001 2RS	Grooved ball bearing 12x28x8-60012RS	DIN 625 T1
23	200004790	Glycodur-Buchse 12x14x05	Glycodure-bush 12x14x05	
24	2025-562	Glycodur-Buchse 12x14x08	Glycodure-bush 12x14x08	
25	2057-501	Kette 05-B1	Chain 05-B1	

Lager vorne / Bearing front

100056590
100072266 (Option: 48 Beladeplätze/Loading spaces)
2079-366 (Option: 60 Beladeplätze/Loading spaces)



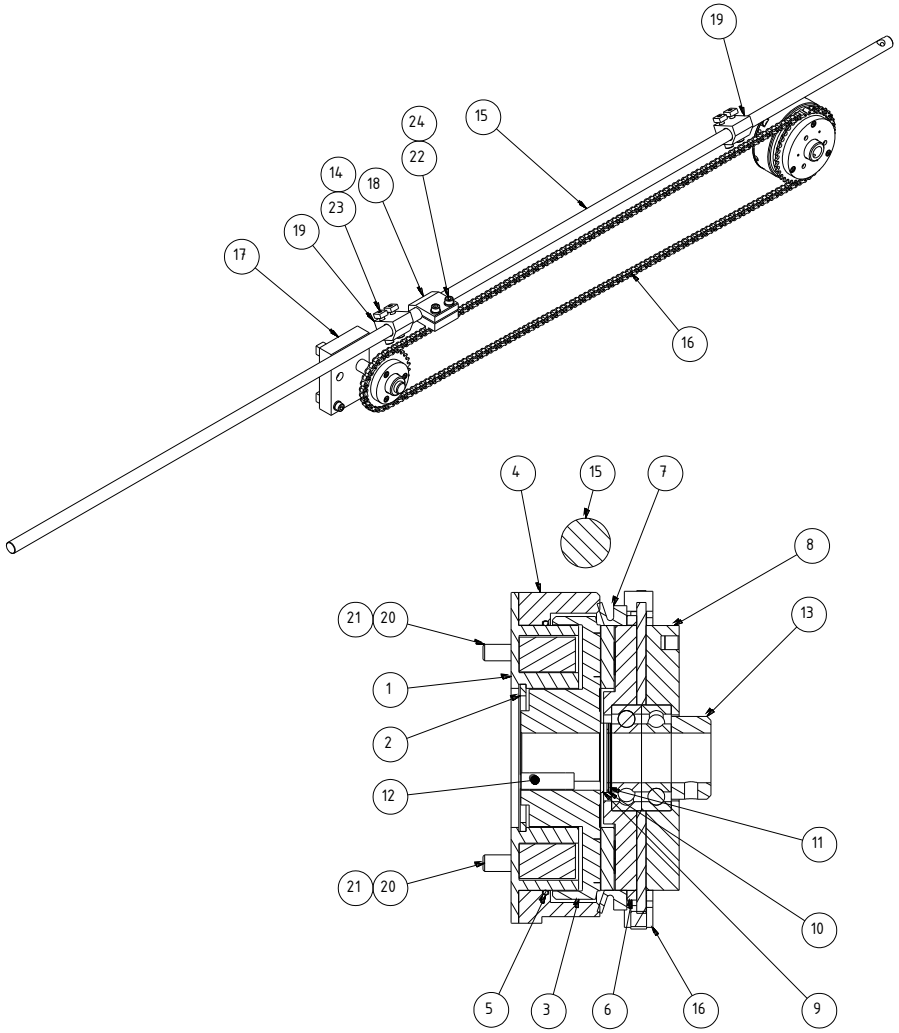
Lager vorne / Bearing front

100056590
100072266 (Option: 48 Beladeplätze/Loading spaces)
2079-366 (Option: 60 Beladeplätze/Loading spaces)

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2057-835	Kettenrad Z=38 mit Nabe	Chain wheel Z=38	
2	2068-925	Anschlag vorne	Stop front	
3	2026-535	Gewindestift M5x8	Threaded pin M5x8	DIN 916
4	2027-124	Stellring A15	Adjusting ring A15	DIN 705
5	0630-160	Rillenkugellager 15x35x11 2RS	Grooved ball bearing 15x35x11 2RS	DIN 625
6	2033-845	Rillenkugellager 15x42x13 2RSH	Grooved ball bearing 15x42x13 2RSH	DIN 625
7	1082-051	Passfeder A5x5x16	Feather key A5x5x16	DIN 6885
8	2031-969	Radial-Wellendichtring A15x35x7	Joint disc A15x35x7	DIN 3760
9	2057-819	O-Ring 11x2	O-ring 11x2	DIN ISO 3601
10	2050-793	Gerätekurbel	Crank	
11	2027-122	Passscheibe 15x21x1	Shim ring 15x21x1	DIN 988
12	0024-678	Sicherungsring 15x1	Retaining ring 15x1	DIN 471

Synchroneinrichtung / Synchronized device

2079-227



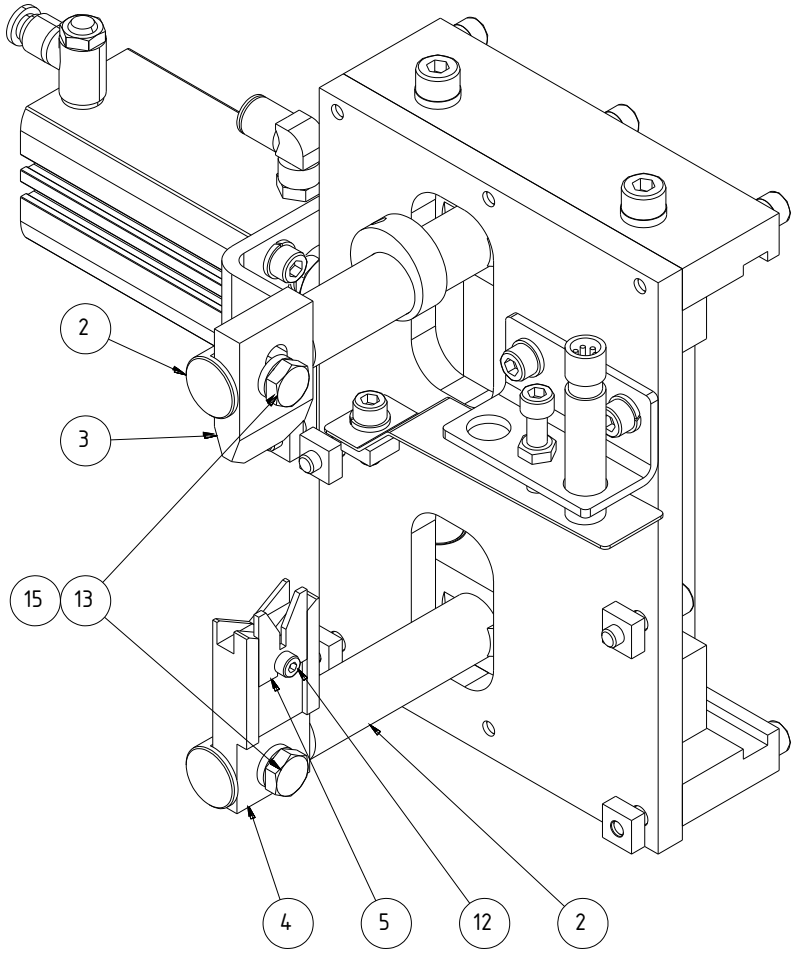
Synchroneinrichtung / Synchronized device

2079-227

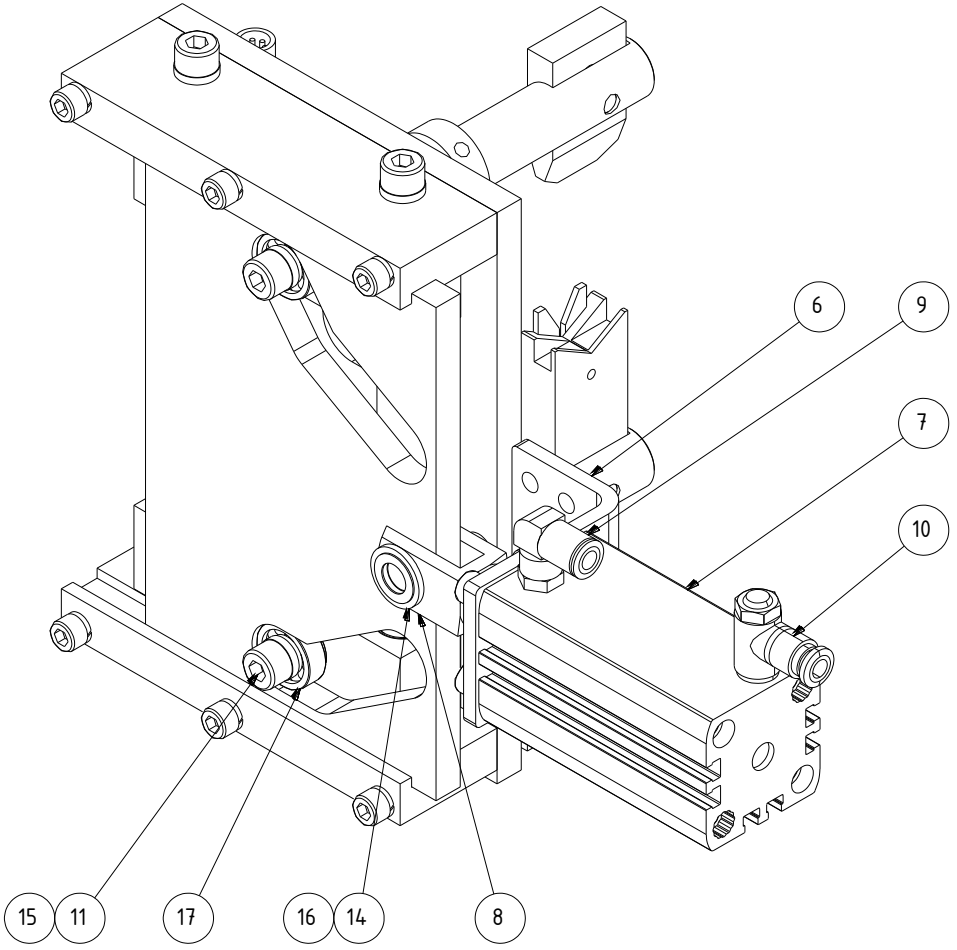
Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2035-164	Synchronstange	Synchronizing bar	
2	2063-514	Lager	Bearing	
3	2063-601	Mitnehmer Synchronstange	Tappet synchronizing bar	
4	2079-271	Kettenrad Z=38 komplett	Chain wheel Z=38 compl.	
5	2057-825	Welle Umlenkrad	Return pulley shaft	
6	2057-826	Flansch	Flange	
7	2057-827	Flansch	Flange	
8	2057-824	Kettenrad Z=30	Chain wheel Z=30	
9	0303-070	Zylinderschraube M6x20	Cheese head screw M6x20	DIN 912
10	2000-388	Federring A10	Spring washer A10	DIN 7980
11	2027-123	Rillenkugellager 15x32x9	Grooved ball bearing 5x32x9	DIN 625
12	0024-678	Sicherungsring 15x1	Retaining ring 15x1	DIN 471
13	2079-226	Gehäuse V-Ring VA-80-N	Casing sealing ring VA-80-N	
14	2058-443	Distanz für V-Ring	Distance for sealing ring	
15	2058-445	V-Ring VA-80-N	Sealing ring VA-80-N	
16	2032-160	Magnetteil für Magnetkupplung Gr. 08	Magnetic part size 8	14.105.08.10-24V-20W
17	2076-209	Rotor für Magnetkupplung Gr. 08	Rotor size 8	14.105.08.10 Ø15H7
18	2000-508	Sicherungsring 42x1,75	Retaining ring 42x1.75	DIN 472
19	2027-124	Stellring A15	Spring washer A15	DIN 705
20	2057-501	Rollenkette 05-B1	Roller chain 05-B1	

Greifer / Gripper

Variante / variant AD 2072-994



Variante / variant BC 2072-759



Greifer / Gripper

Variante / variant AD 2072-994

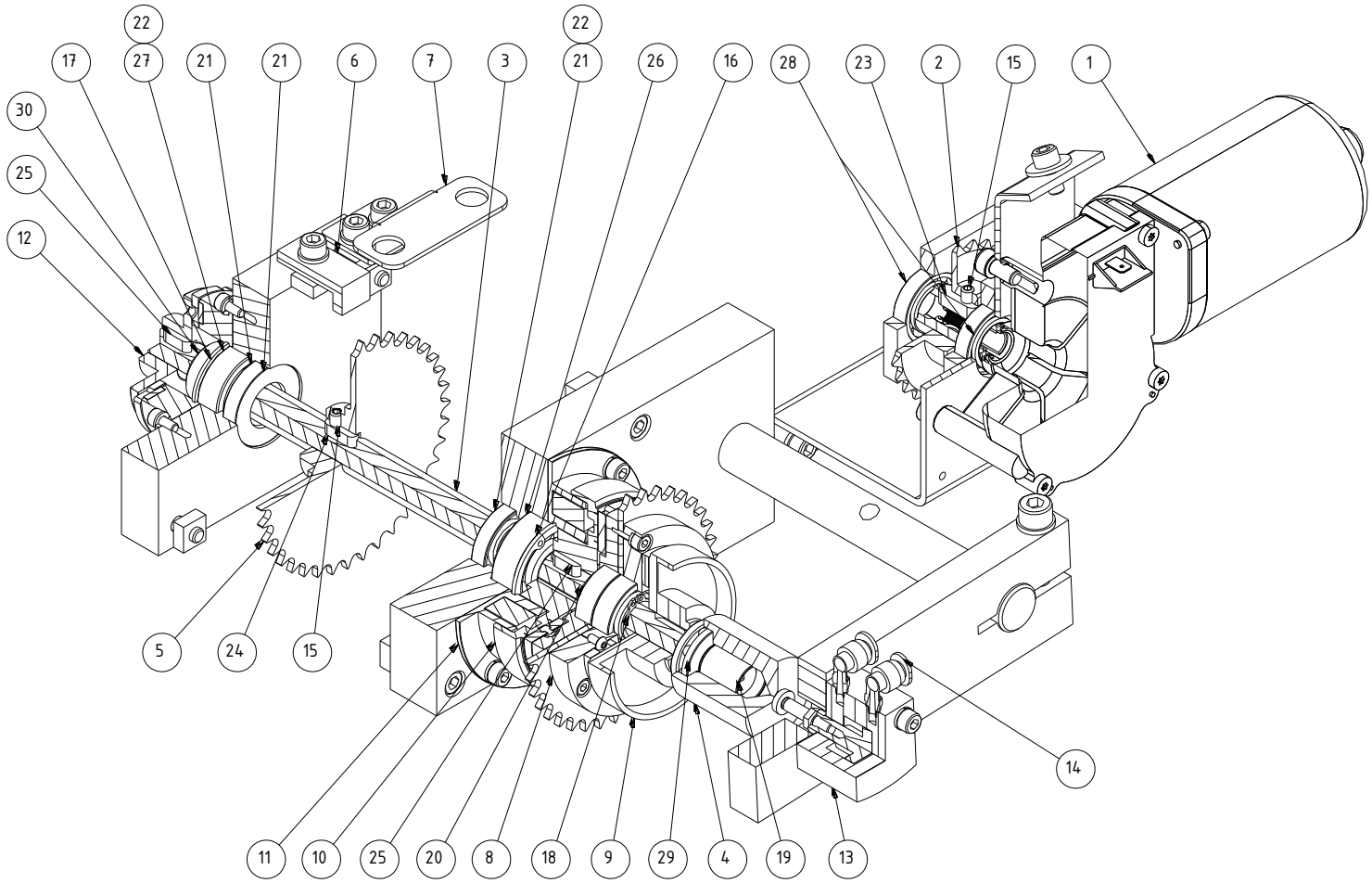
Variante / variant BC 2072-759

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2059-984	Führungswelle	Guide shaft	
2	2069-084	Messerhalter	Holder f. blade	
3	2069-086	Messer oben	Blade top	
4	2072-760	Messer unten	Blade bottom	
5	2057-713	Zentrierblech	Centering sheet	
6	2069-087	Haltewinkel für Zylinder	Retaining angle for cylinder	
7	2059-378	Zylinder	Cylinder	
8	2001-382	Gabelkopf	Fork head	
9	2038-346	Steckverschraubung	Plug-in screwing	
10	2044-441	Drosselrückschlagventil	One-way restrictor	
11	0302-619	Zylinderschraube	Cheese head screw	DIN 912 M8x20
12	0302-074	Zylinderschraube	Cheese head screw	DIN 912 M4x8
13	0305-979	Sechskantschraube	Hexagonal head screw	DIN 933 M8x20
14	2000-403	Scheibe	Washer	
15	2031-006	Scheibe	Washer	
16	2014-901	Passscheibe 10x16x0,5	Shim ring 10x16x0.5	DIN 988
17	0469-246	Rillenkugellager 8x22x7 - 608	Grooved ball bearing 8x22x7 - 608	DIN 625

Antrieb / Drive

Variante / variant AD 100056112

Variante / variant BC 100057487



Antrieb / Drive

Variante / variant AD 100056112

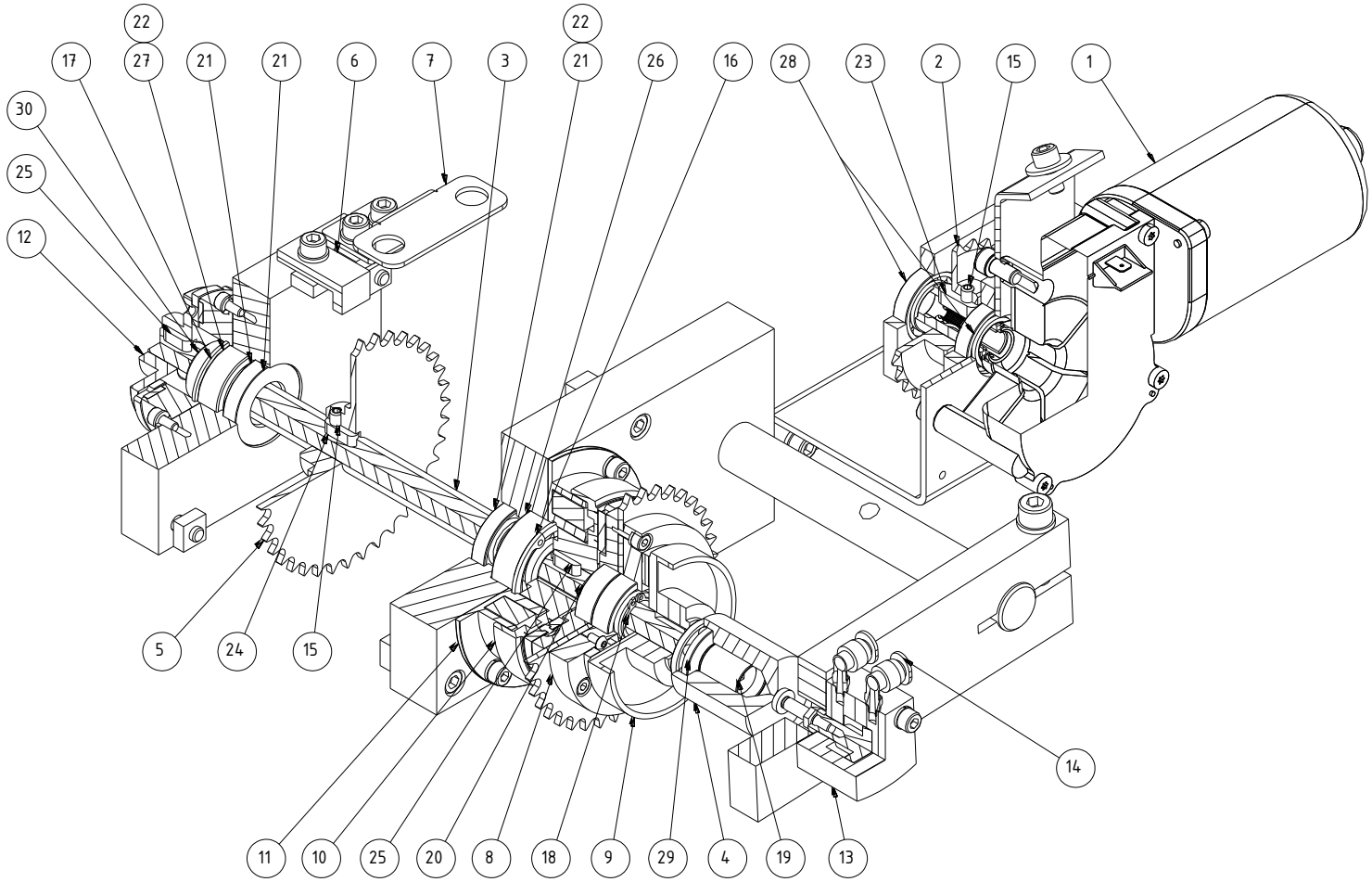
Variante / variant BC 100057487

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2031-758	Getriebemotor	Geared motor	
2	100056111	Kettenrad Z=25 mit Nut	Chain wheel Z=25	
3	2063-596	Welle	Shaft	
4	2057-571	Druckstück	Pressure piece	
5	2057-835	Kettenrad Z=38 mit Nabe	Chain wheel Z=38	
6	100056610	Schlittenanschlag	Carriage stop	
7	100056609	Halter Näherungsschalter	Holder f. proximity switch	
8	2076-206	Kettenrad Z=38 kpl.	Chain wheel Z=38 compl.	
9	2036-414	Rotor Gr. 6	Rotor size 6	14.105.06.10 D 15 H7
10	2076-209	Rotor Gr. 8	Rotor size 8	14.105.08.10 D 15H7
11	2032-160	Magnetteil	Magnetic part	14.105.08.10 24V 20W
12	2030-628	Magnetbremse	Magnetic brake	
13	2044-376	Zylinder	Cylinder	
14	2038-348	Steckverschraubung	Plug-in screwing	
15	0303-496	Gewindestift M5x6	Set screw M5x6	DIN 913
16	2000-508	Sicherungsring I 42	Retaining ring I 42	DIN 472
17	2000-511	Sicherungsring 35x1,5	Retaining ring 35x1.5	DIN 472
18	0024-678	Sicherungsring 15x1,0	Retaining ring 15x1.0	DIN 471
19	2026-136	Glycodur-Buchse 15x17x20	Glycodure bush 15x17x20	GLY-PG 151720 F
20	2058-581	Passscheibe 15x21x0,5	Shim ring 15x21x0.5	DIN 988
21	2031-969	Radial-Wellendichtring 15x35x7 - NBR	Joint-disc 15x35 x7 - NBR	DIN 3760 - BA
22	2057-819	O-Ring 11x2	O-ring 11x2	DIN ISO 3601

Antrieb / Drive

Variante / variant AD 100056112

Variante / variant BC 100057487



Antrieb / Drive

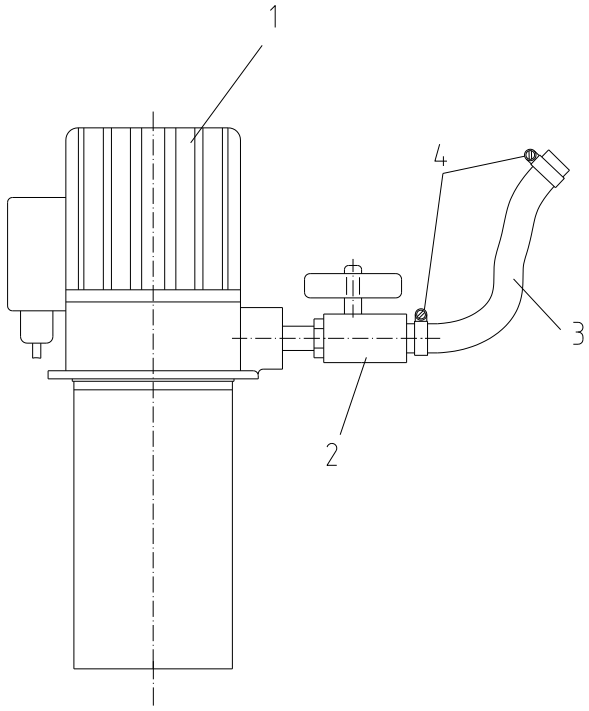
Variante / variant AD 100056112 Variante / variant BC 100057487

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
23	2031-507	Passfeder A6x6x20	Feather key A6x6x20	DIN 6885
24	1082-051	Passfeder A5x5x16	Feather key A5x5x16	DIN 6885
25	2030-624	Passfeder A5x5x14	Feather key A5x5x14	DIN 6885
26	2033-845	Rillenkugellager 15x42x13	Grooved ball bearing 15x42x13	DIN 625
27	0630-160	Rillenkugellager 15x35x11	Grooved ball bearing 15x35x11	DIN 625 T1
28	2036-486	Rillenkugellager 17x30x7	Grooved ball bearing 17x30x7	DIN 625 T1
29	2001-364	Axial-Rillenkugellager 15x28x9	Grooved ball bearing 15x28x9	DIN 711
30	2027-124	Stellring A15	Adjusting ring A15	DIN 705

Ölpumpe komplett / Oil pump complete

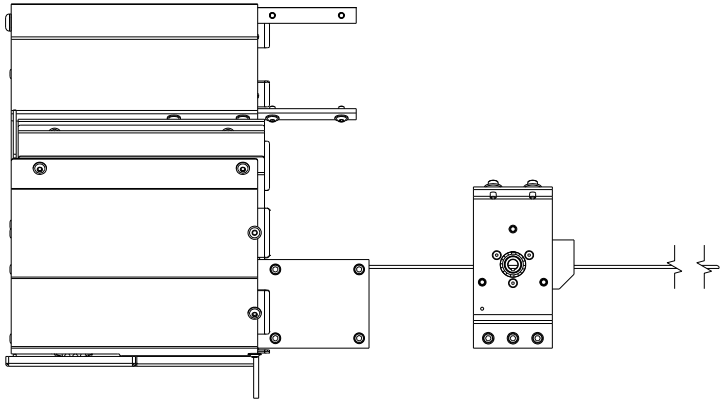
2070-895

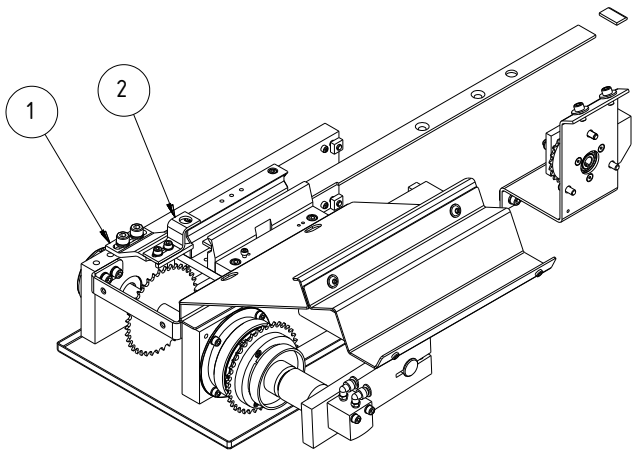
Pos. Item	Ident. Nr. Ident- no.	Bezeichnung	Designation	Kommentar Remarks
	2070-793	Tauchpumpe kpl. mit Kugelhahn HK 2/170	Immersion pump cpl. with ball cock HK 2/170	
		bestehend aus:	**consist of:**	
1	2070-794	Tauchpumpe HK 2/170	Immersion pump HK 2/170	
2	2070-795	Kugelhahn 3/8" für HK 2/170	Ball cock 3/8" for HK 2/170	
3	2031-842	Schlauch 16x3,5	Hose 16 x3,5	
4	2032-485	Schlauchschelle 16-27 mm	Hose band clip 16-27 mm	



Umbausatz – Vorschubstange 1655 / Retrofit kit – Pusher 1655

Variante A;D	200006908 – 1600	200006920 – 1900	100056395 – 3200	200006907 – 3800	200006909 – 4200
Variante B;C	200006921 – 1600	200006922 – 1900	100064440 – 3200	200006923 – 3800	200006924 – 4200





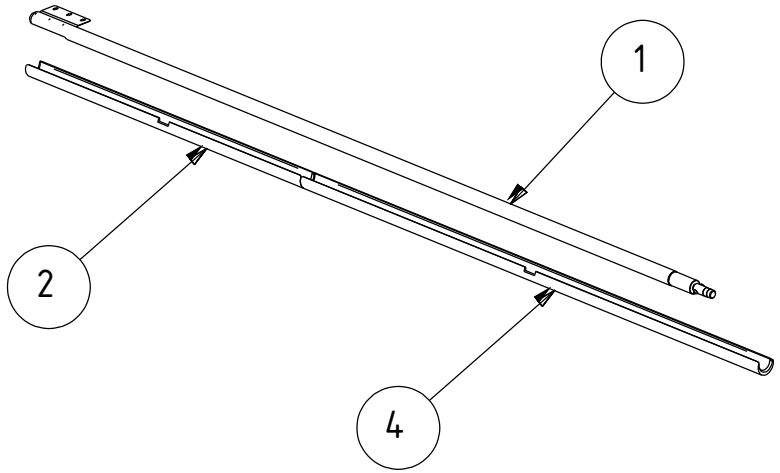
Umbausatz – Vorschubstange 1655 / Retrofit kit – Pusher 1655

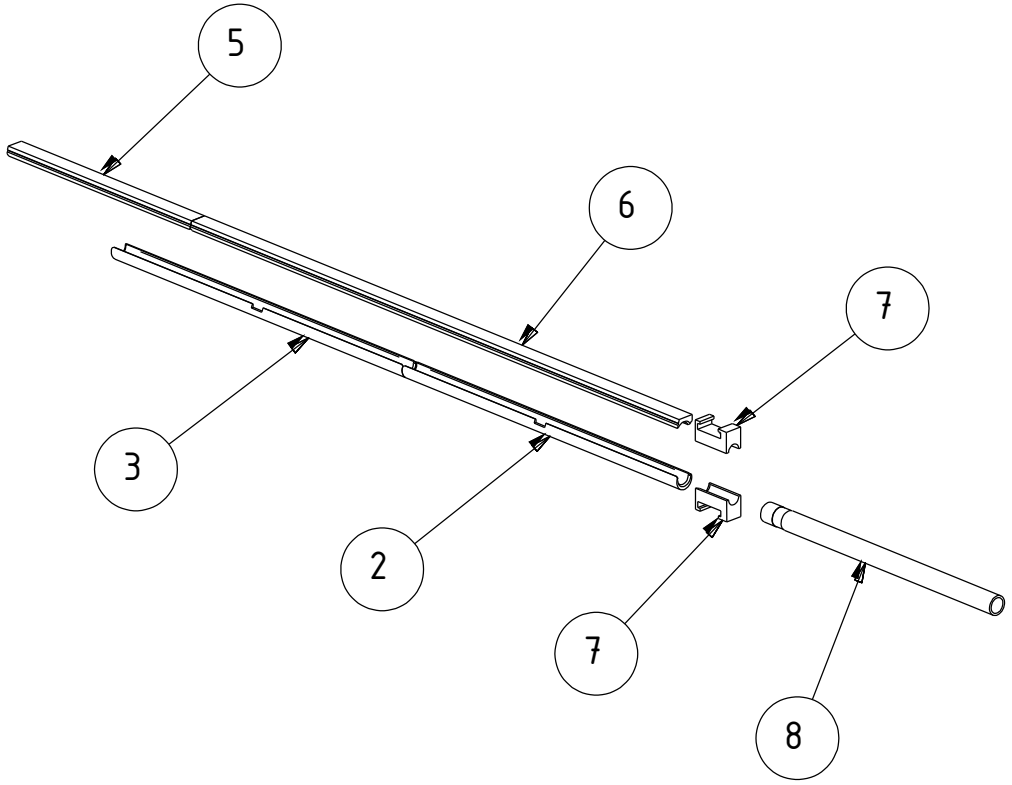
Variante A;D	200006908 – 1600	200006920 – 1900	100056395 – 3200	200006907 – 3800	200006909 – 4200
Variante B;C	200006921 – 1600	200006922 – 1900	100064440 – 3200	200006923 – 3800	200006924 – 4200

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2064-501	Anschlag Vorschubstange	Stop for pusher	
2	2041-472	Halter	Carrier	
3	2057-501	Rollenkette	Chain	
4	2057-502	Steckglied	Plug link	
5	2057-503	Verschlusslasche	Clasp strip	
6	2057-504	Verschlussfeder	Clasp spring	

Umrüstsätze 1600 / Capacity adjustment sets 1600

(Zeichnung für Vorschubstangenlänge 1405 / Drawing for pusher length 1405)





Hinweis:
Die Materialführungen und das Führungsrohr / Teleskoprohr sind materialabhängig und nicht im Umrüstsatz enthalten.

Note:
The guide jaws and the guide tube / telescopic tube are depending on material and not included in the capacity adjustment set.

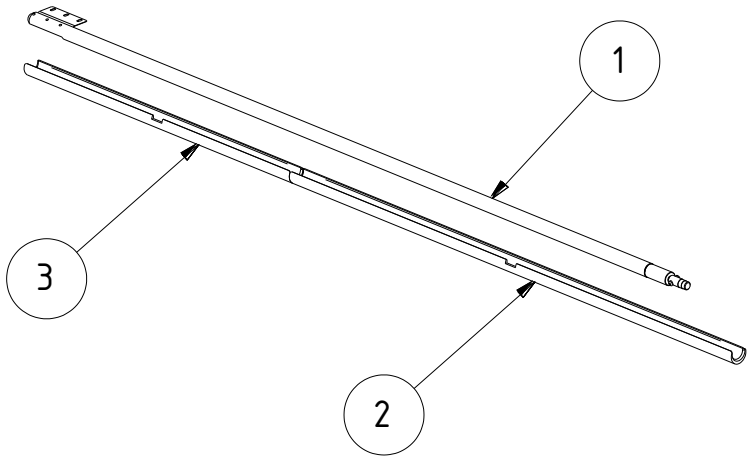
Umrüstsätze 1600 / Capacity adjustment sets 1600

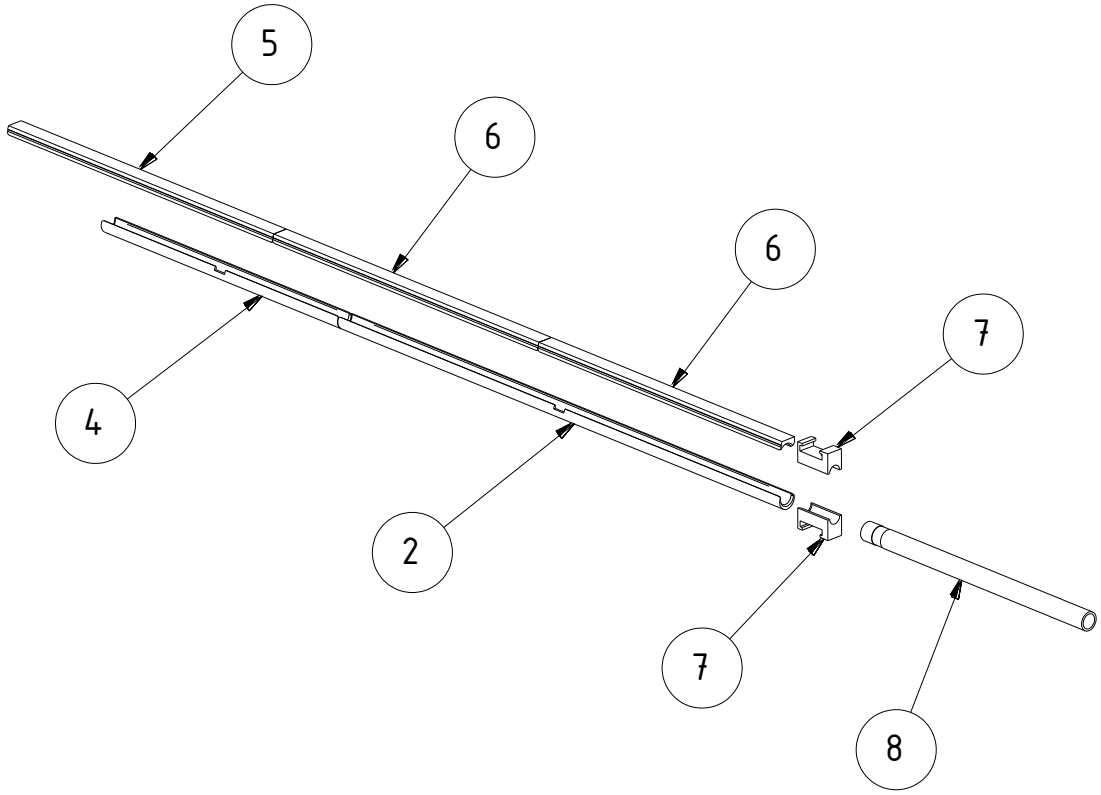
Umrüstsatz komplett Capacity adjustment set complete		
	1405	**1655**
D05 AD	2067-961	2081-711
D05 BC	2066-718	2081-712
D07 AD	2067-962	2081-713
D07 BC	2066-719	2081-714
D08 AD	2067-963	2081-715
D08 BC	2066-721	2081-716
D10	2066-722	2081-717
D12	2066-723	2081-718
D13	2066-724	2081-719
D15	2066-725	2081-720
D16	2066-733	2081-721
D18	2066-734	2081-722
D20	2066-735	2081-723
D22	2066-736	2081-724
D23	2066-721	2081-725

			Vorschubstange / Pusher	
Pos.	**Bezeichnung**	**Designation**	**1405**	**1655**
1	Vorschubstange	Pusher	1	1
2	Einlage unten 600	Insert bottom 600	2	2
3	Einlage unten 635	Insert bottom 635	1	1
4	Einlage unten 1000	Insert bottom 1000	1	1
5	Einlage oben 400	Insert top 400	1	1
6	Einlage oben 1065	Insert top 1065	1	1
	Einlage Verlängerung	Insert extension	-	1
7	Materialführung	Guide jaw	2	2
8	Führungsrohr	Guide tube	1	1

Umrüstsätze 1900 / Capacity adjustment sets 1900

(Zeichnung für Vorschubstangenlänge 1405 / Drawing for pusher length 1405)





Hinweis:
Die Materialführungen und das Führungsrohr / Teleskoprohr sind materialabhängig und nicht im Umrüstsatz enthalten.

Note:
The guide jaws and the guide tube / telescopic tube are depending on material and not included in the capacity adjustment set.

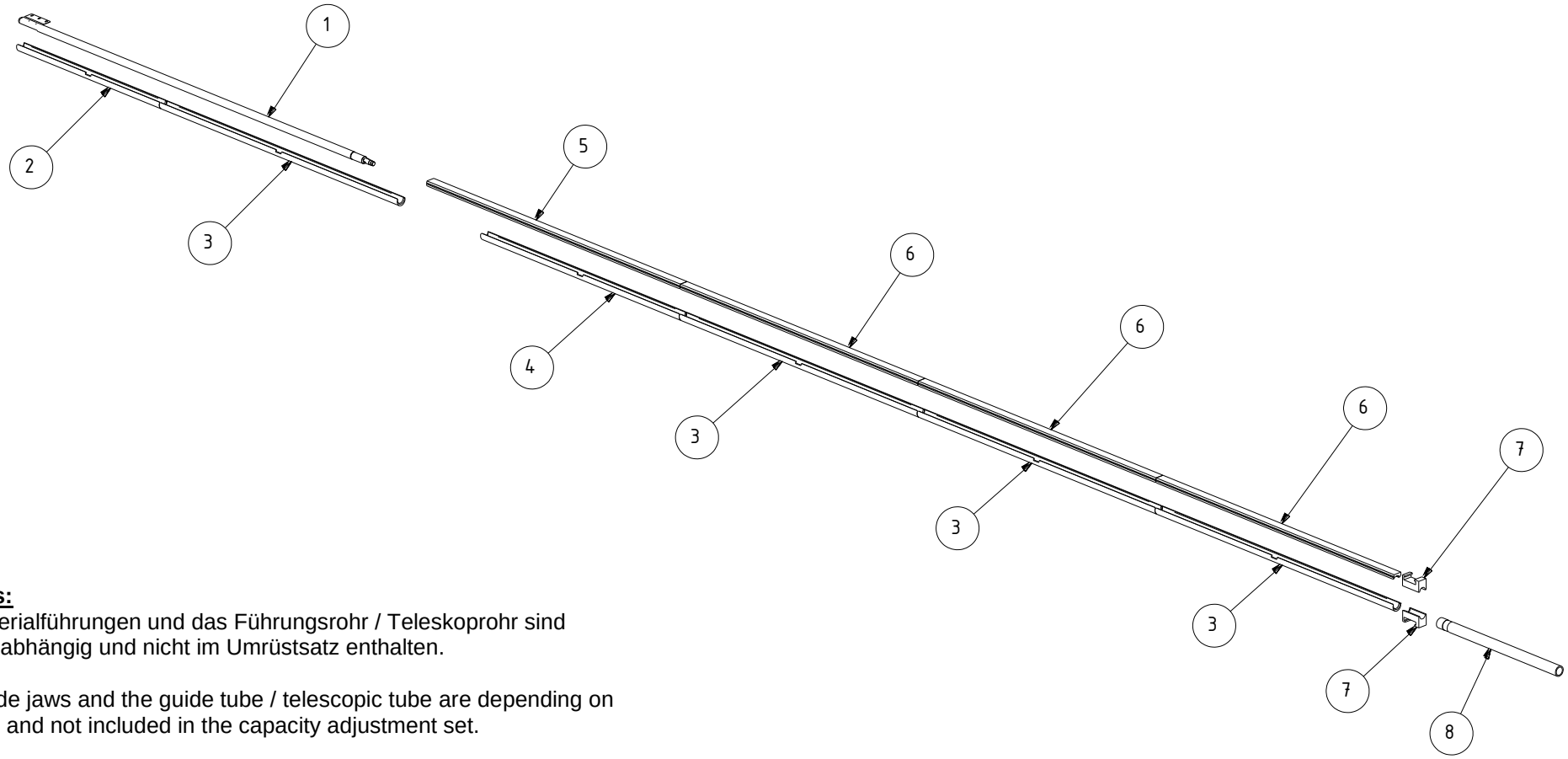
Umrüstsätze 1900 / Capacity adjustment sets 1900

Umrüstsatz komplett Capacity adjustment set complete		
	1405	**1655**
D05 AD	200002461	200002473
D05 BC	2077-422	
D07 AD		
D07 BC	2077-423	
D08 AD		
D08 BC	2077-424	
D10	2077-425	
D12	2077-426	
D13	2077-427	
D15	2077-428	
D16	2077-429	
D18	2077-430	
D20	2077-431	200006223
D22	2077-432	
D23	2077-433	

			Vorschubstange / Pusher	
Pos.	**Bezeichnung**	**Designation**	**1405**	**1655**
1	Vorschubstange	Pusher	1	1
2	Einlage unten 1000	Insert bottom 1000	2	2
3	Einlage unten 600	Insert bottom 600	1	1
4	Einlage unten 535	Insert bottom 535	1	1
5	Einlage oben 550	Insert top 550	2	2
6	Einlage oben 600	Insert top 600	2	2
	Einlage Verlängerung	Insert extension	-	1
7	Materialführung	Guide jaw	2	2
8	Führungsrohr	Guide tube	1	1

Umrüstsätze 3200; 4200 / Capacity adjustment sets 3200; 4200

(Zeichnung für Vorschubstangenlänge 1405 / Drawing for pusher length 1405)



Hinweis:
Die Materialführungen und das Führungsrohr / Teleskoprohr sind materialabhängig und nicht im Umrüstsatz enthalten.

Note:
The guide jaws and the guide tube / telescopic tube are depending on material and not included in the capacity adjustment set.

Umrüstsätze 3200 / Capacity adjustment sets 3200

Umrüstsatz komplett Capacity adjustment set complete		
	1405	**1655**
D05 AD	2072-953	2081-726
D05 BC	2072-954	2081-727
D07 AD	2072-955	2081-728
D07 BC	2072-956	2081-729
D08 AD	2072-957	2081-730
D08 BC	2072-958	2081-731
D10	2072-959	2081-732
D12	2072-960	2081-733
D13	2072-961	2081-734
D15	2072-962	2081-735
D16	2072-963	2081-736
D18	2072-964	2081-737
D20	2072-965	2081-738
D22	2072-966	2081-739
D23	2072-967	2081-740

			Vorschubstange / Pusher	
Pos.	**Bezeichnung**	**Designation**	**1405**	**1655**
1	Vorschubstange	Pusher	1	1
2	Einlage unten 600	Insert bottom 600	1	1
3	Einlage unten 1000	Insert bottom 1000	3	3
4	Einlage unten 835	Insert bottom 835	1	1
5	Einlage oben 1065	Insert top 1065	1	1
6	Einlage oben 1000	Insert top 10100	2	2
	Einlage Verlängerung	Insert extension	-	1
7	Materialführung	Guide jaw	2	2
8	Führungsrohr	Guide tube	1	1

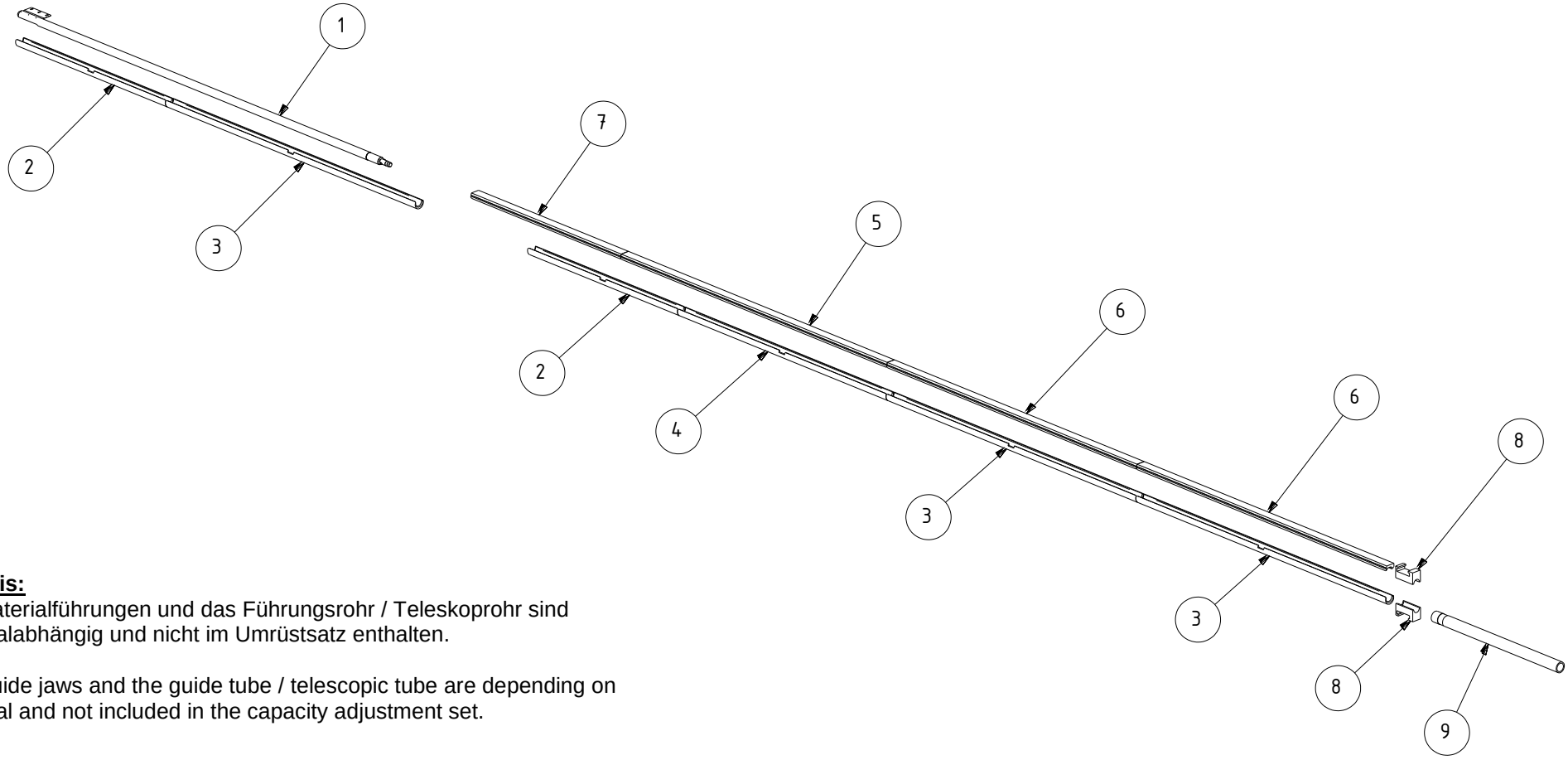
Umrüstsätze 4200 / Capacity adjustment sets 4200

Umrüstsatz komplett Capacity adjustment set complete		
	1405	1655
D05 AD		2081-756
D05 BC		2081-757
D07 AD	2073-171	2081-758
D07 BC	2073-172	2081-759
D08 AD	2073-173	2081-760
D08 BC	2073-174	2081-761
D10	2073-175	2081-762
D12	2073-176	2081-763
D13	2073-177	2081-764
D15	2073-178	2081-765
D16	2073-179	2081-766
D18	2073-180	2081-767
D20	2073-181	2081-768
D22	2073-182	2081-769
D23	2073-183	2081-770

			Vorschubstange / Pusher	
Pos.	Bezeichnung	Designation	1405	1655
1	Vorschubstange	Pusher	1	1
2	Einlage unten 600	Insert bottom 600	1	1
3	Einlage unten 1000	Insert bottom 1000	4	4
4	Einlage unten 835	Insert bottom 835	1	1
5	Einlage oben 1065	Insert top 1065	1	1
6	Einlage oben 1000	Insert top 1000	3	3
	Einlage Verlängerung	Insert extension	-	1
7	Materialführung	Guide jaw	2	2
8	Führungsrohr	Guide tube	1	1

Umrüstsätze 3800 / Capacity adjustment sets 3800

(Zeichnung für Vorschubstangenlänge 1405 / Drawing for pusher length 1405)



Hinweis:
Die Materialführungen und das Führungsrohr / Teleskoprohr sind materialabhängig und nicht im Umrüstsatz enthalten.

Note:
The guide jaws and the guide tube / telescopic tube are depending on material and not included in the capacity adjustment set.

Umrüstsätze 3800 / Capacity adjustment sets 3800

Umrüstsatz komplett Capacity adjustment set complete		
	1405	**1655**
D05 AD	2073-104	2081-741
D05 BC	2073-105	2081-742
D07 AD	2073-106	2081-743
D07 BC	2073-107	2081-744
D08 AD	2073-108	2081-745
D08 BC	2073-109	2081-746
D10	2073-110	2081-747
D12	2073-111	2081-748
D13	2073-112	2081-749
D15	2073-113	2081-750
D16	2073-114	2081-751
D18	2073-115	2081-752
D20	2073-116	2081-753
D22	2073-117	2081-754
D23	2073-118	2081-755

			Vorschubstange / Pusher	
Pos.	**Bezeichnung**	**Designation**	**1405**	**1655**
1	Vorschubstange	Pusher	1	1
2	Einlage unten 600	Insert bottom 600	2	2
3	Einlage unten 1000	Insert bottom 1000	3	3
4	Einlage unten 835	Insert bottom 835	1	1
5	Einlage oben 1065	Insert top 1065	1	1
6	Einlage oben 1000	Insert top 1000	2	2
7	Einlage oben 600	Insert top 600	1	1
	Einlage Verlängerung	Insert extension	-	1
8	Materialführung	Guide jaw	2	2
9	Führungsrohr	Guide tube	1	1

Materialführungen / Guide jaws

Material-führungen	Ident-Nr.	zu verarbeitende Materialdurchmesser
Guide jaws	**Ident-No.**	**Diameter of material to be machined**
D2,5	2060-082	1,5 mm - 2 mm
D04	2060-083	2 mm - 3 mm
D05	2067-337	3 mm – 4 mm
D06	2060-084	4 mm - 5 mm
D07	2060-085	5 mm - 6 mm
D08	2060-086	6 mm - 7 mm
D09	2067-338	7 mm - 8 mm
D10	2060-087	8 mm - 9 mm
D11	2067-339	9 mm -10 mm
D12	2060-088	10 mm - 11 mm
D13	2060-089	11 mm - 12 mm

Material-führungen	Ident-Nr.	zu verarbeitende Materialdurchmesser
Guide jaws	Ident-No.	**Diameter of material to be machined**
D14	2060-090	12 mm - 13 mm
D15	2060-091	13 mm - 14 mm
D16	2067-340	14 mm -15 mm
D17	2060-092	15 mm - 16 mm
D18	2067-341	16 mm - 17 mm
D19	2060-093	17 mm - 18 mm
D20	2060-094	18 mm - 19 mm
D21	2067-342	19 mm - 20 mm
D22	2060-095	20 mm - 21 mm
D23	2067-343	21 mm - 22 mm
D24	2060-096	22 mm - 23 mm

Achtung !

Die Materialführungen müssen mindestens 1 mm größer sein als die Materialstange!
Beispiel: Materialdurchmesser 8 mm
Materialführung D 10

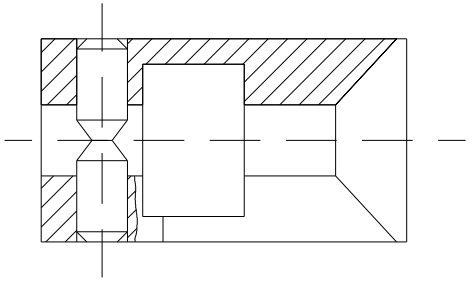
Attention !

The material guides must be at least 1 mm wider than the material bar diameter!
Example: Diameter of material 8 mm
Guide jaws D 10

Vorschubstangen / Pushers

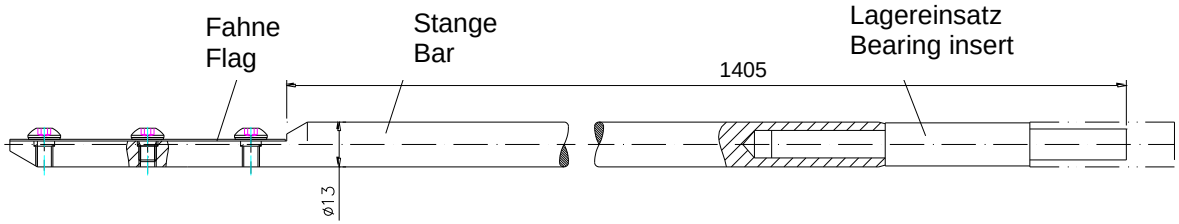
Vorschubstangen D05 bis D23 werden mit Lagereinsätzen für SHK-Spannhülsen (mit Querstift), bei Vorschubstange D05 (mit Gewinde) geliefert. Bei der Bestellung ist immer die Vorschubstangenlänge anzugeben (Standard 1405).

Pushers D05 to D23 are supplied with bearing inserts for SHK-clamping sleeves (with cross pin), or feed bar D05 (with thread). When ordering, the feed bar length should always be indicated (standard 1405).

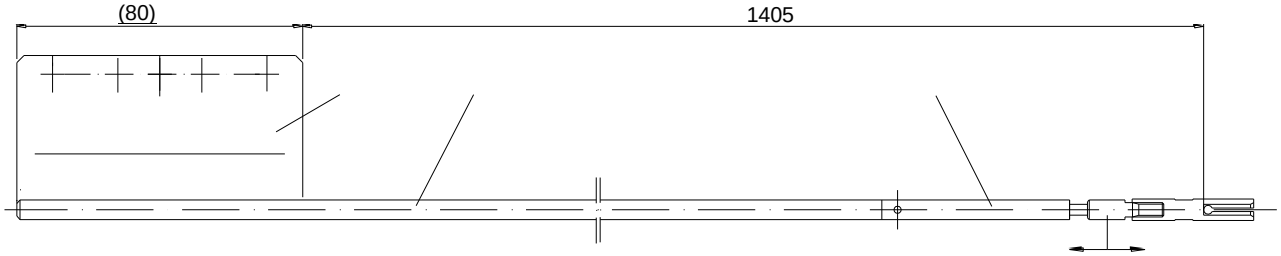


Spannhülse SHK für Lagereinsatz mit Querstift
Clamping sleeve SHK for bearing insert with cross pin

Vorschubstangenlänge 1405 mm / Pusher length 1405 mm
Vorschubstangendurchmesser / Pusher diameter D23; D22; D20; D18, D16; D15; D12; D10; D8, D7, D5



Vorschubstangenlänge 1405 mm / Pusher length 1405 mm
Vorschubstangendurchmesser D5/A;D / Pusher diameter D7/A;D



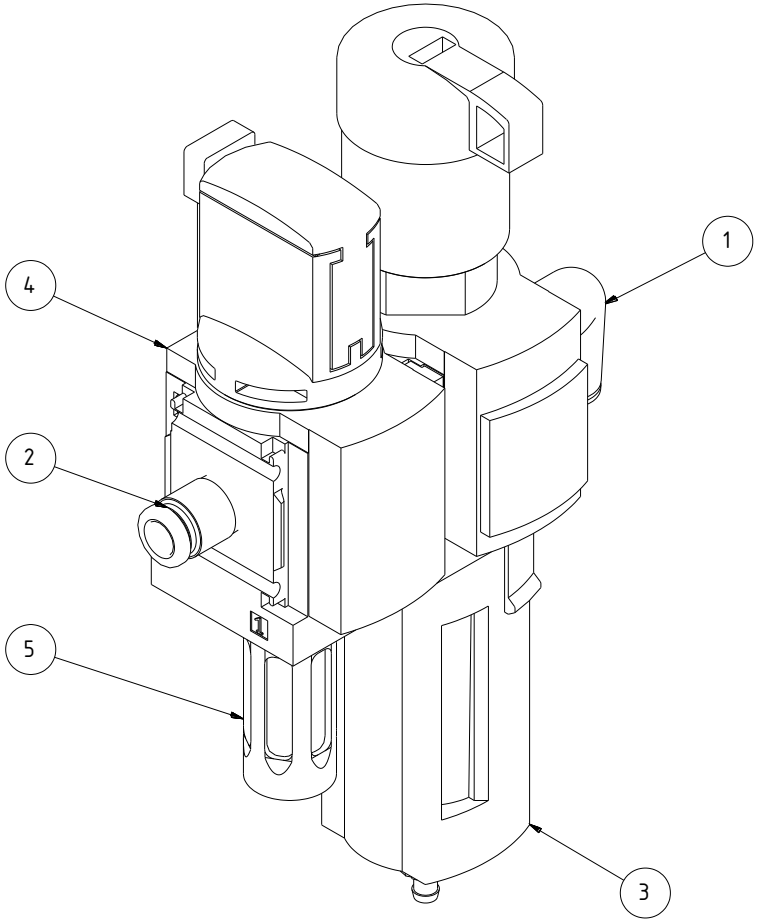
Axialspiel ca. 0,7 mm. Der Spindelkopf muss nach dem Einbau ca. 0,7 mm leicht verschiebbar sein!
End play appr. 0,7 mm. After installation the spindle head must be movable by appr. 0,7 mm.

Führungsrohr / Guide tube

	Führungsrohr kpl. Guide tube compl.	Führungsrohr Guide tube	Reduzierhülse Reducing sleeve	Gewindestift Set screw
Ø	Ident Nr. / Ident-No	Stück/Piece	Stück/Piece	Stück/Piece
D5	2049-127	2055-580	2014-915	0497-738
D7	2049-128	2005-331	2014-915	0497-738
D8	2049-135	2043-868	2014-915	0497-738
D10	2049-129	2005-330	2014-915	0497-738
D12	1049-130	2005-329	2005-682	0497-738
D13	2049-131	2030-949	2005-682	0497-738
D15	2049-132	2005-328	2005-682	0497-738
D16	2049-133	2034-991	2005-682	0497-738
D18	2006-127	-	-	-
D20	2005-326	-	-	-
D22	2020-085	-	-	-
D23	2060-599	-	-	-

Wartungseinheit / Maintenance unit

200005229



Wartungseinheit / Maintenance unit

200005229

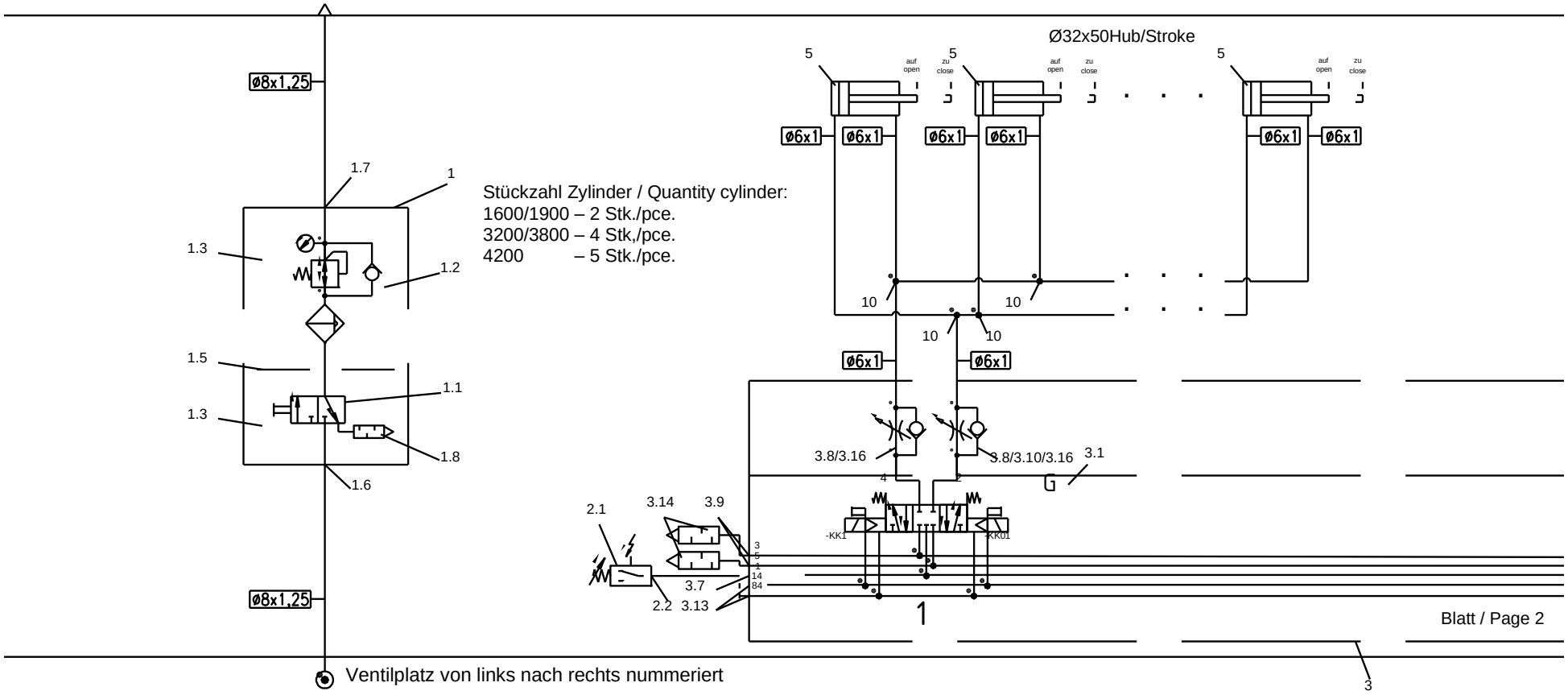
Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2067-008	Steckverschraubung	Plug-in screwing	
2	2068-343	Steckverschraubung	Plug-in screwing	
3	2079-894	Filter-Regelventil	Filter-regulator unit	
4	200004160	Einschaltventil	On/Off valve	
5	2074-205	Schalldämpfer	Silencer	

Pneumatikpläne / Pneumatic diagrams

Seite 1 / page 1

100055342

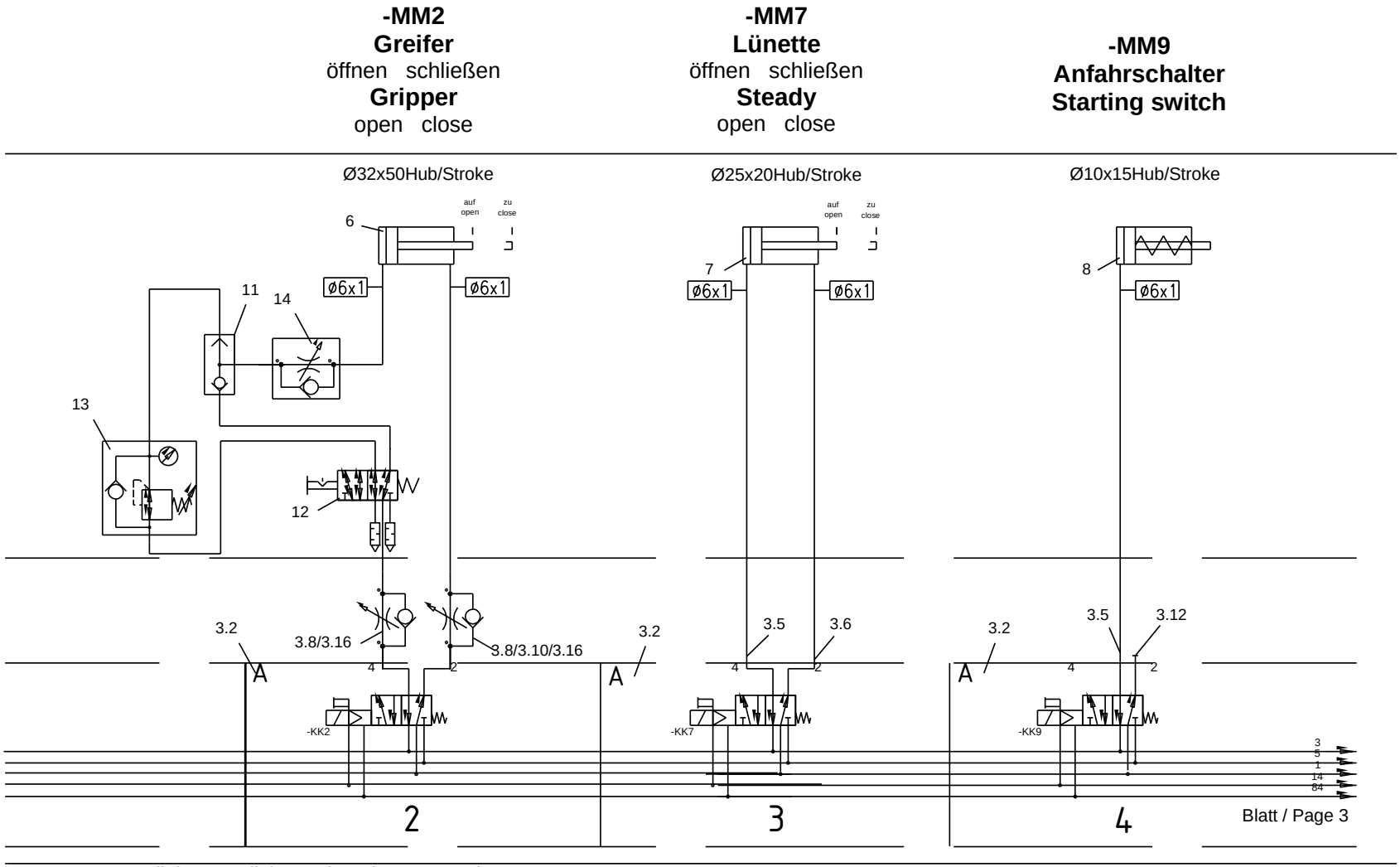
-MM1
Führungskanal
öffnen schließen
Guide channel
open close



Stückzahl Zylinder / Quantity cylinder:
1600/1900 – 2 Stk./pce.
3200/3800 – 4 Stk,/pce.
4200 – 5 Stk./pce.

Ventilplatz von links nach rechts nummeriert
Place of valve numbered from left to right

Seite 2 / page 2



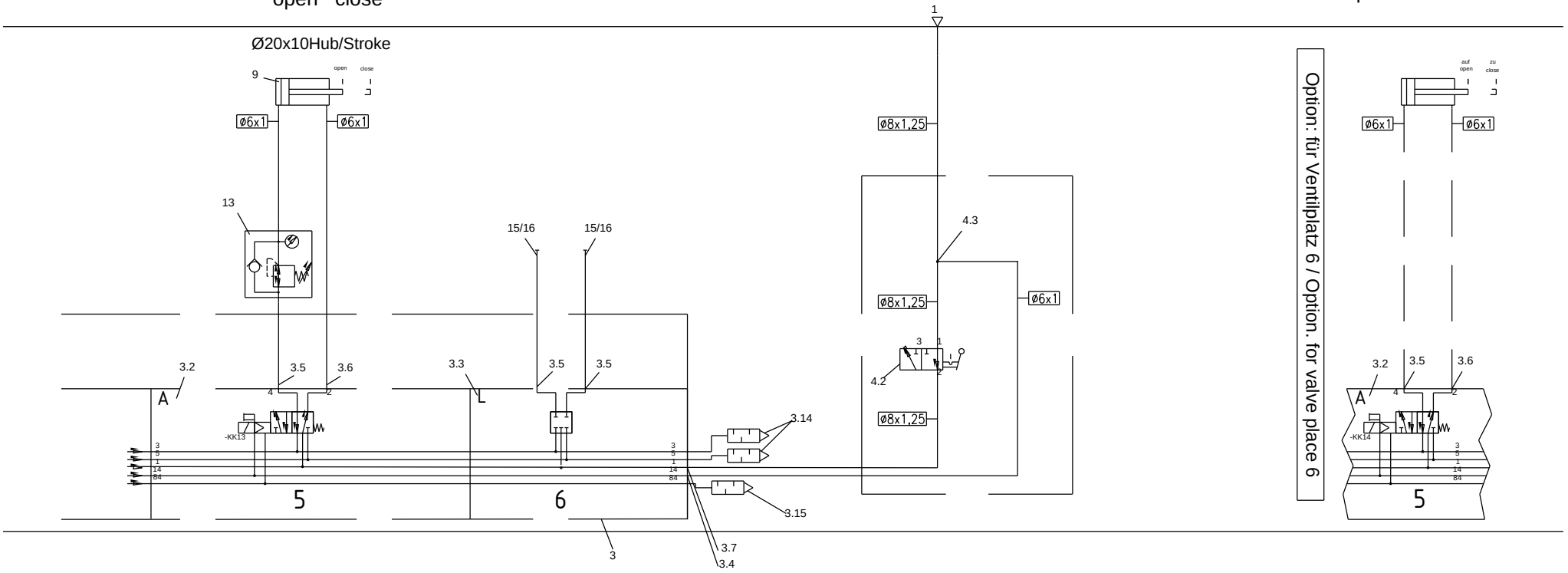
Ventilplatz von links nach rechts nummeriert

Place of valve numbered from left to right

Seite 3 / page 3

-MM13
Pneumatikkupplung
öffnen schließen
Pneumatic coupeling
open close

-MM14
Lünette Drehmaschine
öffnen schließen
Steady lathe
open close



Pneumatikteile / Pneumatic parts

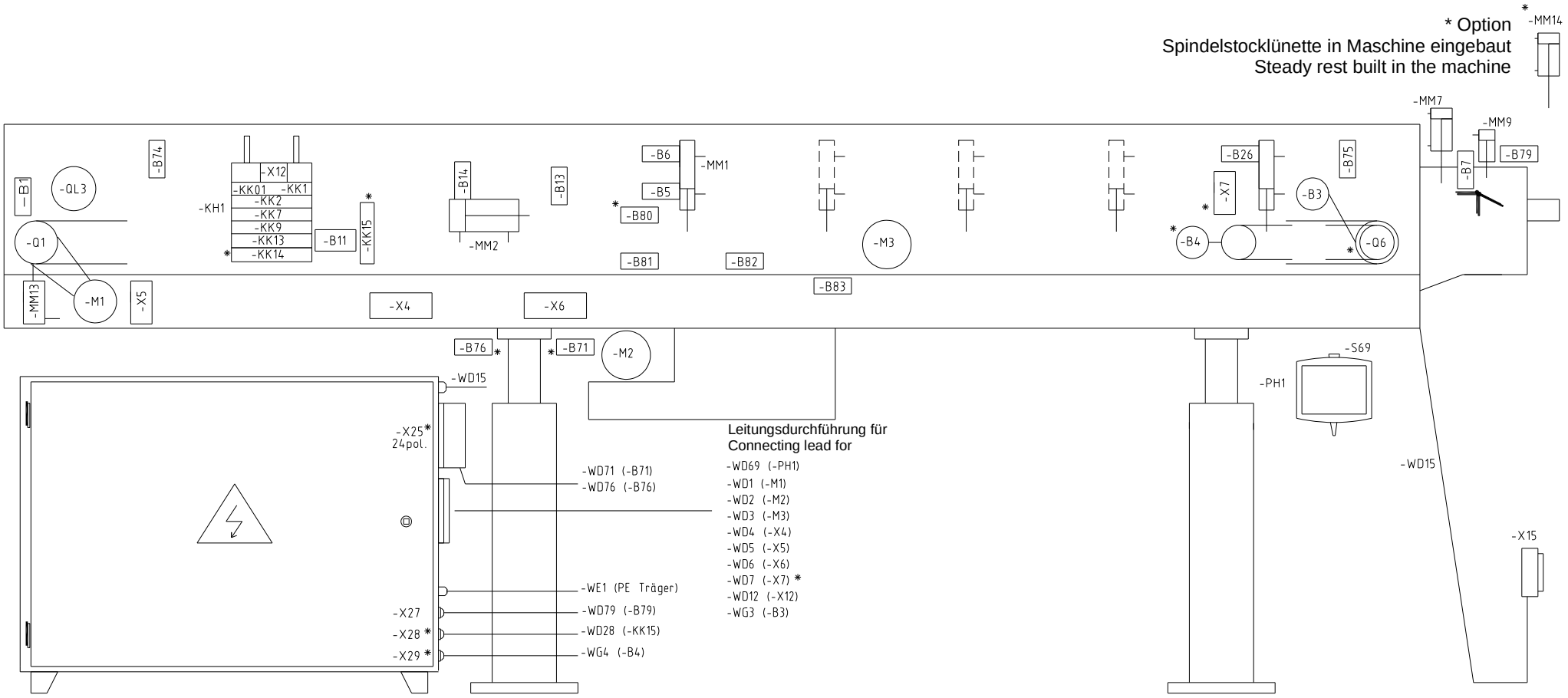
Pos. Item	Ident. Nr. Ident-no.	Bezeichnung	Designation	Kommentar Remarks
1	200005229	Wartungseinheit	Maintenance unit	
1.1	200004160	Einschaltventil manuell	On/Off valve	
1.2	2079-894	Filter-Regelventil	Filter-regulator valve	
1.3	2079-896	Abdeckkappe (hinten)	Cap (rear)	
1.4	2079-897	Befestigungswinkel	Fixing angle	
1.5	200000944	Modulverbinder	Module connector	
1.6	2068-343	Steckverschraubung	Plug-in screwing	
1.7	2067-008	Steckverschraubung	Plug-in screwing	
1.8	2074-205	Schalldämpfer	Silencer	
2	100049628	Druckschalter kpl.	Pressure switch compl.	
2.1	2058-325	Druckschalter	Pressure switch	
2.2	2068-343	Steckverschraubung	Plug-in screwing	
3	100045589	Ventilinsel 6-fach	Valve terminal 6-fold	
3.1	100042337	Magnetventil	Solenoid valve	
3.2	2080-203	Magnetventil	Solenoid valve	
3.3	2079-423	Abdeckplatte	One-way restrictor	
3.4	2038-348	Steckverschraubung	Plug-in screwing	
3.5	2057-833	Steckverschraubung	Plug-in screwing	
3.6	2057-800	Steckverschraubung	Plug-in screwing	
3.7	2067-008	Steckverschraubung	Plug-in screwing	
3.8	2057-797	Drossel-Rückschlagventil	One-way restrictor	

Pneumatikteile / Pneumatic parts

Pos. Item	Ident. Nr. Ident-no.	Bezeichnung	Designation	Kommentar Remarks
3.9	100008518	L-Verschraubung	L-screwing	
3.10	100049160	Verlängerung	Extension	
3.11	2058-890	Blindstopfen B 1/4"	Filler plug B 1/4"	
3.12	2007-149	Blindstopfen B 1/8"	Filler plug B 1/8"	
3.13	2079-425	Blindstopfen B M5-B	Filler plug B M5-B	
3.14	2001-420	Schalldämpfer	Silencer	
3.15	2080-293	Schalldämpfer	Silencer	
3.16	2080-257	Dichtscheibe	Sealing washer	
4	100051565	Entlüftung kpl.	Ventilation compl.	
4.1	100051423	Halteblech Entlüftung	Retaining plate for ventilation	
4.2	100046626	Absperrventil	Shut-off valve	
4.3	2049-120	Steckverbindung	Plug-in connection	
4.4	2058-876	Steckhülse	Plug-in sleeve	
4.5	2057-799	Steckverbindung	Plug-in connection	
5	2059-378	Zylinder	Cylinder	
6	2059-378	Zylinder	Cylinder	
7	2067-941	Zylinder	Cylinder	
8	2031-086	Zylinder	Cylinder	
9	2044-376	Zylinder	Cylinder	
10	2039-064	Steckverbindung	Plug-in connection	
11	2044-153	Oderglied	OR gate	

Elektro-Ersatzteile / Electrical spare parts

Lademagazin / Loading magazine



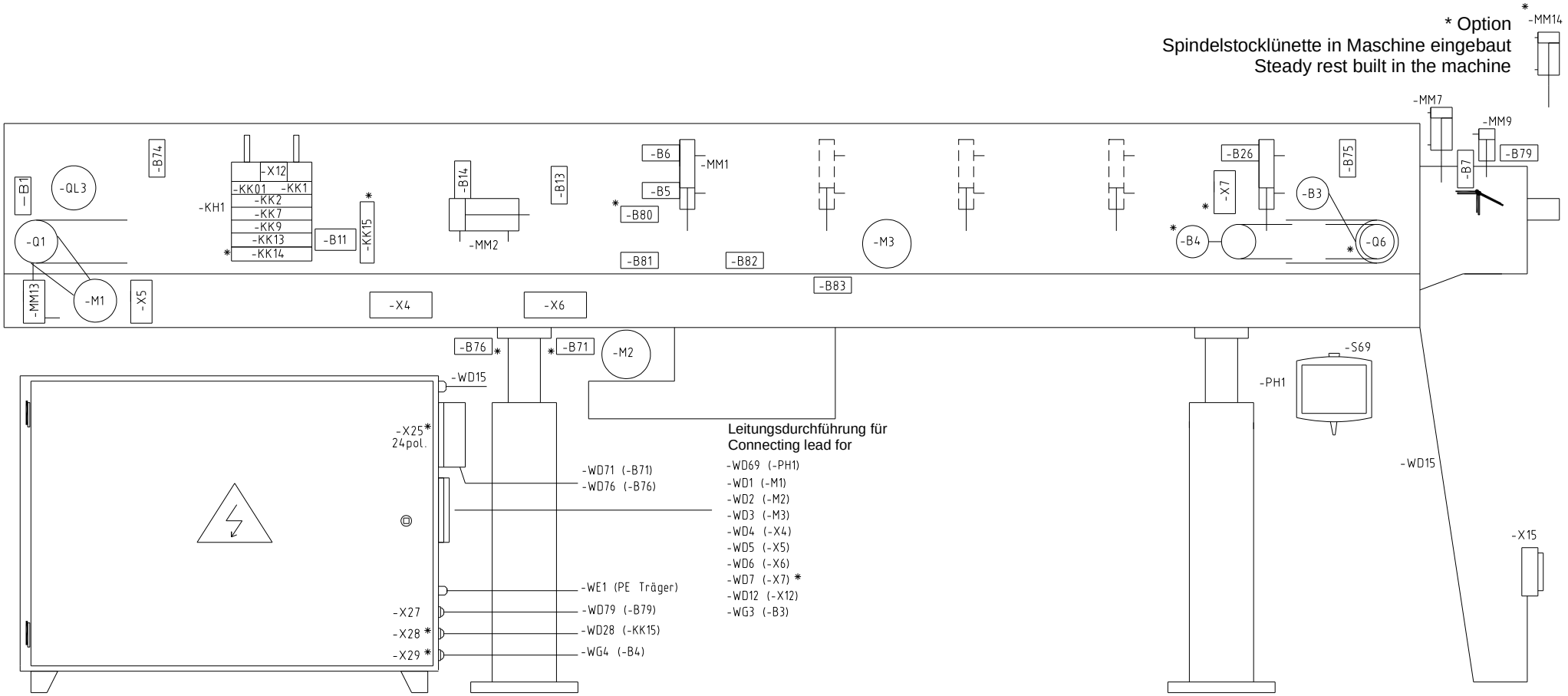
Elektro-Ersatzteile / Electric spare parts

Lademagazin / Loading magazine

Ident. Nr. Ident-no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
200005144	Stecker für Druckschalter	Plug for pressure switch	für / for –B11
2035-221	Näherungsschalter	Proximity switch	-B5,-B6,-B14
2079-304	Näherungsschalter	Proximity switch	-B26
2018-648	Näherungsschalter	Proximity switch	-B1, -B81
2023-003	Näherungsschalter	Proximity switch	-B7,-B13
200005983	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B79
200005984	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B79
2069-382	Y-Verteiler mit Stecker M12	Y-junction with plug M12	für / for -B1,-B14
2042-579	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B7,-B13,-B83
2042-872	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B1
2042-578	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B14
2042-582	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B5,-B6
2063-956	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B74
2071-797	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für / for –B75
2071-113	Sensorleitung mit Stecker M12	Sensor lead with plug M12	für -B26
200006497	Drehgeber	Encoder	-B3
2070-626	Anschlussleitung für Drehgeber	Connecting lead for encoder	für / for –B3
200005841	Anschlussleitung f. Ventilinsel	Connecting lead for valve terminal	für / for -KH1
200004314	Aktor-Sensor-Box 4fach mit 2x7 poligem Stecker	Aktor-Sensor-Box 4fold w. 2x7 pin.plug	-X6
200004319	Aktor-Sensor-Box 8fach mit 2x10 poligem Stecker	Aktor-Sensor-Box 8fold w. 2x10 pin.plug	-X4
2056-916	Universalreflextaster	Reflex sensor	-B83

Elektro-Ersatzteile / Electrical spare parts

Lademagazin / Loading magazine



Elektro-Ersatzteile / Electric spare parts

Lademagazin / Loading magazine

Ident. Nr. Ident-no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
2056-923	Glasfaserlichtleitkabel 500mm	Lead 500mm	an / to -B83
2056-918	Befestigungsschellen BS3	Fixing BS3	an / to -B83
2032-072	Näherungsschalter Schließer	Proximity switch Closer	-B82
200004323	Anschlussleitung	Connecting lead	für / for -M1
200004331	Klemmgehäuse kpl. mit Anschlussleitung	Terminal enclosure	-X5
2063-952	Sicherheitsschalter	Safety switch	-B74,-B75
200004980	Stecker 24polig	Plug 24 pin	für / for option -B76, -B71
200005144	Stecker für Druckschalter	Plug for pressure switch	-B11
2065-961	Sensorleitung	Sensor lead	-B81,-B82
2042-583	Y-Verteiler	Y-junction	-B81/B7,-B82/B13
2072-137 2069-653	Sicherheitsschalter A;D Sicherheitsschalter B;C	Safety switch A;D Safety switch B;C	-B79
2075-203	Betätiger	Actuator	für / for -B79
2074-284	Distanzstück	Distance	für / for -B79

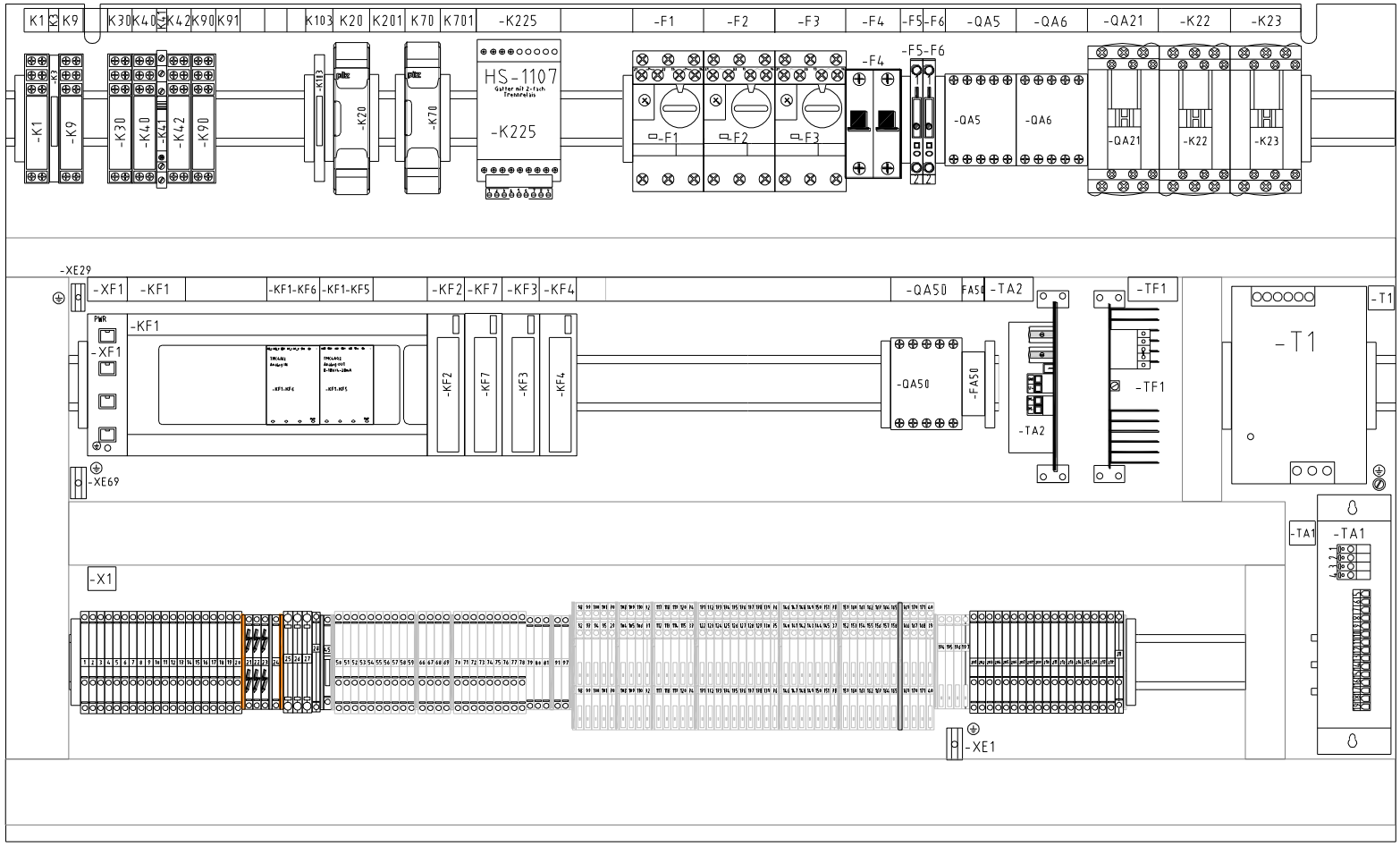
Elektro-Ersatzteile / Electric spare parts
Bedientableau / Control panel

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
2070-620	Steckverbinder	Plug connector	
200004585	Beschriftung Steckklemme	Label plug-in terminal	

Elektro-Ersatzteile / Electric spare parts

Schalttafel / Switch board

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



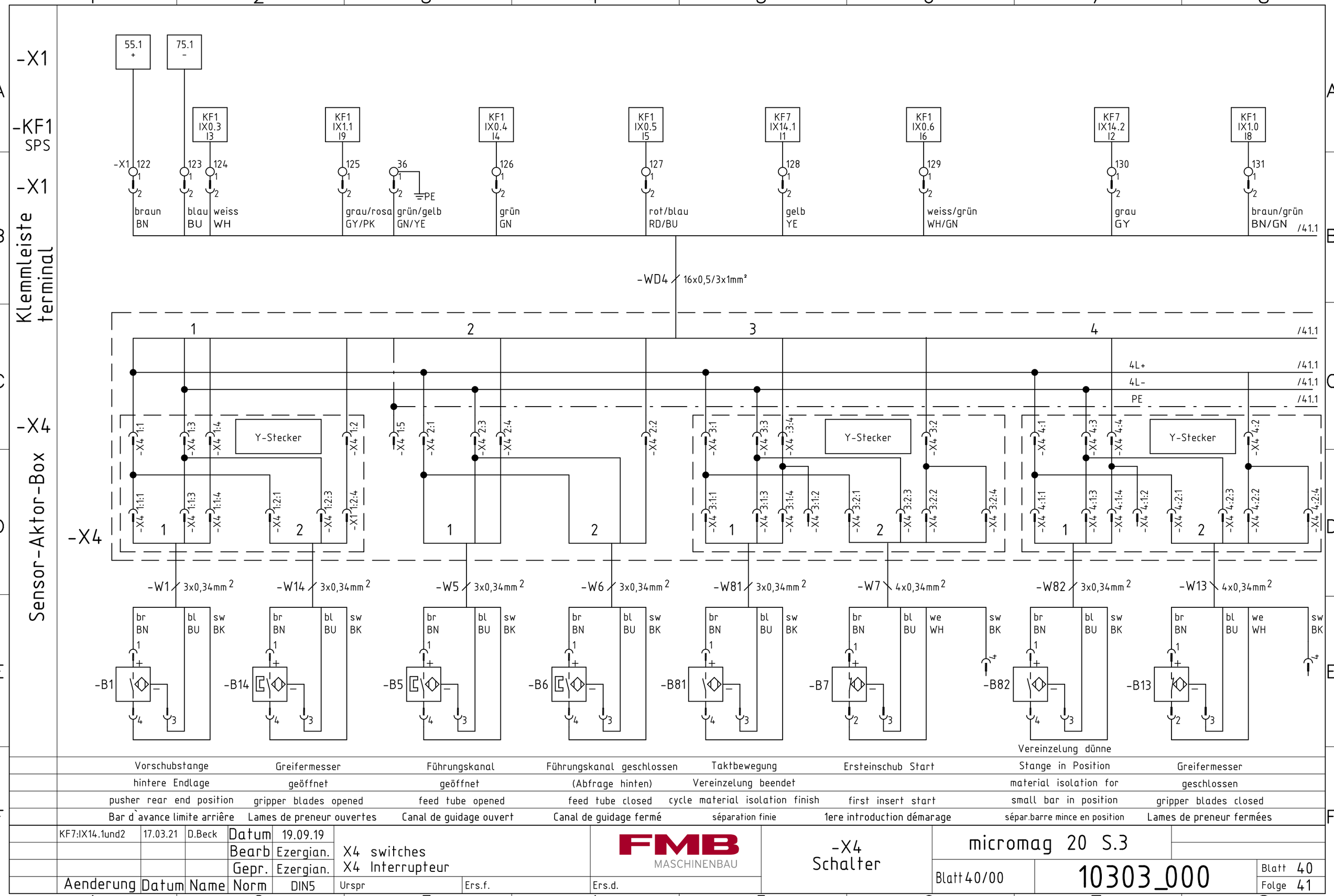
Elektro-Ersatzteile / Electric spare parts

Schalttafel / Switch board

Ident. Nr. Ident- no.	Bezeichnung	Designation	Kommentar Remarks
200004212	Drehzahlsteller 20A	Speed regulator 20A	-TA1
2056-921	Drehzahlsteller 10A mit Poti Strombegrenzung	Speed regulator 10A with potentiometer	-TA2
2023-983	Verstärkerbauteil	Amplifier module	-TF1
200004173	Schaltnetzteil 200-500V	Switching power supply	-T1
200006005	Motorschutzschalter 4-6,3A	Motor protection switch 4-6,3A	-F1
200006004	Motorschutzschalter 1-1,6A	Motor protection switch 1-1,6A	-F3
200006007	Hilfsschalter	Auxiliary switch	für / for -F1
200006274	Erweiterung Klemmleiste	Extension terminal strip	-X1 (option)
200004802	Modul Kanalzuhaltung	Module channel locking	-K225
0943-304	Sicherungsautomat 2x4A	Automatic cut-out 2x4A	-F4
2063-668	Sicherungs-Reihenklemme	Fuse-series terminal	-F5, -F6
2075-206	Gerätesicherung 4 A-Träge	Delay-action fuse 4 A	-F5
2063-670	Gerätesicherung 2 A-Träge	Delay-action fuse 2 A	-F6
200004220	Motorschütz 3H 1Ö1S 24V DC 4 kW	Motor relay 3H 1Ö1S 24V DC 4 kW	auftragsbez -QA21, -K23 as per order -QA21, -K23
200004221	Motorschütz 3H 1Ö1S 24V DC 5 kW	Motor relay 3H 1Ö1S 24V DC 5 kW	auftragsbez -K22 as per order -K22
200005996	Motorschütz 3H 1Ö 24V DC 4 kW	Motor relay 3H 1Ö 24V DC 4 kW	-K22,-QA5,-QA6
2071-375* Pilz	Not-Aus Schaltgerät	Safety relay	-K20 auftragsbez -K70 as per order -K70
200009625* Phoenix	Not-Aus Schaltgerät PSR-MC45	Safety relay PSR-MC45	(alternatives Bauteil/alternative component) -K20 auftragsbez -K70 as per order -K70
2020-946	Relais 2WE 5A 40529024	Relay 2WE 5A 40529024	-K30,-K40,-K42
2025-516	Relaisfassung	Casing for relay	für / for -K30,-K40,-K42
2025-517	Modul mit LED	Module with LED	für / for -K30,-K40,-K42

Elektro-Ersatzteile / Electric spare parts
Schalttafel / Switch board

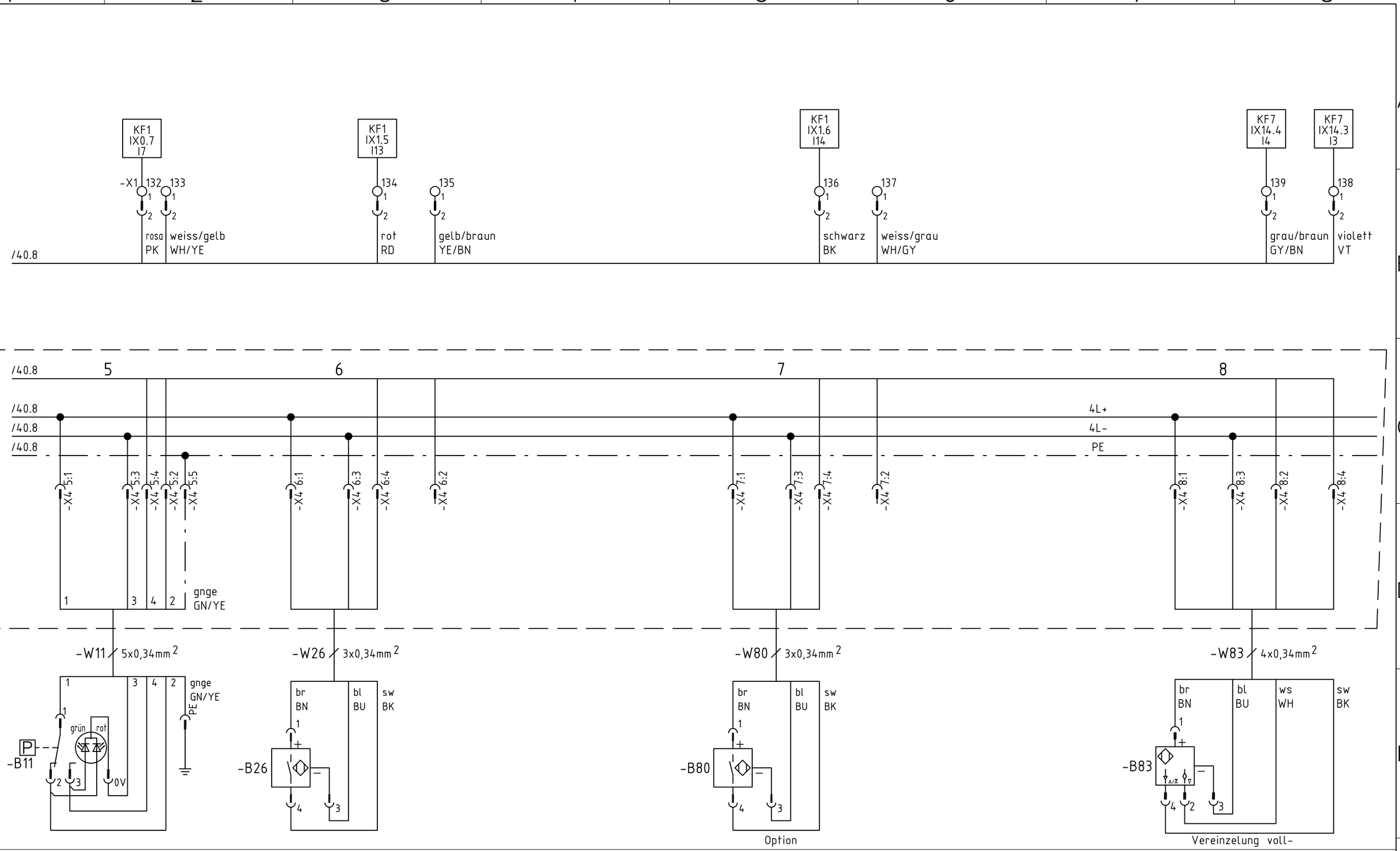
Ident. Nr. Ident- no.	Bezeichnung	Designation	Kommentar Remarks
2042-853	Miniaturrelais	Miniature relay	-K3, -K103
2042-852	Grundklemme für Relais	Basic terminal for relays	für / for -K3, -K103
200004165	SPS Medicon	PLC Medicon	-KF1
200001648	Ethernet Switch TM4	Ethernet Switch TM4	-XF1
200004166	Eingangskarte TM3	Input card TM3	-KF2
200001646	Eingangskarte TM3 8E	Input card TM3 8E	-KF7
200004167	Ausgangskarte TM3	Output card TM3	-KF3
200001647	Ausgangskarte TM3	Output card TM3	-KF4
200004168	Analogmodul TMC4 24OUT	Analogue module TMC4 24OUT	-KF1,-KF5
2071-376	Sicherheitsrelais Erweiterungsgerät	Emergency-Stop extension device	-K201; K701
2049-124	Optokopplermodul 24V DC 2A	Opto-electronic coupler 24V DC 2A	-K41
200006002 200006001	Motorschutzschalter 0,4-0,63A 200V Motorschutzschalter 0,4-0,63A 400V	Motor protection switch 0,4-0,63A 200V Motor protection switch 0,4-0,63A 400V	-F2 -F2
200006007	Hilfsschalter	Auxiliary switch	für/for -F2
200005997	Motorschütz 3H 1Ö 24V DC 2,2 kW	Motor relay 3H 1Ö 24V DC 2,2 kW	-QA50
2001-368	Motorentstörglied RC 3/022-400 BU	Motor screening unit RC 3/022-400 BU	-FA50
Option für Traub-Unimag 4-Schnittstelle:			
200003256	Profibus DP	Profibus DP Slave Modul	
200004037	Profibus Adapter	Profibus adapter	-X40



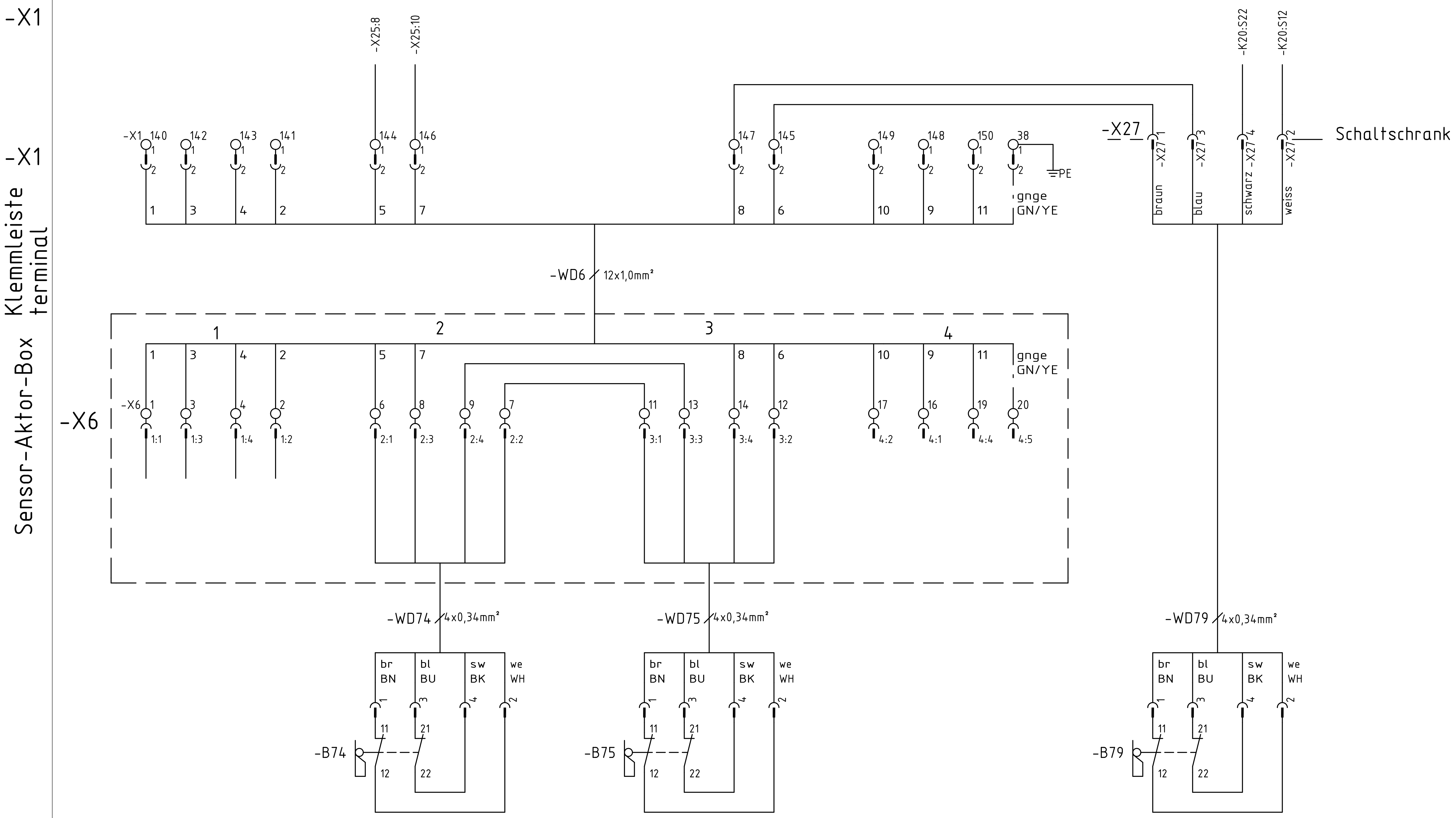
Vorschubstange	Greifermesser	Führungskanal	Führungskanal geschlossen	Taktbewegung	Ersteinschub Start	Stange in Position	Greifermesser
hintere Endlage	geöffnet	geöffnet	(Abfrage hinten)	Vereinzelung beendet		material isolation for	geschlossen
pusher rear end position	gripper blades opened	feed tube opened	feed tube closed	cycle material isolation finish	first insert start	small bar in position	gripper blades closed
Bar d`avance limite arrière	Lames de preneur ouvertes	Canal de guidage ouvert	Canal de guidage fermé	séparation finie	1ere introduction démarage	sépar.barre mince en position	Lames de preneur fermées

Vereinzelung dünne

KF7:IX14.1und2	17.03.21	D.Beck	Datum	19.09.19	X4 switches X4 Interrupteur	FMB MASCHINENBAU	-X4 Schalter
			Bearb	Ezergian.			micromag 20 S.3
			Gepr.	Ezergian.			Blatt 40/00 — 10303_000 — Blatt 40 / Folge 41
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	



KF7:IX.14.3und4	17.03.21	D.Beck	Datum	19.09.19	-X4 switches -X4 Interrupteur	FMB MASCHINENBAU	-X4 Schalter	micromag 20 S.3
			Bearb	Ezergian.				
			Gepr.	Ezergian.				Blatt 41/00 — 10303_000 — Blatt 41 / Folge 42
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		



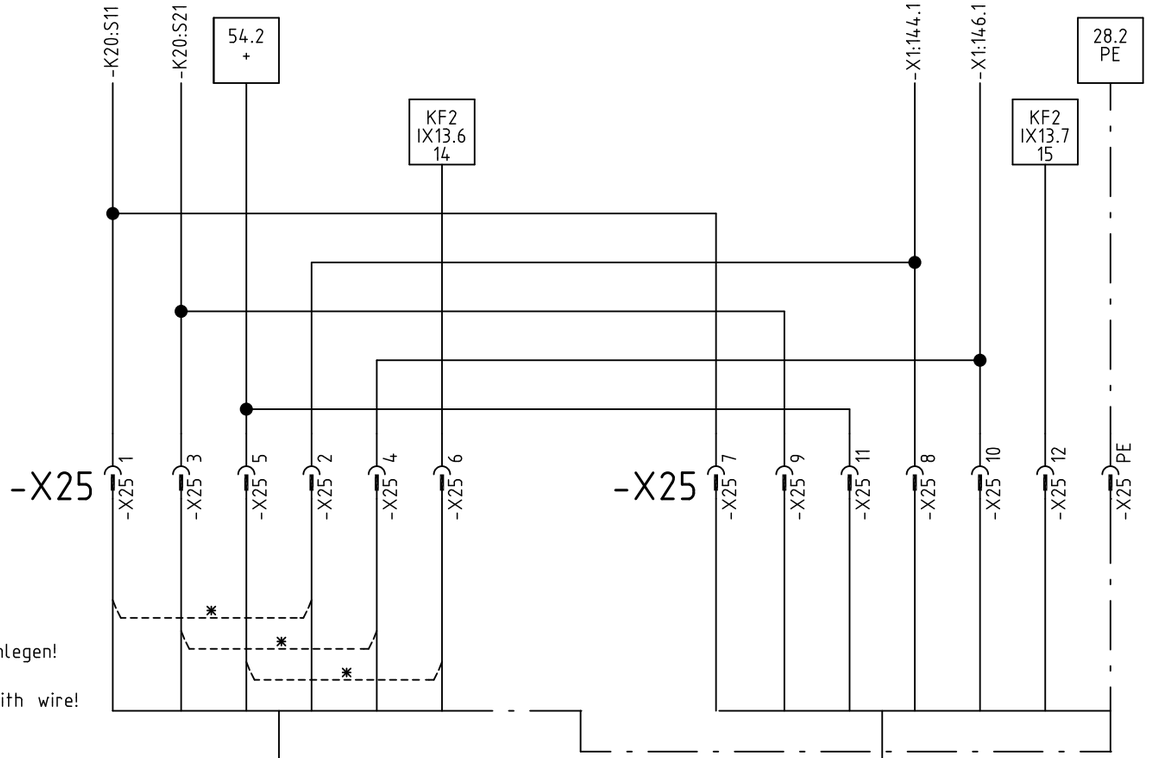
Abdeckung geschlossen	Abdeckung geschlossen	Abdeckung an Lünette
Schalter hinten	Schalter vorne	geschlossen
covering closed, switch in the rear	covering closed, switch in front	cover on steady closed
Carénage fermé	Carénage fermé	Carénage fermé lunette

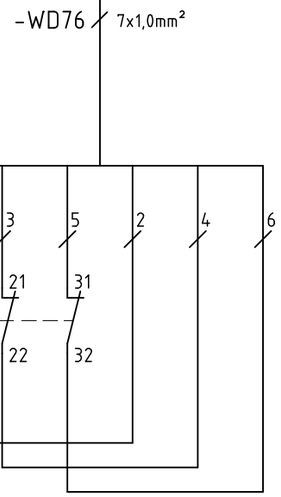
			Datum	19.09.19	-X6 switches safety -X6 Interrupteur	FMB MASCHINENBAU	-X6 Schalter Sicherheit
			Bearb	Ezergian.			micromag 20 S.3
			Gepr.	Ezergian.			Blatt 42/00 — 10303_000 — Blatt 42, Folge 43
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

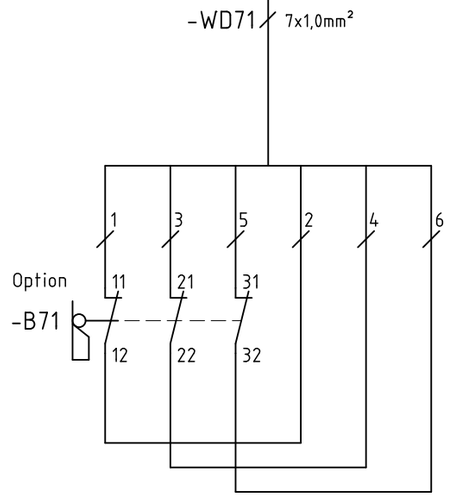
-X1

-KF2
SPS

Klemmleiste Schaltschrank
terminal cabinet



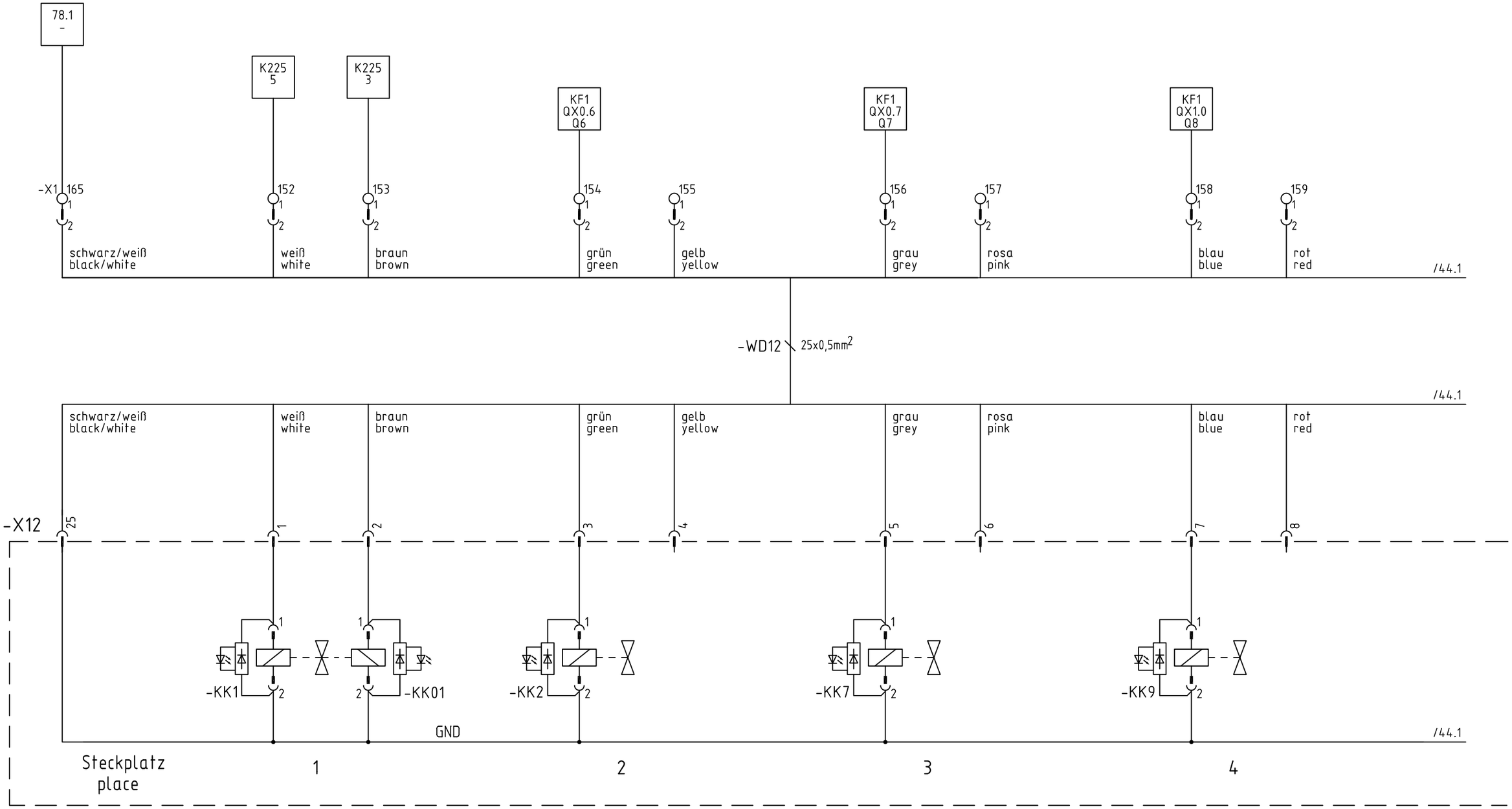




Option Verschiebeeinrichtung -B76 Verschiebeeinrichtung in Position	Option shifting device -B76 shifting device in position
Option bei Lang - Kurz Drehmaschine Option long - short - mode lathe	
-B76 Verschiebeeinrichtung in K - Position shifting device in S - position	-B71 Verschiebeeinrichtung in L - Position shifting device in L - position

Verschiebeeinrichtung in K-Position shifting device in S-position	Verschiebeeinrichtung in L-Position shifting device in L-Position

				Datum	05.06.20	-X25 switches shifting device -X25 Interrupteur	FMB MASCHINENBAU	-X25 Schalter Verschiebeeinrichtung	micromag 20 S.3
				Bearb	Mahr				
				Gepr.	Mahr				Blatt 43/00 — 10303_000 — Blatt 43 / Folge 45
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	



Zuführrohr öffnen	Zuführrohr schließen	Greifermesser schliessen	Lünette schließen	Rückstellung Anfahrschalter -B7
feed tube open	feed tube close	gripper blades close	steady on	initial position -B7
Ouvrir le tube d`alimentation	Fermer le tube d`alimentation	Fermer les lames du preneur	lunette	interrupteur d'accostage -B7

				Datum	19.09.19	-X12 solenoid valves -X12 vannes	FMB MASCHINENBAU	-X12 Magnetventile	micromag 20 S.3
				Bearb	Ezergian.				
				Gepr.	Ezergian.				Blatt 45/00 — 10303_000 — Blatt 45, Folge 46
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	

-X1

-KF1
SPS

-X1

Klemmleiste
terminal

KF1
QX1.1
Q9

KF1
QX1.3
Q11

-X1 160 161 162 163 164

schwarz
black

violett
violet

grau/rosa
grey/pink

rot/blau
red/blue

grün/weiß
green/white

braun/grün
brown/green

gelb/weiß
yellow/white

braun/gelb
brown/yellow

grau/weiß
grey/white

braun/grau
brown/grey

weiß/rosa
white/pink

braun/rosa
brown/pink

blau/weiß
blue/white

braun/blau
brown/blue

rot/weiß
red/white

braun/rot
brown/red

/43.1

KF1
QX1.2
Q10

78.2
-

38.1
PE

Schaltschrank
-X28

-X28:1 braun/brown
-X28:3 blau/blue
-X28:4 schwarz/black
-X28:2 weiß/white
-X28:5 grau/grey

-WD28 3x0,34mm²

/43.1

-X12

9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

-WE12 6mm² GNGE

PE

Maschinenträger
machine support

-KH1

Ventilblock
solenoid valves

-KK13

-KK14

/43.1 GND

Steckplatz
place

5 6

br
BN

bl
BU

gn/ge
GN/YE

PE

-KK15

Option

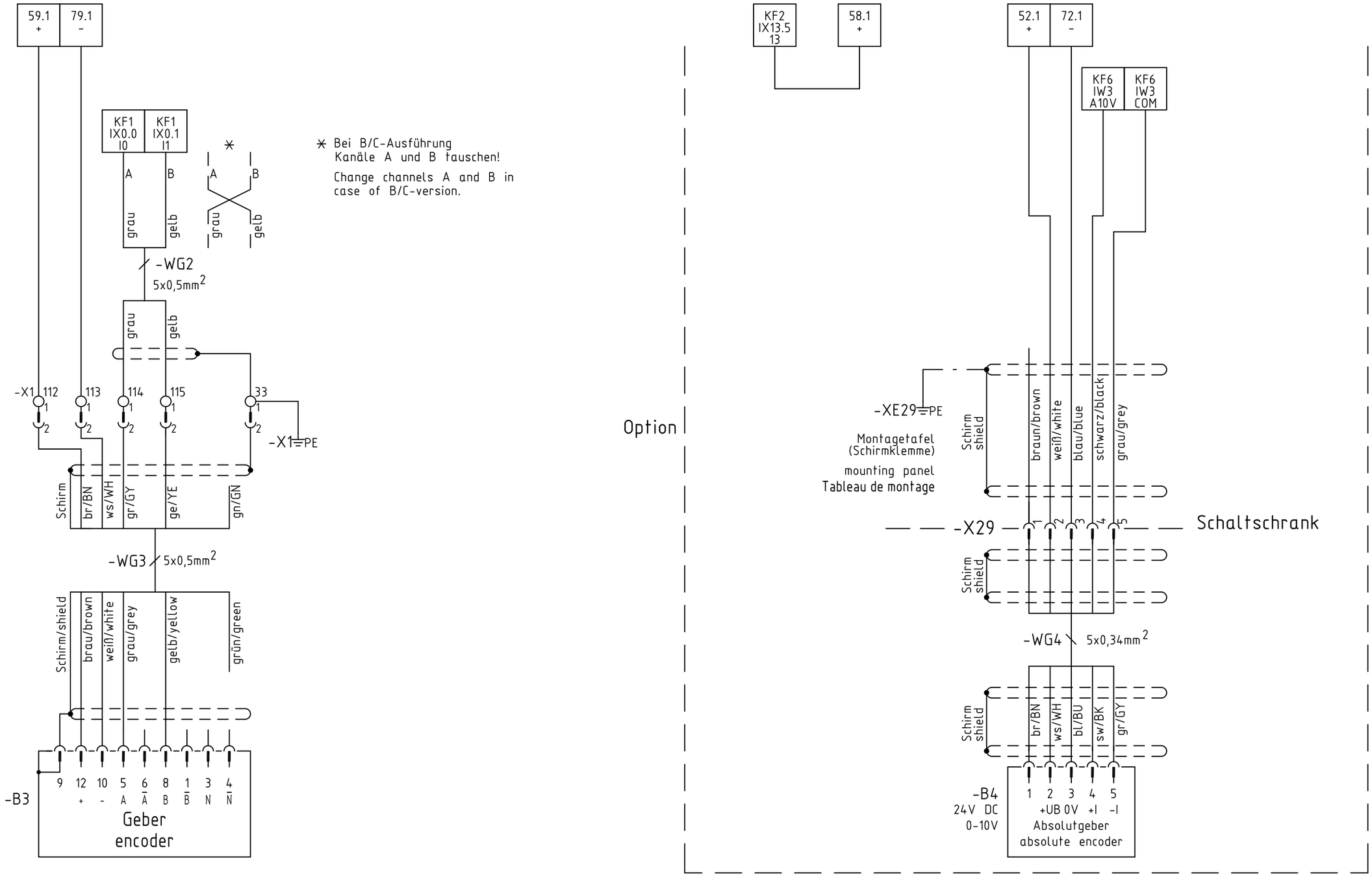
Pneumatische
Vorschubkupplung
pneum. clutch
pneumatique accoupl. d`avance

Lünette Drehautomat
Spindelstocklünette
steady lathe
Lunette tour

Option

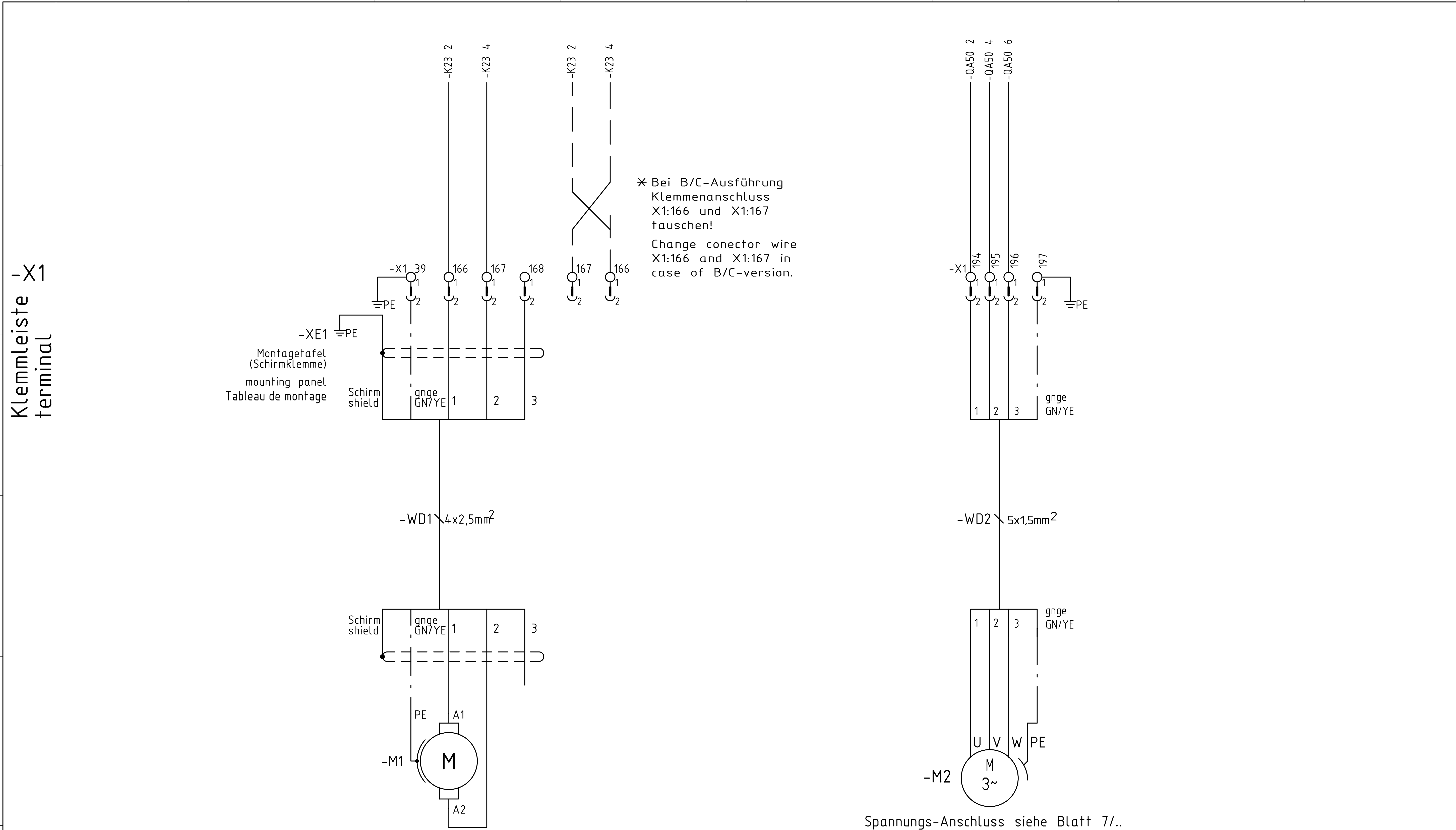
Ölabblaseinrichtung
oil wiper unit
système d'échappement d'huile

				Datum	19.09.19	-X12 solenoid valves -X12 vannes	FMB MASCHINENBAU	-X12 Magnetventile	micromag 20 S.3
				Bearb	Ezergian.				
				Gepr.	Ezergian.				Blatt 46/00 — 10303_000 — Blatt 46 / Folge 48
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	



Drehgeber Vorschub		Drehrichtungsumschaltung:	Geber
		bei Ausführung A/D	Wegerfassung Spindelstocklünette
encoder advance		Eingang beschalten	encoder
encodeur l'avance		version A/D	encodeur

B4 BC->AD	02.02.21	Reitz	Datum	19.09.19	-B3, -B4 encoder,rotation B/C -B3, -B4 encoder,l'inversion B/C	FMB MASCHINENBAU	-B3,-B4 Geber Umschaltung B/C	micromag 20 S.3
			Bearb	Ezergian.				
			Gepr.	Ezergian.				Blatt 48/00
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	10303_000
								Blatt 48 Folge 49

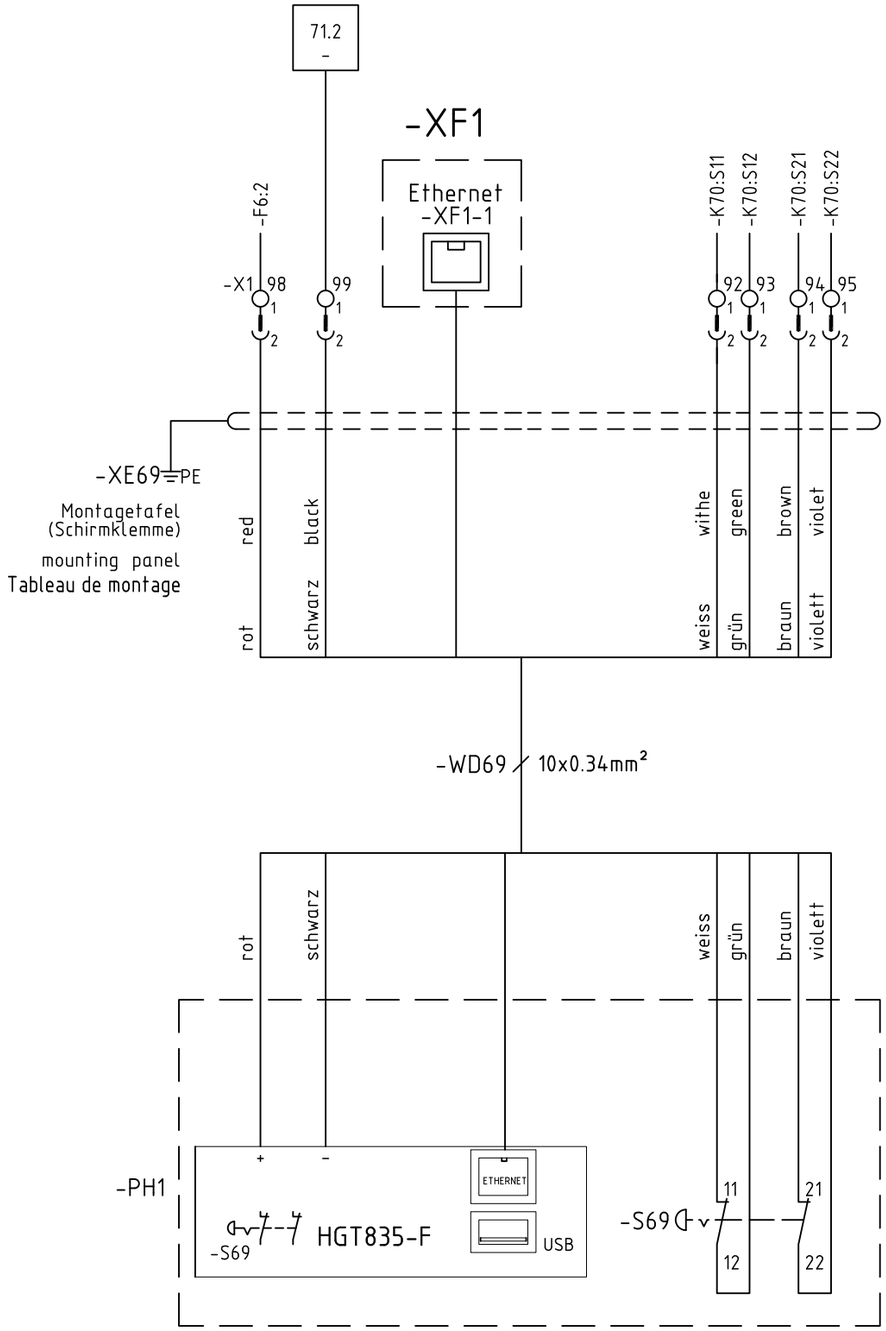


Antriebsmotor — Ölpumpe

driving motor — oil pump

moteur — pompe a huile

Aenderung	Datum	Name				
Datum	19.09.19	motors	FMB MASCHINENBAU	Motoren	micromag 20 S.3	
Bearb	Ezergian.	moteurs			Blatt 49/00	10303_000
Gepr.	Ezergian.				Blatt 49	Folge 51
Norm	DIN5	Urspr	Ers.f.	Ers.d.		



-X1

-X1

Klemmleiste
terminal

Bedientableau

Not-Halt

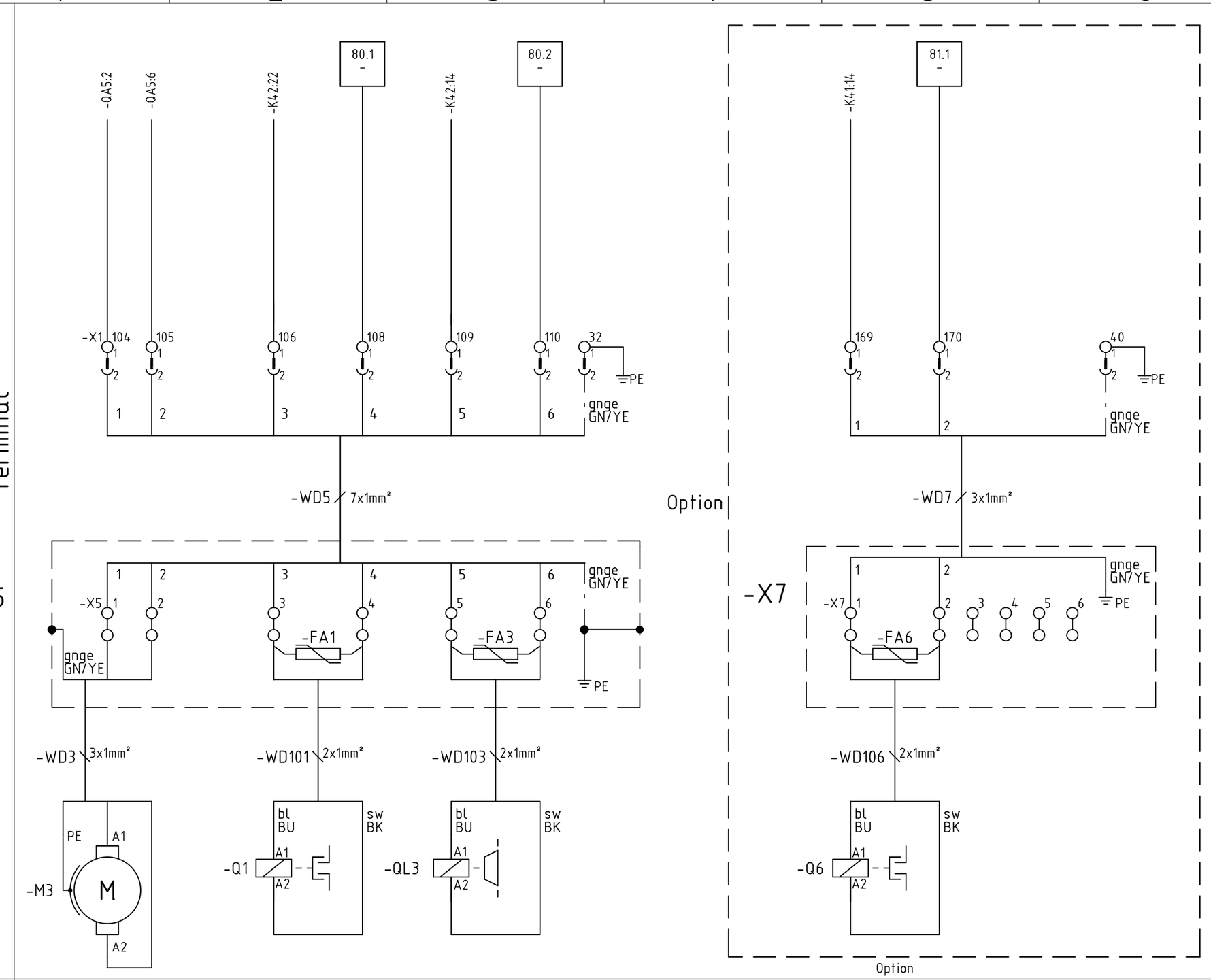
control panel

emergency stop

Tableau de commande

Arrêt d´urgence

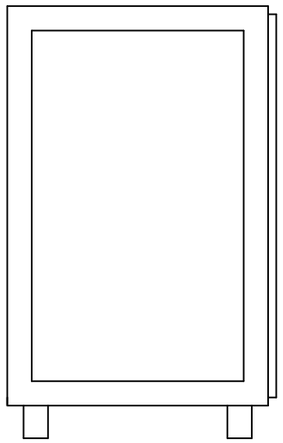
				Datum	19.09.19	-PH1 control panel -PH1 Tableau de commande	FMB MASCHINENBAU	-PH1 Bedientableau	micromag 20 S.3
				Bearb	Ezergian.				
				Gepr.	Ezergian.				Blatt 51/00 — 10303_000 — Blatt 51 / Folge 52
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		

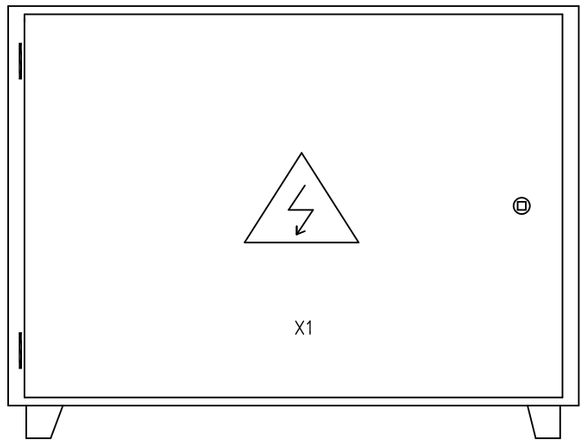


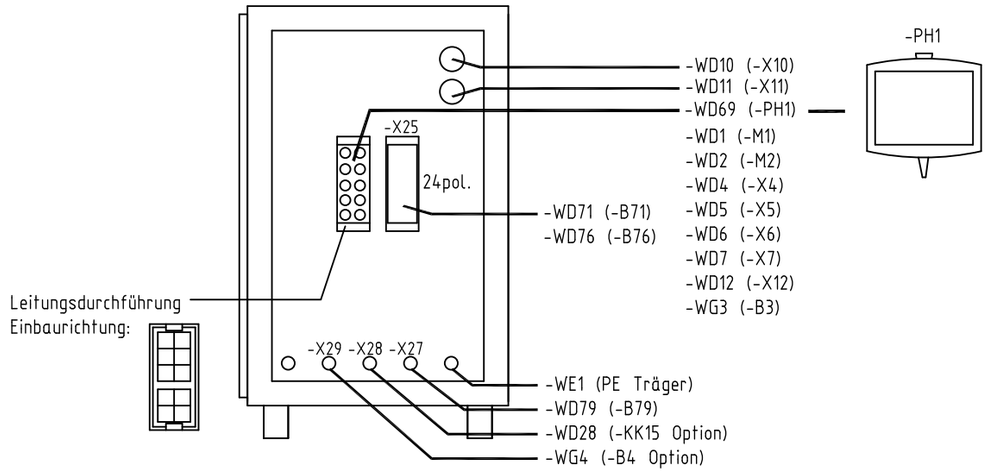
Antriebsmotor	Vorschubkupplung	Bremse	Synchronkupplung					
Vereinzelung								
driving motor material isolation	clutch	brake	Synchronization clutch					
moteur séparer barre	accouplement d'avance	frein	accouplement synchronisation					

M3: 3 x 1,5mm²	16.03.21	D.Beck	Datum	19.09.19	-X5, -X7 clutches, brake -X5, X7 accouplements, frein	FMB MASCHINENBAU	-X5,-X7 Kupplungen Bremse	micromag 20 S.3
			Bearb	Ezergian.				
			Gepr.	Ezergian.			Blatt 52/00	10303_000
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 52 Folge 59

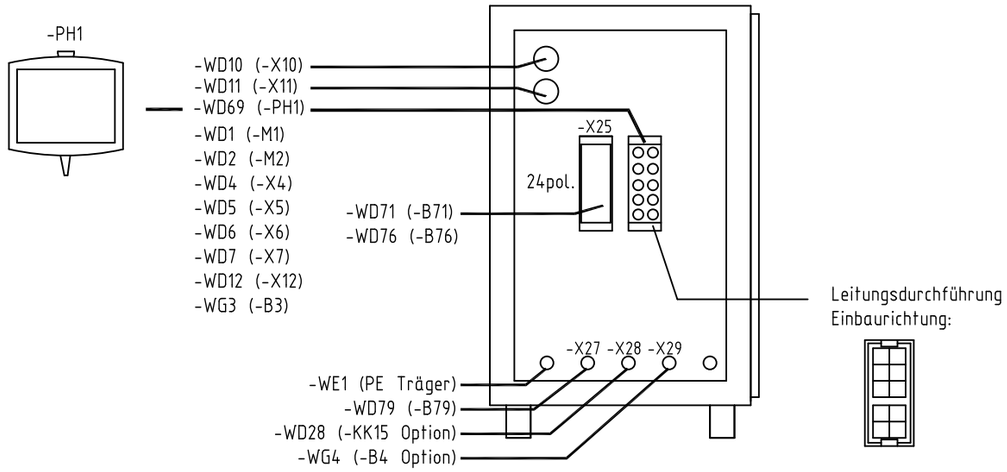
Variante A / B

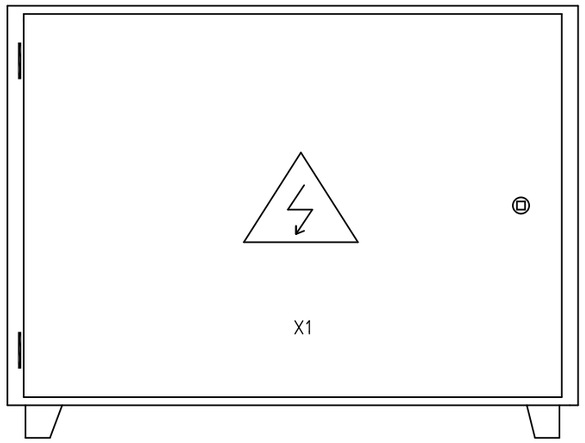


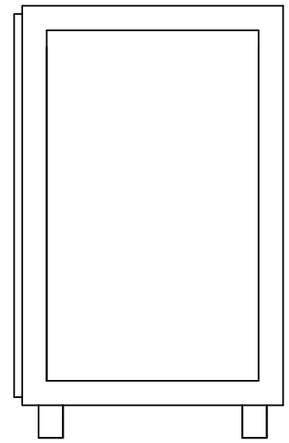




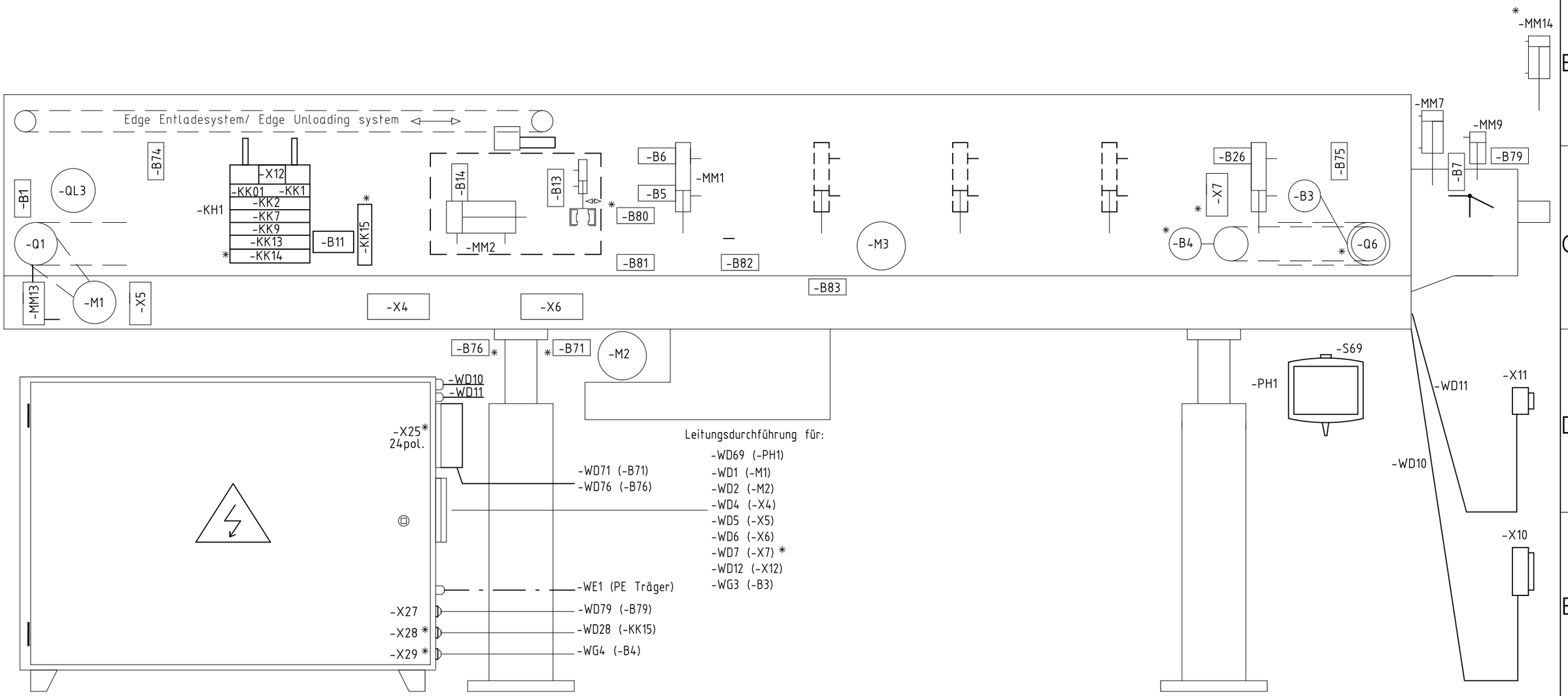
Variante C / D







				Datum	11.10.22	plan of cables plan de ligne	FMB MASCHINENBAU	Stecker- Leitungsanordnung	micromag 20 S.3
				Bearb	Mahr				
				Gepr.	Mahr				Blatt 59/19
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	10303_000
									Blatt 59 Folge 60



* Option

* option

			Datum	11.10.22	device arrangement Disposition des appareils	FMB MASCHINENBAU	Geräteanordnung	micromag 20 S.3
			Bearb	Mahr				
			Gepr.	Mahr				Blatt 60/1465 — 10303_000 — Blatt 60 / Folge --
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	