FMB
MASCHINENBAU

turbo RS 4-45

Operating instructions

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turbo RS 4-45, series 1

Confirmation number from: 2203152

Editorial deadline: 2023-11-14

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Operating instructions

1, 1, en_US

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1 General

1.1 Operating instructions

Product versions and special equipment

The operating instructions cover several versions of the described product. You can see which version of the product you have in the field "Type" on the name plate. ➚ *"Name plate" on page 7*.

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/attachment 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 12*.

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

Reasonably foreseeable misuse

- Non-observance of the requirements on the material bars. ↗ *"Requirements on the material bars" on page 57*.
- Operation with asymmetric profile bars without consultation with FMB.

- Operation with special profiles without consultation with FMB.
- Operation with non-homogenous material bars (imbalance).
- Processing outside of the permitted area (diameter, length). ➚ *"Technical data of the loading magazine" on page 12*.
- Use of unintended fuel. ➚ *"Lubricant" on page 14*.
- 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 24*.
- 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.

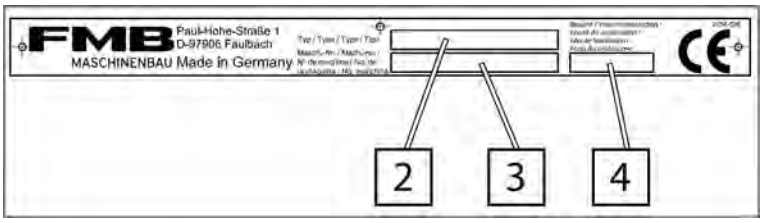
**Personnel who have received training for the product, are familiar with the functions and have been made aware of the risks. The training can be done by FMB or by a person who has already received training.

***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

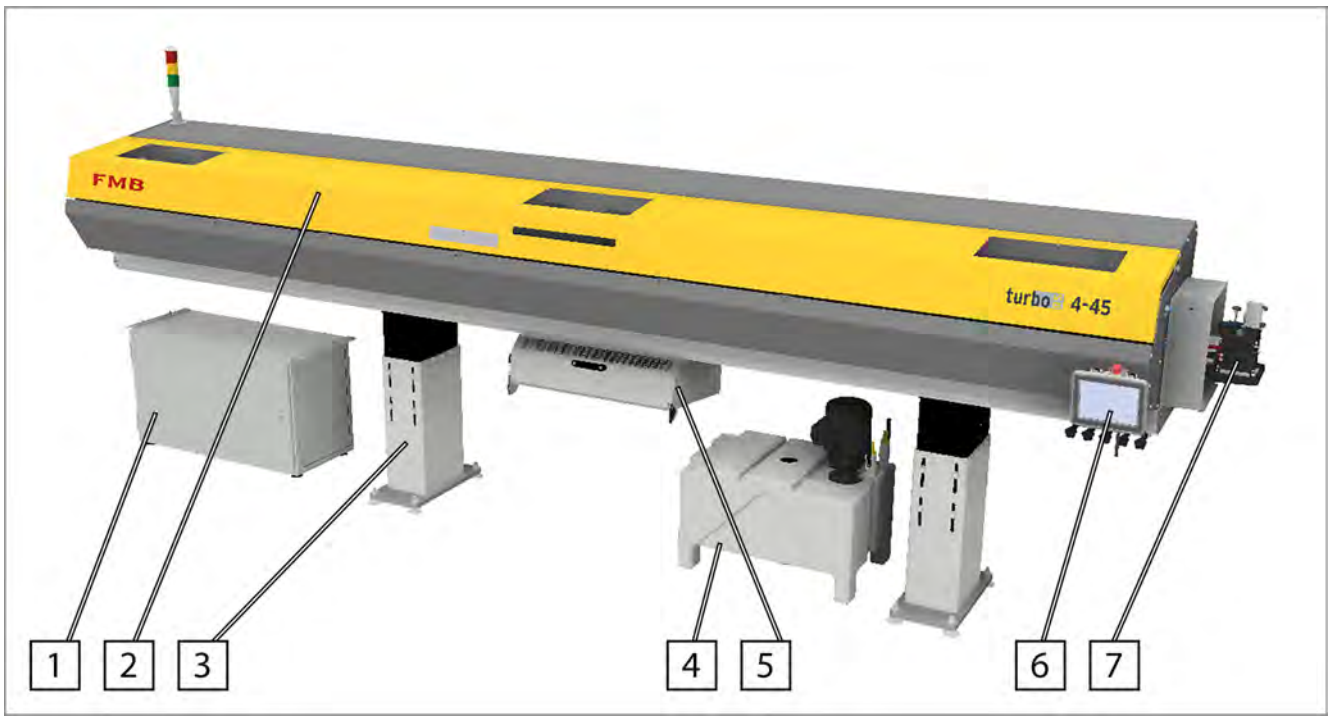
The name plate is attached to the loading magazine in position 1.



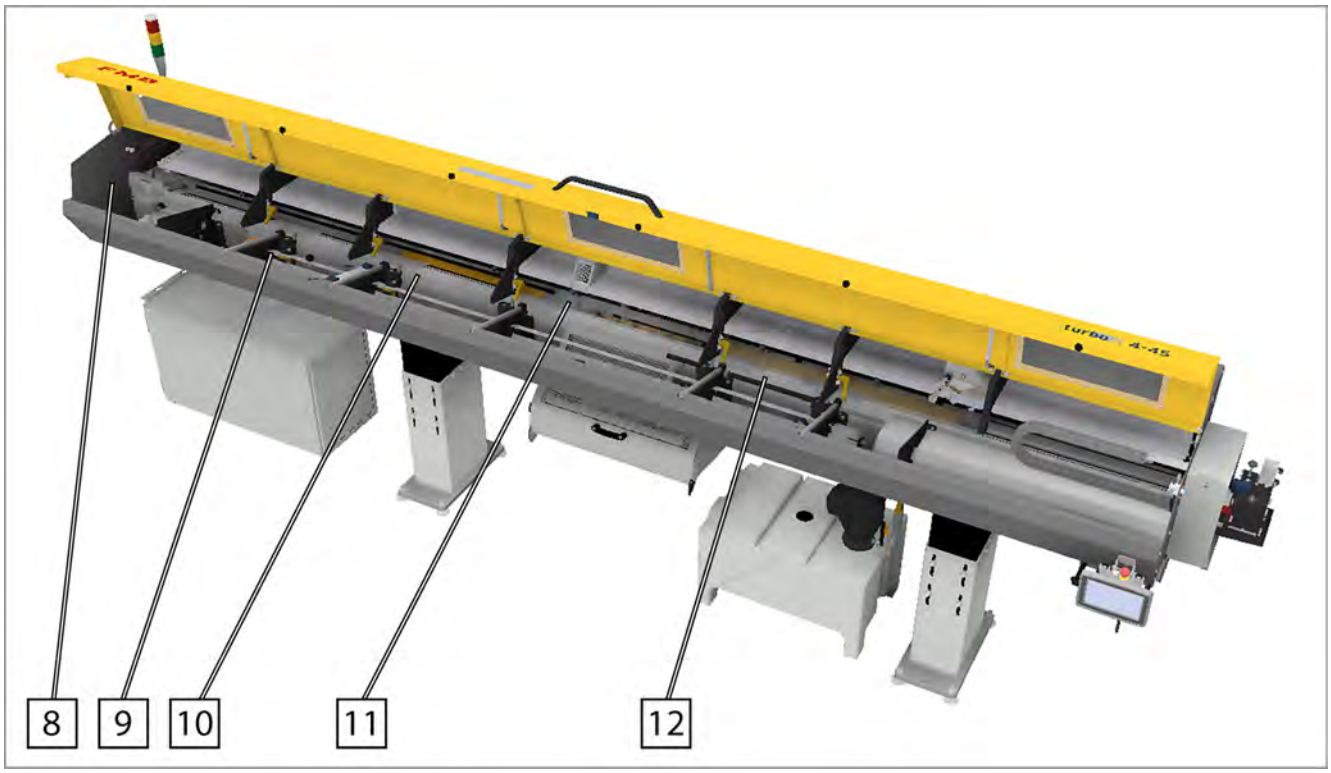
2	Types and lengths	3	Machine number
4	Year of construction		

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

Functional description

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

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

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

Drive

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

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

This function is available as an option.

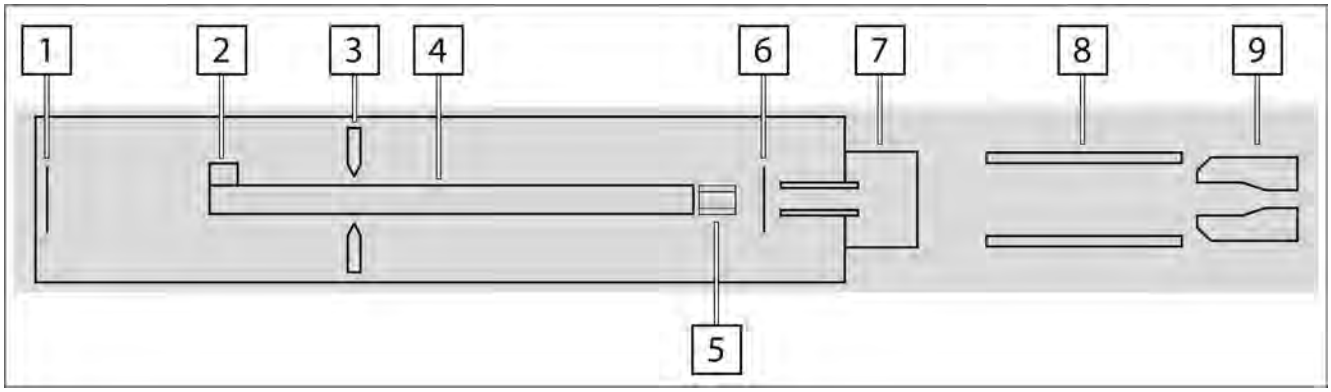
The synchronizing unit is installed only in those loading magazines intended for attaching to lathes with a moving headstock. The synchronization unit ensures that the pusher of the loading magazine and the material bar also complete the traverse paths of the lathe headstock while the lathe is machining.

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.

While the lathe is in operation, 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.

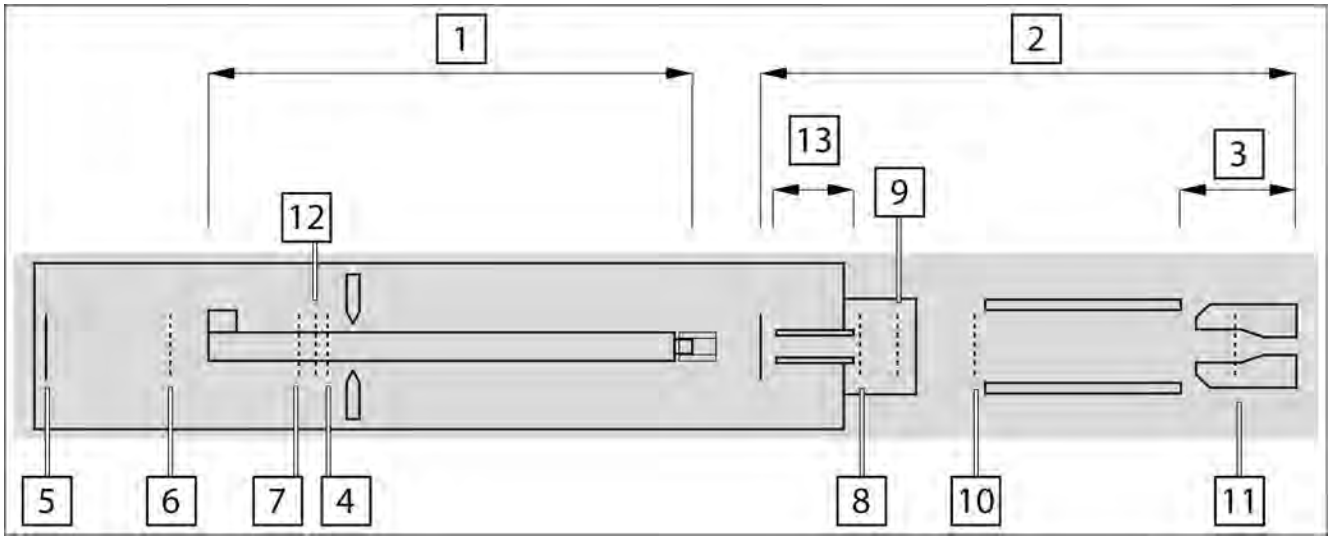
As the bar is being fed, the drive of the loading magazine is switched on and the synchronization clutch is opened. The pusher is moved by the drive of the loading magazine. The material bar is pushed on.

Layout of the components



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

Positions and traverse paths



1	Pusher length	The dimension for the parameter Pusher length is measured from the rear edge of the pusher to the front edge of the bearing insert.
2	Traverse path First insert travel	The first insert is performed after the material bar is changed. The traverse path First insert travel is the path from the starting switch in the loading magazine to the cut-off position in the working area of the lathe.
3	Traverse path Travel interval on	With interval insert active, an intermittent feed takes place in the area of Travel interval on .
4	Position draw off	At position Position draw off the material gripper grabs the material bar.
5	Position rear limit	The maximum rear position the pusher is able to reach. The position Position rear limit is reached when the remnant is removed or the pusher swings out.
6	Position storage	The position at which the pusher picks up a new material bar. The pusher travels at high speed, just before the position Position storage it brakes, picks up the material bar and accelerates again.
7	Position Limit pos. short pusher front	The position to which the pusher moves the material bar, enabling the material gripper to grab the material bar.
8	Position open steady	During operation, the clamping sleeve must pass the steady. When the clamping sleeve is at the position Position open steady the steady opens to prevent damage.
9	Position close steady	During operation, the clamping sleeve must pass the steady. When the pusher has passed the open steady and reached the position Position close steady the steady closes.

10	Pos. reverse rotation return	When returning from the spindle of the lathe, the pusher moves from the position Pos. reverse rotation return at high speed.
11	Position front limit	The maximum front position the pusher is able to reach. The clamping sleeve is positioned just before the collet of the lathe. The value Position front limit and the value Part length 1 are used to calculate when the last part will be fed in.
12	Position press on	The clamping sleeve is pressed on to the material bar up to this position.
13	Length of guide module	The dimension for the parameter Length of guide module is measured from the rear edge to the front edge of the guide tube and depends on the stroke of the guide module.

1.3 Technical data

Technical data of the loading magazine

Characteristic	Unit	Value
Material flow in the guide channel	mm	4 - 45
Bar length	mm	2200 / 3200 / 3800 / 4200 / 6200
Maximum feed force	N	1025
Insert speed	mm/s	520
Feed speed	mm/s	1000
Return speed	mm/s	2000
Maximum remnant length	mm	480
Weight [3] Length version 2200	kg	1050
Weight [3] Length version 3200	kg	1150
Weight [3] Length version 3800	kg	1250
Weight [3] Length version 4200	kg	1350
Weight [3] Length version 6200	kg	1650

Characteristic	Unit	Value
Weight of transport pallet	kg	Depending on length variant approx. 250 - 500
Oil tank level	l	80
Supply of compressed air	bar	6 - 8
Compressed air consumed per loading process	l	approx. 27
Compressed air consumed per double stroke of the steady	l	approx. 0.5
Noise emission during the bar change	dB(A)	48 +/- 5
Operating voltage [1, 4]	V	200 / 400 / other types
Power requirement	KW	2
Nominal frequency [2, 5]	Hz	50 / 60
Control voltage	V	24

1) According to DIN EN 60204 (VDE 0113), the continuous operating voltage must be within 100% ± 10% of the line 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 rated for a nominal frequency of 50 Hz and 60 Hz.

Operating conditions

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

Storage conditions

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

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

Lubricant

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

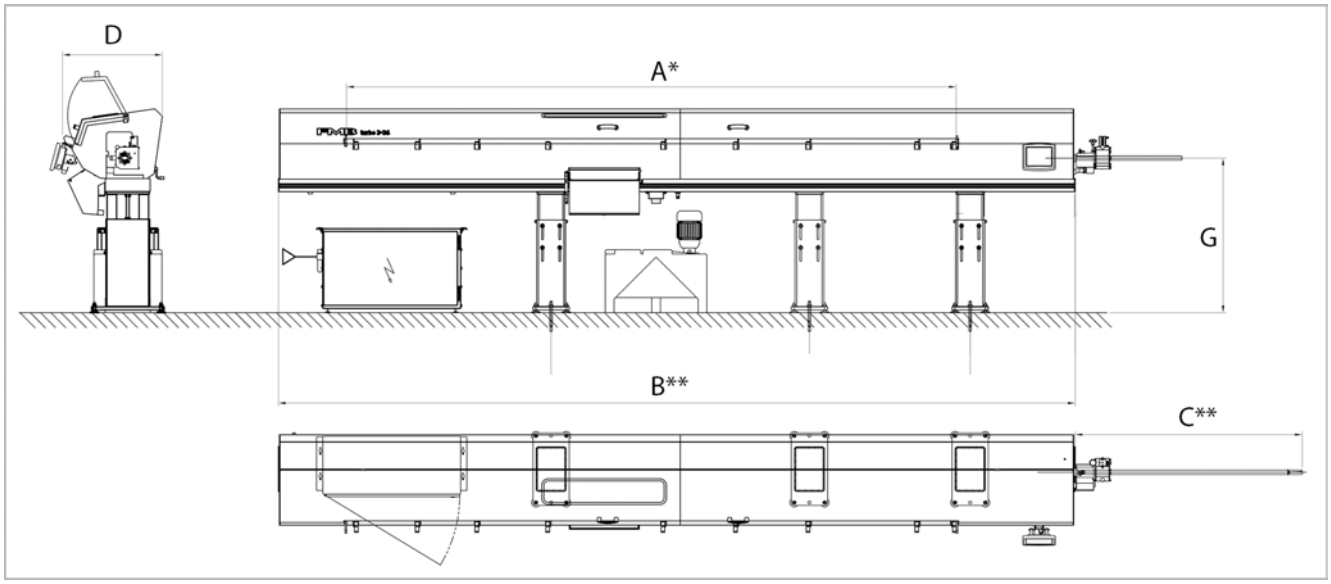
- DIN 51 517-2 CL 68,
- DIN 51 506 VBL 68,
- DIN ISO 3448 ISO VG 68.

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

Manufacturer	Type
Aral	Motanol HE 68
Mobil / Esso	Vacuoline 1409
Shell	Morlina 68

Dimensions of the loading magazine

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



Stroke	600	600
Pusher length	1900	2100
	B1	B2
	C1	C2

Table of dimensions

Loading magazine length	Dimensions in mm						
	A	B1	B2	D	C1	C2	G***
2200	2210	3600	3800	821	1835	2035	920 - 1465

Loading magazine length	Dimensions in mm						
3200	3210	4600	4800				
3800	3810	5200	5400				
4200	4210	5600	5800				
6200	6210	7600	7800				

*** Aligned to spindle height. On loading magazines with a shifting device, this value increases by 30 mm.

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

The loading magazine has an emergency stop device compliant with DIN EN 60204 (VDE 0113). The emergency stop button is mounted on the control panel ➚ *"Press the emergency stop button" on page 43*.

When the emergency stop button is pressed, the power to the safety-relevant PLC outputs is shut off. The power supply to the drive motor is also shut off. The drive motor and hence the pusher cannot perform any more movements. The pressurization of the pneumatic valves for the "Open / close guide channel" function is maintained so that the guide channel remains shut. The pressurization of the remaining pneumatic valves is interrupted. They return to their original position. An error message appears on the control panel of the loading magazine.

The emergency stop signal is relayed 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 relayed to the loading magazine and also triggers an emergency stop there.

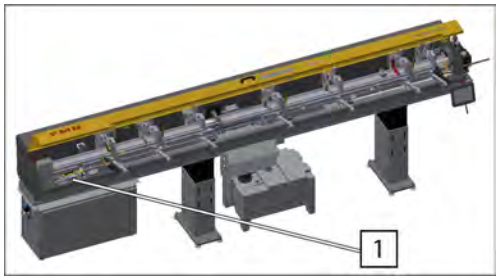
Lock

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.

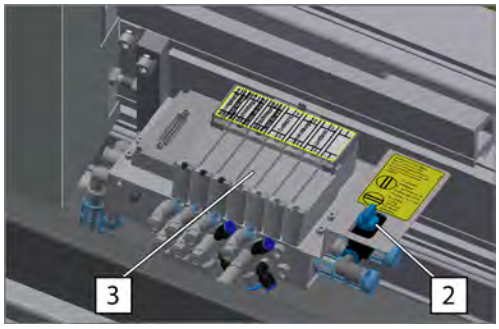
Safety door of the machine tool

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.

Valve block



The valve block is located at position 1 on the loading magazine.



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

Once the compressed air has been shut off, compressed air can be stored 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 valves 3 once the compressed air supply has been shut off.

This is the case for certain repair work and troubleshooting procedures. The valve block may be operated only by personnel qualified for this purpose. Please contact FMB if you have any questions. ↗ *“Service contact details” on page 107*.

3 Transport

3.1 Prepare for transportation

Preparing the loading magazine for transportation

⚠ DANGER

Movable guide channel/guide module can unexpectedly move forward out of the loading magazine

During transport, the movable guide channel/guide module can move forward out of the loading magazine due to its inertia caused by jerky movements. Personal injury from impact can result.

- **Do not loiter in the danger area.**
- **Install the transport lock for the guide channel/guide module before transport as described in the operating instructions.**

⚠ WARNING

Falling attachments/components

Loose attachments or components being transported by the loading magazine can fall and cause personal injury due to crushing and impact.

- **Secure loose attachments or components against slipping and falling before transport.**

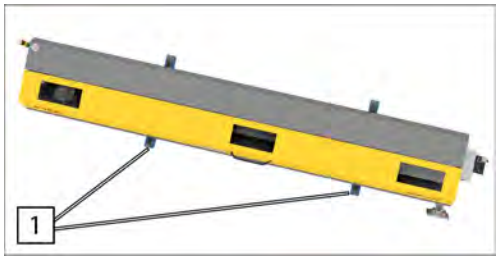
Once the loading magazine has been raised, the pins extending out of the floor must be detached at ground level or removed from the floor using suitable means.

1. Completely remove any material bars. ➚ *"Removing the material bar from the loading magazine" on page 67* or ➚ *"Draw off and eject the remnant" on page 67*.
2. Remove the remnants from the remnant bin. ➚ *"Removing the remnant" on page 69*.
3. Press the ☰ button.
4. SETUP Call .
5. Move the pusher all the way back using the ◂ button.
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. ➚ *"Empty the oil tank of the loading magazine" on page 99*.
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. Remove the plug for the oil pump on the control cabinet.
12. Dispose of the oil / cooling lubricant in accordance with the legal provisions.
13. Unclip the connecting hoses for the oil feed and return.
14. Secure detached oil hose connections to prevent the loss of residual oil.

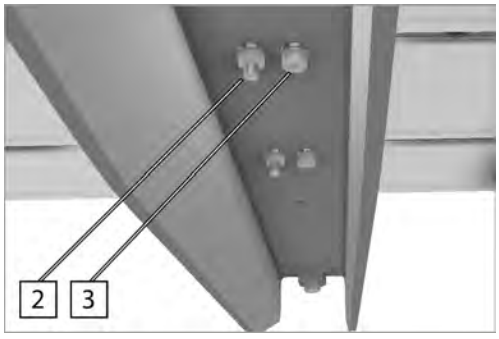
    The oil tank must be transported separately.

15. Depressurize the compressed air line to the loading magazine.
16. Switch off the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
    ➡ The loading magazine is vented.
17. Fasten the control cabinet to the beam *“Removing the control cabinet from / attaching the control cabinet to the loading magazine” on page 34*.
18. Assemble the transport lock for the guide channel/guide module. *“Assembling / disassembling the transport lock for the guide module” on page 21*.
19. Assemble the transport lock for the remnant bin. *“Assembling / disassembling the transport lock for the remnant bin” on page 21*.
20. 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 for transportation. The attachment points for the transport beams 1 are on the underside of the loading magazine.



There are two threaded pins 2 and two attachment screws 3 on the underside of each transport beam. The threaded pins are used to position the transport beams and remain on the loading magazine even when the transport beams are removed.

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.

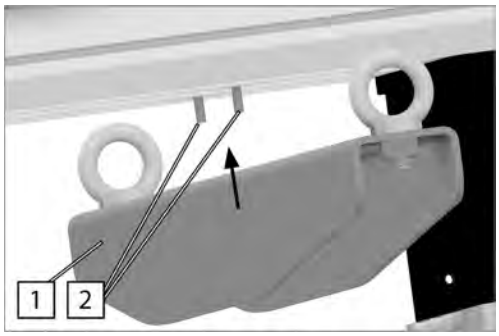
- **Do not stay in the danger area.**
- **Only install transport beams for the purpose of crane transportation and then remove them directly.**

⚠ CAUTION

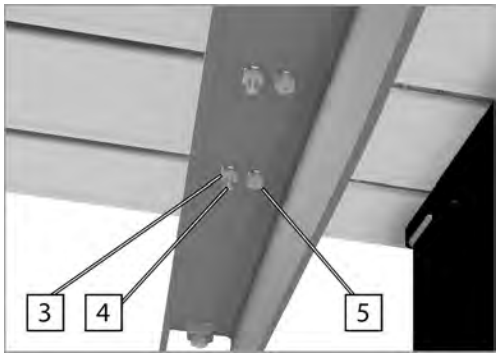
Protruding transport beams

Personal injury because of impact due to protruding transport beams.

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

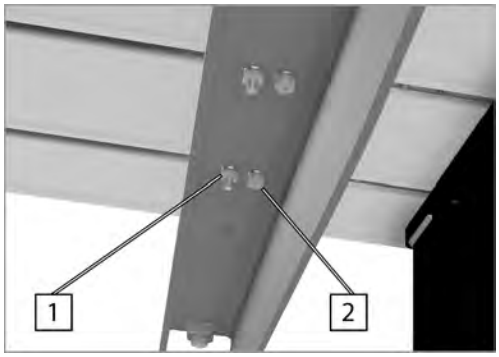


1. Place the transport beams [1] on the threaded pins [2] and hold.

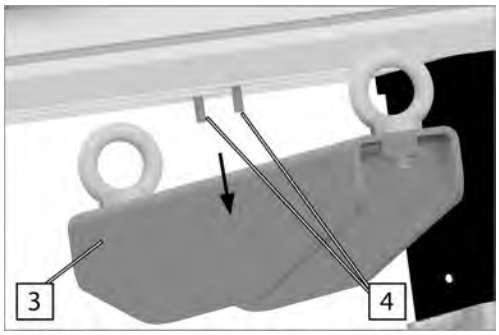


2. Place the nut with washer [3] on the threaded pin [4] and tighten.
3. Repeat the work step for the second threaded pin.
4. Insert the screw with washer [5] and tighten.
5. Repeat the work step for the second screw.

Removing the transport beams

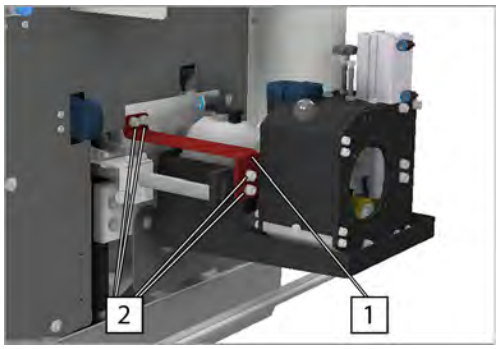


1. Secure the transport beams to prevent falling.
2. Loosen the nut with washer [1] and remove.
3. Repeat the work step for the second nut.
4. Loosen the screw with washer [2] and remove.
5. Repeat the work step for the second screw.



6. Remove the transport beam [3] in the direction indicated by the arrow.
7. Threaded pins [4] remain for repositioning the transport beams on the loading magazine.

Assembling / disassembling the transport lock for the guide module



Assembly:

1. Position the transport lock [1].
2. Insert and tighten the screws [2].

Disassembly:

Disassemble in reverse order.

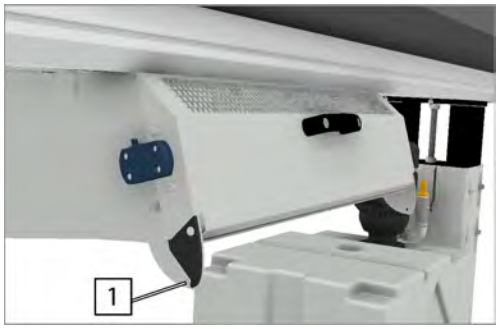
Assembling / disassembling the transport lock for the remnant bin

⚠ DANGER

Remnant basket falling down

During transportation, the flap of the remnant bin can open and the remnant basket inside can fall down. This can result in personal injury due to crushing and impact caused by falling remnant baskets.

- **Install the transport lock for the remnant bin as described in the operating instructions.**
- **Do not loiter in the danger zone.**

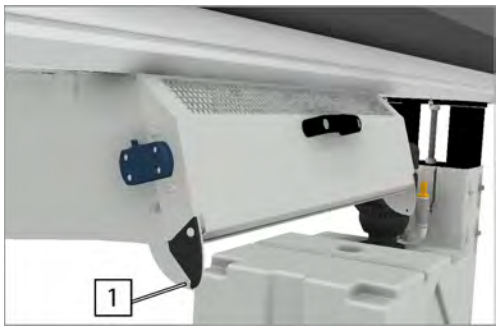


Assemble:

Insert the screw in the bore [1] and tighten.

➡ The transport lock of the remnant bin is installed.

Disassemble:



→ Loosen the screw in the bore 1 and remove.

➡ The transport lock of the remnant bin is disassembled.

Angle of inclination of the load attachment gear

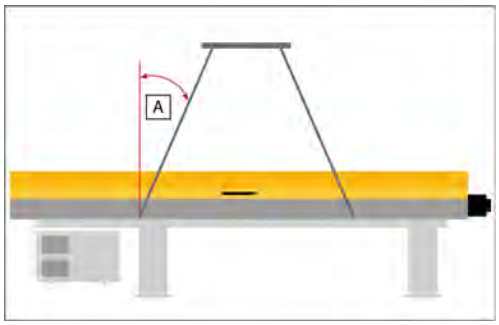
⚠ DANGER

Falling loading magazine

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

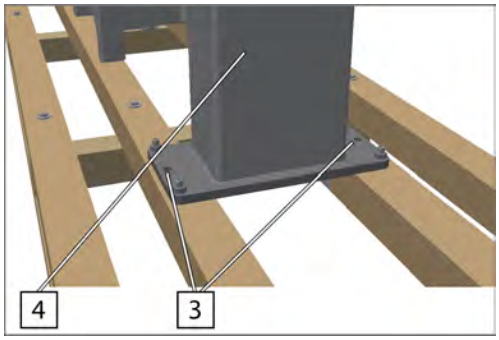
When lifting the loading magazine with the multi-chain load attachment gear, the specified maximum angle of the load attachment gear has to be observed. If this angle is exceeded, the attachments of the transport beams may break and the loading magazine could fall down.

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

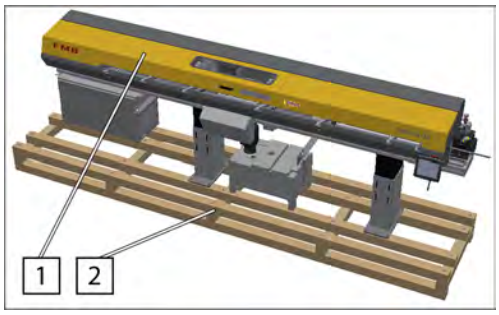


When using the multi-chain load attachment gear, the load attachment gear chosen must not exceed the angle of inclination of A 40°. Greater angles of inclination generate transverse forces that are beyond the rating of the attachment of the transport beams.

Detaching the loading magazine from the transport pallet



1. → Secure the loading magazine to prevent tipping over.
2. → Loosen the screws in the attachment holes 3 of the support 4 and remove.
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 securely ➚ *"Transporting the loading magazine using the crane" on page 24*.

1. Detach the oil tank from the transport pallet.
2. Lift the oil tank off the transport pallet using a suitable hoist.

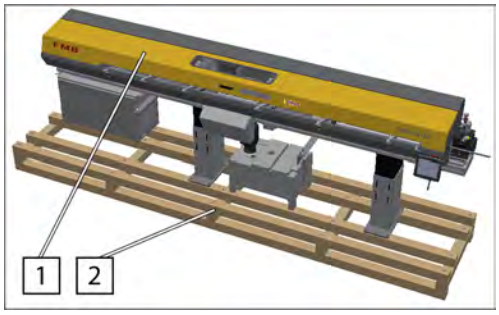
Fastening the loading magazine to the transport pallet

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.

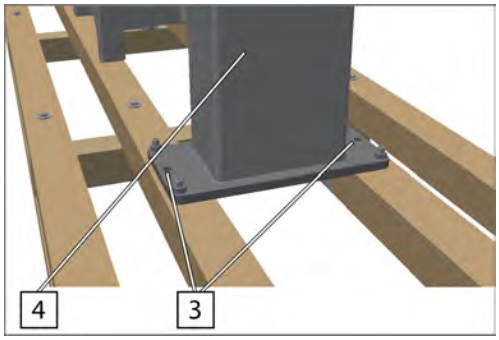
The loading magazine must be fastened to the transport pallet using adequately dimensioned fasteners.

- Pay attention to the weight of the transport pallet in the technical data. ➚ *"Technical data of the loading magazine" on page 12*.

1. Place the oil tank on the transport pallet using a suitable hoist.
2. Secure the oil tank to prevent it from slipping.



1. Raise the loading magazine [1] to the transport pallet [2] using a crane. ➚ *"Transporting the loading magazine using the crane" on page 24*.
2. Secure the loading magazine to prevent tipping over.



3. Drill through the attachment holes [3] in the transport pallet.
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.**

⚠ DANGER

Falling oil tank

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

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

1. Assembling the transport beams ➚ *"Assembling the transport beams" on page 19*.
2. Fasten suitable hoists to all four eyebolts [1] of the transport beam.
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 20*.

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.**

⚠ DANGER

Falling oil tank

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

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

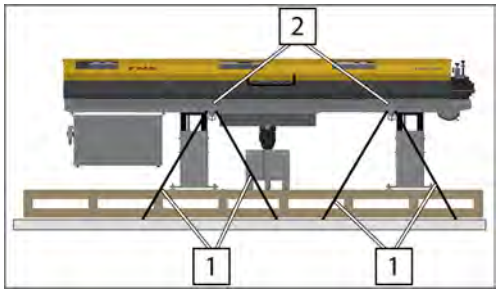
1. Fasten the loading magazine to a transport pallet *"Fastening the loading magazine to the transport pallet" on page 23*.
2. Calculate the center of gravity of the load.
3. Place the forks of the fork-lift truck beneath the center of gravity of the load.

4. Additionally secure the loading magazine to prevent it from tipping forward.
5. Hoist the transport pallet with the loading magazine and set it down securely.
6. Detach the loading magazine from the transport pallet ➚ *"Detaching the loading magazine from the transport pallet" on page 22*.

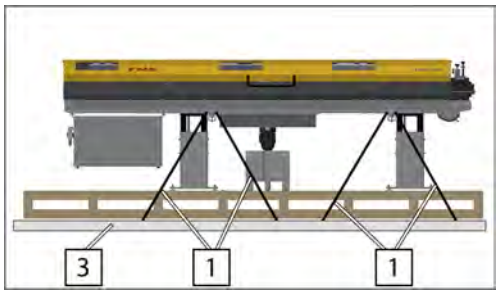
Transport the loading magazine with means of transportation

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 ➚ *"Fastening the loading magazine to the transport pallet" on page 23*. 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 26*.

Attach the loading magazine to the means of transport



1. Attach the loading magazine to a transport pallet ➚ *"Fastening the loading magazine to the transport pallet" on page 23*.
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 24* or ➚ *"Transporting the loading magazine using the fork-lift truck" on page 25*.



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 oil tank is located on the transport pallet and secured to prevent it from slipping.
- 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:

1. Detach the oil tank from the transport pallet.
2. Lift the oil tank off the transport pallet using a suitable hoist.
5. Detach the loading magazine from the transport pallet.
↗ *"Detaching the loading magazine from the transport pallet" on page 22*.

4.2 Aligning

Calculating the distance from the loading magazine to the machine tool

Attachment to machine tools with moving headstock:

1. Set up the loading magazine on the machine tool. ➚ *"Setting up loading magazine" on page 28*.
2. Calculate the distance from the loading magazine to the machine tool using the order-specific adapter diagram.
3. Adjust the distance.

Setting up 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

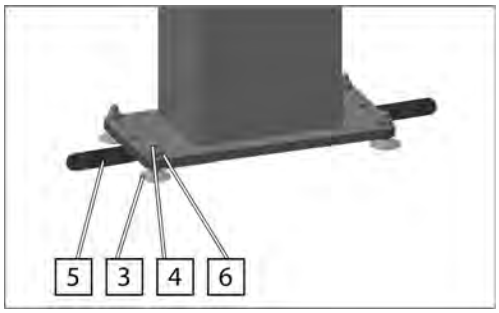
Personal injury due to squashing or impact due to moving the whole loading magazine.

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 the 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 place it together with the supports [2] 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. ➚ *"Calculating the distance from the loading magazine to the machine tool" on page 28*.
5. Move the loading magazine along the round material bars and create the calculated distance to the lathe.



6. Position the foot plates 3 beneath the threaded pins 4.
7. Turn the threaded pins 4 clockwise 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 29*
- Contacts from the lathe to the loading magazine: → *"Contacts from the machine tool to the loading magazine" on page 30*

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 must 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 bar end of the longer part Part length 1 is reached.
-K90	Contact closed >> The loading magazine is in automatic mode
-K44	This signal is emitted after the execution of the part length feed and continues until the moving signal (collet open) is removed. The signal is only emitted in the following cases: Operating mode Part length internal, Part length external and Collet open, fixed speed.

Name	Explanation
Loading magazine emergency stop	Floating 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

Machine tool signal	Loading magazine action
Collet open	The feed equipment of the loading magazine is 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.
Machine tool ready for operation, enable automatic mode	The loading magazine can be switched to automatic mode (requires this contact to be active).
Loading magazine on (option)	Contact starts automatic mode of the loading magazine.
Safety door closed	The feed movement through the loading magazine is executed only if this contact is active.
Follow-up with sub-spindle (optional)	M-command from the machine tool. If this signal is emitted before the collet is opened (push command), the next follow-up is converted from Part length internal, Part length external, to Part follow-up with sub-spindle .
Emergency stop of the machine tool	Floating contact of the lathe. This contact is integrated into 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.

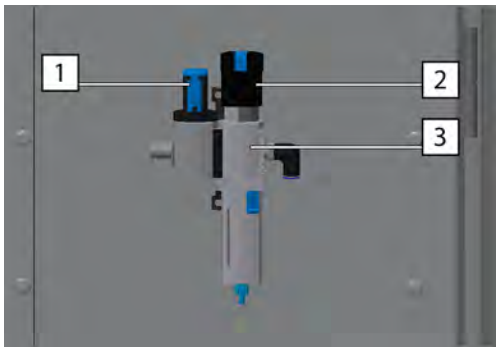
- **Perform a visual check of wires and plug-in connections for damage before inserting them into the control cabinet.**

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 29*
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 compressed air supply to 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 12.*



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

Aligning the loading magazine

⚠ DANGER

Falling loading magazine

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

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

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

⚠ DANGER

Moving pusher without protective equipment

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

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

- **Do not stay in the danger area.**

⚠ CAUTION

Sharp knives of the material gripper

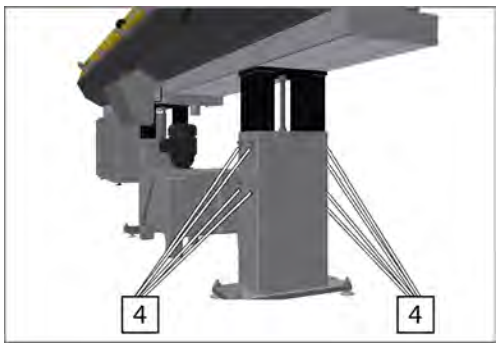
Cuts due to the sharp knives of the material gripper.

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

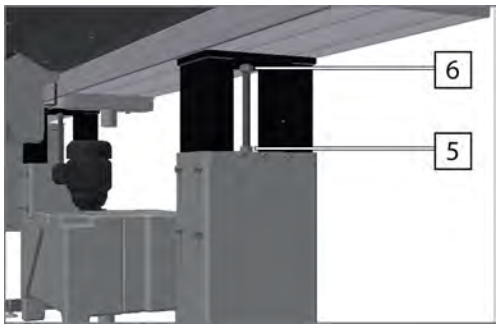
- **Wear safety gloves.**

→ The centering hole on the pusher of the loading magazine must align with the lathe spindle. Set and check the alignment with an optical alignment aid. Please contact FMB if you have any questions. ➚ *"Service contact details" on page 107*.

Correcting the height (roughly):



1. → Loosen the clamping screws 4.

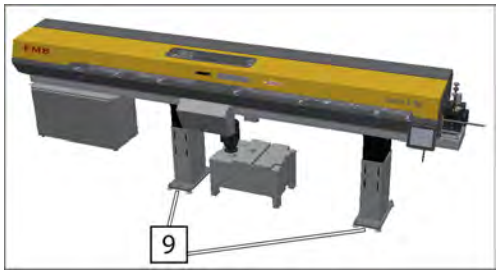


2. → Loosen the lock nuts 5 of the threaded spindles 6.
3. → Correct the height of the loading magazine with the threaded spindles 6.
4. → Tighten the lock nuts 5 of the threaded spindles 6.
5. → Tighten the clamping screws 4.

Correcting the position:

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

Correcting the lateral position:

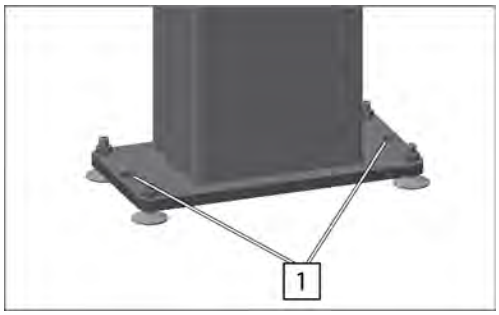


1. → Position the lever (e.g. crowbar) at the leverage points 9 and correct the side position.
2. → Remove the optical alignment aids again.

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. Consult FMB if you are unsure.

To attach the loading magazine to the floor, appropriately designed drop-in anchors or adhesive anchors must be used. Consult FMB if you are unsure.



1. Align the loading magazine ➚ *"Aligning the loading magazine" on page 31*.
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.

Attachment to machine tool

⚠ DANGER

Moving components of the loading magazine and the machine tool

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

When working on the unsecured interface (connection between loading magazine and machine tool released), extremities may become trapped or entangled by the moving components of the loading magazine or machine tool.

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

⚠ CAUTION

Falling add-on parts

Personal injury due to squashing and impact by the falling add-on parts.

When setting up the loading magazine, various add-on parts have to be mounted at the interface between the loading magazine and the machine tool. They might fall down and hit body extremities.

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

The attachment of the loading magazine to the machine tool is order-specific and dependent on the individual design of the interface between the loading magazine and the machine tool. The loading magazine must be positioned directly on the machine tool so that there is no unsecured transition area between the loading magazine and the machine tool. If this is not possible, the transition area must be secured with an order-specific adapter set. Refer to the adapter set/attachment diagram for the precise procedure. ➚ *"Other applicable documents" on page 5*.

If you have any questions about how the loading magazine is attached to the machine tool, please contact FMB. ➚ *"Service contact details" on page 107*.

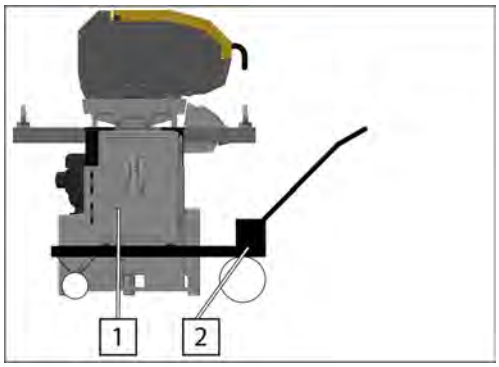
Removing the control cabinet from / attaching the control cabinet to the loading magazine

⚠ CAUTION

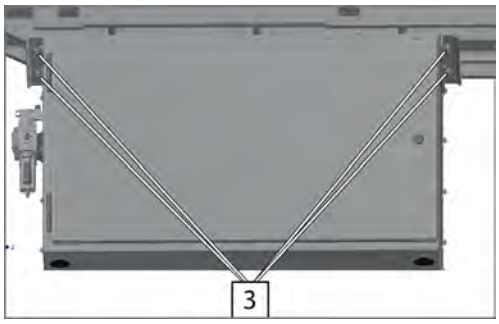
Falling control cabinet

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

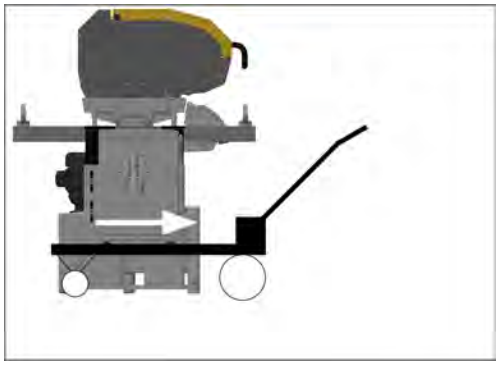
- **Observe the description on removing and fastening the control cabinet from the loading magazine in the operating instructions.**



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 unhinge.
4. Lower the control cabinet and place it on the floor.
5. Attach the control cabinet to the loading magazine in reverse order.

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

Determining value for First insert travel

1. Load a short material bar (approx. 1 m) ➚ *"Draw off remnant, eject it and draw on the new material bar" on page 68*.
2. Press the ☰ button.
3. SETUP Open .
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 until just before the guide sleeve of the lathe using the ▸ button.

   ℹ 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 fixed 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. *ℹ The result is the value for the First insert travel.*
11. Press the ☰ button.
12. *'SETTINGS → Service settings → Position"*
13. Tap the First insert travel field.

    ➡ An input window opens.
14. Enter value for First insert travel .

    ➡ The value for First insert travel is determined.

Determining value for Position front limit

1. **Only for lathes with a moving headstock:** Move the headstock of the spindle towards the guide sleeve to the end position.
2. Close the collet of the lathe.
3. Press the ☰ button.
4. SETUP Open .
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. Tap the Position front limit field.
   ➡ 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 is determined.

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.

Position oilpump on / Position oilpump off Setting

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. Tap the Position oilpump on field.
   ➡ An input field opens.
4. Enter value for Position oilpump on .
5. Tap the Position oilpump off field.
   ➡ An input field opens.
6. Enter 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 11.

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

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Click on the field Position 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 11.

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

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Click on the field Position close steady.
   ➥ An input field opens.
4. Enter the value for Position close steady.

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 11.*

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

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Click on the field Position draw off.
   ➡ An input field opens.
4. Enter the value for Position draw off.

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.

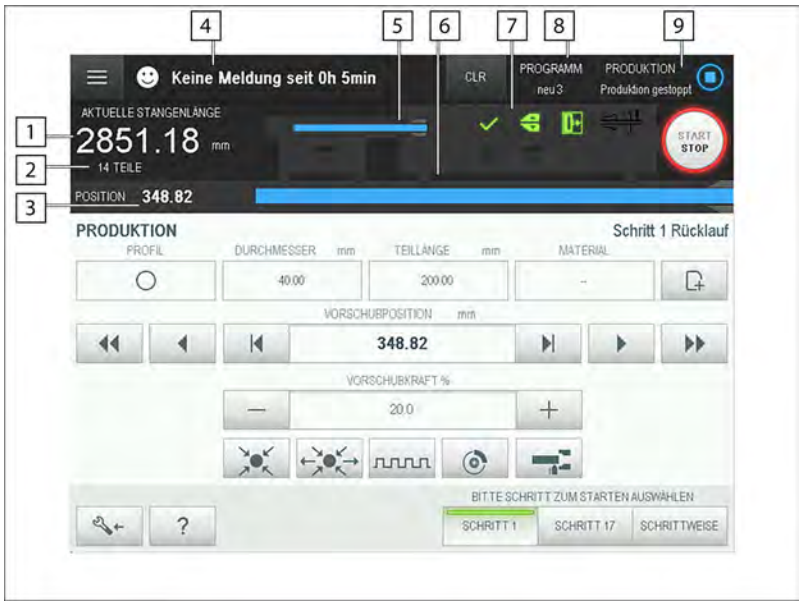
5 Control panel

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.
	Part length internal	Push without stop to the specified position.
	Part length external (optional)	As Part length internal. Feed values are, however, provided by the lathe.
	Part length internal+w/o tension	Push without stop to the specified position. Once the push command has been removed, the system is depressurized.
	Part length external+w/o tension (optional)	As Part length internal. Feed values are, however, provided by the lathe. Once the push command has been removed, the system is depressurized.

Remnant gripper

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

With / without gripper

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.

Selection	Selection option	Description
	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.

Steady

Selection	Selection option	Description
Steady		
	Steady roll. op. as push.pass.	During processing, the roller steady closes. When the pusher moves, the roller steady opens. As soon as the pusher is in the area of the roller steady, the roller steady remains open.
	Steady jaws op. as push.pass.	During processing, the jaw steady closes. When the pusher moves, the steady remains closed. As soon as the pusher is in the area of the jaw steady, the jaw steady remains open.
	Jaw steady closed when pushing	During processing, the jaw steady opens. When the pusher moves the jaw steady closes. As soon as the pusher is in the area of the jaw steady, the jaw steady remains open.

Selection	Selection option	Description
	R. steady on as pusher passes	During processing, the roller steady closes. When the pusher moves, the roller steady opens. As soon as the clamping sleeve of the pusher is in the area of the roller steady, the roller steady opens and remains open until the clamping sleeve is through the steady. After that, the roller steady closes during processing. When the pusher moves, the roller steady opens.
	J. steady on as pusher passes	During processing, the jaw steady closes. When the pusher moves, the jaw steady remains closed. As soon as the clamping sleeve of the pusher is in the area of the jaw steady, the jaw steady opens and remains open until the clamping sleeve is through the steady. The jaw steady then closes during processing. When the pusher moves, the jaw steady opens.

Mode sliding-fixed headstock

This selection is available only if the machine tool can be operated in both modes (Long turn and Short turn).

Selection	Selection option	Description
Mode sliding-fixed headstock		
	Long turn	The parameters "First insert sliding headstock turning" and "Position front end position sliding headstock turning" are used.
	Short turn	The parameters "First insert fixed headstock turning" and "Position front end position fixed headstock turning" are used.

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.
	with channel closed (special)	The material bar is separated if the guide channel is closed and is queued in the guide channel until it opens and then rolls inside.

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).

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 48*.

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 54* .

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.

Exporting / importing programs

NOTICE

Loading magazine malfunction due to incorrect data being imported

Data import to the control panel of a loading magazine may be carried out only with data that has been exported from this loading magazine or a loading magazine with an identical configuration. Importing data from loading magazines with a different configuration leads to malfunctions. This can result in damage to the loading magazine.

- **Check that the data is correct before starting the action.**
- **Contact FMB if you are unsure.**

NOTICE

Overwriting existing data

When importing data from a USB storage medium to the control panel of the loading magazine, existing data are overwritten and are then no longer available.

- **Save existing data before starting the action.**

This function can be used to export programs for data backup and import them again if required.

Exporting a program:

1. Insert an empty USB storage medium into the control panel of the loading magazine.
2. Press the ☰ button.
3. *'Service settings → Mode"*
4. Press the button.
5. Wait 3 seconds.
   ➡ The data are exported.
6. Remove the USB storage medium from the control panel of the loading magazine.

Importing a program:

1. Insert a USB storage medium into the control panel of the loading magazine.
2. Press the ☰ button.
3. *'Service settings → Mode"*
4. Press the button.
5. Wait 3 seconds.
   ➡ The data are imported.
6. Remove the USB storage medium from the control panel of the loading magazine.

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 49*.
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 49*.

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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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 49*.
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.

Correct. value after auto / door start Enter

This function compensates for minor position changes to the pusher, which may occur if the system is relieved of tension.

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

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. Tap the Correct. value after auto / door start field.
   ➡ An input field opens.
4. Enter the value for Correct. value after auto / door start .

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.

Max. remnant length Enter

This function limits the length of the remnant to the entered value. If this value is exceeded, an error message is output.

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

1. Press the ☰ button.
2. *'SETTINGS → Service settings → Position"*
3. Tap the Max. remnant length field.
   ➡ An input field opens.
4. Enter value for "Max. remnant length".

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.

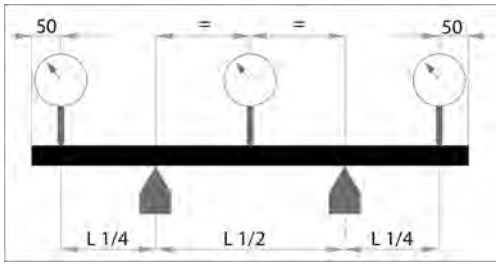
Switching on/off the headstock position determination

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. Tap the Rotary encoder -B4 field.
   ➡ A selection window opens.
4. Tap 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°.

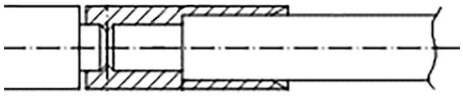
Requirements:

- 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.

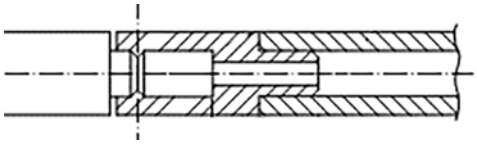
- Bars with multiple sides must not have any circumferential chamfers on the lathe side.
- Material bars with a circular cross-section, whose diameter is closer to the pusher diameter, must be chamfered so that they can be interested easier into the clamping sleeve.

Clamping device

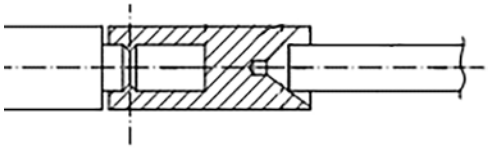
A clamping device is attached to the pusher to guide the end of the material bar. Depending on the application, either a clamping sleeve, a centering sleeve or a clamping mandrel is necessary. The size of the clamping device depends on the diameter of the material bar to be processed.



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.**

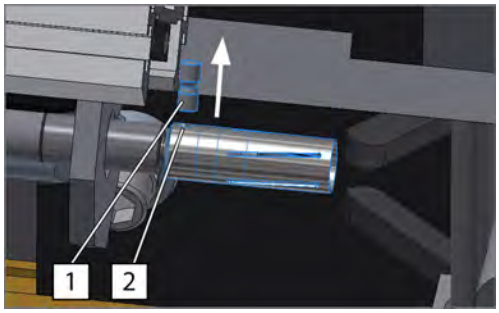
Clamping devices with a diameter < 25 mm are attached to the bearing insert with a cross pin.

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

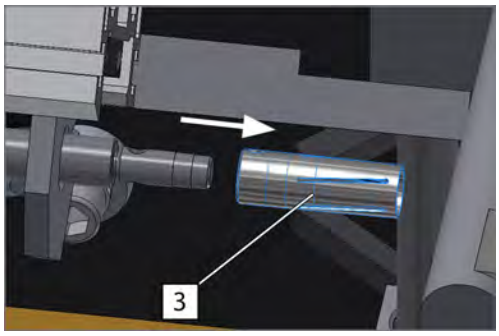
Clamping device with a diameter < 25 mm:

1. Press the ☰ button.
2. SETUP Call .

3. Move the pusher all the way back using the button.
4. Swing out the pusher using the button.
5. Press the emergency stop button. *“Press the emergency stop button” on page 43*.
6. Switch off the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
7. Where necessary, obtain release from the lathe to open the cover.
8. Open the cover.



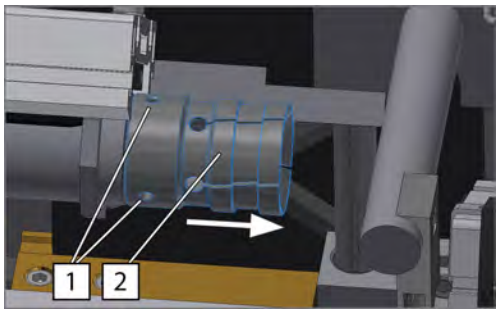
9. Push the cross pin 1 out of the hole 2 in the direction indicated by the arrow.



10. Pull the clamping device 3 in the direction indicated by the arrow and remove.
11. Mount and attach the clamping device in reverse order.
12. Close the cover.
13. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
14. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
15. Swing in the pusher using the button.
16. Acknowledge the error message using the CLR button.

Clamping device with a diameter of 25 mm and greater:

1. Press the button.
2. SETUP Call .
3. Move the pusher all the way back using the button.
4. Swing out the pusher using the button.
5. Press the emergency stop button. *“Press the emergency stop button” on page 43*.
6. Switch off the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
7. Where necessary, obtain release from the lathe to open the cover.
8. Open the cover.



9. Loosen the threaded pins 1 (3 pieces).
10. Pull the clamping device 2 in the direction indicated by the arrow and remove.
11. Mount and attach the clamping device in reverse order.
12. Close the cover.
13. Switch on the compressed air supply. *"Switch the supply of compressed air on/off" on page 100*
14. Unlock the emergency stop button. *"Make the loading magazine ready for operation after the emergency stop" on page 43*
15. Swing in the pusher using the button.
16. Acknowledge the error message using 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

Pushing the part several times

The functions push part once, push part twice, and push part three time allow the material bar to be pushed repeatedly within one machining cycle of the lathe. Entering the corresponding feed values allows the material bar to be pushed into different positions up to three times.

- Push part once: *"Set push part once:" on page 60*
- Push part twice: *"Setting push part twice" on page 61*
- Push part three times: *"Setting push part three times" on page 61*

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 49*.
2. Set the option Part follow-up to selection option Part length internal. *"Set the Selection option Part follow-up" on page 52* or *"Enter the selection option" on page 54*.

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.

Setting push part twice

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

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 49*.
2. Set selection Part follow-up to selection option Part length internal . ➚ *"Set the Selection option Part follow-up" on page 52* or ➚ *"Enter the selection option" on page 54*.
3. Tap the Feed 1 field.
   ➡ An input field opens.
4. Enter the length of the first machining operation.
5. Scroll to the next page using the button.
6. Tap the Feed 2 field.
   ➡ An input field opens.
7. Enter the length of the second machining operation.
8. Save changes.

Setting push part three times

The pusher moves the material bar into the working area of the lathe three times per turned part. The material bar is moved to Feed 1 for the first machining operation. Then the material bar is moved to Feed 2 for the second machining operation. The material bar is now moved to Feed 3 for the third machining operation. At Feed 3 the material bar is cut off.

1. Open the program in the program editor. ➚ *"Creating a new program" on page 48* or ➚ *"Editing a program" on page 49*.
2. Set selection Part follow-up to selection option Part length internal . ➚ *"Set the Selection option Part follow-up" on page 52* or ➚ *"Enter the selection option" on page 54*.
3. Tap the Feed 1 field.
   ➡ An input field opens.
4. Enter the length of the first machining operation.
5. Scroll to the next page using the button.

6. Tap the Feed 2 field.

   ➡ An input field opens.

7. Enter the length of the second machining operation.

8. Tap the Feed 3 field.

   ➡ An input field opens.

9. Enter the length of the third machining operation.

10. Save changes.

Pushing the material bar with the sub-spindle of the machine tool

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.

The values of loading magazine and machine tool should generally be set so that the loading magazine can follow the machine tool. The technical data for the loading magazine must be taken into account.

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

1. Enter values for Feed force for sub-spindle and Speed sub-spindle . ➚ *"Enter Feed force for sub-spindle" on page 54* and ➚ *"Enter Speed sub-spindle" on page 53*.

2. Set selection 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 49*.

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 63*.

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 49*.
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

Loading 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. Place 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

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. In addition, the indicator light on the loading magazine flashes yellow as soon as the message is displayed on the control panel. This tells the operator that the lateral material storage is empty.

Reloading during automatic mode

During production in automatic mode, material bars can be reloaded on the loading magazine even when the machine tool is actively processing. The cover of the loading magazine can be opened for this reason.

A signal light is installed on the loading magazine. This indicates the time at which the cover of the loading magazine can be opened during production to reload material bars without interrupting the production process.

If the cover is opened during the material bar change, the loading magazine and machine tool come to a standstill.

Signal light signal	Reloading in automatic mode	Description
Yellow, constant	Reloading possible.	
Yellow, slow flashing.	Reloading possible.	Last material bar in the guide channel. The lateral material storage is empty.
Yellow, fast flashing.	Reloading possible.	Material bar change will occur soon. The cover must be closed.
Yellow, off.	Reloading not possible.	Material bar change active.

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 65*.
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 End: Position draw off
Step 2 Close gripper blades	The material gripper closes and grabs the remnant.	-
Step 3 Draw off remnant	The pusher moves back again. The remnant is removed from the pusher.	End: Position rear limit
Step 4 Open gripper blades / guide channel	The guide channel opens. The material gripper opens. The remnant falls on the remnant flap.	-
Step 5 Open remnant flap	The remnant flap opens. The remnant falls into the remnant bin.	-

Step	Description	Position
Step 6 Close gripper blades / remnant flap	The remnant flap closes. The material gripper closes.	-
Step 7 Swing pusher out	The pusher swings out of the guide channel. The separation device moves down. A material bar rolls from the lateral material storage onto the separation device.	-
Step 8 Separate material	The separation device moves up. The material bar falls into the open guide channel.	-
Step 9 Close guide channel, short pusher forward	The guide channel closes. The short pusher moves the material bars forward.	End: Limit pos. short pusher front
Step 10 Short pusher return	The material bar remains in position. The short pusher moves back.	End: Position rear limit
Step 11 Swing pusher in	The pusher swings into the guide channel. The material gripper closes and grabs the material bar.	-
Step 12 Press upon	The pusher moves forward. The material bar is pressed onto the pusher.	End: Position draw off
Step 13 Open gripper blades	The material gripper opens.	-
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 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	-

Approaching Position rear limit

The "Position rear limit" position is reached when the pusher stops by itself while moving back and a value in the region of "0.00" (tolerance - 2.00 mm to + 1.50 mm) is displayed in the FEED POSITION field on the control panel.

1. Press the ☰ button.
2. Access SETUP.
3. Move the pusher back using the ◂ or ▸ button until the pusher stops.

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

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. SETUP Call .
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 bar out of the range of the material gripper using the ▸ button.
5. Press the ◂ button to move the bar to position Position rear limit .

6. Swing out the pusher using the button.
7. Open the guide channel with the button.
8. Press the emergency stop button. *“Press the emergency stop button” on page 43*.
9. Switch off the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
10. Where necessary, obtain release from the lathe to open the cover.
11. Open the cover.
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. Close the cover.
15. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
16. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
17. Swing in the pusher using the button.
18. Close the guide channel using the button.
19. Acknowledge the error message using the CLR button.

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.

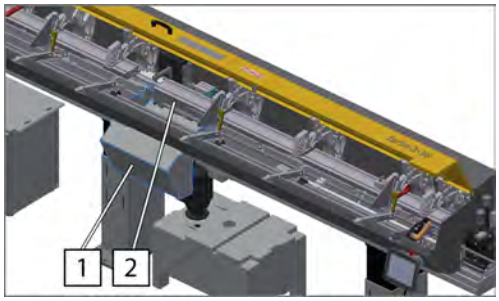
3. Press the button.

➡ 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 1 is located below the loading magazine and is accessible from the front. When the remnant flap 2 opens, the remnant lying on it drops into the remnant bin and can be removed by the operator.

The cover of the remnant bin is actively monitored. If the cover of the remnant bin is open, it is not possible to change the material bar.

Removing the remnant

⚠ WARNING

High weight of the remnant basket

Physical overloading when removing the remnant basket due to heavy weight.

- **Observe the weight of the remnant basket before removing it.**
- **If necessary, get help (second person) or remove individual parts.**

⚠ WARNING

Remnant basket falling down

Personal injury due to crushing and impact by the falling remnant basket.

If the remnant basket is pulled over the tipping point during removal, the remnant basket can tip over and fall down.

- **Do not pull the remnant basket beyond the tipping point.**
- **Observe the weight of the remnant basket.**

⚠ WARNING

Remnants falling out

Personal injury due to crushing and impact by remnants falling out.

If the loading magazine is operated without a remnant basket, remnants can pile up and fall down when the flap of the remnant bin is opened.

- **Do not operate the loading magazine without the remnant basket.**

⚠ WARNING

Leaking operating liquids

Personal injuries due to slipping on leaking operating liquids.

Operating liquids may drip onto the floor when removing the remnant basket. This leads to a risk of slipping in the work area.

- **Remove spilled operating liquids immediately.**

NOTICE

Damage due to over-full remnant basket

If the remnant basket is over-full, remnants may become jammed and the remnant basket can no longer be removed. This can result in damage to the loading magazine.

- **Observe the fill level of the remnant basket.**

1. Open the flap of the remnant bin 1.
2. Remove the remnant.
3. Close the flap of 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.

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 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 while the machine tool is processing and prevents the pusher being pushed back.

1. Press the button.
2. PRODUCTION Call .

Switch on:

→ Press the button.

➡ The status display on the button turns green. The brake function is switched on.

Switch off:

→ 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.

Ejecting the remnant

1. Press the button.
2. SETUP Call .
1. Press and hold the button.
   ➡ The status display on the button turns green. The remnant flap is opened. The remnant drops into the remnant bin.
2. Release the button.
   ➡ The status display on the button is off. The remnant flap is closed.

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.

Swinging the pusher out/in

1. Press the button.
2. SETUP Call .

Swing out:

→ Press the button.

➡ The status display on the button turns green. The pusher has been swung out.

Swing in:

→ Press the button.

➡ The status display on the button is off. The pusher has been swung in.

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 Converting

7.1 General conversion

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 in order to improve material bar guidance. These components are consolidated in a capacity adjustment set and can be exchanged if needed.

If you have any questions about selecting the right capacity adjustment set, please contact FMB. ➚ *"Service contact details" on page 107*.

The capacity adjustment set includes:

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

The guide jaws of the steady and the telescopic tube/guide tube/guide module can also be adapted to the material diameter to be processed. However, these are not part of the capacity adjustment set.

Depending on the extension version and the type of lathe, further adjustments may be necessary when converting to other diameters. For information about this, see the attachment-specific adapter set/attachment diagram. ➚ *"Other applicable documents" on page 5*.

Move to the conversion position

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

Press the ⤮ button.

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

7.2 Guide channel

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 107*

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.**

⚠ WARNING

Heavy weight of the pusher

Physical overloading when raising the pusher due to heavy weight.

- **Observe the weight of the pusher.**
- **Use suitable hoisting equipment.**

⚠ CAUTION

Sharp knives of the material gripper

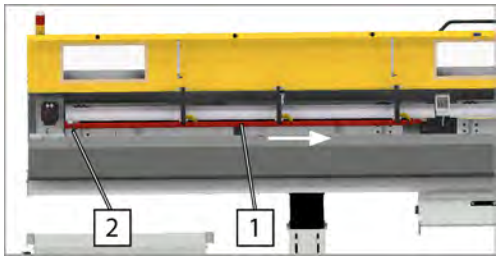
Cuts due to the sharp knives of the material gripper.

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

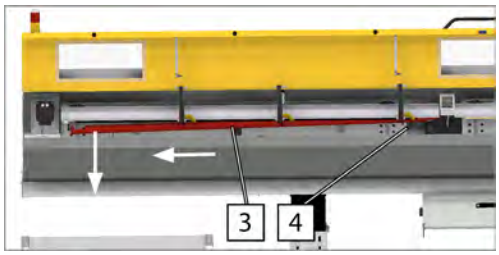
- **Wear safety gloves.**

Removal:

1. Dismantle the clamping device. ↗ *"Changing the clamping device" on page 58*.
2. Press the ☰ button.
3. SETUP Press .
4. Approach the conversion position by pressing the ⤮ button. ↗ *"Move to the conversion position" on page 74*.
5. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
6. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
7. Where necessary, obtain release from the lathe to open the cover.
8. Open the cover.
9. Set the holding-down device in the area of the pusher to the uppermost position. ↗ *"Setting the height of the holding-down device" on page 92*.



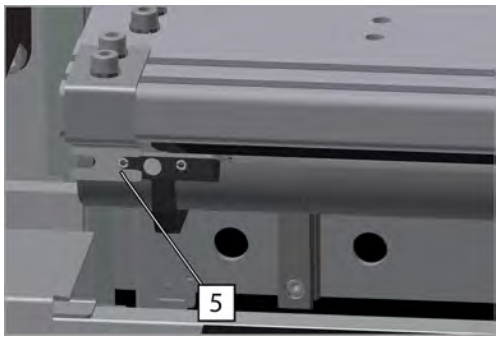
10. Hold the pusher 1.
11. Push the pusher 1 in the direction indicated by the arrow until the pusher is pushed out of the lifting plate 2.



12. Lower the pusher 3 in the direction indicated by the arrow and push until the pusher is pushed out of the lifting plate 4.
13. Remove the pusher.

Installation:

1. Install the pusher in reverse order.
2. Ensure that the pusher is seated correctly (against the stop) in plate 1.
3. Close the cover.
4. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
5. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
6. Swing in the pusher using the button.
7. Close the guide channel using the button.
8. Acknowledge the error message using the CLR button.



Changing the insert of the top rear guide channel

⚠ WARNING

Falling material bar

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

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

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

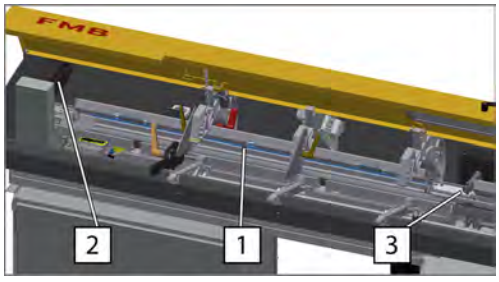
⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

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

- **Wear safety gloves.**



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

To change the top rear guide channel insert, the pusher must be removed. *“Changing the pusher” on page 75*.

1. Press the button.
2. SETUP Press .

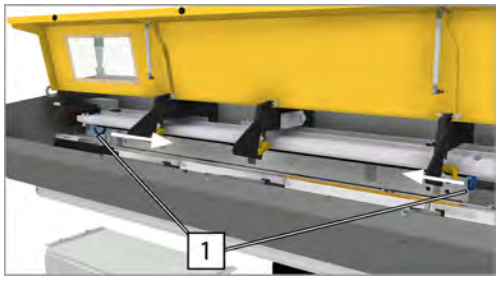
3. Approach the conversion position by pressing the button. ↗ *"Move to the conversion position" on page 74*.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.

8. Take hold of the insert [1].
9. Press the insert lock [2] and release.
   ➡ The insert is now detached.

10. Turn the insert in the direction indicated by the arrow and remove it.
11. Place the new insert in the top rear guide channel.

12. Pull the insert lock [2] until it engages.
    ➡ The insert is secured.
13. Install the pusher. ↗ *"Changing the pusher" on page 75*.

Changing the lifting plates



1. Remove the "top rear insert". ↗ *"Changing the insert of the top rear guide channel" on page 76*.
2. Remove the lifting plate [1] in the direction indicated by the arrow.
3. Install the new lifting plates in the reverse order.
4. Install the "top rear insert". ↗ *"Changing the insert of the top rear guide channel" on page 76*.

Changing the bottom rear insert of the 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.**

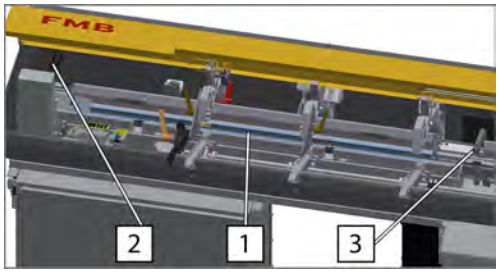
⚠ CAUTION

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.

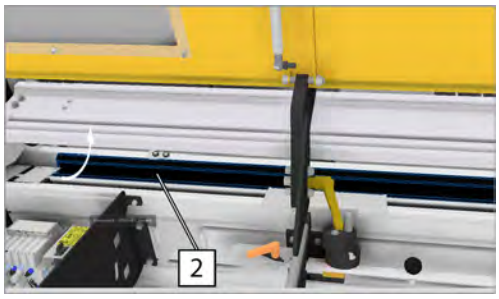
- **Wear safety gloves.**



The bottom rear guide channel insert 1 is located in the area between the drive motor 2 and the remnant bin 3.

1. Press the ☰ button.
2. SETUP Press .
3. Approach the conversion position by pressing the ⤮ button. ↗ *"Move to the conversion position" on page 74*.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.
8. Press the insert locks 1 and release.

   ➡ The insert is now detached.



9. Turn the insert [2] in the direction indicated by the arrow and remove it.
10. Place the new insert into the top rear guide channel.

11. Pull the insert locks [1] until they engage.
    ➡ The insert is secured.
12. Close the cover.
13. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
14. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
15. Swing in the pusher using the button.
16. Close the guide channel using the button.
17. Acknowledge the error message using the CLR button.

Changing the top front insert of the 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.**

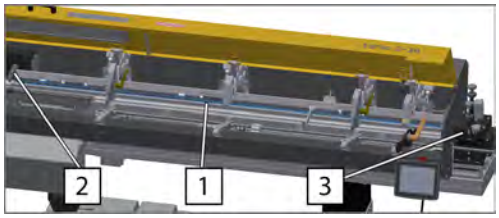
⚠ CAUTION

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.

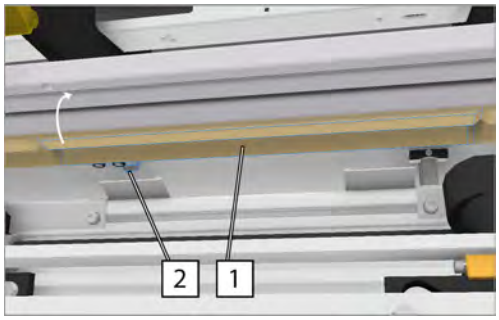
- **Wear safety gloves.**



The top 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. SETUP press.
3. Approach the conversion position by pressing the button. ↗ *"Move to the conversion position" on page 74.*

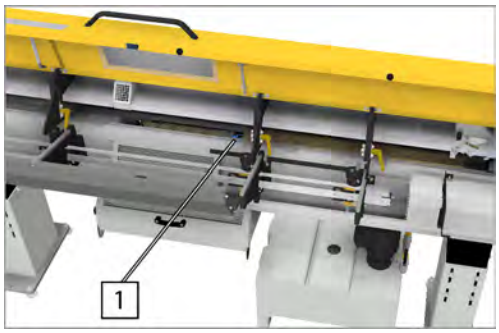
4. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 100*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.



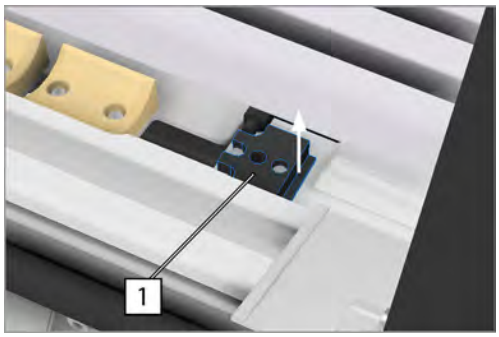
8. Hold the insert 1.
9. Press the insert lock 2 and release.
   ➥ The insert is now detached.
10. Turn the insert 1 in the direction indicated by the arrow and remove it.
11. Place the new insert into the upper front guide channel.
12. Pull the insert lock 2 until it engages.
    ➥ The insert is secured.
13. Close the cover.
14. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 100*
15. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
16. Swing in the pusher using the button.
17. Close the guide channel using the button.
18. Acknowledge the error message using the CLR button.

Changing the flap limiter

The flap limiter 1 is located below the "bottom front insert".



1. Remove the "bottom front insert". ➚ *"Changing the insert of the bottom front guide channel" on page 81*.



2. Pull off the flap limiter [1] in the direction indicated by the arrow.
3. Install the new flap limiter in reverse order.
4. Install the "bottom front insert". *“Changing the insert of the bottom front guide channel” on page 81*.

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.**

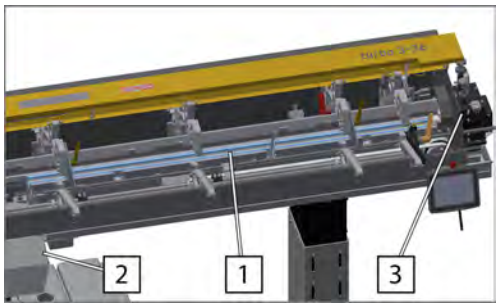
⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

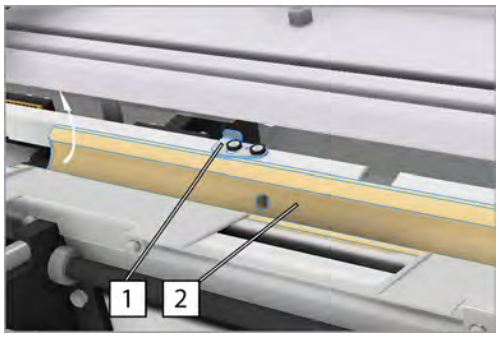
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**



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

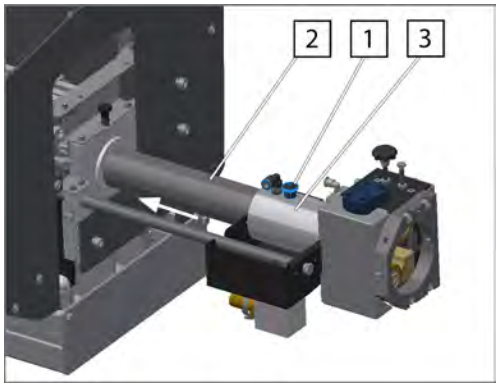
1. Press the ☰ button.
2. SETUP press.
3. Approach the conversion position by pressing the ⤮ button. *“Move to the conversion position” on page 74*.
4. Press the emergency stop button. *“Press the emergency stop button” on page 43*.
5. Switch off the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.



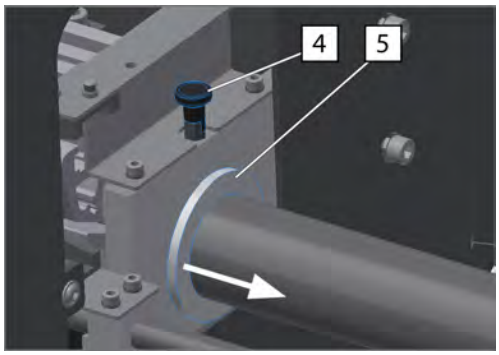
8. Press the insert lock [1] and release.
   ➥ The insert is now detached.
9. Turn the insert [2] in the direction indicated by the arrow and remove it.
10. Place the new insert into the upper front guide channel.
11. Pull the insert lock [1] until it engages.
    ➥ The insert is secured.
12. Close the cover.
13. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
14. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
15. Swing in the pusher using the button.
16. Close the guide channel using the button.
17. Acknowledge the error message using the CLR button.

Changing the guide module

1. Press the button.
2. SETUP Press .
3. Approach the conversion position by pressing the button. ↗ *"Move to the conversion position" on page 74*.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
5. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.



8. Pull the index pin [1] and rotate through 30°.
   ➥ The index pin is in the open position
9. Pull the guide module [2] out of the adapter set [3] in the direction indicated by the arrow.



10. Pull the index pin [4] and rotate through 30°.
    ➡ The index pin is in the open position
11. Remove the guide sleeve [5] in the direction indicated by the arrow.

12. Remove the guide module [6] in the direction indicated by the arrow.
13. Attach the guide module in reverse order. It must be ensured that the locking points for the index pins are in the correct position so that the index pins lock.
14. Close the cover.
15. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 100*
16. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
17. Swing in the pusher using the button.
18. Close the guide channel using the button.
19. Acknowledge the error message using the CLR button.

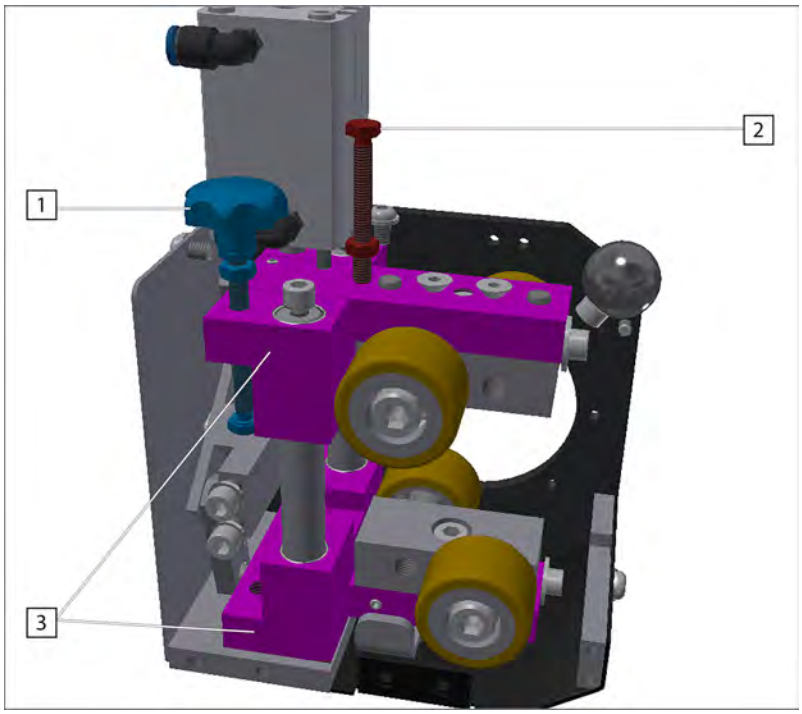
7.3

Reduction, general

The transition area between the loading magazine and the machine tool and the machine tool spindle can be reduced. The procedure is order-specific. The information on "Attachment to the machine tool" must be observed here. ➚ *"Attachment to machine tool" on page 33*.

7.4 Steady

Steady



The steady moves the material bar during the machining operation. For this purpose, the guide jaws of the steady can be equipped with jaws (jaw steady) or rollers (roller steady). To guide the material bar, the steady is closed. When opened, the material bar and pusher can pass.

The open and closed position can be adjusted via the end stops. When closing, the steady moves to the desired material bar diameter and guides the material bar. When opening, the steady moves the guide jaws apart so that the pusher can pass. The stop screw [1] limits the guide jaws [3] on closing. The stop screw [2] limits the guide jaws [3] on opening ➚ *"Setting the steady to the material bar diameter" on page 84*.

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

Setting the steady to the material bar diameter

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

To be able to manually open and close the steady, the following setting must be made for the duration of the set-up process, regardless of the later use: selection Steady, Selection option Jaw steady.

The path of the rollers when the steady is closed is set using the stop screw 2.

The path of the rollers when the steady is opened is set using the stop screw 4. This is only necessary in case of pusher vibrations ➚ *"Guiding the pusher with steady" on page 86*. In all other cases, the stop screw 4 is completely unscrewed so that the steady opens fully in the opened position.

1. Pull the material bar with appropriate diameter onto the clamping sleeve. ➚ *"Draw off remnant, eject it and draw on the new material bar" on page 68*.
2. selection Steady, Selection option Jaw steady set. ➚ *"Enter the selection option" on page 54*.
3. Press the ☰ button.
4. SETUP press.
5. Close the steady by pressing the button.
   ➥ The status display on the button turns green. The steady is closed.
6. Loosen the lock nut 3.
7. Turn the stop screw 4 counterclockwise until the stop screw 4 is completely unscrewed.
8. Open the steady using the button.
   ➥ The status display on the button is off. The steady is open.
9. Turn the stop screw 4 clockwise until you feel resistance.
10. Tighten the lock nut 3
    ➥ The end stop for the open position is set
11. Loosen the lock nut 1.
12. Turn the stop screw 2 clockwise as far as it will go.
13. Move the material bar into the lathe using the button.
14. Clamp the material bar in the lathe.
15. Close the steady by pressing the button.
    ➥ The status display on the button turns green. The steady is closed.

16. Turn the stop screw [2] counterclockwise until you feel resistance.

    ➡ The stop screw [2] is touching the end stop.

17. Open the steady using the button.

    ➡ The status display on the button is off. The steady is open.

18. Turn the stop screw [2] approx. half a turn counterclockwise.

19. Tighten the lock nut [1].

    ➡ The end stop for the closed position is set.

20. **When used as a roller steady:** selection Steady, Selection option Roller steady set. ↗ *"Enter the selection option" on page 54*.

21. **When used as a jaw steady:** selection Steady, Selection option Jaw steady set. ↗ *"Enter the selection option" on page 54*.

Guiding the pusher with steady

If the pusher vibrates, the steady can be set so that it guides the pusher in the open position.

To be able to manually open and close the steady, the following setting must be made for the duration of the set-up process, regardless of the later use: selection Steady, Selection option Jaw steady.

1. selection Steady, Selection option Jaw steady set. ↗ *"Enter the selection option" on page 54*.
2. Press the button.
3. SETUP Press .
4. Close the steady by pressing the button.

   ➡ The status display on the button turns green. The steady is closed.

5. Loosen the lock nut [3].
6. Turn the stop screw [4] clockwise as far as it will go.
7. Open the steady using the button.

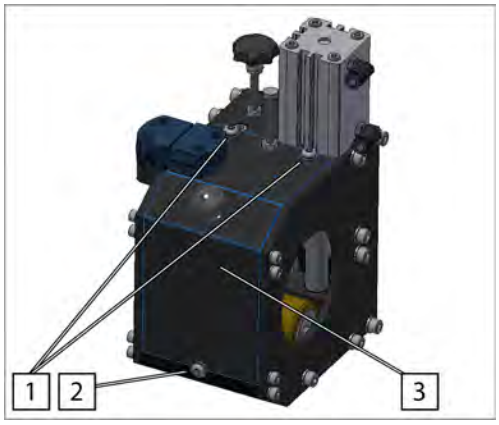
   ➡ The status display on the button is off. The steady is open.

8. Move the pusher into the lathe using the button until the pusher is in the steady area.
9. Loosen the lock nut [1].
10. Turn the stop screw [2] counterclockwise until the stop screw [2] is completely unscrewed.
11. **Condition for closing the steady on the pusher:** selection Steady, Selection option Roller steady set. ↗ *"Enter the selection option" on page 54*.
12. **Condition for closing the steady on the pusher:** close the collet of the lathe.

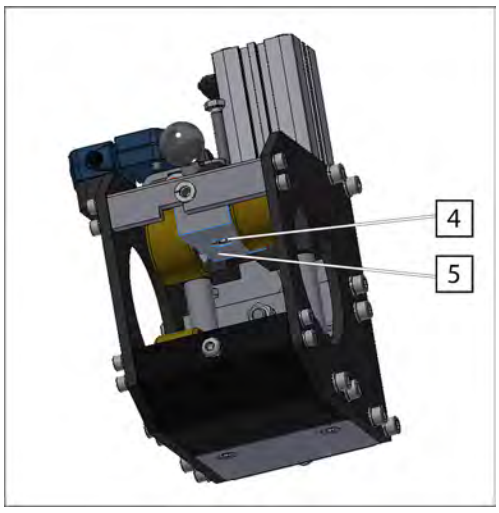
13. Close the steady by pressing the button.
    ➡ The status display on the button turns green. The steady is closed.
14. Turn the stop screw [4] clockwise until you feel resistance.
15. Turn the stop screw [4] approx. half a turn counterclockwise.
16. Tighten the lock nut [3].
    ➡ The end stop for the open position is set
17. Open the steady using the button.
    ➡ The status display on the button is off. The steady is open.
18. **When used as a roller steady:** selection Steady, Selection option Roller steady set. ↗ *"Enter the selection option" on page 54*.
19. **When used as a jaw steady:** selection Steady, Selection option Jaw steady set. ↗ *"Enter the selection option" on page 54*.

Removing/installing rollers with holder

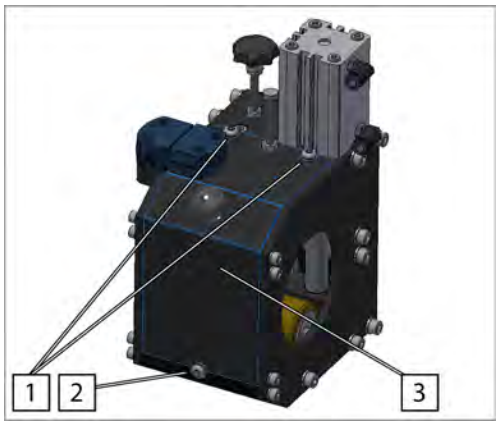
1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*



3. Loosen the screws [1].
4. Loosen the screw [2].
5. Remove the cover [3].



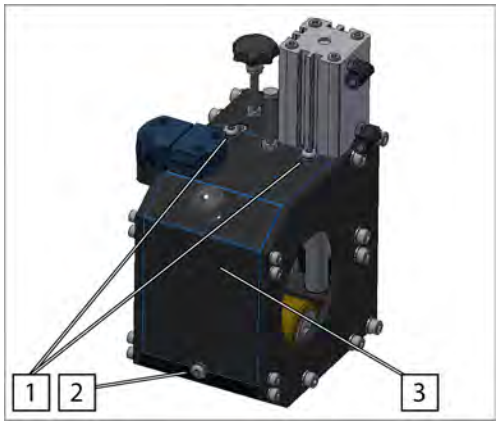
6. Loosen the screw [4] and remove.
7. Remove rollers with holder, top [5].
8. Remove rollers with holder, bottom, in the same way.
9. Insert the rollers with holder in reverse order.



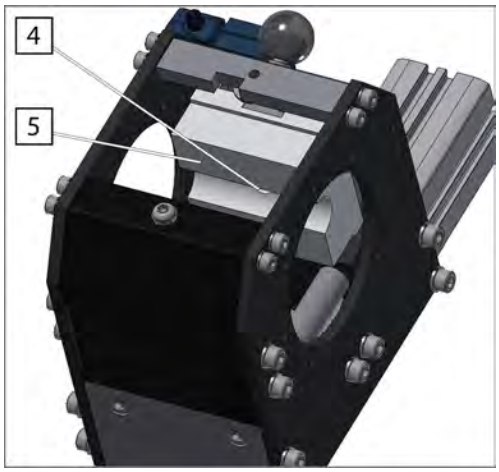
10. Position the cover 3.
11. Tighten the screws 1.
12. Insert the screw 2 and tighten.
13. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
14. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
15. Acknowledge the error message by pressing the CLR button.

Removing/installing guide jaws with holder

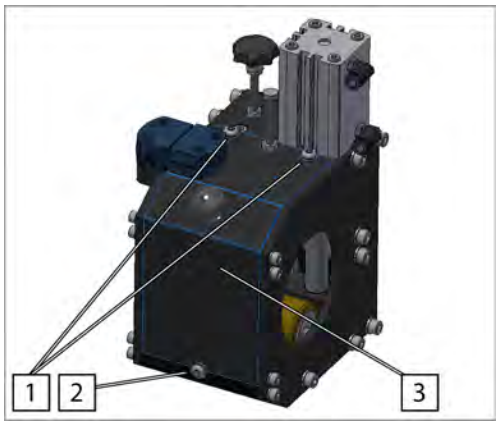
1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*



3. Loosen the screws 1.
4. Loosen the screw 2.
5. Remove the cover 3.



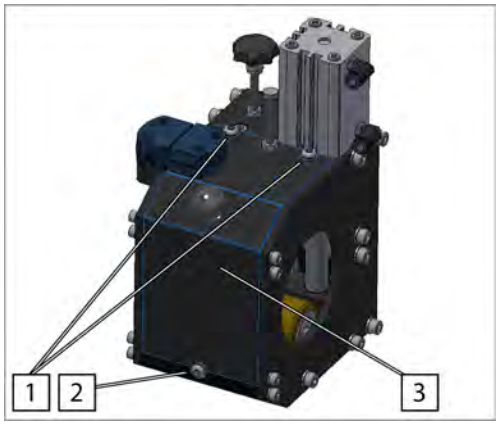
6. Loosen the screw 4 and remove.
7. Remove guide jaws with holder, top 5.
8. Remove guide jaws with holder, bottom, in the same way.
9. Insert the guide jaws with holder in reverse order.



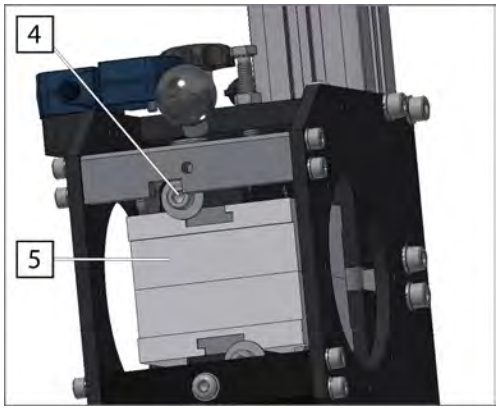
10. Position the cover 3.
11. Tighten the screws 1.
12. Insert and tighten the screw 2.
13. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
14. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
15. Acknowledge the error message by pressing the CLR button.

Changing the guide jaws

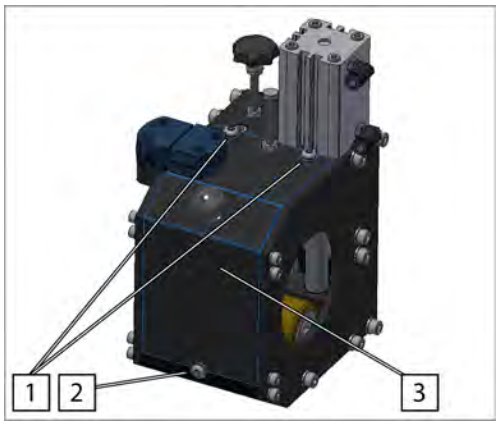
1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*



3. Loosen the screws 1.
4. Loosen the screws 2 and remove.
5. Remove the cover 3.



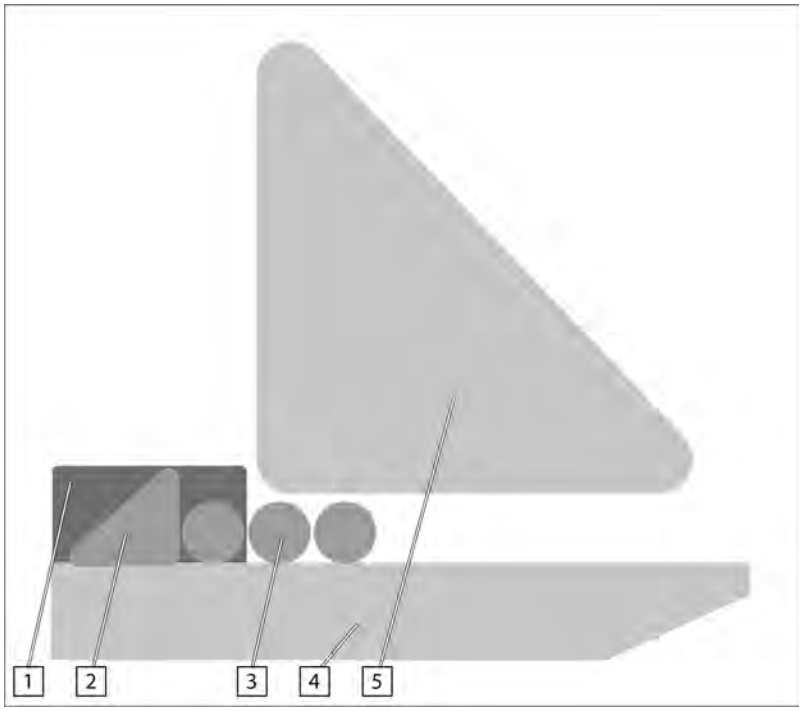
6. Loosen the screw 4 and remove.
7. Remove top guide jaws 5.
8. Remove bottom guide jaws in the same way.
9. Install the guide jaws in reverse order.



10. Position the cover 3.
11. Tighten the screws 1.
12. Insert and tighten the screws 2.
13. Switch on the compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
14. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 43*
15. Acknowledge the error message by pressing the CLR button.

7.5 Separating device

Separation device, general



1	Ejectors	4	Lateral material storage
2	End stop of the ejectors	5	Holding-down device
3	Material bar		

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

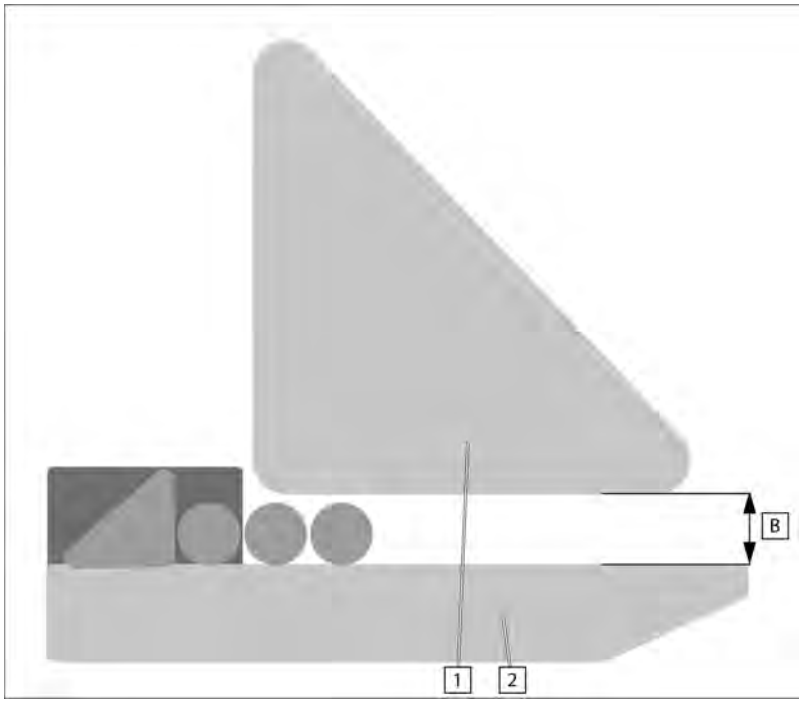
The separation device consists of the lateral material storage, the ejectors, the end stop of the ejectors and the holding-down device.

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

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

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

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 contact surface of the lateral material storage 2.

For the dimension B:

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

Setting the height of the holding-down device

⚠ WARNING

Falling material bar

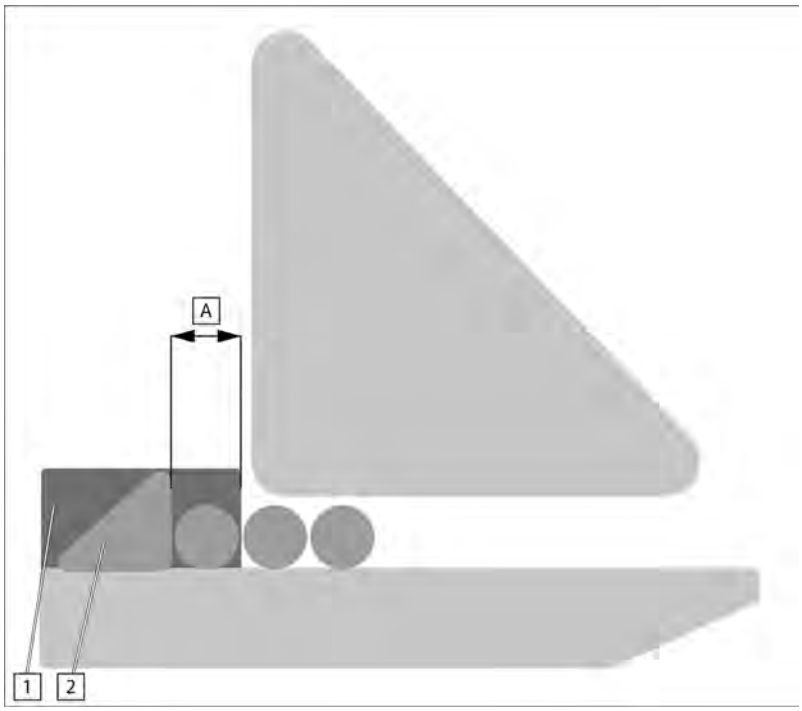
Personal injury due to squashing and impact as a result of a falling material bar.

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 compressed air supply. *“Switch the supply of compressed air on/off” on page 100*
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 100*
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 using the CLR button.

End stop of the ejector



The end stop of the ejector is set by the dimension A. The dimension A is measured from the front edge of the ejector 1 to the front edge of the end stop of the ejectors 2.

For the dimension A:

- The diameter of the material bar about to be machined.
- From material bar diameters of 40 mm, the end stop of the ejector is set to the maximum 40 mm.

Setting the end stop of the ejectors

⚠ WARNING

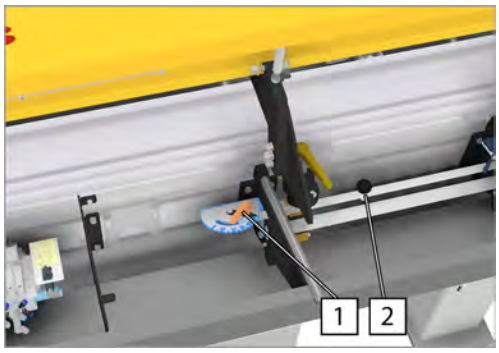
Falling material bar

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

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

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

1. Press the emergency stop button. → *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. → *"Switch the supply of compressed air on/off" on page 100*
3. Where necessary, obtain release from the lathe to open the cover.
4. Open the cover.



5. Loosen the tapper spanner 1.
6. Move the handle 2 in the direction indicated by the arrow to set the desired distance.
7. Close the eccentric spanner 1.
8. Close the cover.
9. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 100*
10. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
11. Acknowledge the error message using the CLR button.

8 Maintenance

8.1 Maintenance actions

Maintenance plan

Chap.	Task to perform	Every 6 months	Every 36 months	If necessary	Page
	Check the drive belt	X			95
	Check the synchronizing unit belt	X			96
	Replace the relay insert in the control cabinet		X		97
	Check the blades of the material gripper	X			97
	Check the lubricant in the oil tank			X	98

Check the drive belt

⚠ 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.**

Condition of the drive belt:

If the drive belt has cracks or is missing teeth, it must be replaced. Contact FMB. ➚ "Service contact details" on page 107.

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 100*
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 condition: Check the drive belt visually for missing teeth.
7. Close the cover.
8. Turn on the machine tool at the main switch.
9. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 100*
10. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 43*
11. Acknowledge the error message by pressing the CLR button.

Check the synchronizing unit belt

⚠ 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.**

Condition of the synchronizing unit belt:

If the synchronizing unit belt has cracks or is missing teeth, the synchronizing unit belt must be replaced. Contact FMB. → *"Service contact details" on page 107.*

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 100*
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 condition: Check the synchronizing unit belt visually for cracks and missing teeth.
7. Close the cover.
8. Turn on the machine tool at the main switch.

9. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
10. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 43*
11. 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 107.

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 100*

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. .
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 100*
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.

Check the lubricant in the oil tank

⚠ WARNING

Leaking fuel

Personal injuries due to slipping on leaking fuel.

Leaking fuel causes a slipping hazard in the working area.

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

1. Check the lubricant in the oil tank for the formation of foam.
2. Check the lubricant in the oil tank for severe contamination.
3. If the lubricant forms foam in the oil tank, or is severely contaminated, the lubricant in the oil tank must be replaced. *“Empty the oil tank of the loading magazine” on page 99*.

Filling the oil tank of the loading magazine

⚠ WARNING

Leaking fuel

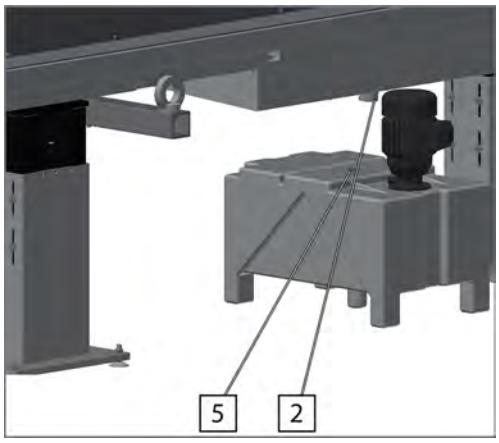
Personal injuries due to slipping on leaking fuel.

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 oil grades.



1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 100*
3. Turn off the machine tool at the main switch.
4. Pull the oil return line out of the oil return opening 5.
5. Add the stated quantity of oil to the oil return opening 5.
6. Guide the oil return line into the oil return opening 5.
7. Turn on the machine tool at the main switch.
8. Switch on the compressed air supply. ➚ *"Switch the supply of compressed air on/off" on page 100*
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.

Empty the oil tank of the loading magazine

⚠ 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.**

⚠ WARNING

Leaking fuel

Personal injuries due to slipping on leaking fuel.

Leaking fuel causes a slipping hazard in the working area.

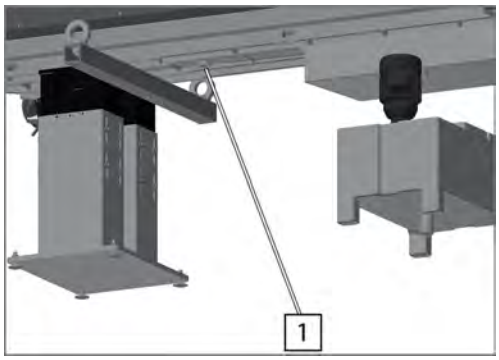
- **Remove leaking fuel immediately.**
- **Observe the description in the operating instructions about filling / emptying the oil tank.**
- **Only fill fuel in the intended containers.**

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

Before the next operation of the loading magazine, the oil tank of the loading magazine must be refilled. ➚ "Filling the oil tank of the loading magazine" on page 98.

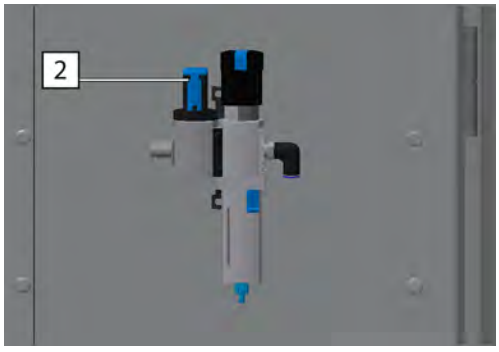
To empty the oil tank, a suitable pump has to be used.

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 43*.



2. Switch off the compressed air supply. → *"Switch the supply of compressed air on/off" on page 100*
3. Turn off the machine tool at the main switch.
4. Prepare a suitable container with sufficient capacity to collect the oil.
5. Loosen the hose clip on the oil feed 1.
6. Remove the oil feed hose on the oil feed 1.
7. Guide the end of the removed oil feed hose into the container provided.
8. Pump the whole contents of the oil tank into the container provided, using a suitable pump.
9. Insert the oil feed hose onto the oil feed 1.
10. Tighten the hose clip on the oil feed 1.
11. Turn on the machine tool at the main switch.
12. Switch on the compressed air supply. → *"Switch the supply of compressed air on/off" on page 100*
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.

Switch the supply of compressed air on/off



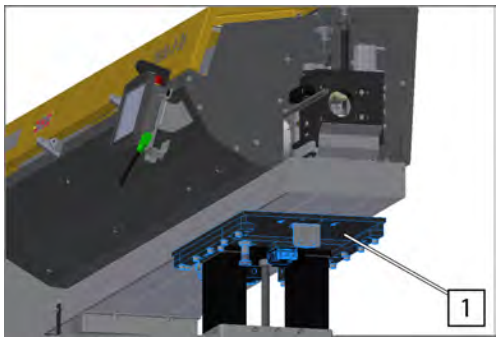
The supply of compressed air is switched on/off at the maintenance unit 1.

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

8.2 Auxiliary equipment

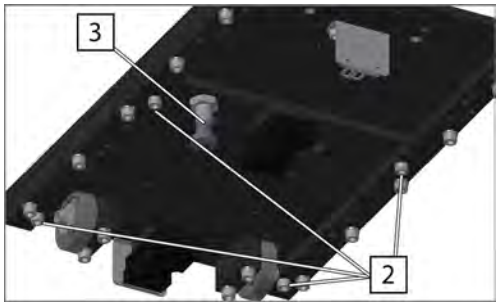
Shifting the loading magazine

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.

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



1. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 43*.
2. Switch off the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
3. Loosen the screws 2 and remove.
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 the screws 2.
8. Switch on the compressed air supply. ↗ *"Switch the supply of compressed air on/off" on page 100*
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 using the CLR button.

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.	Position Position draw off has been 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 channel diameter setting 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 separation diameter setting 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	Caution 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 of the clamping sleeve when returning. 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 button 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 without authorization. ■ Pilgrim step separation was raised without authorization. ■ The pilgrim step separation cycle was interrupted.	
Pos.software end position was overrun. Release with manual return function	The positive software stop was overrun.	
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 is oily. The remnant 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.
Remnant to long	The "Maximum remnant length" function is active. The length of the remnant exceeds the entered value.	
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). ■ Defective connection ■ Relay worn (on the lathe side)	

Fault message of the loading magazine	Possible cause	Switch / position
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.	
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	Caution 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	Caution 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	Caution Min. part length follow-up active. The entered value was not reached when pushing the material bar. ■ Feed force too low. ■ The collet signal is unstable.	
Part follow-up too long	Caution Max. part length follow-up active. The entered value was exceeded when pushing the material bar. ■ End stop in the lathe overrun.	
Cover not closed -B76/B77/B78/B79/K20/K21	The cover (guide channel cladding) 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	Caution Part length internal or Part length external active. The pusher was moved during 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 107*.

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Ersatzteilliste
Spare parts list

turbo RS 4-45 Serie 1

Rückmeldenummer ab: 2203152

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

Achtung ! Angaben für Ersatzteilbestellung:

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

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

Attention ! Data for spare parts orders:

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

Redaktionsschluss: 21.08.2024
Editorial deadline: 21.08.2024

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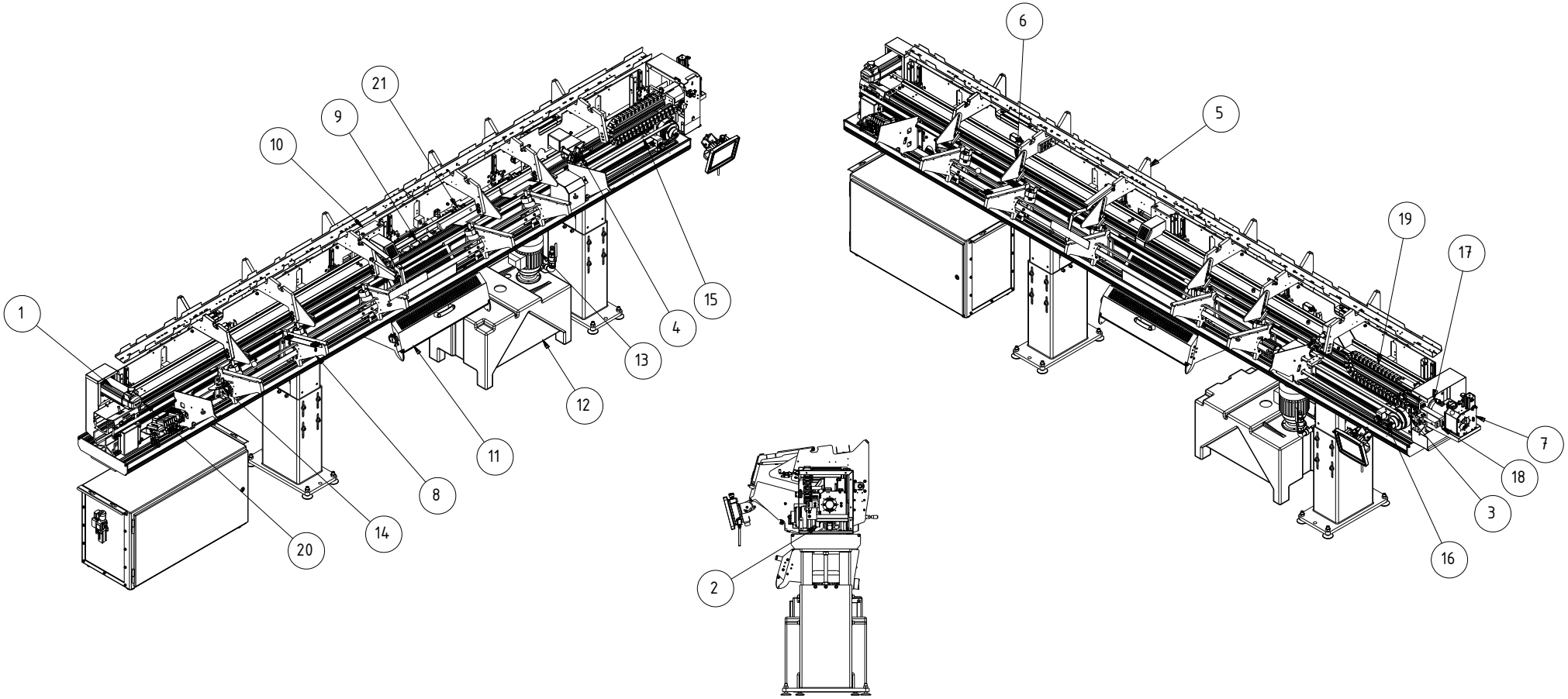
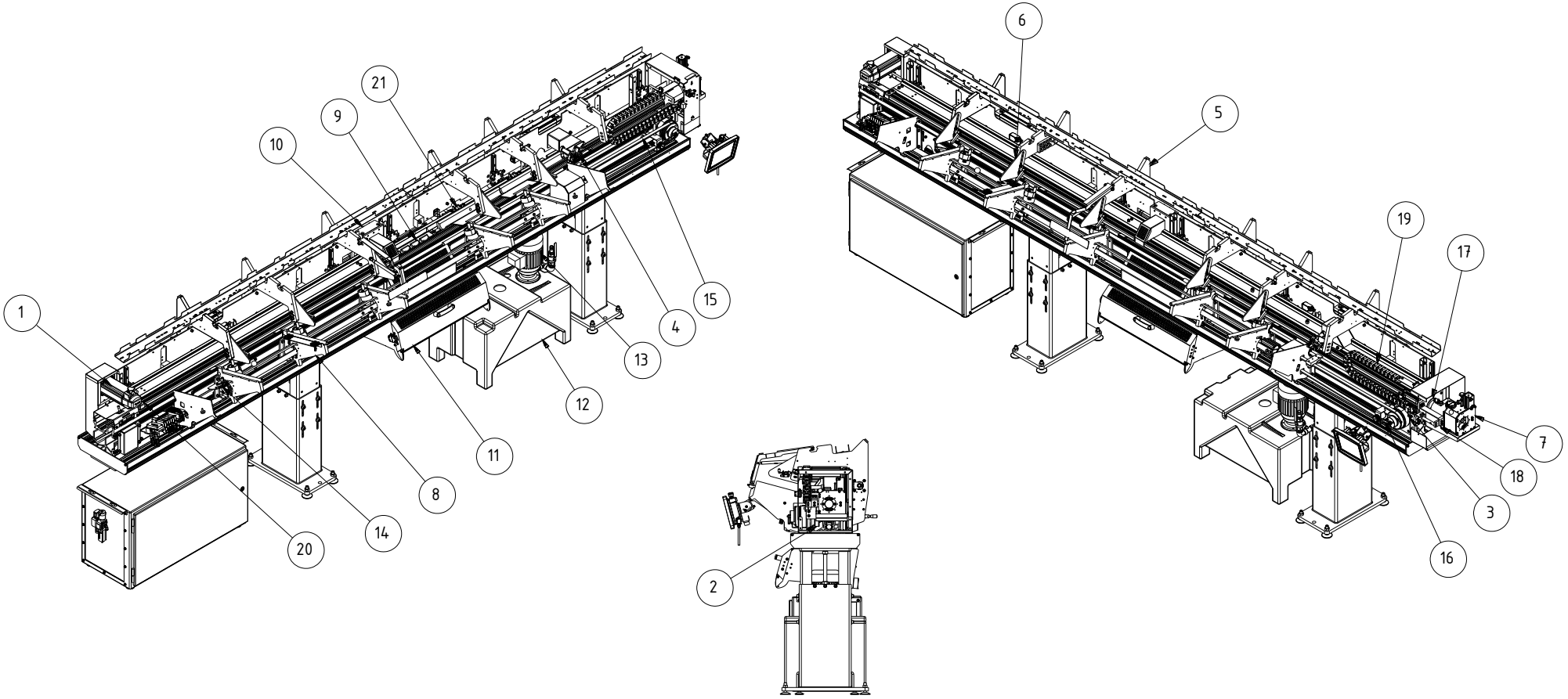


Grundaufbau / Basic construction

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100099166	Antrieb	Drive	
2	100086490 100104508 100115185	Zahnriemen 3200 Zahnriemen 3800 Zahnriemen 4200	Toothed belt 3200 Toothed belt 3800 Toothed belt 4200	
3	100083689	Lager vorne	Bearing front	
4	100102199 100102266	Anfahrschalter Variante A;D Anfahrschalter Variante B;C	Starting switch Variant A;D Starting switch Variant B;C	
5	längenabhängig dependent on length	Kanalöffner	Channel opener	
6	100092717	Niederhalter	Holding-down device	
7	100092794	Lünette D45 Spindelstock	Steady D 45 spindle stock	
8	längenabhängig dependent on length	Seitliche Materialauflage	Lateral material storage	
	100100223 100100225 100102100 100102102	Auflagebock A;D rechts Auflagebock A;D links Auflagebock B;C rechts Auflagebock B;C links	Bearing support A;D right Bearing support A;D left Bearing support B;C right Bearing support B:C left	
9	100100555 100102048	Reststückklappe Variante A;D Reststückklappe Variante B;C	Remnant flap Variant A;D Remnant flap Variant B;C	
10	100098615 100102040	Greifer A;D Greifer B;C	Gripper A;D Gripper B;C	
11	100103617	Reststückbehälter	Remnant bin	
12	100092666	Ölbehälter	Oil reservoir	
13	100092667	Tauchpumpe	Submerged pump	

Grundaufbau / Basic construction

Abbildung Variante / Drawing Variant A;D

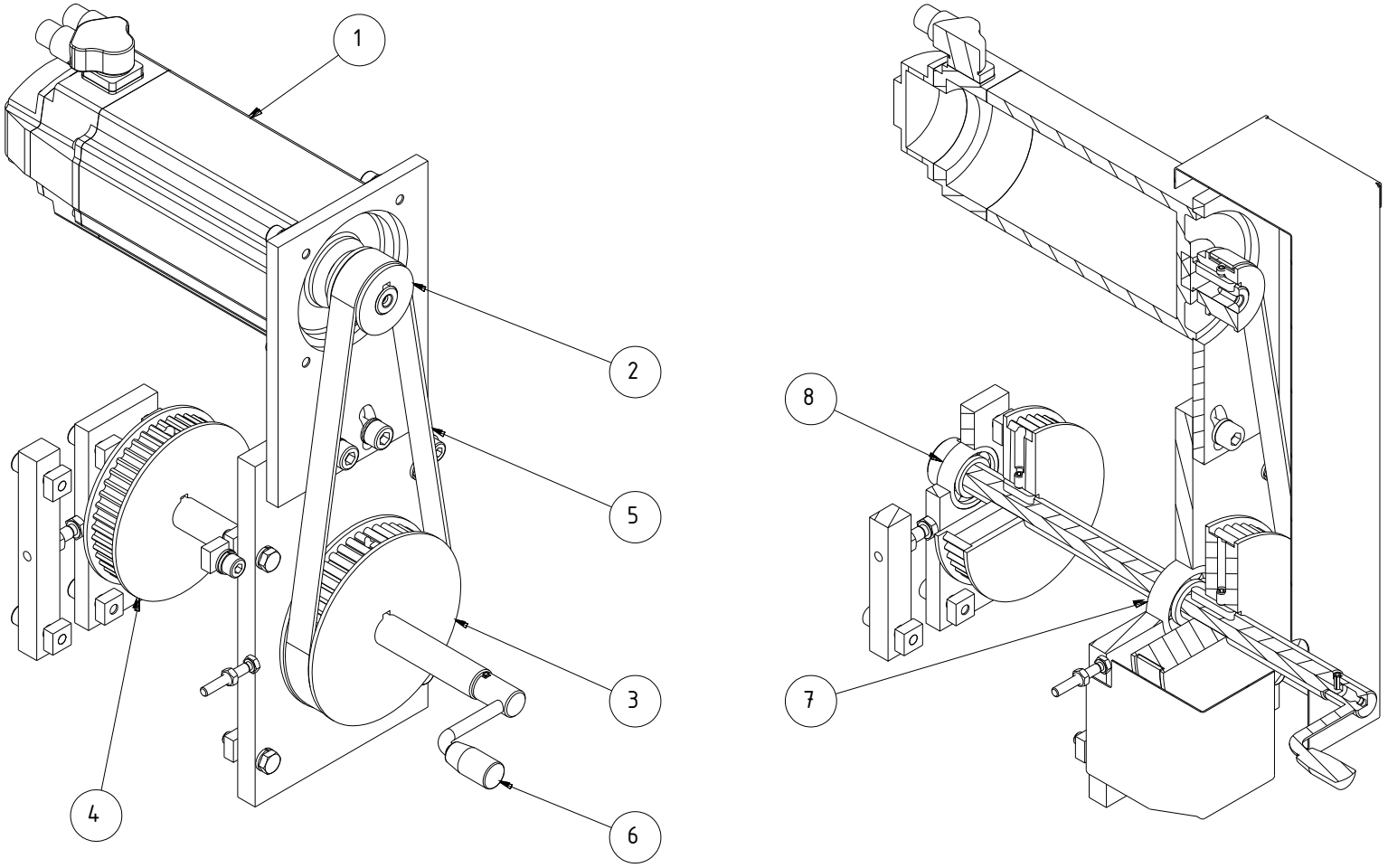


Grundaufbau / Basic construction

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
14	100100780 100102112	Manuelle Durchmessereinstellung A;D Manuelle Durchmessereinstellung B;C	Manual diameter setting A;D Manual diameter setting B;C	
15	100087352	Synchroneinrichtung	Synchronized device	
16	100103782	Sensor Synchroneinrichtung	Sensor, synchronized device	
17	100101538	Abstützung Führungsmodul	Support guide module	
18	100088605 100104267	Adapterset D45 A;D Adapterset D45 B;C	Adapter set D45 A;D Adapter set D45 B;C	
19	100101544	Energiekette	Energy chain	
20	100103029 100102488	Schlitten A;D Schlitten B;C	Carriage A;D Carriage B;C	
21	100103627	Einlagensicherung	Insert safety	

Antrieb / Drive

100099166



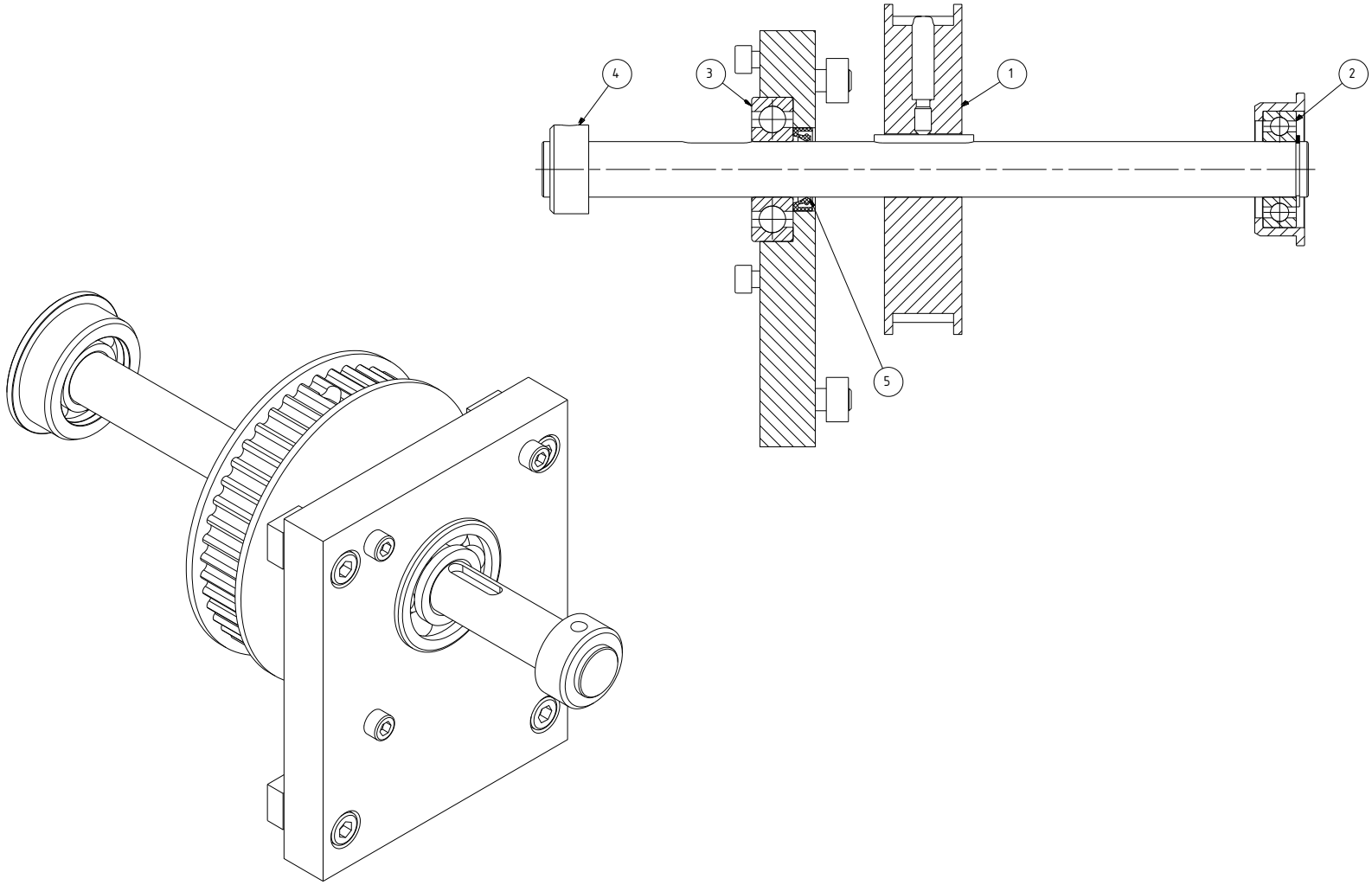
Antrieb / Drive

100099166

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	200004100	Servomotor	Servomotor	
2	100052114	Zahnscheibe Z=17	Synchronized disk Z=17	
3	2034-844	Zahnscheibe Z 48-8M 20	Synchronized disk Z=48-8M 20	
4	2050-925	Zahnscheibe Z=44	Synchronized disk Z=44	
5	2047-772	Zahnriemen	Toothed belt	
6	2050-793	Gerätekurbel	Hand crank	
7	1095-641	Rillenkugellager 20x52x15	Grooved ball bearing 20x52x15	DIN 625
8	0469-238	Rillenkugellager 20x42x12	Grooved ball bearing 20x42x12	DIN 625

Lager vorne / Bearing front

100083689



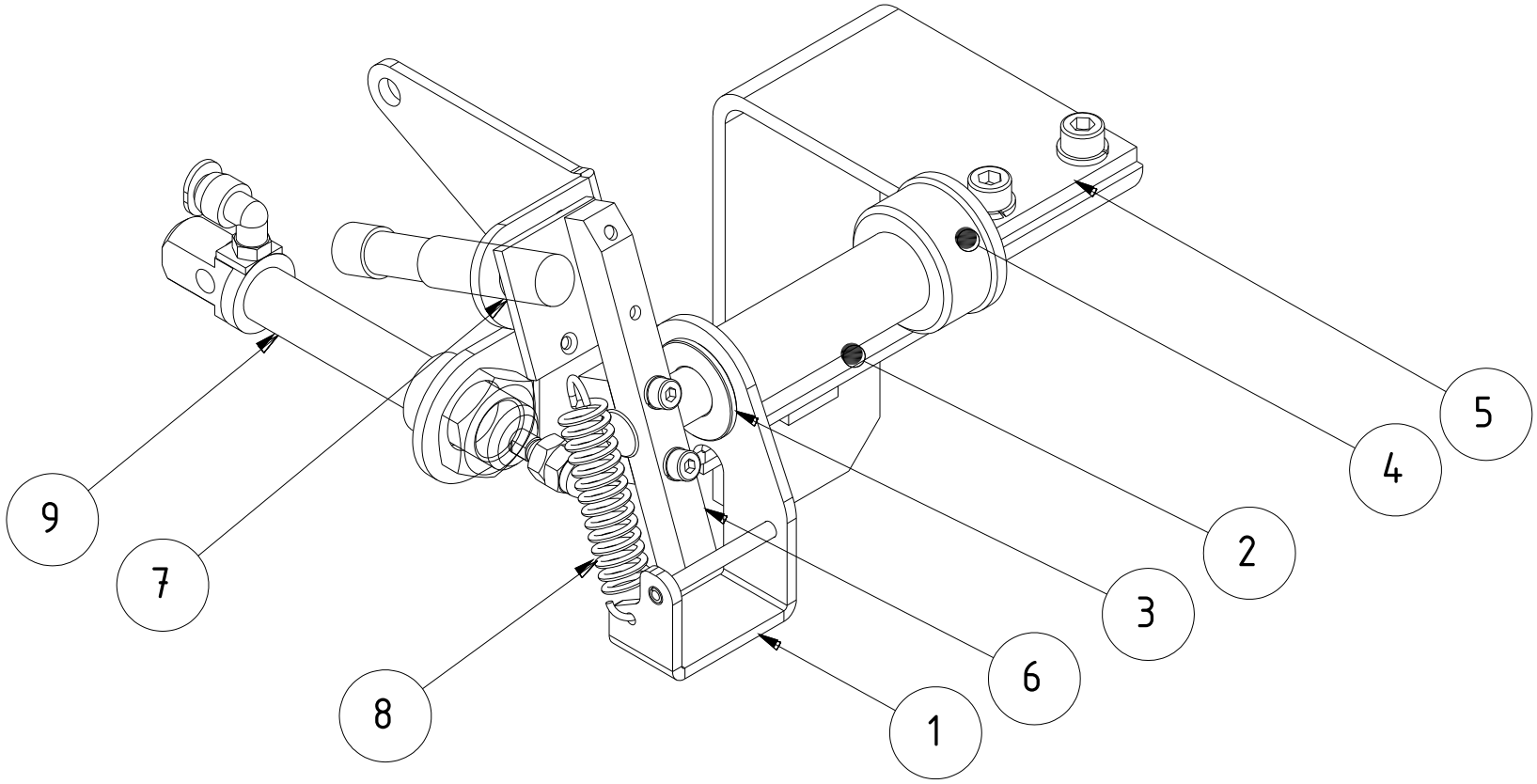
Lager vorne / Bearing front

100083689

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2050-925	Zahnscheibe Z44	Toothed disk Z44	
2	0469-238	Rillenkugellager 20x42x12	Grooved ball bearing 20x42x12	DIN 625
3	1095-641	Rillenkugellager 20x52x15	Grooved ball bearing 20x52x15	DIN 625
4	1112-554	Stellring A20,2 +0,1	Adjusting ring A20,2 +0,1	DIN 705
5	2029-202	Radial-Wellendichtring	Rotary shaft seal	DIN 3760

Anfahrschalter komplett / Starting switch complete

Variante / Variant A;D: 100102199
Variante / Variant B;C: 100102266 (Zeichnung/Drawing)



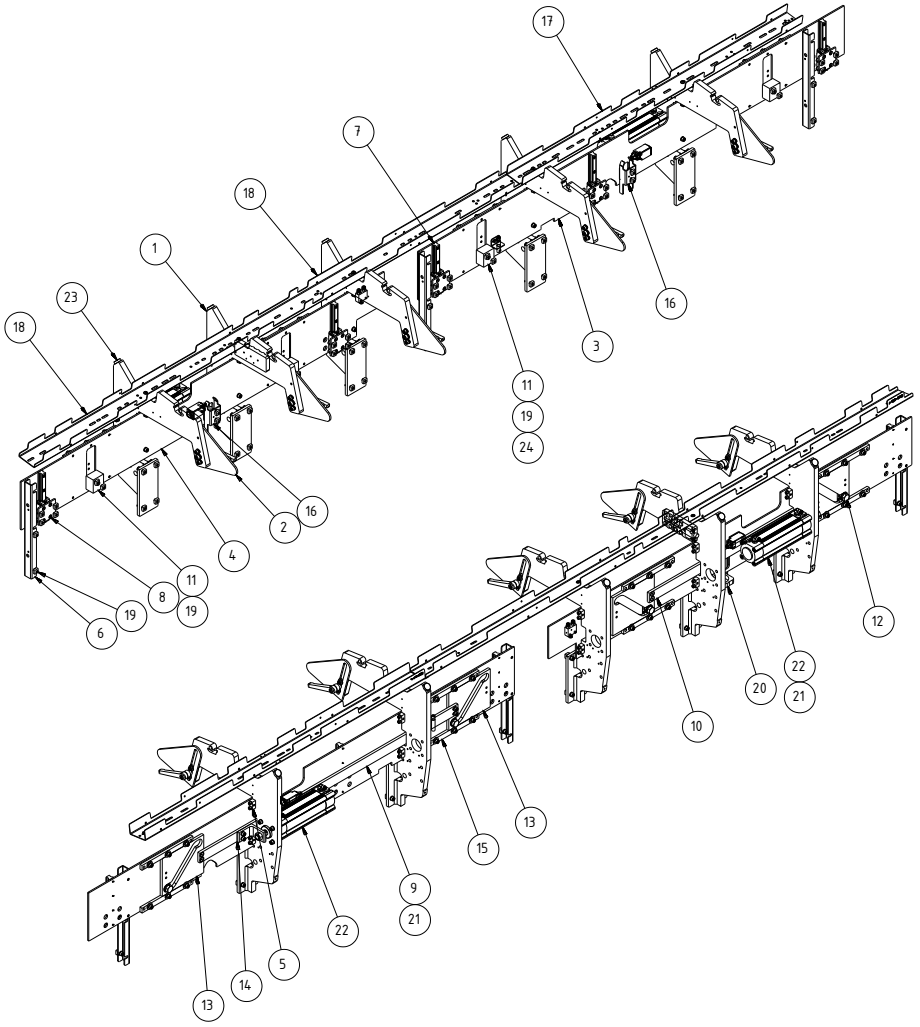
Anfahrschalter komplett / Starting switch complete

Variante / Variant A;D: 100102199
Variante / Variant B;C: 100102266

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100102195 100102269	Anfahrschalterblech A;D Anfahrschalterblech B;C	Plate for starting switch A;D Plate for starting switch B;C	
2	100102213	Welle	Shaft	
3	100107665	Führungsbuchse	Guide bush	
4	2076-278	Clipslager	Clip bearing	
5	2054-248	Fahne	Flag	
6	2016-784	Fahne	Flag	
7	2027-038	Schaltfahne	Switching flag	
8	2027-033	Zugfeder 1,6x12x43x14	Tension spring 1,6x12x43x14	
9	2030-646	Zylinder	Cylinder	

Kanalöffner / Channel opener

Zeichnung Variante / Drawing Variant A;D

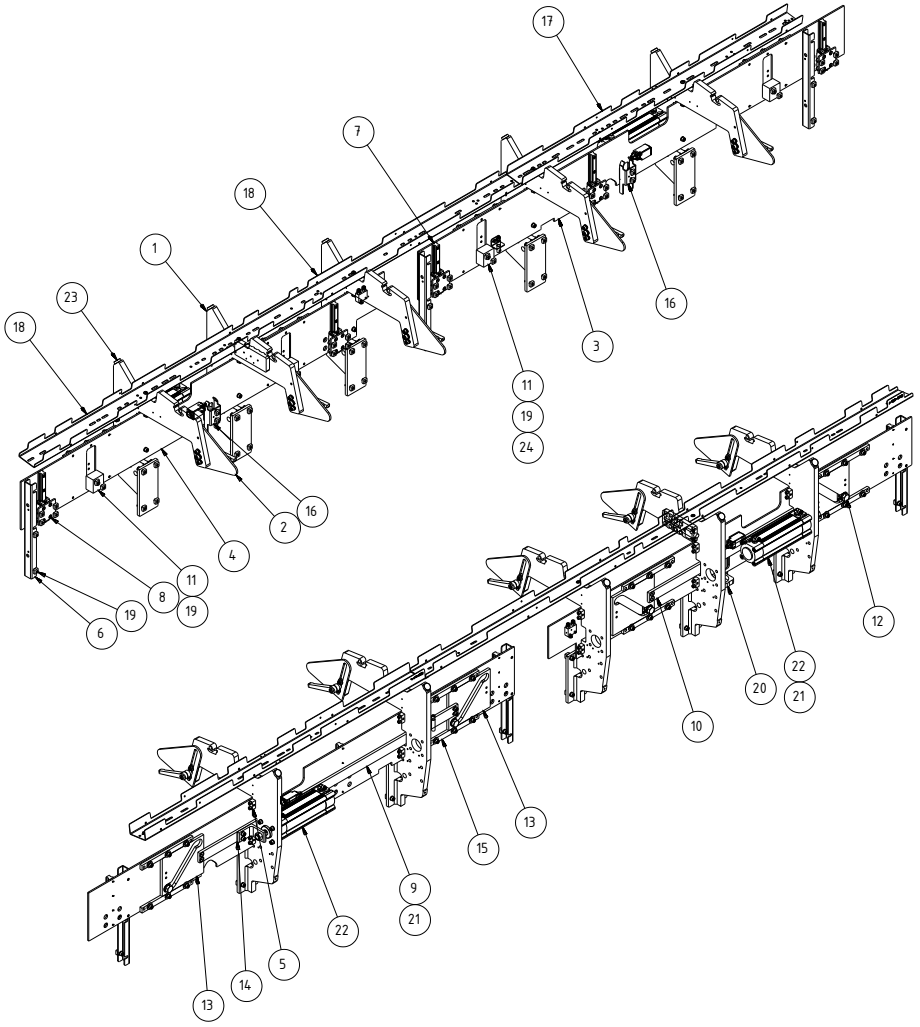


Kanalöffner / Channel opener

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100098106	Lagerbock geschweißt	Bearing block	
2	100092717	Niederhalter kpl.	Holding down device complete	
3	100100645 100104511 100115115	Grundplatte vorne 3200 Grundplatte vorne 3800 Grundplatte vorne 4200	Base plate front 3200 Base plate front 3800 Base plate front 4200	
4	100100644	Grundplatte hinten	Base plate rear	
5	100102483	Anschraubklotz	Screw-on block	
6	100100685	Abstützungsleiste	Support gib	
7	100092740	Profilschienenführung	Profile rail guidance	
8	100086883	Befestigungsplatte	Fixing plate	
9	100101047 100104512 100115118	Synchronleiste 3200 Synchronleiste 3800 Synchronleiste 4200	Synchronous gib 3200 Synchronous gib 3800 Synchronous gib 4200	
10	100100835	Synchronleiste	Synchronous gib	
11	100098149	Aufnahme für Kurvenrolle	Receiving for cam roller	
12	100098153	Distanzhülse D 17,2/ 22x7	Spacer sleeve D 17,2/ 22x7	
13	100098342	Kulissenplatte	Slotted plate	
14	100098402	Befestigungswinkel Zylinder	Fixing angle cylinder	
15	100098808	Führung für Kulisse	Guidance for slotted plate	
16	100103739	Betätigerblech kpl.	Actuator sheet complete	
17	2060-548	Kabelkanal	Cable channel	
18	2060-550	Kabelkanal universal	Cable channel	
19	2001-188	Vierkantmutter M8 - 8,0x16x16	Square nut M8 - 8,0x16x16	
20	2038-437	Universalhalter teilbar	Universal holder divisible	

Kanalöffner / Channel opener

Zeichnung Variante / Drawing Variant A;D

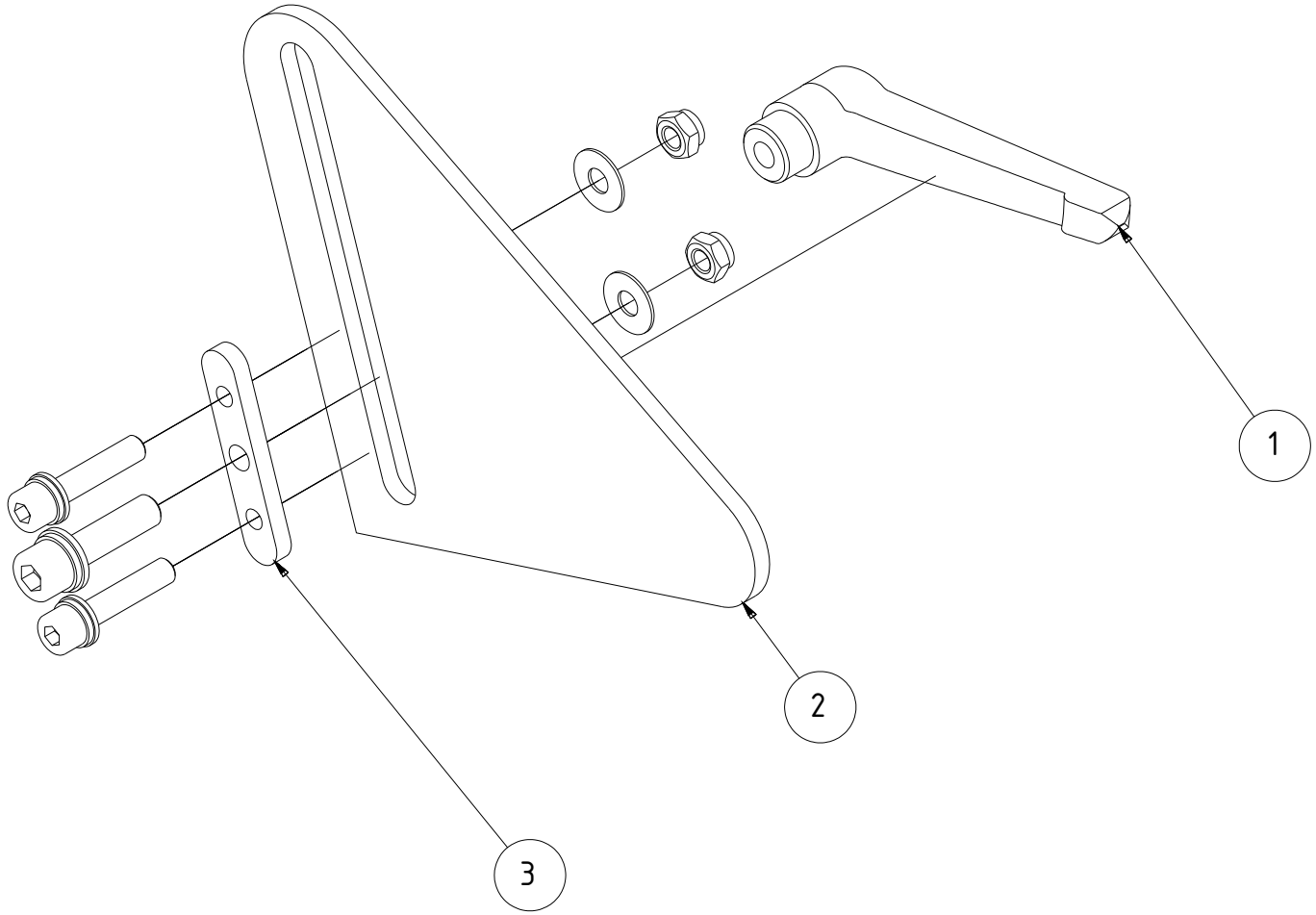


Kanalöffner / Channel opener

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
21	100048374	Steckverschraubung	Plug-in screwing	
22	100092747	Zylinder	Cylinder	
23	2053-047	Rundpuffer Typ D, d=25, h=8	Buffer, round Type D, d=25, h=8	
24	2036-486	Rillenkugellager 17x30x7	Grooved ball bearing 17x30x7	DIN 625

Niederhalter / Holding-down device

100092717



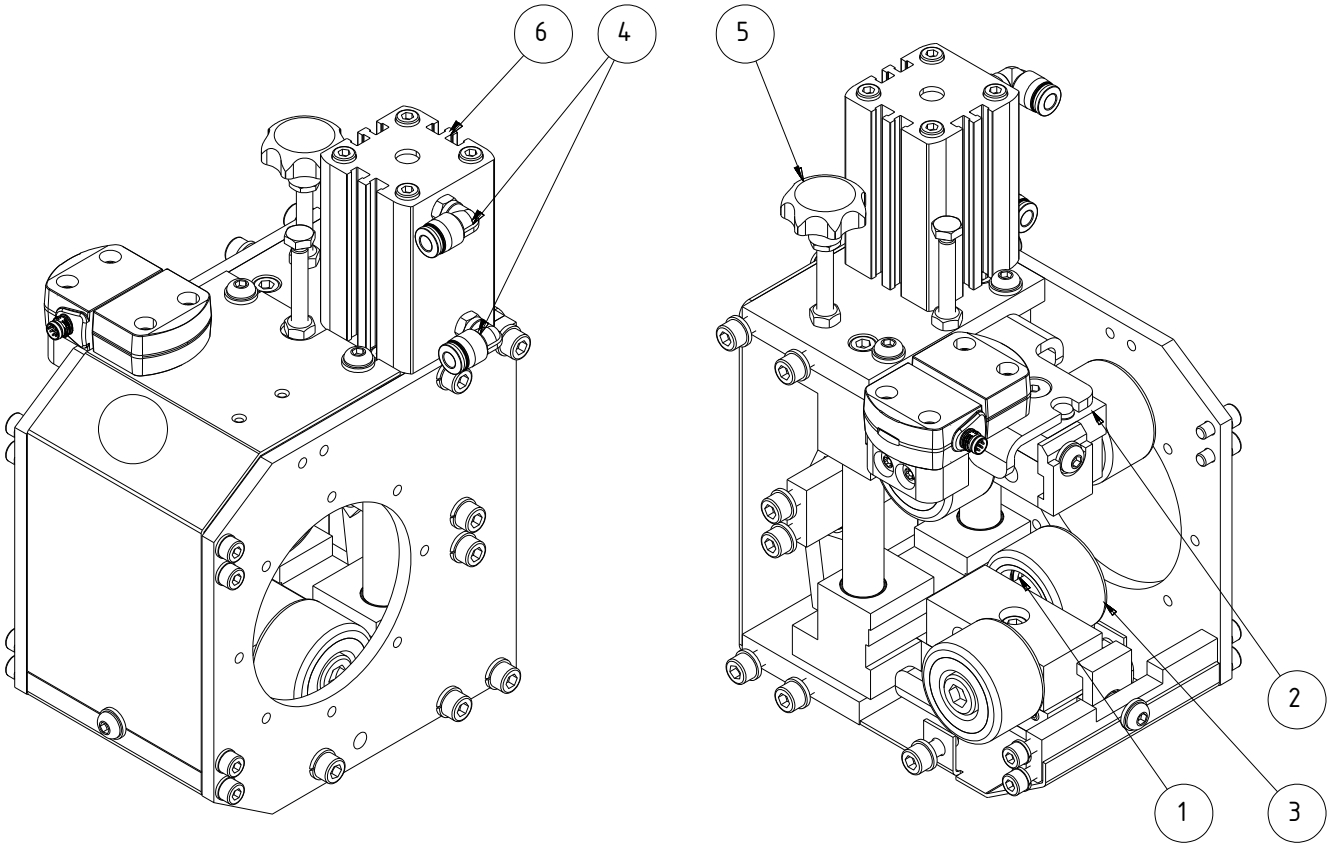
Niederhalter / Holding-down device

100092717

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	2054-483	Klemmhebel	Clamping lever	
2	2055-825	Niederhalter	Holding-down device	
3	2054-726	Niederhalterführung	Guidance for holding-down device	

Lünette D 45 Spindelstock / Steady D 45 spindle stock

100092794



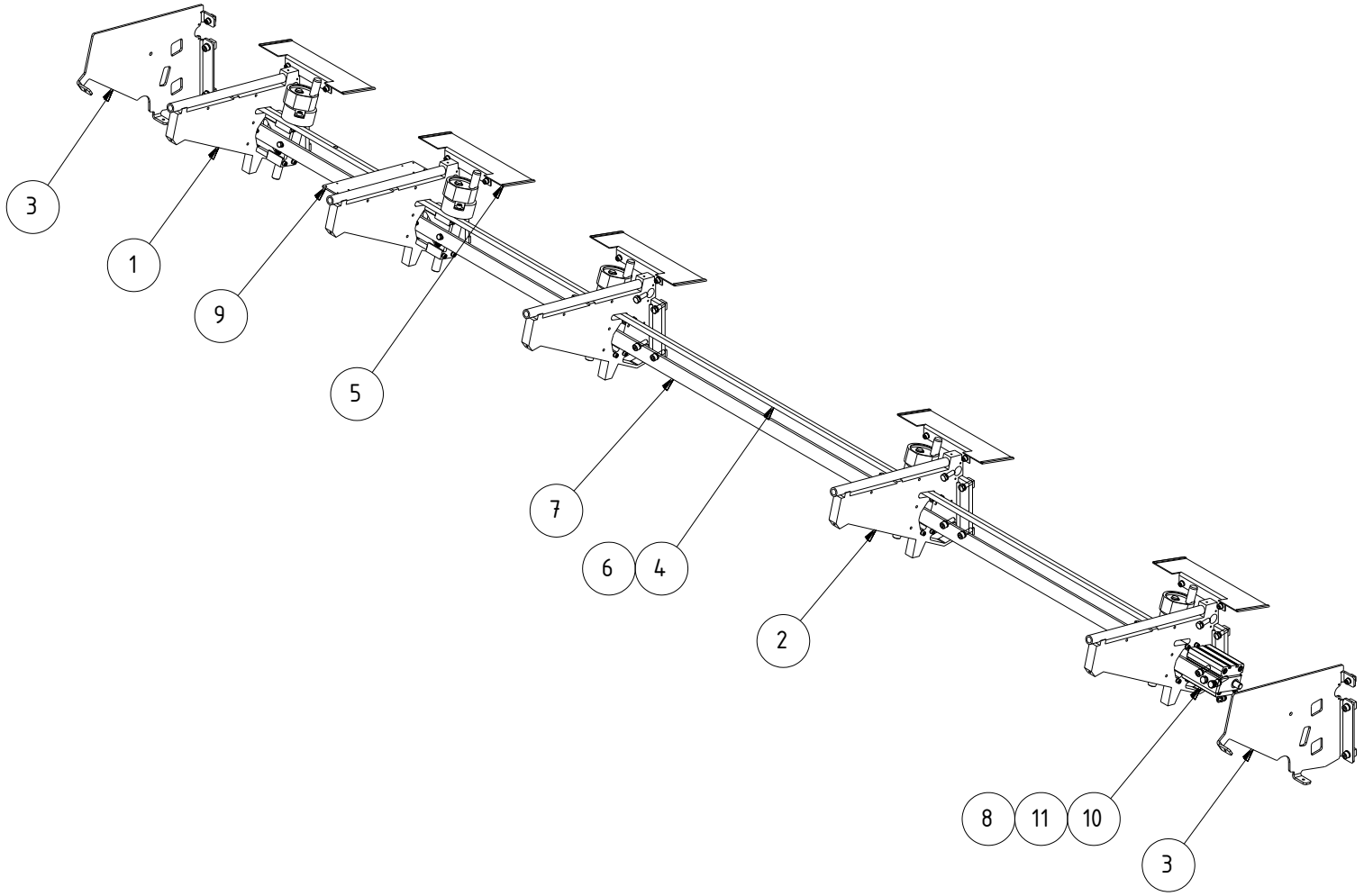
Lünette D 45 Spindelstock / Steady D 45 spindle stock

100092794

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2058-2335	Distanz für Rolle	Distance for roller	
2	100092818	Führung	Guidance	
3	2058-243	Rolle	Roller	
4	2038-346	Steckverschraubung	Plug-in screwing	
5	100077703	Sterngriff	Star grip	
6	2055-066	Zylinder	Cylinder	

Seitliche Materialauflage / Lateral material storage

Zeichnung Variante / Drawing Variant A;D



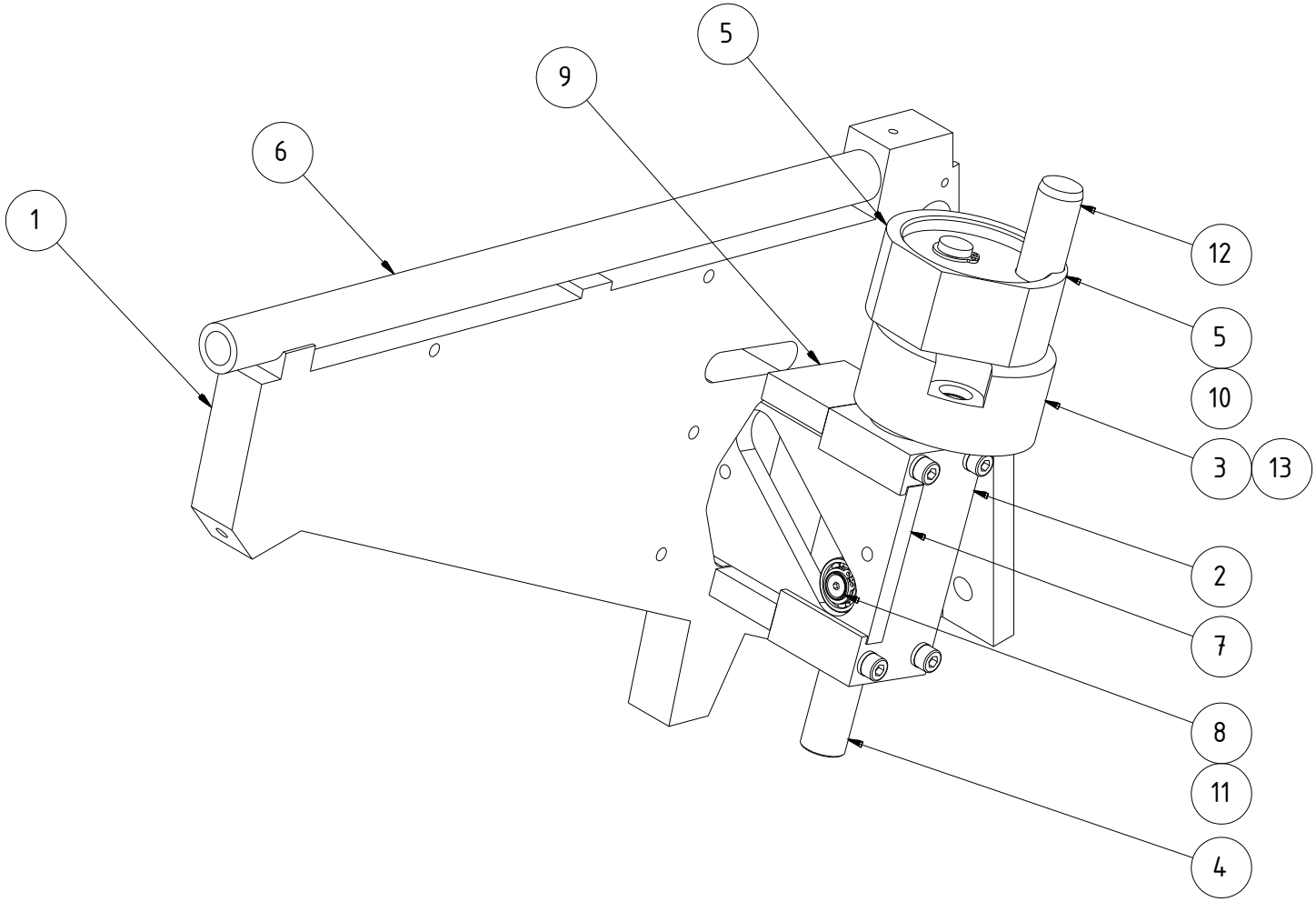
Seitliche Materialauflage / Lateral material storage

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100100223 100102100	Auflagebock rechts A;D Auflagebock rechts B;C	Bearing support right A;D Bearing support right B;C	
2	100100225 100102102	Auflagebock links A;D Auflagebock links B;C	Bearing support left A;D Bearing support left B;C	
3	100097930	Materialanschlag	Material stop	
4	100100199 100104514 100115170	Synchronstange 3200 Synchronstange 3800 Synchronstange 4200	Synchronized bar 3200 Synchronized bar 3800 Synchronized bar 4200	
5	100090627	Übergangsblech Kanal	Transition sheet, channel	
6	100100328	Laufhülse	Barrel sleeve	
7	100100196 100104515 100115168	Zugstange 3200 Zugstange 3800 Zugstange 4200	Pull rod 3200 Pull rod 3800 Pull rod 4200	
8	100100013	Winkel Zylinder	Angle cylinder	
9	100099710	Halteblech	Retaining plate	
10	2056-576	Zylinder	Cylinder	
11	2038-346	Steckverschraubung	Plug-in screwing	

Auflagebock / Bearing support

Variante / Variant A;D rechts: 100100223 (Zeichnung/Drawing)
Variante / Variant B;C right: 100102100

Variante / Variant A;D links: 100100225
Variante / Variant B;C left: 100102102



Auflagebock / Bearing support

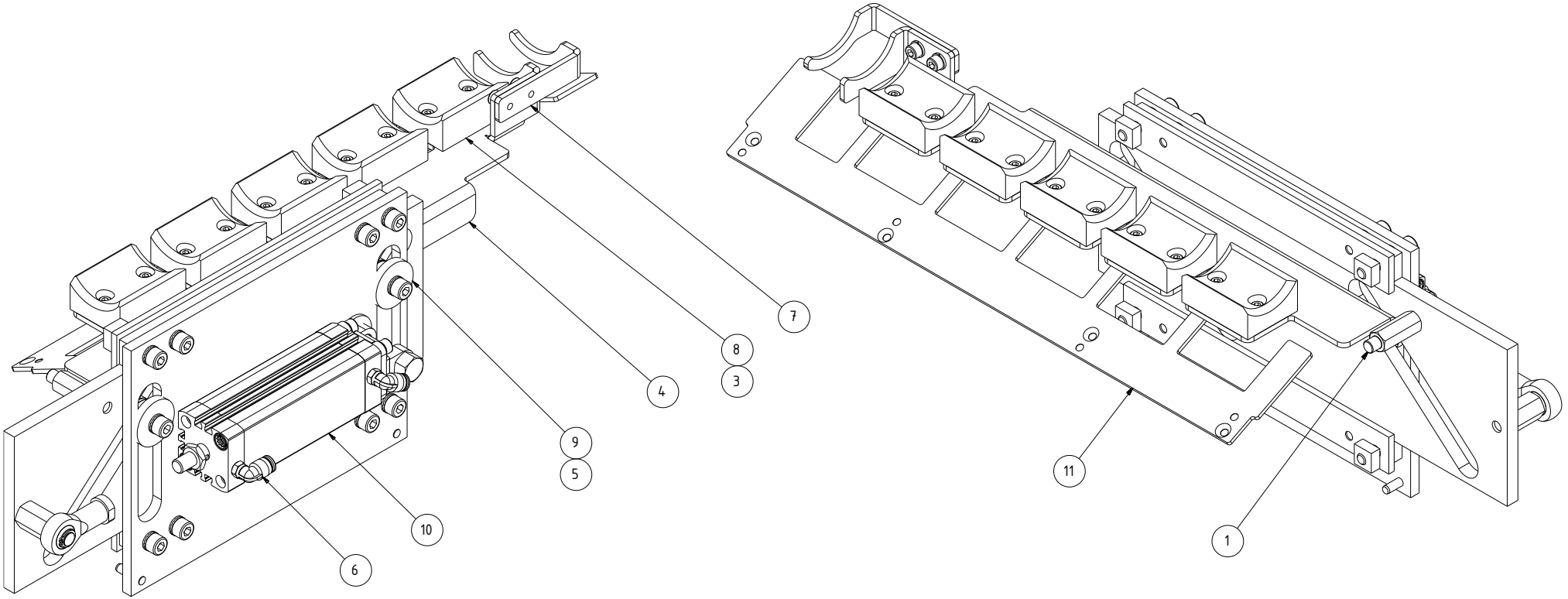
Variante / Variant A;D rechts: 100100223
Variante / Variant B;C right: 100102100

Variante / Variant A;D links: 100100225
Variante / Variant B;C left: 100102102

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100099858	Auflagebock	Bearing support	
2	100099861	Aufnahmeachse	Receiving axis	
3	100100310	Durchmessereinstellung	Diameter setting	
4	100099925	Einwerferachse	Throw-in axis	
5	100099676	Einwerferstößel	Throw-in tappet	
6	100101564	Materialauflage	Material storage	
7	100099909	Kulissenplatte	Slotted plate	
8	100099924	Aufnahme für Kugellager	Receiver for ball bearing	
9	100099987	Haltestück	Retaining piece	
10	0477-591	Glycodurbuchse 16x18x15 F	Glycodur bush 16x18x15 F	
11	200012650	Rillenkugellager 10x19x5	Groved ball bearing 10x19x5	DIN 625
12	2041-178	Zylinderstift mit Innengewinde 16x70	Cylindrical pin with internal thread 16x70	ISO 8735
13	0503-177	Glycodurbuchse 10x12x15 F	Glycodur bush 10x12x15 F	

Reststückklappe / Remnant flap

Variante / Variant A;D: 100100555 (Zeichnung/Drawing)
Variante / Variant B;C: 100102048



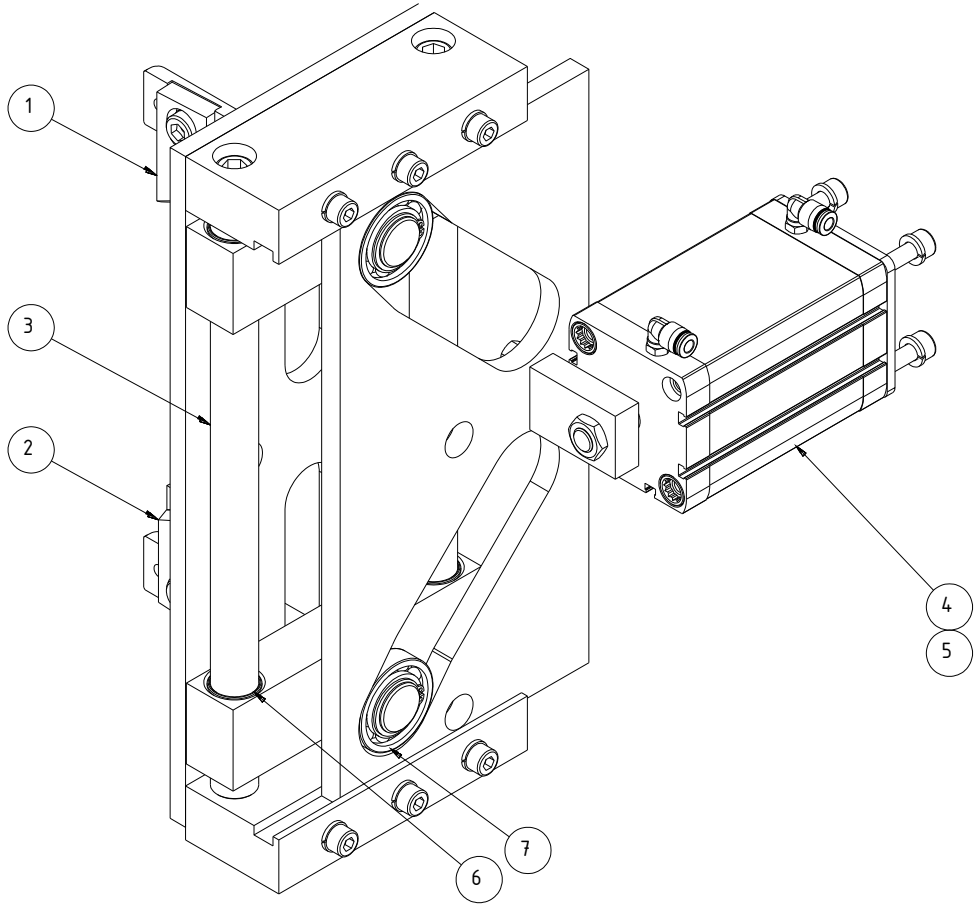
Reststückklappe / Remnant flap

Variante / Variant A;D: 100100555
Variante / Variant B;C: 100102048

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100087648	Anschlagbolzen	Bolt	
2	100098808	Führung	Guidance	
3	100092320	Klemmbuchse	Clamping bush	
4	100100771 100102053	Reststückkamm A;D Reststückkamm B;C	Remnant comb A;D Remnant comb B;C	
5	0469-246	Rillenkugellager 8x22x7	Grooved ball bearing 8x22x7	DIN 625
6	2038-346	Steckverschraubung	Plug-in screwing	
7	100102065 100102076	Stützblech A;D Stützblech B;C	Support sheet A;D Support sheet B;C	
8	100087096	Universaleinlage	Universal insert	
9	2041-545	Unterlegscheibe	Washer	
10	100087497	Zylinder	Cylinder	
11	100101059	Reststückmaske	Remnant mask	

Greifer / Gripper

Variante / Variant A;D: 100098615 (Zeichnung/Drawing)
Variante / Variant B;C: 100102040



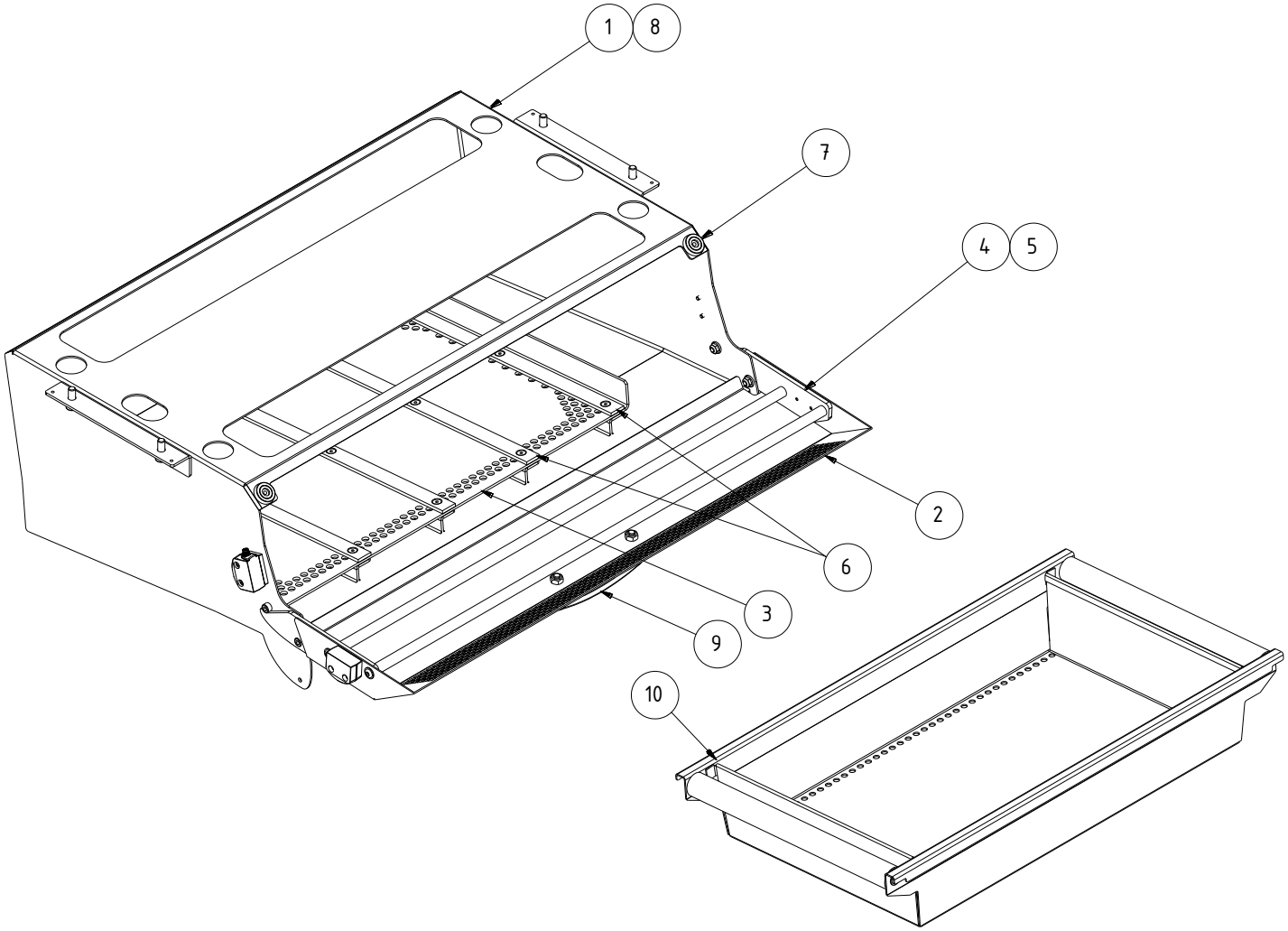
Greifer / Gripper

Variante / Variant A;D: 100098615
Variante / Variant B;C: 100102040

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100098693	Messer oben	Blade, top	
2	100098680	Messer unten	Blade, bottom	
3	100098757	Führungsstange	Guide bar	
4	2075-985	Zylinder	Cylinder	
5	2038-346	Steckverschraubung	Plug-in screwing	
6	2064-899	Glycodur-Buchse 22x25x20 F	Glycodur bush 22x25x20 F	
7	2027-118	Rillenkugellager 25x47x12	Grooved ball bearing 25x47x12	DIN 625

Reststückbehälter / Remnant bin

100103617



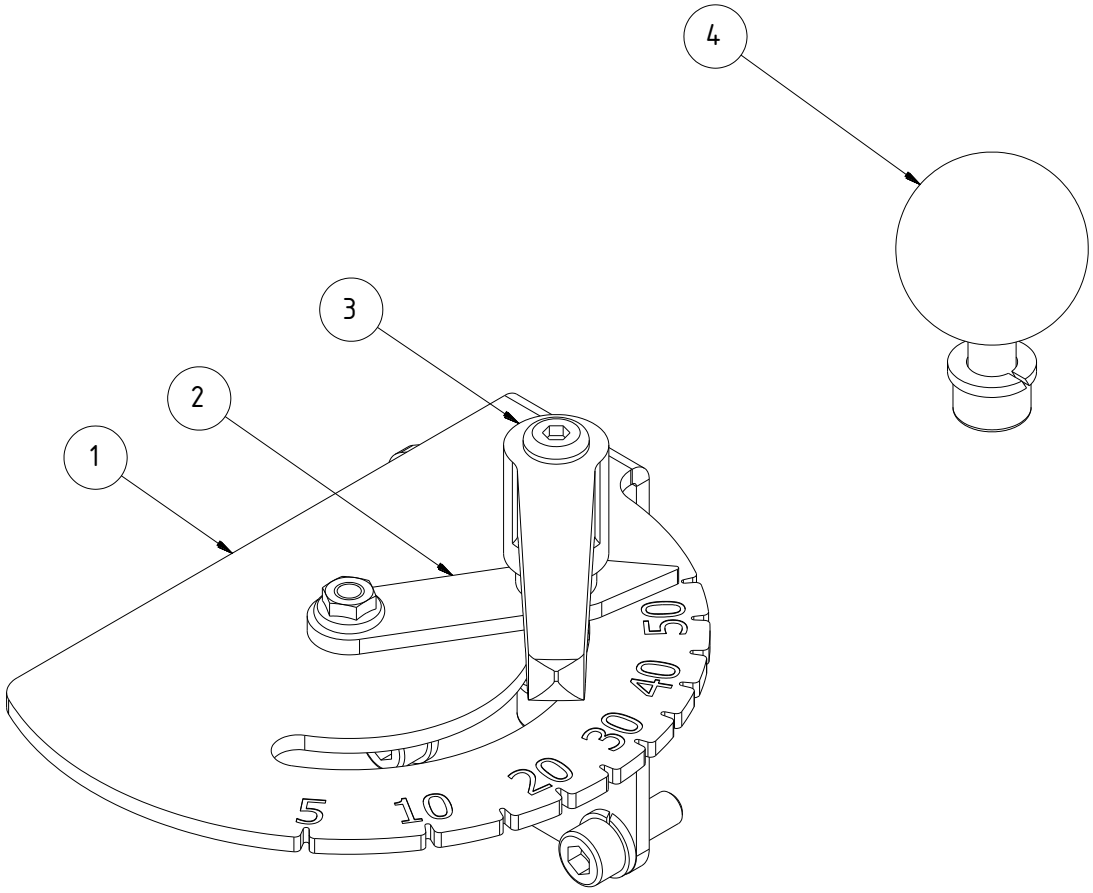
Reststückbehälter / Remnant bin

100103617

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100099124	Reststückbehälter	Remnant bin	
2	100103620	Klappe	Flap	
3	100099230	Abtropfblech	Drip plate	
4	100099056	Schwenkleiste	Slewing gib	
5	100099520	Auflagestange	Support rod	
6	100099329	Führungsleiste	Guide gib	
7	2036-888	Gerätefuß 5 mm	Vibration dumper 5 mm	
8	2053-709	Gerätefuß 10 mm	Vibration dumper 10 mm	
9	2006-974	Bügelgriff	Bow handle	
10	100094323	Reststückwanne	Remnant tray	

Manuelle Durchmessereinstellung / Manual diameter setting

Variante / Variant 3200 A;D: 100100780 (Zeichnung/Drawing)
Variante / Variant 3200 B;C: 100102112



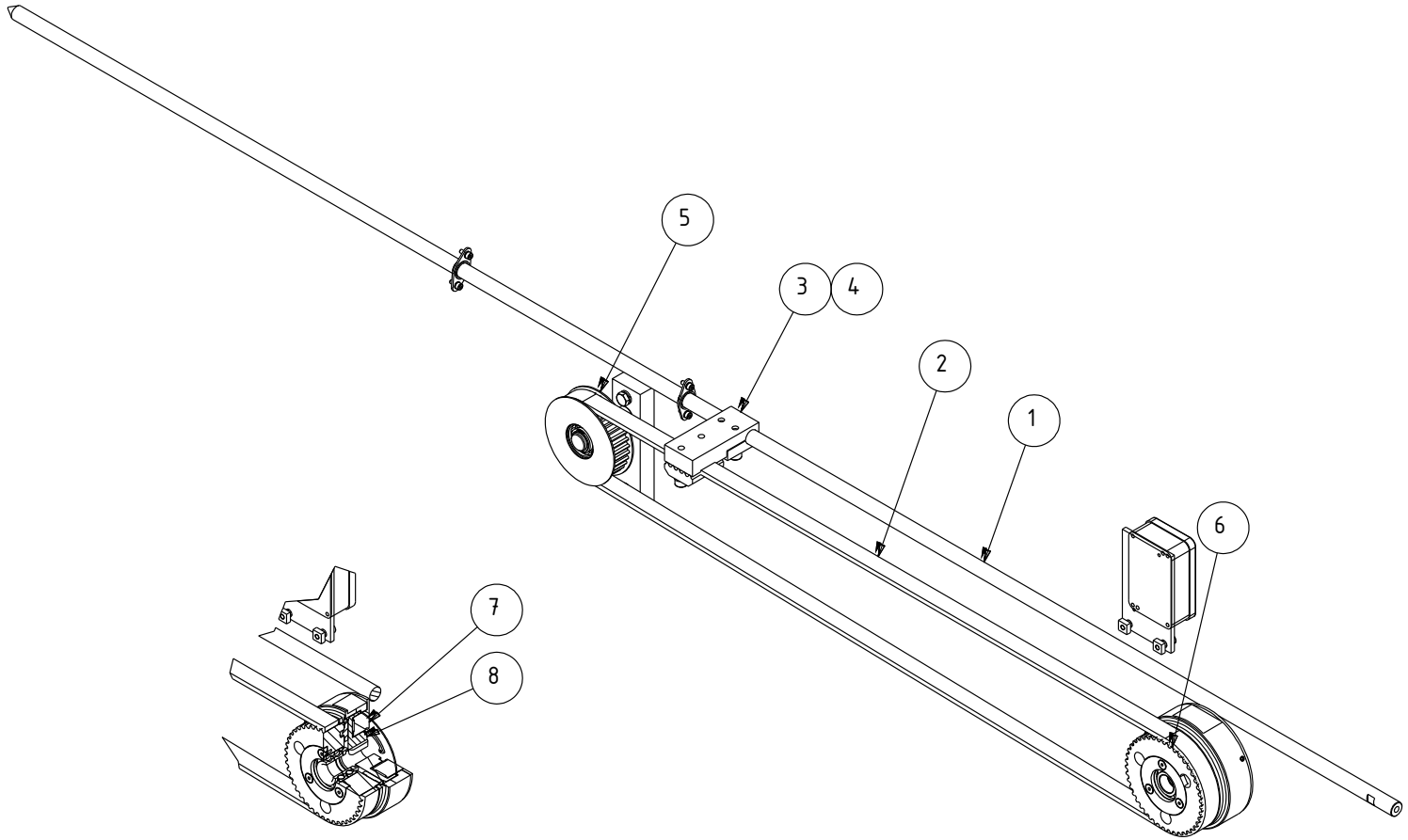
Manuelle Durchmessereinstellung / Manual diameter setting

Variante / Variant 3200 A;D: 100100780
Variante / Variant 3200 B;C: 100102112

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100100734 100102113	Arretierblech A;D Arretierblech B;C	Fixing sheet A;D Fixing sheet B;C	
2	100100752	Zeiger	Indicator	
3	2082-064	Klemmhebel	Clamping lever	
4	2041-158	Kugelknopf	Ball knob	

Synchroneinrichtung / Synchronized device

100087352 Hub/stroke 600 (Abbildung Variante A;D / Drawing variant A;D)



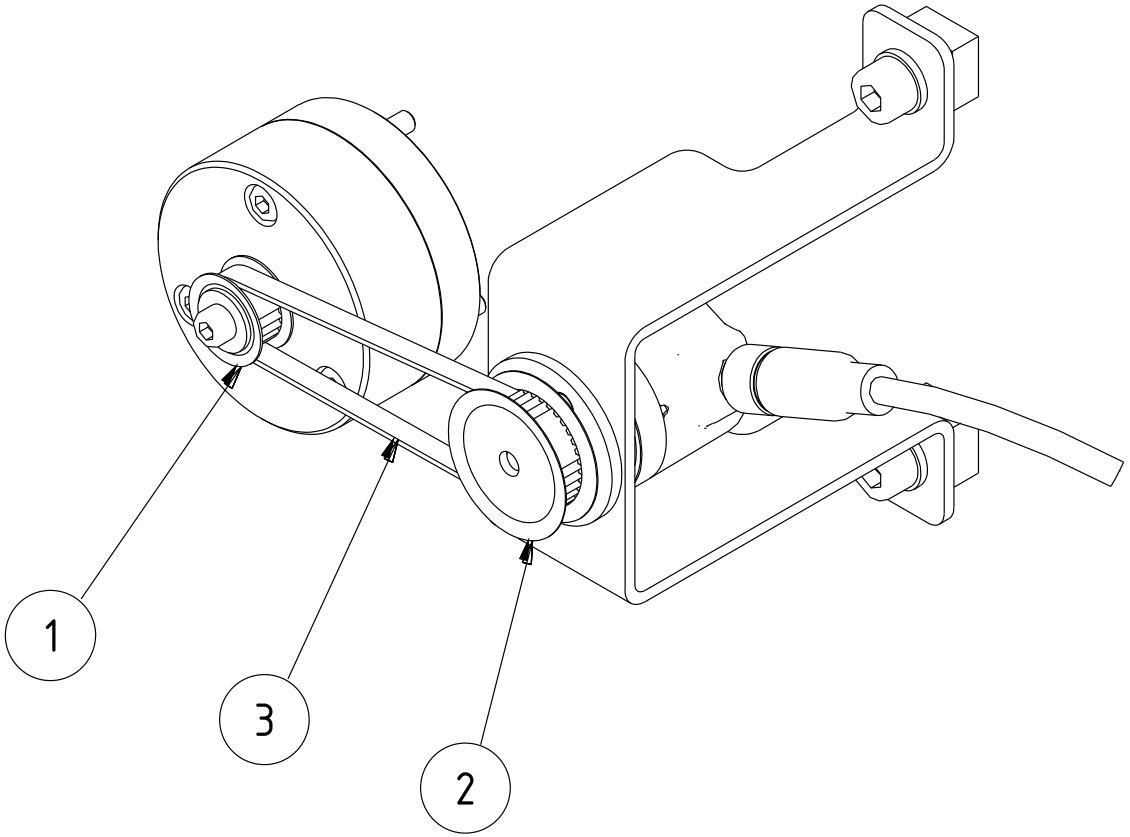
Synchroneinrichtung / Synchronized device

100087352 Hub/stroke 600

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100093147	Synchronstange	Synchronized bar	
2	100093339	Zahnriemen 2000 Hub 600	Toothed belt 2000 stroke 600	
3	100083952	Mitnehmer	Carrier	
4	2035-080	Spannplatte	Clamping plate	
5	100083918	Umlenkrad	Deflection wheel	
6	2055-542	Zahnscheibe Z44	Toothed disk Z44	
7	2000-197	Magnetteil Gr. 10	Magnetic part size 10	
8	2000-195	Rotor Gr. 10	Rotor size 10	

Sensor Synchroneinrichtung / Sensor Synchronized device

100103782



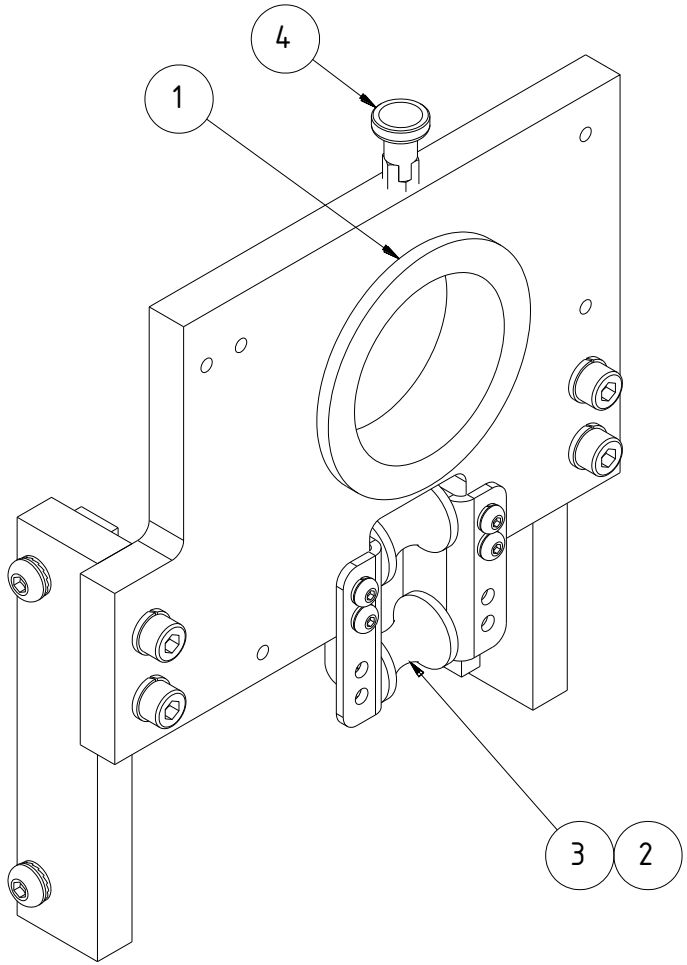
Sensor Synchroneinrichtung / Sensor Synchronized device

100103782

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	2069-696	Zahnscheibe Z22	Toothed disk Z22	
2	100093063	Zahnscheibe Z40	Toothed disk Z40	
3	100087603	Zahnriemen	Toothed belt	

Abstützung Führungsmodul / Support guide module

100101538



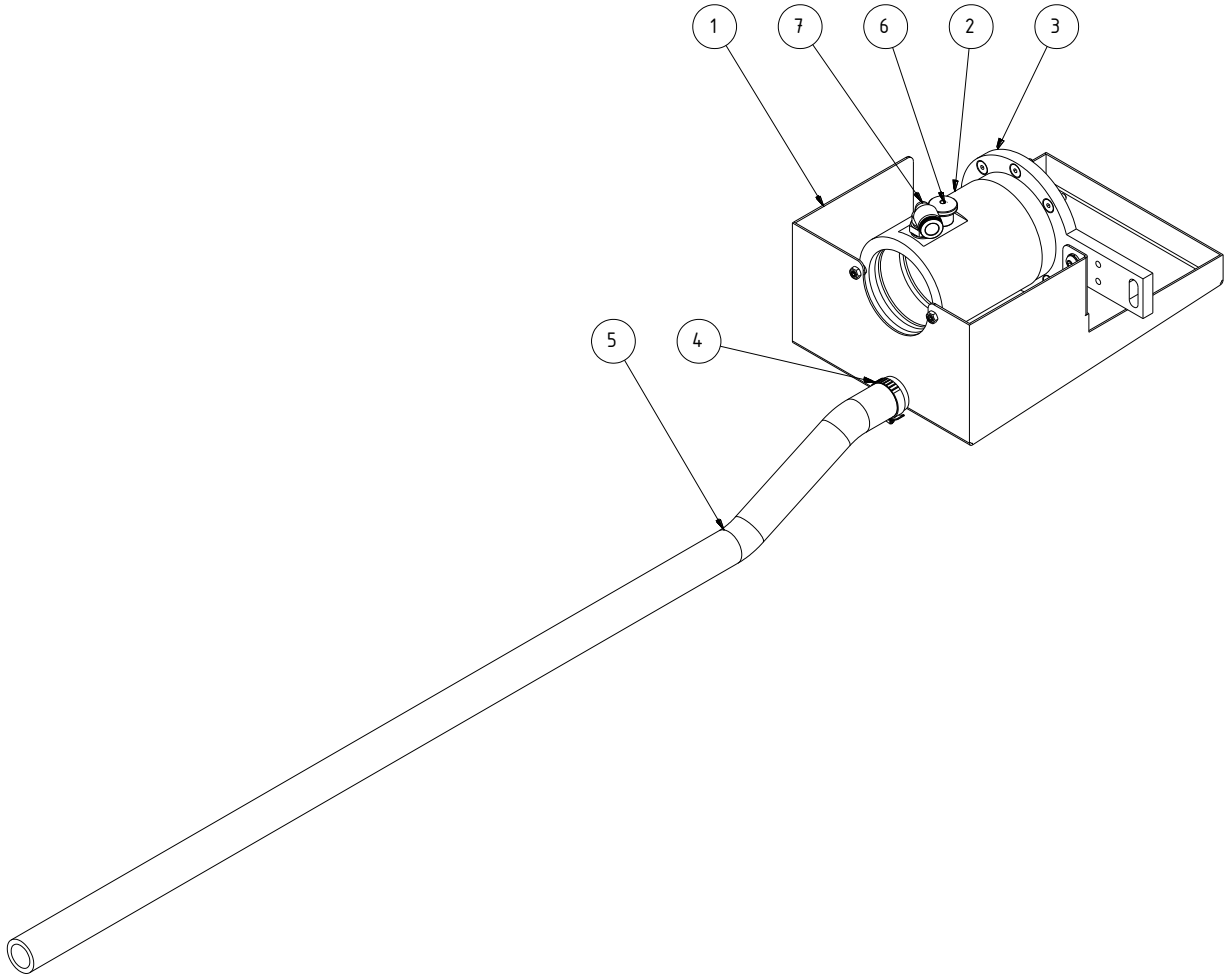
Abstützung Führungsmodul / Support guide module

100101538

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100088583	Führungsbuchse D65	Guide bush D65	
2	100092925	Achse	Axis	
3	100073710	Rolle	Roller	
4	100007948	Rastbolzen	Stop bolt	

Adapterset / Adapter set

Variante / Variant A;D: 100088605
Variante / Variant B;C: 100104267



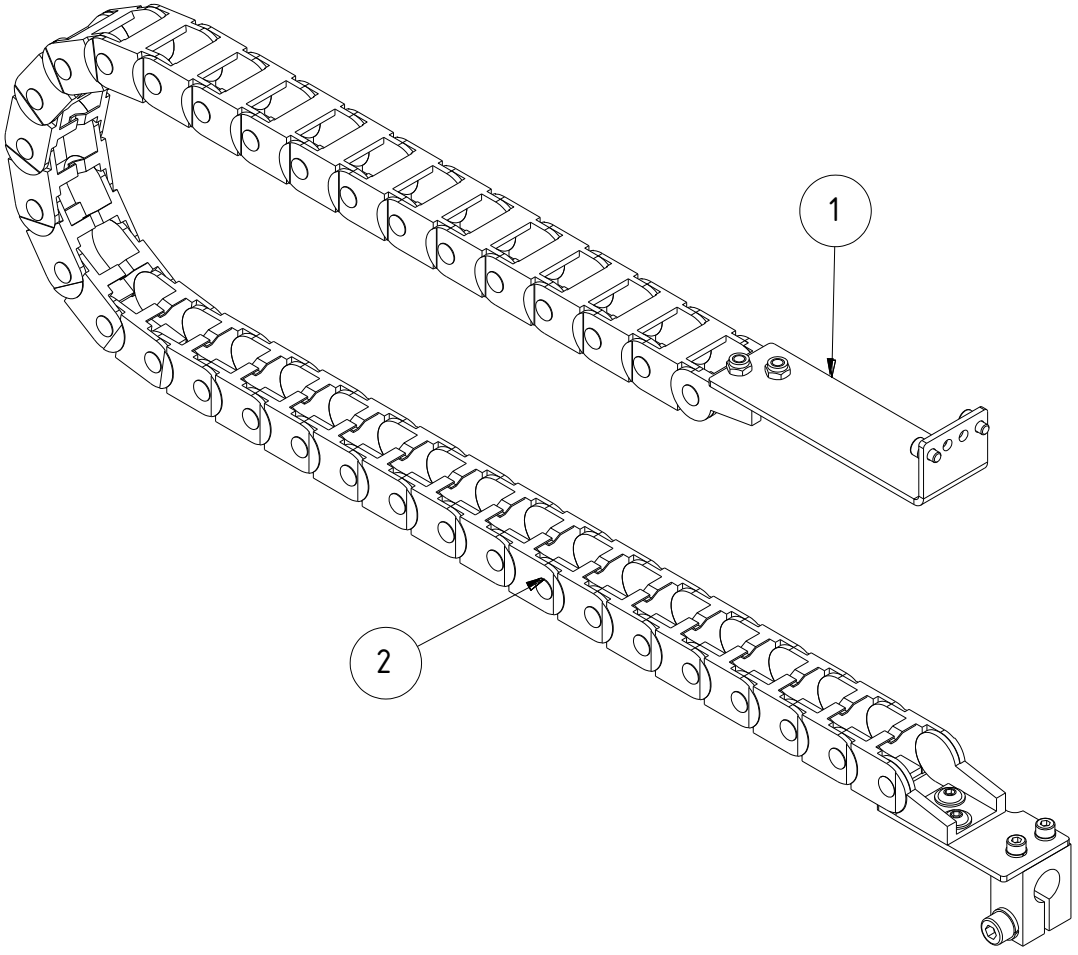
Adapterset / Adapter set

Variante / Variant A;D: 100088605
Variante / Variant B;C: 100104267

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100090491	Ablaufbehälter	Drain tank	
2	100088606	Adapter Führungsrohr	Adapter guide tube	
3	100088607	Befestigung Synchronstange	Fixing synchronized bar	
4	2002-055	Schlauchschelle	Hose clip	
5	200007829	Schlauch 19x4	Hose 19x4	
6	100091280	Miniraster	Mini indexing plunger	
7	100055428	Steckverschraubung	Plug-in screwing	

Energiekette kpl. / Energy chain, complete

100101544



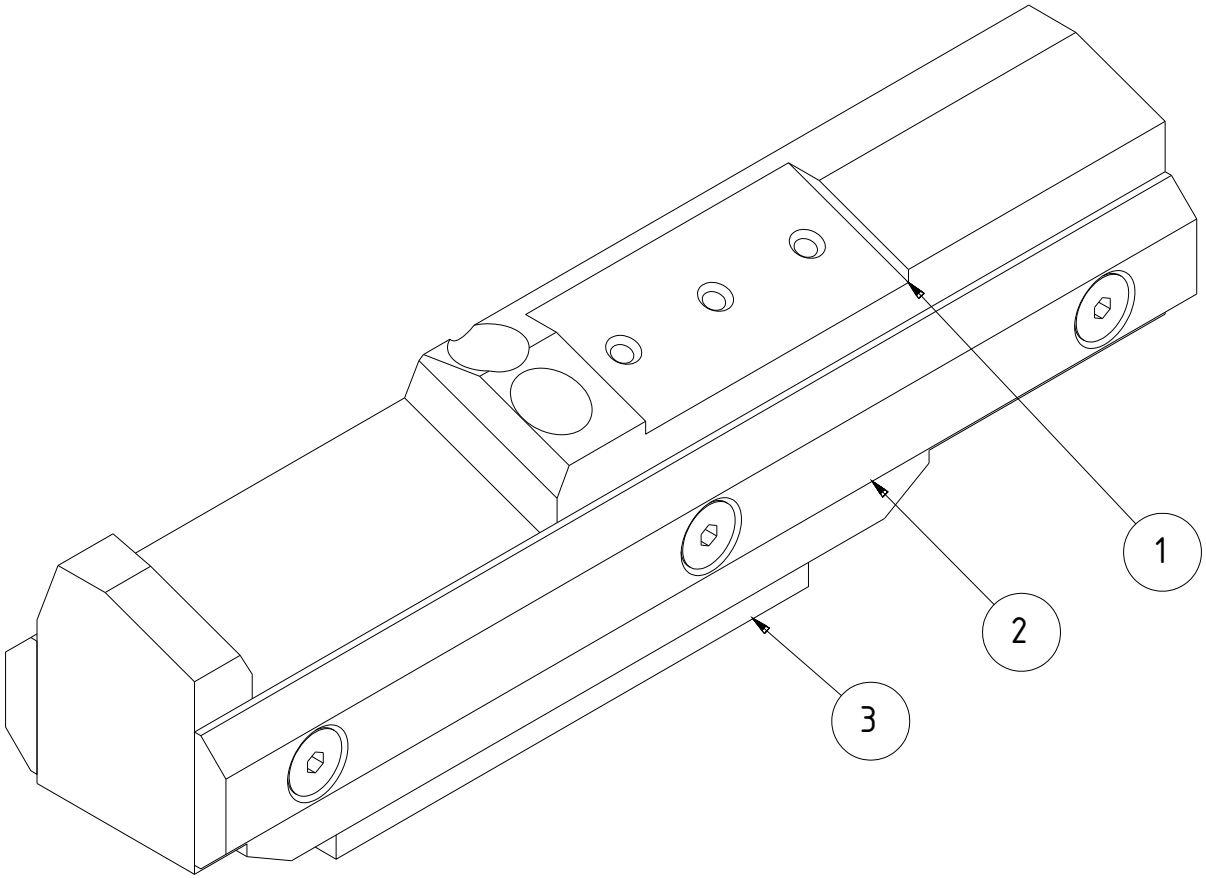
Energiekette kpl. / Energy chain, complete

100101544

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100101547	Befestigungswinkel	Fixing angle	
2	100101595	Energiekette	Energy chain	

Schlitten kpl. / Carriage, complete

Variante / Variant A;D: 100103029 (Zeichnung/Drawing)
Variante / Variant B;C: 100102488



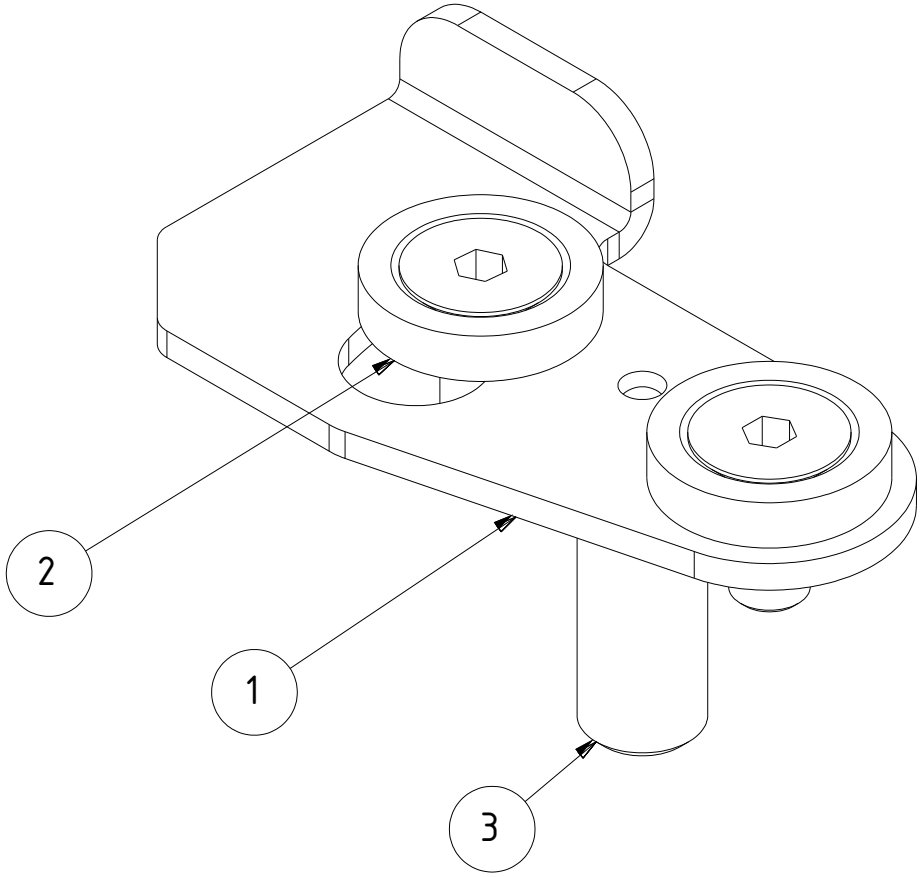
Schlitten kpl. / Carriage, complete

Variante / Variant A;D: 100103029
Variante / Variant B;C: 100102488

Pos. Item	**Ident-Nr.** Ident. no.	**Bezeichnung**	**Designation**	**Kommentar** Remarks
1	100103032 100102491	Schlitten A;D Schlitten B;C	Carriage A;D Carriage B;C	
2	100103391	Führungsleiste	Guide gib	
3	2050-797	Klemmplatte	Clamping plate	

Einlagensicherung kpl. / Insert safety, complete

100103627



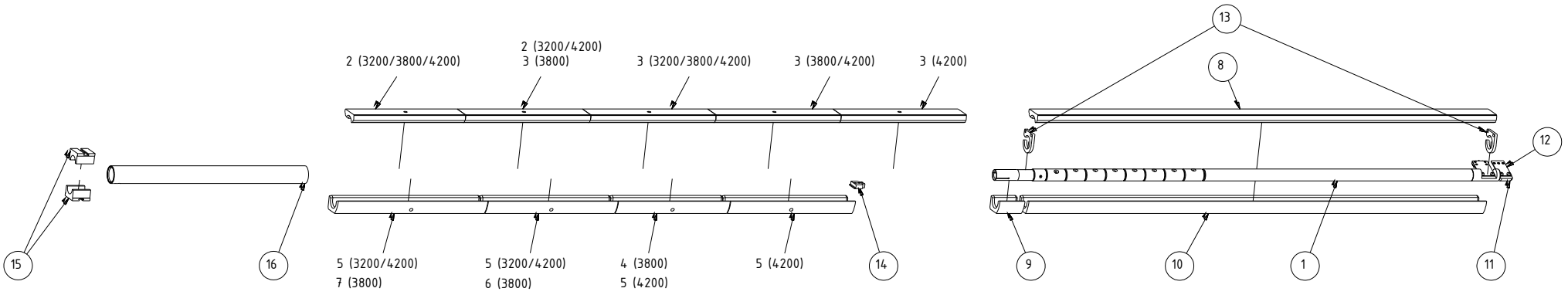
Einlagensicherung kpl. / Insert safety, complete

100103627

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100103632	Einlagensicherung	Insert safety	
2	100091745	Buchse	Bush	
3	100107162	Druckstück (federnd)	Spring plunger	

Umrüstsätze / Capacity adjustment sets

Abbildung / Drawing



***Hinweis:**
Die Materialführungen der Lünette (15) und das Führungsmodul (16) sind ebenfalls durchmesserabhängig. Diese sind nicht im Umrüstsatz enthalten und müssen separat bestellt werden.

***Note:**
The guide jaws (15) and the guide module (16) are also diameter-dependent. These are not included in the capacity adjustment set and must be ordered separately.

Umrüstsätze / Capacity adjustment sets

Pos.	Bezeichnung Designation
1	Vorschubstange Pusher
2	Einlage vorne oben 448 Insert front top 448
3	Einlage vorne oben 502 Insert front top 502
4	Einlage vorne unten 448 Insert front bottom 448
5	Einlage vorne unten 500 Insert front bottom 500
6	Einlage vorne unten 520 Insert front bottom 520
7	Einlage vorne unten 600 Insert front bottom 600
8	Einlage hinten oben 1840 Insert rear top 1840

Pos.	Bezeichnung Designation
9	Einlage hinten unten 108 Insert rear bottom 108
10	Einlage hinten unten 1835 Insert rear bottom 1835
11	Schieber Short pusher
12	Fahne Schieber Flag short pusher
13	Hubplatte Lifting plate
14	Reststückklappenbegrenzung Remnant flap limitation
15	Materialführung / Guide jaw
16	Führungsmodul / Guide module

***Hinweis:**
Die Materialführungen der Lünette (15) und das Führungsmodul (16) sind ebenfalls durchmesserabhängig. Diese sind nicht im Umrüstsatz enthalten und müssen separat bestellt werden.

***Note:**
The guide jaws (15) and the guide module (16) are also diameter-dependent. These are not included in the capacity adjustment set and must be ordered separately.

Umrüstsätze 1900 / Capacity adjustment sets 1900

Umrüstsatz komplett Capacity adjustment set complete	3200	3800	4200
D10/1900	200011659	200012488	
D15/1900	200011663	200012490	
D20/1900	200011669	200012493	
D22/1900	200011671	200012494	
D25/1900	200011673	200012496	
D28/1900	200011677	200012498	
D30/1900	200011679	200012499	
D32/1900	200011681	200012500	
D34/1900	200011683	200012501	
D36/1900	200011685	200012502	
D38/1900	200012737	200012739	
D40/1900	200011687	200012503	
D42/1900	200011689	200012504	
D44/1900	200012509	200012506	
D44//40/1900	200012510	200012511	200013713
D45/1900	200011693	200012505	

Materialführungen / Material guide jaws

Materialführung Guide jaw	Ident-Nr. Ident-No.	zu verarbeitender Materialdurchmesser Diameter of material to be machined
D07	2021-764	4 - 6 mm
D10	2021-765	6 - 9 mm
D12	2053-000	9 - 11 mm
D13	2053-195	11 - 12 mm
D15	2021-766	12 - 14 mm
D16	2027-704	14 - 15 mm
D18	2044-040	15 - 17 mm
D20	2021-767	17 -19 mm
D22	2027-705	19 - 21 mm
D25	2021-768	21 - 24 mm
D26	2053-196	24 - 25 mm
D28	2030-119	25 - 27 mm

Materialführung Guide jaw	Ident-Nr. Ident-No.	zu verarbeitender Materialdurchmesser Diameter of material to be machined
D30	2021-769	27 - 29 mm
D32	2023-714	29 - 31 mm
D34	2024-758	31 - 33 mm
D35	2021-770	33 - 34 mm
D36	2024-970	34 - 35 mm
D37	2053-911	35 - 36 mm
D38	2060-512	36 - 37 mm
D40	200011612	37 - 39 mm
D42	200011613	39 - 41 mm
D44	200011614	41 - 43 mm
D45	200011615	43 - 44 mm
D47	200011616	44 - 45 mm

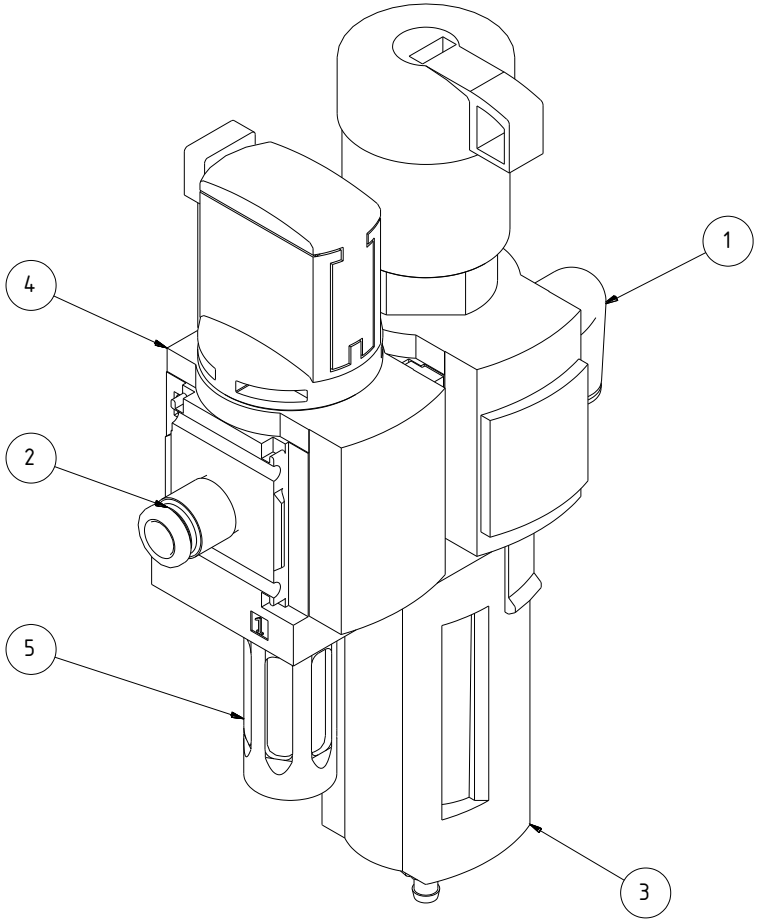
Führungsmodul / Guide module

	Führungsmodul Guide module
Ø	Ident Nr. Ident-No
D10	200012350
D12	200012351
D13	200012352
D15	200012353
D16	200012354
D18	200012355
D20	200012356
D22	200012357
D25	200012358
D26	200012359

	Führungsmodul Guide module
Ø	Ident Nr. Ident-No
D28	200012360
D30	200012361
D32	200012362
D34	200012363
D36	200012364
D38	200012365
D40	200012366
D42	200012367
D44	100087284
D45	200012368

Wartungseinheit / Maintenance unit

200005229



Wartungseinheit / Maintenance unit

200005229

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

Pneumatikplan / Pneumatic diagram

Betriebsmittelkennzeichnung / Equipment marking

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

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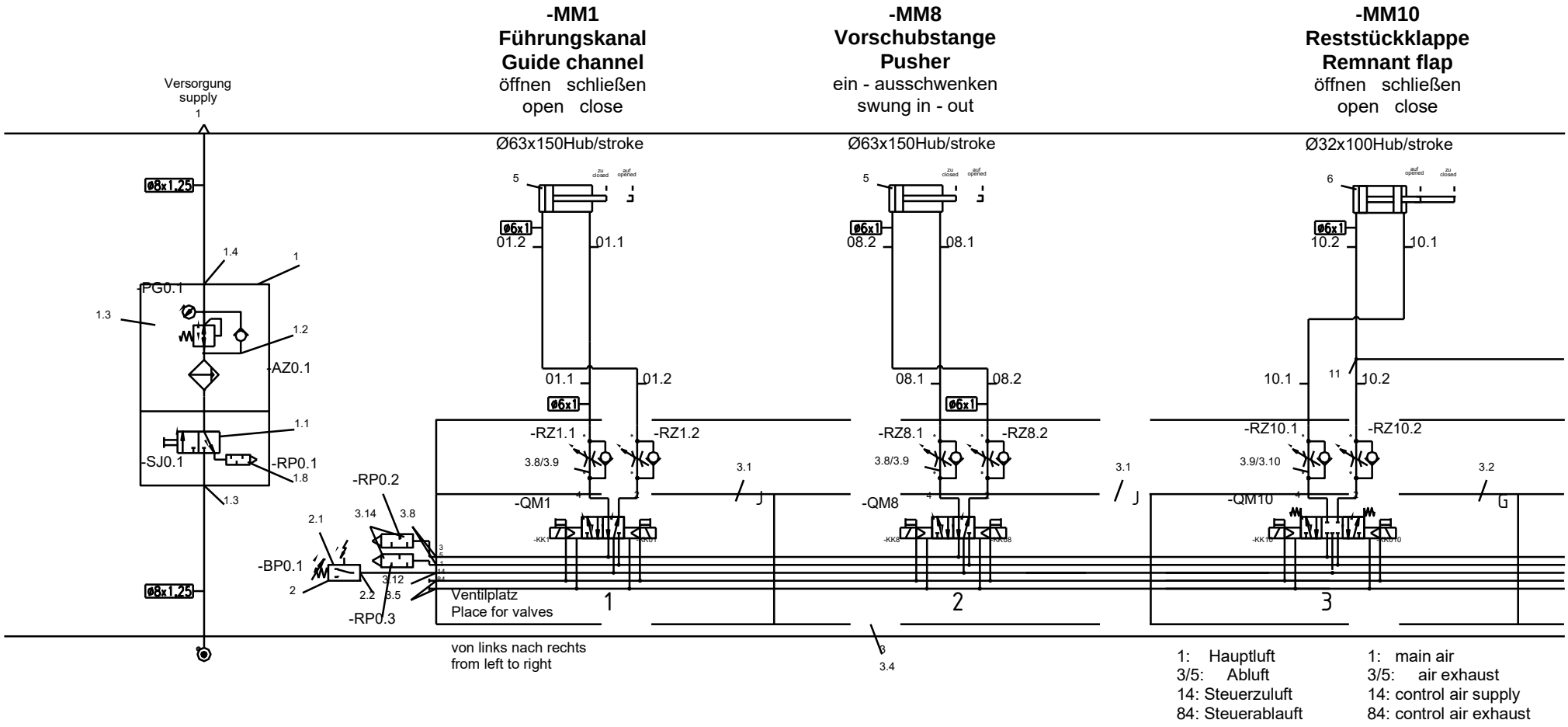
200012449



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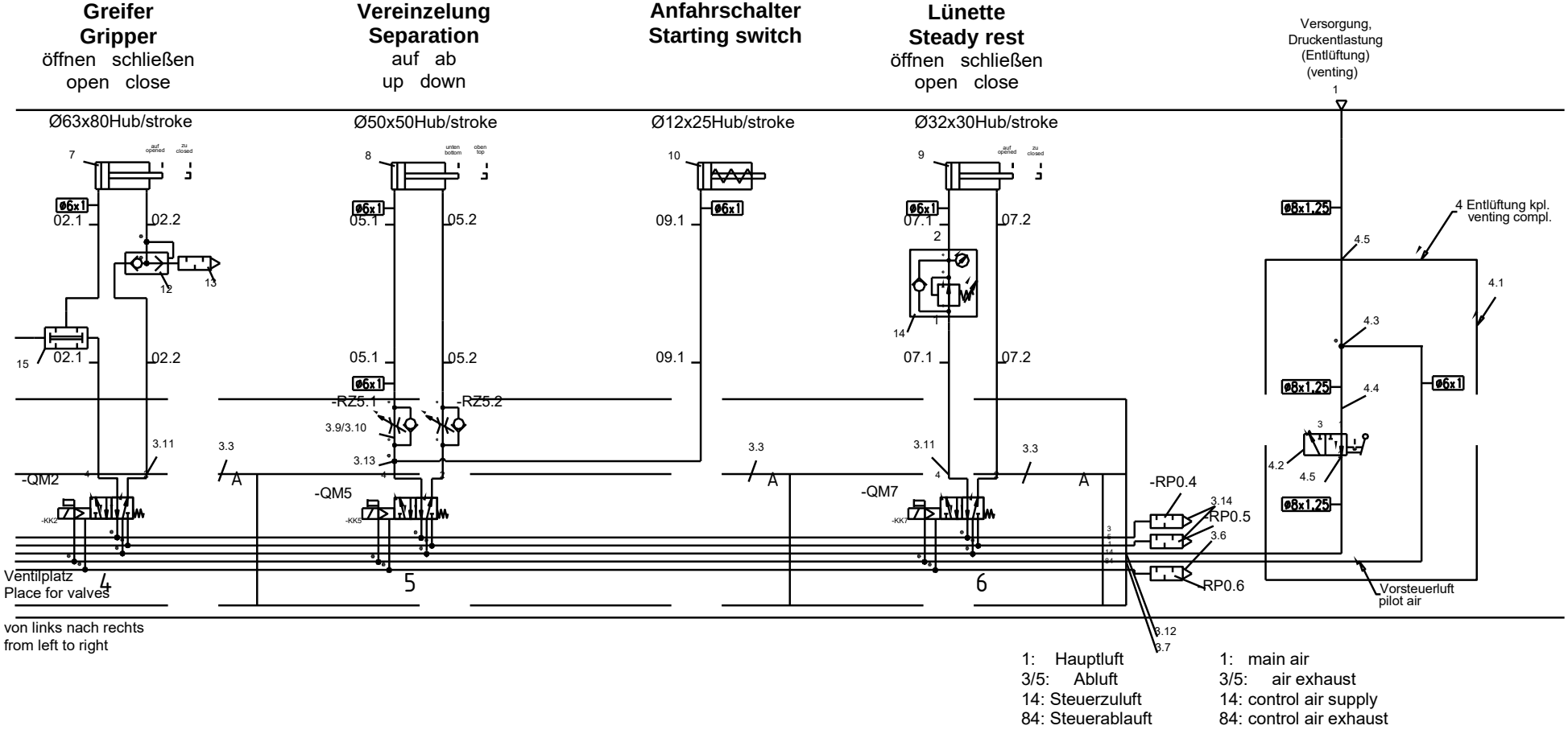


Pneumatikteile / Pneumatic parts

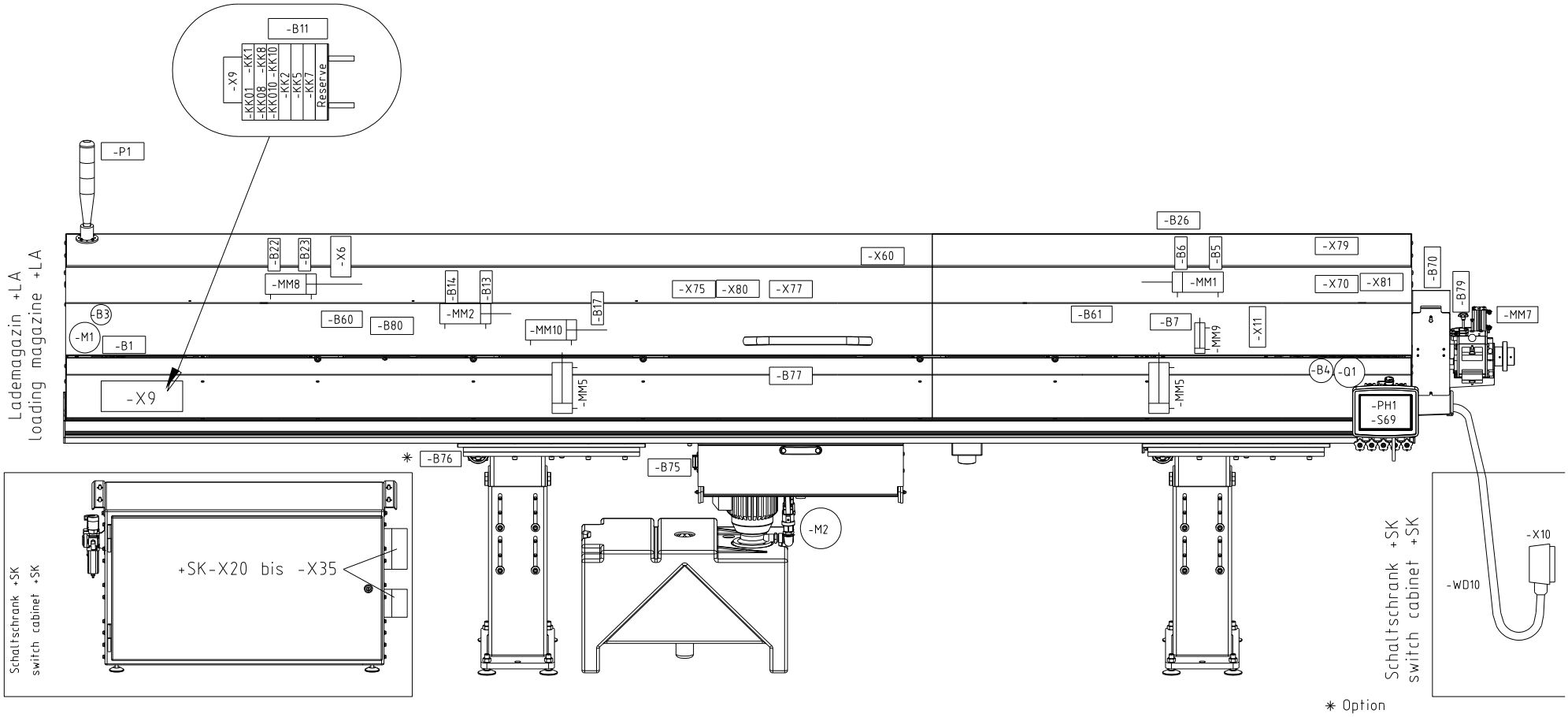
Pos. Item		Ident-Nr. Ident no	Bezeichung/Typ	Designation/Type	
1		200005229	Wartungseinheit komplett	Maintenance unit complete	
	1.1	200004160	Einschaltventil	Switch on valve	
	1.2	2079-894	Filter-Regelventil	Filter-regulator valve	
	1.3	2068-343	Steckverschraubung	Plug-in screwing	
	1.4	2067-008	Steckverschraubung	Plug-in screwing	
	1.5	2074-205	Schalldämpfer	Silencer	
2		100049628	Druckschalter komplett	Pressure switch complete	
	2.1	2058-325	Druckschalter	Pressure switch	
	2.2	2068-343	Steckverschraubung	Plug-in screwing	
3		100105075	Ventilinsel 6-fach	Valve terminal 6-fold	
	3.1	100094151	Magnetventil 5/2	Solenoid valve 5/2	
	3.2	100042337	Magnetventil 5/3	Solenoid valve 5/3	
	3.3	2080-203	Magnetventil 5/2	Solenoid valve 5/2	
	3.4	2080-255	Schilderträger	Label holder	
	3.5	2079-425	Blindstopfen	Filler plug	
	3.6	2080-293	Schalldämpfer	Silencer	
	3.7	100024932	Steckverschraubung	Plug-in screwing	
	3.8	100008518	L-Verschraubung	L-screwing	
	3.9	2057-797	Drosselrückschlagventil	One-way restrictor	
	3.10	2080-257	Dichtscheibe	Sealind disk	
	3.11	2057-833	Steckverschraubung	Plug-in screwing	
	3.12	2068-343	Steckverschraubung	Plug-in screwing	
	3.13	2057-830	Steckverschraubung	Plug-in screwing	
	3.14	2001-420	Schalldämpfer	Silencer	

Pneumatikteile / Pneumatic parts

Pos. Item		Ident-Nr. Ident no	Bezeichung/Typ	Designation/Type	
4		100048698	Entlüftung komplett	Venting complete	
	4.1	100047929	Halteblech für Absperrventil	Retaining plate for Shut-off valve	
	4.2	100046626	Absperrventil	Shut-off valve	
	4.3	100087497	Steckverbindung	Plug-in connector	
	4.4	2058-876	Steckhülse	Plug-in sleeve	
	4.5	2057-799	Steckverbindung	Plug-in connector	
5		100092747	Zylinder (Führungskanal / Vorschubstange)	Cylinder (Führungskanal / Pusher)	-MM1 -MM8
6		100087497	Zylinder (Reststückklappe)	Cylinder (Remnant flap)	-MM10
7		2075-985	Zylinder (Greifer)	Cylinder (Gripper)	-MM2
8		100081629	Zylinder (Vereinzelung)	Cylinder (Separation)	-MM5
9		2055-066	Zylinder (Lünette)	Cylinder (Steady rest)	-MM7
10		2030-646	Zylinder (Anfahrschalter)	Cylinder (Starting switch)	-MM9
11		2038-351	Steckverbindung	Plug-in connector	
12		2039-716	Schnellentlüftung	Quick venting	
13		2041-980	Schalldämpfer	Silencer	
14		2040-874	Druckregelventil	Pressure regulator	
15		200012077	UND-Glied	AND gate	

Elektroteile / Electrical parts

Lademagazin / Loading magazine



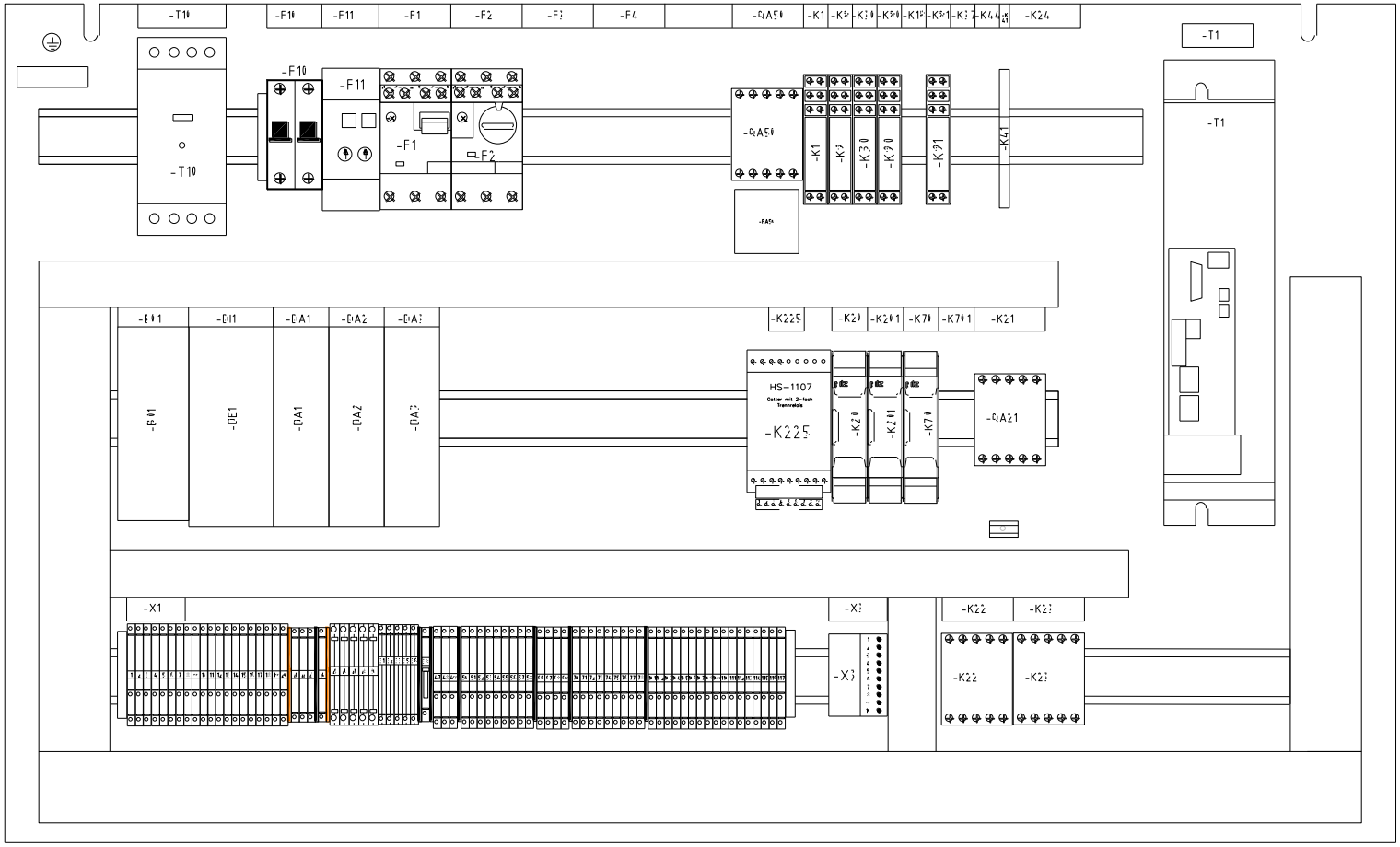
Elektroteile / Electrical spare parts
Lademagazin / Loading magazine

Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
200004101	Leistungskabel 5 m	Power cable 5 m	WD1
200004102	Geberkabel 5 m	Cable for encoder 5 m	WG3
2018-648	Näherungsschalter	Proximity switch	-B1
2032-072	Näherungsschalter	Proximity switch	-B17
2023-003	Näherungsschalter	Proximity switch	-B7
2035-221	Näherungsschalter	Proximity switch	-B5,-B6,-B13,-B14,-B22,-B23,-B26
200002618	Näherungsschalter	Proximity switch	-B80,-B81
200009636	Sicherheitssensor	Safety sensor	-B70,-B75,-B77,-B79
200009637	Betätiger	Actuator	-B70,-B75,-B77,-B79
200011941	Sicherheitsschalter	Safety switch	-B60,-B61
2036-784	Funkenlöschglied	Protection relay	-FA1,-FA4
2042-920	Aktor-Sensor-Box mit 24 poligem Stecker	Aktor-Sensor-Box with plug 24 pol.	-X6
200005144	Stecker mit Leitung für Druckschalter	Plug with lead for pressure switch	-W11
200007007	Meldeleuchte	Signal lamp	-P1
100049628	Druckschalter 0,5-8 bar	Pressure switch 0,5-8 bar	-B11
200004100	Servomotor mit Geber	Servomotor with encoder	-M1 mit/with -B3
200009573	Anschlussleitung kpl. für Ventilblock 25pol.	Lead complete for valve block 25pol.	-WD9
2068-440	Sicherheitsschalter	Safety switch	-B76
2051-354	Betätiger	Actuator	-B76
2041-038	Tauchpumpe	Oil pump	-M2
2043-453	Anschluss Tauchpumpe	Connecting cable oil pump	für/for -M2
2070-052	Drehgeber	Encoder	-B4
1099-051	Magnetkupplung Gr. 10	Electro magnetic clutch size 10	-Q1

Elektroteile / Electrical spare parts

Schalttafel / Switch board

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



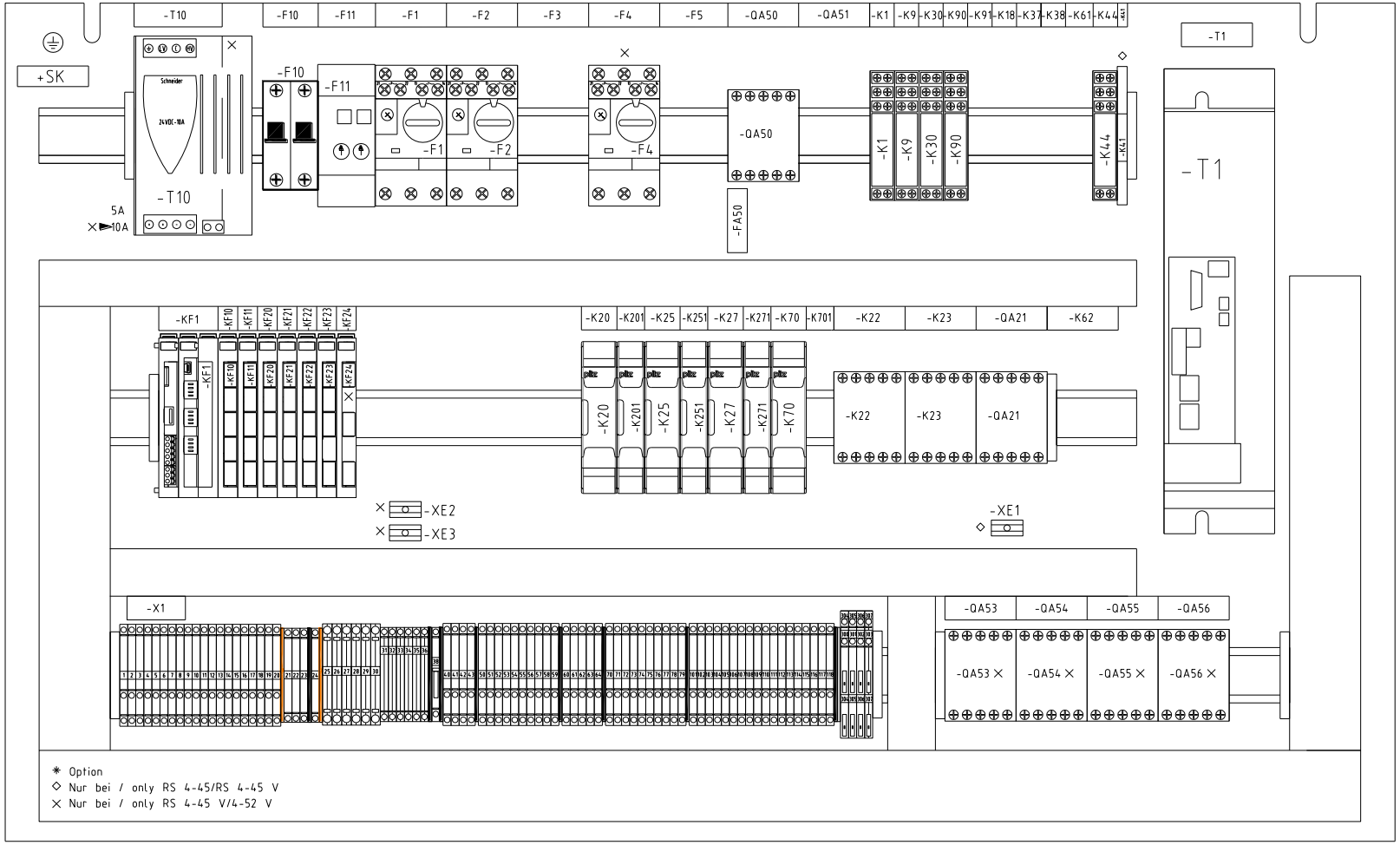
Elektroteile / Electrical spare parts
Schalttafel / Switch board

Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
200009854	CPU-Modul CP 112-1	CPU module CP 112-1	-KF1
200009827	CPU-Modul CP 102	CPU module CP 102	-KF1 (Alternative)
200009828	Digital Eingang	Digital input card	-KF10,-KF11
0943-304	Sicherungsautomat 2x4A	Automatic cut-out 2x4A	-F10
2076-869	Elektronische Sicherung 1,2,4,6A	Electronic fuse 1,2,4,6A	-F11
200006006	Motorschutzschalter 4-6,3A	Motor protection switch 4-6,3A	-F1
200006007	Hilfsschalter	Auxiliary switch	für/for -F1,-F2,-F4
200006004	Motorschutzschalter 1-1,6A	Motor protection switch 1-1,6A	-F2 bei Betriebsspannung 200-230V -F2 for 200-230V machines
200006003	Motorschutzschalter 0,6-1A	Motor protection switch 0,6-1A	-F2 bei Betriebsspannung 400-460V -F2 for 400-460V machines
200004090	Kompaktumrichter HCS01.1E	Compact converter HCS01.1E	-T1
200004091	Kompaktumrichter HCS01.1E Multi Ethernet	Compact converter HCS01.1E Multi Ethernet	-T1 (Option)
200004092	Kompaktumrichter HCS01.1E Profibus	Compact converter HCS01.1E Profibus	-T1 (Option)
200000735	Programm-Modul micro SD-Karte	Program module micro SD-card	für/for -T1
200009829	Digital Ausgang	Digital output card	-KF20,-KF21,-KF22,-KF23
2025-516	Relaisfassung	Casing for relay	-K1,-K9,-K90,-K30,-K44,-K91,-K32
2020-946	Relais 2WE	Relay 2WE	-K1,-K9,-K90,-K30,-K44,-K91,-K32
2025-517	Modul mit LED	Module with LED	-K1,-K9,-K90,-K30,-K44,-K91,-K32
200005997	Schütz 24V DC 3H 1Ö	Contactor 24V DC 3H 1Ö	-K22,QA21,QA50,QA53,QA54,QA55,QA56
2037-095	Schütz 24V DC 3H 1Ö	Contactor 24V DC 3H 1Ö	-K23
2001-368	Motorentstörung	Motor suppressor	-FA50

Elektroteile / Electrical spare parts

Schalttafel / Switch board

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



Schalttafel / Switch board

Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
2071-375	NOT-HALT Schaltgerät	Emergency stop safety relais	-K20,-K25,-K27,-K70
2071-376	NOT-HALT Erweiterungsgerät	Emergency stop expansion module	-K201,-K251,-K271,-K701
200009830	Varan Kabel RJ45	Varan cable RJ45	zwischen -T1 und -KF1 between -T1 and -KF1
2037-096	Hilfsschalterkontakt 22 DILEM	Auxiliary contact module 22 DILEM	auftragsbez. -K23 as per order -K23
200004037	Profibus Adapter	Profibus adapter	-X40
200003702	Netzteil 24V 5A	Power supply 24V 5A	-T10
2049-124	Optokopplermodul 24V DC 2A	Opto-electronic coupler 24V DC 2A	-K41

Elektroteile / Electrical spare parts
Bedientableau / Control panel

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

turbo RSV

Interface EDGE Standard

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

Blatt-Nr.:	Inhalt	contents
1/1063	Zeichnungs Aufstellung	index of plans
2/1063	Kennzeichnung der Betriebsmittel	marking of the electrical equipment
3/1063	Schnittstelle Edge Standard	interface edge standard
4/1063	Schnittstelle Edge Standard	interface edge standard
5/1063	Erdung	grounding
6/1063	Hauptstromkreis Servoantrieb -M1	main circuits Servodrive motors -M1
7/1063	Hauptstromkreis Ölpumpe -M2	main circuits Oilpump -M2
8/1063	Steuerspannung	control voltage
9/1063	SPS-Steuerung, Bedieneinheit	PLC-control, control panel
10/1063	Refferenzschalter, Messschalter	refference-switch, measuring-switch
11/1063	Not-Halt Sicherheit	emergency stop, safety
12/1063	Überwachung Abdeckung Lademagazin	check covering loading magazine
13/1063	Überwachung Abdeckung Lademagazin	check covering loading magazine
14/1063	Überwachung Abdeckung Lünette	check covering steady
15/1063	Überwachung Abdeckung Lünette	check covering steady
16/1063	Überwachung Führungskanal Lademagazin	check guide channel loading magazine
17/1063	Überwachung Führungskanal Lademagazin	check guide channel loading magazine
18/1063	Eingangskarte KF10 MX400.0-7	input-card KF10 MX400.0-7
19/1063	Eingangskarte KF10 MX401.0-7	input-card KF10 MX401.0-7
20/1063	Eingangskarte KF11 MX402.0-7	input-card KF11 MX402.0-7
21/1063	Eingangskarte KF11 MX403.0-7	input-card KF11 MX403.0-7
22/1063	Eingangskarte KF10/KF11 MX404.0-7	input-card KF10/KF11 MX404.0-7
23/1063	Ausgangskarte KF20 MX600.0-7	output-card KF20 MX600.0-7
24/1063	Ausgangskarte KF20/K21 MX601.0-7	output-card KF20/21 MX601.0-7
25/1063	Ausgangskarte KF21 MX602.0-7	output-card KF21 MX602.0-7
26/1063	Ausgangskarte KF22 MX603.0-7	output-card KF22 MX603.0-7
27/1063	Ausgangskarte KF22/KF23 MX604.0-7	input-card KF22/KF23 MX604.0-3
28/1063	Ausgangskarte KF23 MX605.0-7	output-card KF23 MX605.0-7
29/1063	Analogein- Ausgangskarte KF24	analog in/output-card A24-2,AQ1-2
30/1063	Synchronkupplung / Wegerfassung	synchr. clutch / encoder distance
31/1063	Durchmessereinstellung Motor -M3/M4	motor diametter setting -M3/M4
32/1063	Schaltschrank Anschluss	switch cabinet Interface
33/1063	Geräteanordnung turbo RS 4-45	device arrangement RS 4-45
34/1063	Geräteanordnung turbo RS 4-45 V	device arrangement RS 4-45 V
35/1063	Geräteanordnung turbo 4-52	device arrangement 4-52
36/1063	Geräteanordnung turbo 4-52 V	device arrangement 4-52 V
70/1063	Schalttafel	switch board

				Datum	22.11.23	index of plans	FMB MASCHINENBAU	Zeichnungs Aufstellung	turbo RSV
				Bearb	D.Beck				
				Gepr.	D.Beck				Blatt 1/1063
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	11111_003
									Blatt 1 / Folge 2

Kennzeichnung der Betriebsmittel nach DIN EN 81346 Teil 2
Marking of the electrical equipment by DIN EN 81346 part 2

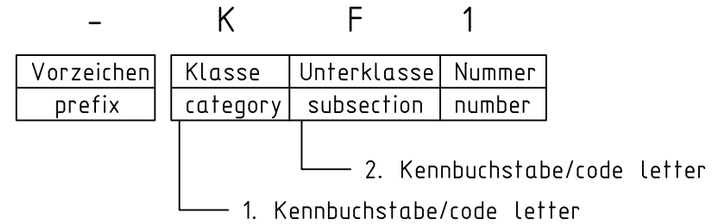
Vorzeichenermittelung durch Angabe des Aspekttyps:

= Funktion wird verwendet
+ Ort wird verwendet
- Produkt wird verwendet
andere Aspekte wird nicht verwendet

Identification of prefix in consideration of aspect-typs:

= function is used
+ place is used
- product is used
different aspects is not used

Darstellung Referenzzeichen/description of signifier:



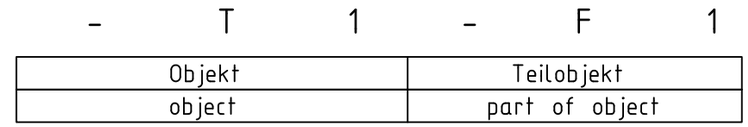
Objektklassen:

B für Drehgeber, Näherungs- u. Positionsschalter
C für Kondensator
F für Sicherungen, Motorschutz- u. Leitungsschutzschalter
FA für Varistorbaustein, Motorentstörbaustein
K für Relais, Hilfsschütze, Optokoppler
KF für CPU, Eingangs- u. Ausgangsmodule, Analogmodul
KH für Ventilblock
KK für Magnetventile
M für Motor
MM für Pneumatikzylinder
P für Leuchtmelder, Ziffernanzeige
PH für Textdisplay
Q für Magnetkupplungen
QA für Lastschütze
QL für Magnetbremse
R für Widerstand
S für Tast-, Wahl- und Steuerschalter
T für Transformator, Gleichspannungsnetzteil
TA für DC/DC-Drehzahlsteller
TB für Gleichrichter
TF für Verstärkermodul
W für Sensorleitung
WD für Netzanschlußleitung, Leitung Klemmengehäuse
WE für Erdungsleiter, Potentialausgleich
WG für Datenleitung, Steuerleitung
X für Klemmleisten, Steckverbinder

catergory of objekts:

B for encoder, proximity- and position switches
C for capacitor
F for fuse, motor-circuit switch, wire safety switch
FA for varistorelement,
K for relay, auxiliary relay, optoelectronic coupler
KF for CPU, Input- u. Outputmodule, analog module
KH for valve block
KK for solenoid valves
M for motor
Q for pneumatic cylinders
P for signal lamp, digital display
PH for text display
Q for electro-magnetic clutch
QA for power contactor
QL for magnetic brake
R for resistor
S for push button, selector- and control switch
T for transformator an DC-power supply
TA for DC/DC-speed regulator
TB for transformator rectifier
TF foramplifier module
W for sensor wire
WD for power lead, cable of terminal box
WE for ground- and potential equalization wire
WG for data- and control wire
X for connector block and plug-in connector

Darstellung Referenzzeichen-Satz/description of signifier-block:



Darstellung Referenznummer zur besonderen Kennzeichnung der Objektzugehörigkeit/description of signifier with specific identification mark:

Drahtquerschnitte wire cross sections	
⬠	2.5mm² schwarz/black
×	1.5mm² schwarz/black
○	1.0mm² violett/violet
／	1.0mm² blau/blue
□	0.75mm² blau/blue
◇	0.5mm² blau/blue

Nummer:

Zur Unterscheidung von Betriebsmitteln mit gleichem Buchstaben im Teil "Objektklassen".

Bezeichnung der Anschlüsse an Geräten und Klemmleisten (wird nur in Verbindung mit dem Referenzzeichen angewendet).

To differenciate the system - elements having the same letter in the part "class of objects".

Marking of the connections of equipment and terminal strip block (is only used with sign of reference).

Aderkennzeichnung nach DIN EN 60204-1; 2006-06:

Hauptstromkreis	:schwarz/BK 1.5mm²
24V AC Steuerstromkreis	:rot/RD 1mm²
24V DC Steuerstromkreis	:blau/BU 1mm²
Fremdspannung	:violett/VT 1mm²

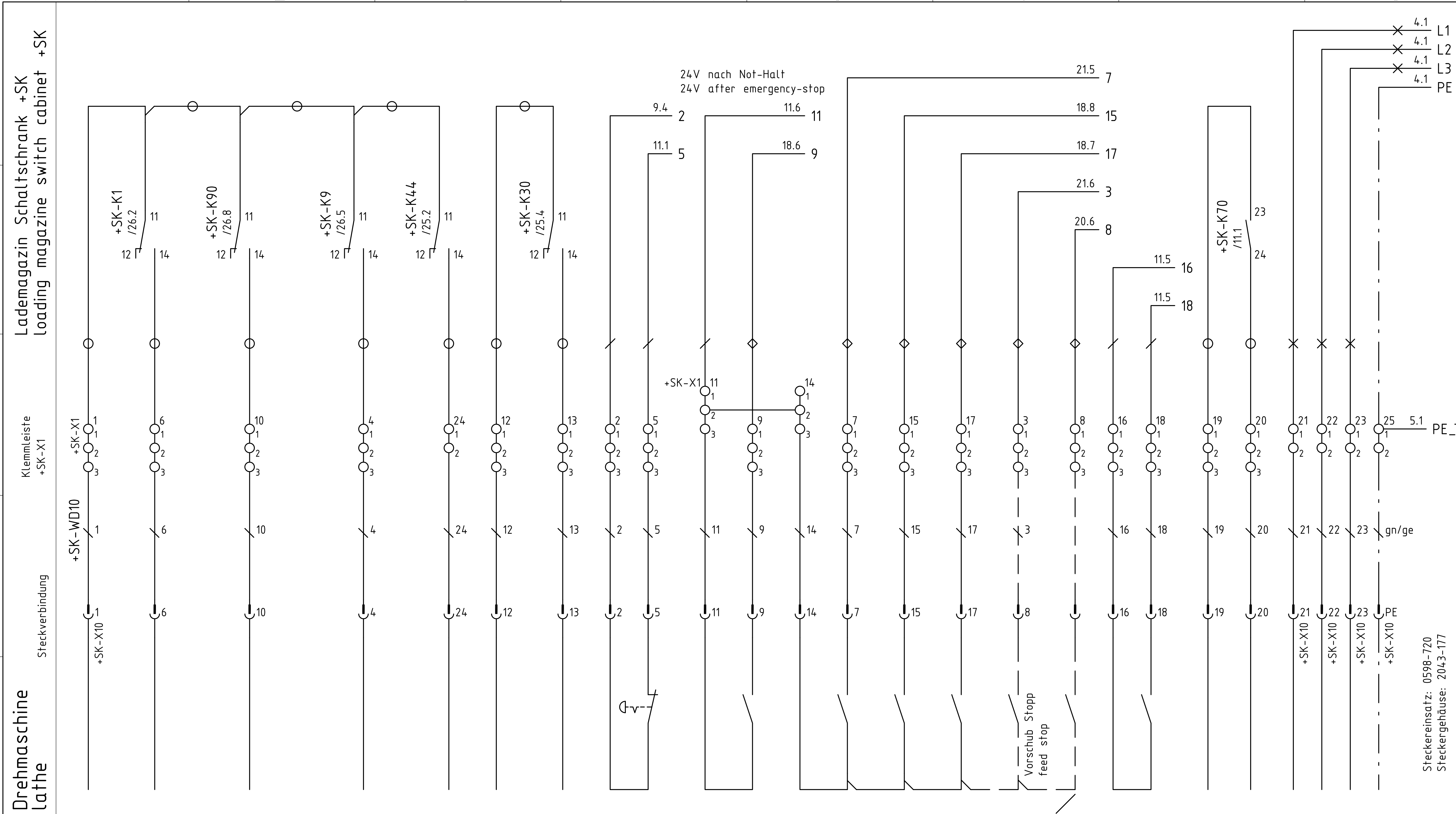
Wire marking by DIN EN 60204-1: 2006-06:

main circuit	: black/BK 1.5mm²
control circuit 24V AC	: red/RD 1mm²
control circuit 24C DC	: blue/BU 1mm²
external voltage	: violet/VT 1mm²

				Datum	22.11.23	marking of the electrical equipment	FMB MASCHINENBAU	Kennzeichnung d.Betriebsmittel
				Bearb	D.Beck			
				Gepr.	D.Beck			
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f. / Ers.d.	

turbo RSV

Blatt 2/1063 | 11111_003 | Blatt 2 / Folge 3



Stangenwechsel ende	Automatik ein	Stangenende	Nachschieben	keine Störung	Not - Halt	Freigabe	Lademagazin	Zyklus	Spannzange	Option	Schutztür	Not - Halt	Betriebsspannung
Programm start	Magazin betriebsber.	Programm stopp	OK	Lademagazin	Drehmaschine	Automatikbetrieb	Automatik ein	ende	geöffnet	Nachschieben	geschlossen	Lademagazin	3x 200V 50/60 Hz, PE
										m.Gegenspindel			Absicherung: 3x10A
bar change end	automatic mode on	bar end	push OK	no fault	emergency stop	release	loading magazine	end	collet open	follow up	safety door	emergency stop	operating voltage
program start	magazine ready for work	program stop		loading magazine	lathe	magazine	automatic mode	of cycle		w.sub spindle	closed	loading magazine	fuse protection : 3x10A

			Datum	22.11.23
			Bearb	D.Beck
			Gepr.	D.Beck
Aenderung	Datum	Name	Norm	DIN5

interface edge standard

Urspr | Ers.f. | Ers.d.

FMB MASCHINENBAU

Schnittstelle
Edge Standard

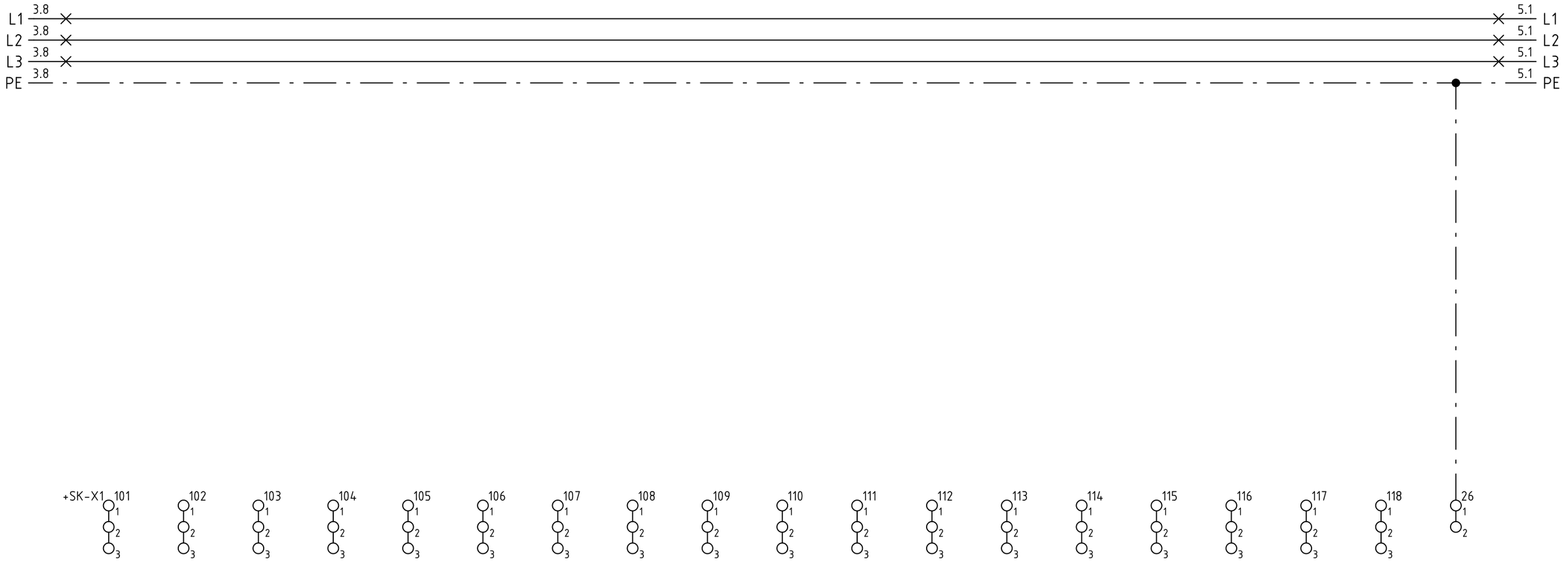
turbo RSV

Blatt 3/1063

11111_003

Blatt 3
Folge 4

Lademagazin Schaltschrank +SK
loading magazine switch cabinet +SK

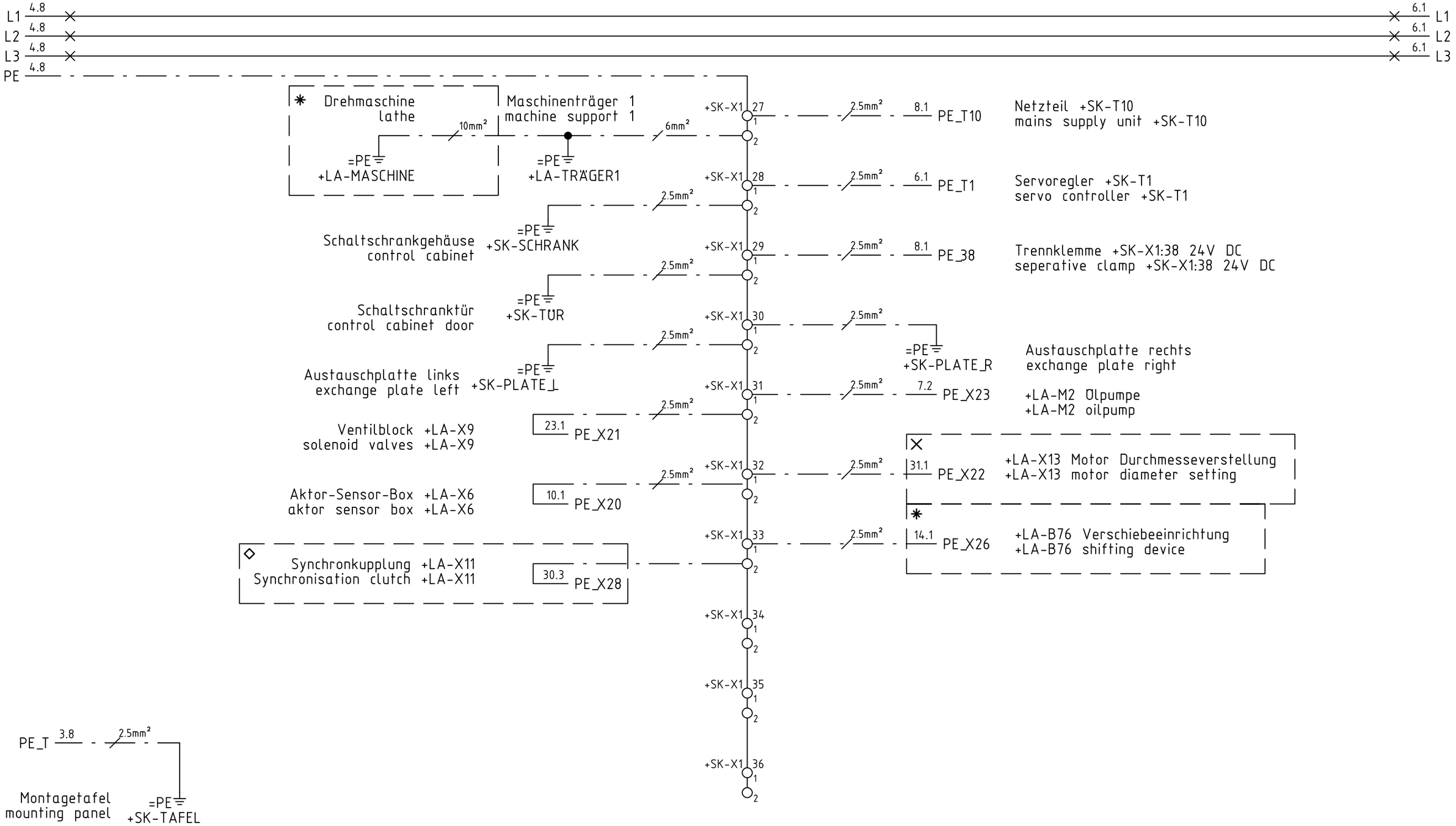


Klemmleiste
+SK-X1

Steckverbindung

Drehmaschine
Lathe

				Datum	22.11.23	interface edge standard	FMB MASCHINENBAU	Schnittstelle Edge Standard	turbo RSV
				Bearb	D.Beck				
				Gepr.	D.Beck				Blatt 4/1063
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		11111_003
									Blatt 4 / Folge 5

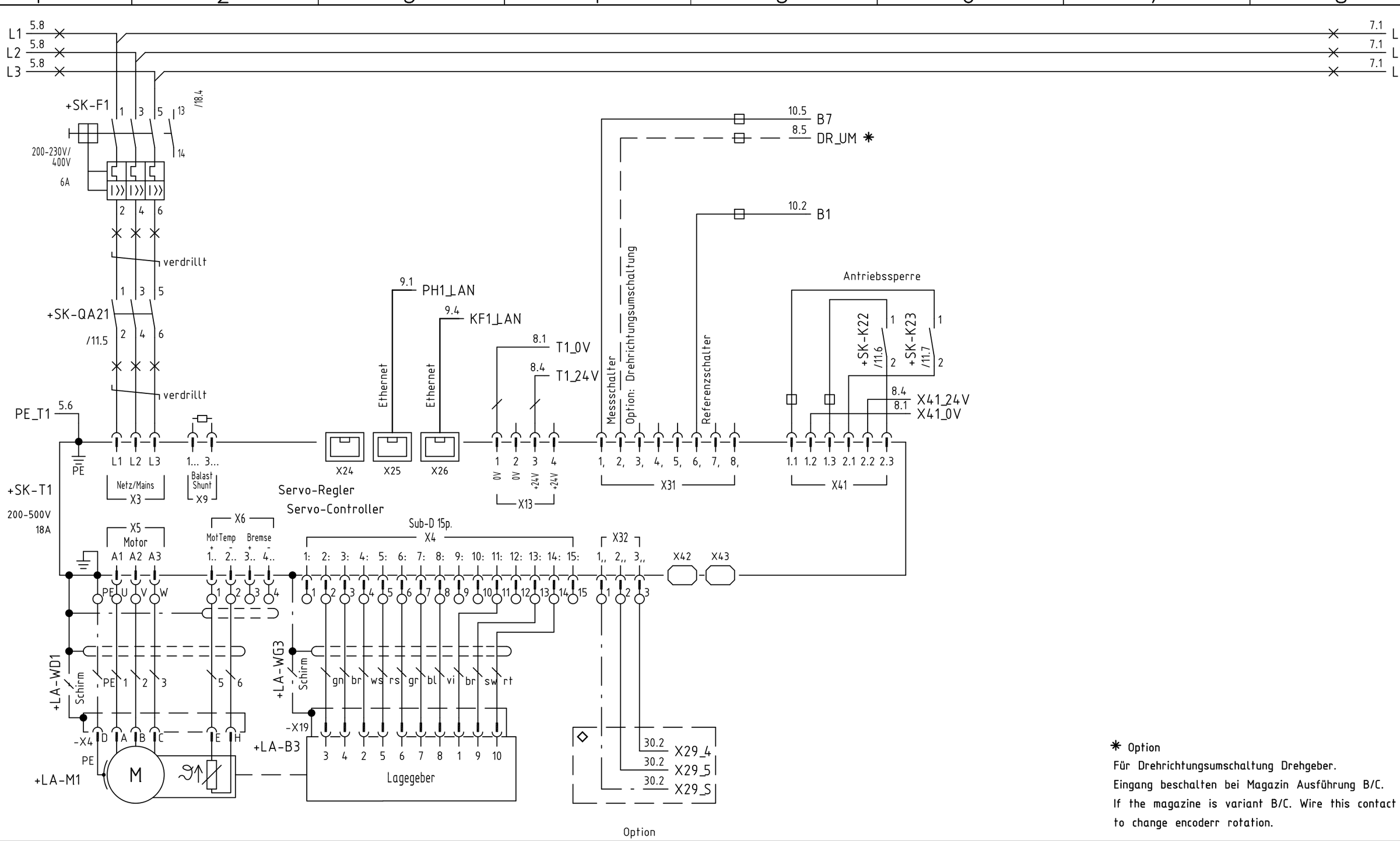


* Option
◇ Nur bei / only for RS
× Nur bei / only for V

PE_X28 2,5mm²	10.07.24	D.Beck	Datum	22.11.23	grounding	FMB MASCHINENBAU	Erdung
			Bearb	D.Beck			
			Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.

turbo RSV

Blatt 5/1063 | 11111_003 | Blatt 5 | Folge 6



✱ Option
Für Drehrichtungsumschaltung Drehgeber.
Eingang beschalten bei Magazin Ausführung B/C.
If the magazine is variant B/C. Wire this contact to change encoderr rotation.

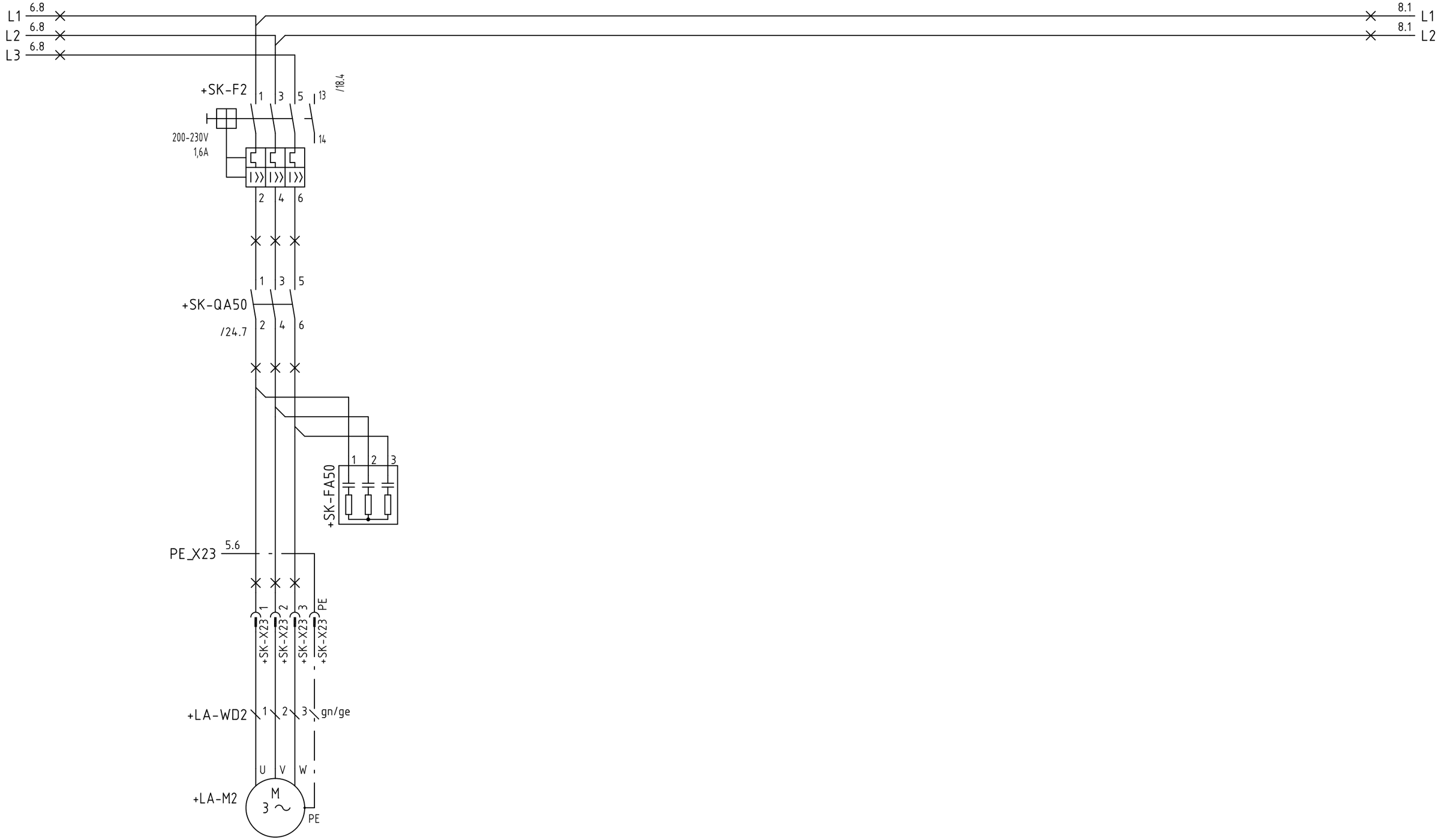
◇ Nur bei / only for RS

Antriebsmotor	Geber	Geber Wegerfassung Spindelstock
		Weg Lünette
driving motor	encoder	encoder distance headstock / steady

			Datum	22.11.23	main circuits Servodrive motors -M1	FMB MASCHINENBAU	Hauptstromkreis Servoantrieb Antriebsmotor -M1
			Bearb	D.Beck			
			Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.

turbo RSV

Blatt 6/1063 | 11111_003 | Blatt 6 Folge 7

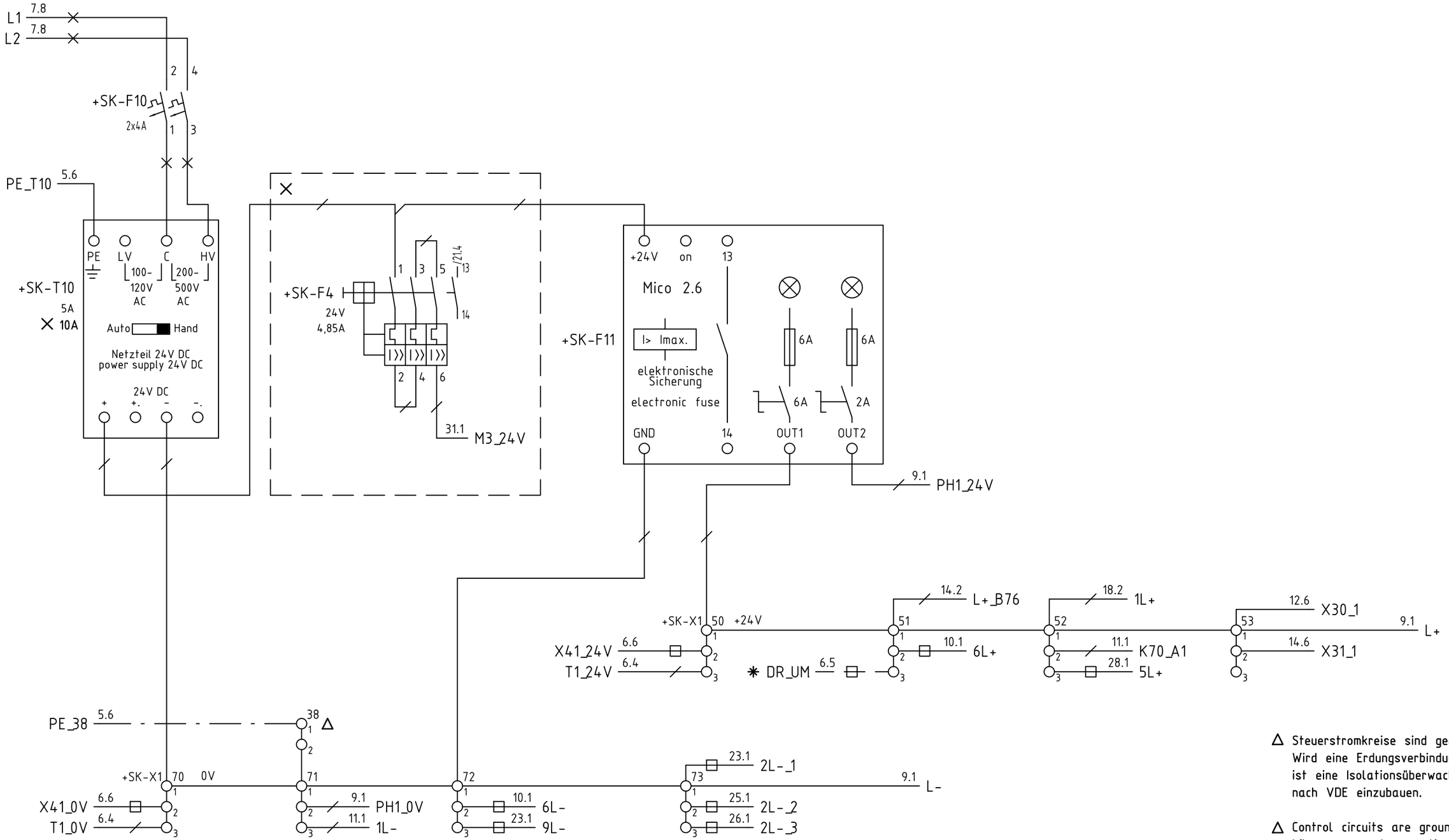


Olpumpe 1

0,37KW 200-230V 1,6A △

oil-pump 1

			Datum	22.11.23	main circuits Oilpump -M2	FMB MASCHINENBAU	Hauptstromkreis Olpumpe -M2	turbo RSV
			Bearb	D.Beck				
			Gepr.	D.Beck				Blatt 7/1063
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		11111_003
								Blatt 7 / Folge 8



Δ Steuerstromkreise sind geerdet. Wird eine Erdungsverbindung entfernt, ist eine Isolationsüberwachung nach VDE einzubauen.

Δ Control circuits are grounded. When a ground connection is removend, an insultation monitoring has to be installed. (VDE)

Steuerspannung 24V- control voltage 24V DC

Motorschutz -M3/M4 Durchmesserverstellung motor protection -M3/M4 diameter setting

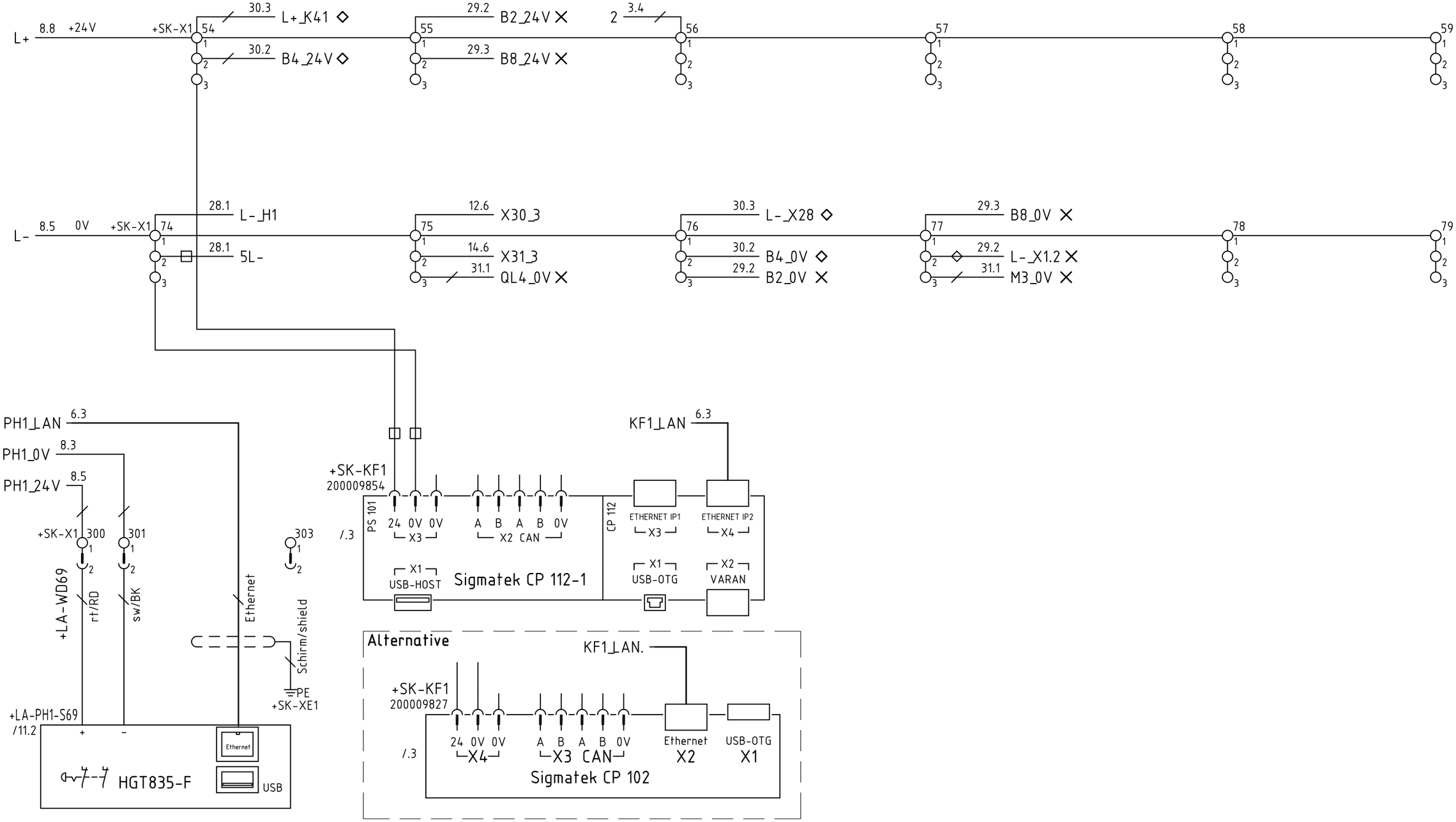
-F11 OUT1 24V DC für SPS / E- A-Karten 24V DC for Control / I / O

-F11 OUT2 24V für PH1 24V for control panel

* Option

X Nur bei / only for V

			Datum	22.11.23	control voltage	FMB MASCHINENBAU	Steuerspannung	turbo RSV
			Bearb	D.Beck				
			Gepr.	D.Beck				Blatt 8
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 8/1063 11111_003 Folge 9



Bedieneinheit	TCP-Koppler	✱ Option
	CP 112-1 alternativ CP 102	◇ Nur bei / only for RS
control panel	TCP-coupler	✕ Nur bei / only for V
	CP 112-1 or CP 102	

				Datum	22.11.23	PLC-control, control panel	FMB MASCHINENBAU
				Bearb	D.Beck		
				Gepr.	D.Beck		
Aenderung	Datum	Name	Norm	DIN5		Ursprung Ers.f.	Ers.d.

SPS-Steuerung, Bedieneinheit

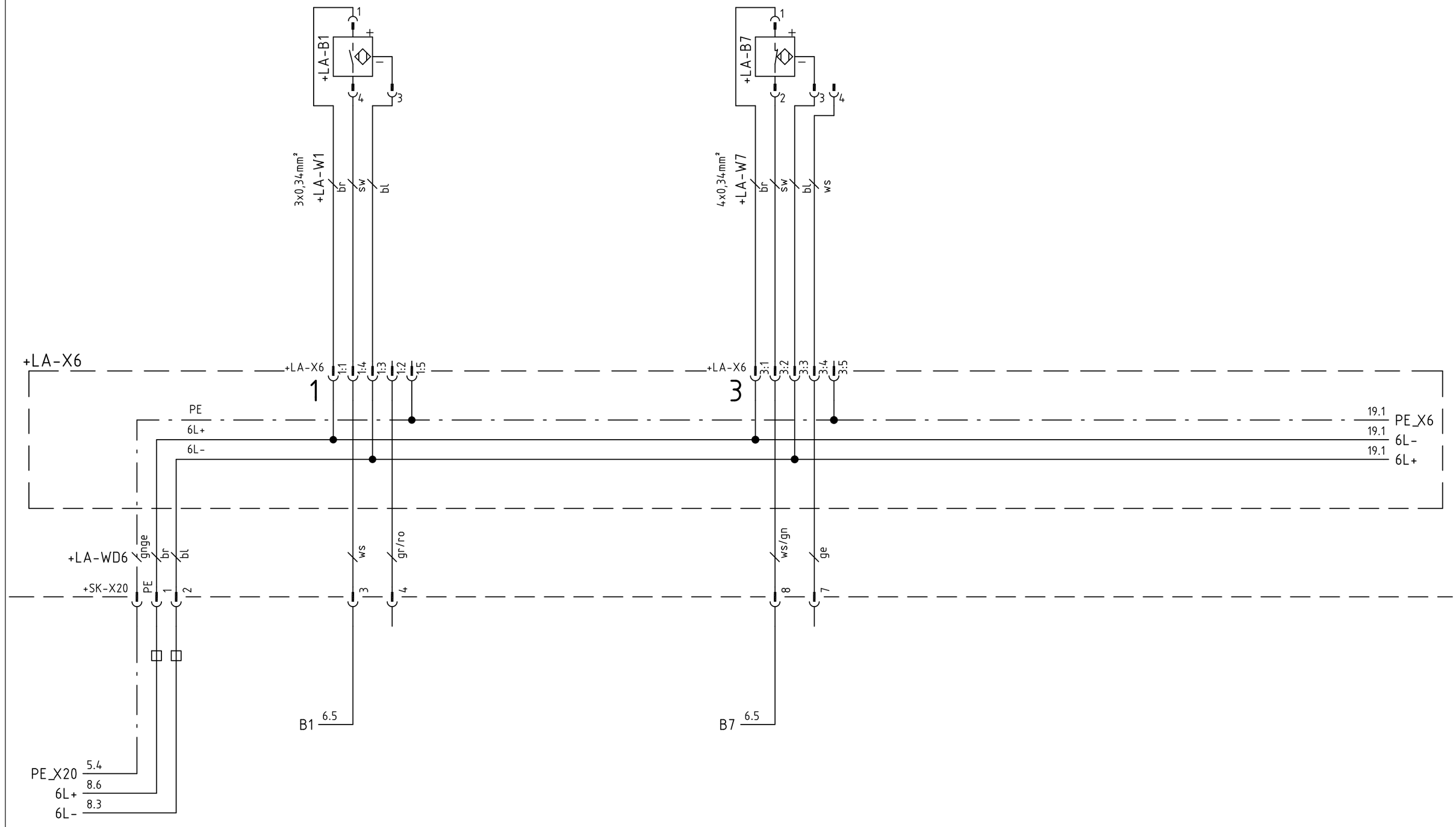
turbo RSV

Blatt 9/1063 | 11111_003 | Blatt 9 | Folge 10

Lademagazin +LA
loading magazine +LA

Sensor-Aktor-Box
+LA-X6

Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF10



Refferenzschalter	Messschalter
hintere Endlage	Ersteinschub Start
refference-switch	measuring-switch
rear limit position	first insert start

Aenderung	Datum	Name		
			Datum	22.11.23
			Bearb	D.Beck
			Gepr.	D.Beck
			Norm	DIN5

refference-switch,
measuring-switch

Urspr | Ers.f. | Ers.d.

FMB MASCHINENBAU

Refferenzschalter,
Messschalter

turbo RSV

Blatt 10/1063 | 11111_003 | Blatt 10 | Folge 11

+24V nach Not-Halt
+24V DC emergeny stop

5 3.4 — 13 — +SK-K70 /.1 — 14

+SK-X1 60 — 1 — 2 — 3 — 23

+SK-K201 /12.3 — 24

+SK-K251 /14.3 — 43 — 44

+SK-K251 /14.3 — 23 — 24 — 23.1 3L+_1

+SK-X1 40 — 1 — 2 — 3 — 23.1 3L+_2 — 25.1 3L+_3 — 41 — 1 — 2 — 3

+SK-K201 /12.3 — 33 — 34

+SK-K271 /16.3 — 23 — 24 — 23.1 4L+_1

✳

+SK-X1 42 — 1 — 2 — 3 — 25.1 4L+_2 — 25.1 4L+_3 — 43 — 1 — 2 — 3 — 26.1 4L+_4

✳ hier Steckbrücke einsetzen

26.1 2L+_1 — 61 — 1 — 2 — 3

26.1 2L+_2

12.1 L+_K20 — 62 — 1 — 2 — 3 — 18.3 MX400.1 — 63 — 1 — 2 — 3 — 64 — 1 — 2 — 3

11 3.5 — 3

+SK-K20 /12.2 — 13 — 14

+SK-K27 /16.2 — 13 — 14

+SK-K201 /12.3 — 13 — 14 — 18.5 MX400.4

+SK-K271 /16.3 — 13 — 14 — 19.2 MX401.0

+SK-K251 /14.3 — 13 — 14 — 19.7 MX401.7

+SK-K22 /.6 — 3 — 4

+SK-K23 /.7 — 3 — 4 — 21.2 MX403.1

+SK-K25 /14.2 — 13 — 14

+SK-X1 302 — 1 — 2

+SK-X1 305 — 1 — 2

+LA-WD69 ws/WH — 11

+LA-PH1-S69 /9.1

+LA-WD69 br/BN — 21

+LA-WD69 gn/GN — 12

+LA-WD69 vi/VT — 22

+SK-X1 304 — 1 — 2

+SK-X1 306 — 1 — 2

307 — 1 — 2

K70_A1 8.6

+SK-K70 Sicherheitsrelais safety relay

A1+ — S11 — S12 — S21 — S22 — S34

A2−

1L- 8.3

16 3.7 — +SK-QA21 — A1 — A2

18 3.7 — +SK-K22 — A1 — A2

+SK-K23 — A1 — A2

12.1 1L-

/.1 13 14 — /3.7 23 24 — 33 34 — /18.2 41 42 — In2+ In2-

/6.1 1 2 — /6.1 3 4 — /6.1 5 6 — /14.1 21 22

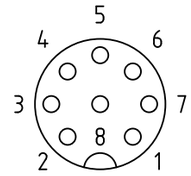
/6.6 1 2 — /.8 3 4 — 5 6 — /14.1 21 22

/6.6 1 2 — /.8 3 4 — 5 6 — /14.1 21 22

Not - Halt Lademagazin		Freigabe Motor	Antriebssperre 1	Antriebssperre 2
emergency stop loading magazine		release motor	drive barrier 1	drive barrier 2

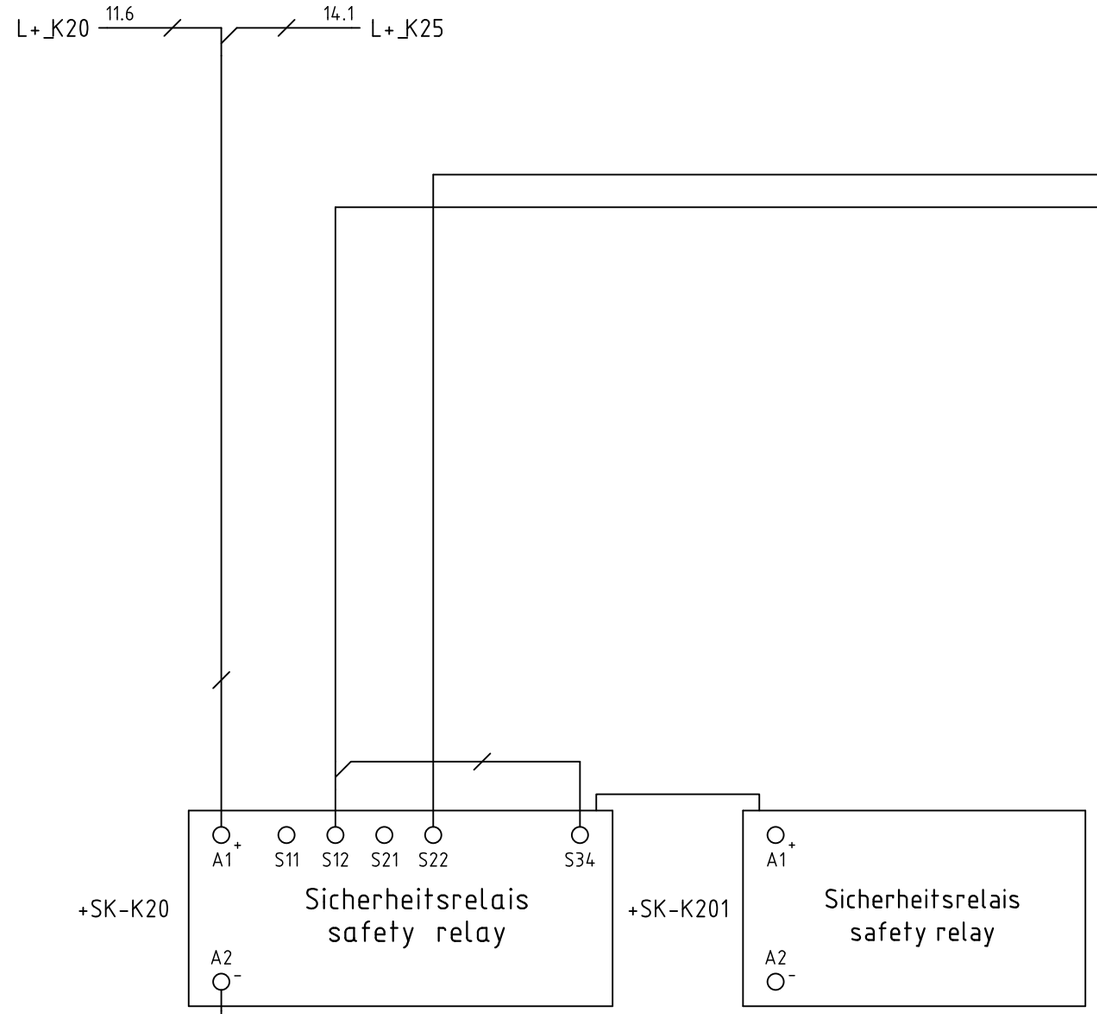
			Datum	22.11.23	emergency stop, safety	FMB MASCHINENBAU	Not-Halt Sicherheit	turbo RSV	
			Bearb	D.Beck				Blatt 11/1063	11111_003	Blatt 11
			Gepr.	D.Beck						Folge 12
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.			

L+_K20 11.6 — 14.1 L+_K25

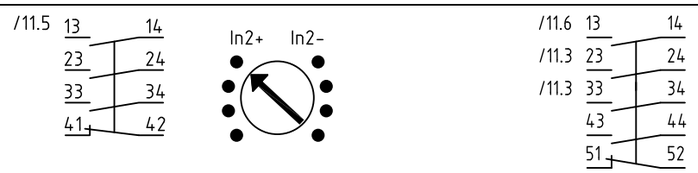


+SK-WD30

		+SK-X30 8 13.1		X30_8
rt	rot_red	+SK-X30 7 13.1		X30_7
bl	blau_blue	+SK-X30 6 13.1		X30_6
rs	rosa_pink	+SK-X30 5 13.1		X30_5
gr	grau_gray	+SK-X30 4 13.1		X30_4
glb	gelb_yellow	+SK-X30 3 13.1	X30_3 9.3 0V	X30_3
grn	grün_green	+SK-X30 2 13.1		X30_2
br	braun_brown	+SK-X30 1 13.1	X30_1 8.7 +24V	X30_1
ws	weiß_white			

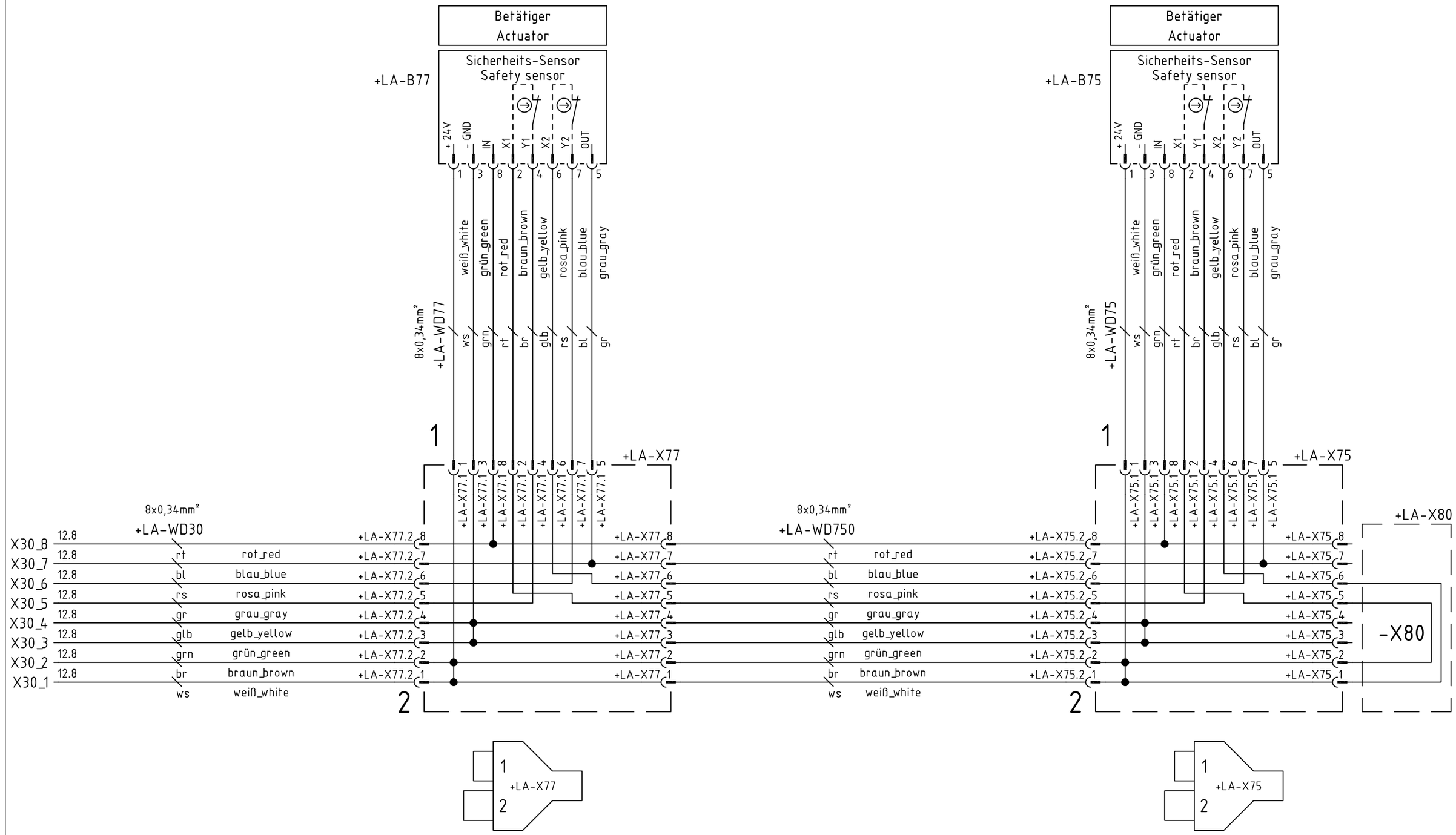


1L- 11.8 — 14.1 1L-



Abdeckung Lademagazin geschlossen covering loading magazine closed	Abdeckung Lademagazin geschlossen covering loading magazine closed

			Datum	22.11.23	check covering loading magazine	FMB MASCHINENBAU	Überwachung Verkleidung Lademagazin	turbo RSV
			Bearb	D.Beck				
			Gepr.	D.Beck				Blatt 12/1063 — 11111_003 — Blatt 12 / Folge 13
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	



				Datum	22.11.23	check covering loading magazine	FMB MASCHINENBAU	Überwachung Verkleidung Lademagazin	turbo RSV
				Bearb	D.Beck				
				Gepr.	D.Beck				
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		Blatt 13/1063 · 11111_003 · Blatt 13 · Folge 14

L+_B76 8.6

L+_K25 12.2 — 16.1 L+_K27

PE_X26 5.6 — +SK-X26 PE

+SK-X26 1 3 5

+LA-WD76 1 3 5

+LA-B76 11 21 31 / 12 22 32

Option -B76
Verschiebeeinrichtung
in Position

Option
shifting device
in position

+LA-WD76 2 4 6

+SK-X26 2 4 6

+SK-K22 21 / 22 /11.6

+SK-K23 21 / 22 /11.7

+SK-QA21 21 / 22 /11.5

19.7 MX401.6

✱ Option

Wenn Schalter nicht
eingebaut, Brücke einlegen!

If switch is not used,
connecting contacts with wire.

+SK-K25 Sicherheitsrelais safety relay
A1 S11 S12 S21 S22 S34 A2

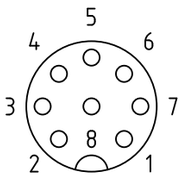
+SK-K251 Sicherheitsrelais safety relay
A1 A2

1L- 12.8 — 16.1 1L-

/11.5 13 14 / 23 24 / 33 34 / 41 42

In2+ In2-

/11.7 13 14 / /11.3 23 24 / 33 34 / /11.3 43 44 / 51 52



+SK-WD31

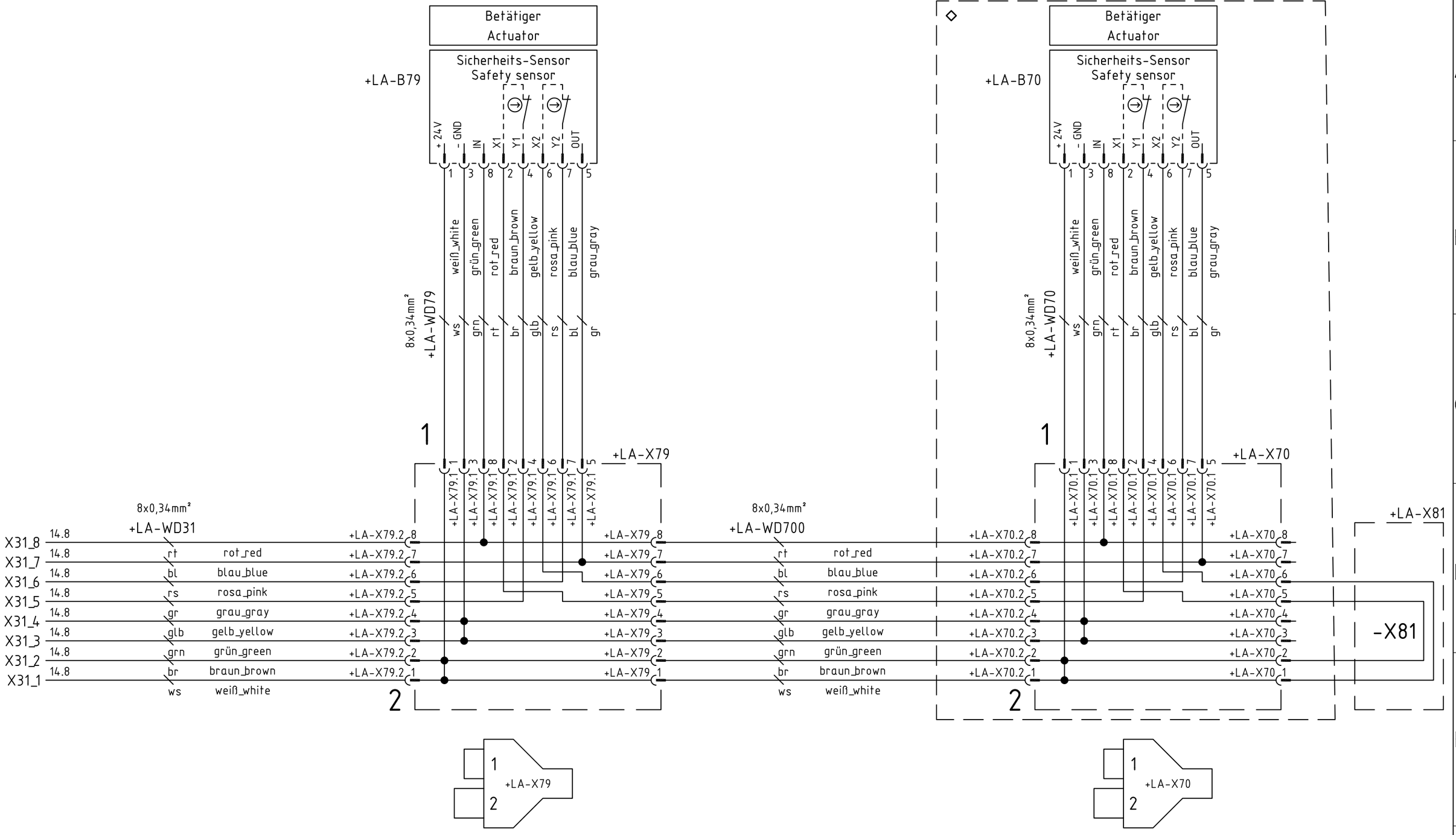
		+SK-X31 8	15.1	X31_8
rt	rot_red	+SK-X31 7	15.1	X31_7
bl	blau_blue	+SK-X31 6	15.1	X31_6
rs	rosa_pink	+SK-X31 5	15.1	X31_5
gr	grau_gray	+SK-X31 4	15.1	X31_4
glb	gelb_yellow	+SK-X31 3	15.1	X31_3
grn	grün_green	+SK-X31 2	15.1	X31_2
br	braun_brown	+SK-X31 1	15.1	X31_1
ws	weiß_white			

X31_3 9.3 0V

X31_1 8.7 +24V

Abdeckung Lünette	Abdeckung Lünette	
geschlossen	geschlossen	
covering steady closed	covering steady closed	

K25: S34	21.06.24	D.Beck	Datum	22.11.23	check covering steady	FMB MASCHINENBAU	Überwachung Verkleidung Lünette	turbo RSV
			Bearb	D.Beck				
			Gepr.	D.Beck			Blatt 14/1063	11111_003
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		Blatt 14 / Folge 15



◇ Nur bei / only for RS

ansonsten Kontakte von Leitung mit Stecker -X81 überbrücken.

otherwise connect wire with plug -X81.

	Abdeckung Lünette	Abdeckung RS Adapterset
	geschlossen	geschlossen
	cover on steady closed	cover on RS adapter
		set close

Aenderung	Datum	Name		
			Datum	22.11.23
			Bearb	D.Beck
			Gepr.	D.Beck
			Norm	DIN5

check covering steady

Urspr | Ers.f. | Ers.d.

FMB MASCHINENBAU

Überwachung Verkleidung Lünette

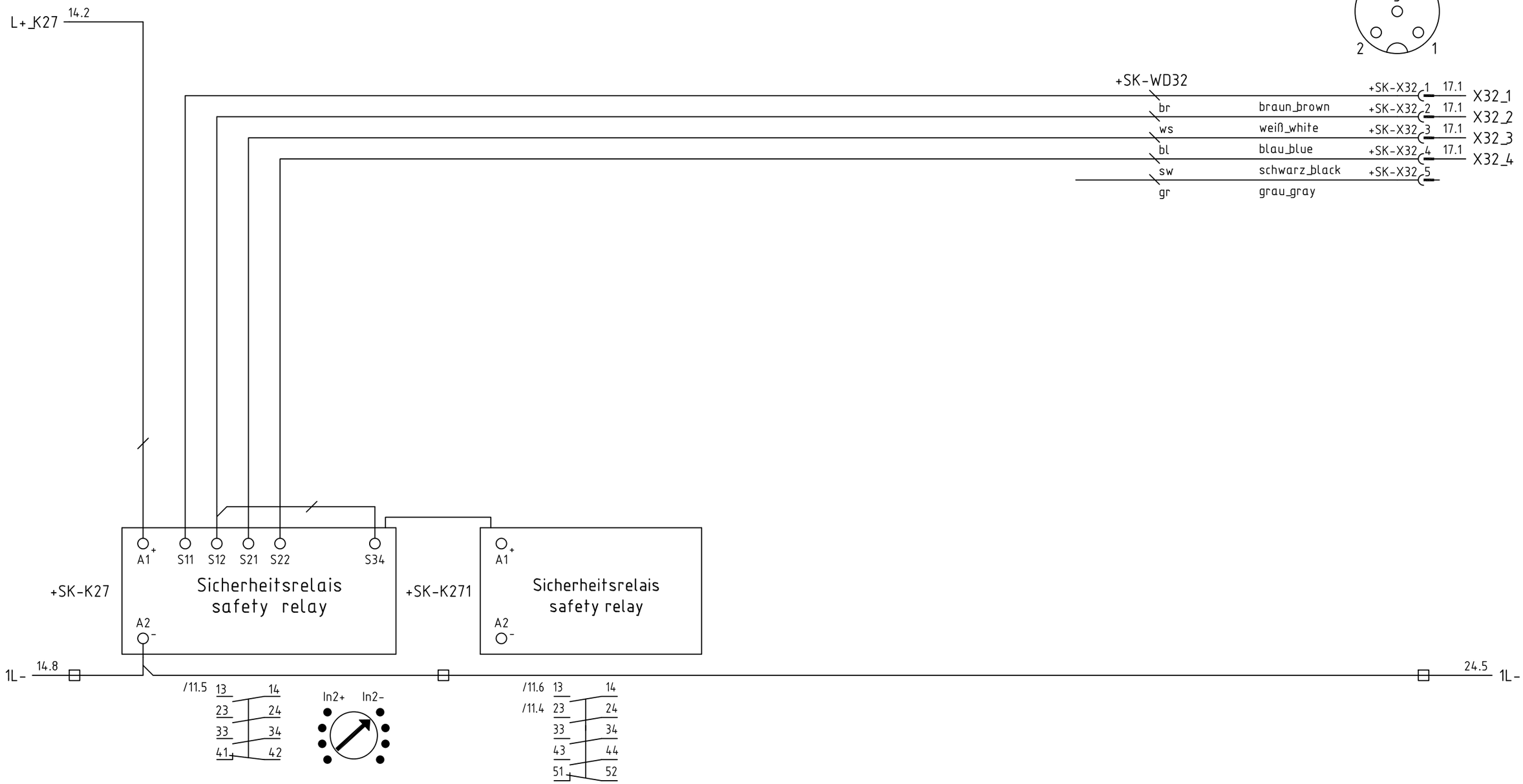
turbo RSV

Blatt 15/1063

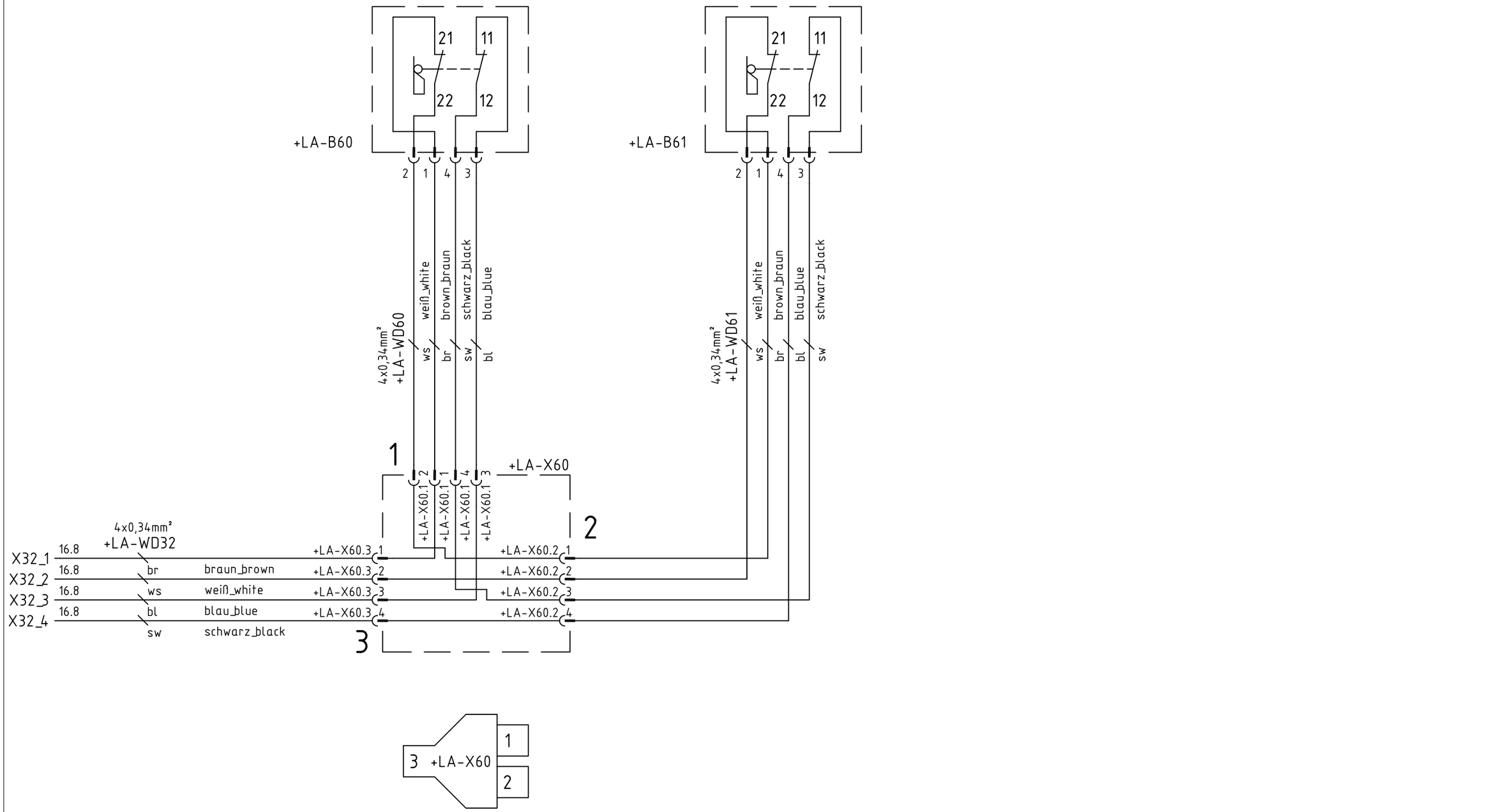
11111_003

Blatt 15

Folge 16



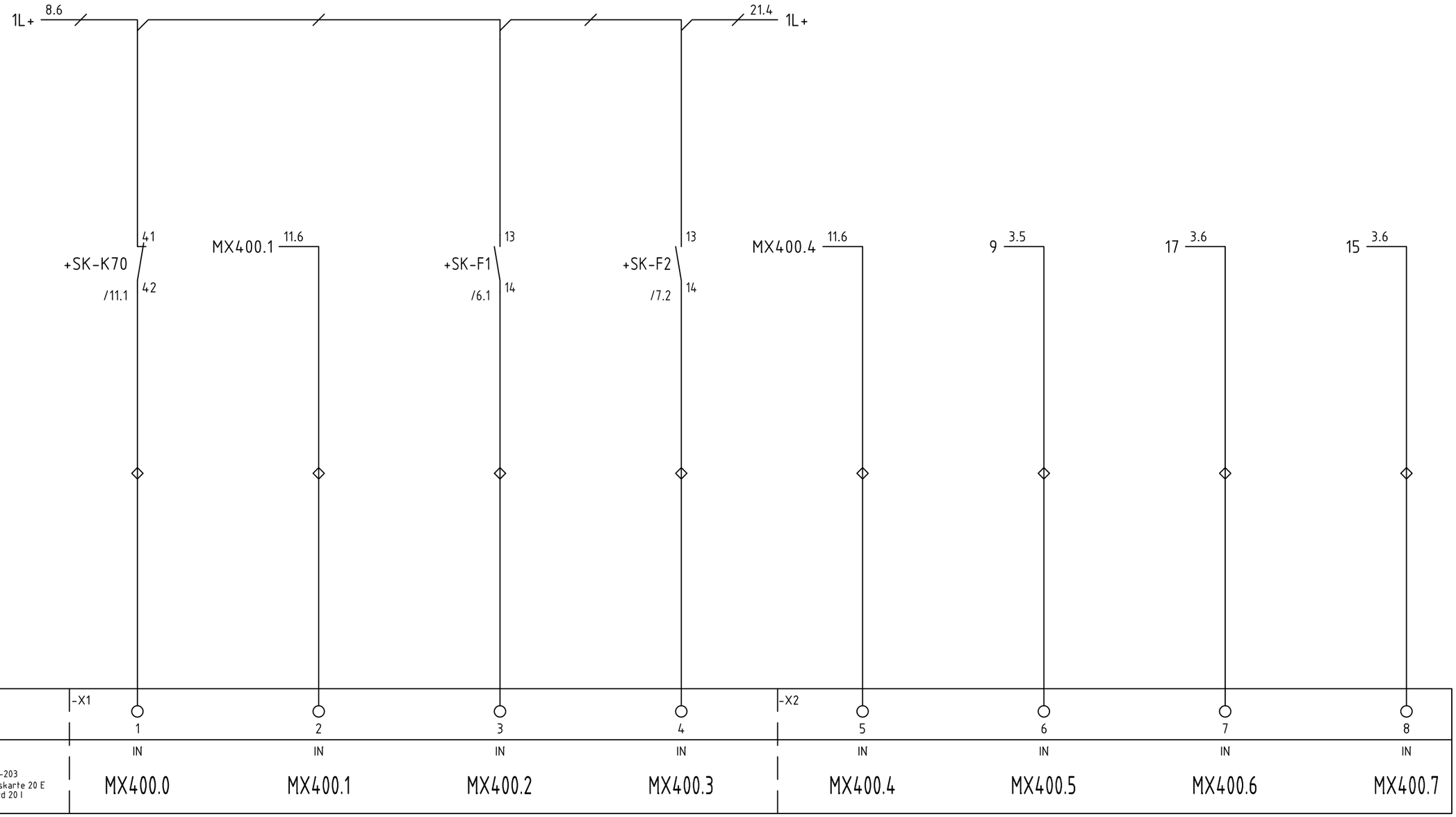
Kanal Lademagazin geschlossen guide channel loading magazinel closed					Kanal Lademagazin geschlossen guide channel loading magazinel closed			
			Datum	22.11.23	check guide channel loading magazine	FMB MASCHINENBAU	Überwachung Führungskanal Lademagazin	turbo RSV
			Bearb	D.Beck				
			Gepr.	D.Beck			Blatt 16/1063	11111_003
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 16 / Folge 17



Vorschubstange im Kanal — Führungskanal geschlossen

pusher in channel — guide channel closed

				Datum	22.11.23	check guide channel loading magazine	FMB MASCHINENBAU	Überwachung Führungskanal Lademagazin	turbo RSV
				Bearb	D.Beck				
				Gepr.	D.Beck			Blatt 17/1063	11111_003
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		Blatt 17 / Folge 18



Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF10

Not - Halt	Not - Halt	Schutzschalter	Schutzschalter	Abdeckung	Freigabe	Spannzange	Zyklus Ende
Lademagazin	Drehmaschine	Antriebsmotor +LA-M1	Olpumpe +LA-M2/M5	geschlossen	Automatikbetrieb	geöffnet	Stangenwechsel Start
emergency stop	emergency stop	protective switch	protective switch	cover closed	release magazine	collet opened	cycle end
loading magazine	lathe	motor +LA-M1	oil-pump +LA-M2/M5				

SPZ geöffnet	21.06.24	D.Beck	Datum	22.11.23	input-card KF10 MX400.0-7	FMB MASCHINENBAU	Eingangskarte KF10 MX400.0-7
			Bearb	D.Beck			
			Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.

turbo RSV

Blatt 18/1063 | 11111_003 | Blatt 18 | Folge 19

Lademagazin +LA
loading magazine +LA

Sensor-Aktor-Box
+LA-X6

Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF10

+LA-B5 br sw bl
+LA-B6 br sw bl
+LA-B11 br gr rt PE sw ws bl gn/ge
+LA-B13 br sw bl
+LA-B14 br sw bl

3x0,34mm² +LA-W5 br sw bl
3x0,34mm² +LA-W6 br sw bl
5x0,34mm² +LA-W11 br sw ws bl gn/ge
3x0,34mm² +LA-W13 br sw bl
3x0,34mm² +LA-W14 br sw bl

+LA-X6
+LA-X6 2:1 2:4 2:3 2:2 2:5
+LA-X6 5:1 5:4 5:2 5:3 5:5
+LA-X6 4:1 4:4 4:3 4:2 4:5

PE_X6 10.8 PE
6L+ 10.8 6L+
6L- 10.8 6L-

20.1 PE_X6
20.1 6L-
20.1 6L+

+LA-WD6 gn rt/bl ro gr br/gn
+SK-X20 5 6 11 9 10

MX401.0 11.7
21.6 MX403.6
MX401.6 14.3
MX401.7 11.7

+SK-KF10 /18.2

-X3				-X4			
9	10	11	12	13	14	15	16
IN	IN	IN	IN	IN	IN	IN	IN
MX401.0	MX401.1	MX401.2	MX401.3	MX401.4	MX401.5	MX401.6	MX401.7

Kanal geschlossen	Führungskanal geöffnet (Abfrage vorne)	Führungskanal geschlossen (Abfrage vorne)	Druckschalter	Greifermesser geschlossen	Greifermesser geöffnet	Verschiebeeinrichtung -B76 in Position	Abdeckung Lünette geschlossen
cannel closed	guide channel opened	guide channel closed	pressure switch	gripper blades opened	gripper blades opened	shifting device	cover on steady closed

				Datum	22.11.23	input-card KF10 MX401.0-7		
				Bearb	D.Beck		FMB MASCHINENBAU	Eingangskarte KF10 MX401.0-7
				Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	

turbo RSV

Blatt 19/1063 | 11111_003 | Blatt 19 | Folge 20

Lademagazin +LA
loading magazine +LA

Sensor-Aktor-Box
+LA-X6

Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF11

+LA-B17 br sw bl
+LA-B22 br sw bl
+LA-B23 br sw bl
+LA-B80 1 4 3

3x0,34mm² +LA-W17 br sw bl
3x0,34mm² +LA-W22 br sw bl
3x0,34mm² +LA-W23 br sw bl
3x0,34mm² +LA-W80 br sw bl

Y-Verteiler M12 2x M12 Art.:2069-382
+LA-X6 7:1:1 7:1:4 7:1:3 7:2:1 7:2:4 7:2:3

+LA-X6 7:1 7:4 7:3 7:2 7:5 8:1 8:4 8:3 8:2 8:5

7 8

PE_X6 19.8 PE — 21.7 PE_X6
6L+ 19.8 6L+ — 21.7 6L-
6L- 19.8 6L- — 21.7 6L+

+LA-WD6 sw vi gr/br ws/gr
+SK-X20 15 17 18 16

8 3.6

+SK-KF11 /21.2 /22.5
SIGM-DI-203 Eingangskarte 20 E inputcard 20 I

-X1				-X2			
1	2	3	4	5	6	7	8
IN	IN	IN	IN	IN	IN	IN	IN
MX402.0	MX402.1	MX402.2	MX402.3	MX402.4	MX402.5	MX402.6	MX402.7

					Option	Option	
Reststückausfallklappe eingeschwenkt remnant flap swung in	Vorschubstange ausgeschwenkt pusher swung out	Vorschubstange im Kanal pusher in the channel	Option Vorlauf option forward	Option Rücklauf option backward	Nachschieben mit Gegenspindel push with sub spindle	Testkontakt Durchmessereinstellung test contact diameter setting	Material auf Seitlicher-Auflage material on lateral storage

				Datum	22.11.23	input-card KF11 MX402.0-7	FMB MASCHINENBAU	Eingangskarte KF11 MX402.0-7
				Bearb	D.Beck			
				Gepr.	D.Beck			
Aenderung	Datum	Name		Norm	DIN5	Urspr	Ers.f.	Ers.d.

turbo RSV

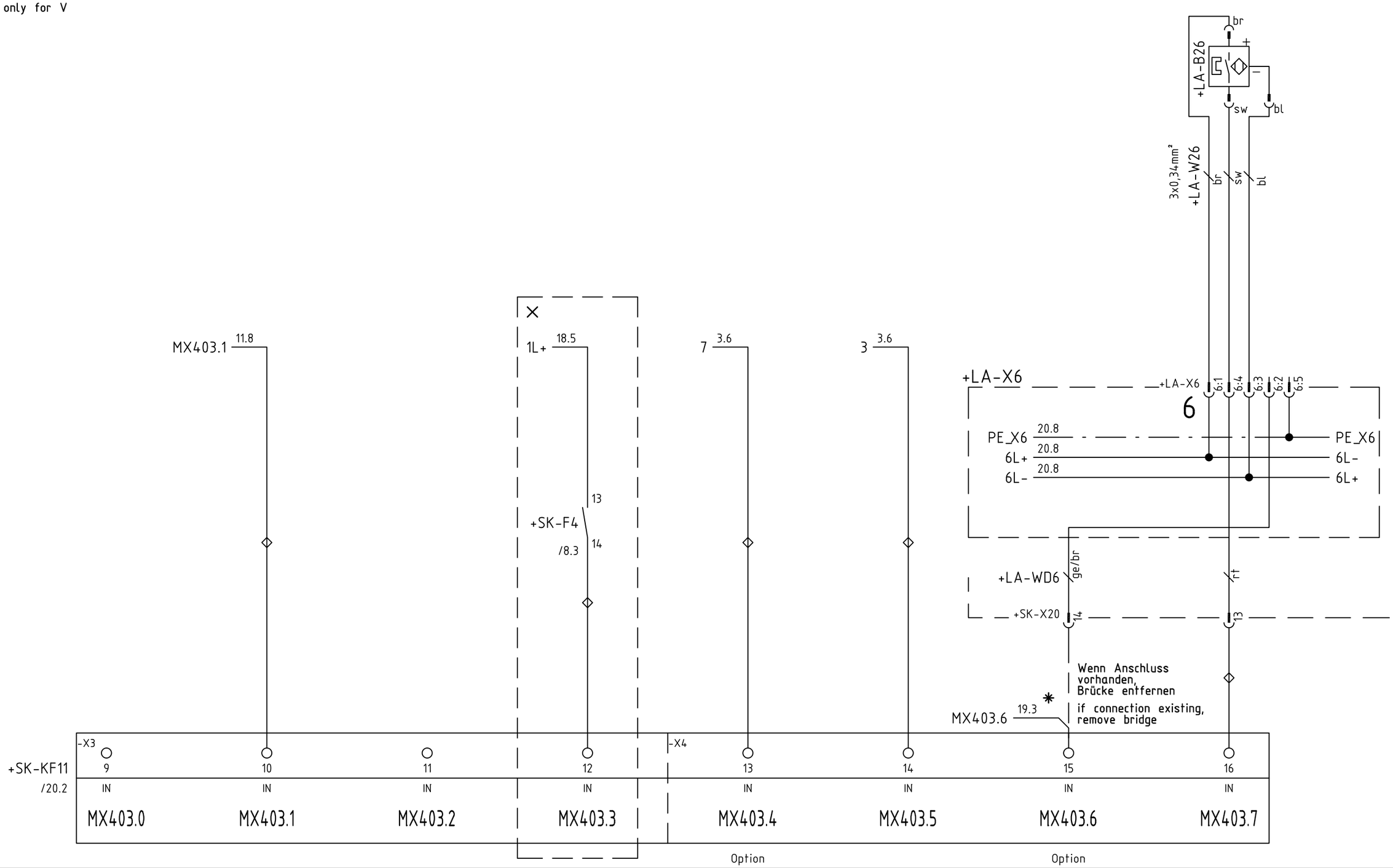
Blatt 20/1063 — 11111_003 — Blatt 20 / Folge 21

× Nur bei / only for V

✱ Option

Sensor-Aktor-Box
+LA-X6

Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF11



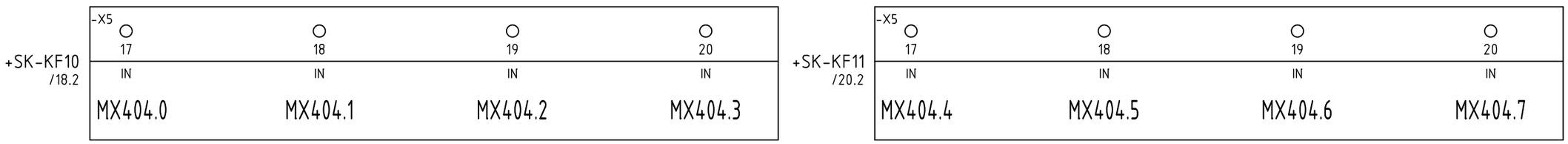
Option	Schutztür	reset	Schutzschalter	Automatik ein	Vorschub Stopp	Führungskanal geöffnet	Führungskanal geschlossen
Kurzdrehmodus	geschlossen		-M4 Vereinzelung	von Drehmaschine		(Abfrage hinten)	(Abfrage hinten)
short mode	door closed	reset	Protective switch	automatic mode on	feed stop	feed channel closed	feed channel closed
			-M4 seperation	from lathe			

				Datum	22.11.23	input-card KF11 MX403.0-7	FMB MASCHINENBAU	Eingangskarte KF11 MX403.0-7
				Bearb	D.Beck			
				Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5		Urspr	Ers.f.	Ers.d.

turbo RSV

Blatt 21/1063 | 11111_003 | Blatt 21 | Folge 22

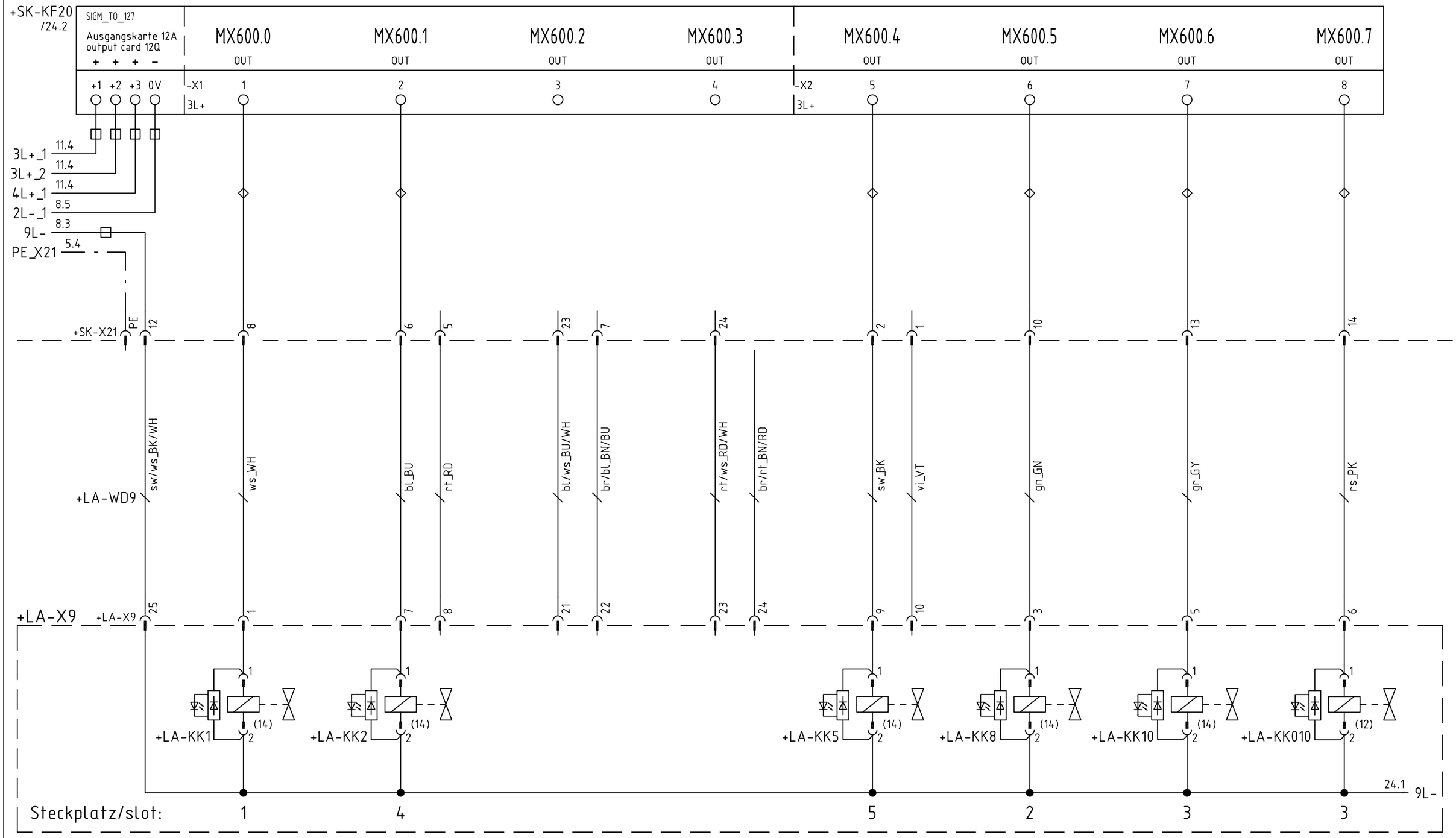
Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF10/KF11



				Datum	22.11.23	input-card KF10/KF11 MX404.0-7	FMB MASCHINENBAU	Eingangskarte KF10/KF11 MX404.0-7
				Bearb	D.Beck			
				Gepr.	D.Beck			
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

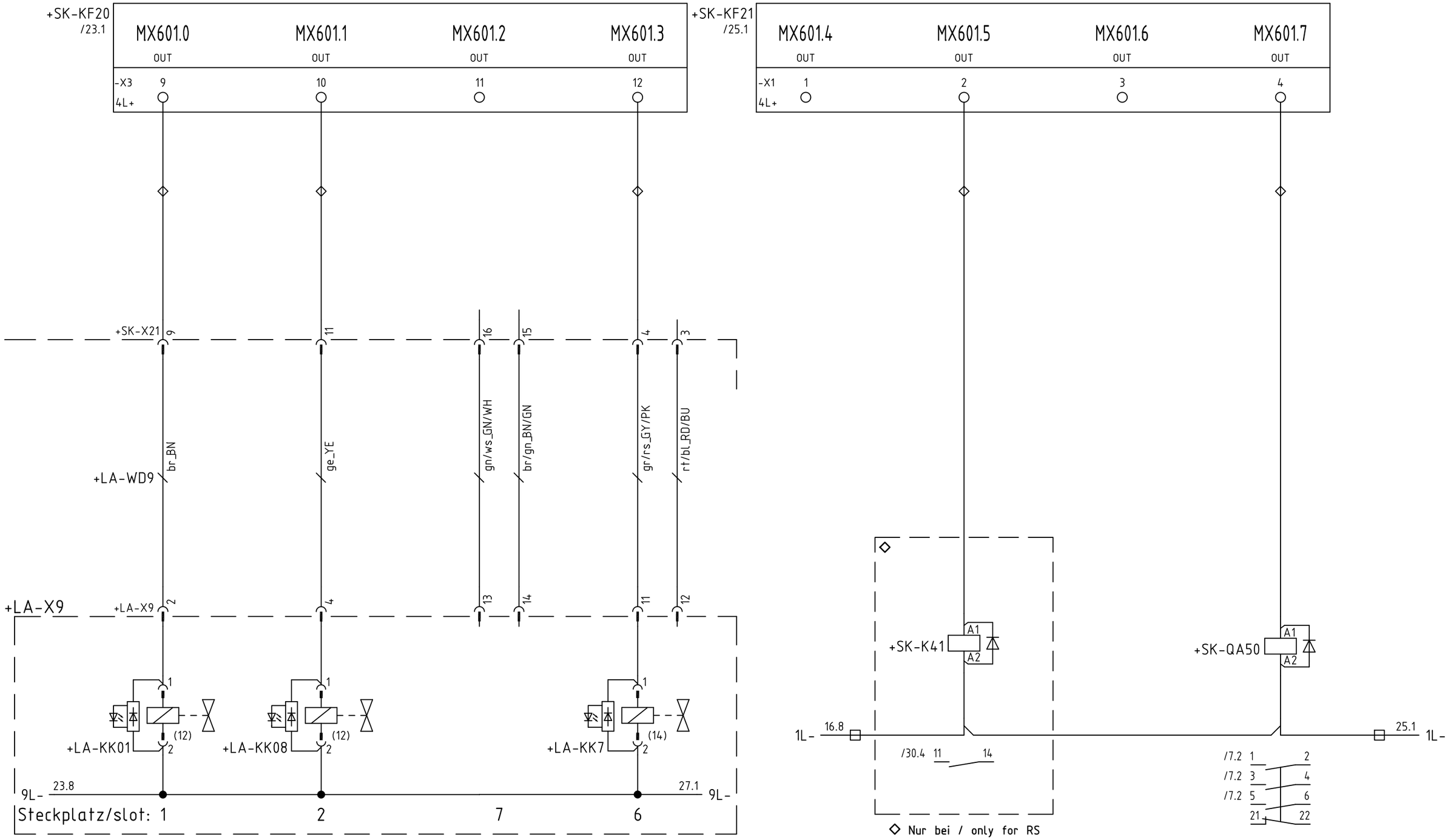
turbo RSV

Blatt 22/1063 | 11111_003 | Blatt 22 / Folge 23



Führungskanal öffnen guide channel open	Greifermesser schliessen gripper blades close		Materialvereinzelung material separation	Vorschubstange ausschwenken pusher swing out	Reststückklappe ausschwenken remnant flap swing out	Reststückklappe einschwenken remnant flap swing in

-X21: 7,23,24	06.09.24	D.Beck	Datum	22.11.23	output-card KF20 MX600.0-7	FMB MASCHINENBAU	Ausgangskarte KF20 MX600.0-7	turbo RSV
			Bearb	D.Beck				
			Gepr.	D.Beck			Blatt 23/1063	11111_003 Blatt 23 Folge 24
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		



Führungskanal schliessen guide channel close	Vorschubstange einschwenken pusher swing in	Reserve reserve	Lünette steady	Synchronkupplung Synchronisation clutch	Synchronkupplung über Freigabe synchronous clutch release	Ölpumpe -M2 oil-pump -M2	

			Datum	22.11.23	output-card KF20/21 MX601.0-7	FMB MASCHINENBAU	Ausgangskarte KF20/21 MX601.0-7
			Bearb	D.Beck			
			Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

turbo RSV

Blatt 24/1063 | 11111_003 | Blatt 24 / Folge 25

+SK-KF21
/24.5

SIGM_TO_127

Ausgangskarte 12A
output card 12Q

+ + + −

+1 +2 +3 0V

	MX602.0	MX602.1	MX602.2	MX602.3	MX602.4	MX602.5	MX602.6	MX602.7
	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
-X2 / -X3	5	6	7	8	9	10	11	12
4L+ / 3L+	○	○	○	○	○	○	○	○

4L+_2 11.3
4L+_3 11.3
3L+_3 11.4
2L-_2 8.5

+SK-K44 (A1/A2)
+SK-K30 (A1/A2)

1L- 24.8

/3.3 12 14 11 22 24 21

/3.3 12 14 11 22 24 21

× +SK-QA55 (A1/A2) +SK-QA56 (A1/A2) +SK-QA53 (A1/A2) +SK-QA54 (A1/A2)

1L- 26.1

/31.2 1 2	/31.3 1 2	/31.4 1 2	/31.5 1 2
/31.2 3 4	/31.3 3 4	/31.4 3 4	/31.5 3 4
/31.2 5 6	/31.3 5 6	/31.4 5 6	/31.5 5 6
/31.4 21 22	/31.4 21 22	/31.6 21 22	/31.6 21 22

Option

× Nur bei / only for V

Nachschieben — OK — pushing OK

Störung — fault

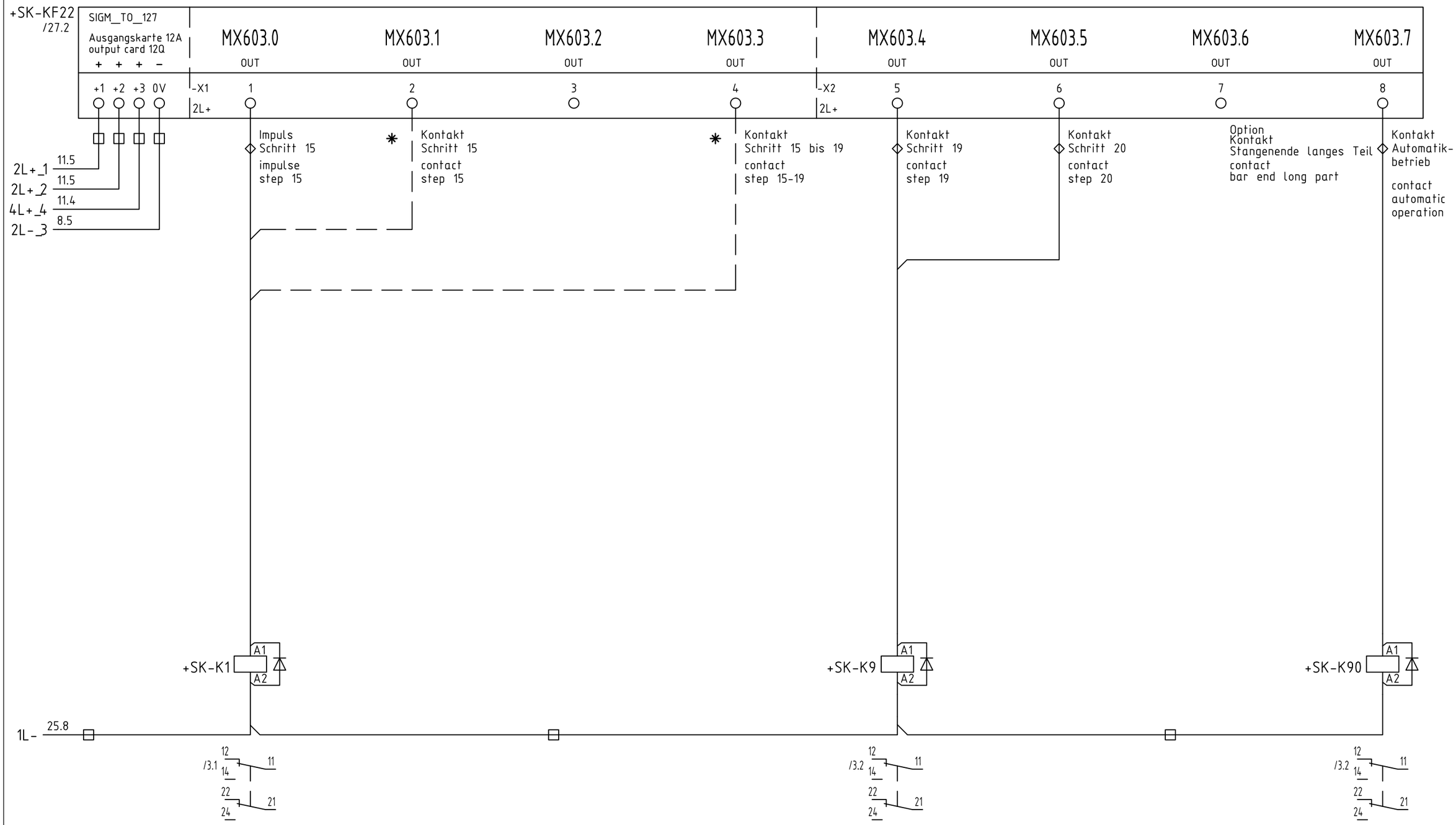
Kanal Durchmessereinstellung — rechtslauf — clockwise rotation — linkslauf — anticlockwise rotation

Vereinzelung Durchmessereinstellung — rechtslauf — clockwise rotation — linkslauf — anticlockwise rotation

			Datum	11.05.23	output-card KF21 MX602.0-7	FMB MASCHINENBAU	Ausgangskarte KF21 MX602.0-7
			Bearb	D.Beck			
			Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

turbo RSV

Blatt 25/00 — 11111_003 — Blatt 25 / Folge 26



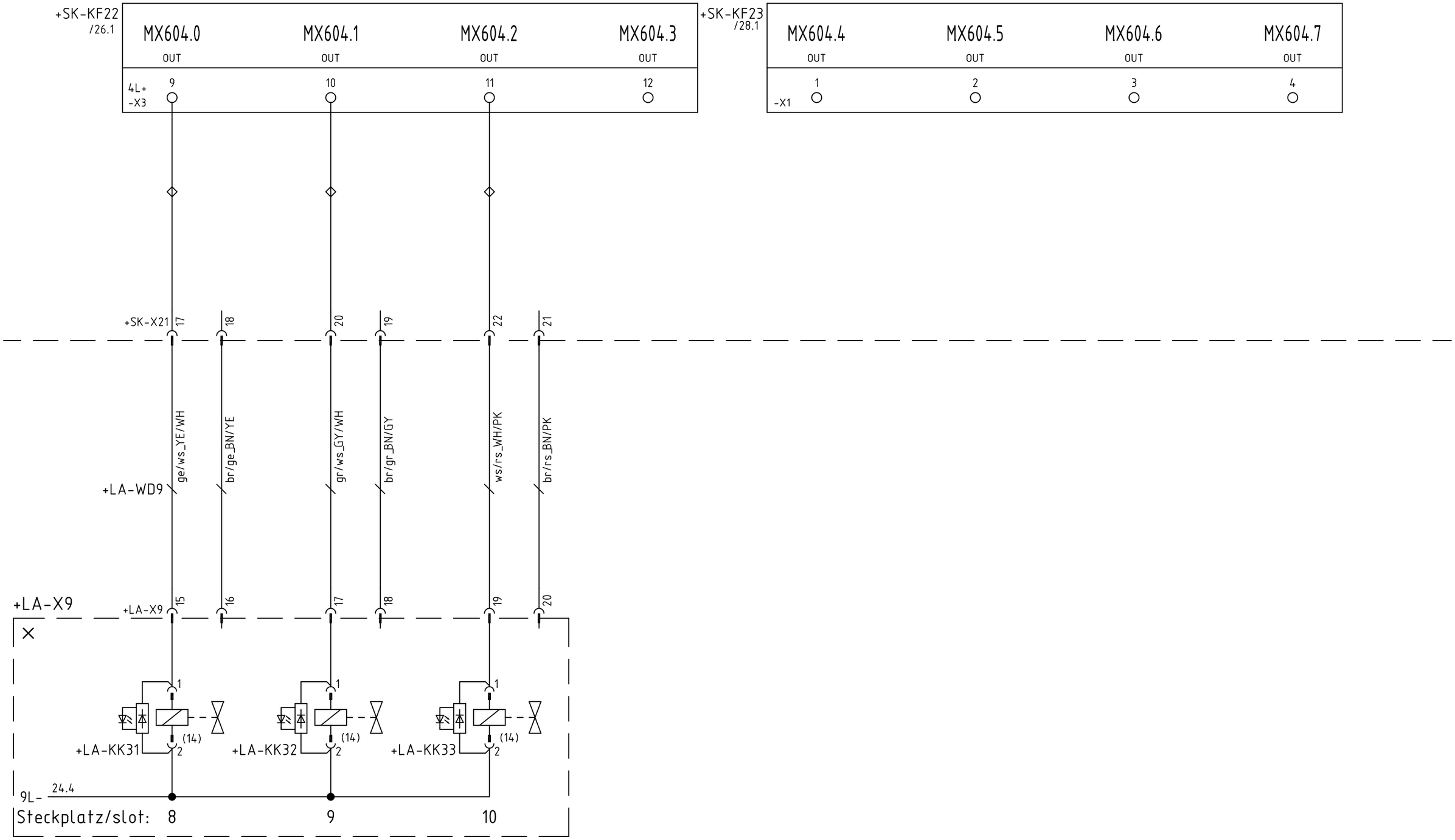
✱ Option

Stangenwechsel Ende
Programm Start
bar change end,
program start

Stangenende
Programm Stopp
bar end, Program stop

Automatik Ein
automatic on

				Datum	22.11.23	output-card KF22 MX603.0-7		turbo RSV
				Bearb	D.Beck		FMB MASCHINENBAU	Ausgangskarte KF22 MX603.0-7
				Gepr.	D.Beck			Blatt 26/1063 — 11111_003 — Blatt 26, Folge 27
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	



Durchmessereinstellung 1 Durchmessereinstellung 2 Durchmessereinstellung 3

diameter setting 1 diameter setting 2 diameter setting 3

× Nur bei / only for V

				Datum	22.11.23	Nur für RS 4-45V / 4-52 V input-card KF22/KF23 MX604.0-3 only at RS 4-45V / 4-52 V	FMB MASCHINENBAU	Ausgangskarte KF22/KF23 MX604.0-7
				Bearb	D.Beck			
				Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	

turbo RSV

Blatt 27/1063 | 11111_003 | Blatt 27 | Folge 28

+SK-KF23
/27.5

SIGM_TO_127
Ausgangskarte 12A
output card 12Q

	MX605.0	MX605.1	MX605.2	MX605.3	MX605.4	MX605.5	MX605.6	MX605.7
	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
	+ + + −							
	+1 +2 +3 0V	-X2			-X3			
		5	6	7	8	9	10	11	12
		5L+							

5L+ 8.6
5L- 9.2
L-_H1 9.2

Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF23

+SK-X35

	3	7	6	5	2
	grün	blau	rosa	grau	braun

+LA-W35

	3	7	6	5	2
	gn	bl	rs	gr	br

Lademagazin +LA
loading magazine +LA

+LA-P1

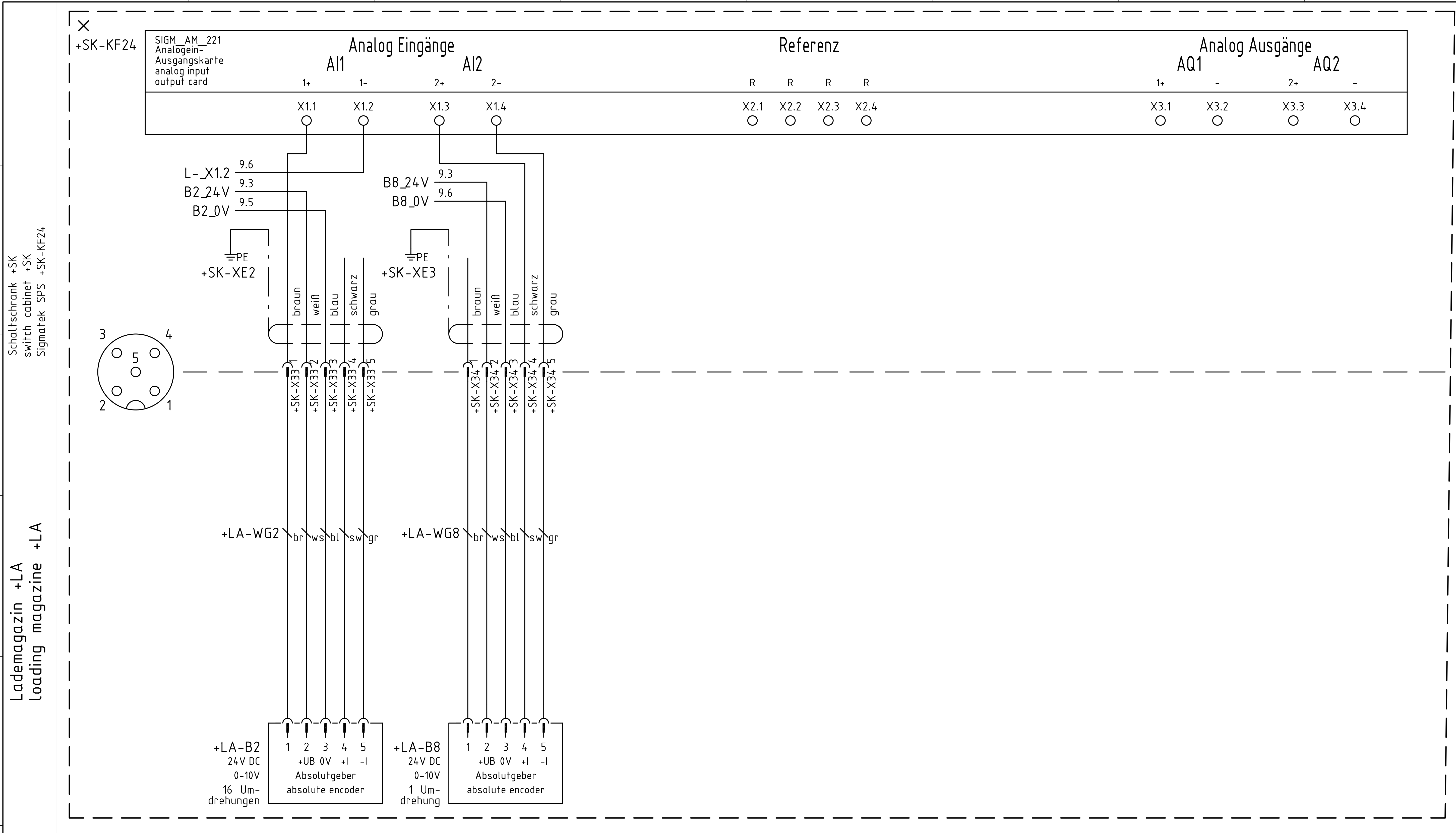
	3	7	6	5	2
	grün	gelb	rot	Buzzer	

Grün	Gelb	Rot
Automatikbetrieb	Nachladen erlaubt	Störung
Lademagazin	Stange geht zu ende	Lademagazin
Option "Letzte Materialstange"	reload allowed	fault
auto mode on		magazine

				Datum	22.11.23	output-card KF23 MX605.0-7	FMB MASCHINENBAU	Ausgangskarte KF23 MX605.0-7
				Bearb	D.Beck			
				Gepr.	D.Beck			
Aenderung	Datum	Name		Norm	DIN5	Urspr	Ers.f.	Ers.d.

turbo RSV

Blatt 28/1063 | 11111_003 | Blatt 28 | Folge 29


Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF24
Lademagazin +LA
loading magazine +LA
+SK-KF24
SIGM_AM_221
Analogein-
Ausgangskarte
analog input
output card
Analog Eingänge
AI1
AI2
1+
1-
2+
2-
X1.1
X1.2
X1.3
X1.4
Referenz
R
R
R
R
X2.1
X2.2
X2.3
X2.4
Analog Ausgänge
AQ1
AQ2
1+
-
2+
-
X3.1
X3.2
X3.3
X3.4
L-_X1.2
9.6
B2_24V
9.3
B2_0V
9.5
B8_24V
9.3
B8_0V
9.6
PE
+SK-XE2
PE
+SK-XE3
braun
weiß
blau
schwarz
grau
+SK-X33
+SK-X34
+LA-WG2
+LA-WG8
br
ws
bl
sw
gr
+LA-B2
24V DC
0-10V
16 Um-
drehungen
+LA-B8
24V DC
0-10V
1 Um-
drehung
+UB 0V +I -I
Absolutgeber
absolute encoder

Geber Kanal
Durchmessereinstellung
encoder channel
diameter setting

Geber Vereinzelung
Durchmessereinstellung
encoder material separtion
diameter setting

✕ Nur bei / only for V

			Datum	22.11.23	Nur bei RS 4-45V / 4-52V
			Bearb	D.Beck	analog in/output-card A24-2,AQ1-2
			Gepr.	D.Beck	only at RS 4-45V / 4-52V
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f. / Ers.d.

FMB MASCHINENBAU

Analogein-
Ausgangskarte
KF24 AI1-2/AQ1-2

turbo RSV

Blatt 29/1063

11111_003

Blatt 29
Folge 30

Schaltschrank +SK
switch cabinet +SK

Lademagazin +LA
loading magazine +LA

X29_5 6.4
X29_4 6.4
B4_0V 9.5
B4_24V 9.2
X29_S 6.4

L+_K41 9.2
L-_X28 9.5
PE_X28 5.4

+SK-K41 /24.6
11 +
- 14

braun weiß blau schwarz grau

3 4 5 2 1

+SK-X29 1 2 3 4 5

+SK-X28 1 2 3 4 5

+LA-WG4 br ws bl sw gr

+LA-WD11 1 2

GNGE

+LA-X11

+LA-FA1

PE

+LA-B4
24V DC
0-10V
1 Um-
drehung

1 2 3 4 5
+UB 0V +I -I
Absolutgeber
absolute encoder

+LA-Q1
A1
A2

Geber Wegerfassung Spindelstock — Synchronkupplung — ◇ Nur bei / only for RS

Weg Lünette

encoder distance headstock / steady — Synchronisation clutch

				Datum	22.11.23	Nur bei RS 4-45 / RS 4-45V synchr. clutch / encoder distance only at RS 4-45 / RS 4-45V	FMB MASCHINENBAU	Synchron-kupplung/ Wegerfassung	turbo RSV
				Bearb	D.Beck				
				Gepr.	D.Beck				Blatt 30/00
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	11111_003
									Blatt 30
									Folge 31

Schaltschrank +SK
switch cabinet +SK

Lademagazin +LA
loading magazine +LA

M3_24V 8.3
M3_0V 9.6
QL4_0V 9.3
PE_X22 5.6

+SK-QA55 /25.5
+SK-QA56 /25.6
+SK-QA55 /25.5
+SK-QA56 /25.6
+SK-QA53 /25.7
+SK-QA54 /25.8
+SK-QA53 /25.7
+SK-QA54 /25.8

+SK-X22 PE
+SK-X22 23
+SK-X22 24
+SK-X22 19
+SK-X22 20
+SK-X22 21
+SK-X22 22

+LA-WD13 gn/ge 5 6 1 2 3 4

+LA-X13 PE 5 6 1 2 3 4

+LA-FA4

+LA-WD3 gn/ge 1 2
PE rot
+LA-M3 4A 24V M sw

+LA-WD4 gn/ge 1 2
PE rot
+LA-M4 4A 24V M sw

+LA-QL4 A1 A2

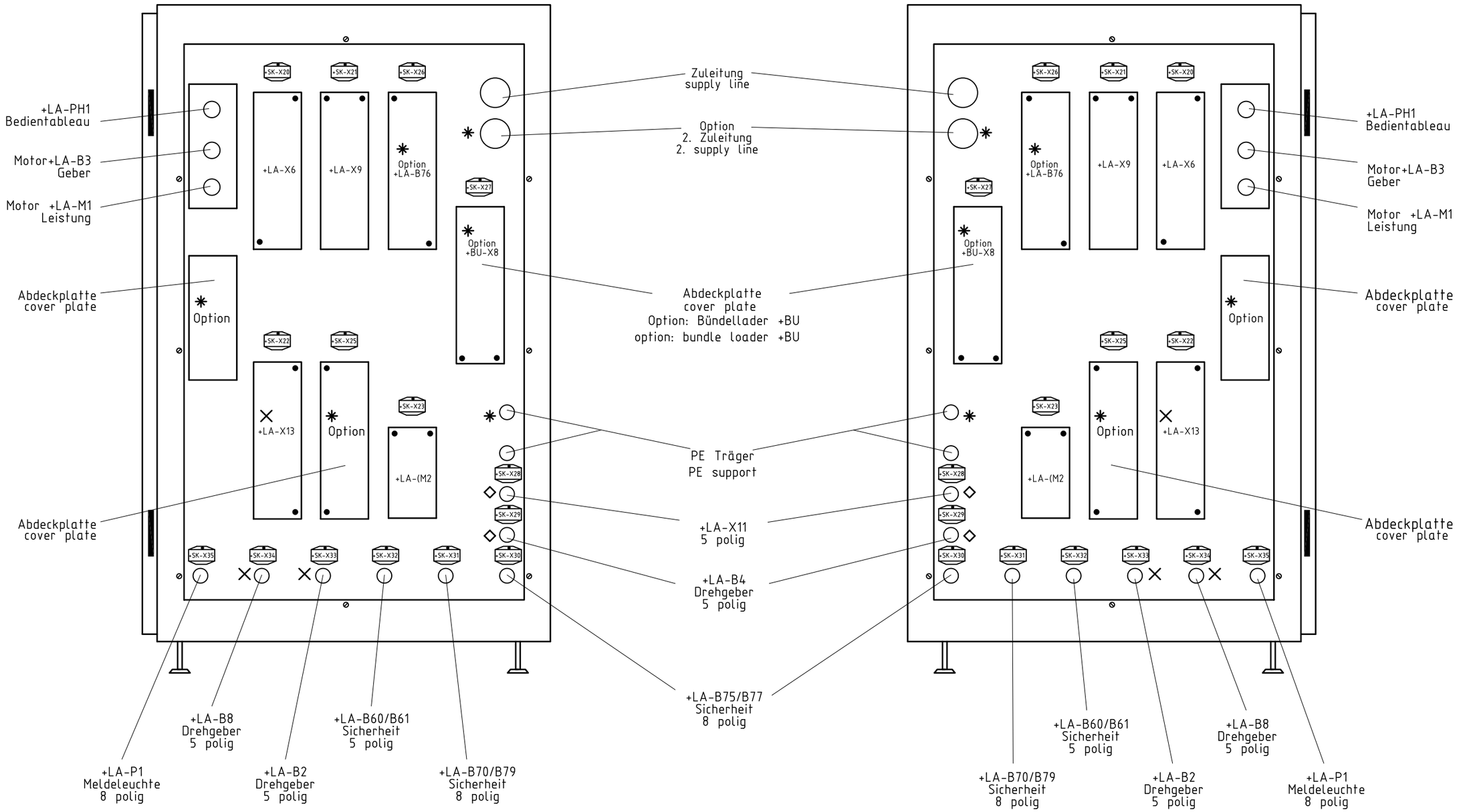
× Nur bei / only for V

Motor	Motor Vereinzelung	Bremse
Durchmessereinstellung	Durchmessereinstellung	brake
motor diameter setting	motor material separation	
	diameter setting	

				Datum	22.11.23	Nur bei RS 4-45V / 4-52V motor diametter setting -M3/M4 only at RS 4-45V / 4-52V	FMB MASCHINENBAU	Durchmesser-einstellung Motor -M3/M4	turbo RSV
				Bearb	D.Beck				
				Gepr.	D.Beck				Blatt 31
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 31/1063 · 11111_003 · Folge 32

Ausführung
variant
(A und B)

Ausführung
variant
(C und D)



✱ Option

◇ Nur bei / only for RS

✕ Nur bei / only for V

				Datum	22.11.23	Switch cabinet Interface	FMB MASCHINENBAU
				Bearb	D.Beck		
				Gepr.	D.Beck		
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f. / Ers.d.	

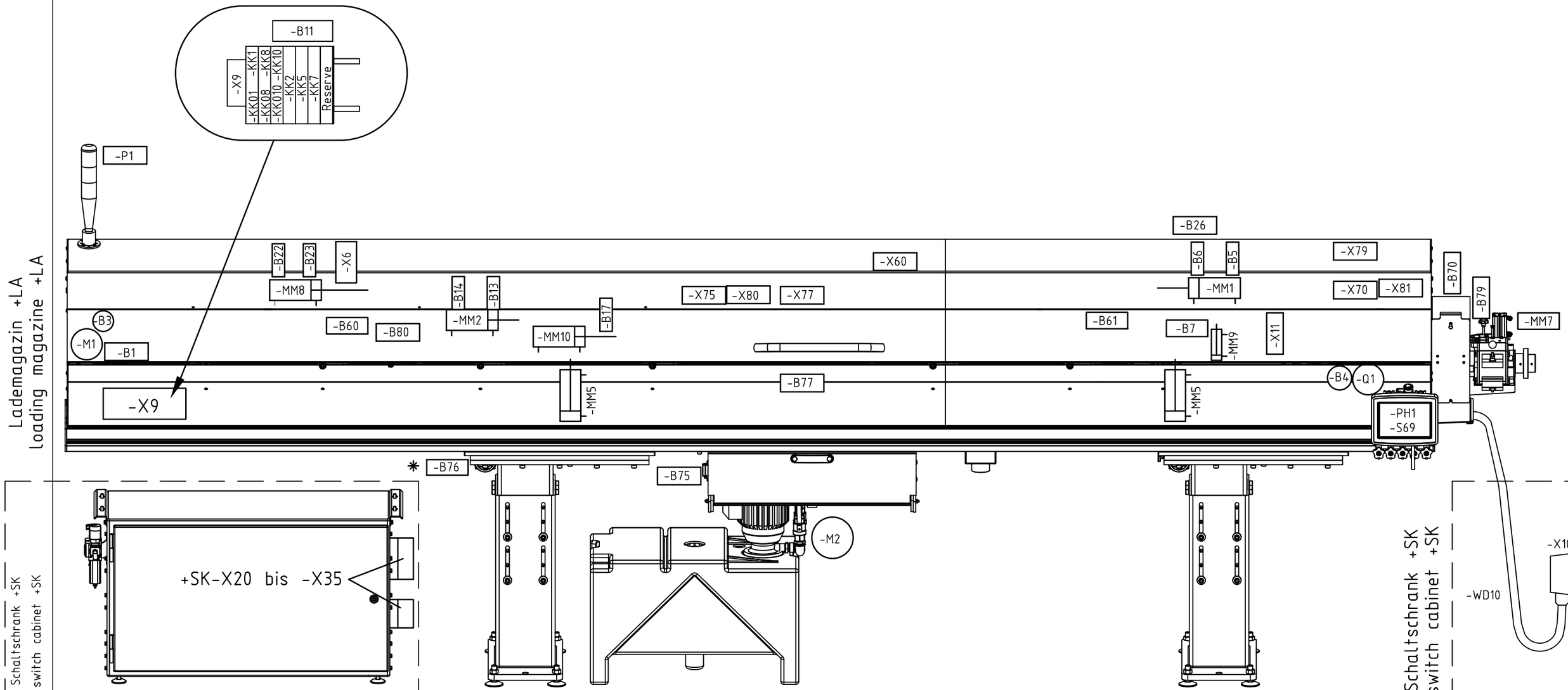
Schaltschrank
Anschluss

turbo RSV

Blatt 32/1063

11111_003

Blatt 32
Folge 33

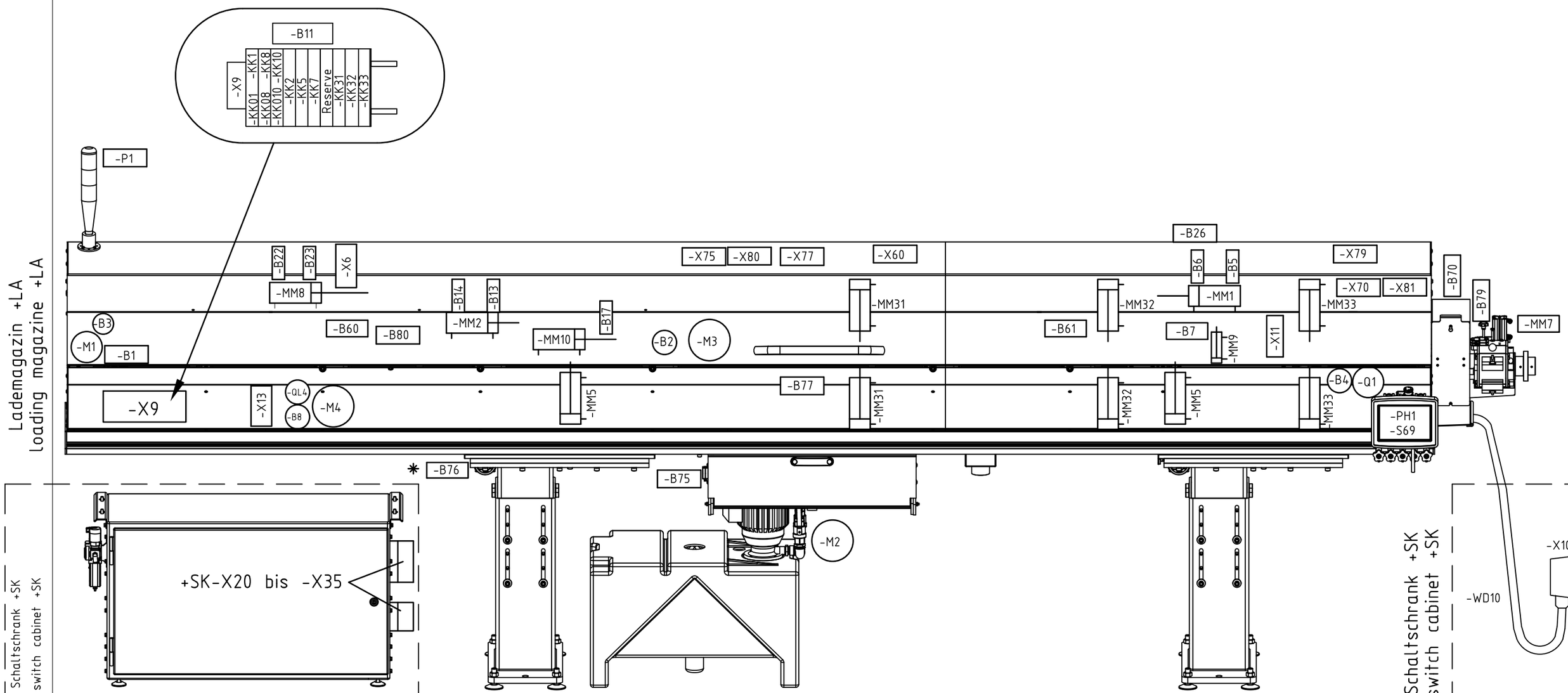


✳ Option

				Datum	22.11.23	device arrangement RS 4-45	FMB MASCHINENBAU	Geräteanordnung turbo RS 4-45
				Bearb	D.Beck			
				Gepr.	D.Beck			
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

turbo RSV

Blatt 33/1063 | 11111_003 | Blatt 33 | Folge 34

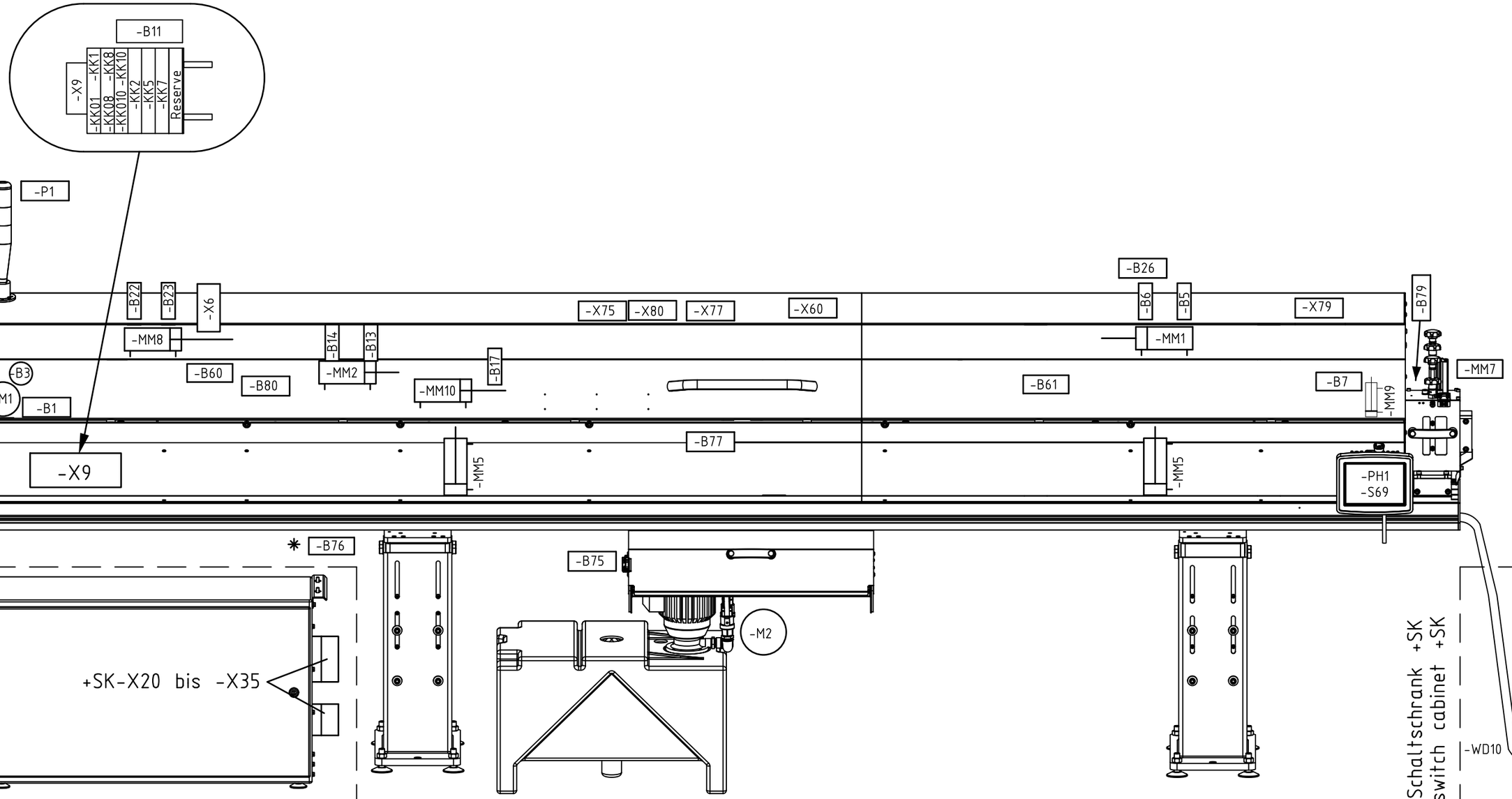


✳ Option

				Datum	22.11.23	device arrangement RS 4-45 V	FMB MASCHINENBAU	Geräteanordnung turbo RS 4-45 V
				Bearb	D.Beck			
				Gepr.	D.Beck			
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

turbo RSV

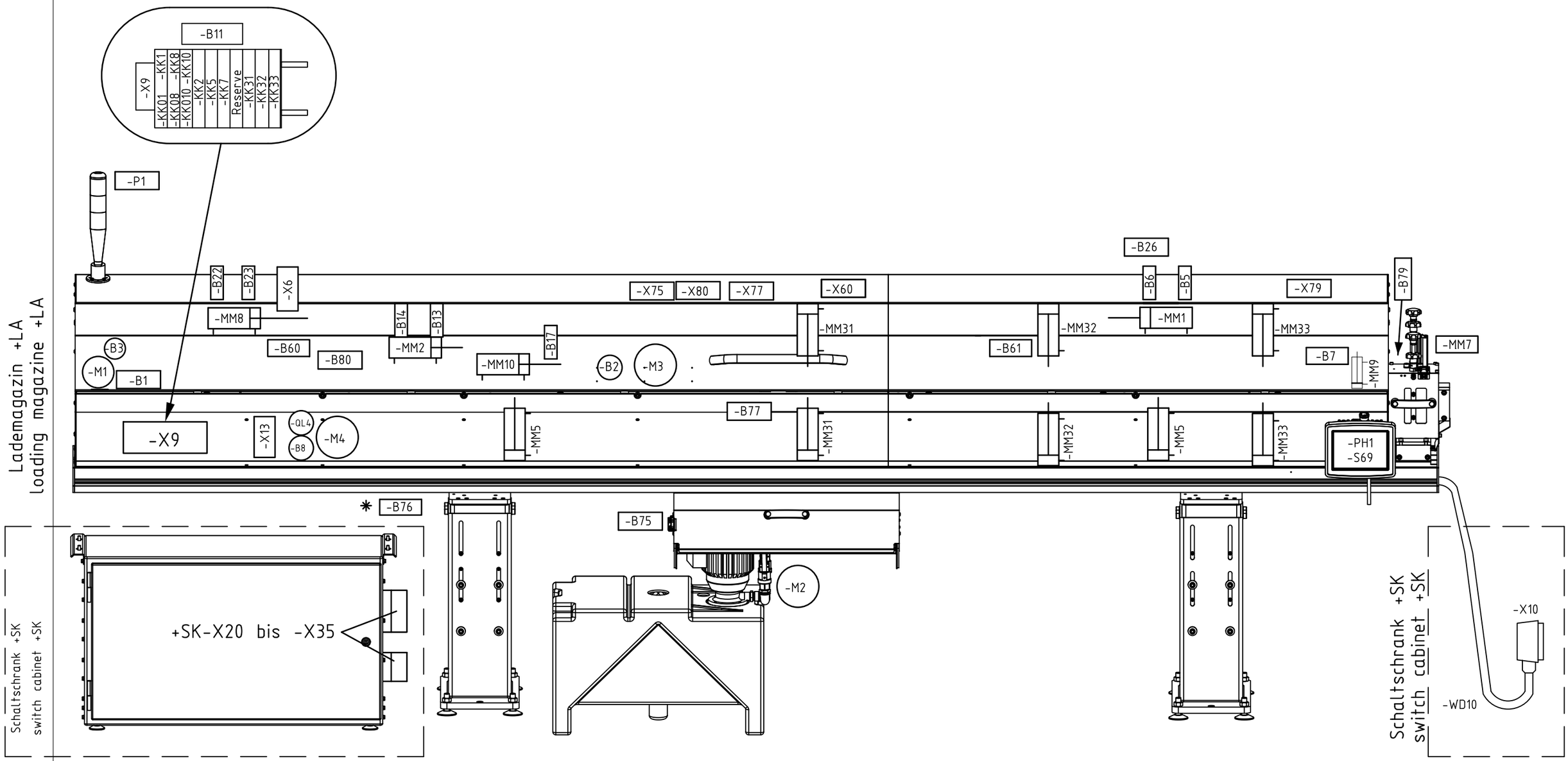
Blatt 34/1063 — 11111_003 — Blatt 34 / Folge 35



* Option

				Datum	22.11.23	device arrangement 4-52	FMB MASCHINENBAU	Geräteanordnung turbo 4-52
				Bearb	D.Beck			
				Gepr.	D.Beck			
Aenderung	Datum	Name		Norm	DIN5	Urspr	Ers.f.	Ers.d.

turbo RSV			
Blatt 35/1063	11111_003	Blatt	35
		Folge	36



* Option

				Datum	22.11.23	device arrangement 4-52 V	FMB MASCHINENBAU	Geräteanordnung turbo 4-52 V
				Bearb	D.Beck			
				Gepr.	D.Beck			
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

turbo RSV

Blatt 36/1063 | 11111_003 | Blatt 36 | Folge 70

-T10 | -F10 | -F11 | -F1 | -F2 | -F3 | -F4 | -F5 | -QA50 | -QA51 | -K1 | -K9 | -K30 | -K90 | -K91 | -K18 | -K37 | -K38 | -K61 | -K44 | -K41

-T1

+SK

Schneider

24 VDC-10A

-T10

5A

10A

-F10

-F11

-F1

-F2

-F4

-QA50

-FA50

-K1

-K9

-K30

-K90

-K44

-K41

-T1

-KF1 | -KF10 | -KF11 | -KF20 | -KF21 | -KF22 | -KF23 | -KF24

-K20 | -K201 | -K25 | -K251 | -K27 | -K271 | -K70 | -K701 | -K22 | -K23 | -QA21 | -K62

-XE2

-XE3

-XE1

-X1

-QA53 | -QA54 | -QA55 | -QA56

-QA53 -QA54 -QA55 -QA56

* Option
◇ Nur bei / only for RS
× Nur bei / only for V

				Datum	22.11.23	switch board		FMB MASCHINENBAU	Schalttafel	turbo RSV
				Bearb	D.Beck					
				Gepr.	D.Beck					
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 70/1063	11111_003
										Blatt 70
										Folge