FMB
MASCHINENBAU

turbo RS 4-45 V

Operating instructions

Operating instructions

turbo RS 4-45 V, series 1

Confirmation number from: 2212752

Editorial deadline: 2023-11-14

FMB Maschinenbau
Paul-Hohe-Straße 1
97906 Faulbach
Telephone: +49 9392 801 0
Fax:
E-mail: info@fmb-machinery.de
Internet: www.fmb-machinery.de

Operating instructions

1, 1, en_US

Table of contents

1 General

1.1 Operating instructions

Product versions and special equipment

The operating instructions cover several versions of the described product. You can see which version of the product you have in the field "Type" on the name plate. ➚ *"Name plate" on page 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 11*.

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

Reasonably foreseeable misuse

- Non-observance of the requirements on the material bars. .
- Operation with asymmetric profile bars without consultation with FMB.
- Operation with special profiles without consultation with FMB.

- Operation with non-homogenous material bars (imbalance).
- Processing outside of the permitted area (diameter, length). ➚ *"Technical data of the loading magazine" on page 11*.
- Use of unintended fuel. .
- Operation without lubrication.
- Operation without a capacity adjustment set or with the wrong set.

  Operation without a clamping device or with the wrong clamping device.
- Transportation not done in accordance with the operating instructions. ➚ *Chapter 3.2 "Transporting the product" on page 21*.
- Operation outdoors.
- Manipulation of safety equipment.
- Performance of work without sufficient qualifications. ➚ *"Qualifications of the personnel" on page 7*.

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

Qualifications of the personnel

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

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

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

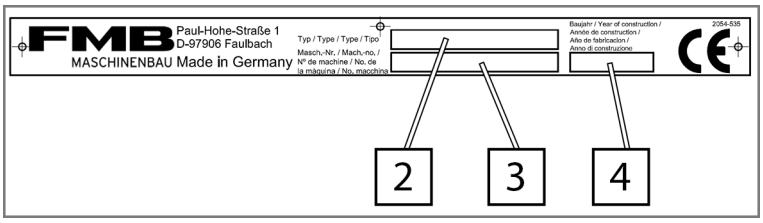
**Personnel who have received training for the product, are familiar with the functions and have been made aware of the risks. The training can be done by FMB or by a person who has already received training.

***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

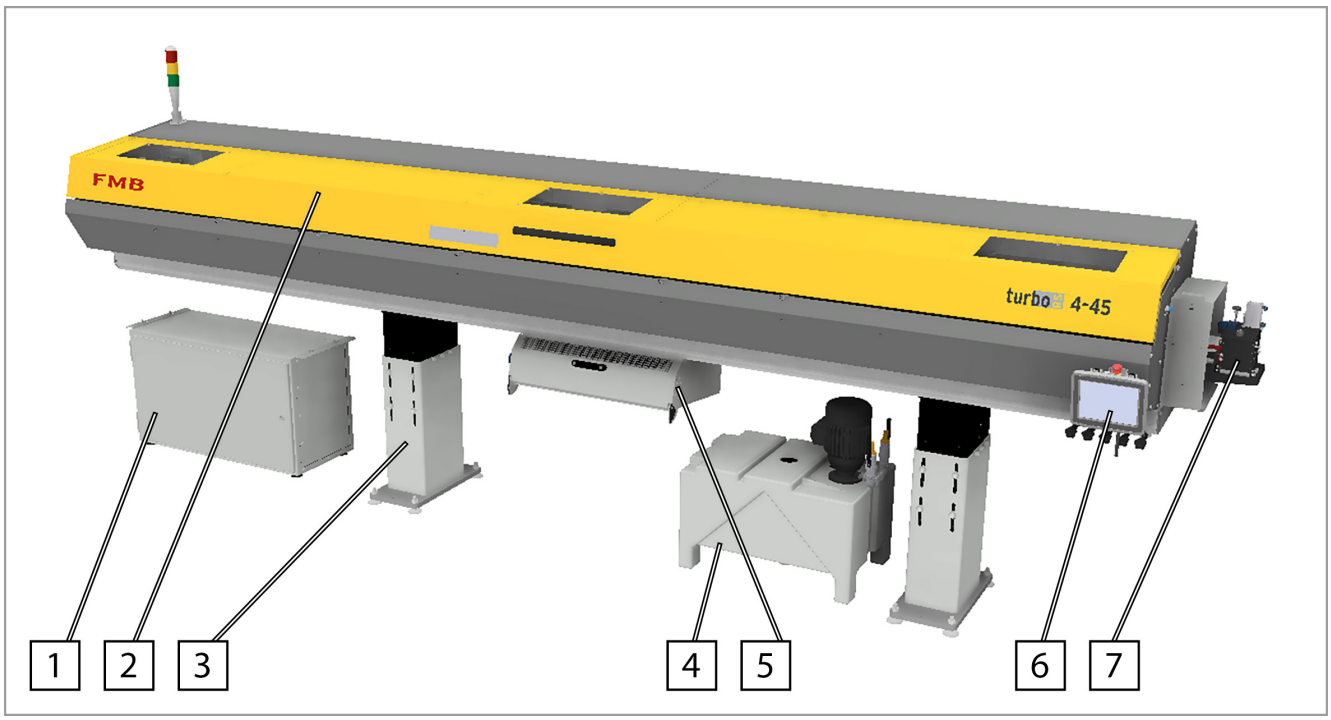
The name plate is attached to the loading magazine in position 1.



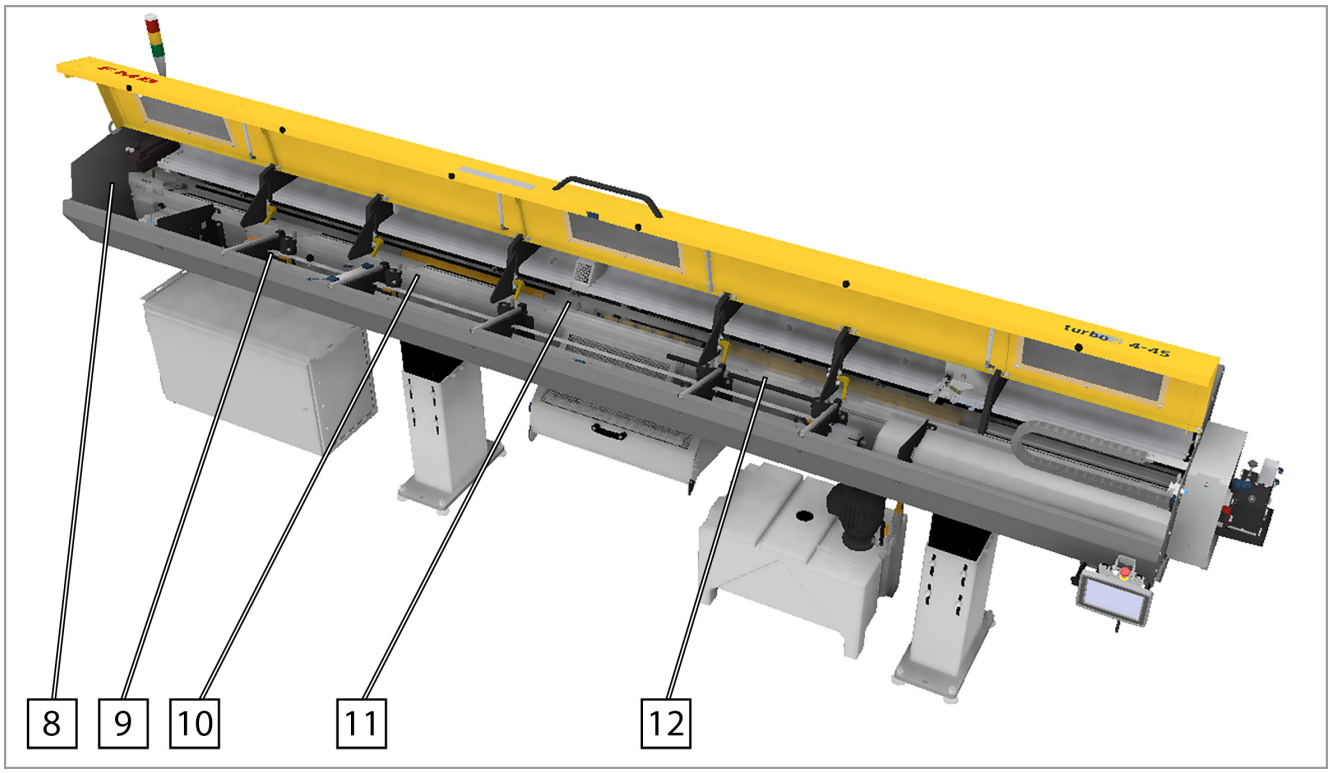
2	Types and lengths	3	Machine number
4	Year of construction		

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.

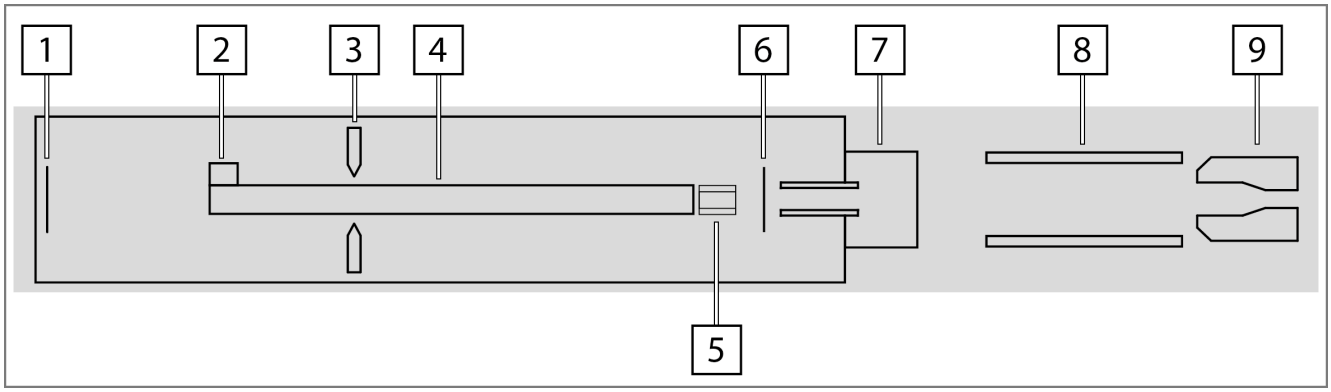
The collet of the machine tool closes and processing begins. The guide channel filled with oil and the steady placed between the machine tool and the guide channel ensure the exact bar guide required for processing. After a workpiece has been completed, the collet of the machine tool opens. The pusher 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

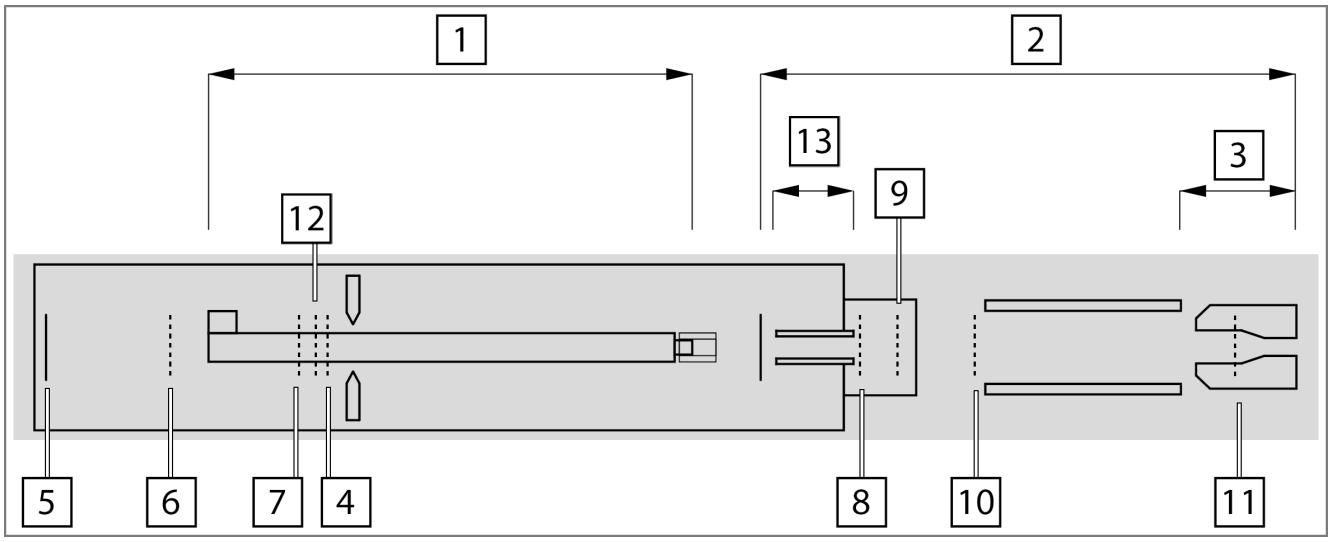
The pusher is driven by a servomotor with a toothed belt. A sensor on the servomotor detects the exact position of the pusher.

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

Characteristic	Unit	Value
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
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

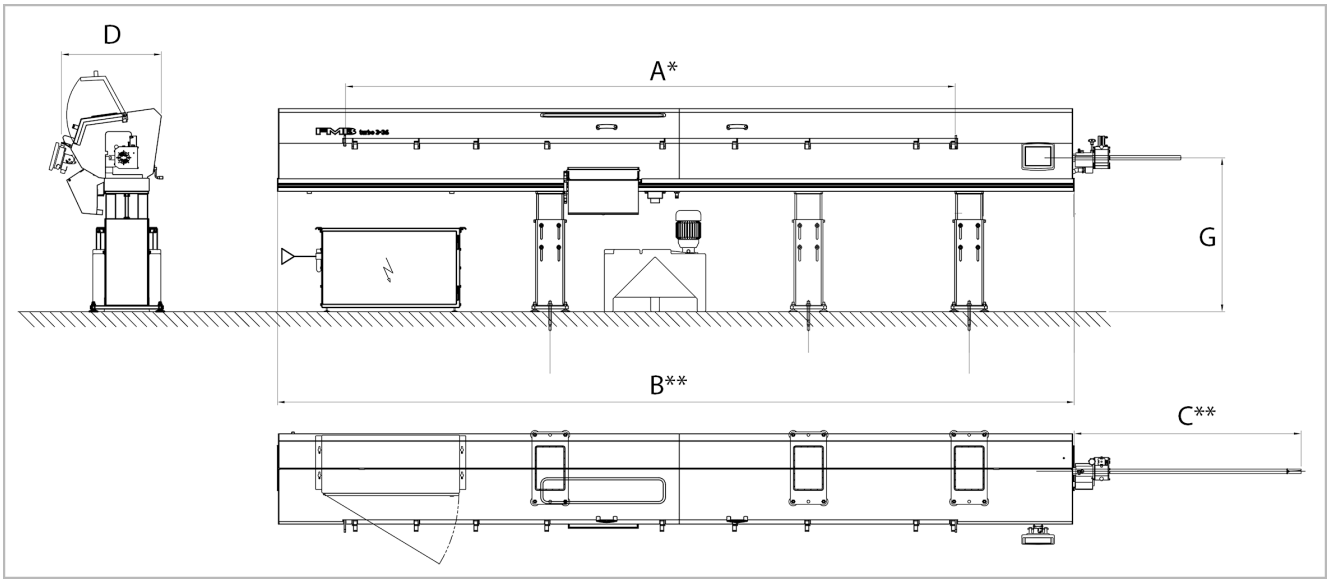
Storage conditions

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

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

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***

Loading magazine length	Dimensions in mm						
2200	2210	3600	3800	821	1835	2035	920 - 1465
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 40*.

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.

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.**

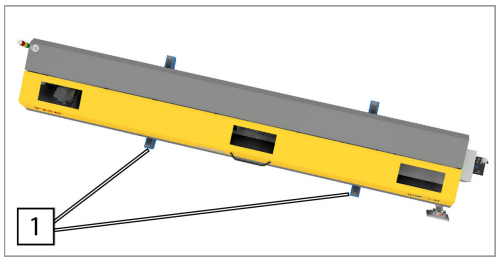
Once the loading magazine has been raised, the pins extending out of the floor must be detached at ground level or removed from the floor using suitable means.

1. Completely remove any material bars. *“Removing the material bar from the loading magazine” on page 51* or .
2. Remove the remnants from the remnant bin. .
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 68*.
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.

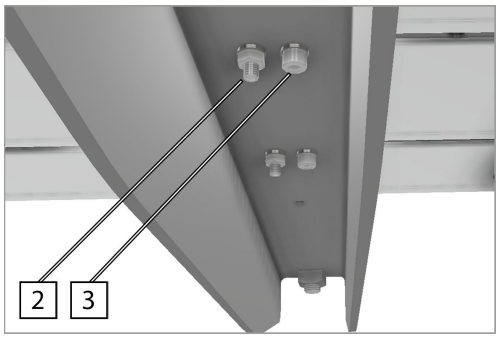
    The oil tank must be transported separately.

15. Depressurize the compressed air line to the loading magazine.
16. Switch off the compressed air supply.
    ➡ 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 32*.
18. Assemble the transport lock for the guide channel/guide module. ↗ *"Assembling / disassembling the transport lock for the guide module" on page 19*.
19. Assemble the transport lock for the remnant bin. .
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.

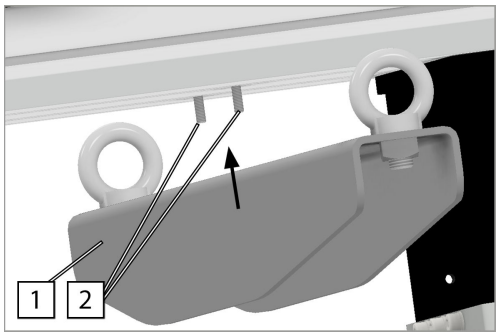
- **Do not stay in the danger area.**
- **Only install transport beams for the purpose of crane transportation and then remove them directly.**

⚠ CAUTION

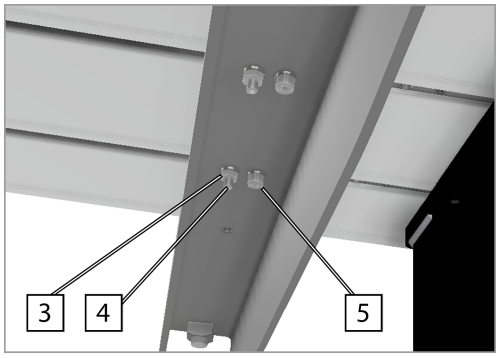
Protruding transport beams

Personal injury because of impact due to protruding transport beams.

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

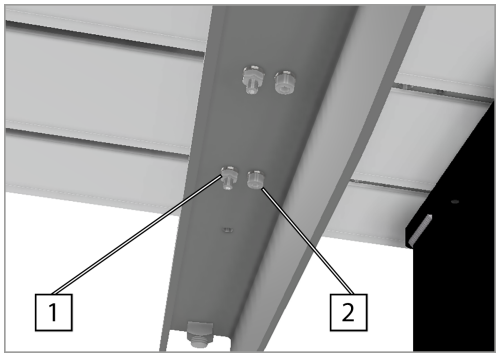


1. Place the transport beams [1] on the threaded pins [2] and hold.

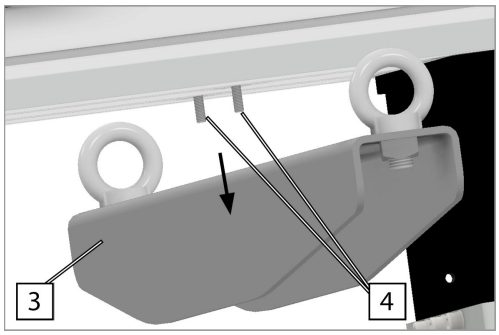


2. Place the nut with washer [3] on the threaded pin [4] and tighten.
3. Repeat the work step for the second threaded pin.
4. Insert the screw with washer [5] and tighten.
5. Repeat the work step for the second screw.

Removing the transport beams

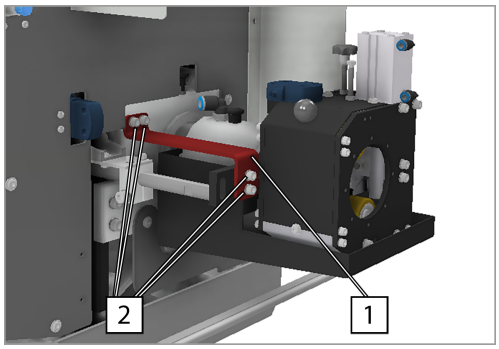


1. Secure the transport beams to prevent falling.
2. Loosen the nut with washer [1] and remove.
3. Repeat the work step for the second nut.
4. Loosen the screw with washer [2] and remove.
5. Repeat the work step for the second screw.



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.

Angle of inclination of the load attachment gear

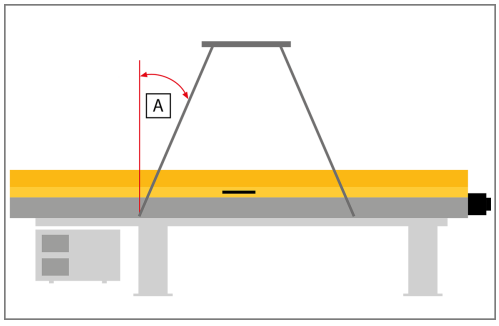
⚠ DANGER

Falling loading magazine

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

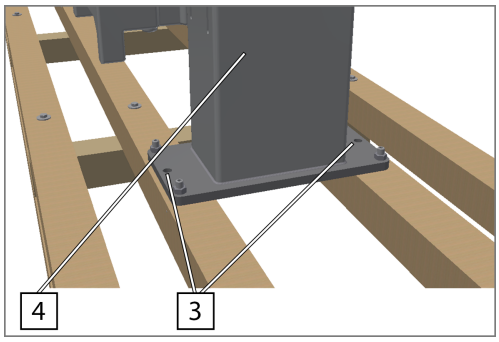
When lifting the loading magazine with the multi-chain load attachment gear, the specified maximum angle of the load attachment gear has to be observed. If this angle is exceeded, the attachments of the transport beams may break and the loading magazine could fall down.

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

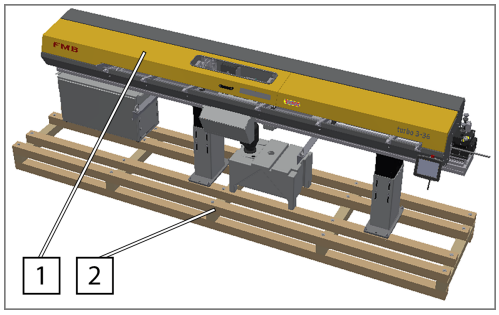


When using the multi-chain load attachment gear, the load attachment gear chosen must not exceed the angle of inclination of [A] 40°. Greater angles of inclination generate transverse forces that are beyond the rating of the attachment of the transport beams.

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 21*.

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

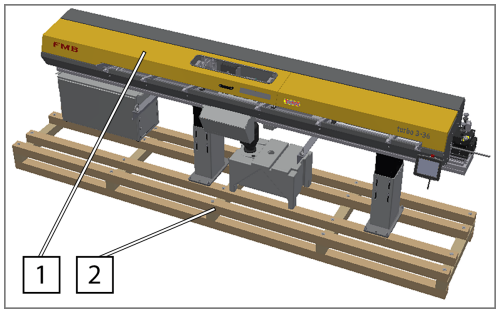
Fastening the loading magazine to the transport pallet

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.

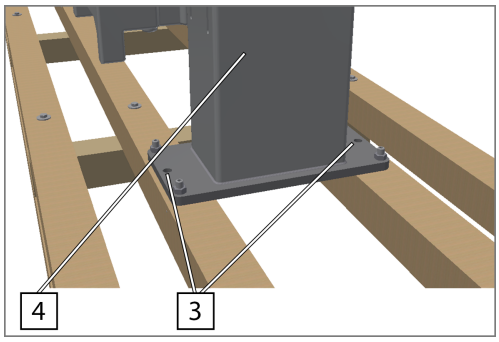
The loading magazine must be fastened to the transport pallet using adequately dimensioned fasteners.

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

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 21*.
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 17*.
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 18*.

Transporting the loading magazine using the fork-lift truck

⚠ DANGER

Falling loading magazine

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

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

⚠ DANGER

Falling transport pallets / Loose loading magazine

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

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

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

⚠ DANGER

Falling control cabinet

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

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

⚠ DANGER

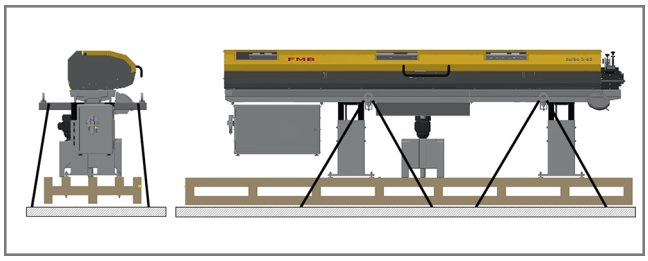
Falling oil tank

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.**

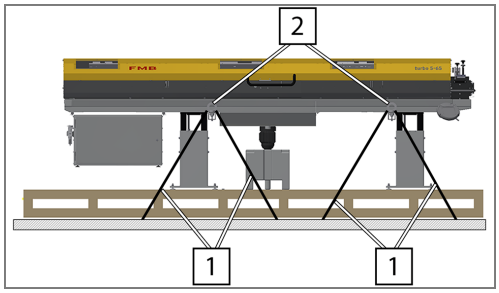
1. Fasten the loading magazine to a transport pallet ➚ *"Fastening the loading magazine to the transport pallet" on page 20*.
2. Calculate the center of gravity of the load.
3. Place the forks of the fork-lift truck beneath the center of gravity of the load.
4. Additionally secure the loading magazine 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 20*.

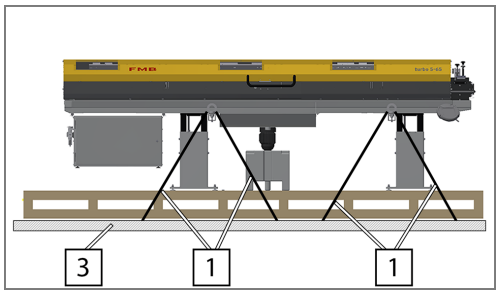
Transport the loading magazine with means of transportation



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

Attach the loading magazine to the means of transport





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

4 Assembly and start-up

4.1 Prepare for assembly

Assembly requirements

NOTICE

Damage to the floor

The floor on which the 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 20*.

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 26*.
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

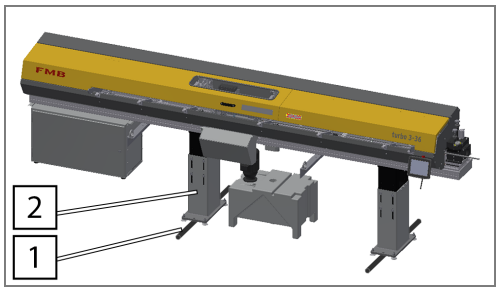
Moving the whole loading magazine during set-up

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

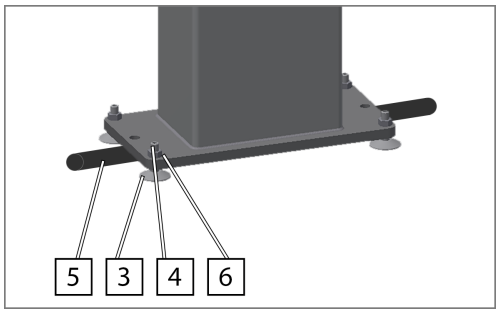
When setting up and aligning the loading magazine, the whole loading magazine has to be moved. People may be struck by the loading magazine or become stuck between the loading magazine and the lathe.

- **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 26*.
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 27*
- Contacts from the lathe to the loading magazine: ➚ *"Contacts from the machine tool to the loading magazine" on page 28*

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 27*
3. Insert the main power supply cable of the loading magazine into the control cabinet of the lathe.
4. Check the input voltage of the loading magazine.
5. Insert the connecting pipe for the compressed air supply to the loading magazine into the maintenance unit [1].

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

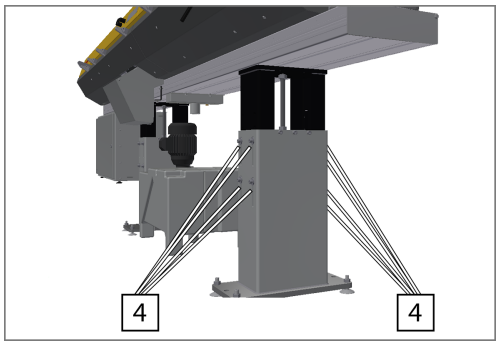
Cuts due to the sharp knives of the material gripper.

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

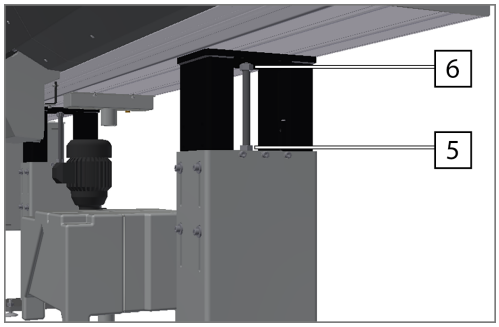
- **Wear safety gloves.**

→ 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 75*.

Correcting the height (roughly):

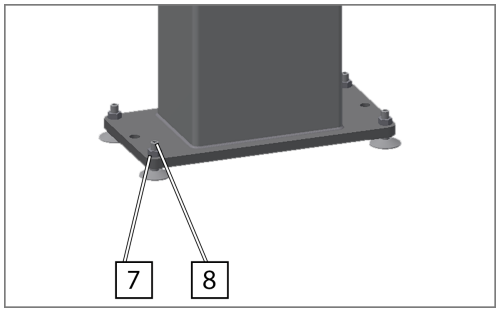


1. Loosen the clamping screws [4].



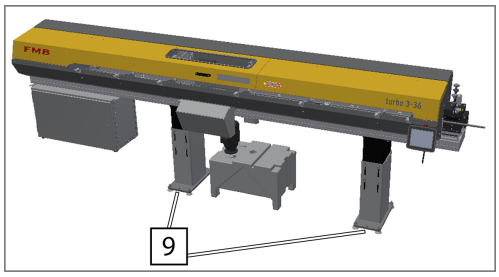
2. Loosen the lock nuts [5] of the threaded spindles [6].
3. Correct the height of the loading magazine with the threaded spindles [6].
4. Tighten the lock nuts [5] of the threaded spindles [6].
5. Tighten the clamping screws [4].

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:



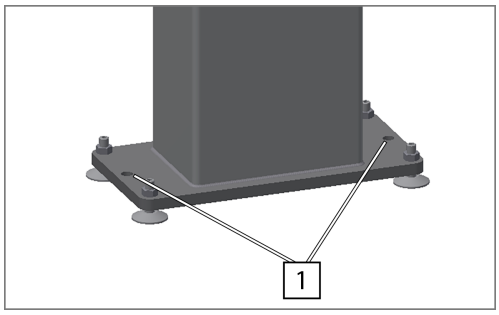
1. Position the lever (e.g. crowbar) at the leverage points [9] and correct the side position.
2. Remove the optical alignment aids again.

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 29*.



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 75*.

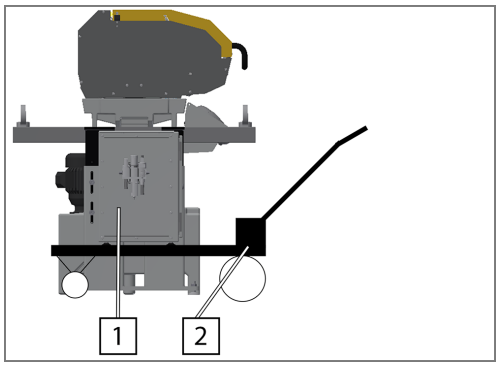
Removing the control cabinet from / attaching the control cabinet to the loading magazine

⚠ CAUTION

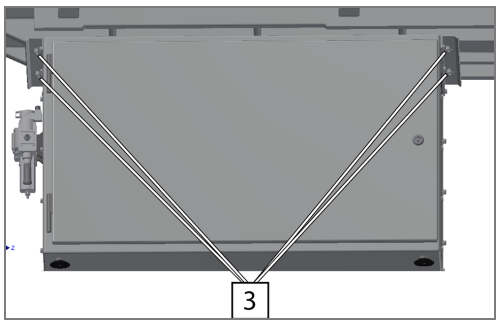
Falling control cabinet

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

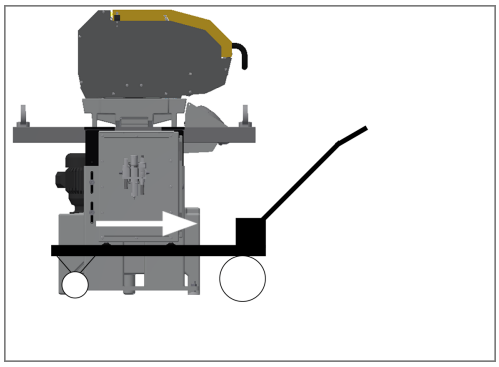
- **Observe the description on removing and fastening the control cabinet from the loading magazine in the operating instructions.**



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.

Setting up and connecting the oil tank

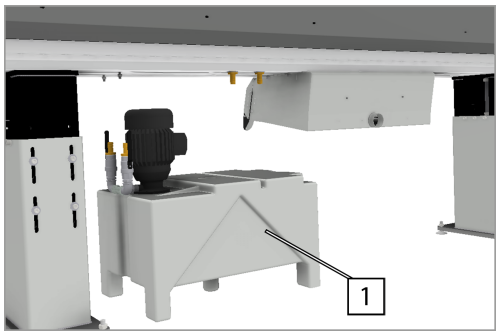
⚠ DANGER

Damaged wires or plugs

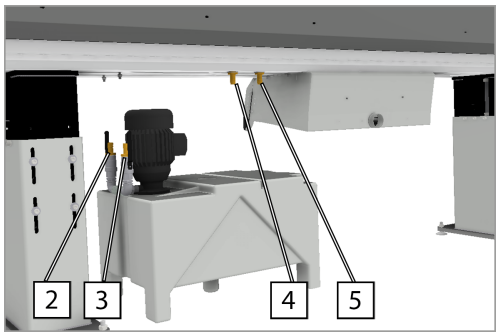
Personal injury by electric shock due to damaged wires or plug-in connections.

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

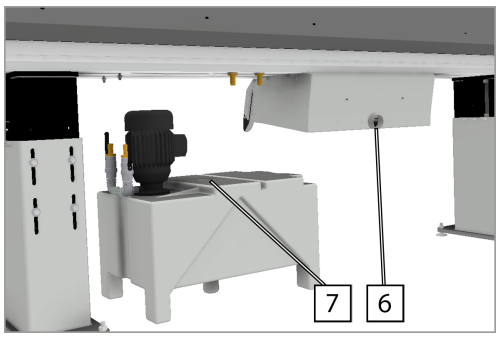
1. Turn off the machine tool before starting work on the main switch.



2. Place the oil tank [1] below the loading magazine using suitable hoisting equipment.



3. Connect pump outlet [2] and [3] with oil feed and [5] with oil feed hose.



4. Guide the oil return hose into the oil return opening [6].
5. Connect the remaining end of the oil return hose to the oil return [7].
6. Secure the oil return hose to the oil return [6] using a hose clip.
7. Insert the plug of the oil pump into the control cabinet (the socket is located outside the control cabinet) of the loading magazine.
8. Fill the oil tank. .

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) .
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.

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 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.

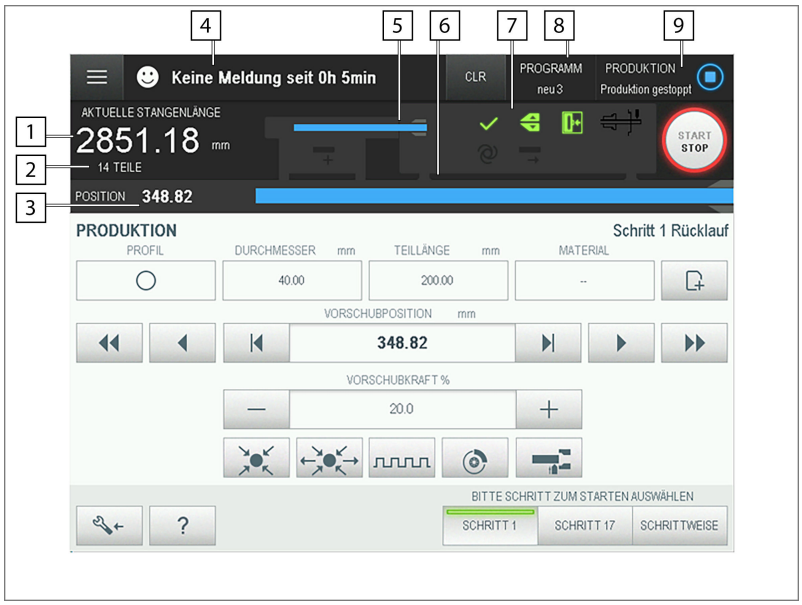
5 Control panel

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 39*.

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 41*.

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 41.*

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.

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.

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.

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.

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 43*.

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 45* .

Creating a new program

1. Press the ☰ button.
2. *‘PROGRAM → NEW”*
   ➡ PROGRAM EDITOR opens.
3. Enter the program parameters.
4. Scroll to page 2 using the ↷ button.
5. Press the 🖫 button.
6. Give the program a name.
7. Press the NEW button.
   ➡ A new program is created.

Editing a program

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

Load program

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

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

Enter the profile of the material bar

1. Open the program in the program editor. ➚ *"Creating a new program" on page 43* or ➚ *"Editing a program" on page 44*.
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 43* or ➚ *"Editing a program" on page 44*.
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 43* or ➚ *"Editing a program" on page 44*.
2. Click on the field Diameter.
   ➡ An input field opens.
3. Enter the diameter to be processed.
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 43* or ➚ *"Editing a program" on page 44*.
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 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 43* or ➚ *"Editing a program" on page 44*.
2. Click on the field Extension first insert.
   ➡ An input field opens.
3. Enter Extension first insert.
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.

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".

6.5 Feed material bars

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 47*.

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 43* or ↗ *"Editing a program" on page 44*.
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.

6.6 Processing phase

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 .

Start/stop production

1. Observe the prerequisites for automatic mode ➚ *"Production" on page 49*.
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 6 Close gripper blades / remnant flap	The remnant flap closes. The material gripper closes.	-

Step	Description	Position
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.

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 40*.
9. Switch off the compressed air supply.
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.
16. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 40*
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.

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.

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.

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.

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 75*.

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

7.2 Guide channel

Adjusting the guide channel diameter

Adjusting the diameter sets the guide channel diameter to the entered value.

Adjusting the guide channel diameter

1. Press the ☰ button.
2. DIAMETER press.
3. Tap the Channel diameter field.
   ➥ An input field opens.
4. Enter the value.

5. Press the Set press.

➡ The guide channel diameter is set to the entered value.

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 75*

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

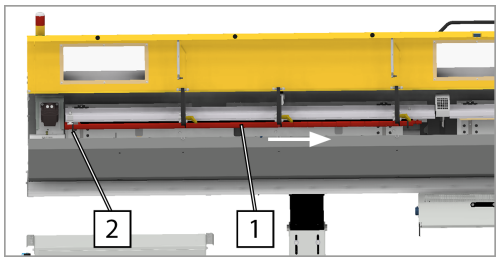
Cuts due to the sharp knives of the material gripper.

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

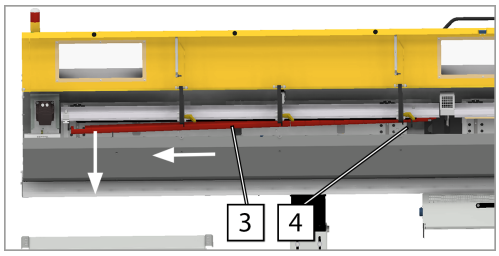
- **Wear safety gloves.**

Removal:

1. Dismantle the clamping device. .
2. Press the ☰ button.
3. SETUP Press .
4. Approach the conversion position by pressing the ⤮ button. ↗ *"Move to the conversion position" on page 54*.
5. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 40*.
6. Switch off the compressed air supply.
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. .



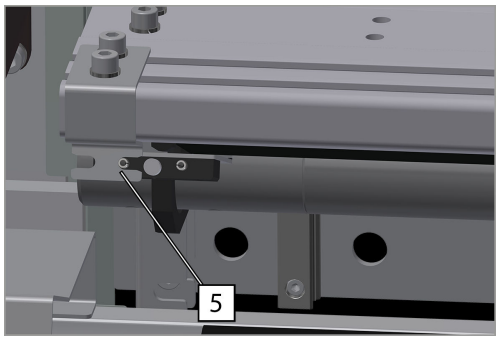
10. Hold the pusher [1].
11. Push the pusher [1] in the direction indicated by the arrow until the pusher is pushed out of the lifting plate [2].



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.
5. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 40*
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.**

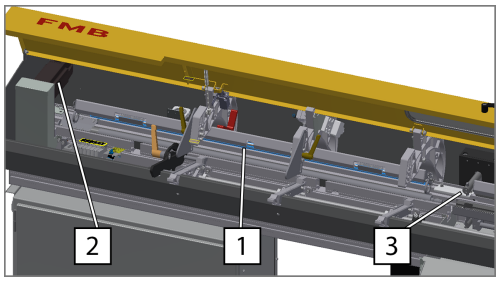
⚠ CAUTION

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.

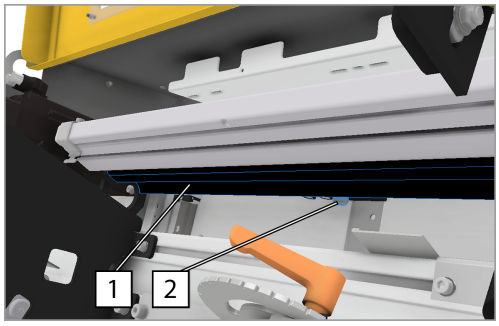
- **Wear safety gloves.**



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

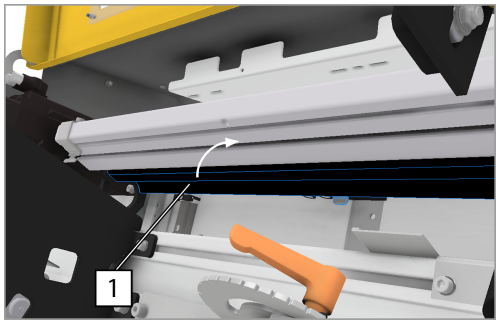
To change the top rear guide channel insert, the pusher must be removed. ➚ *"Changing the pusher" on page 55*.

1. Press the ☰ button.
2. SETUP Press .
3. Approach the conversion position by pressing the ⤮ button. ➚ *"Move to the conversion position" on page 54*.
4. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 40*.
5. Switch off the compressed air supply.
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.

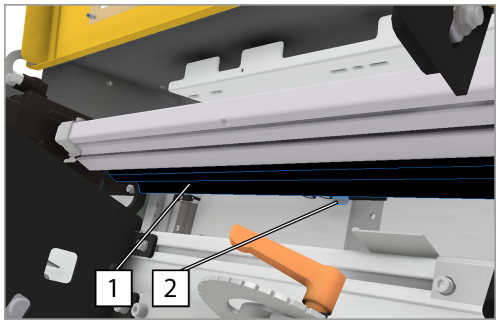


8. Take hold of the insert [1].
9. Press the insert lock [2] and release.

   ➥ The insert is now detached.



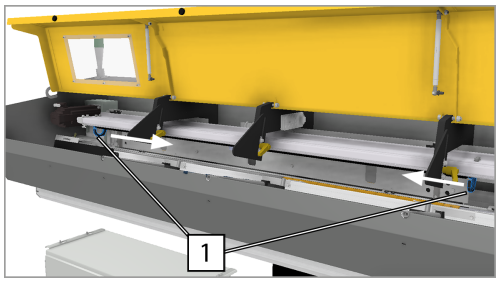
10. Turn the insert in the direction indicated by the arrow and remove it.
11. Place the new insert in the top rear guide channel.



12. Pull the insert lock [2] until it engages.

    ➥ The insert is secured.
13. Install the pusher. ➚ *"Changing the pusher" on page 55*.

Changing the lifting plates



1. Remove the "top rear insert". ➚ *"Changing the insert of the top rear guide channel" on page 56*.
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 56*.

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.**

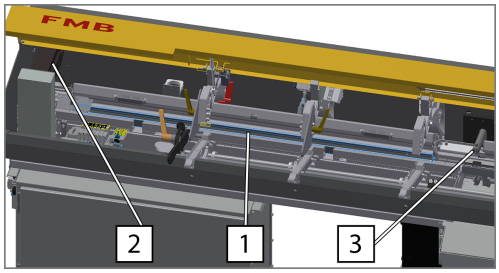
⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

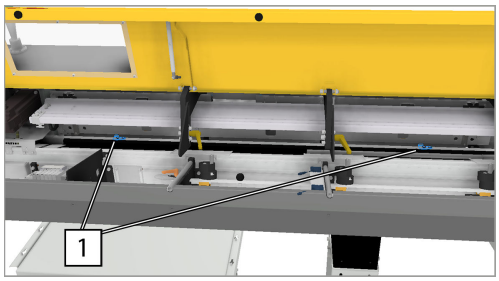
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **Wear safety gloves.**

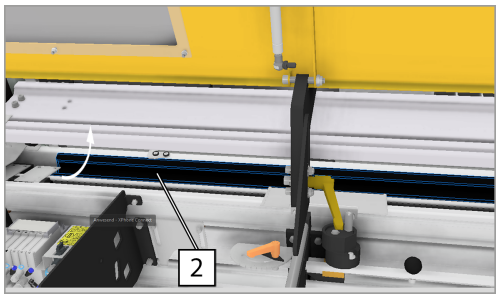


The bottom rear guide channel insert [1] is located in the area between the drive motor [2] and the remnant bin [3].

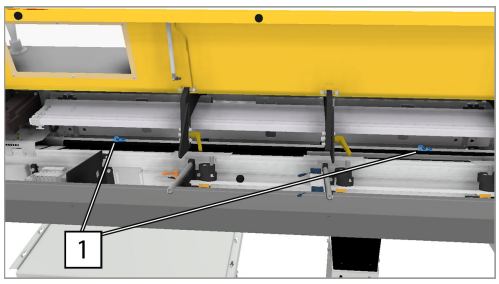
1. Press the ☰ button.
2. SETUP Press .
3. Approach the conversion position by pressing the ⤮ button. ➚ *"Move to the conversion position" on page 54*.
4. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 40*.
5. Switch off the compressed air supply.
6. Where necessary, obtain 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.
14. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 40*
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.**

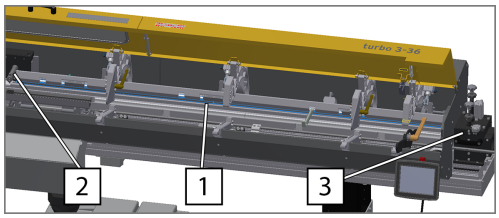
⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

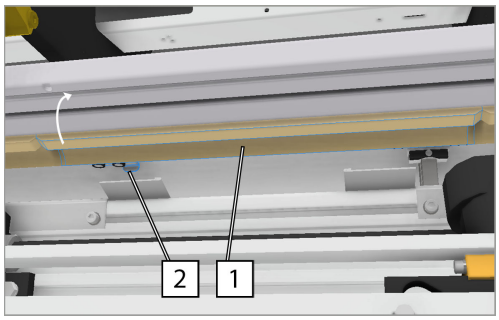
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **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 54*.
4. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 40*.
5. Switch off the compressed air supply.
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.

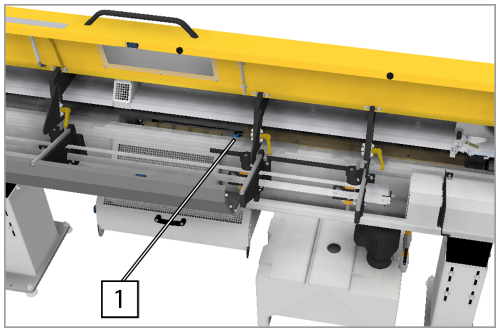


8. Hold the insert [1].
9. Press the insert lock [2] and release.

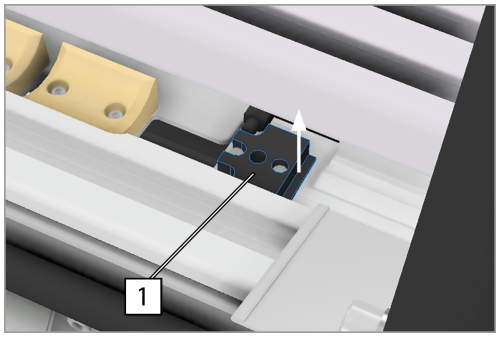
   ➥ The insert is now detached.
10. Turn the insert [1] in the direction indicated by the arrow and remove it.
11. Place the new insert into the upper front guide channel.
12. Pull the insert lock [2] until it engages.

    ➥ The insert is secured.
13. Close the cover.
14. Switch on the compressed air supply.
15. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 40*
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 61*.
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 61*.

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.**

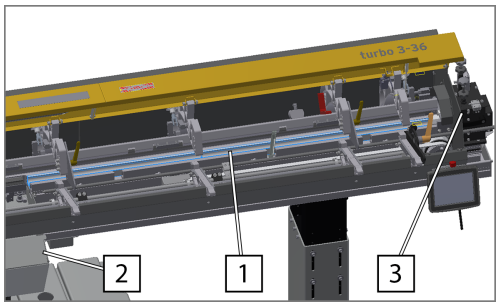
⚠ CAUTION

Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

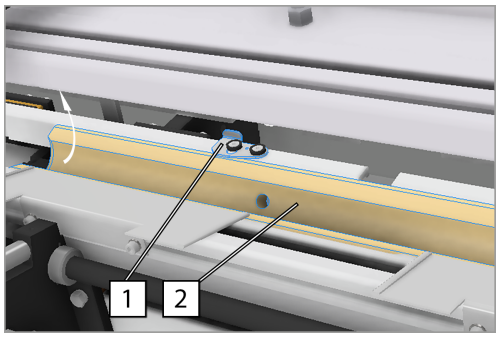
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- **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.

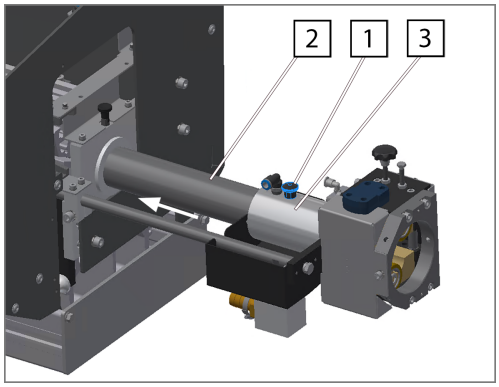
1. Press the ☰ button.
2. SETUP press.
3. Approach the conversion position by pressing the ⤮ button. ↗ *"Move to the conversion position" on page 54*.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 40*.
5. Switch off the compressed air supply.
6. Where necessary, obtain release from the lathe to open the cover.
7. Open the cover.



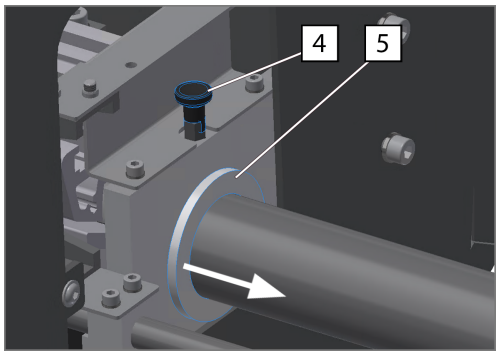
8. Press the insert lock [1] and release.
   ➡ The insert is now detached.
9. Turn the insert [2] in the direction indicated by the arrow and remove it.
10. Place the new insert into the upper front guide channel.
11. Pull the insert lock [1] until it engages.
    ➡ The insert is secured.
12. Close the cover.
13. Switch on the compressed air supply.
14. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 40*
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.

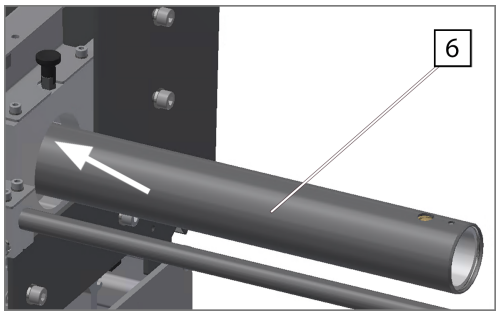
Changing the guide module

1. Press the button.
2. SETUP Press .
3. Approach the conversion position by pressing the button. ↗ *"Move to the conversion position" on page 54*.
4. Press the emergency stop button. ↗ *"Press the emergency stop button" on page 40*.
5. Switch off the compressed air supply.
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.

16. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 40*

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.

8 Maintenance

8.1 Maintenance actions

Maintenance plan

Chap.	Task to perform	Every 6 months	Every 36 months	Page
	Check the drive belt	X		64
	Check the belts of the diameter setting	X		65
	Lubricate the worm gear of the diameter setting	X		66
	Replace the relay insert in the control cabinet		X	67

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 75.

1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 40.*
2. Switch off the supply of compressed air.
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.
10. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 40*
11. Acknowledge the error message by pressing the CLR button.

Check the belts of the diameter setting

⚠ 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

Moving components of the loading magazine without a safety cover

Personal injury due to squashing and impact due to freely-accessible, driven components of the loading magazine.

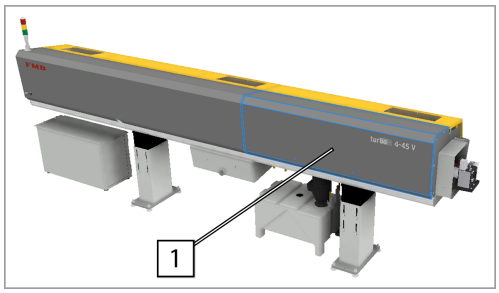
With maintenance work on the loading magazine, it may be necessary for technical reasons to remove screwed-on safety covers. Screwed in safety covers are not electrically locked. That means that the loading magazine is not automatically shut down when these safety covers are removed, and driven components may still move.

- **Before removing safety covers, press the emergency stop button.**
- **After the end of the maintenance work, reattach the safety covers directly.**
- **Maintenance work is only to be performed if the person holds the respective qualification described in these operating instructions.**

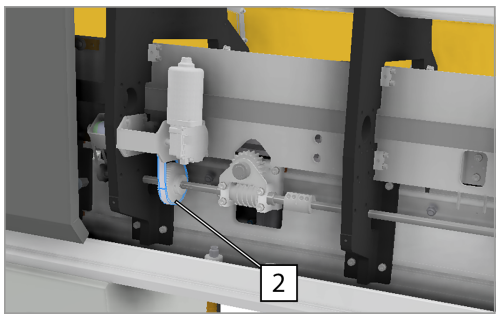
Condition of the diameter setting belt:

If the diameter setting belt has cracks or is missing teeth, the diameter setting belt must be replaced. Contact FMB. → *"Service contact details" on page 75.*

1. Turn off the machine tool at the main switch.
2. Press the emergency stop button. → *"Press the emergency stop button" on page 40*.



3. Loosen the screws of the back wall [1] and remove.
4. Remove the back wall [1].



5. Check the condition: Check the belt [2] visually for cracks and missing teeth.
6. Put the back wall [1] into position.
7. Insert the screws of the back wall [1] and tighten.
8. Turn on the machine tool at the main switch.
9. Unlock the emergency stop button. *“Make the loading magazine ready for operation after the emergency stop” on page 40*

Lubricate the worm gear of the diameter setting

⚠ 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

Moving components of the loading magazine without a safety cover

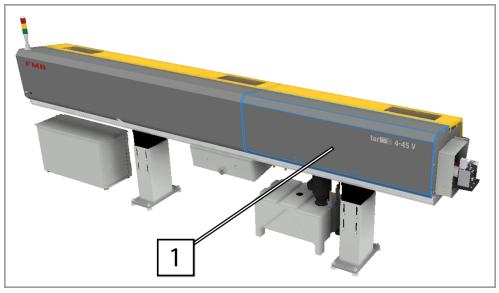
Personal injury due to squashing and impact due to freely-accessible, driven components of the loading magazine.

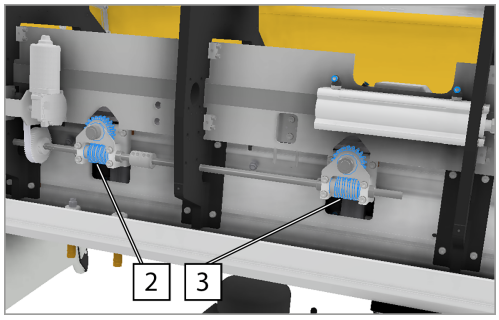
With maintenance work on the loading magazine, it may be necessary for technical reasons to remove screwed-on safety covers. Screwed in safety covers are not electrically locked. That means that the loading magazine is not automatically shut down when these safety covers are removed, and driven components may still move.

- **Before removing safety covers, press the emergency stop button.**
- **After the end of the maintenance work, reattach the safety covers directly.**
- **Maintenance work is only to be performed if the person holds the respective qualification described in these operating instructions.**

The number of worm gears depends on the length of the loading magazine. All worm gears must always be lubricated during maintenance.

1. Turn off the machine tool at the main switch.
2. Loosen the screws of the back wall [1] and remove.





3. Lubricate the worm gear [2].
4. Lubricate the worm gear [3].
5. Put the back wall [1] into position.
6. Insert the screws of the back wall [1] and tighten.
7. Turn on the machine tool at the main switch.
8. Unlock the emergency stop button. ↗ *"Make the loading magazine ready for operation after the emergency stop" on page 40*

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 75.*

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.

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.

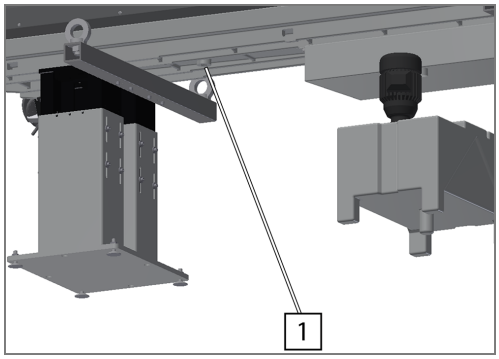
Leaking fuel causes a slipping hazard in the working area.

- **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 11.

Before the next operation of the loading magazine, the oil tank of the loading magazine must be refilled. .

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



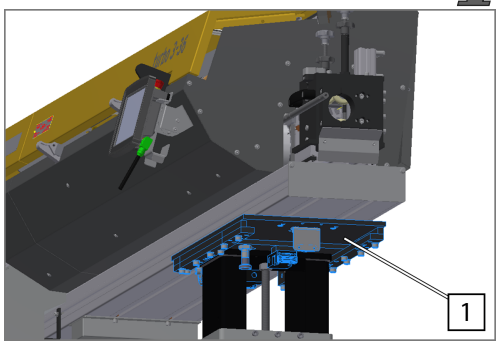
1. Press the emergency stop button. ➚ *"Press the emergency stop button" on page 40*.
2. Switch off the compressed air supply.
3. Turn off the machine tool at the main switch.
4. Prepare a suitable container with sufficient capacity to collect the oil.
5. Loosen the hose clip on the oil feed [1].
6. 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.
13. Unlock the emergency stop button. ➚ *"Make the loading magazine ready for operation after the emergency stop" on page 40*

14. Acknowledge the error message by pressing the CLR button.

8.2 Auxiliary equipment

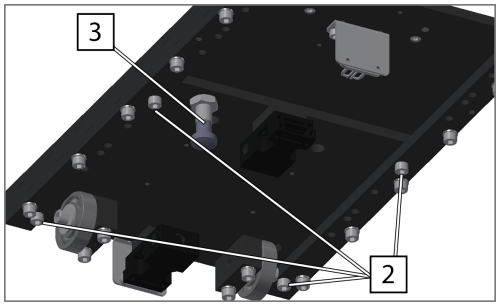
Shifting the loading magazine

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 40*.
2. Switch off the compressed air supply.
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.
9. Unlock the emergency stop button. → *"Make the loading magazine ready for operation after the emergency stop" on page 40*
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.

10 Index

U

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:

-	K	F	1
Vorzeichen / prefix	Klasse / category	Unterklasse / subsection	Nummer / number

2. Kennbuchstabe/code letter
1. Kennbuchstabe/code letter

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:

-	T	1	-	F	1
Objekt / object			Teilobjekt / part of object		

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

-	K	K	1		1.Objekt 1 / 1.object 1
-	K	K	0	1	2.Objekt 1.1 / 2.object 1.1

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

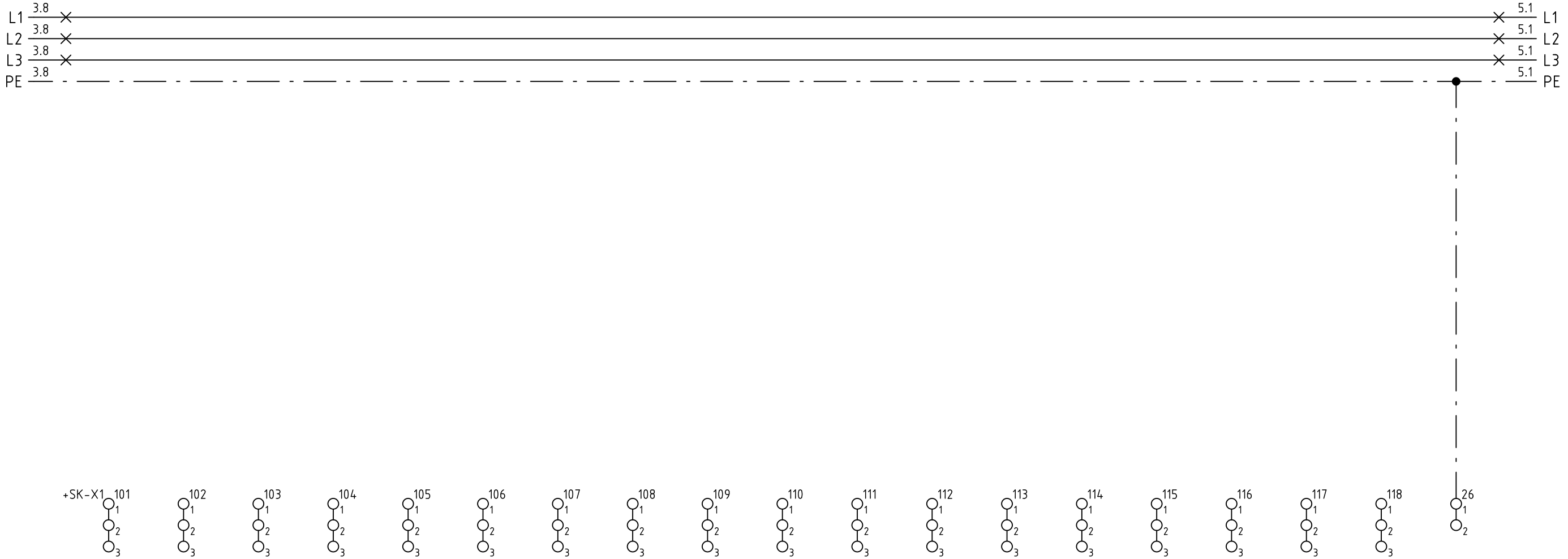
Blatt 3
Folge 4

Lademagazin Schaltschrank +SK
loading magazine switch cabinet +SK

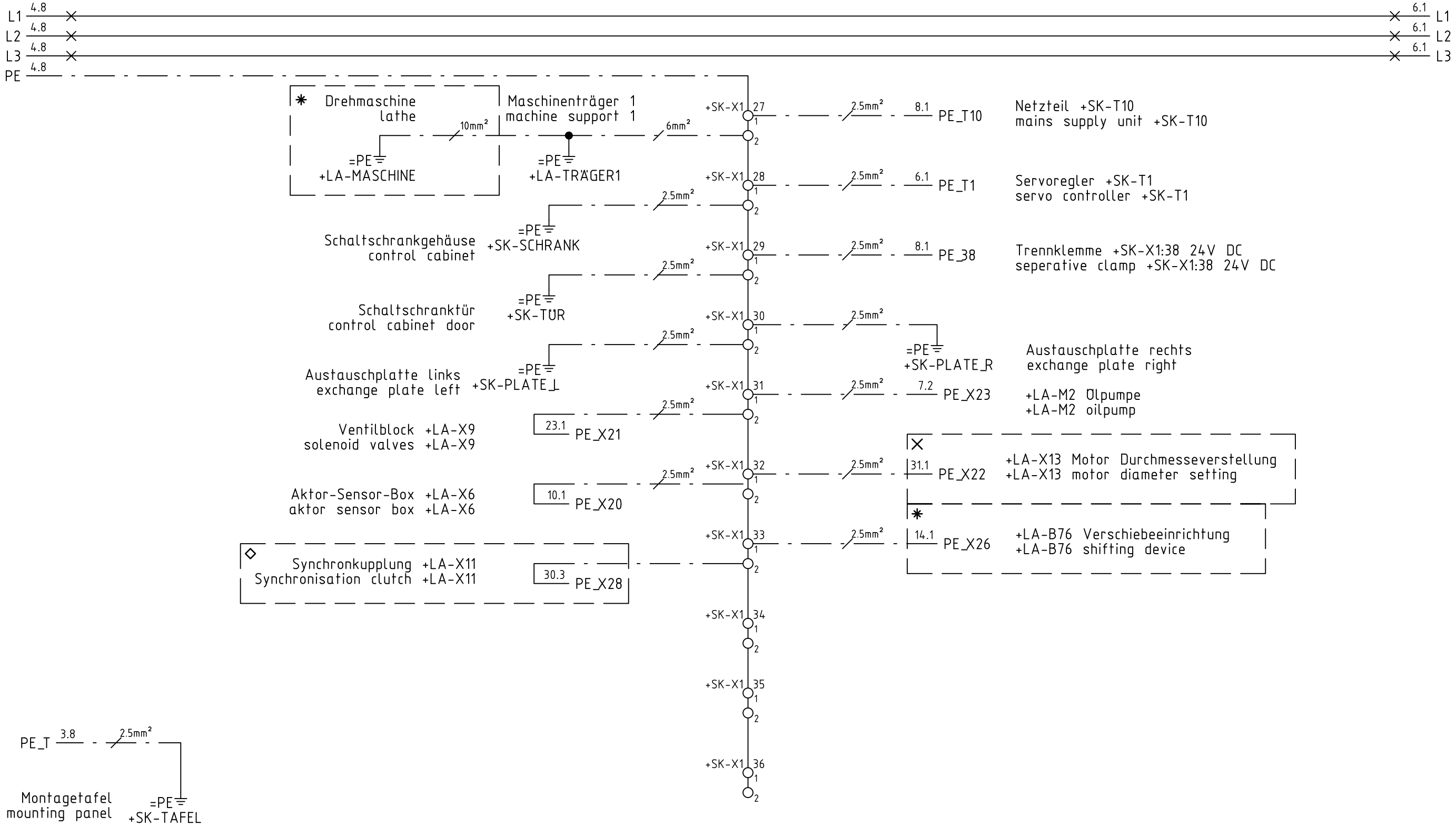
Klemmleiste
+SK-X1

Steckverbindung

Drehmaschine
lathe

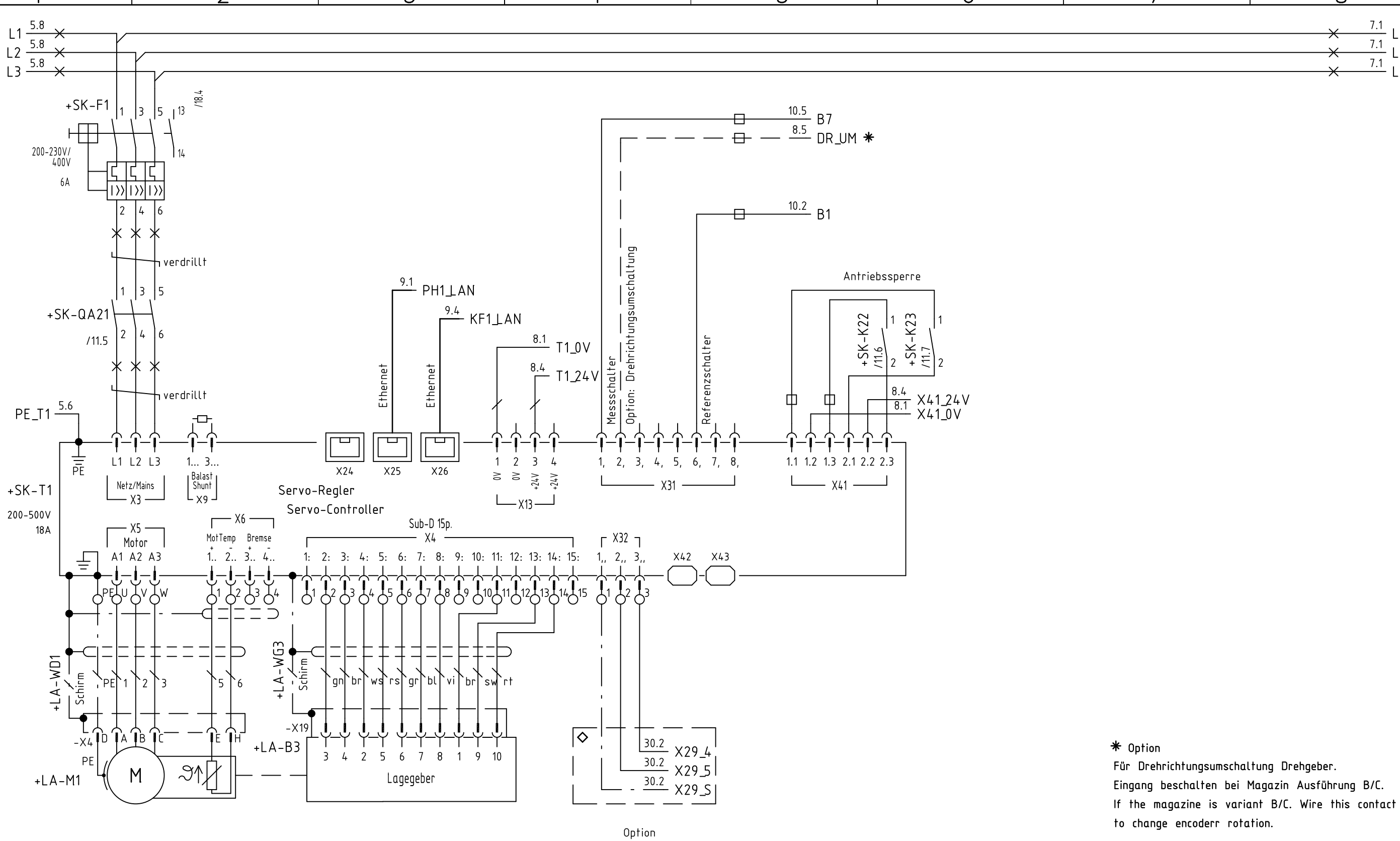


			Datum	22.11.23	interface edge standard	FMB MASCHINENBAU	Schnittstelle Edge Standard	turbo RSV	
			Bearb	D.Beck					
			Gepr.	D.Beck				Blatt 4/1063	11111_003	Blatt 4
Aenderung	Datum	Name	Norm	DIN5	Urspr Ers.f.	Ers.d.			Folge 5



✱ 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	turbo RSV
			Bearb	D.Beck				
			Gepr.	D.Beck			Blatt 5/1063	11111_003 Blatt 5
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.		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.

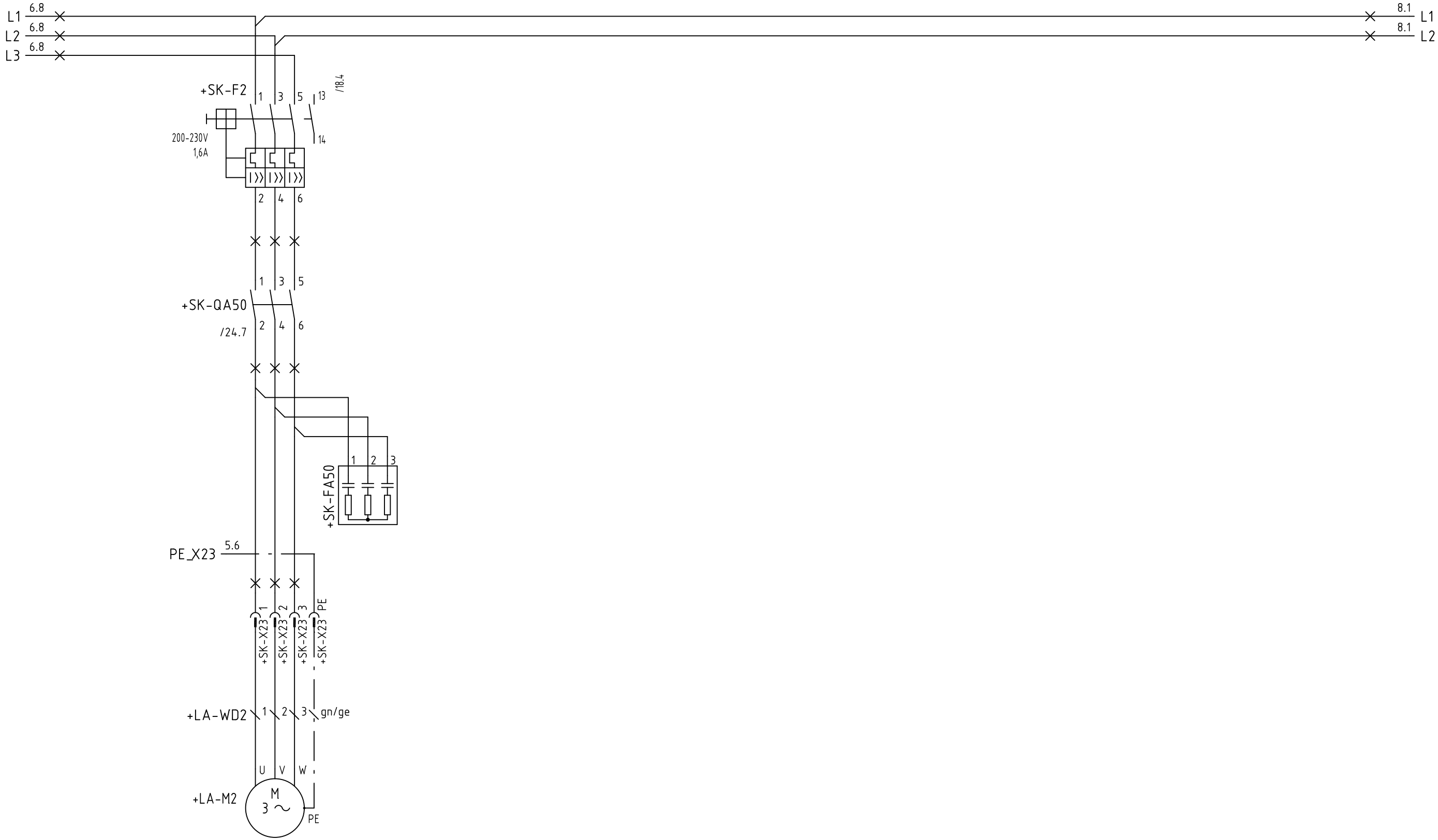
◇ Nur bei / only for RS

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

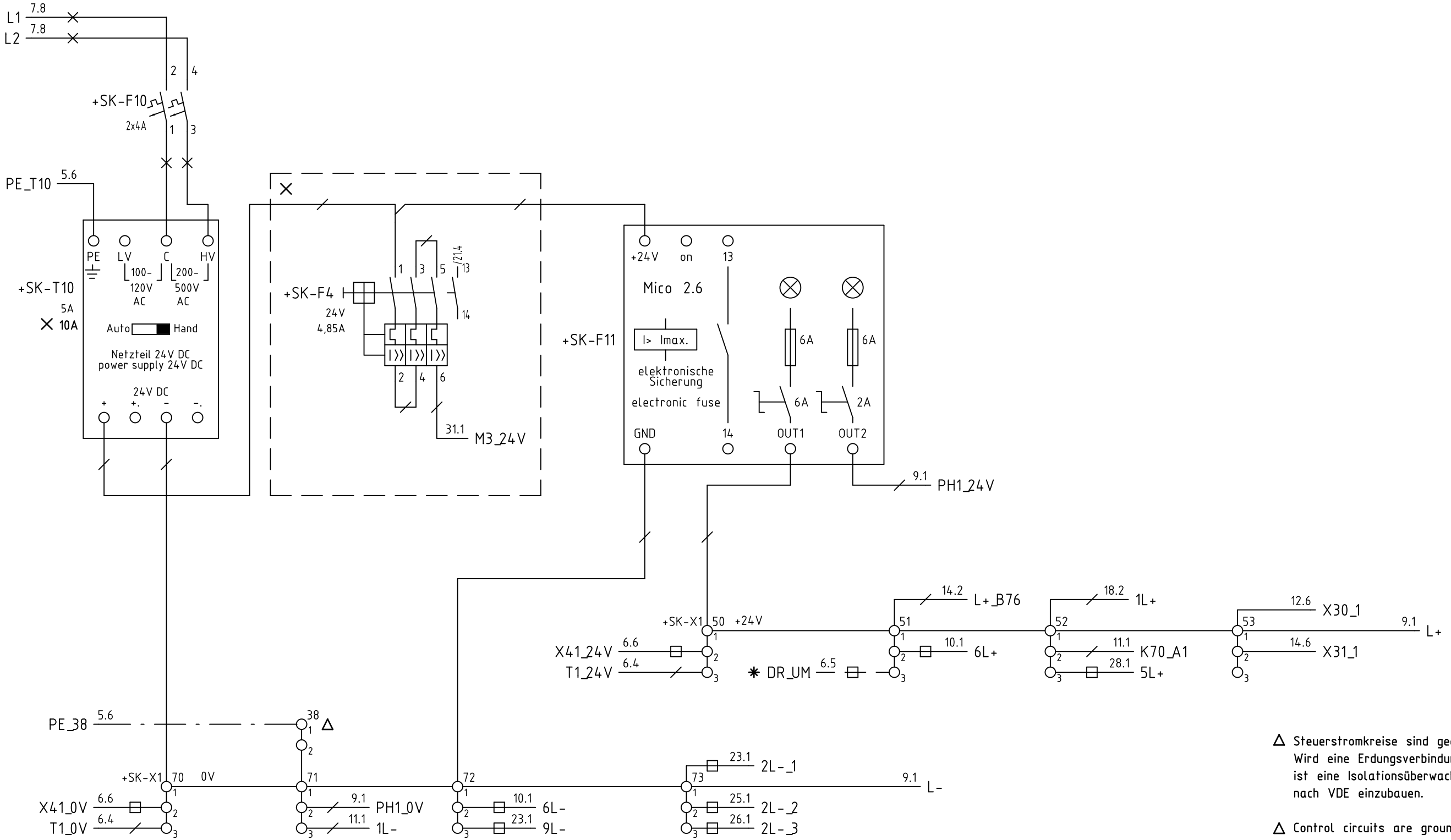


Ölpumpe 1

0,37KW 200-230V 1,6A △

oil-pump 1

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



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)

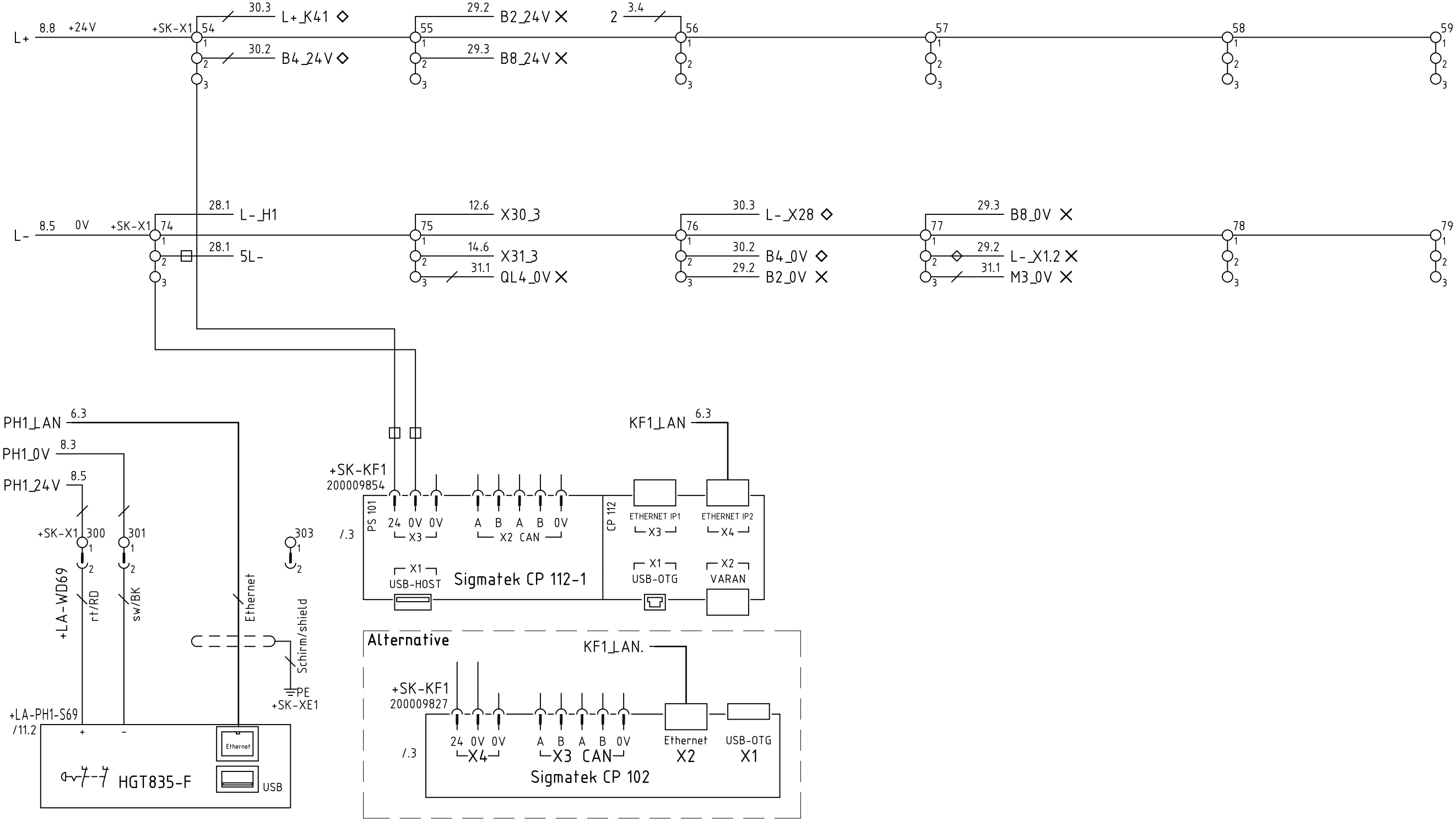
Steuerspannung 24V- | Motorschutz -M3/M4 | -F11 OUT1 | -F11 OUT2 | * Option

Durchmesserverstellung | 24V DC für | 24V für PH1 | X Nur bei / only for V

control voltage 24V DC | motor protection -M3/M4 | SPS / E- A-Karten

diameter setting | 24V DC for Control / I / O | 24V for control panel

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



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	SPS-Steuerung, Bedieneinheit
				Bearb	D.Beck			
				Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5		Urspr / Ers.f.	Ers.d.	

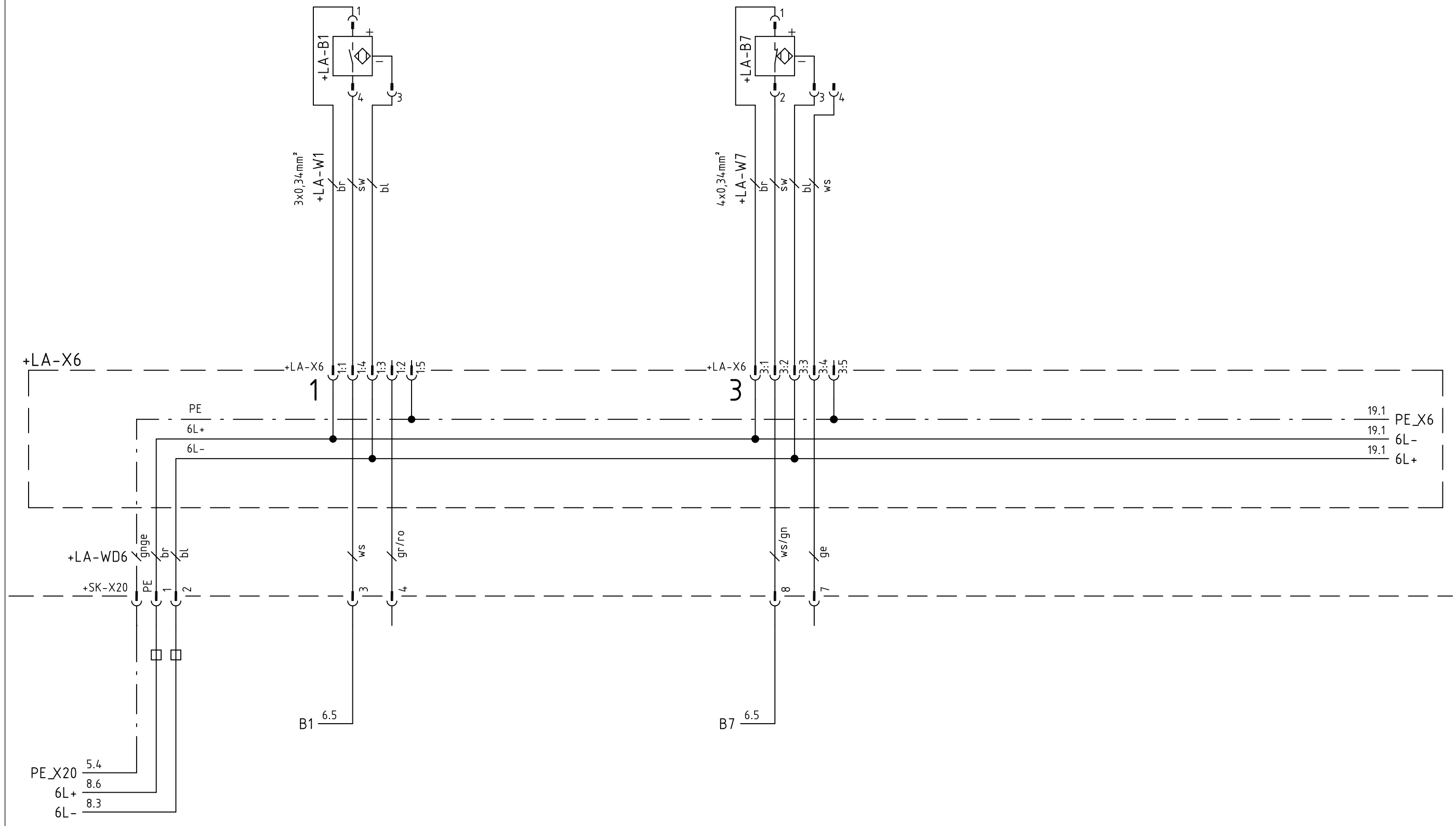
turbo RSV

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

Lademagazin +LA
loading magazine +LA

Sensor-Aktor-Box
+LA-X6

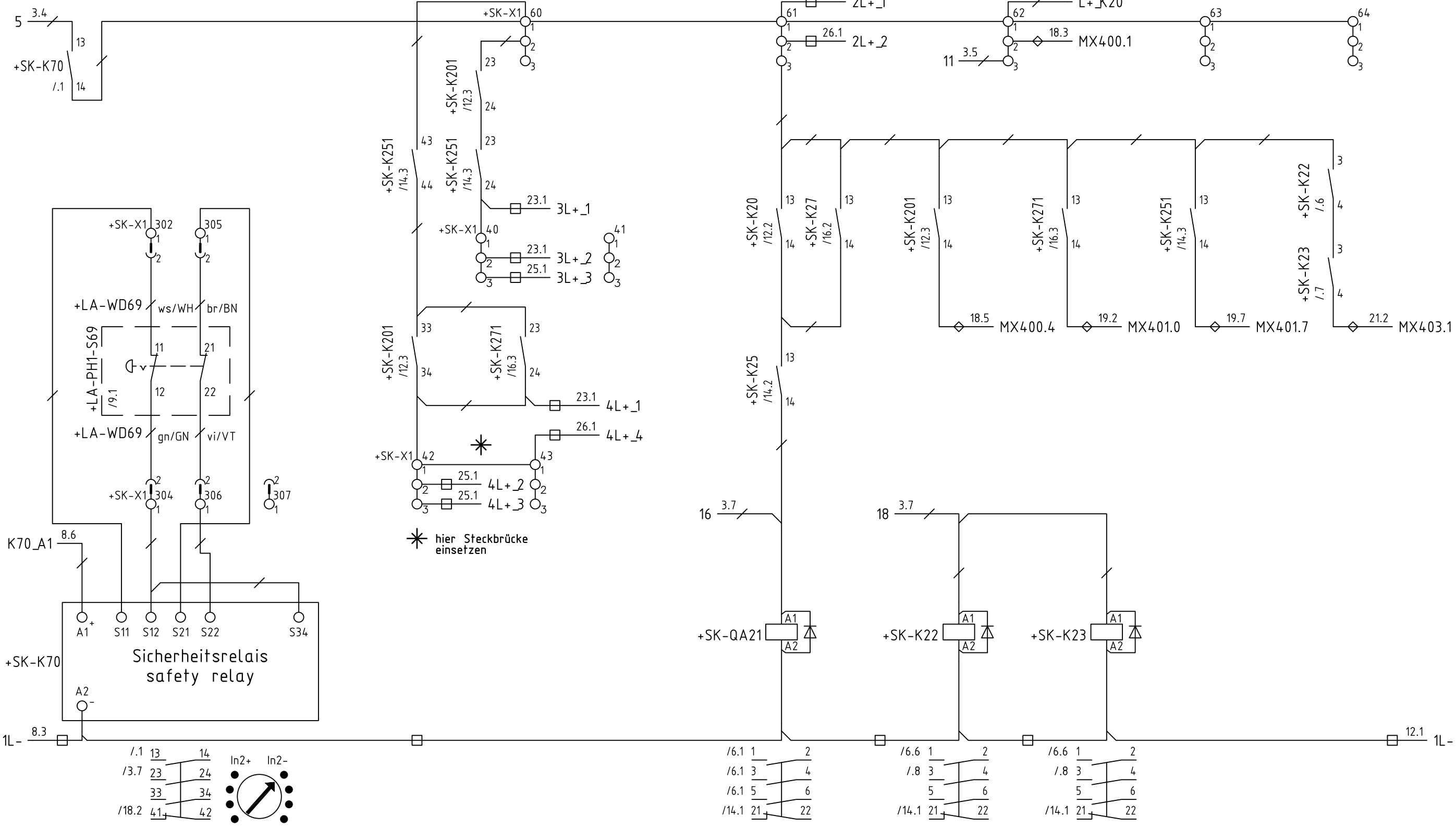
Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF10



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

			Datum	22.11.23	refference-switch, measuring-switch		Refferenzschalter, Messschalter	turbo RSV
			Bearb	D.Beck		FMB MASCHINENBAU		
			Gepr.	D.Beck				Blatt 10
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f. / Ers.d.	Blatt 10/1063	11111_003 / Folge 11

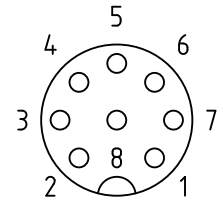
+24V nach Not-Halt
+24V DC emergeny stop



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

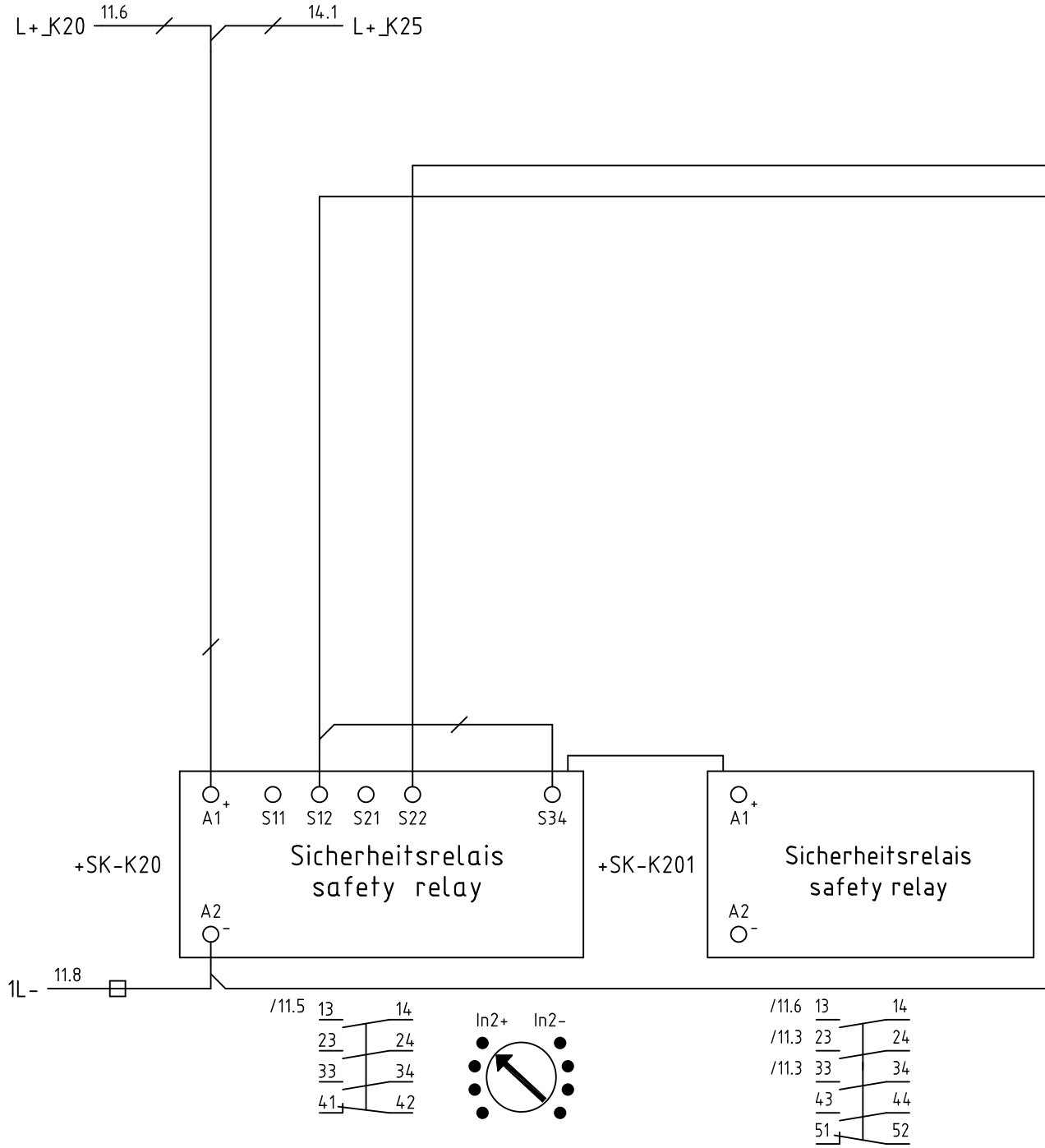
			Datum	22.11.23	emergency stop, safety	FMB MASCHINENBAU	Not-Halt Sicherheit
			Bearb	D.Beck			turbo RSV
			Gepr.	D.Beck			Blatt 11/1063 — 11111_003 — Blatt 11, Folge 12
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

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			

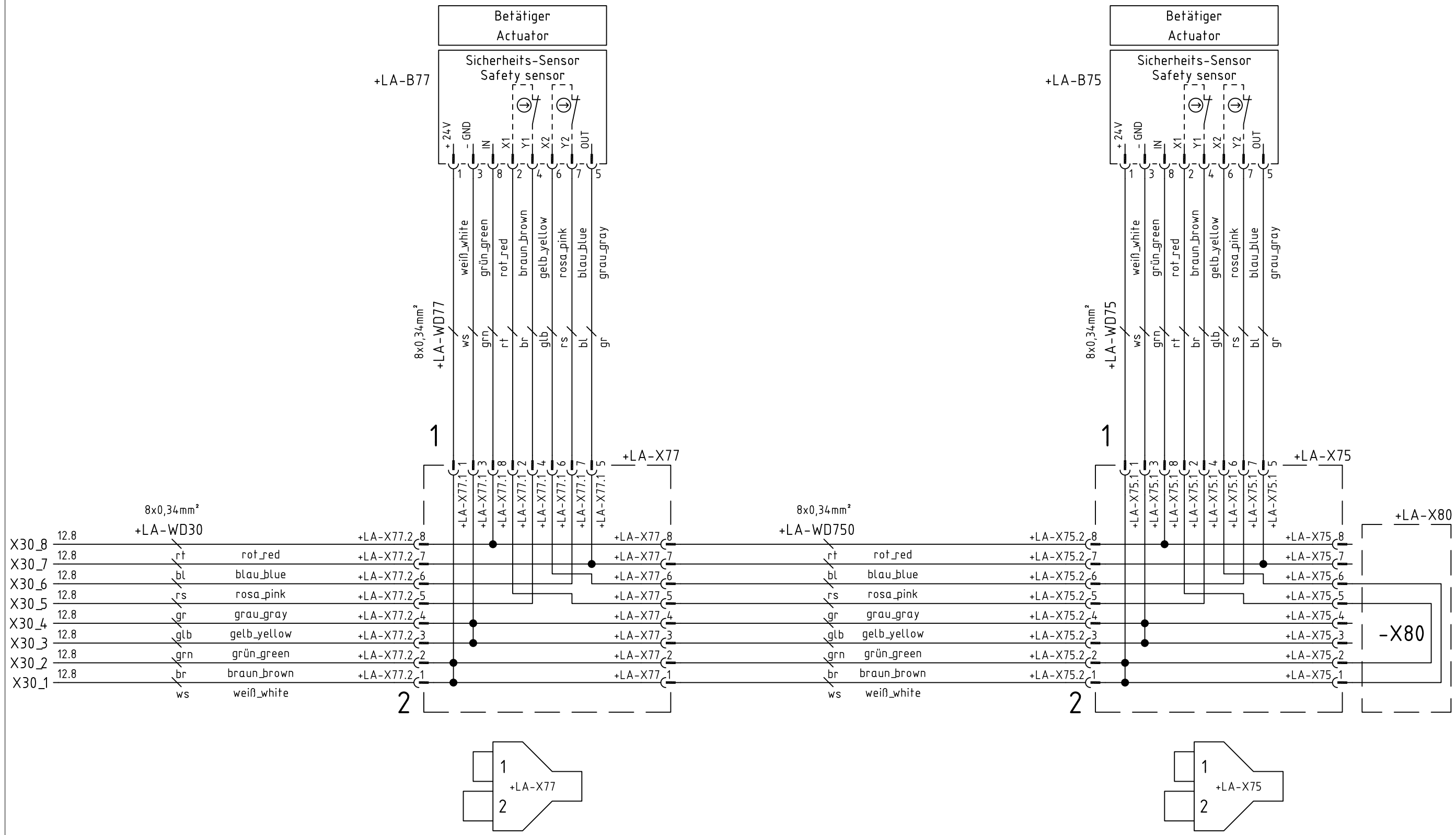


Abdeckung Lademagazin geschlossen covering loading magazine closed	Abdeckung Lademagazin geschlossen covering loading magazine closed

			Datum	22.11.23	check covering loading magazine	FMB MASCHINENBAU	Überwachung Verkleidung Lademagazin
			Bearb	D.Beck			
			Gepr.	D.Beck			
Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f.	Ers.d.	

turbo RSV

Blatt 12/1063 | 11111_003 | Blatt 12 / Folge 13



Abdeckung Lademagazin
geschlossen
covering magazine closed

Abdeckung Reststückbehälter
geschlossen
covering remnant box closed

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

check covering loading magazine

Urspr | Ers.f. | Ers.d.

FMB MASCHINENBAU

Überwachung Verkleidung Lademagazin

turbo RSV

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-

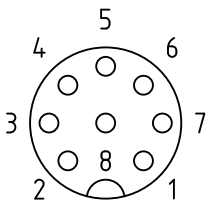
+SK-K251 Sicherheitsrelais safety relay
A1+ A2-

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

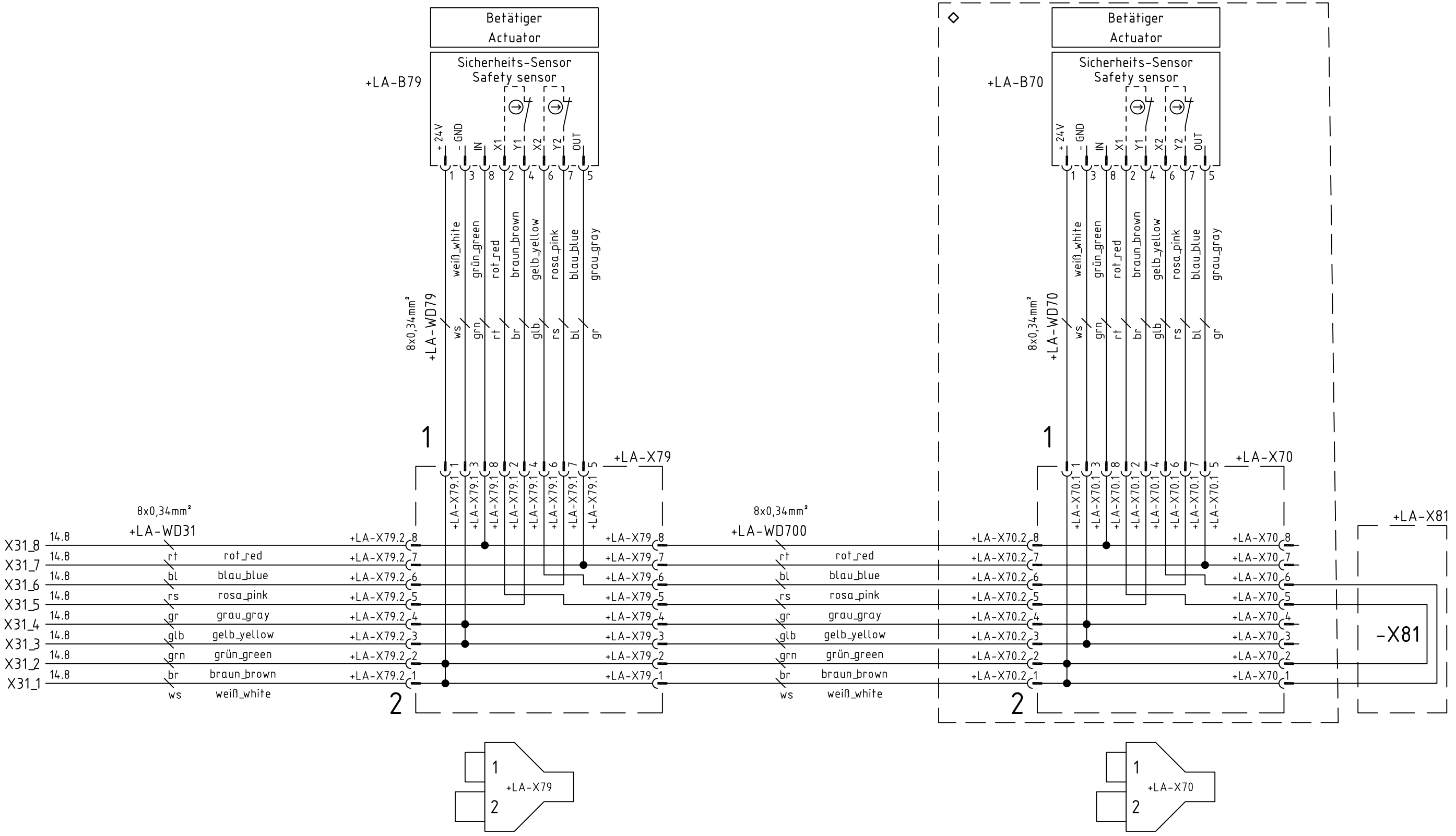
		+SK-X31 8	15.1	X31_8
rt	rot_red	+SK-X31 7	15.1	X31_7
bl	blau_blue	+SK-X31 6	15.1	X31_6
rs	rosa_pink	+SK-X31 5	15.1	X31_5
gr	grau_gray	+SK-X31 4	15.1	X31_4
glb	gelb_yellow	+SK-X31 3	15.1	X31_3
grn	grün_green	+SK-X31 2	15.1	X31_2
br	braun_brown	+SK-X31 1	15.1	X31_1
ws	weiß_white			

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

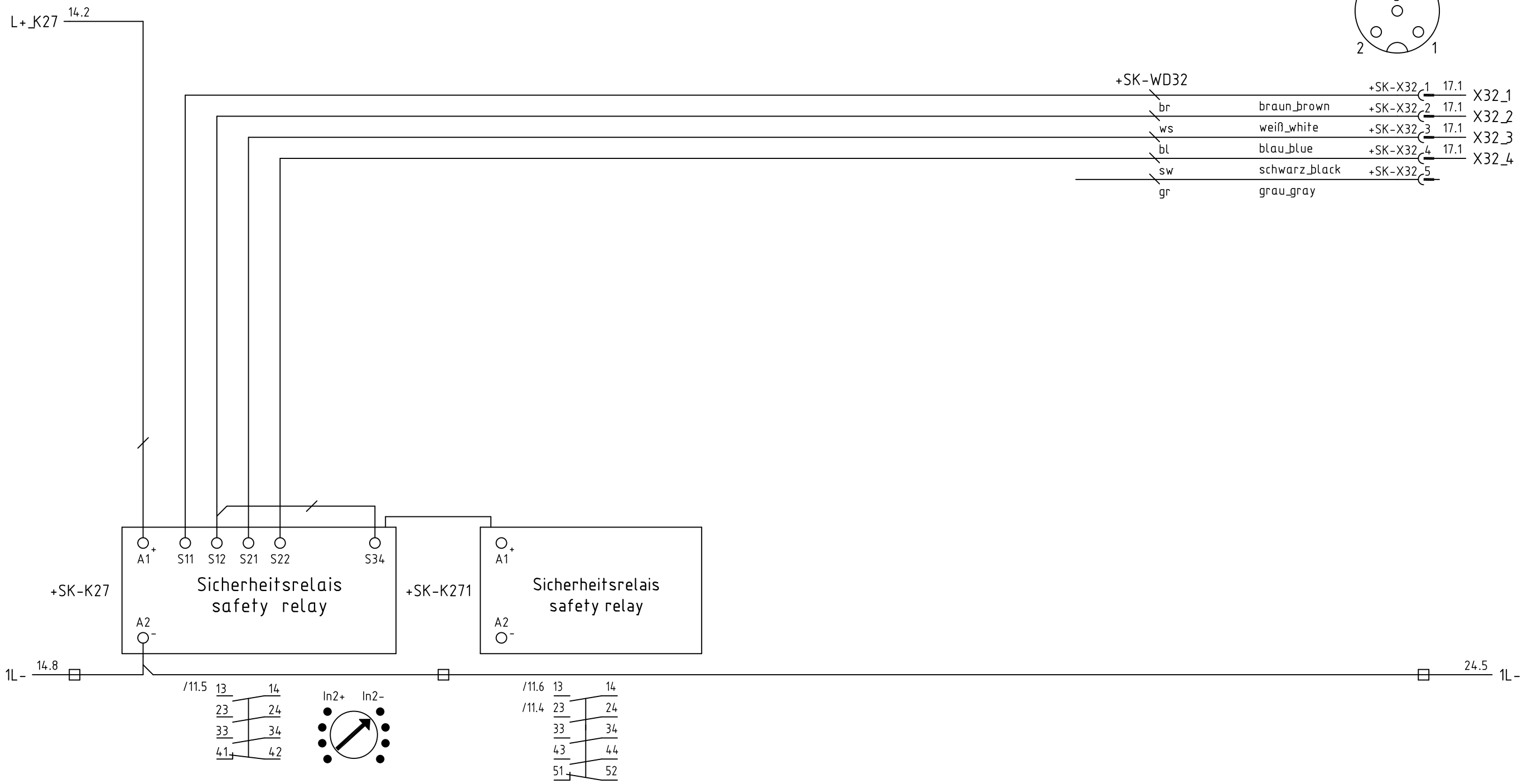
turbo RSV

Blatt 15/1063

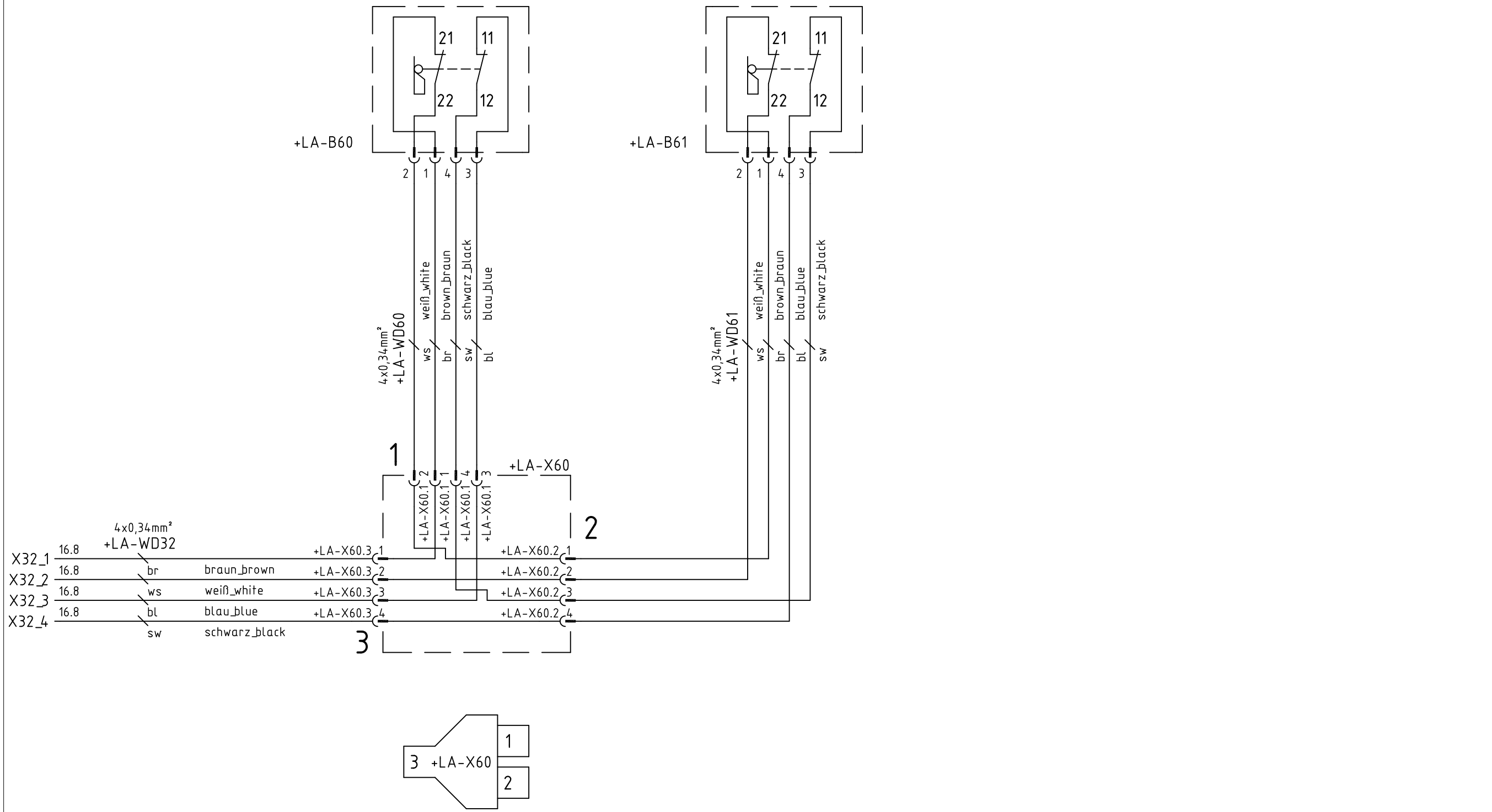
11111_003

Blatt 15

Folge 16



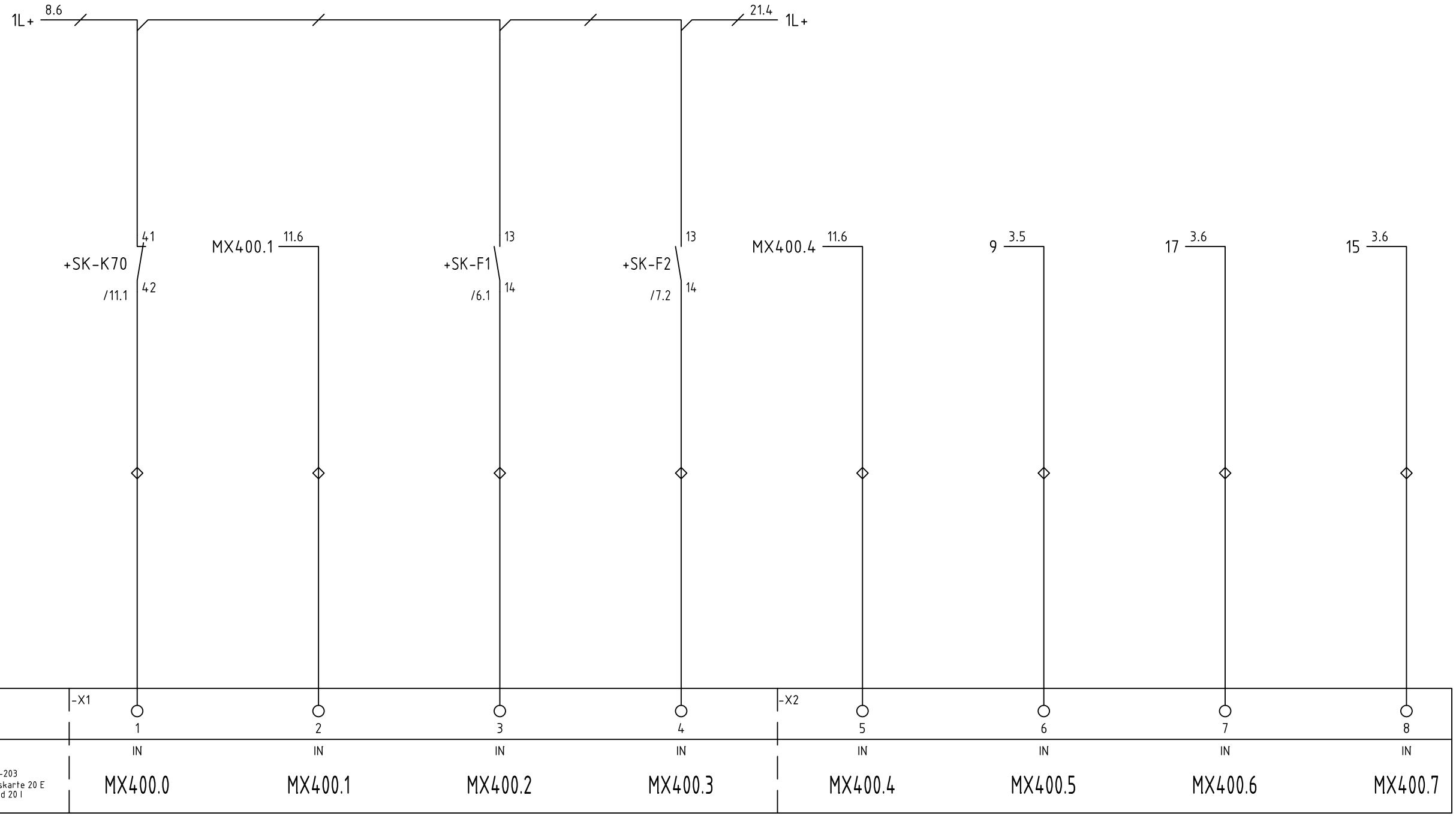
Kanal Lademagazin geschlossen guide channel loading magazinel closed					Kanal Lademagazin geschlossen guide channel loading magazinel closed		
			Datum	22.11.23	check guide channel loading magazine	FMB MASCHINENBAU	Überwachung Führungskanal Lademagazin
			Bearb	D.Beck			turbo RSV
			Gepr.	D.Beck			Blatt 16/1063
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.
							11111_003
							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 P 1 2 3 4 5 gr rt PE
+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
5 5:1 5:4 5:2 5:3 5:5
4 4:1 4:4 4:3 4:2 4:5

PE_X6 10.8 PE — 20.1 PE_X6
6L+ 10.8 6L+ — 20.1 6L-
6L- 10.8 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 9 10 11 12 -X4 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	FMB MASCHINENBAU	Eingangskarte KF10 MX401.0-7
				Bearb	D.Beck			
				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

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

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	Option Nachschieben mit Gegenspindel push with sub spindle	Option Testkontakt Durchmessereinstellung test contact diameter setting	Material auf Seitlicher-Auflage material on lateral storage

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

turbo RSV

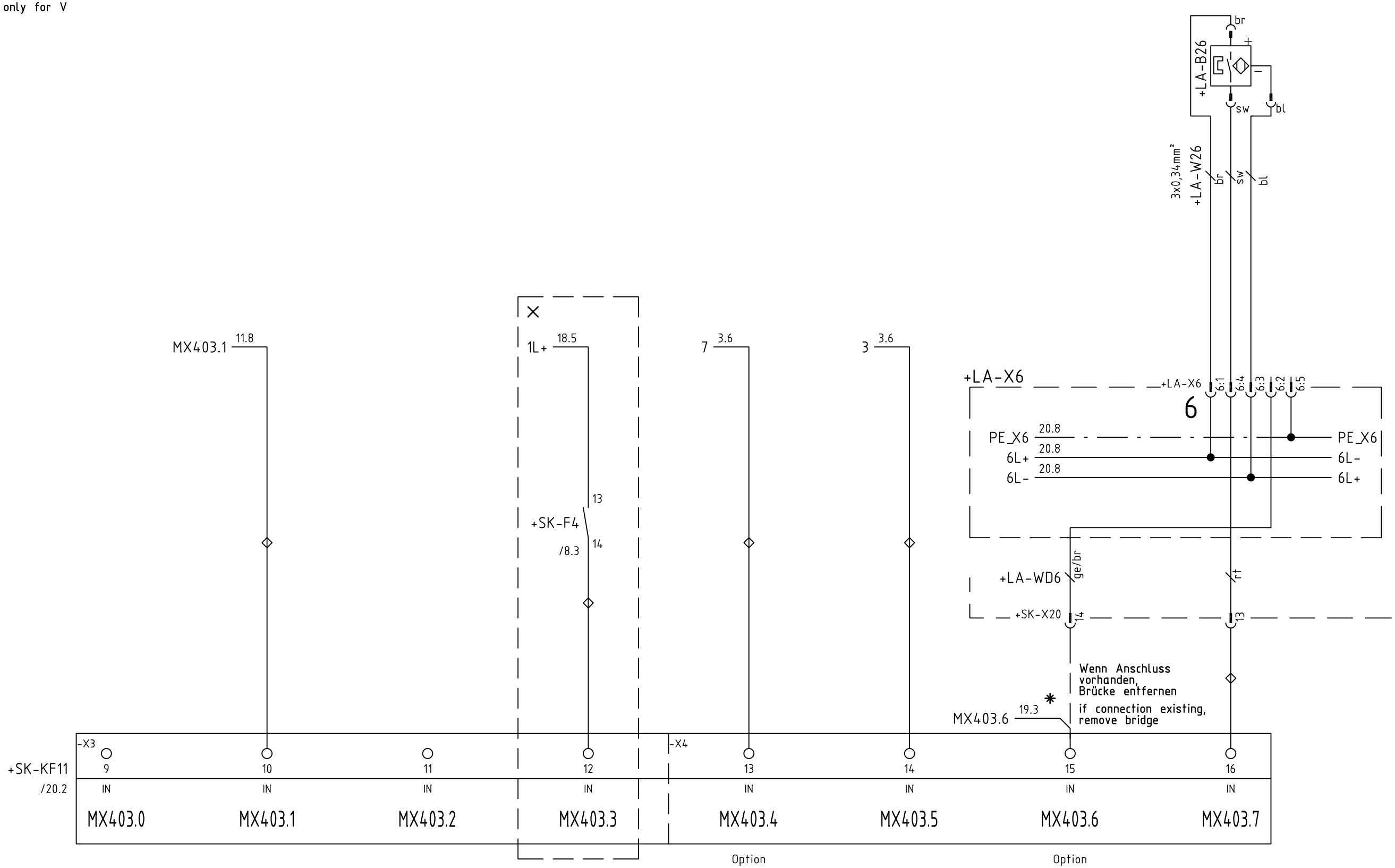
Blatt 20/1063 — 11111_003 — Blatt 20 / Folge 21

× Nur bei / only for V

✱ Option

Sensor-Aktor-Box
+LA-X6

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



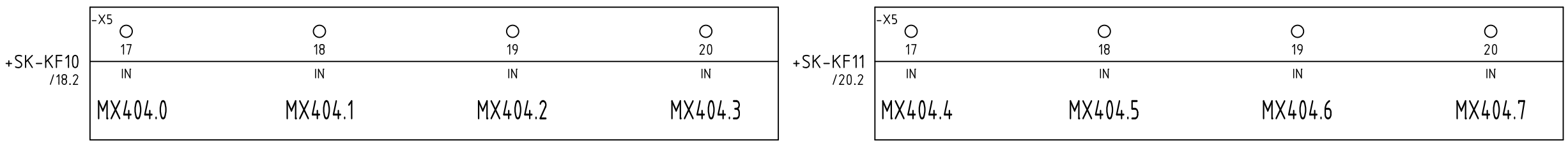
Option	Schutztür	reset	Schutzschalter	Automatik ein	Vorschub Stopp	Führungskanal geöffnet	Führungskanal geschlossen
Kurzdrehmodus	geschlossen		-M4 Vereinzelung	von Drehmaschine		(Abfrage hinten)	(Abfrage hinten)
short mode	door closed	reset	Protective switch	automatic mode on	feed stop	feed channel closed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

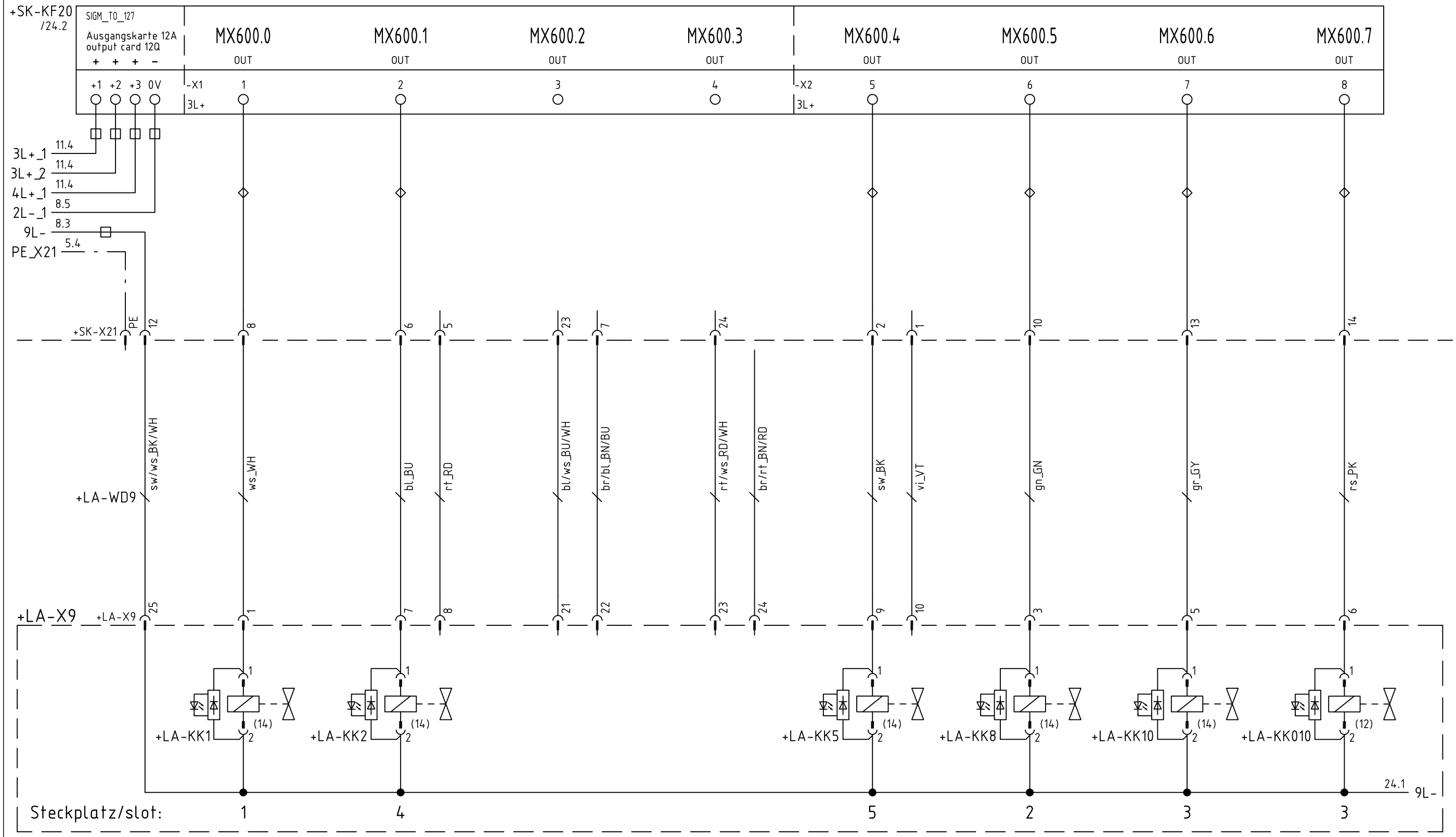
Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF10/KF11



				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.		

Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF20

Ventilinsel +LA-X9
Festo Pneumatik

+SK-KF20
/23.1

MX601.0	MX601.1	MX601.2	MX601.3
OUT	OUT	OUT	OUT
-X3 9	10	11	12
4L+			

+SK-KF21
/25.1

MX601.4	MX601.5	MX601.6	MX601.7
OUT	OUT	OUT	OUT
-X1 1	2	3	4
4L+			

+SK-X21 9 11 16 15 4 3

+LA-WD9 br_BN ge_YE gn/ws_GN/WH br/gn_BN/GN gr/rs_GY/PK rt/bl_RD/BU

+LA-X9 +LA-X9 2 4 13 14 11 12

+LA-KK01 (12) 2
+LA-KK08 (12) 2
+LA-KK7 (14) 2

9L- 23.8 27.1 9L-

Steckplatz/slot: 1 2 7 6

+SK-K41 A1 A2

1L- 16.8 /30.4 11 14

+SK-QA50 A1 A2

25.1 1L-

/7.2 1 2
/7.2 3 4
/7.2 5 6
21 22

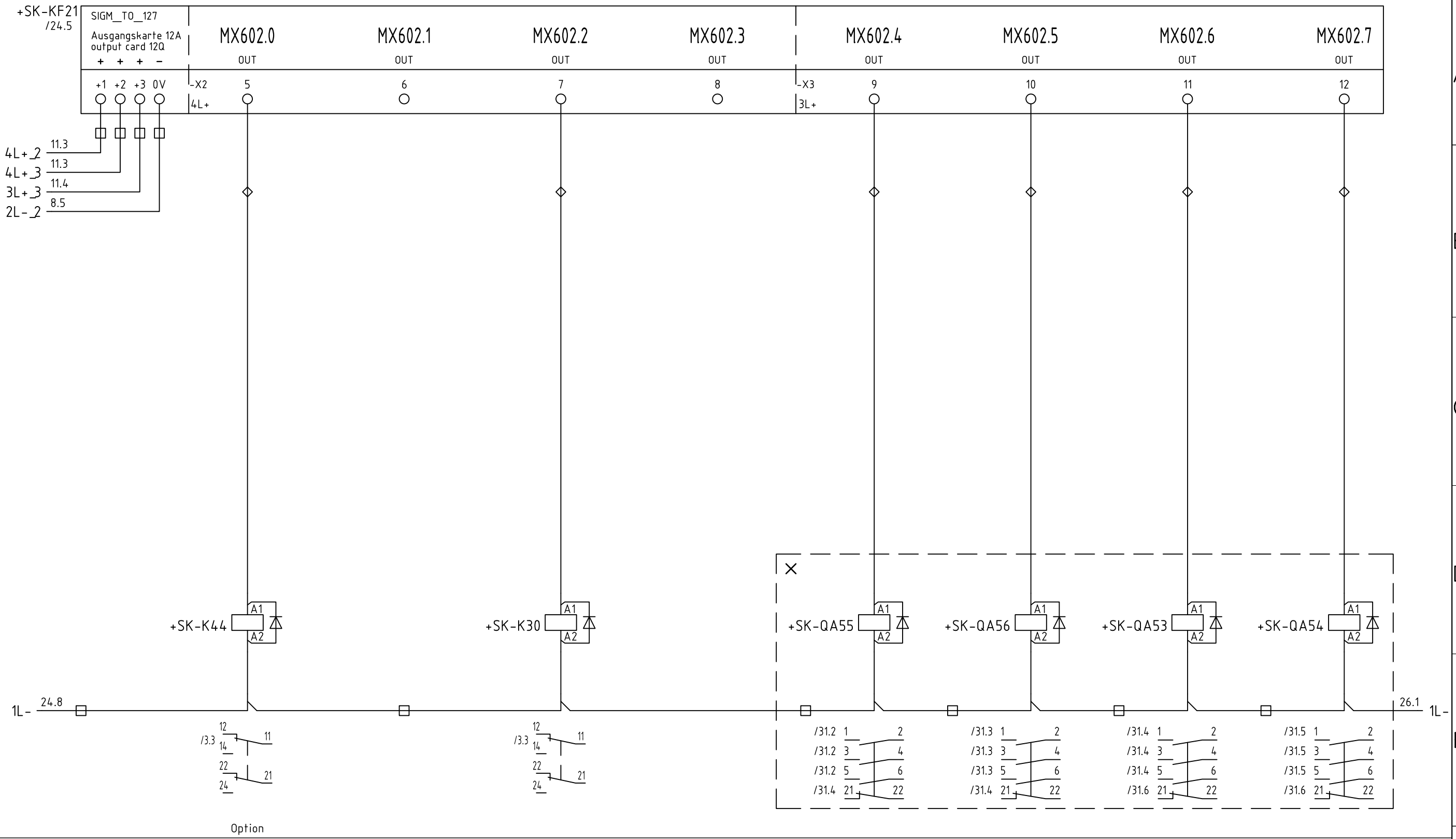
◇ Nur bei / only for RS

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



Option

× Nur bei / only for V

Nachschieben	Störung	Kanal Durchmessereinstellung		Vereinzelung Durchmessereinstellung	
OK		rechtslauf	linkslauf	rechtslauf	linkslauf
pushing OK	fault	channel diameter setting		material separation diameter setting	
		clockwise rotation	anticlockwise rotation	clockwise rotation	anticlockwise rotation

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

FMB MASCHINENBAU

Ers.d.

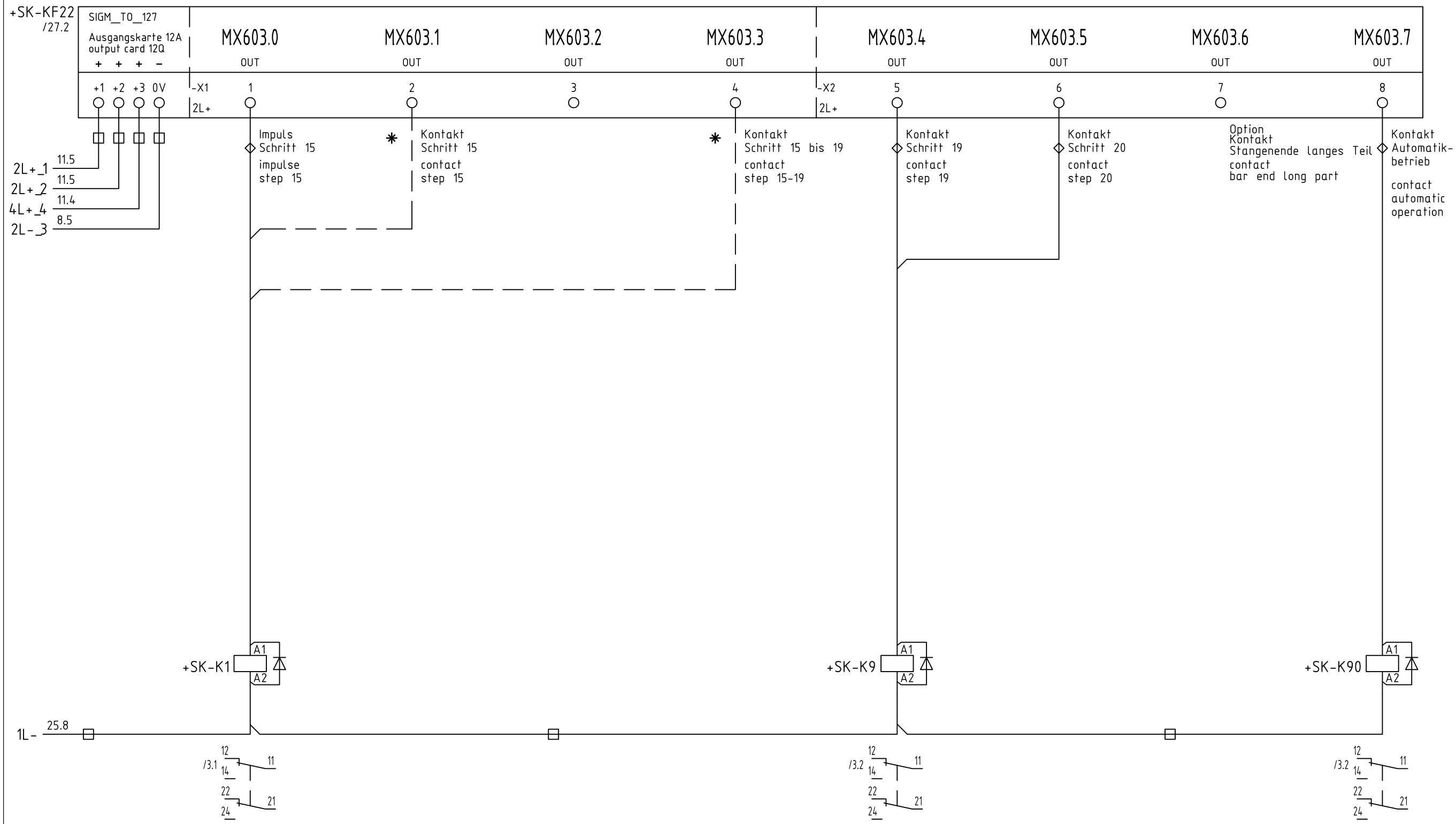
Ausgangskarte KF21 MX602.0-7

turbo RSV

Blatt 25/00

11111_003

Blatt 25
Folge 26



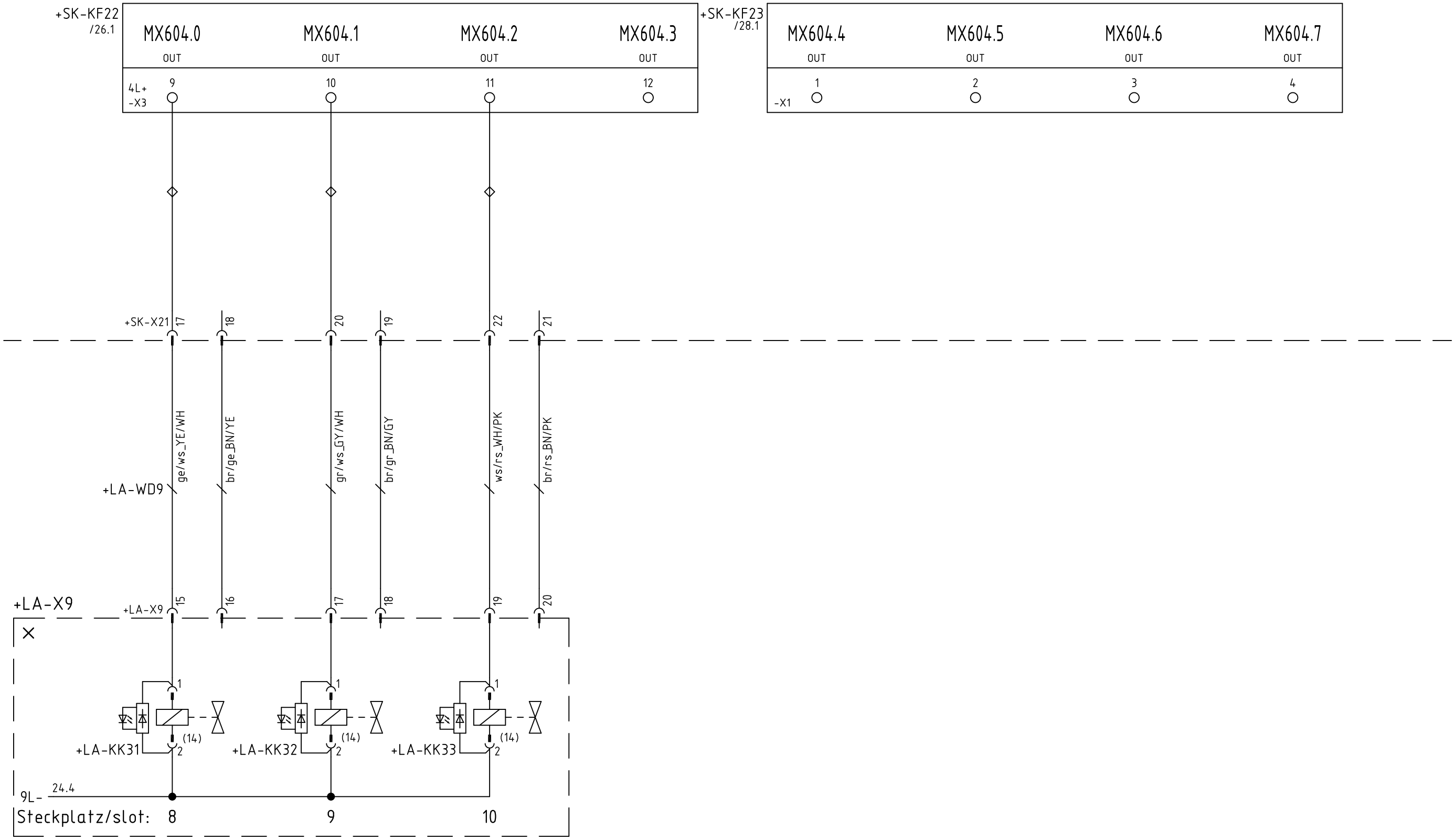
✱ Option

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

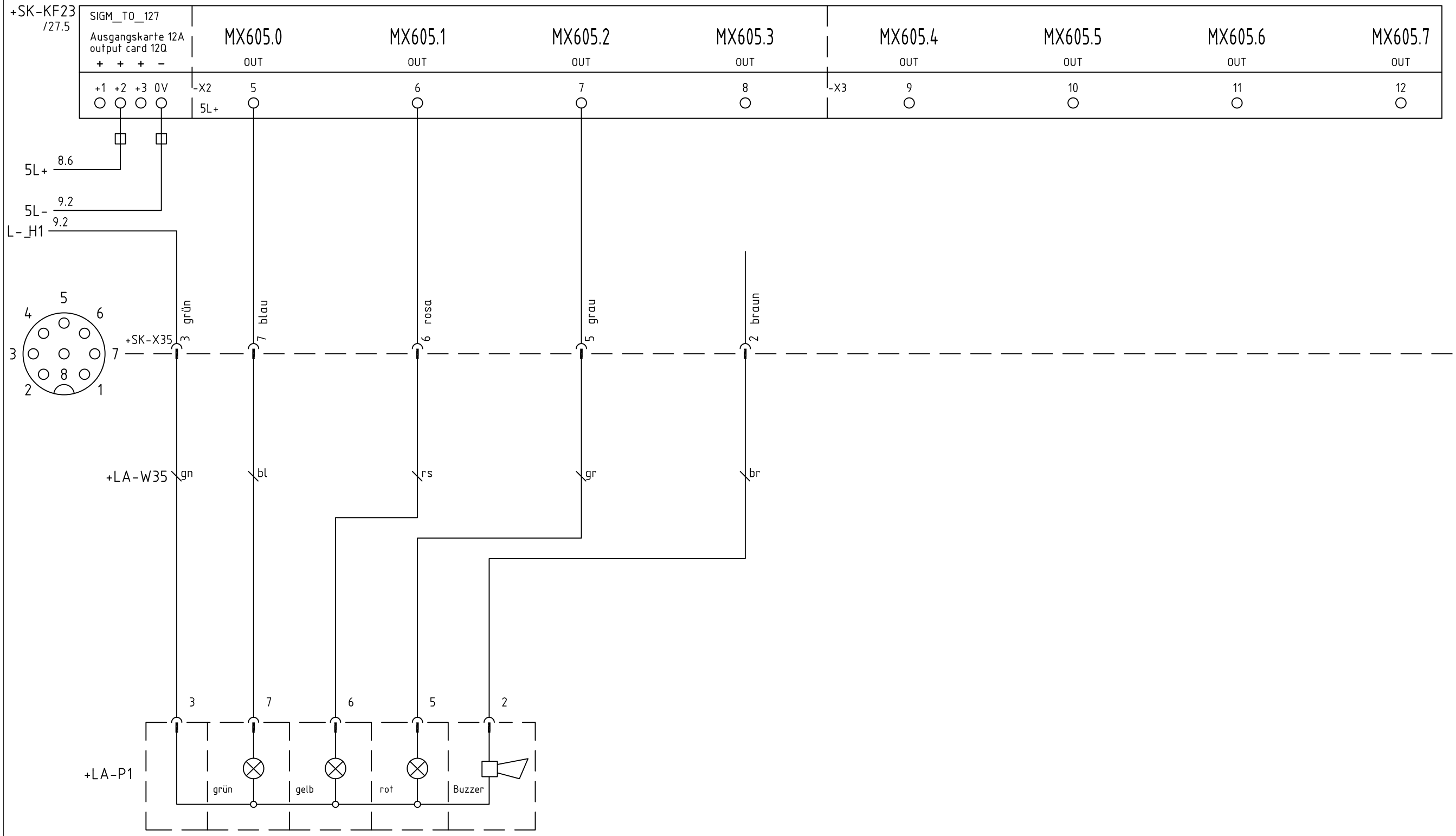


Durchmessereinstellung 1 Durchmessereinstellung 2 Durchmessereinstellung 3

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	turbo RSV	
				Bearb	D.Beck					
				Gepr.	D.Beck				Blatt 27/1063	11111_003
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.			Blatt 27 Folge 28



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			turbo RSV
				Gepr.	D.Beck			Blatt 28/1063 — 11111_003 — Blatt 28, Folge 29
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	

+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

PE
+SK-XE2

braun weiß blau schwarz grau

3 4 5 2 1

+SK-X33:1 +SK-X33:2 +SK-X33:3 +SK-X33:4 +SK-X33:5

B8_24V 9.3
B8_0V 9.6

PE
+SK-XE3

braun weiß blau schwarz grau

+SK-X34:1 +SK-X34:2 +SK-X34:3 +SK-X34:4 +SK-X34:5

+LA-WG2 br ws bl sw gr

+LA-WG8 br ws bl sw gr

+LA-B2
24V DC
0-10V
16 Um-
drehungen

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

+LA-B8
24V DC
0-10V
1 Um-
drehung

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

Schaltschrank +SK
switch cabinet +SK
Sigmatek SPS +SK-KF24

Lademagazin +LA
loading magazine +LA

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 analog in/output-card A24-2,AQ1-2 only at RS 4-45V / 4-52V	FMB MASCHINENBAU	Analogein-Ausgangskarte KF24 AI1-2/AQ1-2
				Bearb	D.Beck			turbo RSV
				Gepr.	D.Beck			Blatt 29/1063 — 11111_003 — Blatt 29, Folge 30
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	

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

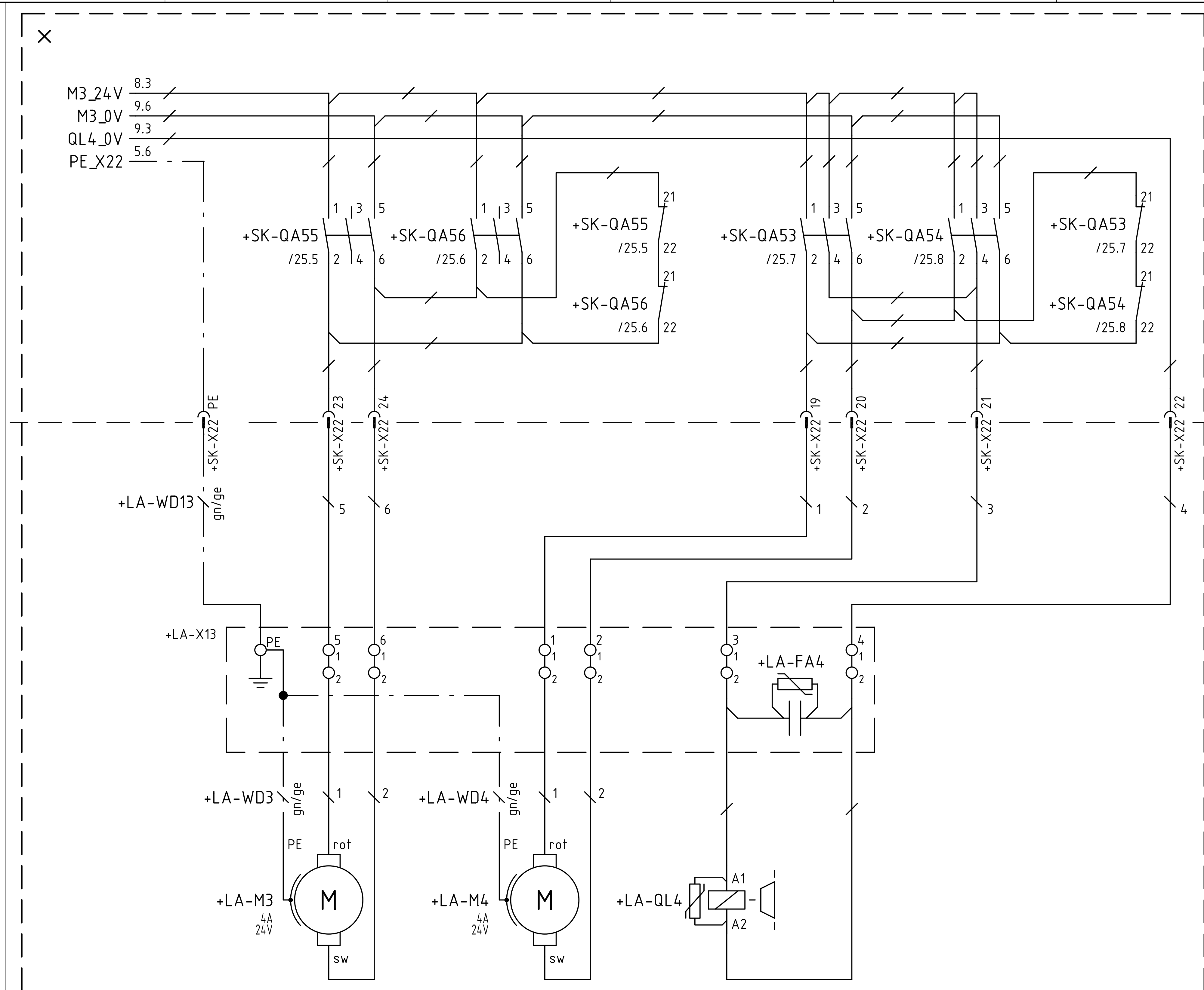
+LA-Q1
A1
A2

Geber Wegerfassung Spindelstock
Weg Lünette
encoder distance headstock / steady

Synchronkupplung
Synchronisation clutch

◇ Nur bei / only for RS

				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
				Bearb	D.Beck			turbo RSV
				Gepr.	D.Beck			Blatt 30/00 — 11111_003 — Blatt 30, Folge 31
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f. / Ers.d.	



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

✕ Nur bei / only for V

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

Nur bei RS 4-45V / 4-52V
motor diametter setting -M3/M4
only at RS 4-45V / 4-52V

Urspr | Ers.f. | Ers.d.

FMB MASCHINENBAU

Durchmesser-
einstellung
Motor -M3/M4

turbo RSV

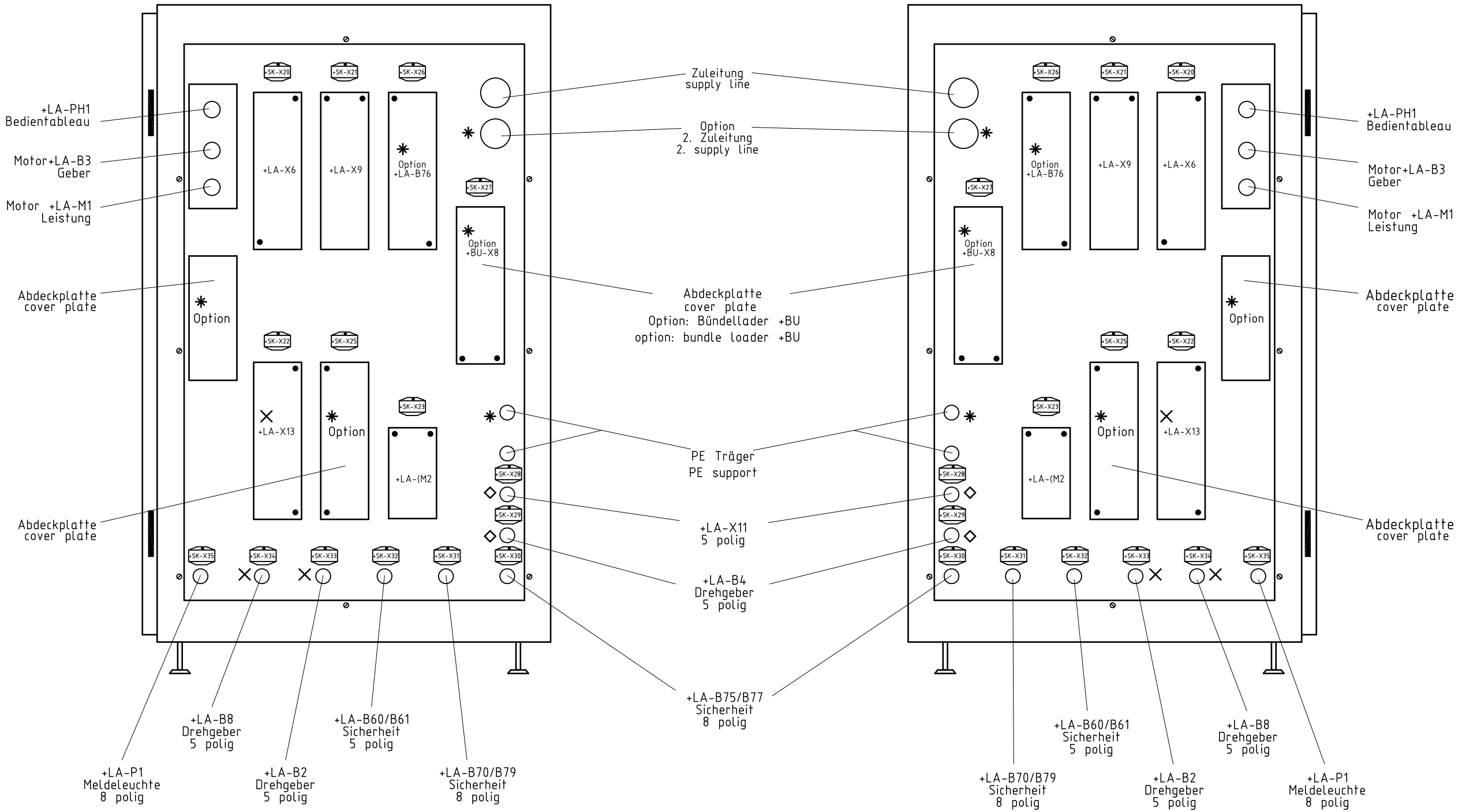
Blatt 31/1063

11111_003

Blatt 31
Folge 32

Ausführung
variant
(A und B)

Ausführung
variant
(C und D)

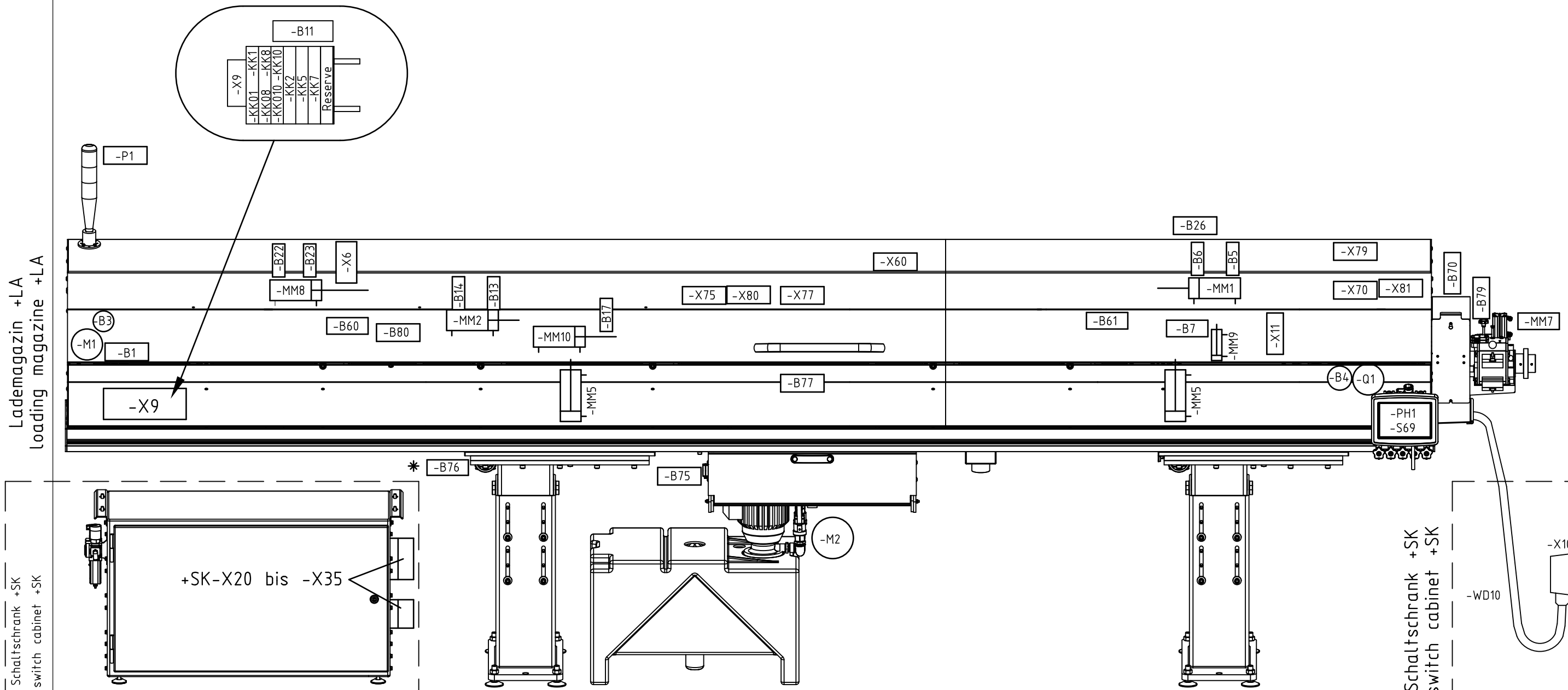


✱ Option

◇ Nur bei / only for RS

✕ Nur bei / only for V

				Datum	22.11.23	Switch cabinet Interface	FMB MASCHINENBAU
				Bearb	D.Beck		Schaltschrank Anschluss
				Gepr.	D.Beck		turbo RSV
	Aenderung	Datum	Name	Norm	DIN5	Urspr / Ers.f. / Ers.d.	Blatt 32/1063 — 11111_003 — Blatt 32 / Folge 33

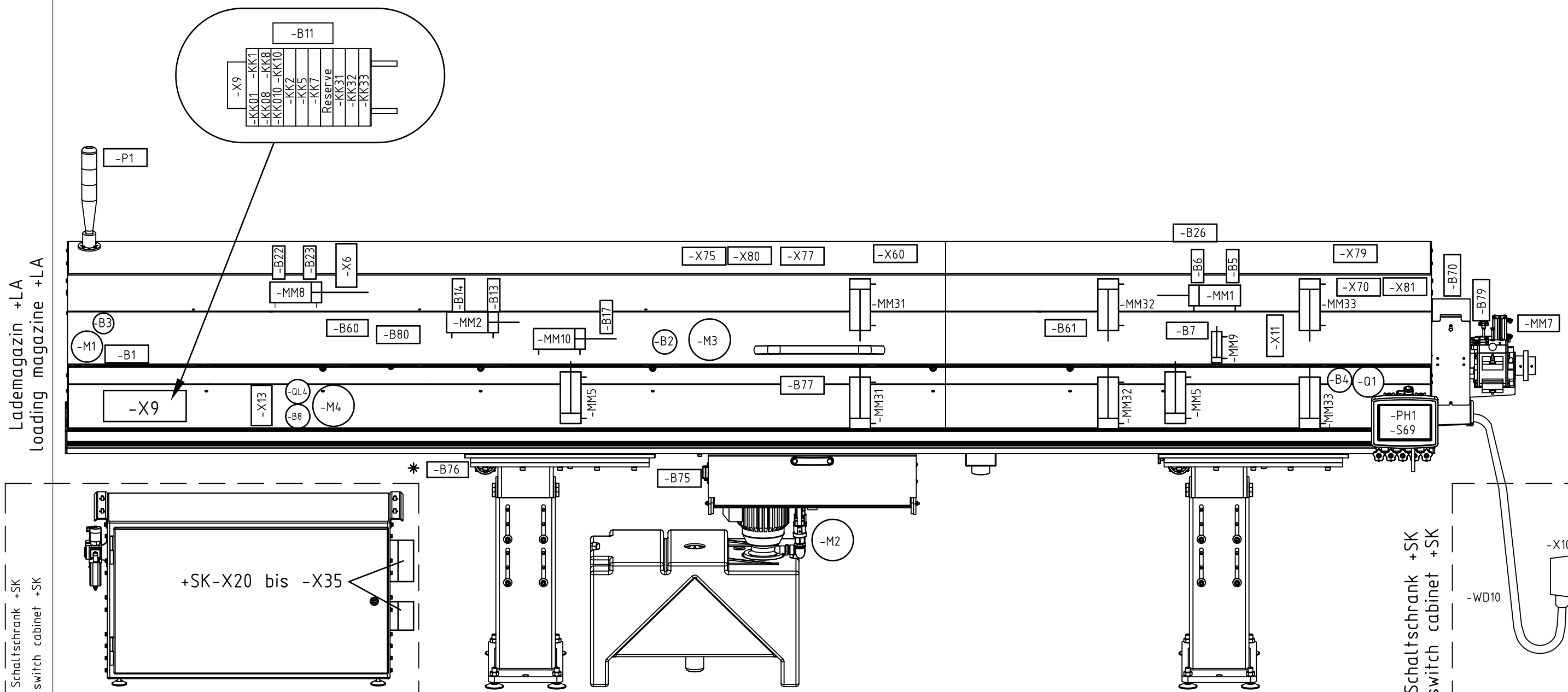


✳ Option

				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

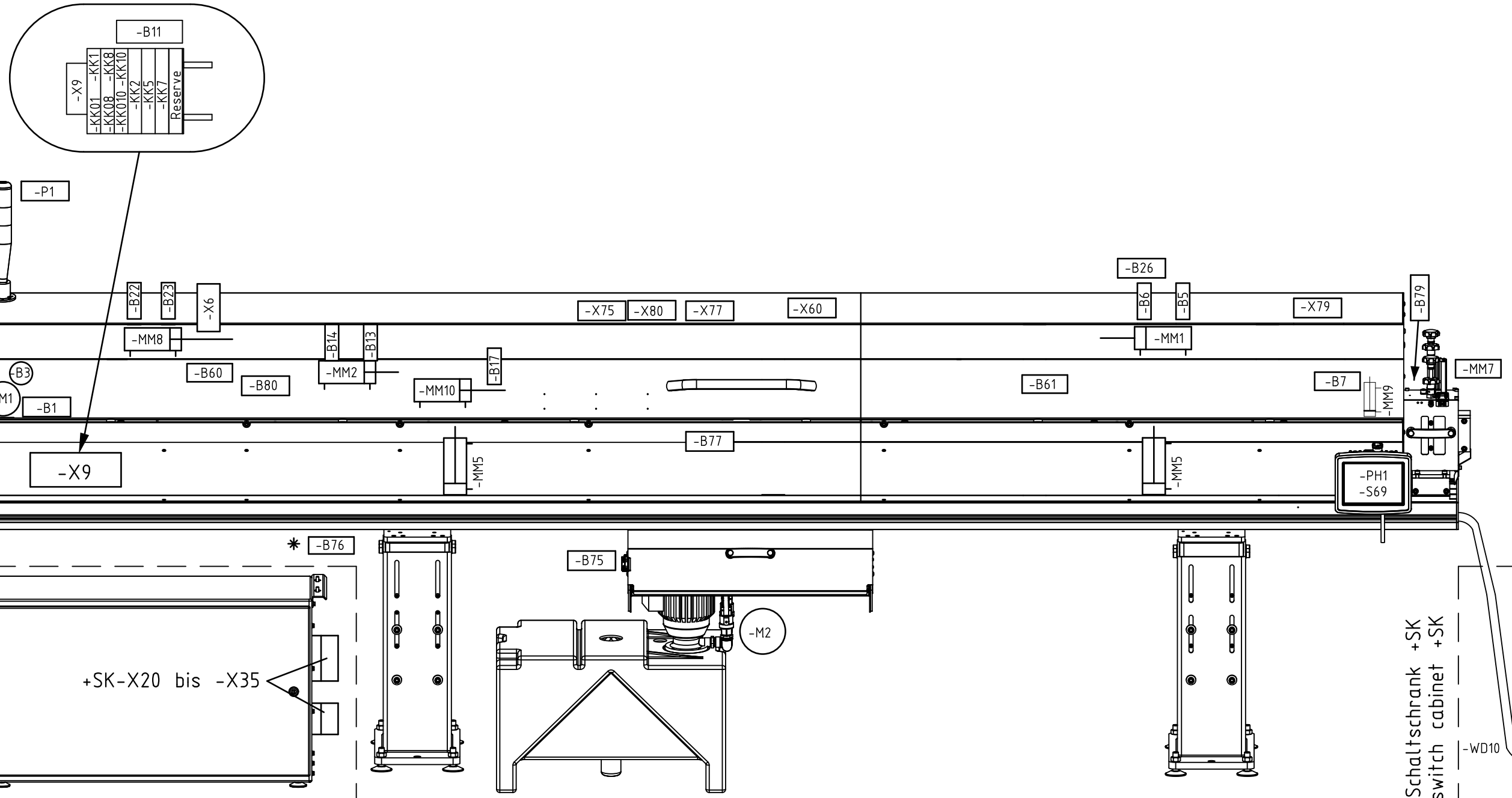


✳ Option

				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

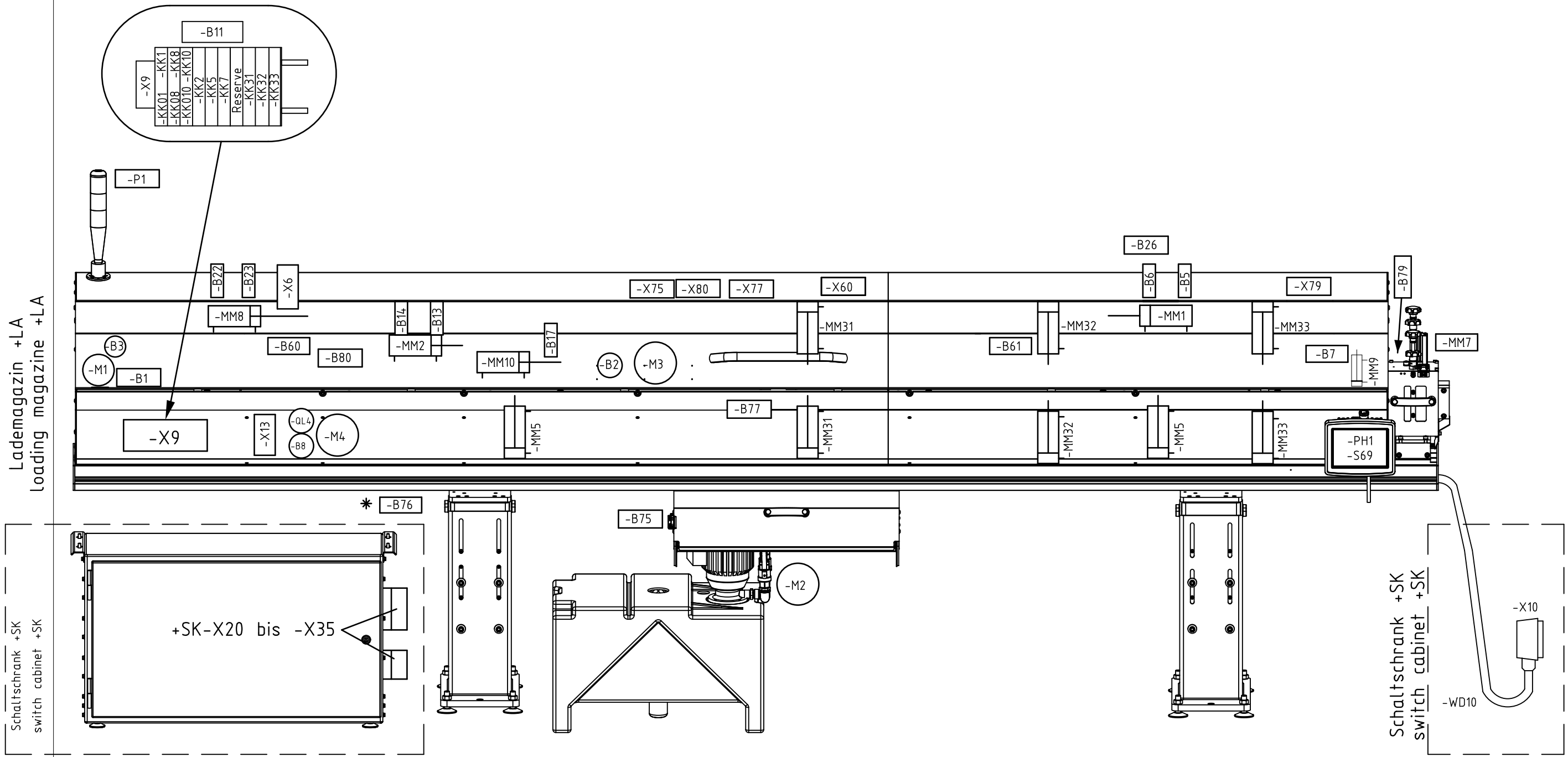


* Option

				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

+SK

Schneider

24VDC-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

-K20 | -K201 | -K25 | -K251 | -K27 | -K271 | -K70

-K22 | -K23 | -QA21

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