

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	5
1.1	Operating instructions	5
1.2	Information about the product	7
1.3	Technical data	11
2	Safety	15
2.1	Safety measures	15
2.2	Safety equipment	15
3	Transport	16
3.1	Prepare for transportation	16
3.2	Transporting the product	21
4	Assembly and start-up	25
4.1	Prepare for assembly	25
4.2	Aligning	26
4.3	Electrical connection	27
4.4	Assembly	28
4.5	Adjustments	33
4.6	Settings	34
4.7	Pre-set parameters	35
5	Control panel	38
5.1	Control panel, general	38
6	Operation	40
6.1	Basic functions	40
6.2	Overview of selections	41
6.3	Edit and manage programs	43
6.4	Processing settings	45
6.5	Feed material bars	47
6.6	Processing phase	48
7	Converting	54
7.1	General conversion	54
7.2	Guide channel	54
8	Maintenance	64
8.1	Maintenance actions	64
8.2	Auxiliary equipment	69
9	Faults	70
9.1	Fault messages	70
9.2	Fault table	71

9.3 Service..... 75

9.4 Technical problems..... 75

10 Index..... 77

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

 **DANGER**

Warning Hazard

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

Type and source of hazard

Consequences if the note is disregarded.

- Actions necessary to avert the hazard.

Warning Hazard

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

 **WARNING**

Type and source of hazard

Consequences if the note is disregarded.

- Actions necessary to avert the hazard.

⚠ CAUTION

Warning Caution

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

Type and source of hazard

Consequences if the note is disregarded.

- Actions necessary to avert the hazard.

Note (material damage)

A note that misuse could cause material damage.

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 supplied, which have been agreed with FMB in advance.

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

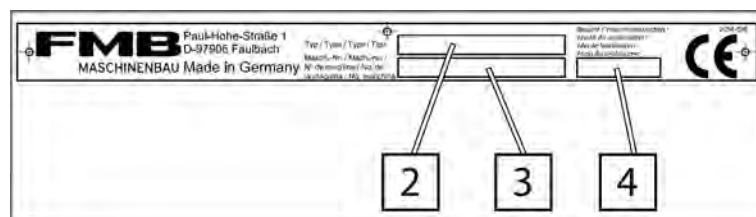
**Personnel who have received training for the product, are familiar with the functions and have been made aware of the risks. The training can be done by FMB or by a person who has already received training.

***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

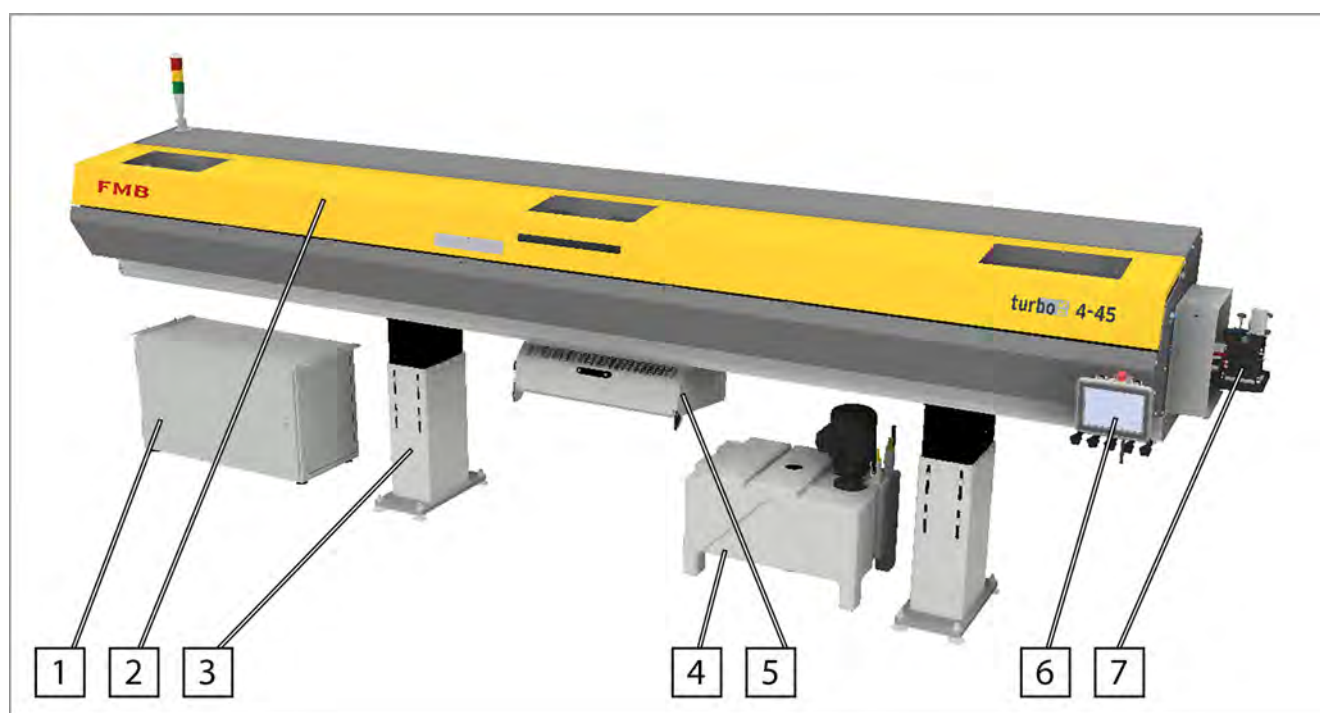
The name plate is attached to the loading magazine in position 1.



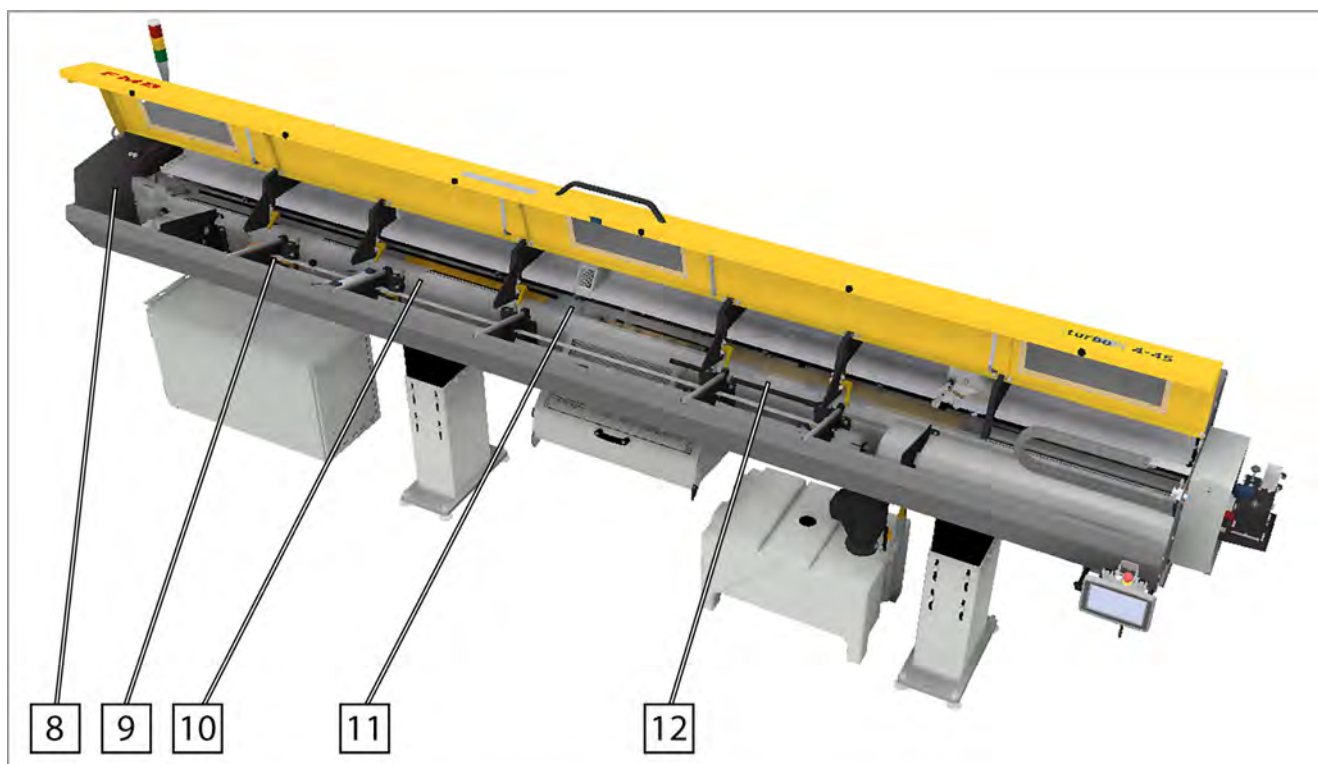
2	Types and lengths	3	Machine number
4	Year of construction		

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.

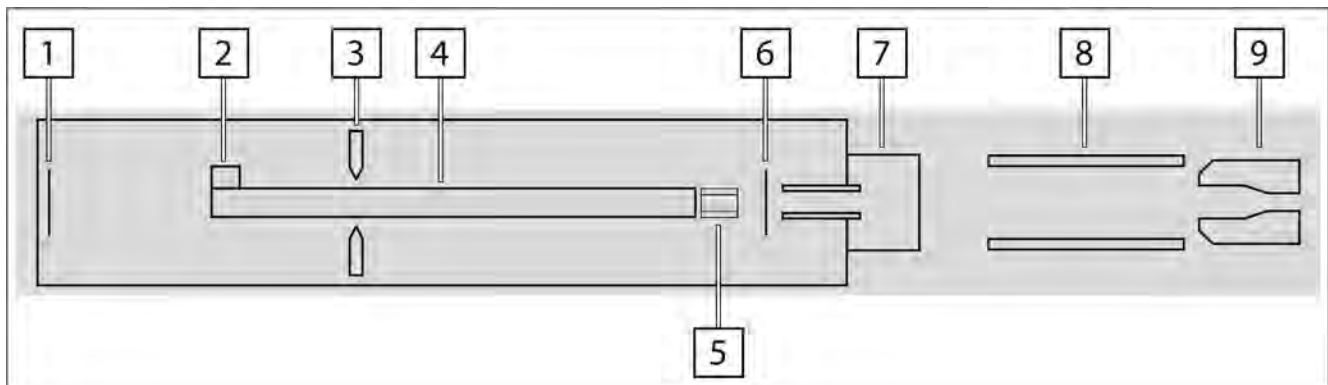
The collet of the machine tool closes and processing begins. The guide channel filled with oil and the steady placed between the machine tool and the guide channel ensure the exact bar guide required for processing. After a workpiece has been completed, the collet of the machine tool opens. The pusher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

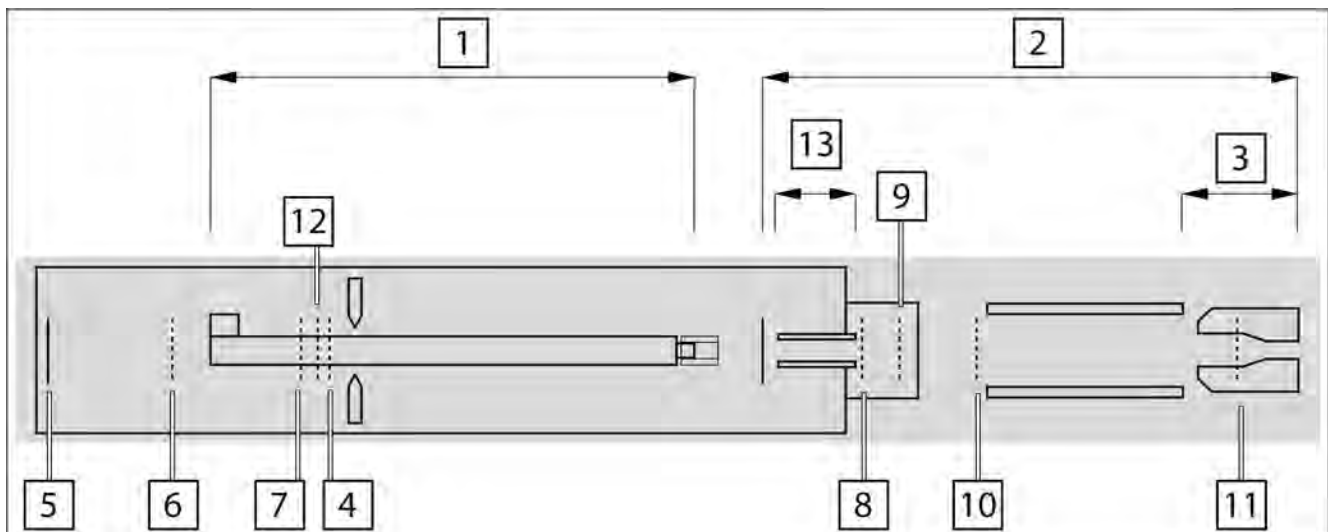
The pusher is driven by a servomotor with a toothed belt. A sensor on the servomotor detects the exact position of the pusher.

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

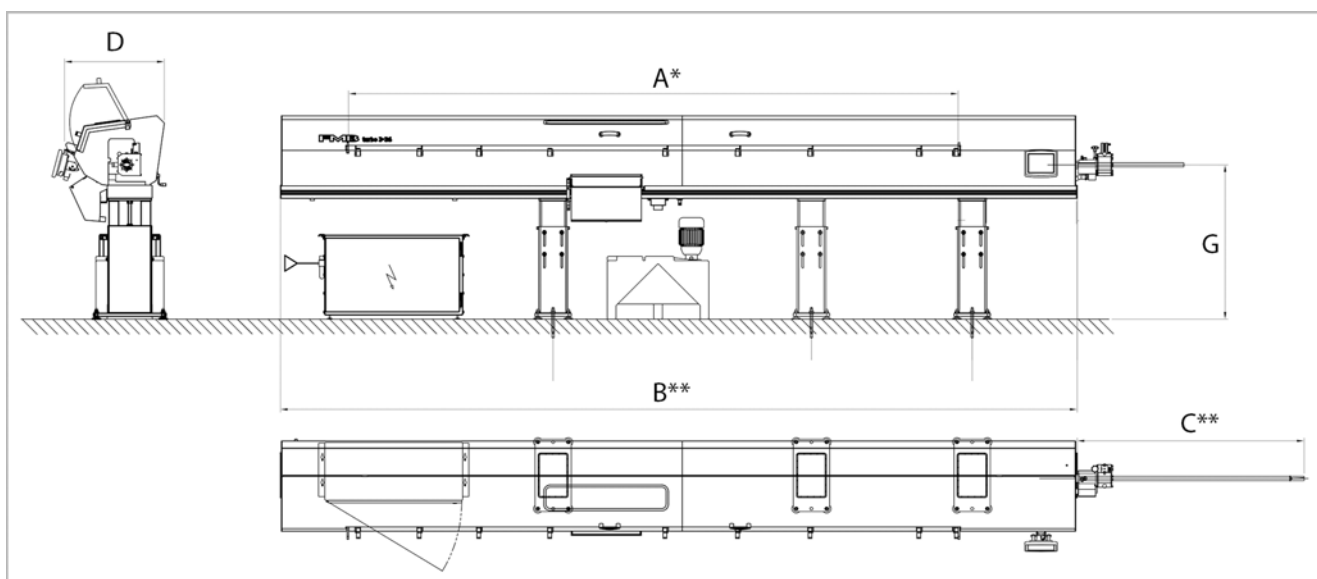
Storage conditions

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.

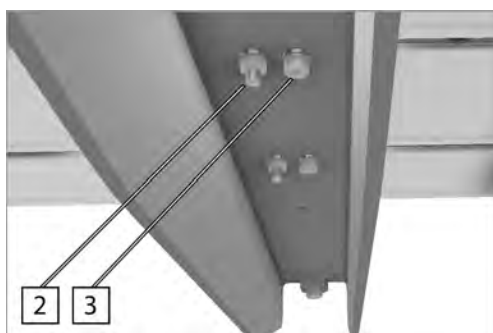
***i** The oil tank must be transported separately.*

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.

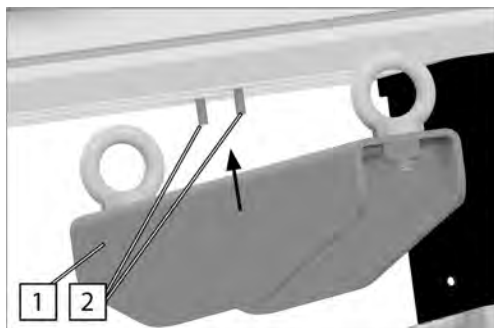
- Do not stay in the danger area.
- Only install transport beams for the purpose of crane transportation and then remove them directly.

⚠ CAUTION

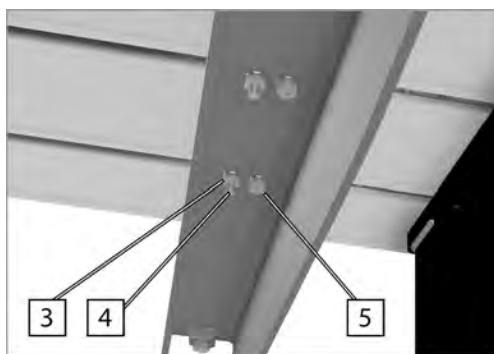
Protruding transport beams

Personal injury because of impact due to protruding transport beams.

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

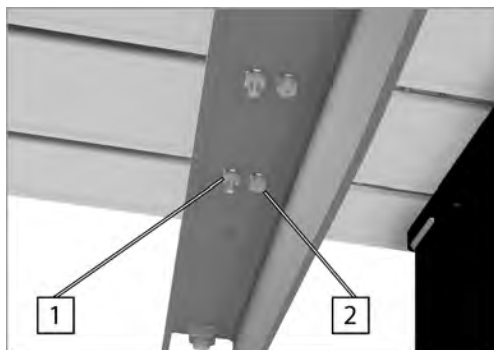


1. ➞ Place the transport beams 1 on the threaded pins 2 and hold.

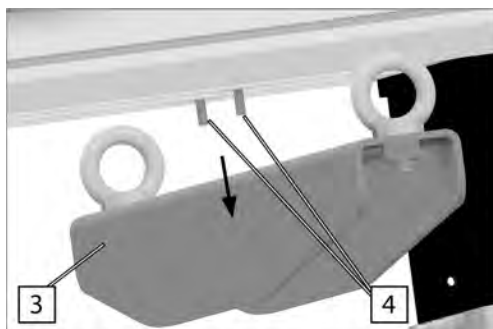


2. ➞ Place the nut with washer 3 on the threaded pin 4 and tighten.
3. ➞ Repeat the work step for the second threaded pin.
4. ➞ Insert the screw with washer 5 and tighten.
5. ➞ Repeat the work step for the second screw.

Removing the transport beams

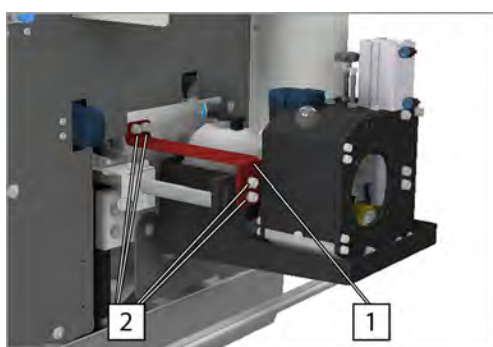


1. ➞ Secure the transport beams to prevent falling.
2. ➞ Loosen the nut with washer 1 and remove.
3. ➞ Repeat the work step for the second nut.
4. ➞ Loosen the screw with washer 2 and remove.
5. ➞ Repeat the work step for the second screw.



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

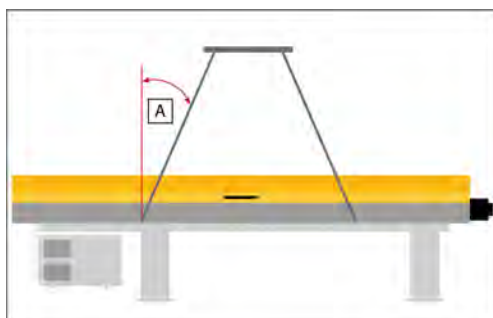
Falling loading magazine

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

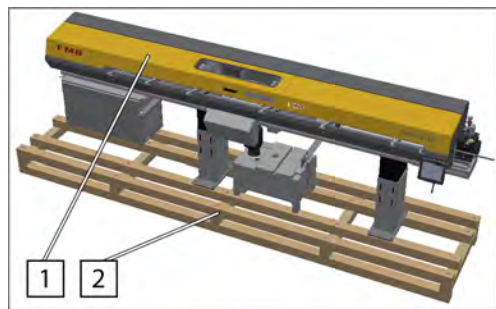
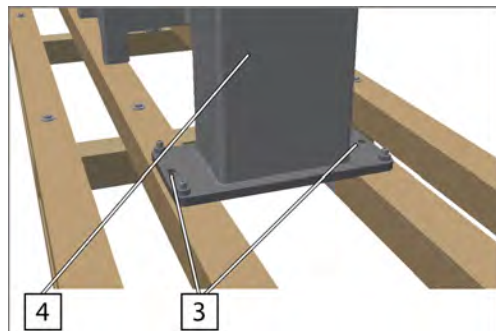
When lifting the loading magazine with the multi-chain load attachment gear, the specified maximum angle of the load attachment gear has to be observed. If this angle is exceeded, the attachments of the transport beams may break and the loading magazine could fall down.

- 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

i

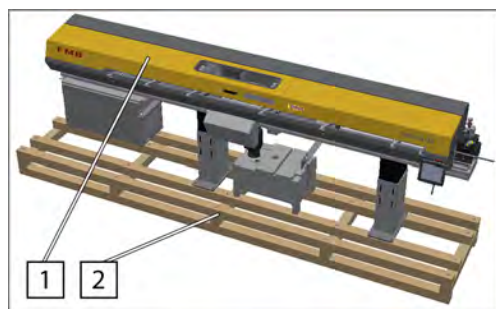
Fastening the loading magazine to the transport pallet serves only to prevent it from slipping or to raise the loading magazine and transport pallet over the transport beams of the loading magazine. For transportation, the loading magazine has to be additionally secured. Fastening it to the transport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

i

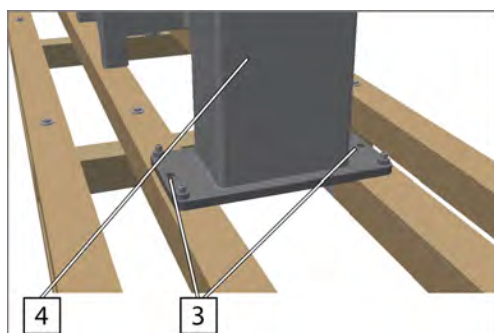
The loading magazine must be fastened to the transport pallet using adequately dimensioned fasteners.

- 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.

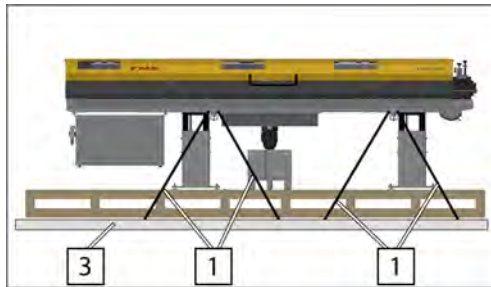
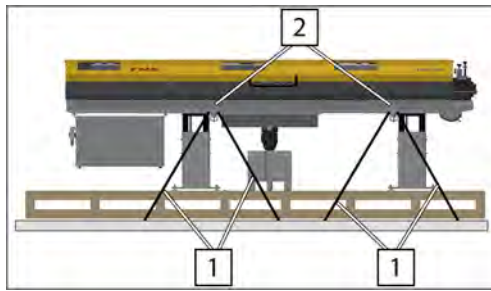
- Do not stay in the danger area.
 - Secure the oil tank on the transport pallet against slipping.
1. ➤ Fasten the loading magazine to a transport pallet ➤ *“Fastening the loading magazine to the transport pallet” on page 20.*
 2. ➤ Calculate the center of gravity of the load.
 3. ➤ Place the forks of 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.

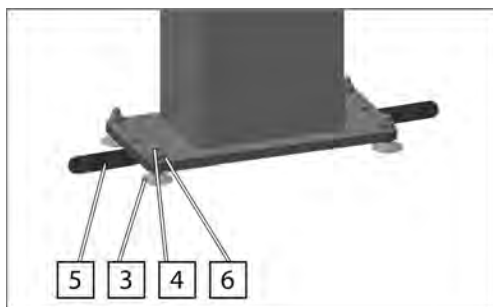
When setting up and aligning the loading magazine, the whole loading magazine has to be moved. People may be struck by the loading magazine or become stuck between the loading magazine and the lathe.

- 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

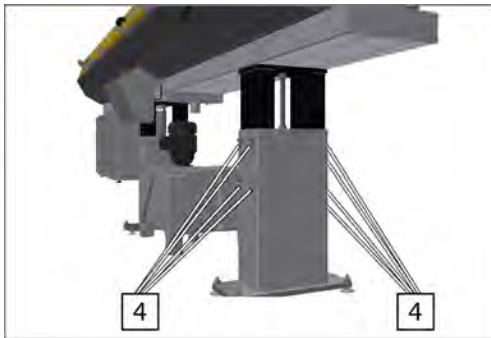
Cuts due to the sharp knives of the material gripper.

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

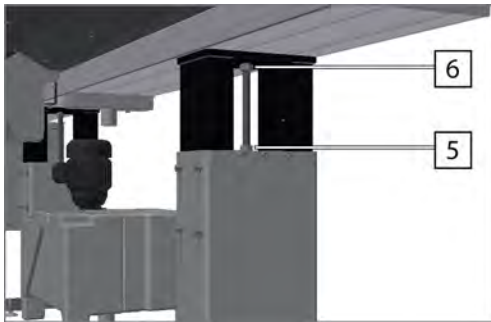
- Wear safety gloves.

- 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].

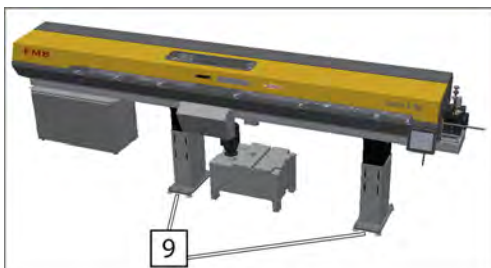


2. ➔ Loosen the lock nuts [5] of the threaded spindles [6].
3. ➔ Correct the height of the loading magazine with the threaded spindles [6].
4. ➔ Tighten the lock nuts [5] of the threaded spindles [6].
5. ➔ Tighten the clamping screws [4].



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.

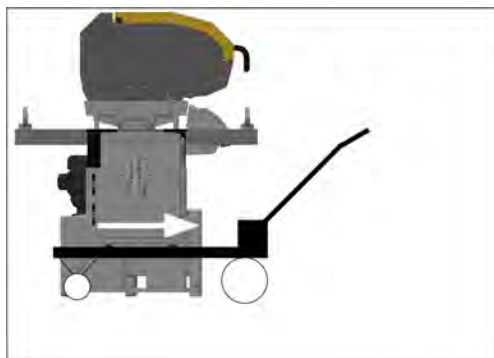
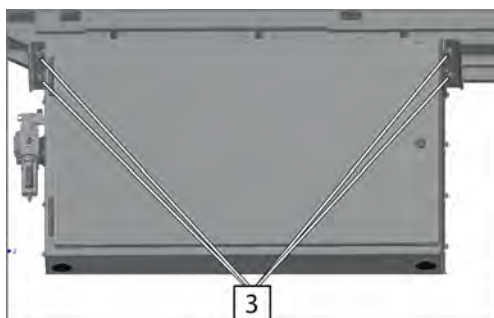
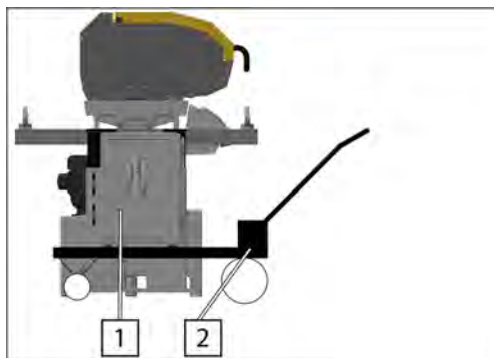
The attachment of the loading magazine to the machine tool is order-specific and dependent on the individual design of the interface between the loading magazine and the machine tool. The loading magazine must be positioned directly on the machine tool so that there is no unsecured transition area between 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.

! 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. ➤ *! 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.

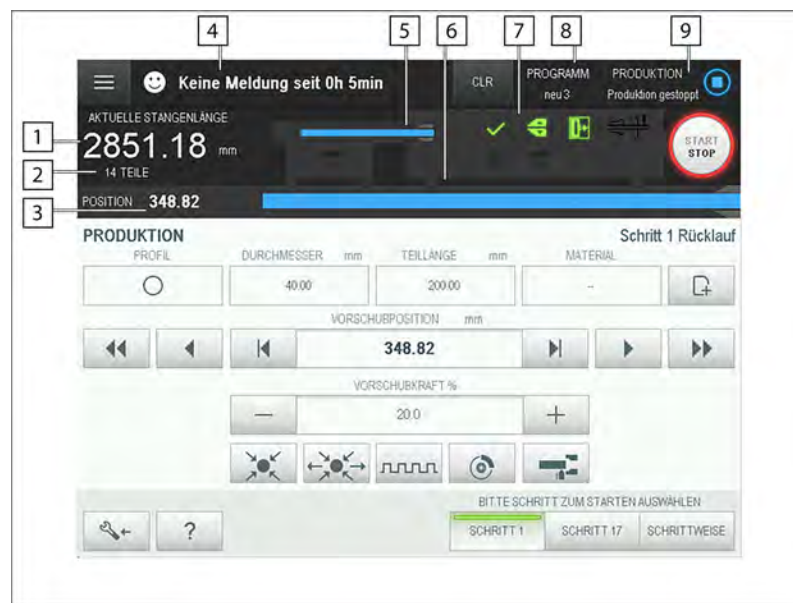
5 Control panel

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

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

i Production can only be restarted, if the actual value of the parts counter has been reset ➔ “Reset the actual value of the parts counter” on page 41.

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

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

Reset the actual value of the parts counter

1. ➤ Press the  button.
2. ➤ ‘**SETTINGS** ➔ **Basic settings** ➔ **Parts counter**’
3. ➤ Click on the field **Reset parts counter**.
 - ➔ The parts counter is reset.

6.2 Overview of selections

Selections

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

Part follow-up

Selection	Selection option	Description
Part follow-up		
	Collet open, fixed speed	Push to the stop.
	Part length internal	Push without stop to the specified position.
	Part length external (optional)	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

i

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

i

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

1. ➤ Open the program in 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

i

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

i

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

1. ➤ Open the program in 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

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

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

1. ➤ Press the  button.
2. ➤ 'SETTINGS → Service settings → SPEED'
3. ➤ 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

i *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.

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

1. ➤ Press the  button.
2. ➤ 'SETTINGS → Basic settings → Parameter'
3. ➤ 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

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

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

1. ➤ Press the  button.
2. ➤ 'SETTINGS → Basic settings → Parameter'

3. ➤ 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  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**.
- ➔ 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

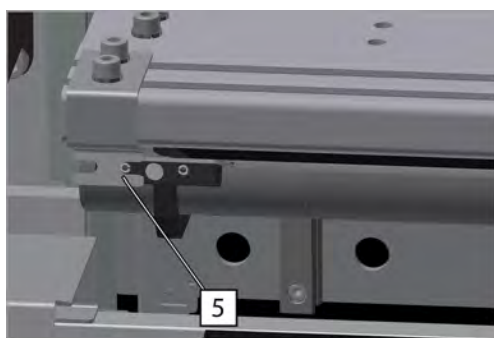
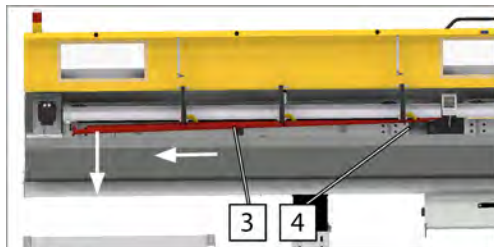
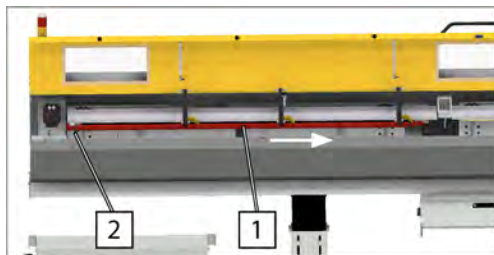
Cuts due to the sharp knives of the material gripper.

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  button.

Changing the insert of the top rear guide channel

 **WARNING**

 **CAUTION**

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.

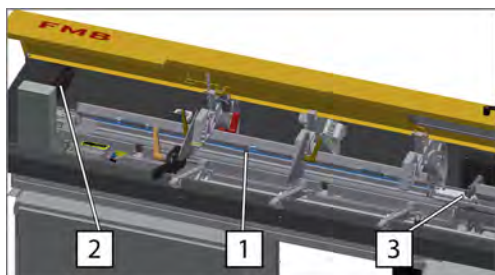
- Before conversion work, remove the material bars from the lateral material storage.

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.



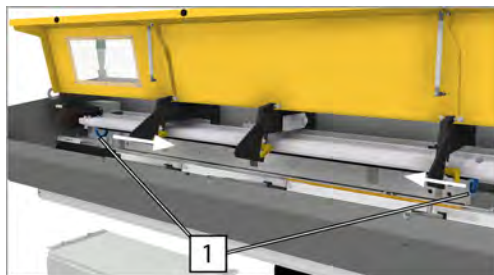
10. ➤ Turn the insert in the direction indicated by the arrow and remove it.
11. ➤ Place the new insert in the top rear guide channel.



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

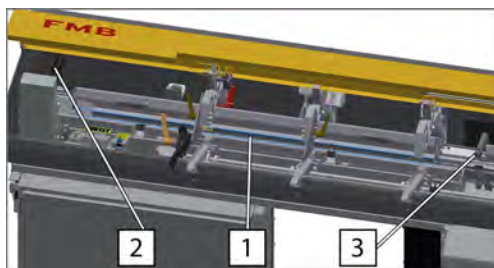
Sharp knives of the material gripper

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].

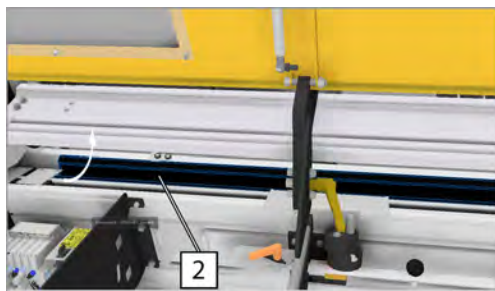


1. ➤ Press the button.
2. ➤ **SETUP** Press .
3. ➤ Approach the conversion position by pressing the button. ➔ *"Move to the conversion position" on page 54.*
4. ➤ Press the emergency stop button. ➔ *"Press the emergency stop button" on page 40.*
5. ➤ Switch off the compressed air supply.
6. ➤ Where necessary,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

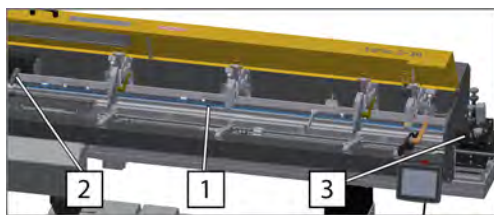
CAUTION

Sharp knives of the material gripper

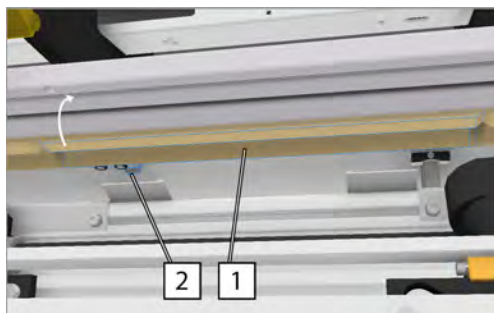
Cuts due to the sharp knives of the material gripper.

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.

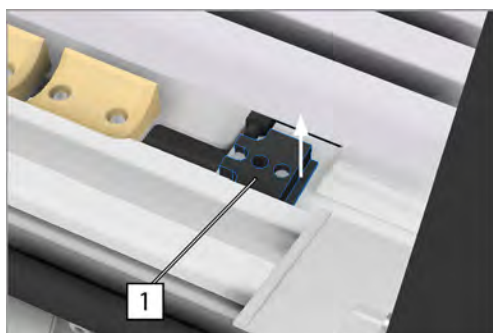


1. ➤ Press the button.
2. ➤ **SETUP** press.
3. ➤ Approach the conversion position by pressing the button.
➔ "Move to the conversion position" on page 54.
4. ➤ Press the emergency stop button. ➔ "Press the emergency stop button" on page 40.
5. ➤ Switch off the compressed air supply.
6. ➤ Where necessary, 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 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

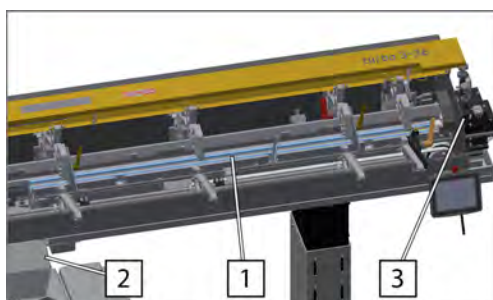
Sharp knives of the material gripper

Cuts due to the sharp knives of the material gripper.

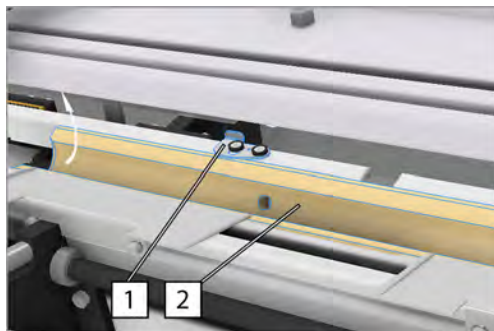
When working in the vicinity of the material gripper, there is a risk of cuts in the event of inattentiveness.

- 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.

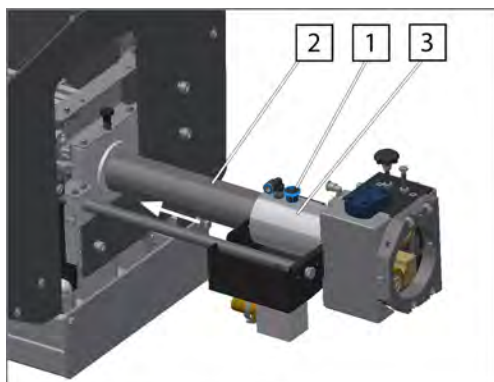


1. ➤ Press the  button.
2. ➤ **SETUP** press.
3. ➤ Approach the conversion position by pressing the  button. ➤ *"Move to the conversion position" on page 54.*
4. ➤ Press the emergency stop button. ➤ *"Press the emergency stop button" on page 40.*
5. ➤ Switch off the compressed air supply.
6. ➤ Where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

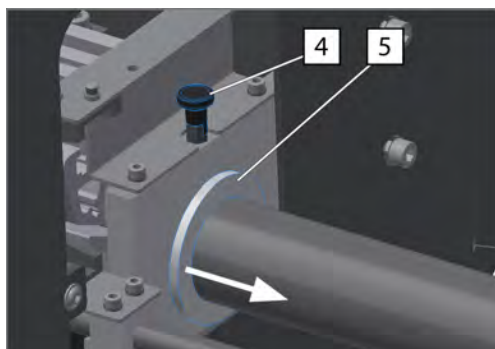


8. ➤ Press the insert lock **1** and release.
➔ The insert is now detached.
9. ➤ Turn the insert **2** in the direction indicated by the arrow and remove it.
10. ➤ Place the new insert into the upper front guide channel.
11. ➤ Pull the insert lock **1** until it engages.
➔ The insert is secured.
12. ➤ 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  button.

Changing the guide module



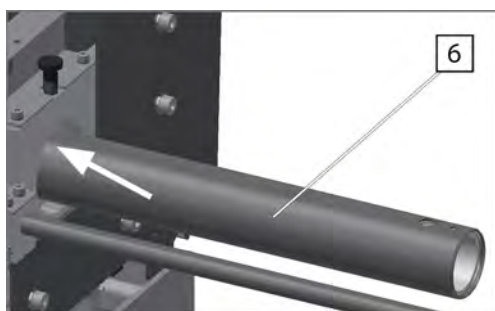
1. ➤ Press the  button.
2. ➤ **SETUP** Press .
3. ➤ Approach the conversion position by pressing the  button.
➔ *“Move to the conversion position” on page 54.*
4. ➤ Press the emergency stop button. ➔ *“Press the emergency stop button” on page 40.*
5. ➤ Switch off the compressed air supply.
6. ➤ Where 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  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  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.

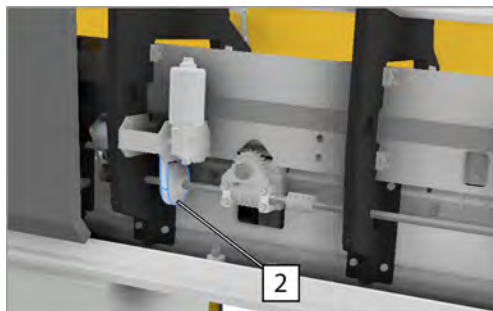
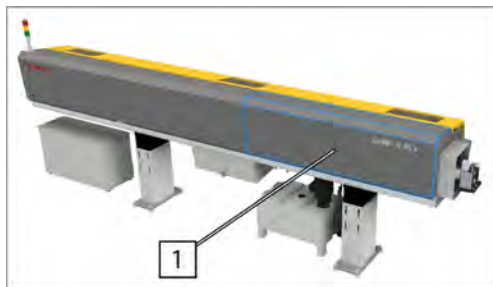
- Before removing safety covers, press the emergency stop button.
- After the end of the maintenance work, reattach the safety covers directly.
- Maintenance work is only to be performed if the person holds the respective qualification described in these operating instructions.



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

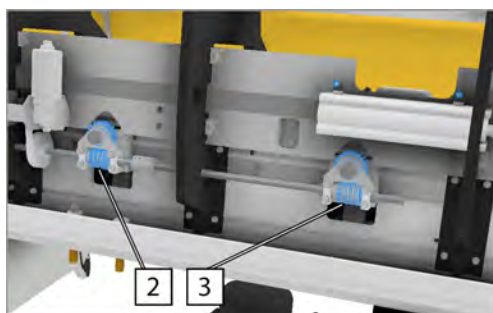
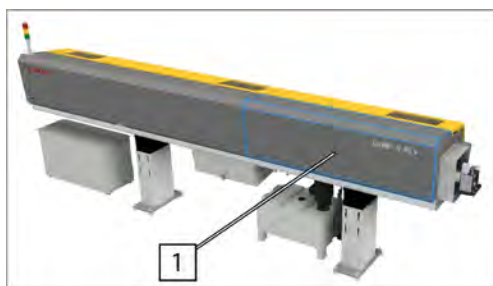
Personal injury due to squashing and impact due to freely-accessible, driven components of the loading magazine.

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.

i

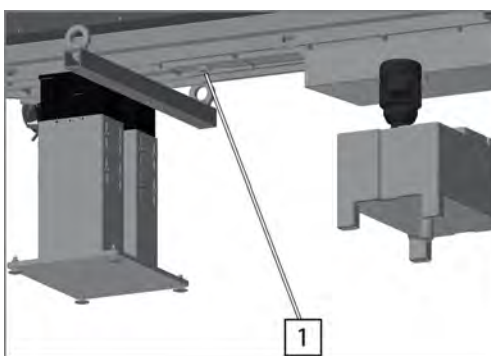
Observe the oil tank level. ➔ "Technical data of the loading magazine" on page 11.

i

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

i

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

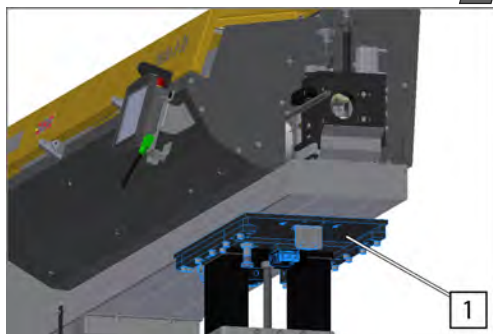
14. Acknowledge the error message by pressing the **CLR** button.

8.2 Auxiliary equipment

Shifting the loading magazine



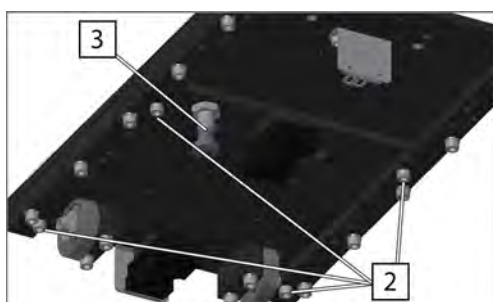
This function is available as an option.



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 **STOP** button.
2. **SETTINGS** → **Service settings** → **Position diagnosis**
3. Press the **GO** 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  button.

Display of pending fault messages in the fault list

1. → Press the  button.
2. → *'DIAGNOSIS → Fault list'*

Delete fault messages in the fault list

1. → Press the  button.
2. → *'DIAGNOSIS → Fault list'*

Delete an error message:

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

Delete all error message:

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

Access the fault history

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

Display the position of the current fault on the loading magazine

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

9.2 Fault table

Fault message and possible cause

Fault message of the loading magazine	Possible cause	Switch / position
Axis 1 fault, code: xx	The servo drive issues a fault message.	
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.
Remnant 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 too 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 head-stock lathe mode does not match shifting device -B71/B76	The external signal of the machine tool (long or short turning mode) does not agree with the position of the shifting device.	
Collet in the lathe closed	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

A		
Aligning		
the loading magazine.	29	
Assembling		
the transport beams.	17	
Attaching the control cabinet		
to the loading magazine.	32	
Attaching the loading magazine		
to the floor.	30	
C		
Capacity adjustment set.	54	
CE marking.	7	
Changing		
the guide module.	62	
the lifting plates.	55	
the limiter flap.	60	
the lubricant.	68	
the pusher.	55	
Changing the		
lifting plates.	58	
Connection of the loading magazine and the lathe		
Electrical connection.	27	
Connection of the loading magazine and the machine		
tool		
Contacts from the loading magazine to the		
machine tool.	27	
Contacts from the machine tool to the loading		
magazine.	28	
Contacts from the loading magazine to the machine		
tool.	27	
Contacts from the machine tool to the loading		
magazine.	28	
Control panel		
Explanation of symbols.	39	
Layout.	38	
Navigation.	38	
Converting		
Change the insert of the bottom front guide		
channel.	61	
Changing the bottom rear insert of the guide		
channel.	58	
Changing the lifting plates.	58	
Changing the limiter flap.	60	
Changing the top front insert of the guide channel		
.	59	
Cover		
Safety switch.	15	
Cover of the loading magazine		
Lock.	15	
opening.	15	
D		
Date		
Set the	35	
Delivery state.	25	
Detaching the loading magazine		
from the transport pallet.	20	
Diameter of the material bar		
Entering.	45	
Dimensions		
Loading magazine.	13	
Distanceview.	34	
Set the	35	
Drive.	9	
Drive belt		
Checking.	64	
E		
Electrical connection of the loading magazine and		
lathe.	27	
Emergency stop		
Emergency stop device.	15	
Make the loading magazine ready for operation		
after the emergency stop.	40	
Press the emergency stop button.	40	
Emptying		
the oil tank.	68	
Explanation of symbols.	39	
F		
Fastening the loading magazine		
to the transport pallet.	20	
fault message		
Access the fault history.	70	
delete the current fault message.	70	
Display of pending fault messages.	70	
Display the position of the current fault on the		
loading magazine.	70	
Fault message		
show the current fault message.	70	
Feed the material bar		
Feed the multiple-sided material.	47	
Feed the multiple-sided material		
bar.	47	
Front end position		
Setting the positional value.	34	
Functional description.	9	
G		
Guide channel		
adjusting diameter.	54	
Guide channel diameter		
adjusting.	54	
Guide channel insert		
Changing bottom rear insert.	58	
Changing the bottom front insert.	61	
Changing the top front insert.	59	
Changing the top rear insert.	56	

I		Profile	
Interval insert.	47	Enter the profile of the material bar.	44
L		Program	
Language		Creating a new program.	43
change.	35	Editing.	44
Language settings		R	
change.	35	Reference run	
Lathe		Performing a run.	69
Safety door.	15	Reloading during automatic mode.	48
Load attachment gear		Removing	
Angle of inclination.	19	the transport beams.	18
Loading magazine		Removing the material bar	
attach to means of transport.	24	from the loading magazine.	51
Calculating the distance to the machine tool.	26	Return speed shift.	36
Dimensions.	13	S	
Functional description.	9	Safety	
Overview of components.	8	Personal safety equipment.	15
switching off.	40	Safety equipment.	15
switching on.	40	selection	
transport with means of transportation.	23	Overview.	41
M		Selection options.	41
Maintenance plan.	64	Set the	45
Material		Selections.	41
Entering the material to be processed.	44	Enter the selection option.	45
Max. bar return		Setting up	
Setting.	46	the control cabinet.	32
Max. remnant length		the loading magazine.	26
Setting.	47	Shifting	
Menus		the loading magazine.	69
Navigation.	38	Shifting device.	69
N		Special equipment.	5
Name plate.	7	Speed	
Navigation		First insert.	46
Control panel.	38	First insert low.	35
Menus.	38	Return from spindle.	36
O		Return high.	36
Oil tank		Steady	
connecting.	32	Lid.	15
setting up.	32	Storage conditions.	13
Operating conditions.	13	Switching brake function	
Overview		on/off.	52
Components.	8	T	
P		Technical data	
Packaging.	25	Loading magazine.	11
Parts counter.	41	Time	
Personal safety equipment.	15	Set the	35
Pos. reverse rotation return		Transport	
Entering.	36	Angle of inclination of the load attachment gear.	19
Power failure		Transport lock.	19
Behavior of the loading magazine.	75	Transporting	
Product versions.	5	loading magazine by means of transportation.	23
		Preparing the loading magazine for transportation	
			16
		the loading magazine using the crane.	21
		the loading magazine using the fork-lift truck.	22

Transporting the loading magazine

using the crane.	21
using the fork-lift truck.	22

U**Unit of measure**

change.	35
-----------------	----



FMB Maschinenbaugesellschaft mbH & Co. KG

Paul-Hohe-Straße 1

97906 Faulbach

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

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

Ersatzteilliste Spare parts list

turbo RS 4-45 V Serie 1

Rückmeldenummer ab: 2212752

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

Achtung ! Angaben für Ersatzteilbestellung:

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

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

Attention ! Data for spare parts orders:

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

Inhaltsverzeichnis

Contents

Grundaufbau / Basic construction	6
Antrieb / Drive	10
Lager vorne / Bearing front.....	12
Anfahrschalter komplett / Starting switch complete	14
Kanalöffner / Channel opener.....	16
Niederhalter / Holding-down device	20
Lünette D 45 Spindelstock / Steady D 45 spindle stock	22
Seitliche Materialauflage / Lateral material storage.....	24
Auflagebock / Bearing support.....	26
Reststückklappe / Remnant flap.....	28
Greifer / Gripper	30
Reststückbehälter / Remnant bin	32
Vereinzelungsautomatik / Automatic separation	34
Synchroneinrichtung / Synchronized device	36
Sensor Synchroneinrichtung / Sensor Synchronized device	38
Abstützung Führungsmodul / Support guide module	40
Adapterset / Adapter set	42

Energiekette kpl. / Energy chain, complete	44
Hubeinrichtung DurchmesserEinstellung, oben / Lifting device diameter setting, top	46
Hubeinrichtung DurchmesserEinstellung, unten / Lifting device diameter setting, bottom	48
Stelleinheit / Adjusting unit.....	50
Schlitten kpl. / Carriage, complete	52
Einlagensicherung kpl. / Insert safety, complete	54
Umrüstsätze / Capacity adjustment sets	56
Abbildung / Drawing	56
Umrüstsätze / Capacity adjustment sets	57
Umrüstsätze 1900 / Capacity adjustment sets 1900	58
Materialführungen / Material guide jaws	59
Führungsmodul / Guide module	60
Wartungseinheit / Maintenance unit.....	61
Pneumatikplan / Pneumatic diagram	63
Seite 1 / Page 1	64
Seite 2 / Page 2	65
Seite 3 / Page 3	66
Pneumatikteile / Pneumatic parts.....	67
Elektroteile / Electrical parts.....	69
Lademagazin / Loading magazine.....	69
Schalttafel / Switch board	72
Bedientableau / Control panel	76

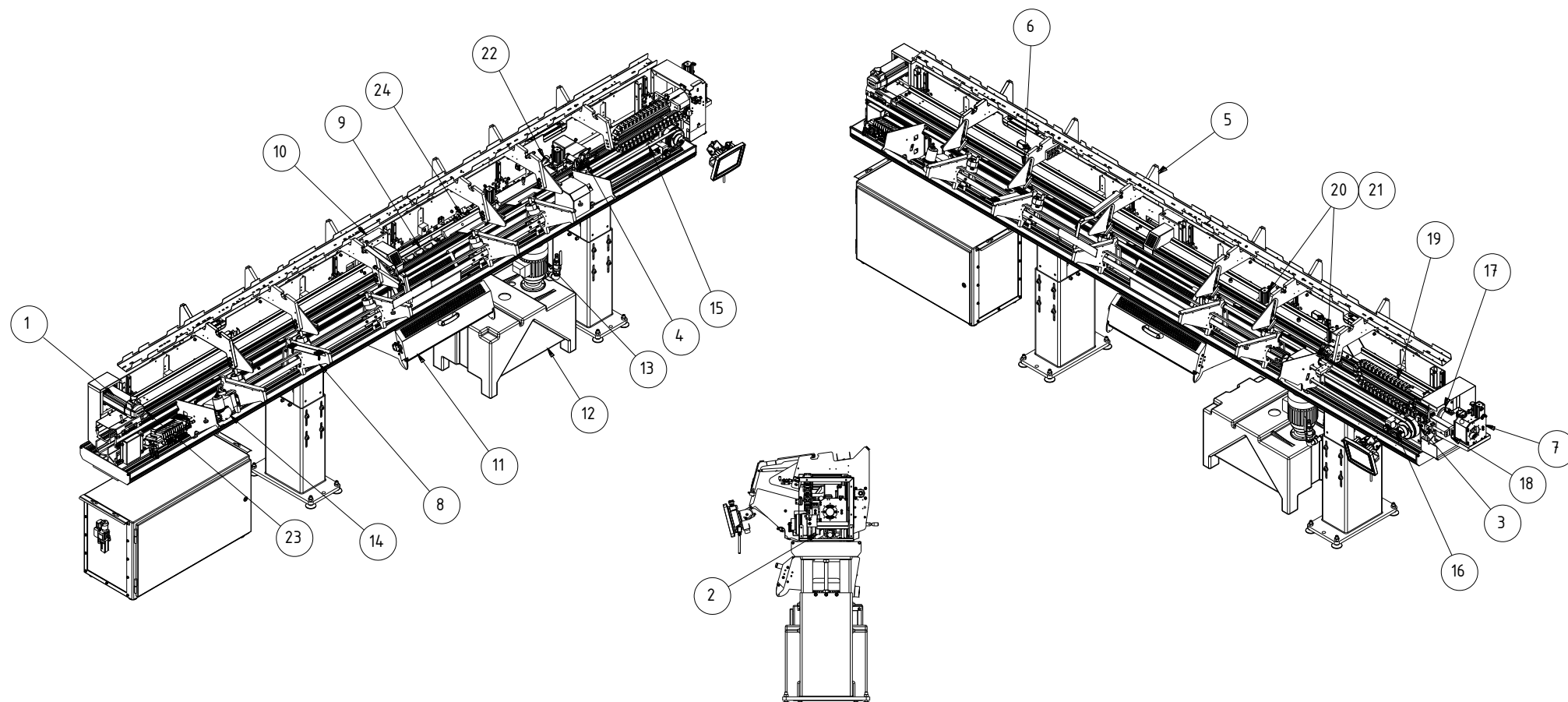
FMB turbo RS 4-45 V

Abbildung / Drawing Variante A;D



Grundaufbau / Basic construction

Abbildung Variante / Drawing Variant A;D

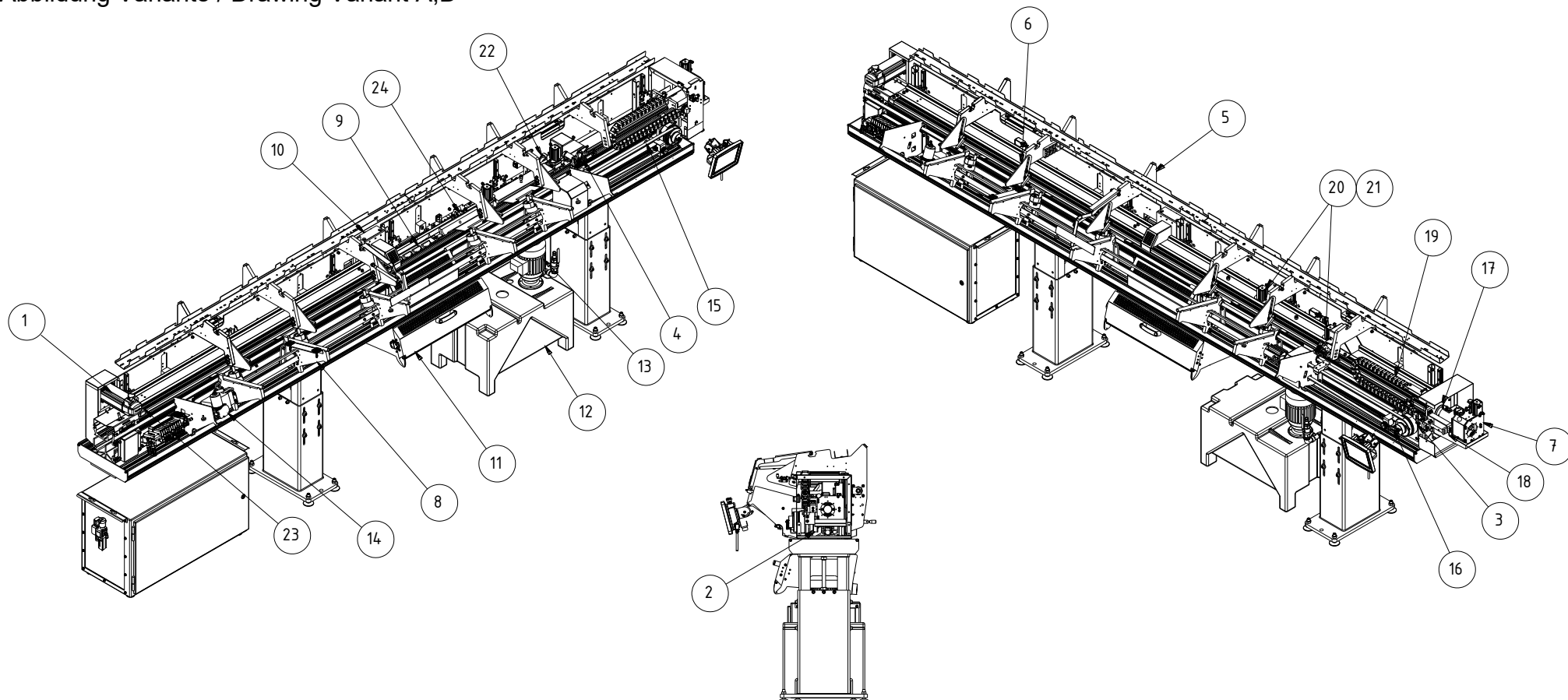


Grundaufbau / Basic construction

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

Grundaufbau / Basic construction

Abbildung Variante / Drawing Variant A;D

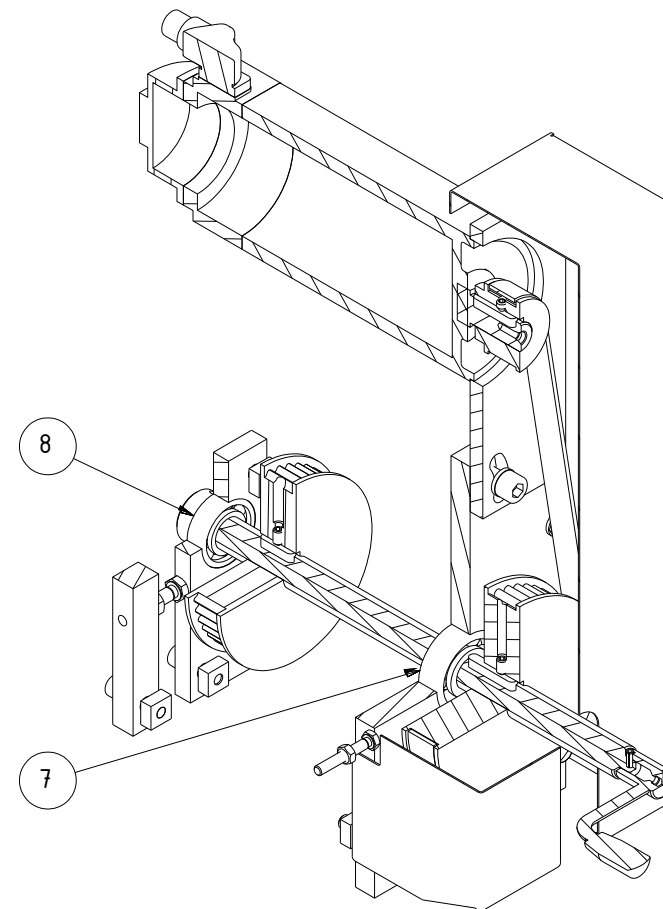
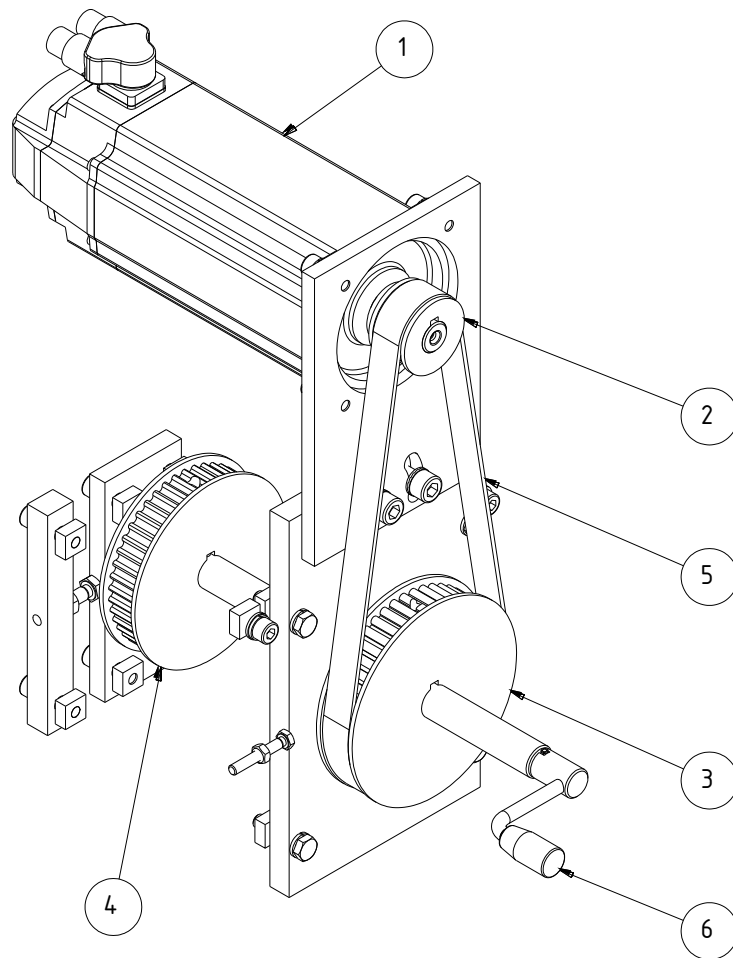


Grundaufbau / Basic construction

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
14	100100228 100102350	Vereinzelungsautomatik A;D Vereinzelungsautomatik B;C	Automatic separation A;D Automatic separation B;C	
15	100087352	Synchroneinrichtung	Synchronized device	
16	100103782	Sensor Synchroneinrichtung	Sensor, synchronized device	
17	100101538	Abstützung Führungsmodul	Support guide module	
18	100088605 100104267	Adapterset D45 A;D Adapterset D45 B;C	Adapter set D45 A;D Adapter set D45 B;C	
19	100101544	Energiekette	Energy chain	
20	100103486	Hubeinrichtung Durchmesser-einstellung, oben	Lifting device diameter setting, top	
21	100100220	Hubeinrichtung Durchmesser-einstellung, unten	Lifting device diameter setting, bottom	
22	längenabhängig dependent on length	Stelleinheit	Adjusting unit	
23	100103029 100102488	Schlitten A;D Schlitten B;C	Carriage A;D Carriage B;C	
24	100103627	Einlagensicherung	Insert safety	

Antrieb / Drive

100099166



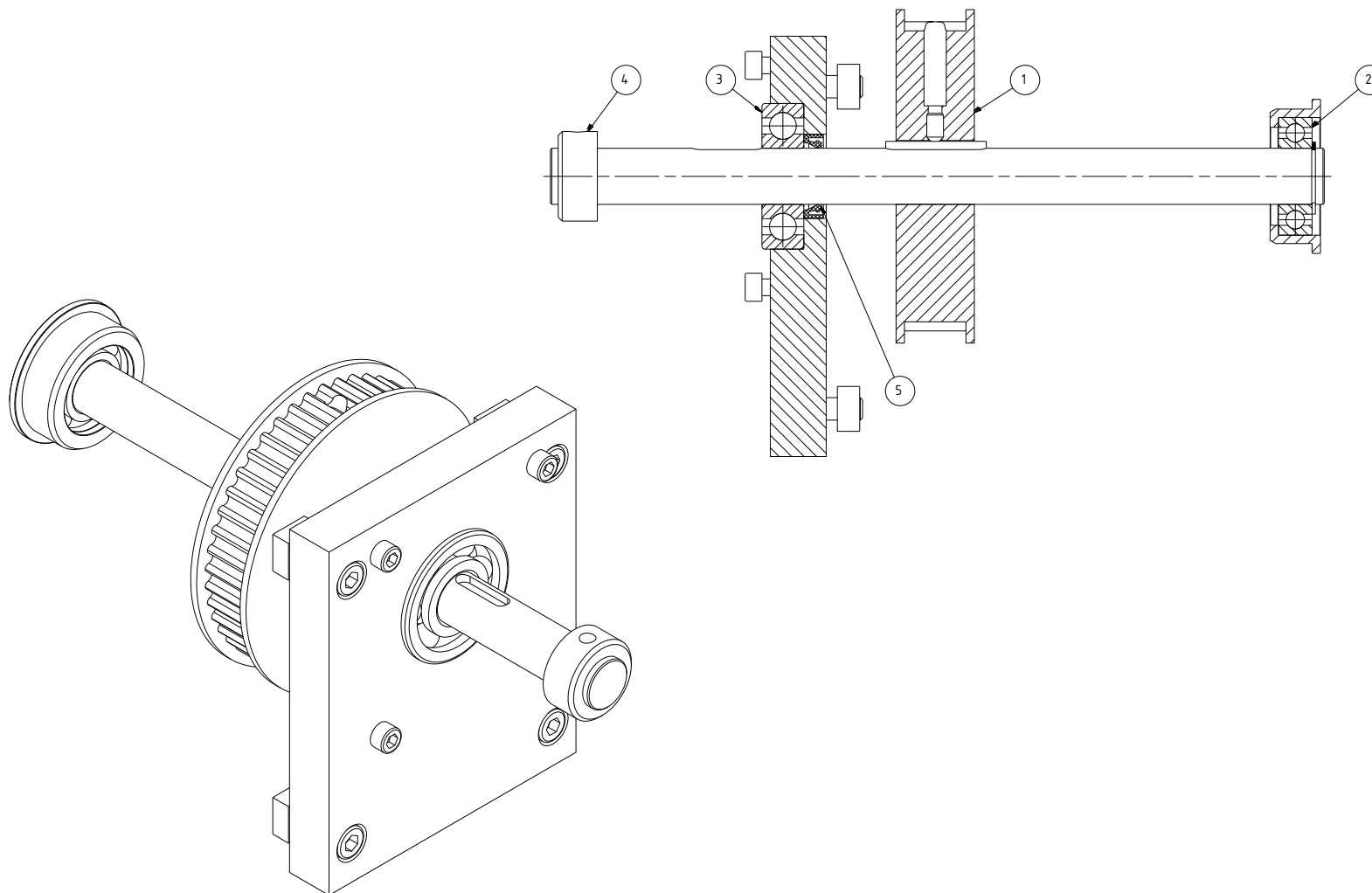
Antrieb / Drive

100099166

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

Lager vorne / Bearing front

100083689



Lager vorne / Bearing front

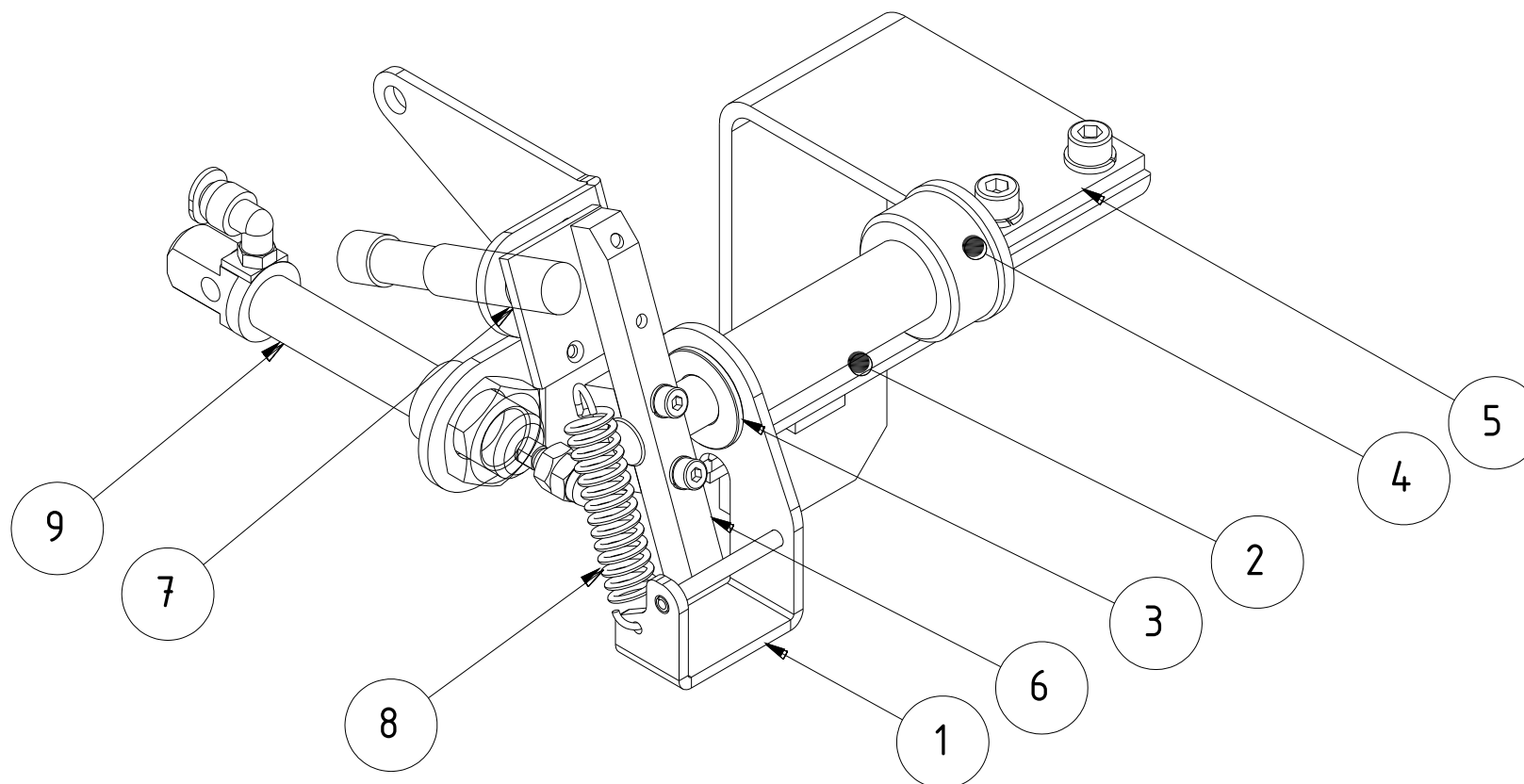
100083689

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

Anfahrschalter komplett / Starting switch complete

Variante / Variant A;D: 100102199

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



Anfahrschalter komplett / Starting switch complete

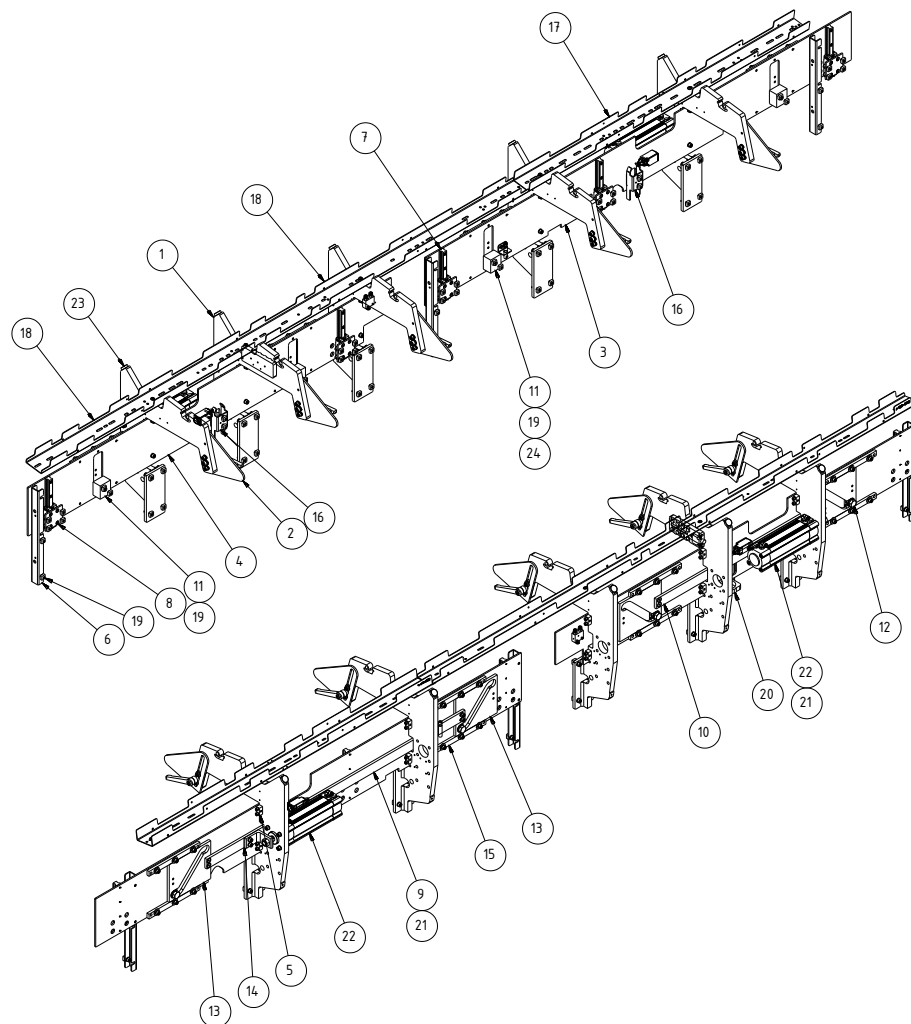
Variante / Variant A;D: 100102199

Variante / Variant B;C: 100102266

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

Kanalöffner / Channel opener

Zeichnung Variante / Drawing Variant A;D

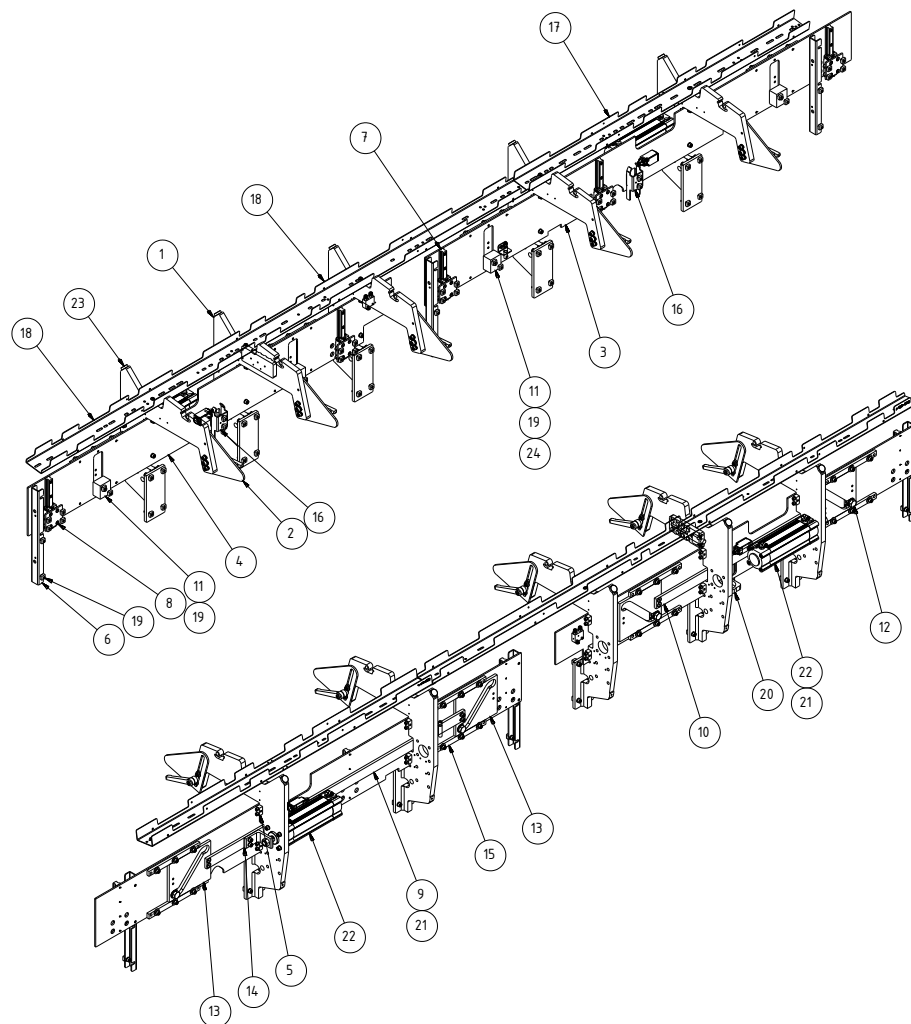


Kanalöffner / Channel opener

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

Kanalöffner / Channel opener

Zeichnung Variante / Drawing Variant A;D

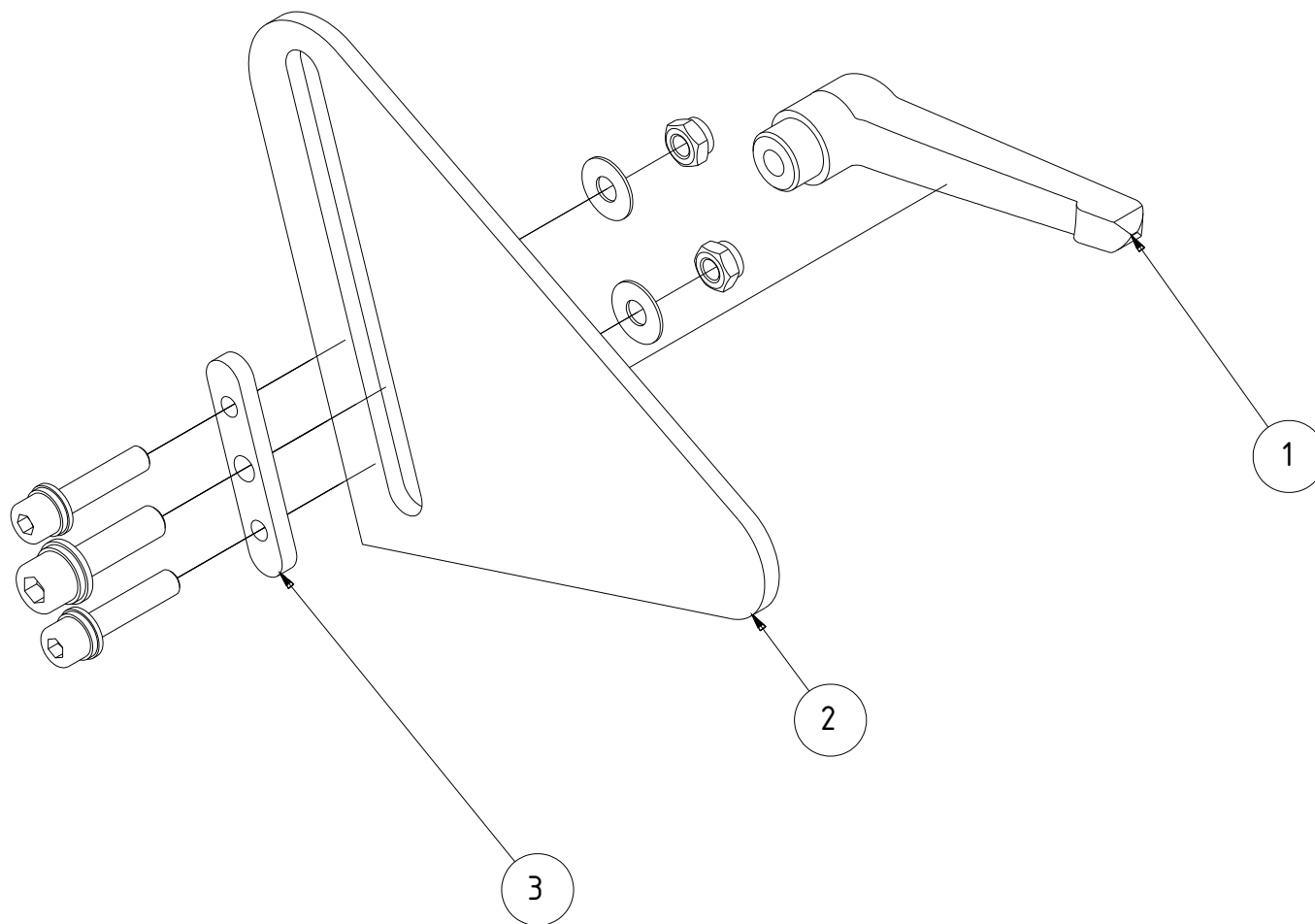


Kanalöffner / Channel opener

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

Niederhalter / Holding-down device

100092717



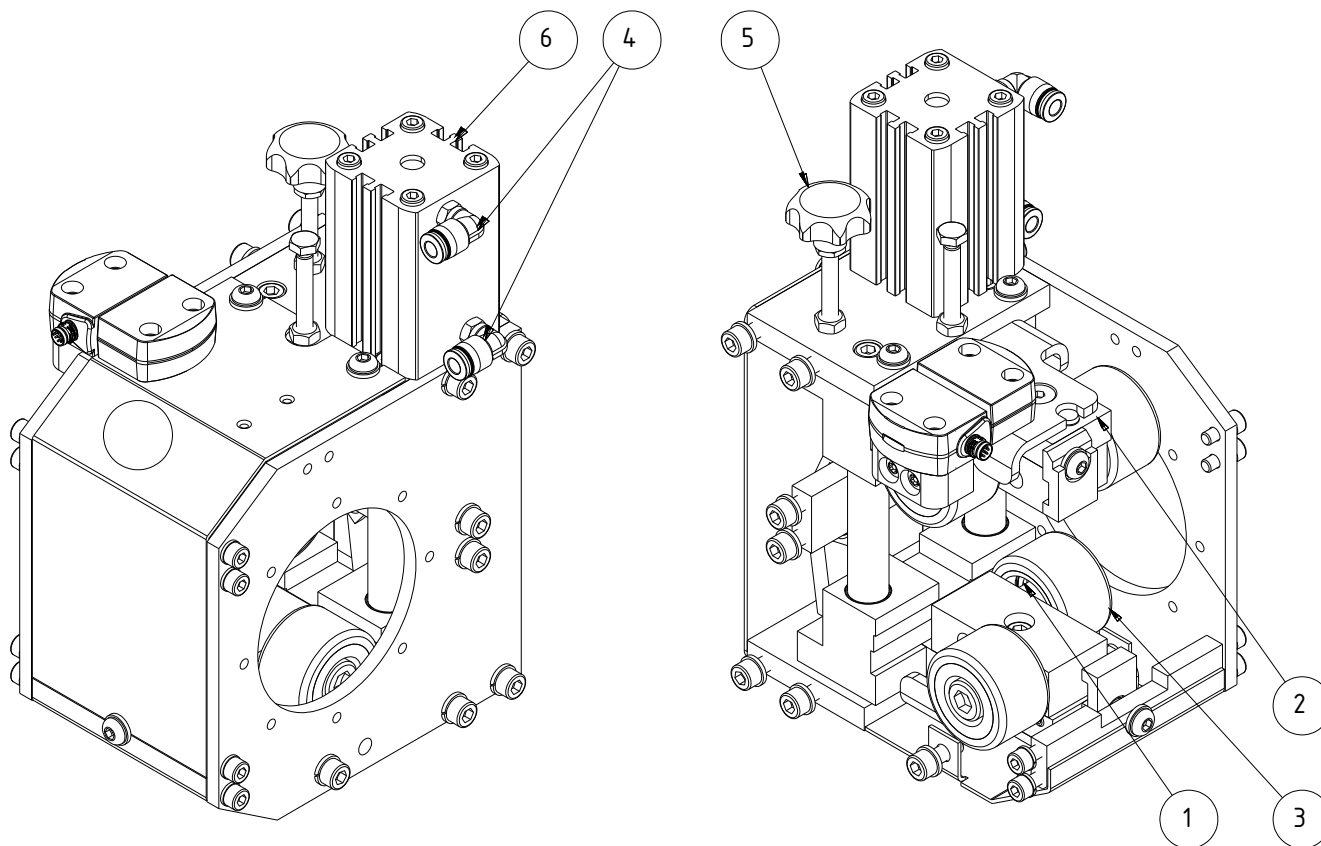
Niederhalter / Holding-down device

100092717

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

Lünette D 45 Spindelstock / Steady D 45 spindle stock

100092794 (Abbildung Variante A;D / Drawing variant A;D)



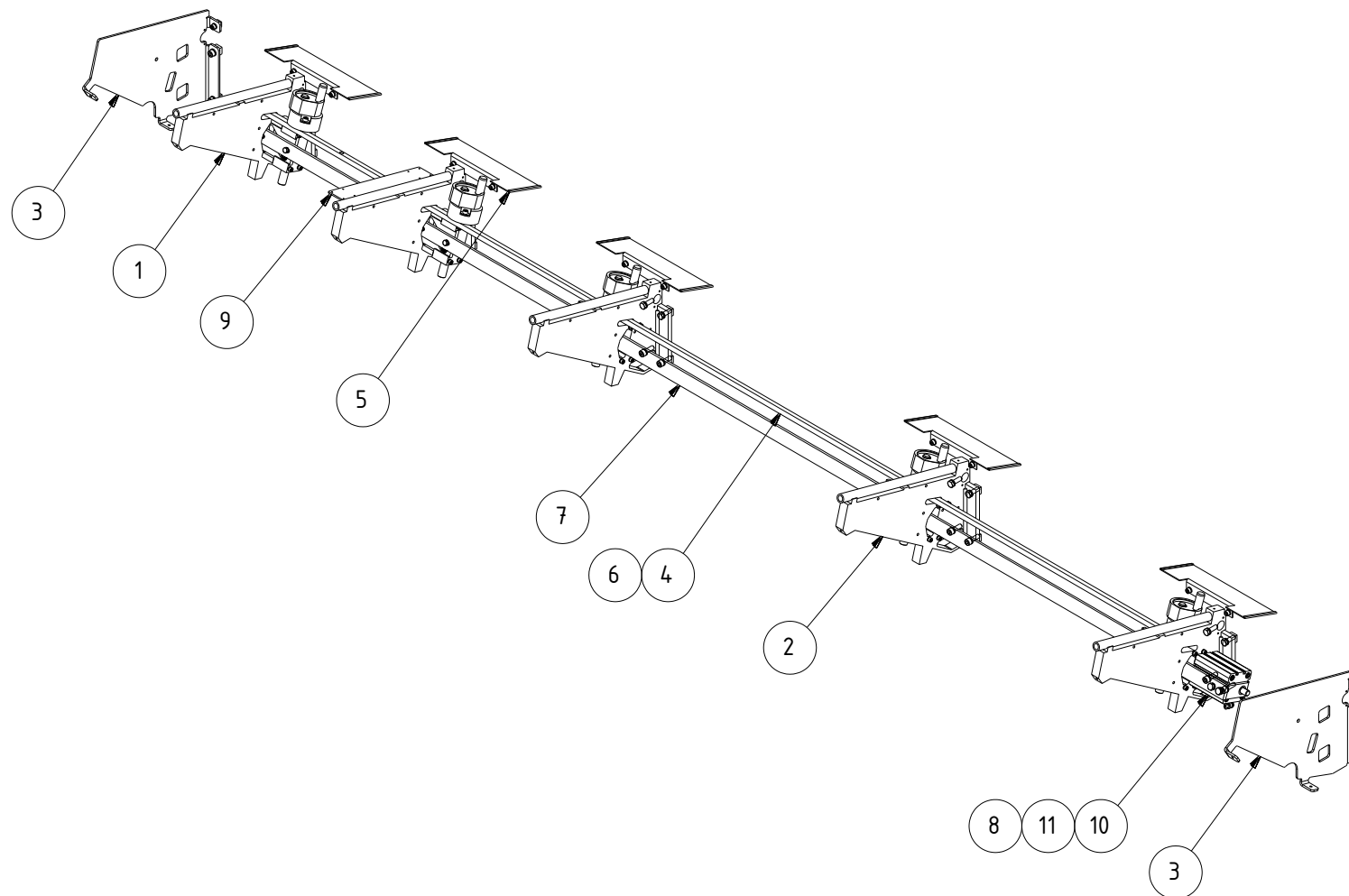
Lünette D 45 Spindelstock / Steady D 45 spindle stock

100092794

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

Seitliche Materialauflage / Lateral material storage

Zeichnung Variante / Drawing Variant A;D



Seitliche Materialauflage / Lateral material storage

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

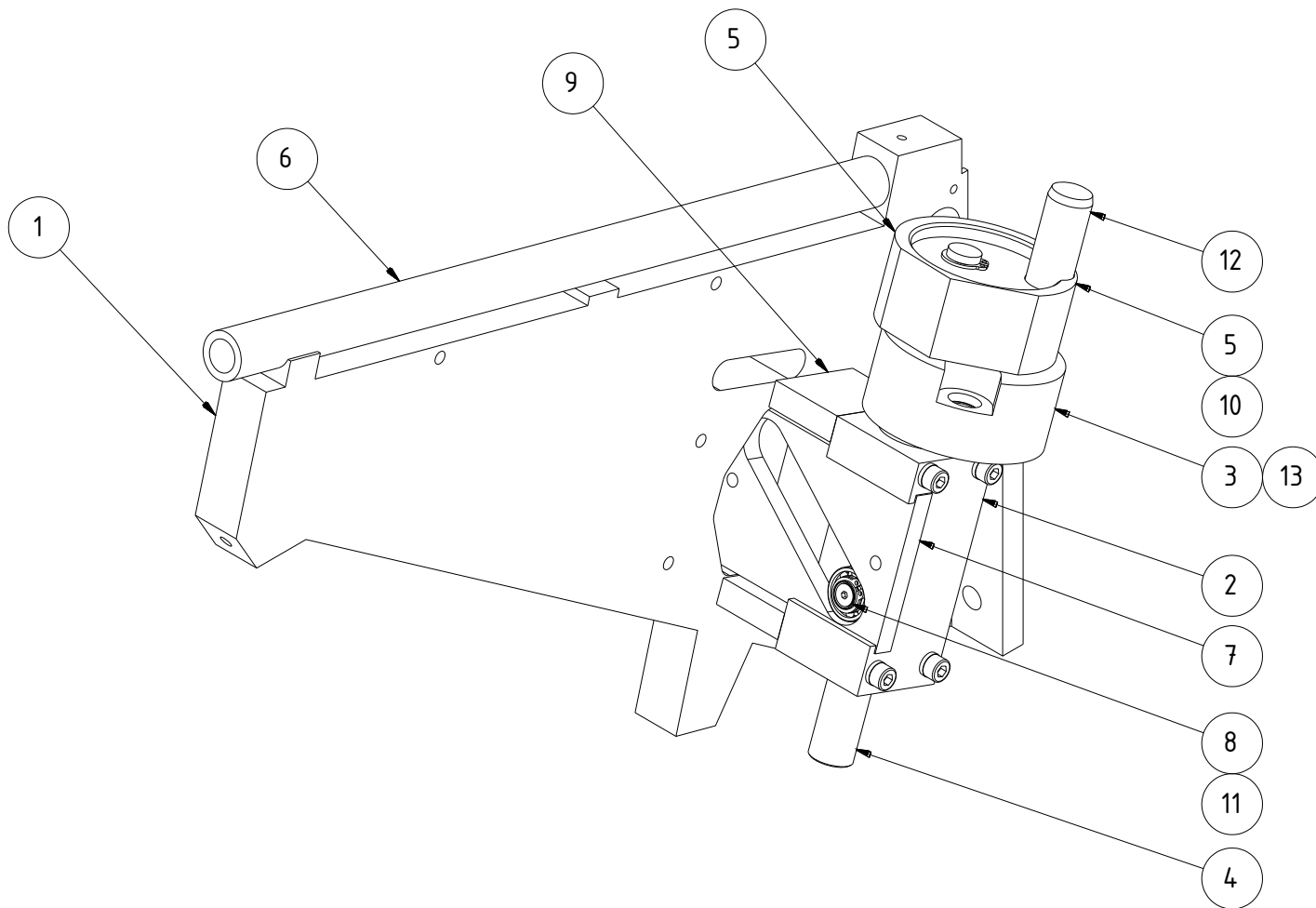
Auflagebock / Bearing support

Variante / Variant A;D rechts: 100100223 (Zeichnung/Drawing)

Variante / Variant B;C right: 100102100

Variante / Variant A;D links: 100100225

Variante / Variant B;C left: 100102102



Auflagebock / Bearing support

Variante / Variant A;D rechts: 100100223

Variante / Variant B;C right: 100102100

Variante / Variant A;D links: 100100225

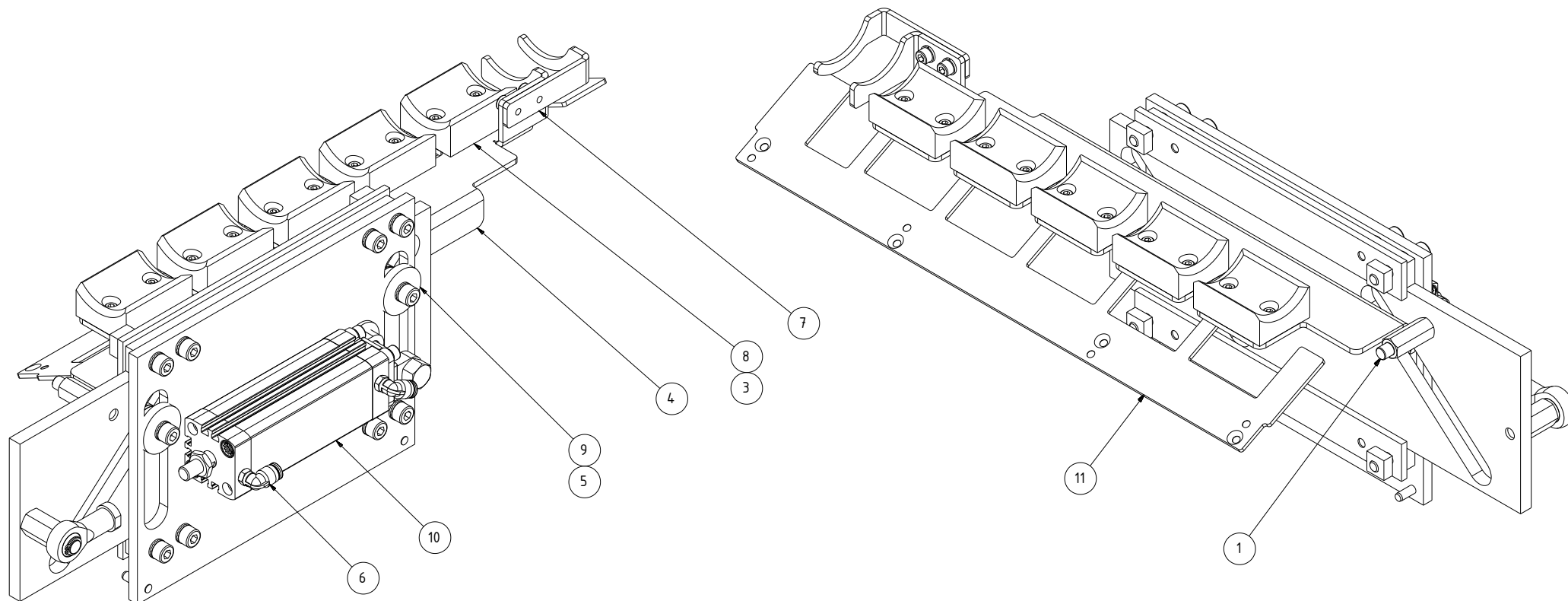
Variante / Variant B;C left: 100102102

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

Reststückklappe / Remnant flap

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

Variante / Variant B;C: 100102048



Reststückklappe / Remnant flap

Variante / Variant A;D: 100100555

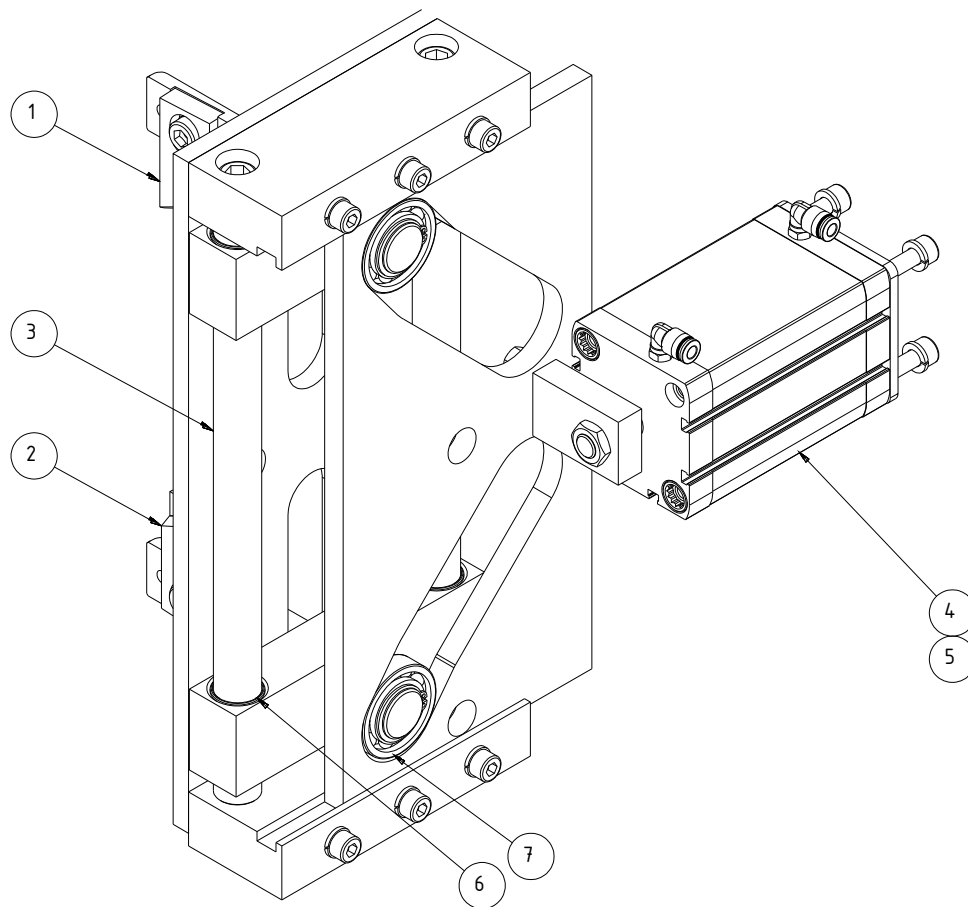
Variante / Variant B;C: 100102048

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

Greifer / Gripper

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

Variante / Variant B;C: 100102040



Greifer / Gripper

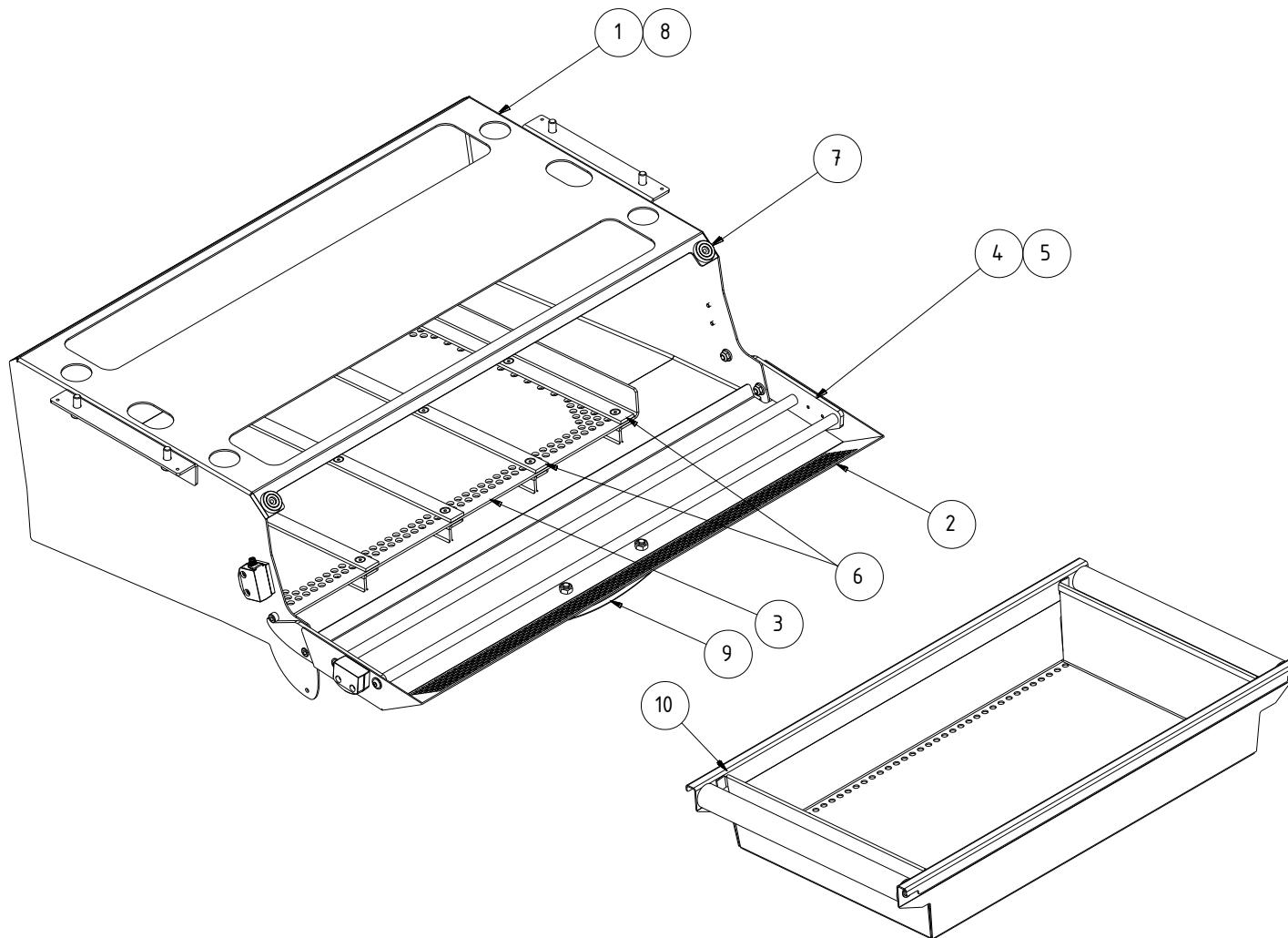
Variante / Variant A;D: 100098615

Variante / Variant B;C: 100102040

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

Reststückbehälter / Remnant bin

100103617



Reststückbehälter / Remnant bin

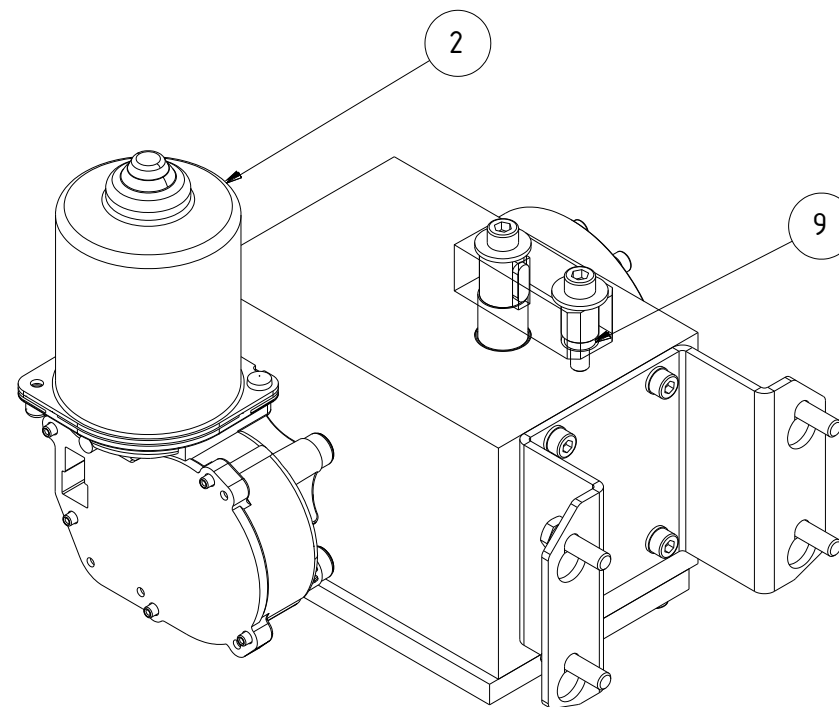
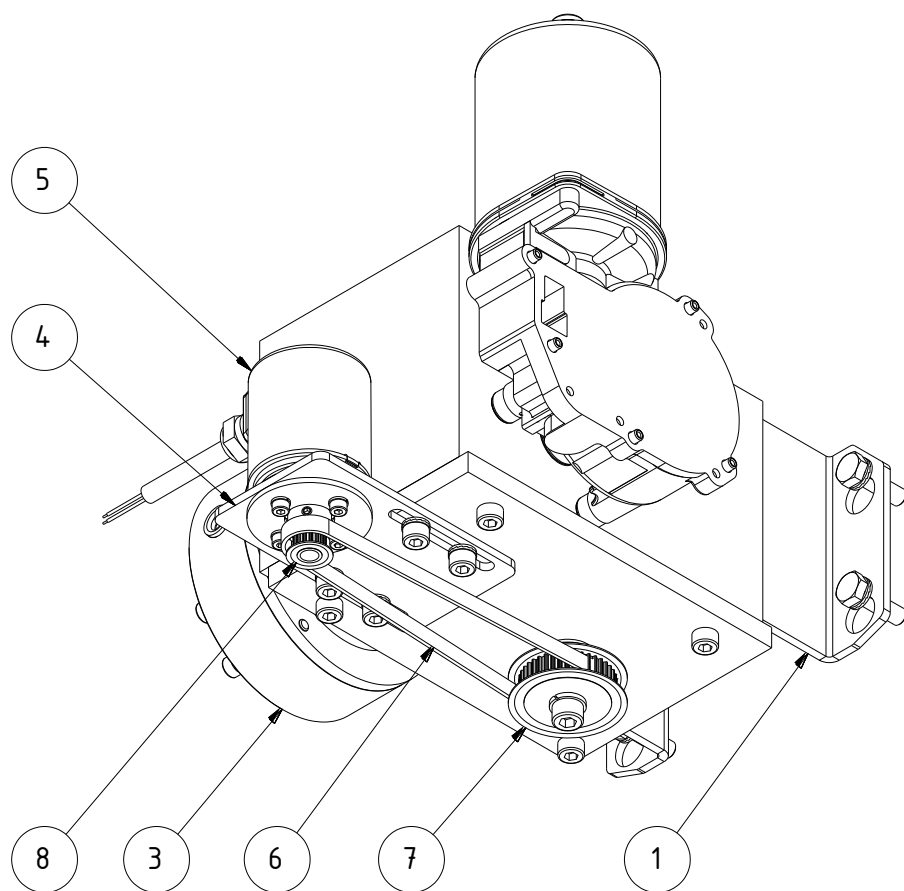
100103617

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

Vereinzelungsautomatik / Automatic separation

Variante / Variant A;D: 100100228 (Zeichnung/Drawing)

Variante / Variant B;C: 100102350



Vereinzelungsautomatik / Automatic separation

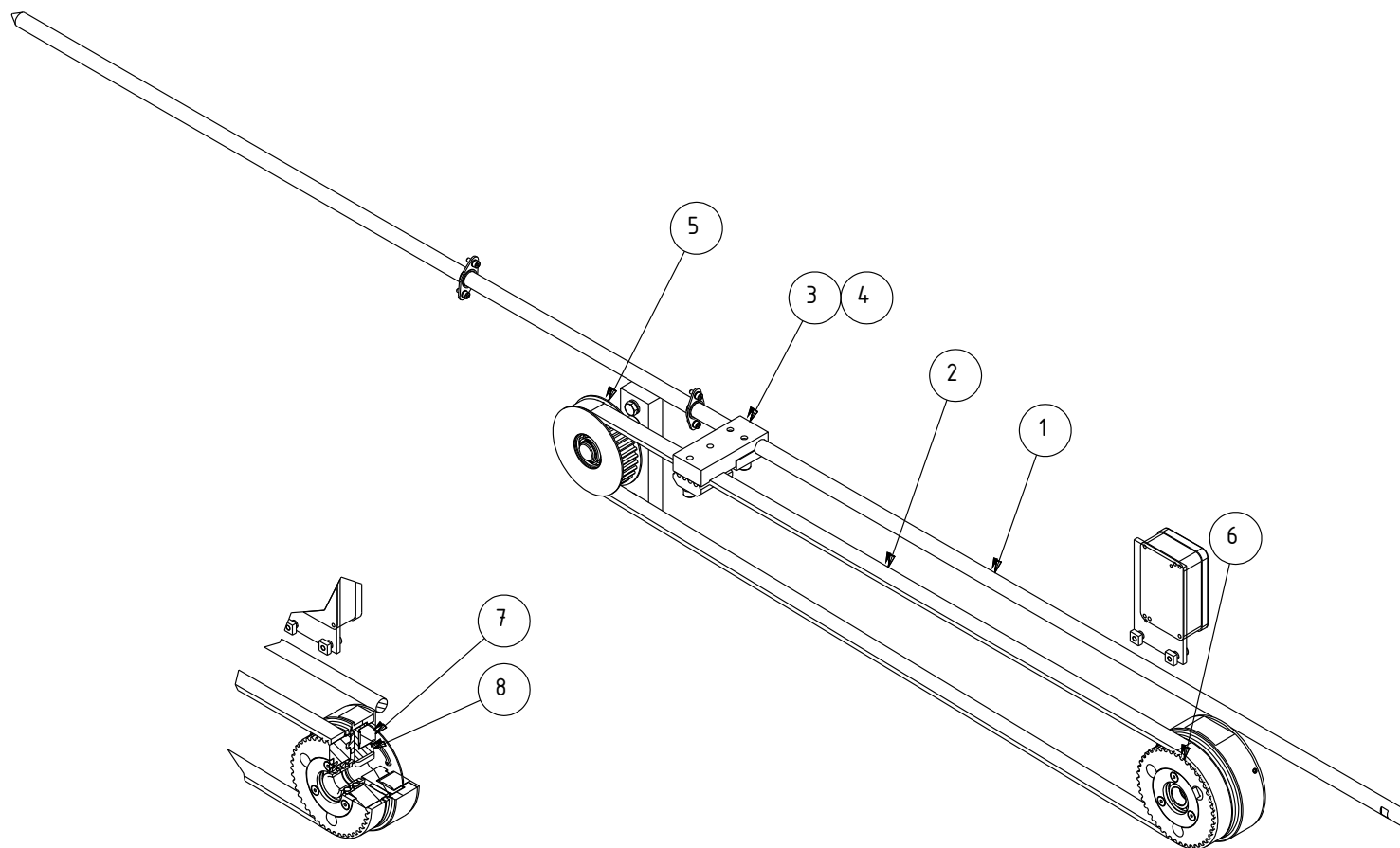
Variante / Variant A;D: 100100228

Variante / Variant B;C: 100102350

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100101253	Halteblech	Retaining plate	
2	2056-305	Gleichstrom Motor	Motor	
3	2080-358	Federkraftbremse	Spring-applied brake size	
4	100100256	Drehgeberaufnahme	Encoder attachment	
5	200008298	Drehgeber	Encoder	
6	100087603	Zahnriemen	Toothed belt	
7	100093063	Zahnscheibe	Toothed disk	
8	100090388	Zahnscheibe	Toothed disk	
9	100100328	Laufhülse	Barrel sleeve	

Synchroneinrichtung / Synchronized device

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



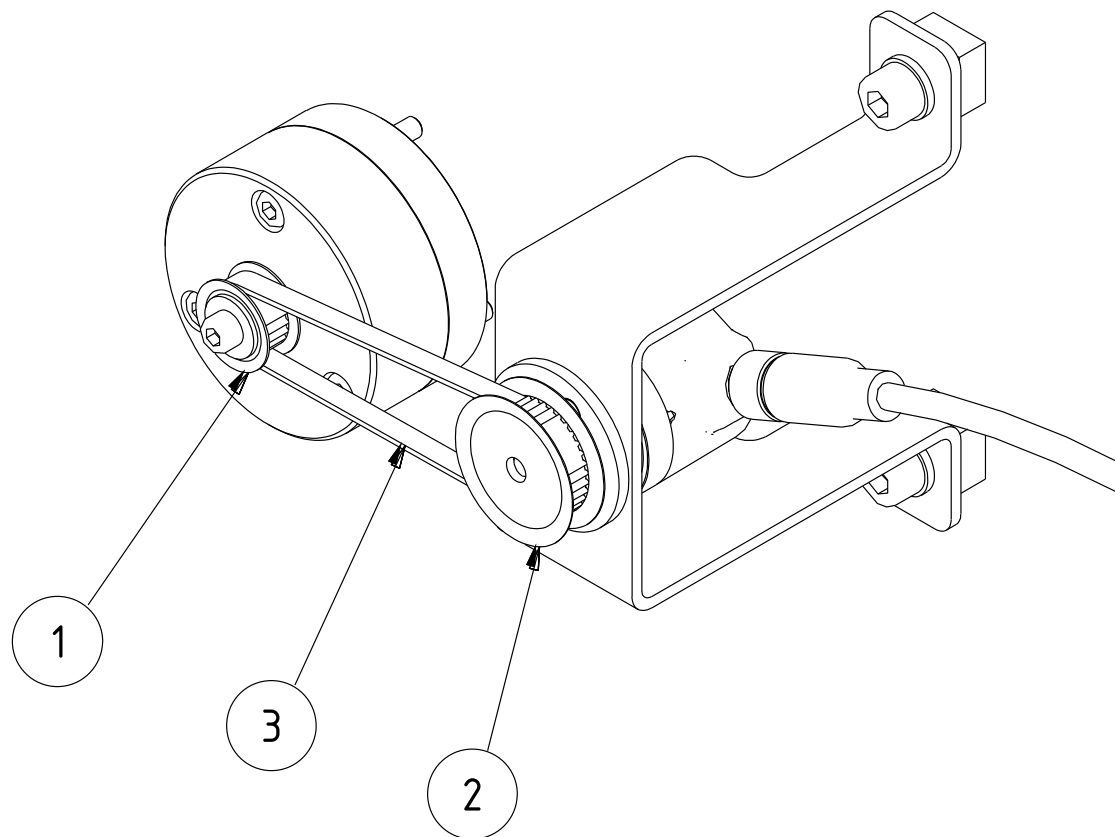
Synchroneinrichtung / Synchronized device

100087352 Hub/stroke 600

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

Sensor Synchronisierung / Sensor Synchronized device

100103782



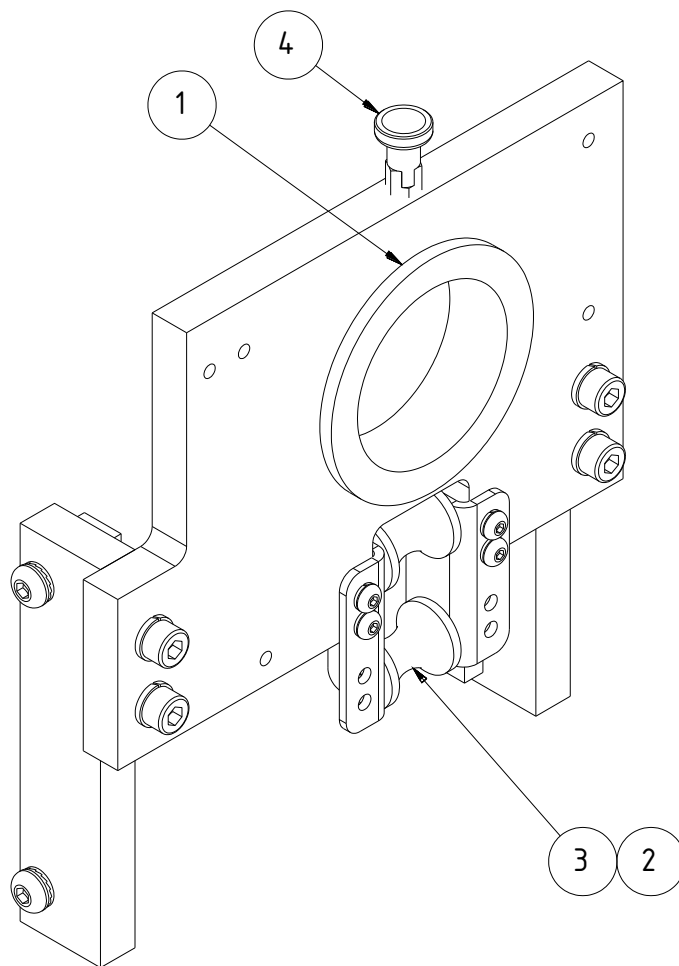
Sensor Synchroneinrichtung / Sensor Synchronized device

100103782

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

Abstützung Führungsmodul / Support guide module

100101538



Abstützung Führungsmodul / Support guide module

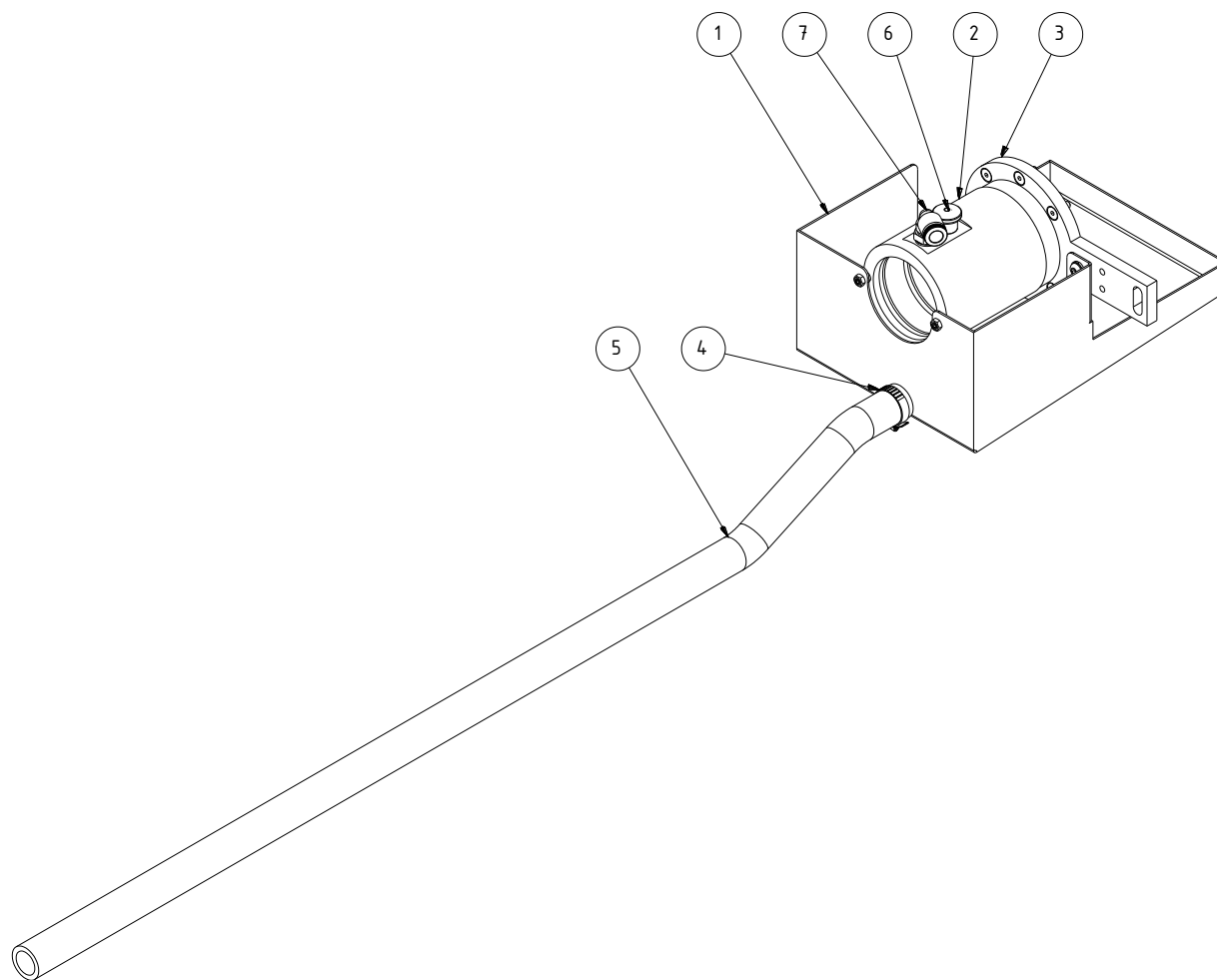
100101538

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

Adapterset / Adapter set

Variante / Variant A;D: 100088605

Variante / Variant B;C: 100104267



Adapterset / Adapter set

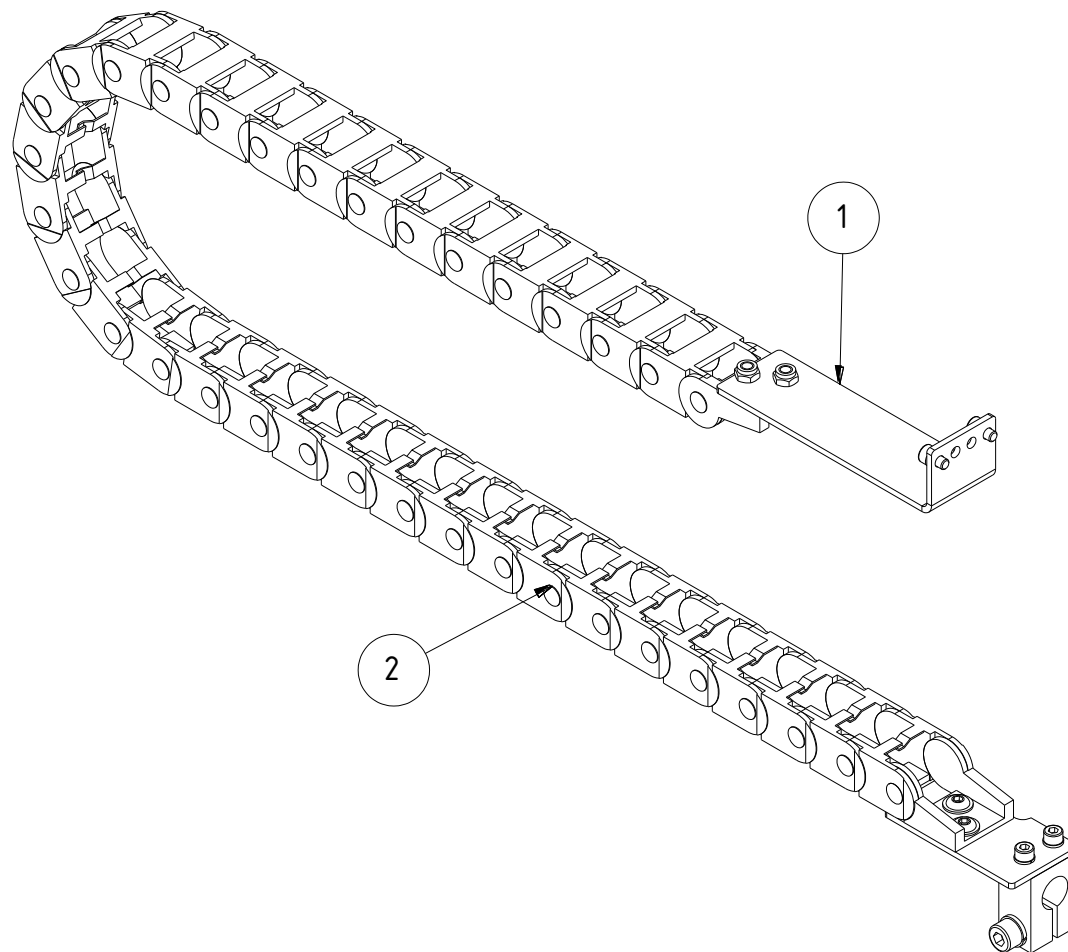
Variante / Variant A;D: 100088605

Variante / Variant B;C: 100104267

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

Energiekette kpl. / Energy chain, complete

100101544



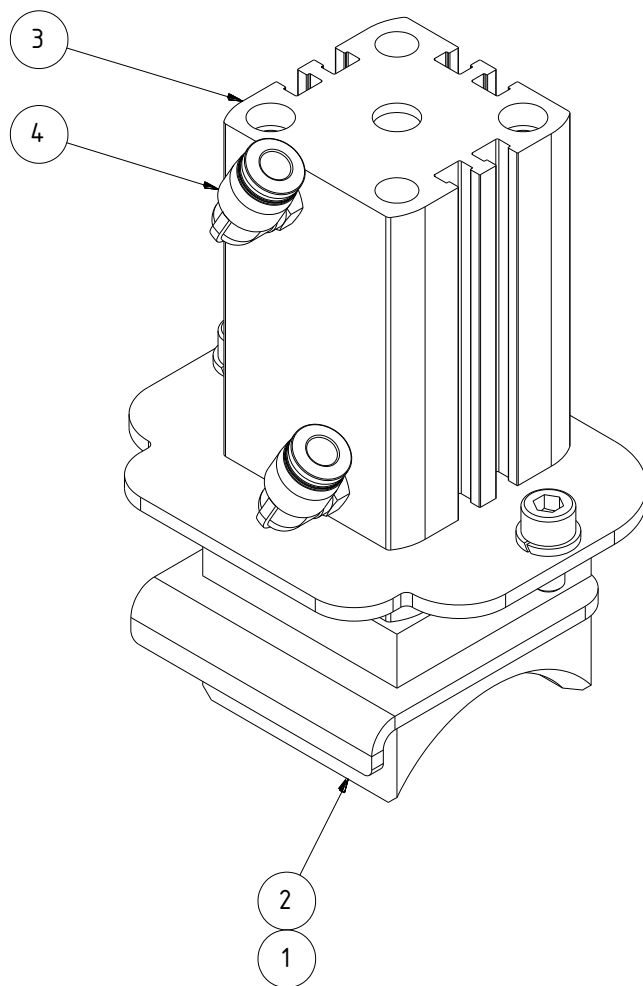
Energiekette kpl. / Energy chain, complete

100101544

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

Hubeinrichtung DurchmesserEinstellung, oben / Lifting device diameter setting, top

100103486



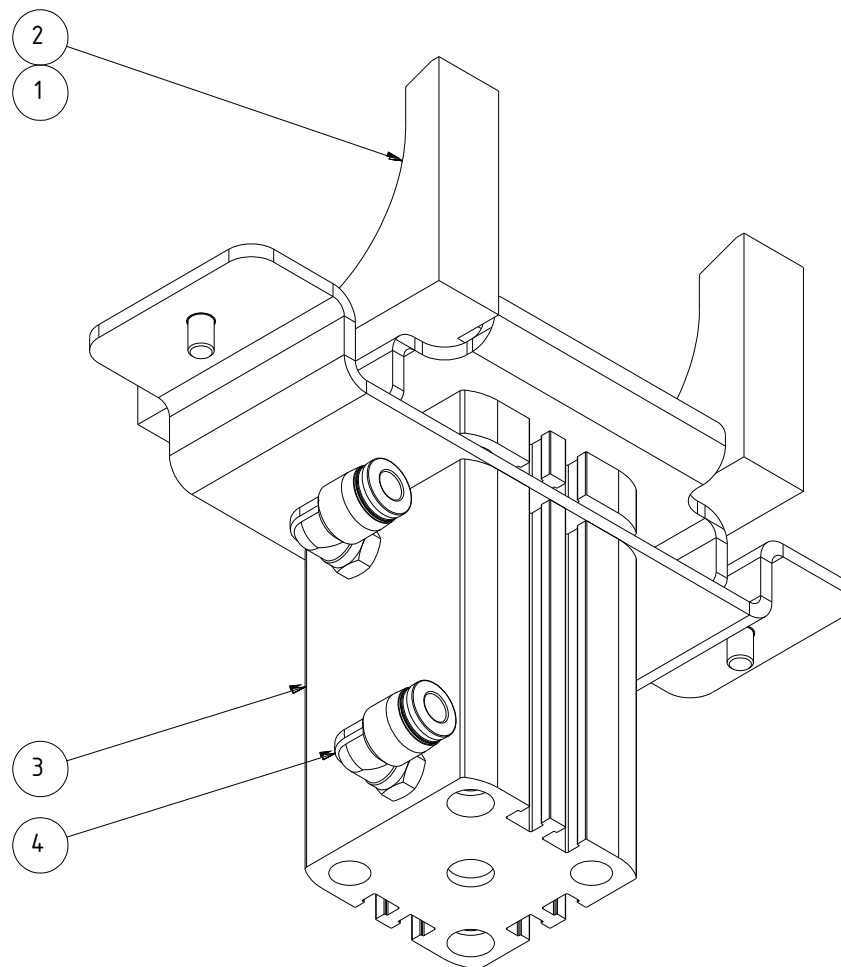
Hubeinrichtung DurchmesserEinstellung, oben / Lifting device diameter setting, top

100103486

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100092320	Klemmbuchse für Einlage	Clamping bush for insert	
2	100086988	Einlage D55	Insert D55	
3	2059-002	Zylinder	Cylinder	
4	2038-346	Steckverschraubung	Plug-in screwing	

Hubeinrichtung DurchmesserEinstellung, unten / Lifting device diameter setting, bottom

100100220



Hubeinrichtung DurchmesserEinstellung, unten / Lifting device diameter setting, bottom

100100220

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100092320	Klemmbuchse für Einlage	Clamping bush for insert	
2	100087067	Einlage D55	Insert D55	
3	2059-002	Zylinder	Cylinder	
4	2038-346	Steckverschraubung	Plug-in screwing	

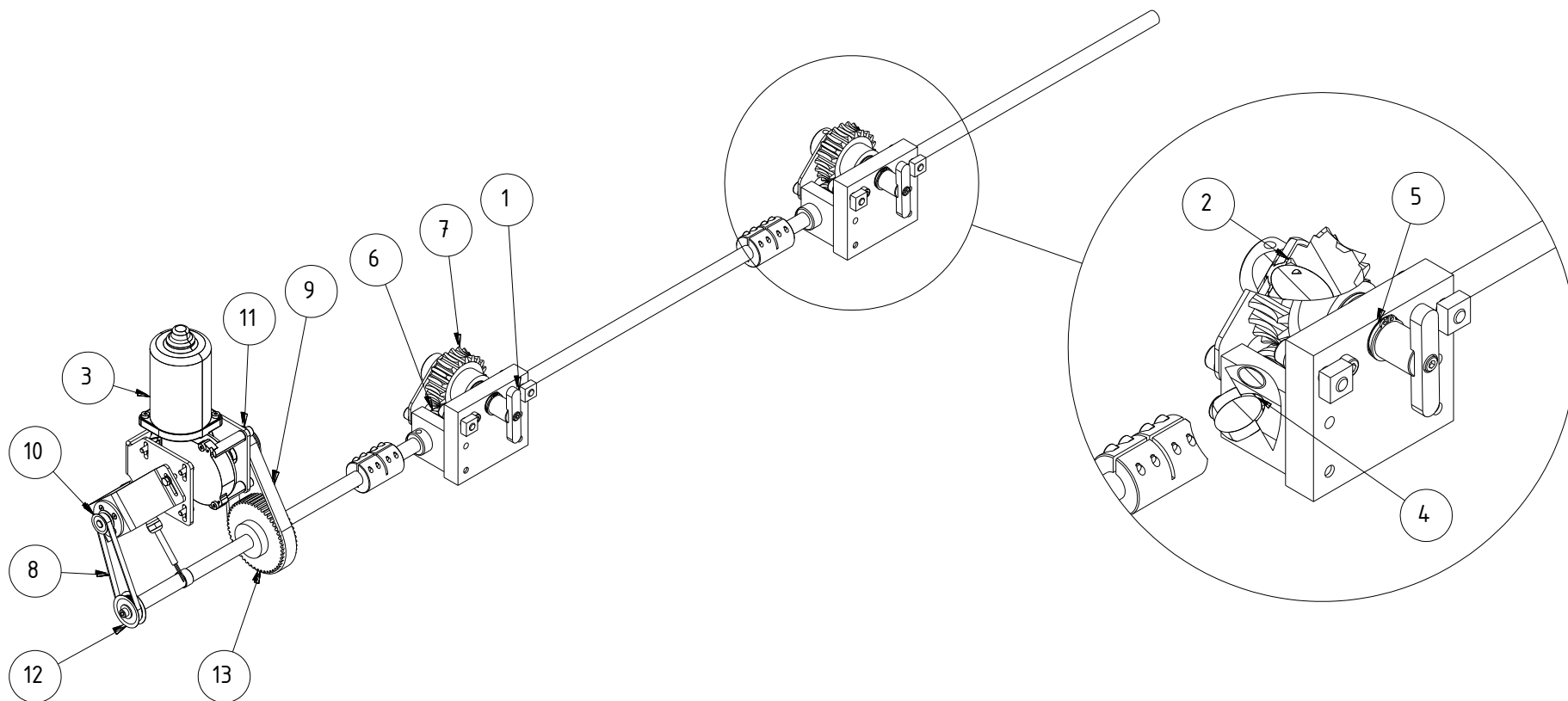
Stelleinheit / Adjusting unit

Variante / Variant 3200 A;D: 100101147 (Zeichnung/Drawing)

Variante / Variant 3200 B;C: 100104046

Variante / Variant 3800 A;D: 100104507

Variante / Variant 3800 B;C: 100104790



Stelleinheit / Adjusting unit

Variante / Variant 3200 A;D: 100101147

Variante / Variant 3200 B;C: 100104046

Variante / Variant 3800 A;D: 100104507

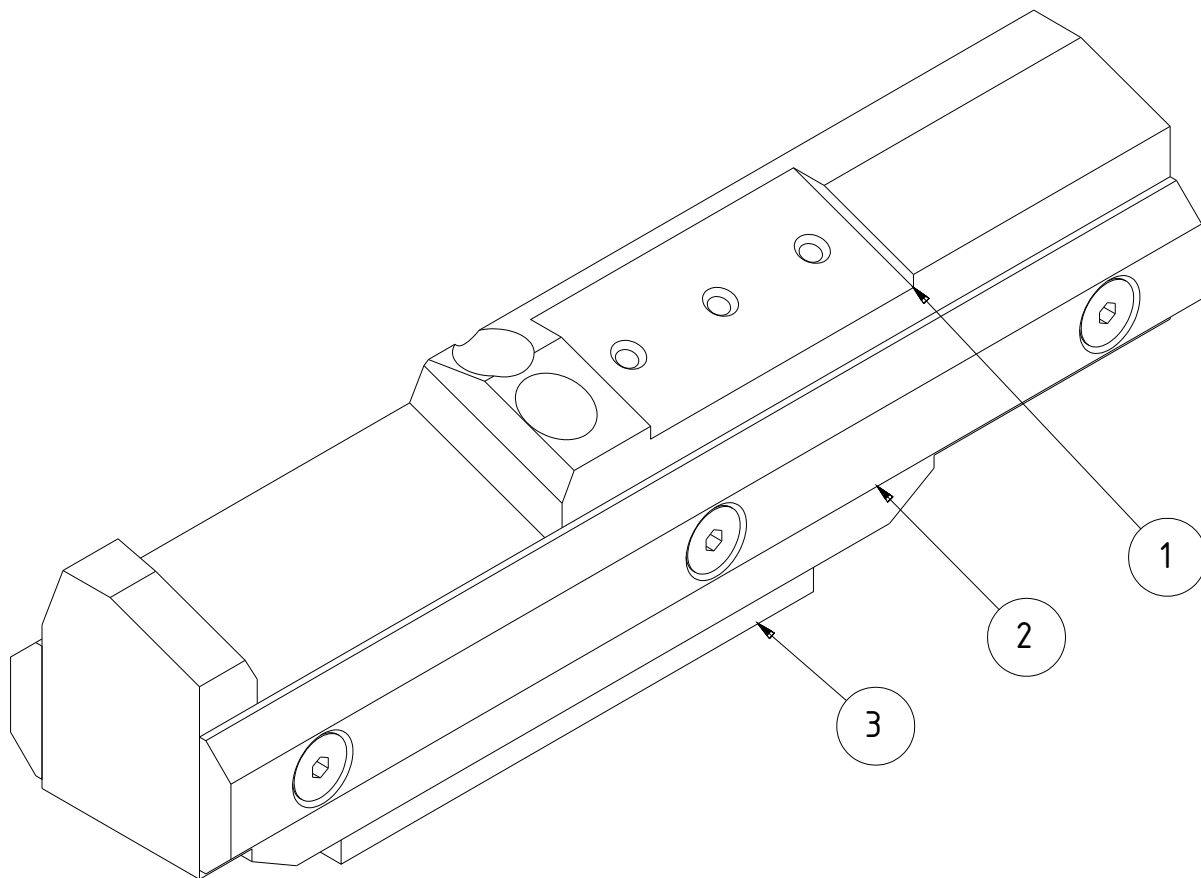
Variante / Variant 3800 B;C: 100104790

Pos. Item	Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
1	100099012	Anschlag	Stop	
2	2076-278	Clipslager	Clip bearing	
3	2031-758	Getriebemotor	Motor	
4	2036-707	Glycodurbuchse 15x17x10	Glycodur bush 15x17x10	
5	2002-033	Glycodurbuchse 20x23x20	Glycodur bush 20x23x20	
6	2079-547	Hohlschnecke D38	Hollow worm	
7	2079-854	Schneckenrad	Worm wheel	
8	100103255	Zahnriemen	Toothed belt	
9	2079-656	Zahnriemen	Toothed belt	
10	100103309	Zahnscheibe	Toothed disk	
11	100093070	Zahnscheibe	Toothed disk	
12	100103313	Zahnscheibe	Toothed disk	
13	100086939	Zahnscheibe	Toothed disk	

Schlitten kpl. / Carriage, complete

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

Variante / Variant B;C: 100102488



Schlitten kpl. / Carriage, complete

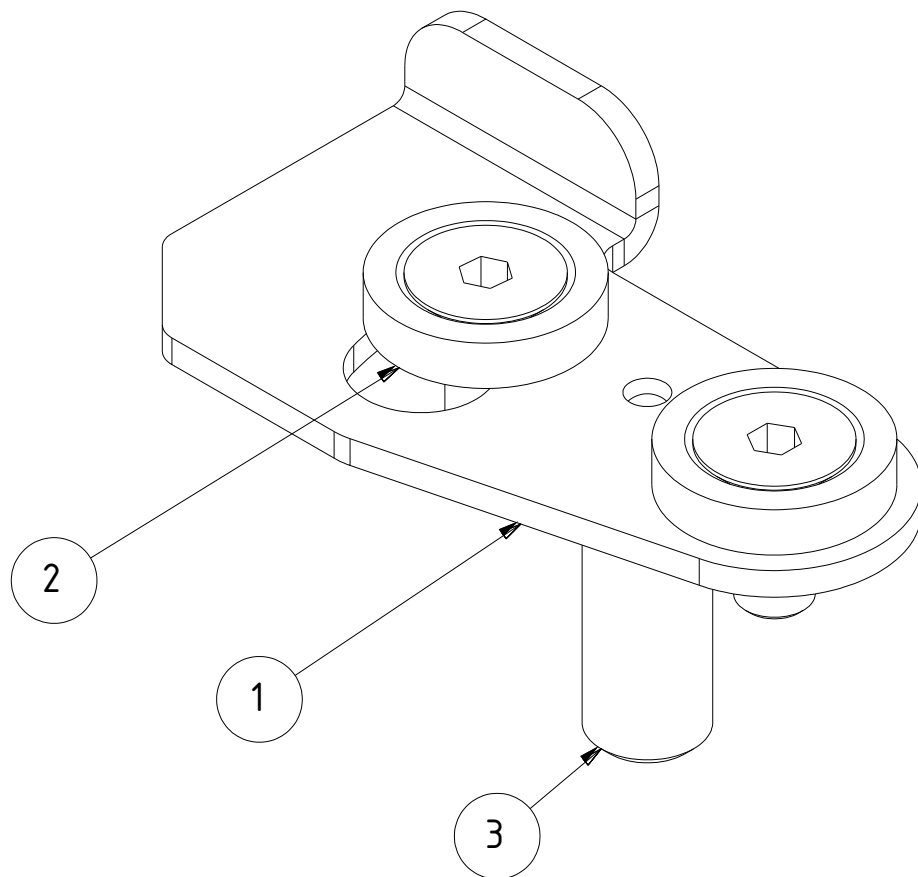
Variante / Variant A;D: 100103029

Variante / Variant B;C: 100102488

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

Einlagensicherung kpl. / Insert safety, complete

100103627



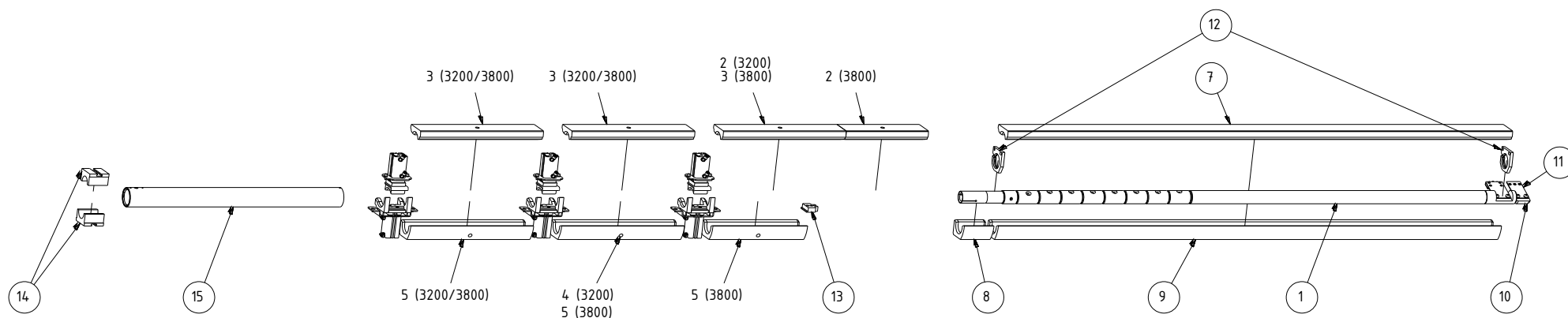
Einlagensicherung kpl. / Insert safety, complete

100103627

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

Umrüstsätze / Capacity adjustment sets

Abbildung / Drawing



***Hinweis:**

Die Materialführungen der Lünette (14) und das Führungsmodul (15) sind ebenfalls durchmesserabhängig. Diese sind nicht im Umrüstsatz enthalten und müssen separat bestellt werden.

***Note:**

The guide jaws (14) and the guide module (15) are also diameter-dependent. These are not included in the capacity adjustment set and must be ordered separately.

Umrüstsätze / Capacity adjustment sets

Pos.	Bezeichnung Designation
1	Vorschubstange Pusher
2	Einlage vorne oben 300 Insert front top 300
3	Einlage vorne oben 448 Insert front top 448
4	Einlage vorne unten 448 Insert front bottom 448
5	Einlage vorne unten 448 Insert front bottom 448
6	Einlage vorne unten 448 Insert front bottom 448
7	Einlage hinten oben 1840 Insert rear top 1840
8	Einlage hinten unten 108 Insert rear bottom 108

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

***Hinweis:**

Die Materialführungen der Lünette (14) und das Führungsmodul (15) sind ebenfalls durchmesserabhängig. Diese sind nicht im Umrüstsatz enthalten und müssen separat bestellt werden.

***Note:**

The guide jaws (14) and the guide module (15) are also diameter-dependent. These are not included in the capacity adjustment set and must be ordered separately.

Umrüstsätze 1900 / Capacity adjustment sets 1900

Umrüstsatz komplett Capacity adjustment set complete	3200	3800
D10/1900	200011623	200012307
D15/1900	200011627	200012309
D18/1900	200011631	200012311
D20/1900	200011633	200012312
D22/1900	200011635	200012313
D25/1900	200011637	200012314
D28/1900	200011641	200012317
D30/1900	200011643	200012319
D32/1900	200011645	200012320
D34/1900	200011647	200012321
D36/1900	200011649	200012322
D38/1900	200012741	200012743
D40/1900	200011651	200012323
D42/1900	200011653	200012324
D44/1900	200011621	200012325
D44//40/1900	200012451	200012452
D45/1900	200011657	200012326

Materialführungen / Material guide jaws

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

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

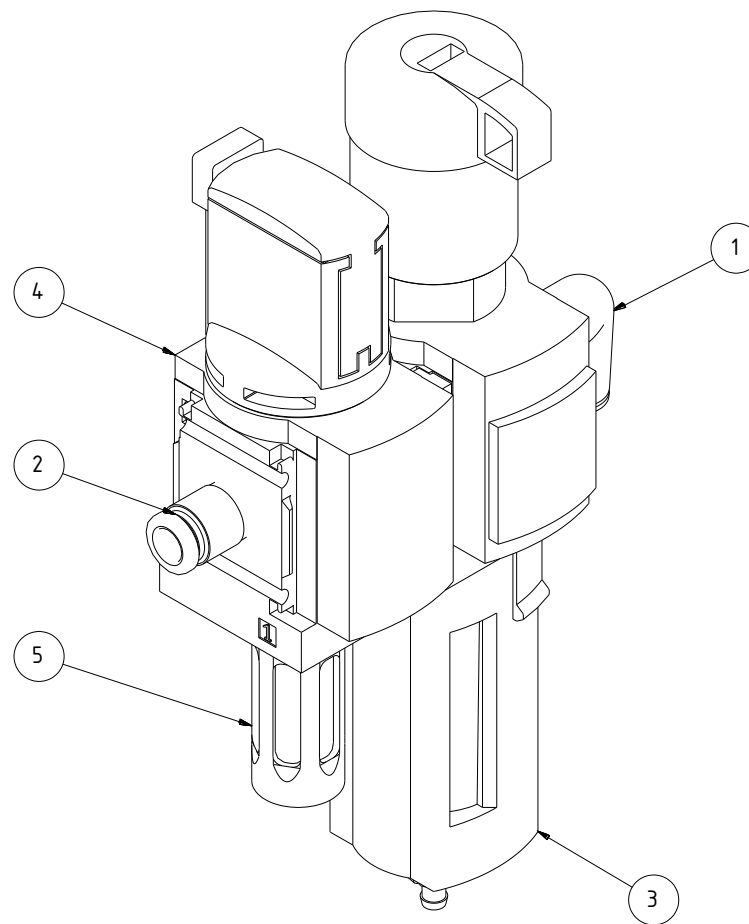
Führungsmodul / Guide module

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

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

Wartungseinheit / Maintenance unit

200005229



Wartungseinheit / Maintenance unit

200005229

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

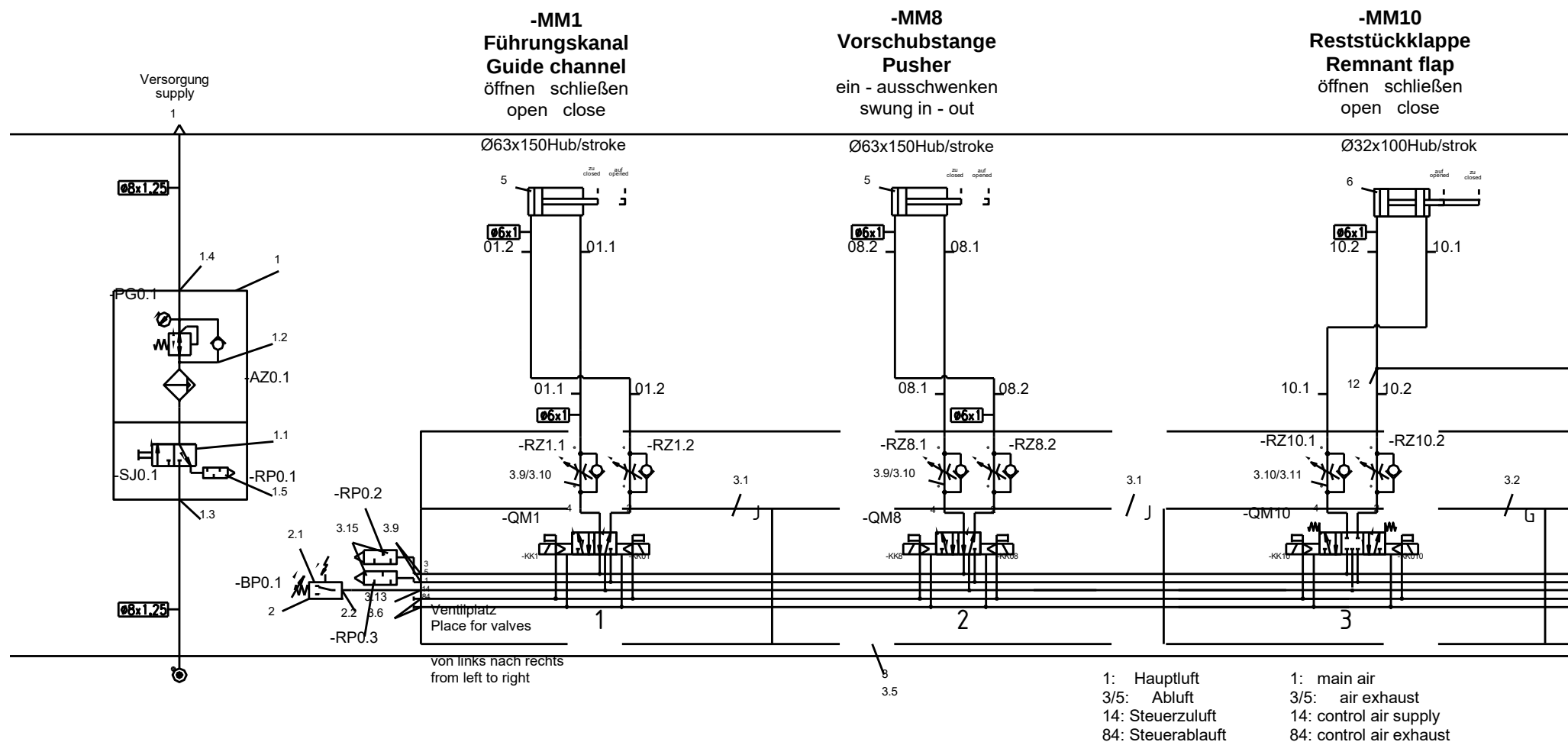
Pneumatikplan / Pneumatic diagram

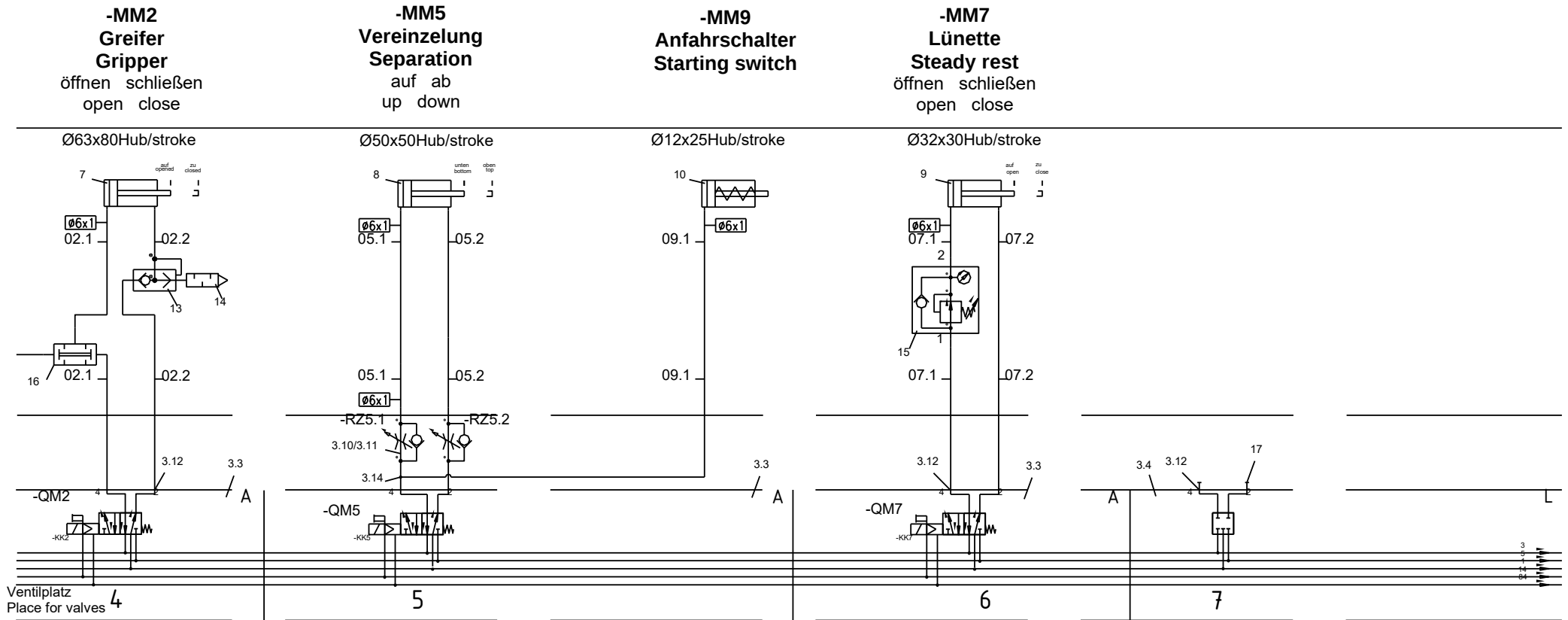
Betriebsmittelkennzeichnung / Equipment marking

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

Seite 1 / Page 1

100103395





von links nach rechts
from left to right

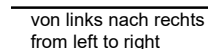
1: Hauptluft
3/5: Abluft
14: Steuerzuluft
84: Steuerabluft

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

-MM23

3 unten
ein / aus

3 bottom
on / off



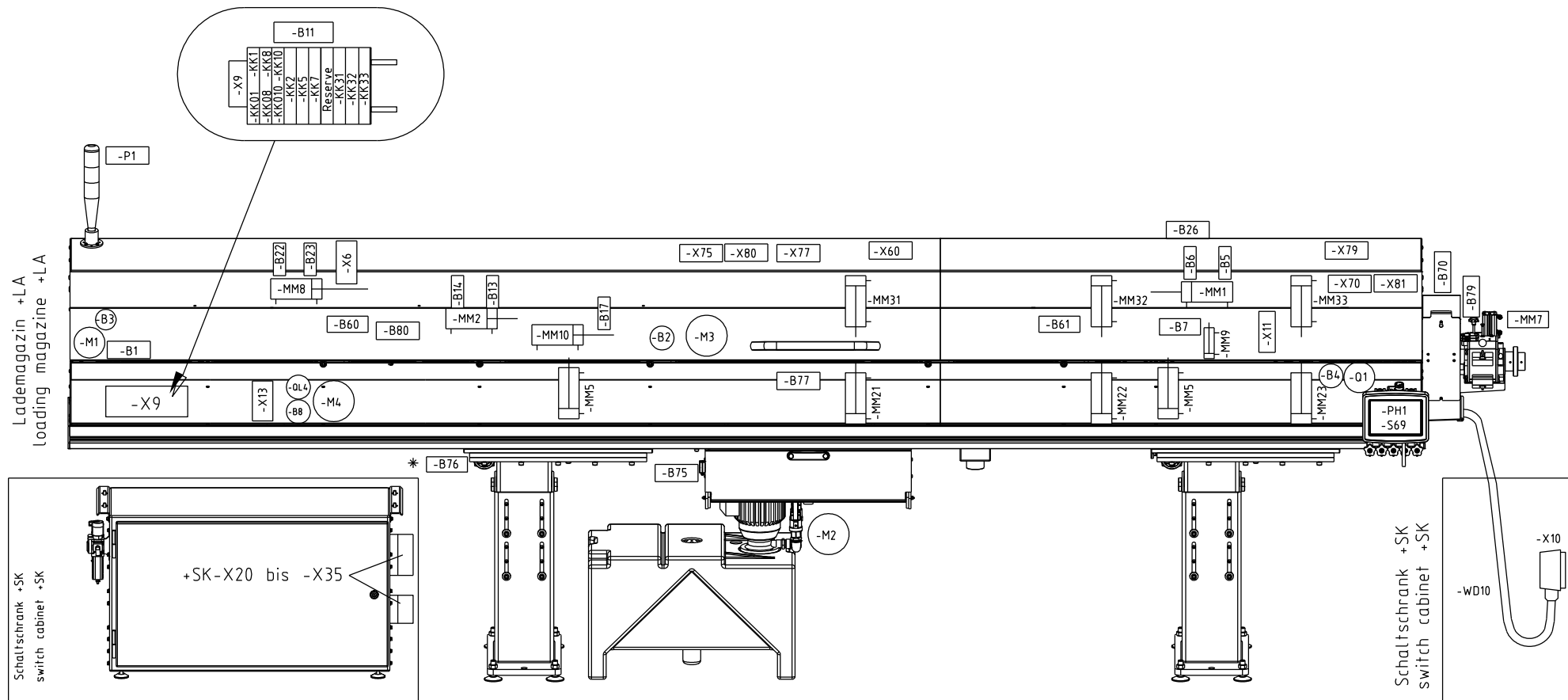
Pneumatikteile / Pneumatic parts

Pos. Item	Ident-Nr. Ident no	Bezeichnung/Typ	Designation/Type	
1		200005229	Wartungseinheit komplett	Maintenance unit complete
	1.1	200004160	Einschaltventil	Switch on valve
	1.2	2079-894	Filter-Regelventil	Filter-regulator valve
	1.3	2068-343	Steckverschraubung	Plug-in screwing
	1.4	2067-008	Steckverschraubung	Plug-in screwing
	1.5	2074-205	Schalldämpfer	Silencer
2		100049628	Druckschalter komplett	Pressure switch complete
	2.1	2058-325	Druckschalter	Pressure switch
	2.2	2068-343	Steckverschraubung	Plug-in screwing
3		100104487	Ventilinsel 10-fach	Valve terminal 10-fold
	3.1	100094151	Magnetventil 5/2	Solenoid valve 5/2
	3.2	100042337	Magnetventil 5/3	Solenoid valve 5/3
	3.3	2080-203	Magnetventil 5/2	Solenoid valve 5/2
	3.4	2079-423	Abdeckplatte	Cover plate
	3.5	2080-204	Schilderträger	Label holder
	3.6	2079-425	Blindstopfen	Filler plug
	3.7	2080-293	Schalldämpfer	Silencer
	3.8	100024932	Steckverschraubung	Plug-in screwing
	3.9	100008518	L-Verschraubung	L-screwing
	3.10	2057-797	Drosselrückschlagventil	One-way restrictor
	3.11	2080-257	Dichtscheibe	Sealind disk
	3.12	2057-833	Steckverschraubung	Plug-in screwing
	3.13	2068-343	Steckverschraubung	Plug-in screwing
	3.14	2057-830	Steckverschraubung	Plug-in screwing
	3.15	2001-420	Schalldämpfer	Silencer

Pneumatikteile / Pneumatic parts

Pos. Item	Ident-Nr. Ident no	Bezeichnung/Typ	Designation/Type	
4		100048698	Entlüftung komplett	Venting complete
	4.1	100047929	Halteblech für Absperrventil	Retaining plate for Shut-off valve
	4.2	100046626	Absperrventil	Shut-off valve
	4.3	2049-120	Steckverbindung	Plug-in connector
	4.4	2058-876	Steckhülse	Plug-in sleeve
	4.5	2057-799	Steckverbindung	Plug-in connector
5		100092747	Zylinder (Führungskanal / Vorschubstange)	Cylinder (Führungskanal / Pusher) -MM1;-MM8
6		100087497	Zylinder (Reststückklappe)	Cylinder (Remnant flap) -MM10
7		2075-985	Zylinder (Greifer)	Cylinder (Gripper) -MM2
8		100081629	Zylinder (Vereinzelung)	Cylinder (Separation) -MM5
9		2055-066	Zylinder (Lünette)	Cylinder (Steady rest) -MM7
10		2030-646	Zylinder (Anfahrsschalter)	Cylinder (Starting switch) -MM9
11		2059-002	Zylinder (Hubeinrichtung)	Cylinder (Lifting device) -MM31-33 -MM21-23
12		2038-351	Steckverbindung	Plug-in connector
13		2039-716	Schnellentlüftung	Quick venting
14		2041-980	Schalldämpfer	Silencer
15		2040-874	Druckregelventil	Pressure regulator
16		200012077	UND-Glied	AND gate
17		2052-644	Blindstopfen	Filler plug

Elektroteile / Electrical parts
Lademagazin / Loading magazine



* Option

Elektroteile / Electrical spare parts
Lademagazin / Loading magazine

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

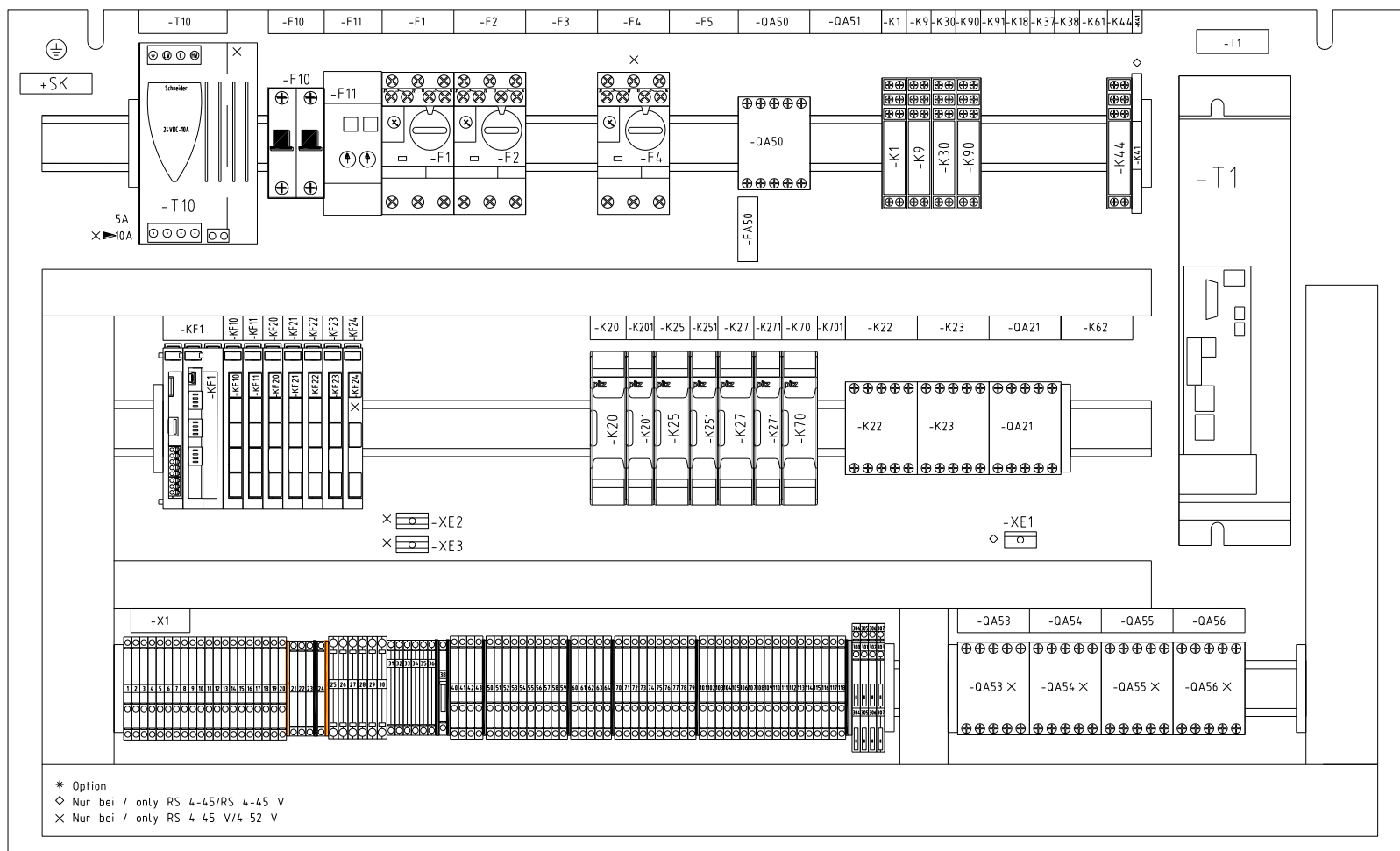
Lademagazin / Loading magazine

Ident-Nr. Ident. No.	Bezeichnung	Designation	Kommentar Remarks
2070-052	Drehgeber	Encoder	-B4,-B8
200008298	Drehgeber	Encoder	-B2
1099-051	Magnetkupplung Gr. 10	Electro magnetic clutch size 10	-Q1
2056-305	Gleichstrom Motor	Motor	-M4
2031-758	Getriebemotor	Motor	-M3
2080-358	Federkraftbremse Gr.06	Spring-applied brake size 06	-QL4

Elektroteile / Electrical spare parts

Schalttafel / Switch board

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



Elektroteile / Electrical spare parts

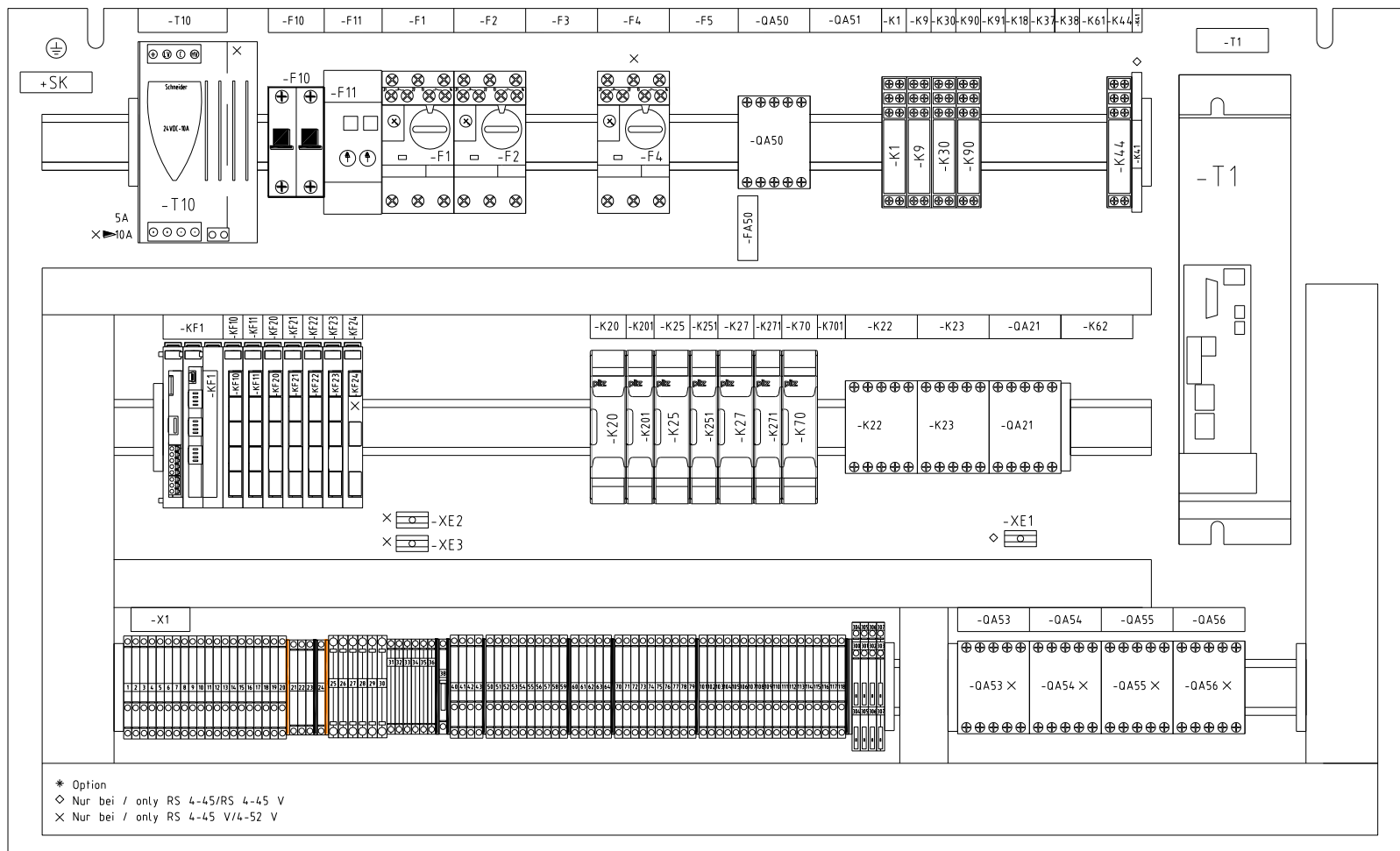
Schalttafel / Switch board

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

Elektroteile / Electrical spare parts

Schalttafel / Switch board

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



Schalttafel / Switch board

Ident-Nr. Ident. no.	Bezeichnung	Designation	Kommentar Remarks
2071-375	NOT-HALT Schaltgerät	Emergency stop safety relais	-K20,-K25,-K27,-K70
2071-376	NOT-HALT Erweiterungsgerät	Emergency stop expansion module	-K201,-K251,-K271,-K701
200009830	Varan Kabel RJ45	Varan cable RJ45	zwischen -T1 und -KF1 between -T1 and -KF1
2037-096	Hilfsschalterkontakt 22 DILEM	Auxiliary contact module 22 DILEM	auftragsbez. -K23 as per order -K23
200004037	Profibus Adapter	Profibus adapter	-X40
200006005	Motorschutzschalter 4-6,3A	Motor protection switch 4-6,3A	-F4
200003702	Netzteil 24V 5A	Power supply 24V 5A	-T10
200010205	Analog Mix 2 Ein- 2 Ausgänge	Analog Mix 2 inputs 2 outputs	-KF24
2049-124	Optokopplermodul 24V DC 2A	Opto-electronic coupler 24V DC 2A	-K41

Elektroteile / Electrical spare parts
Bedientableau / Control panel

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

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

Vorzeichenermittlung durch Angabe des Aspekttyps:

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

Objektklassen:

- B für Drehgeber, Näherungs- u. Positionsschalter
- C für Kondensator
- F für Sicherungen, Motorschutz- u. Leitungsschutzschalter
- FA für Varistorbaustein, Motorentstörbaustein
- K für Relais, Hilfsschütze, Optokopler
- 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 Netzananschlußleitung, Leitung Klemmengehäuse
- WE für Erdungsleiter, Potentialausgleich
- WG für Datenleitung, Steuerleitung
- X für Klemmleisten, Steckverbinder

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).

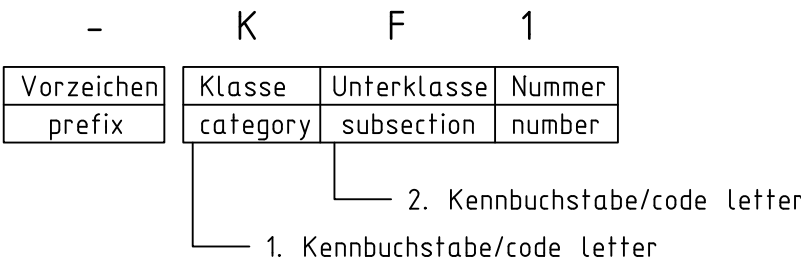
Identification of prefix in consideration of aspect-typs:

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

category 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/description of signifier:



Darstellung Referenzzeichen-Satz/description of signifier-block:

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

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

-	K	K	1	1.Objekt 1
-	K	K	0	1.1
-	K	K	0	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

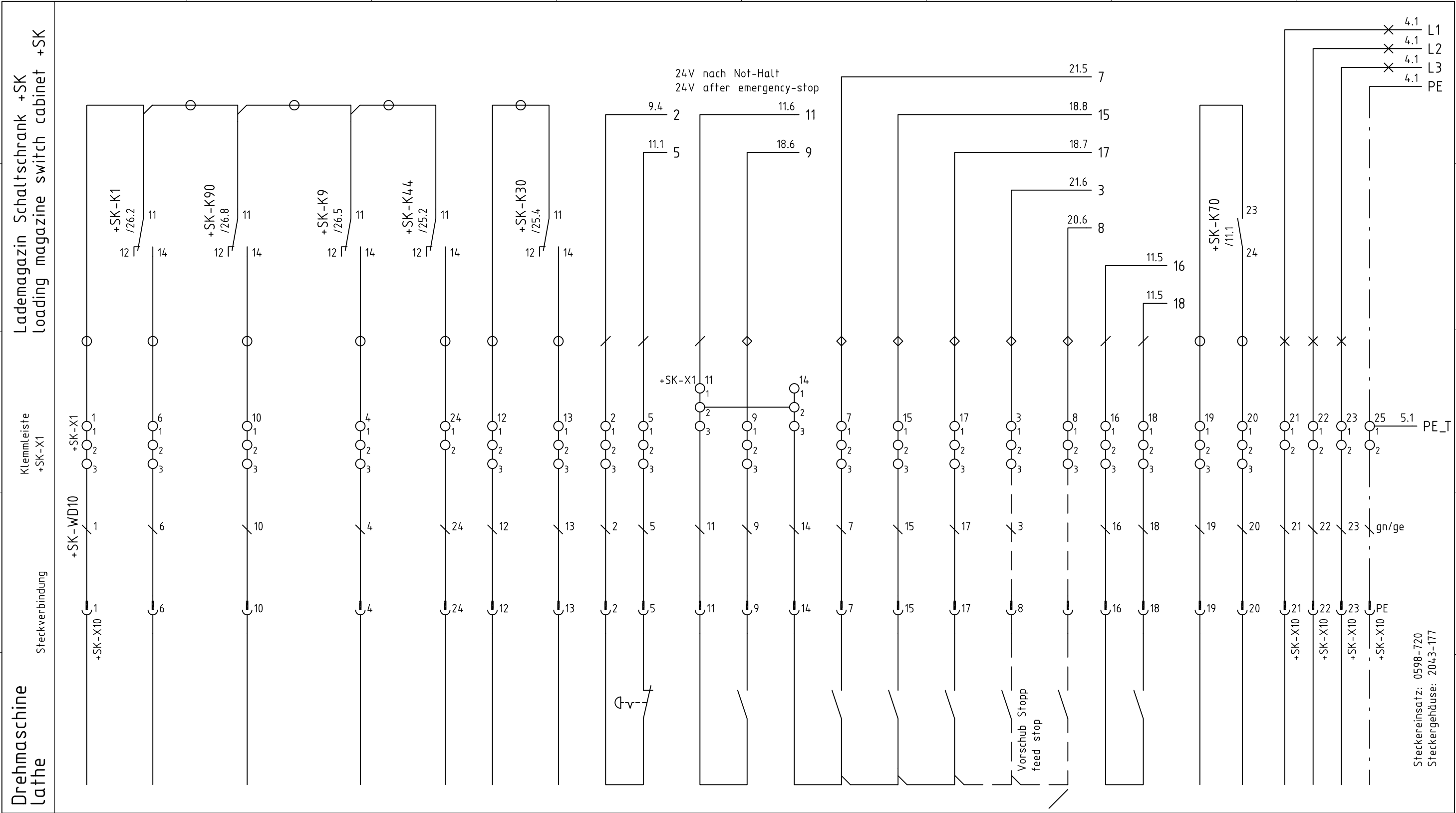
Aderkennzeichnung nach DIN EN 60204-1; 2006-06:

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

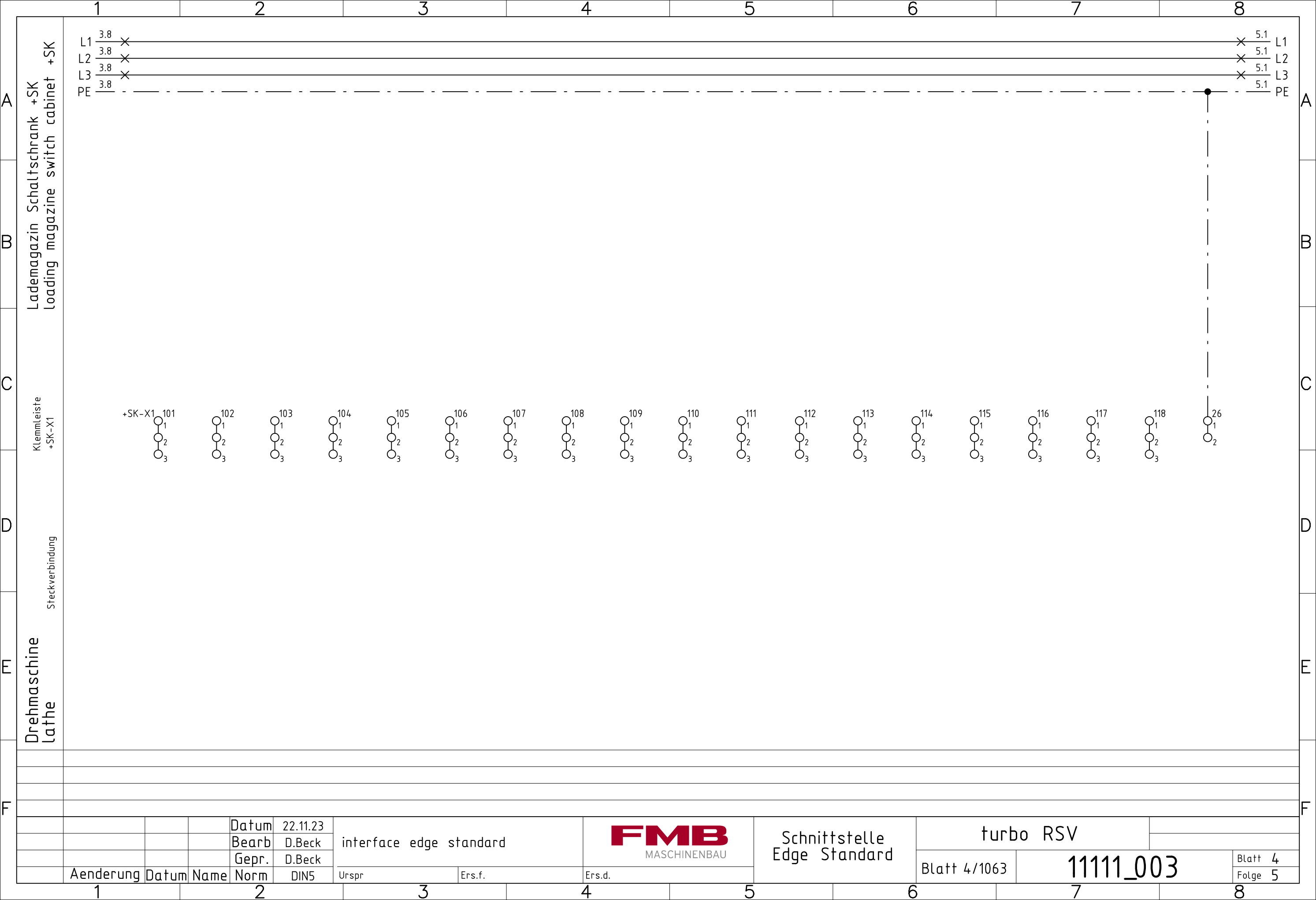
Wire marking by DIN EN 60204-1: 2006-06:

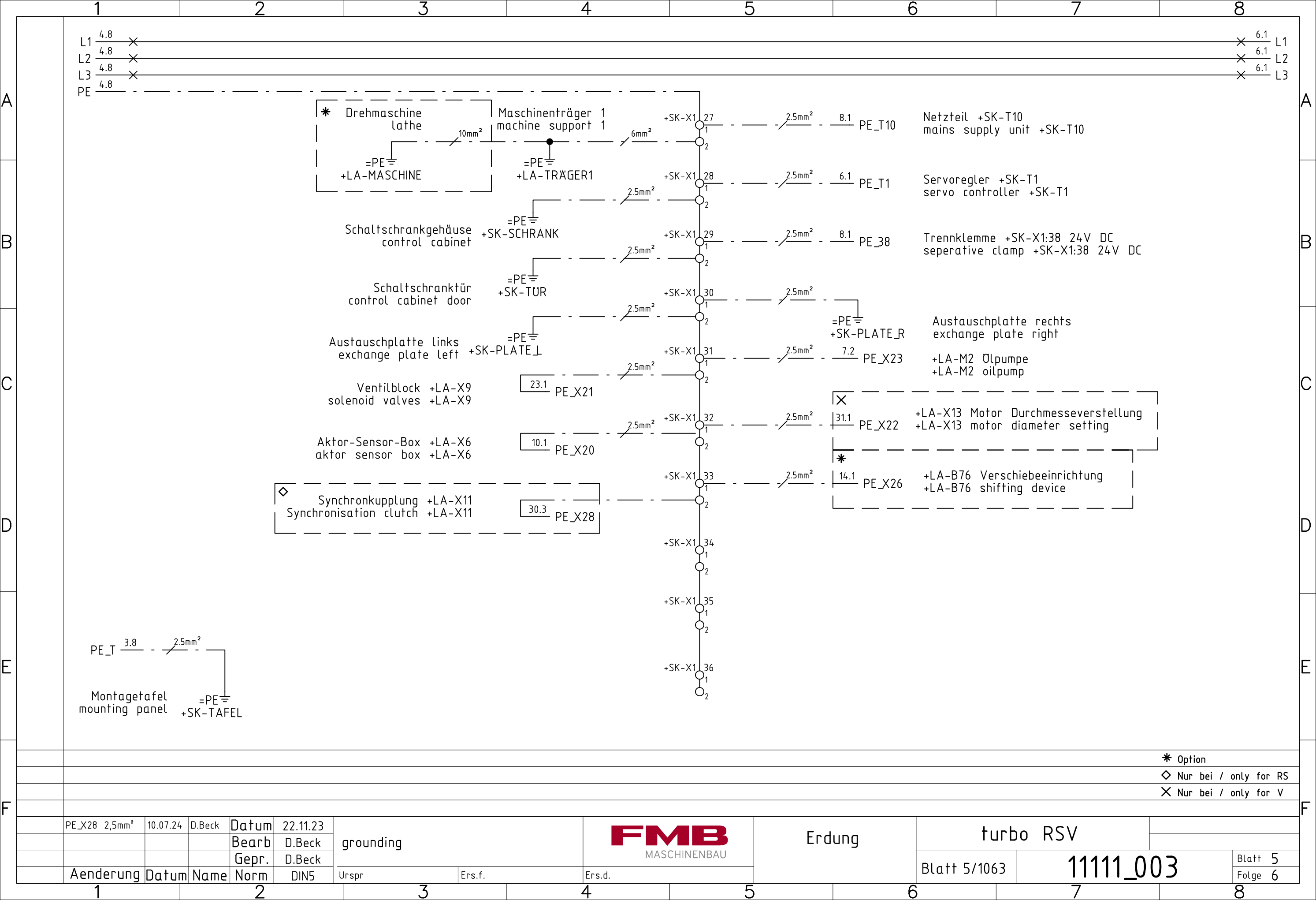
- main circuit : black/BK 1.5mm²
- control circuit 24V AC : red/RD 1mm²
- control circuit 24C DC : blue/BU 1mm²
- external voltage : violet/VT 1mm²

				Datum	22.11.23	marking of the electrical equipment			Kennzeichnung d.Betriebsmittel	turbo RSV			
				Bearb	D.Beck								
				Gepr.	D.Beck								
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.		Blatt 2/1063	11111_003		Blatt 2
													Folge 3

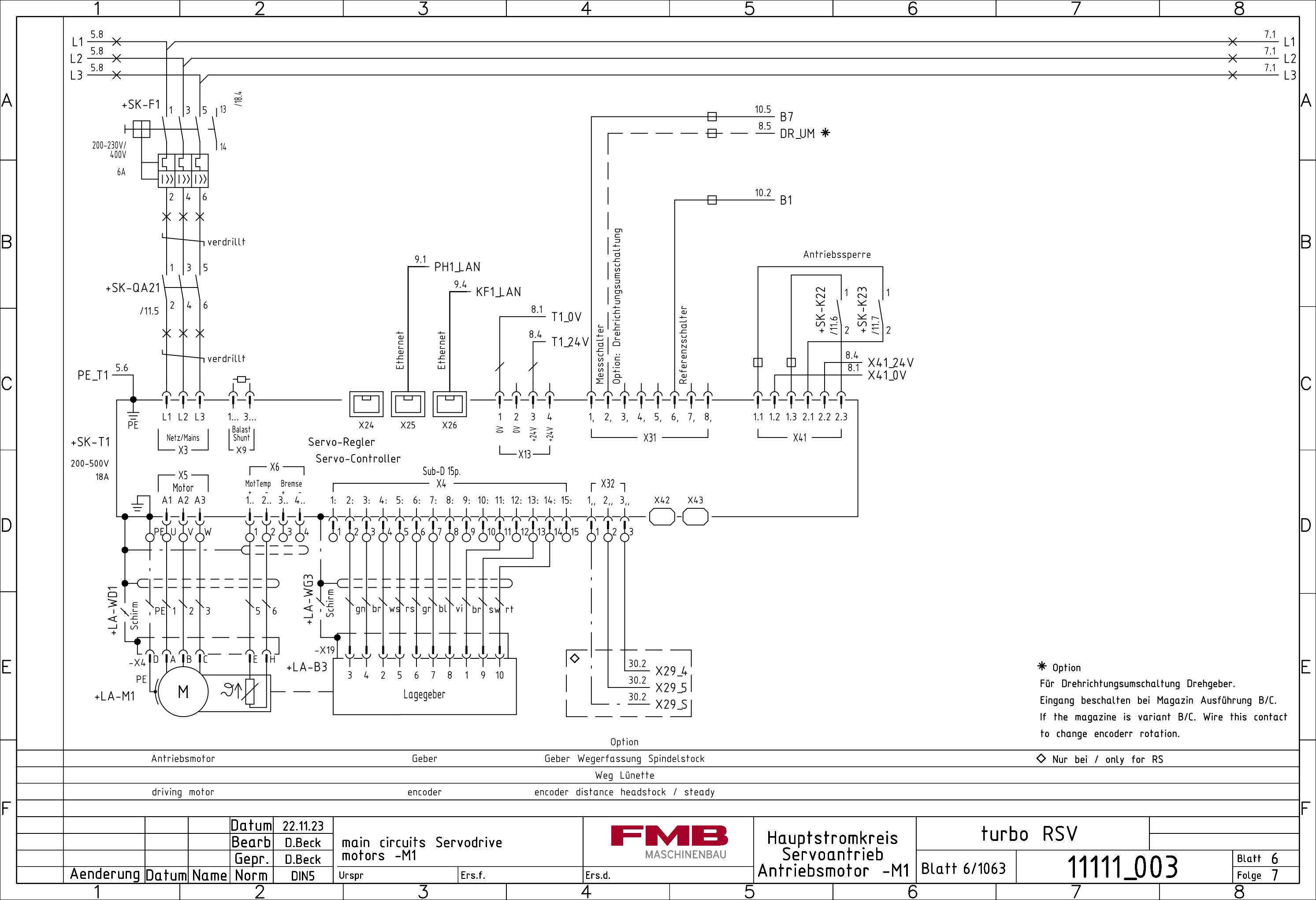


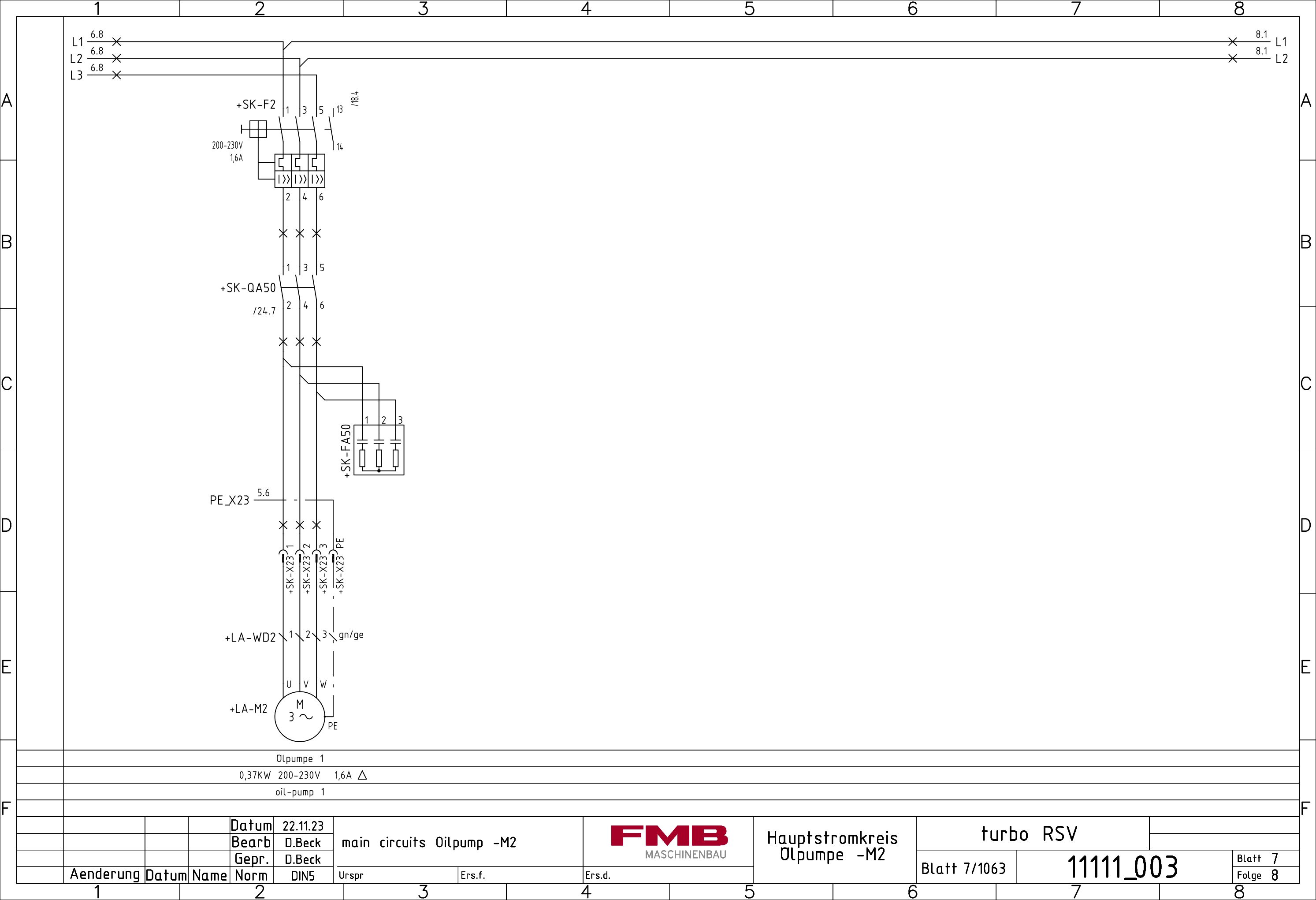
Stangenwechsel ende		Automatik ein		Stangenende		Nachschieben		keine Störung		Not - Halt		Freigabe		Lademagazin		Zyklus		Spannzange		Option		Schutztür		Not - Halt		Betriebsspannung			
Programm start		Magazin betriebsber.		Programm stopp		OK		Lademagazin		Drehmaschine		Automatikbetrieb		Automatik ein		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	interface edge standard								Schnittstelle Edge Standard		turbo RSV													
				Bearb	D.Beck																								
				Gepr.	D.Beck																								
Aenderung		Datum	Name	Norm	DIN5	Urspr		Ers.f.		Ers.d.				Blatt 3/1063		11111_003				Blatt 3									
																				Folge 4									

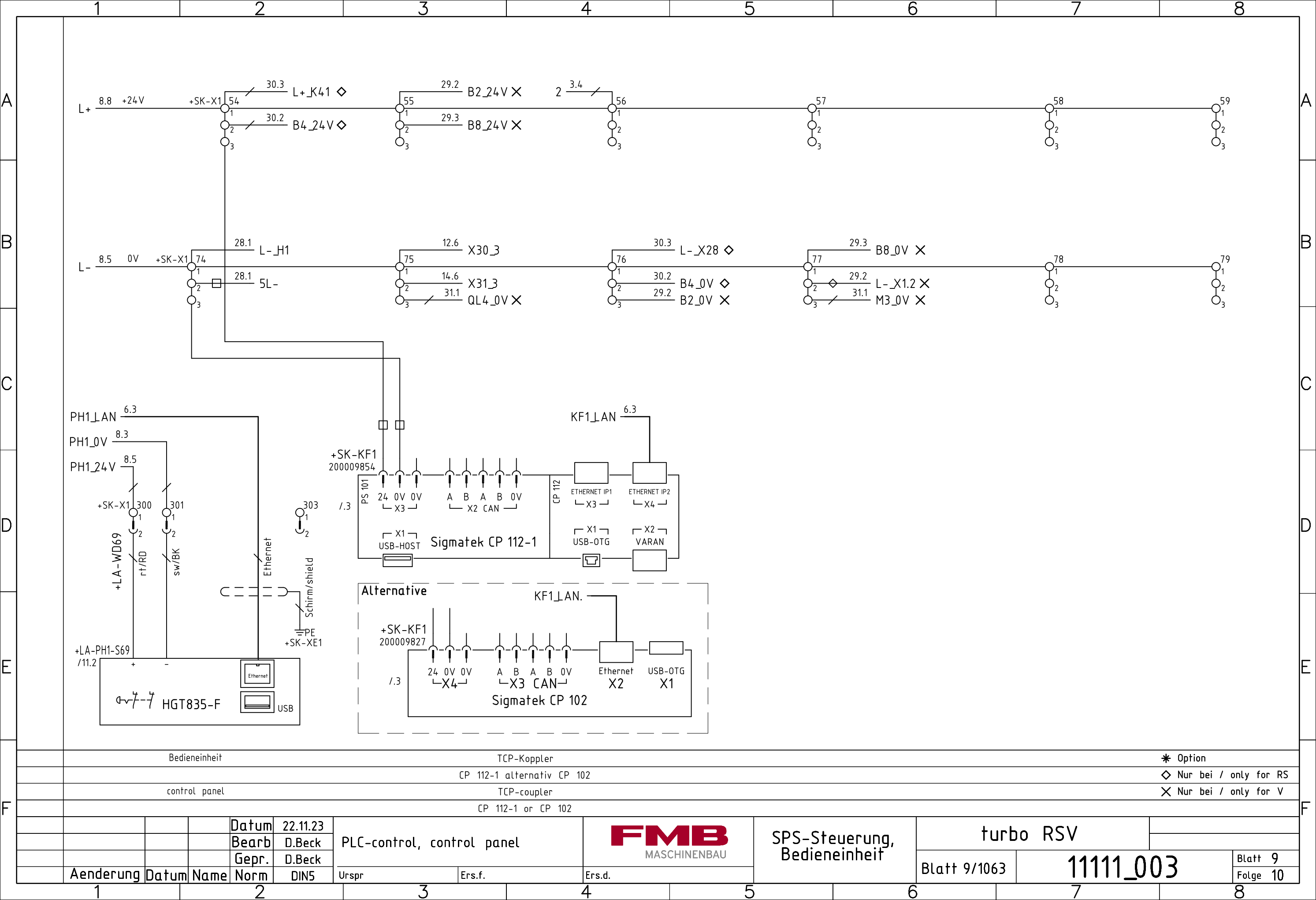


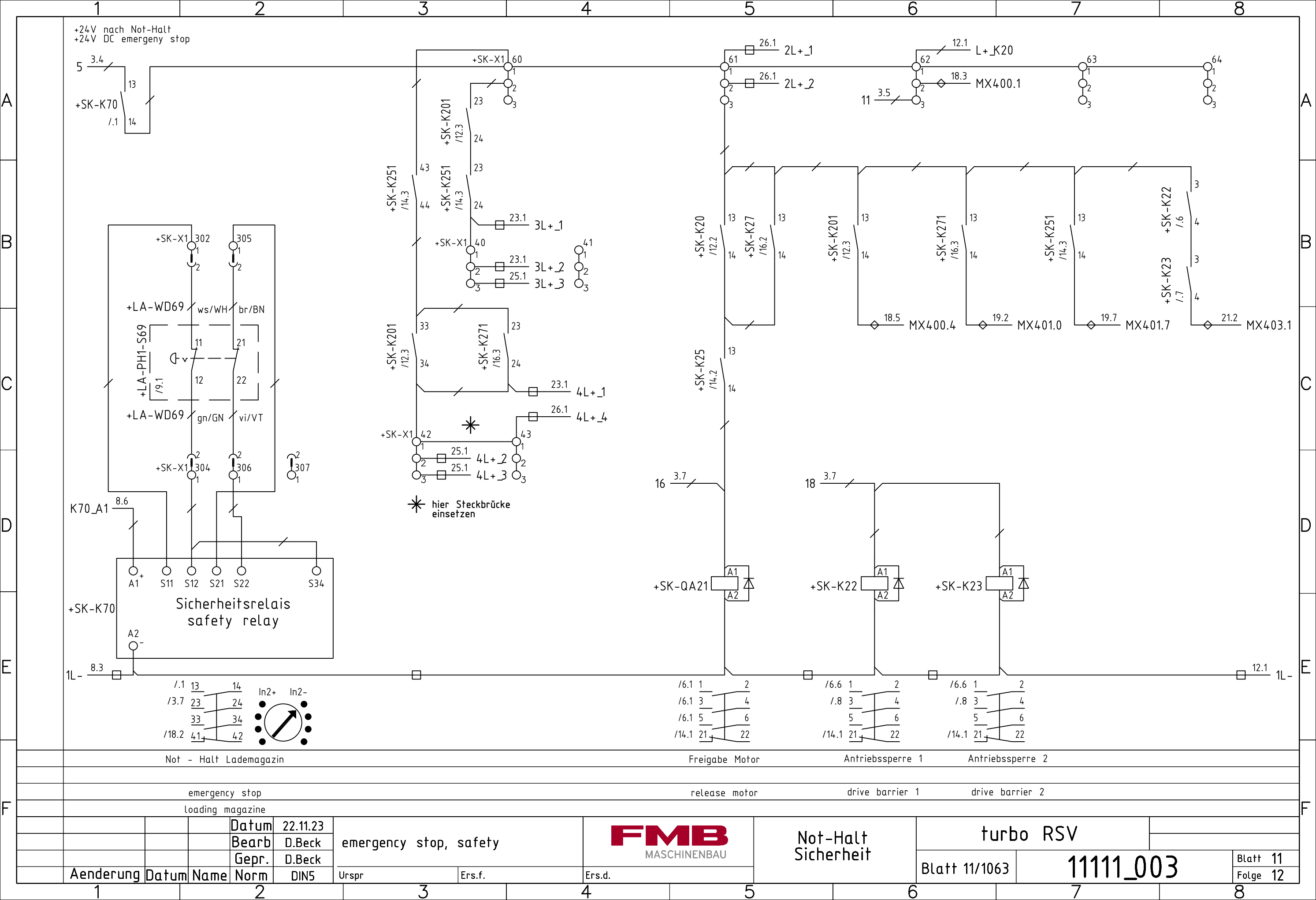


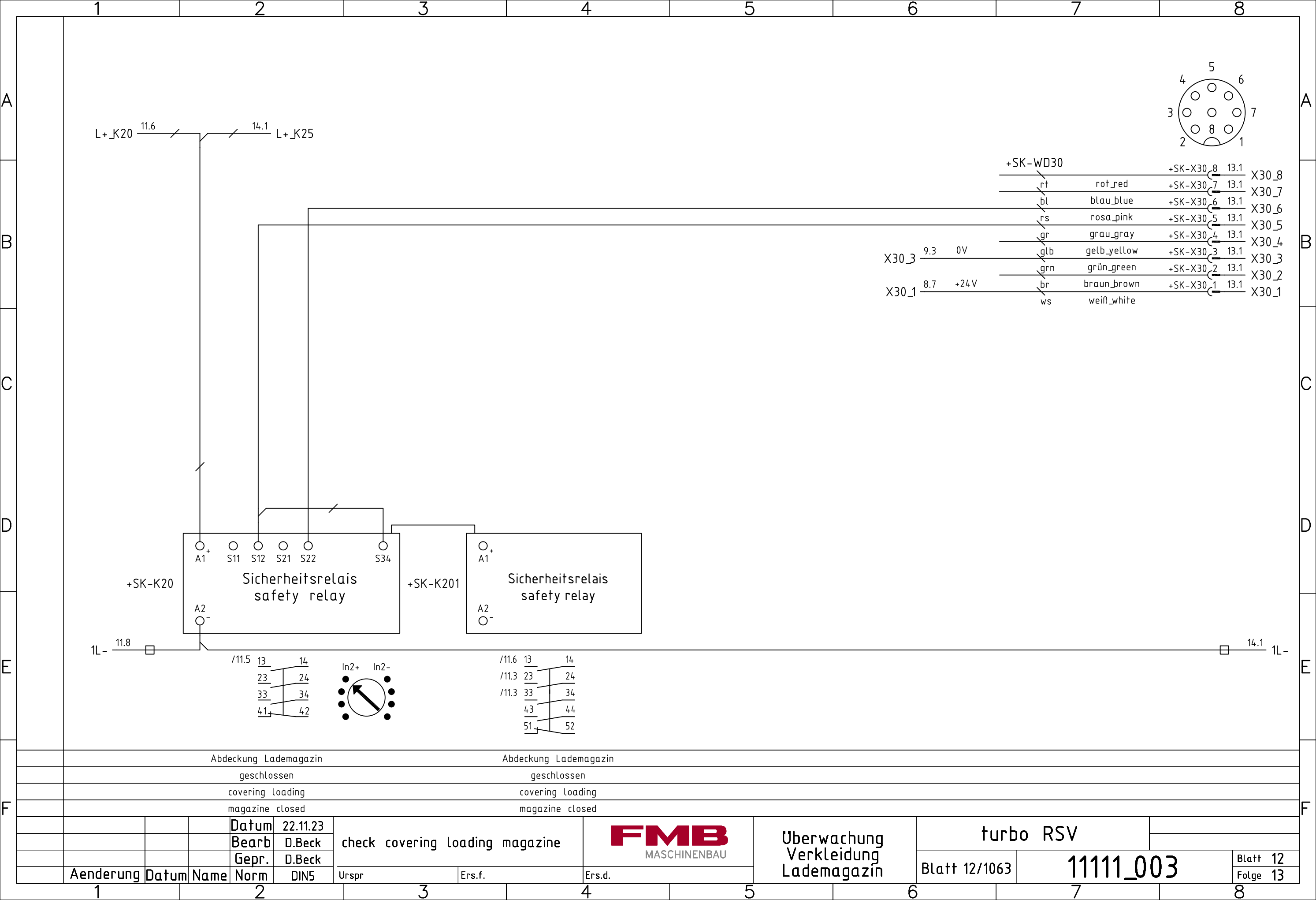
* Option									
◇ Nur bei / only for RS									
✕ Nur bei / only for V									
PE_X28 2,5mm²	10.07.24	D.Beck	Datum	22.11.23	grounding			turbo RSV	
			Bearb	D.Beck					
			Gepr.	D.Beck	FMB MASCHINENBAU			Erdung	
Aenderung	Datum	Name	Norm	DIN5					
			Urspr	Ers.f.	Ers.d.			Blatt 5/1063	
								11111_003	
								Blatt 5	
								Folge 6	

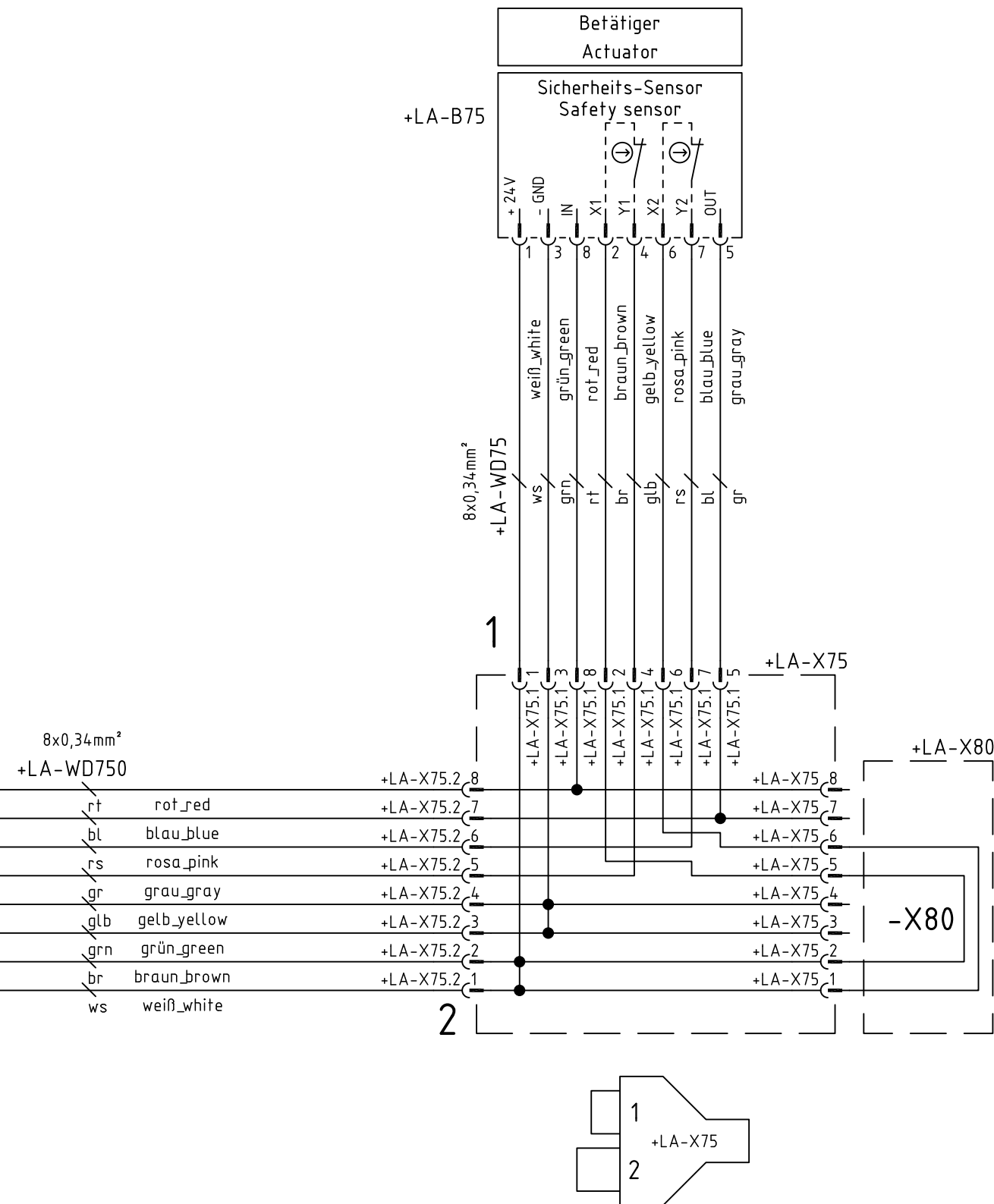
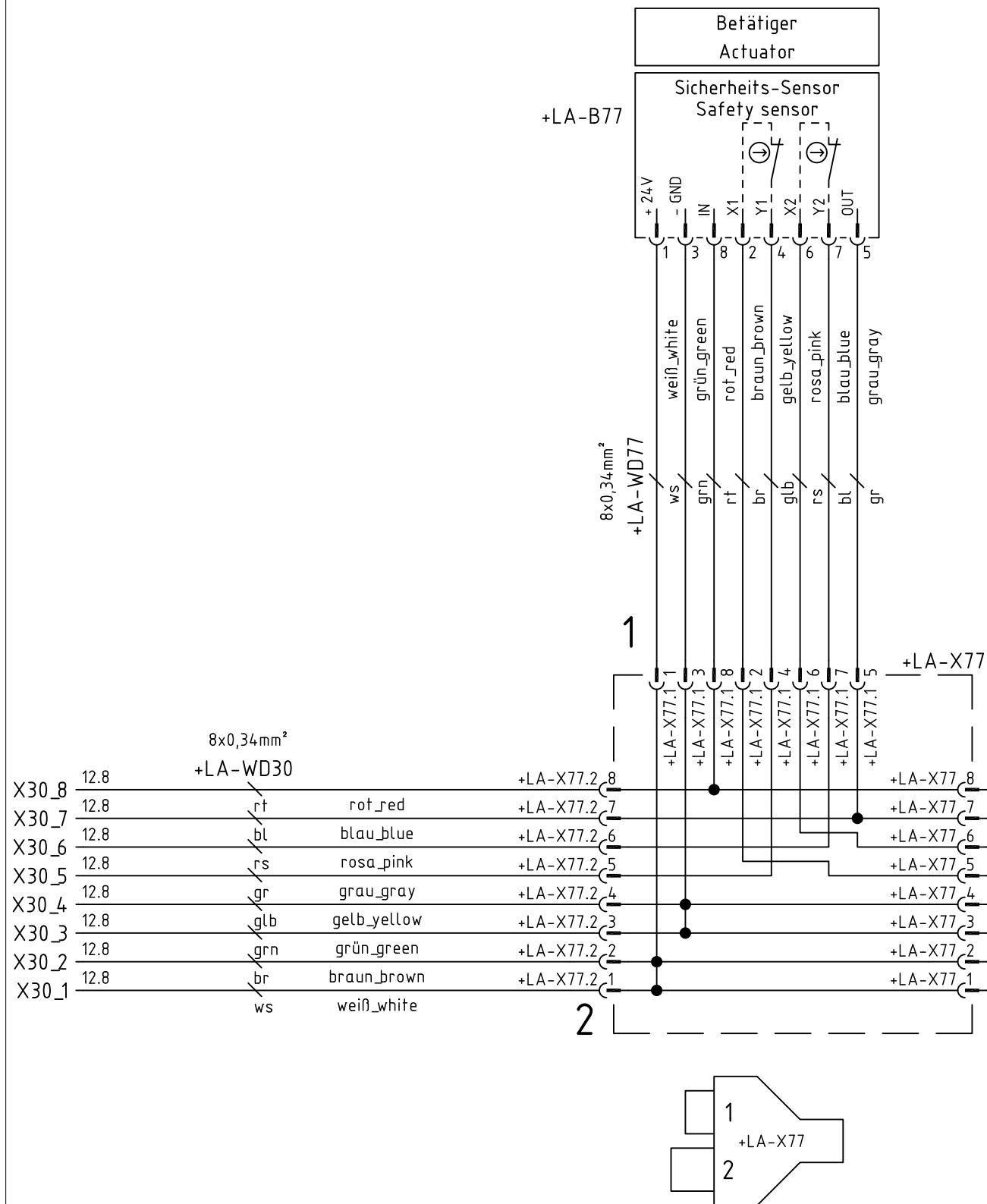








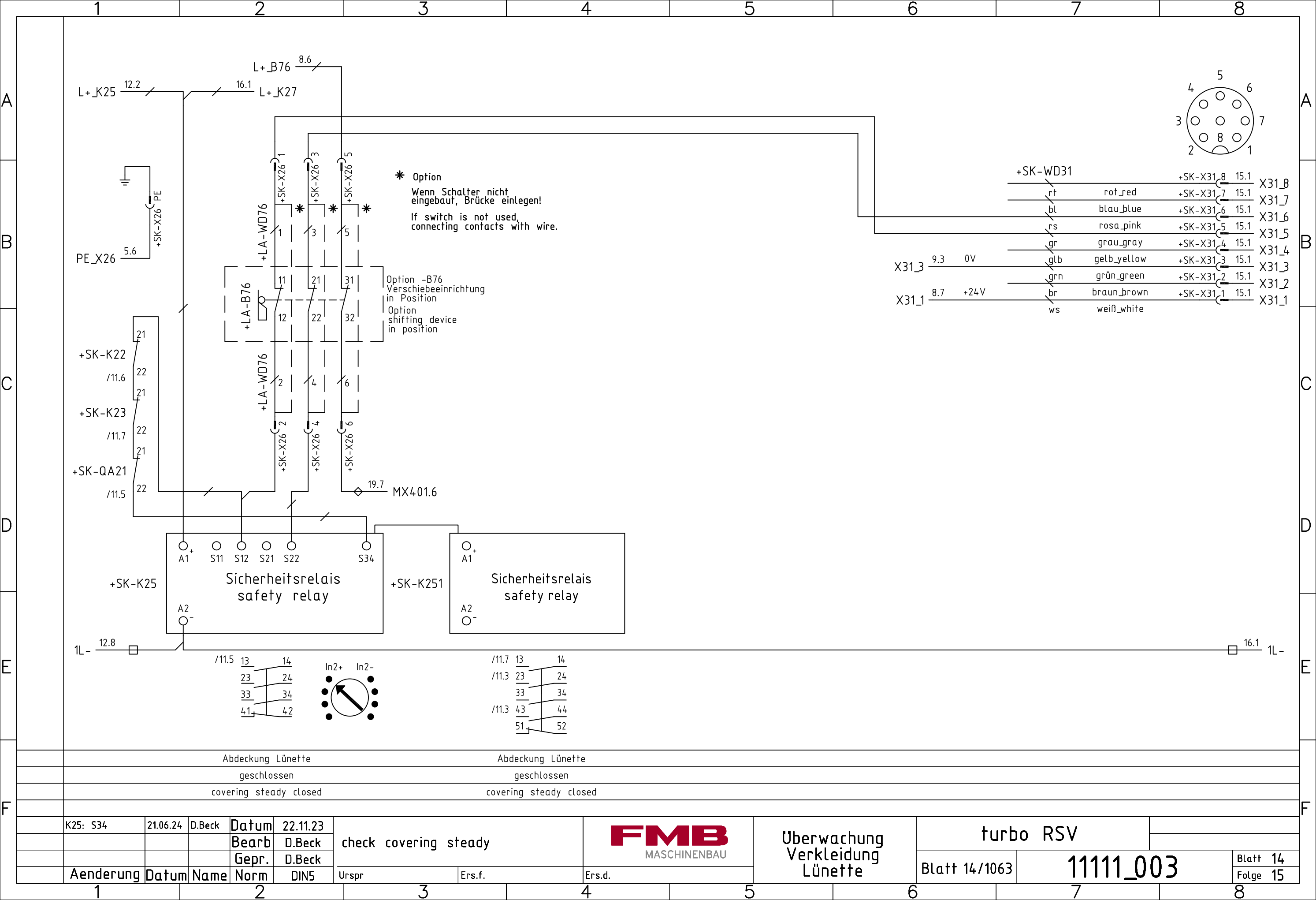


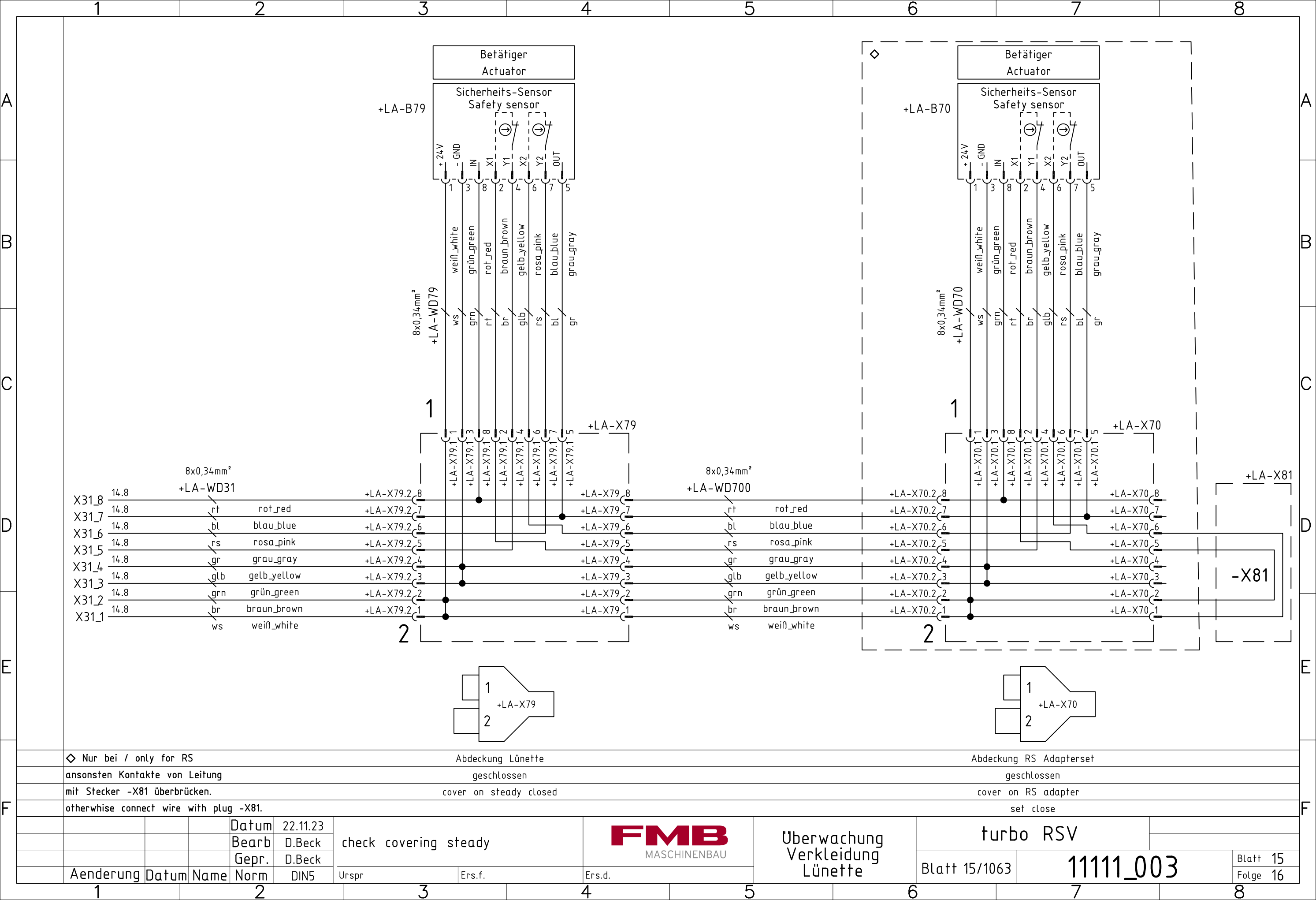


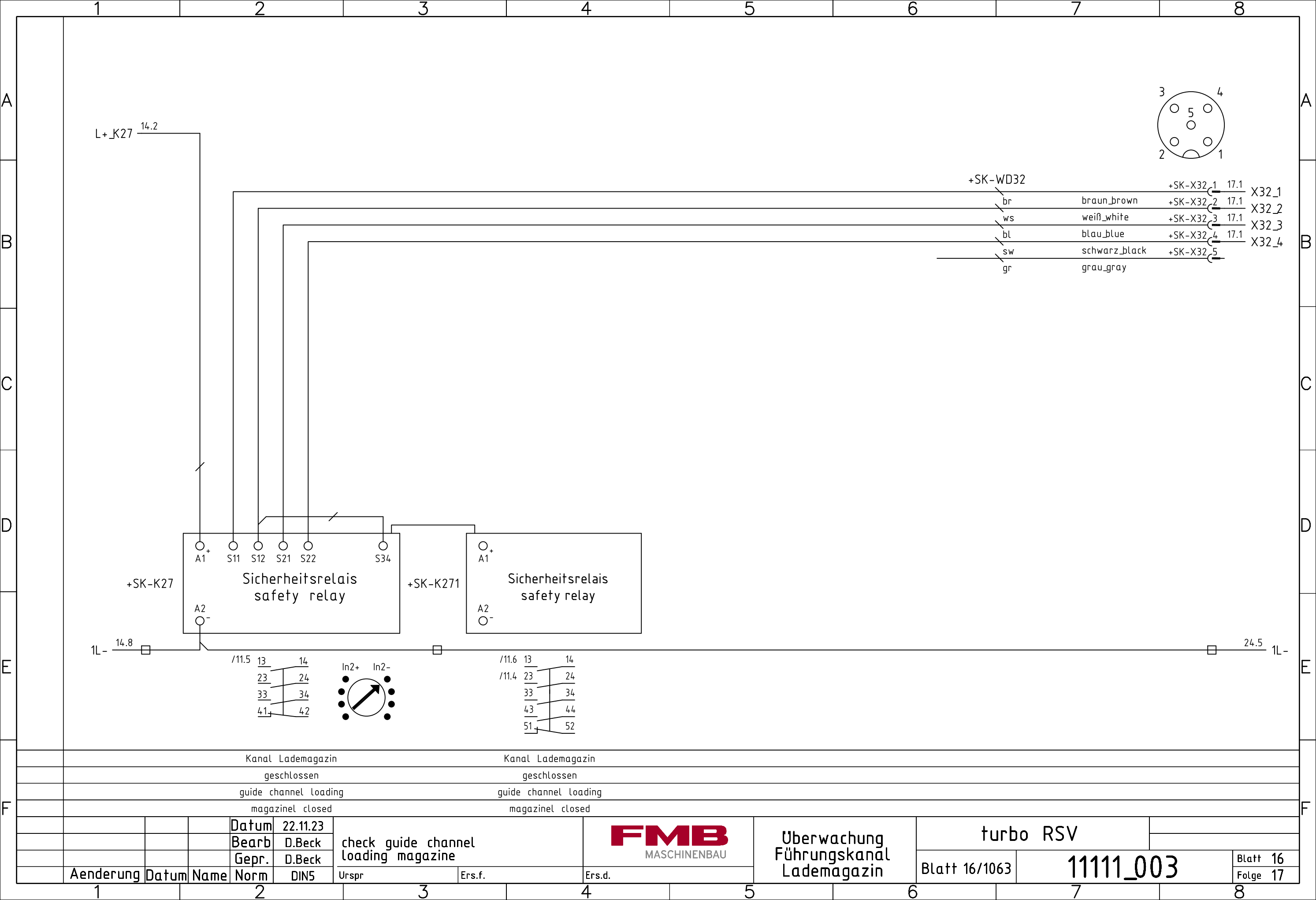
Abdeckung Lademagazin
geschlossen
covering magazine closed

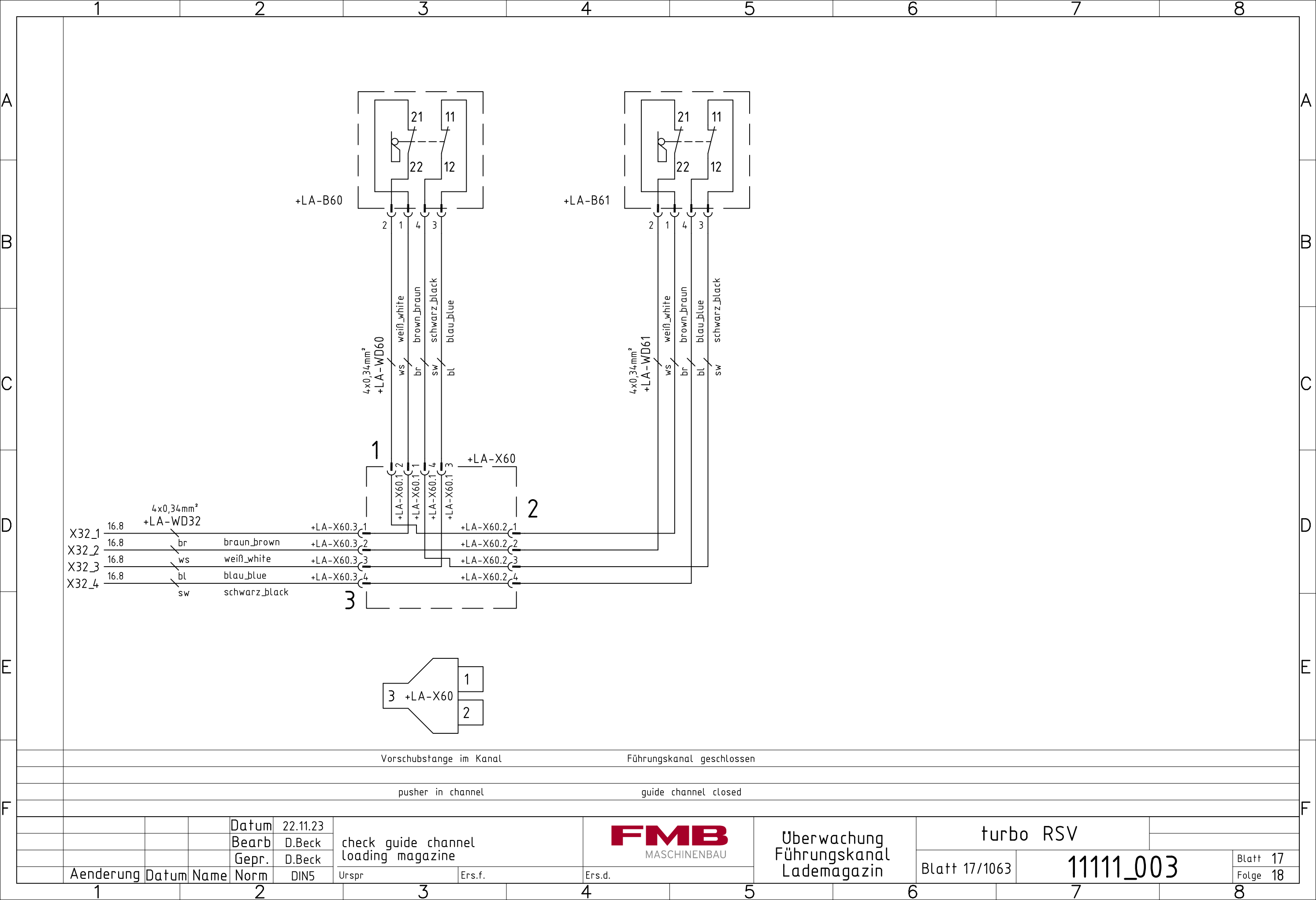
Abdeckung Reststückbehälter
geschlossen
covering remnant box closed

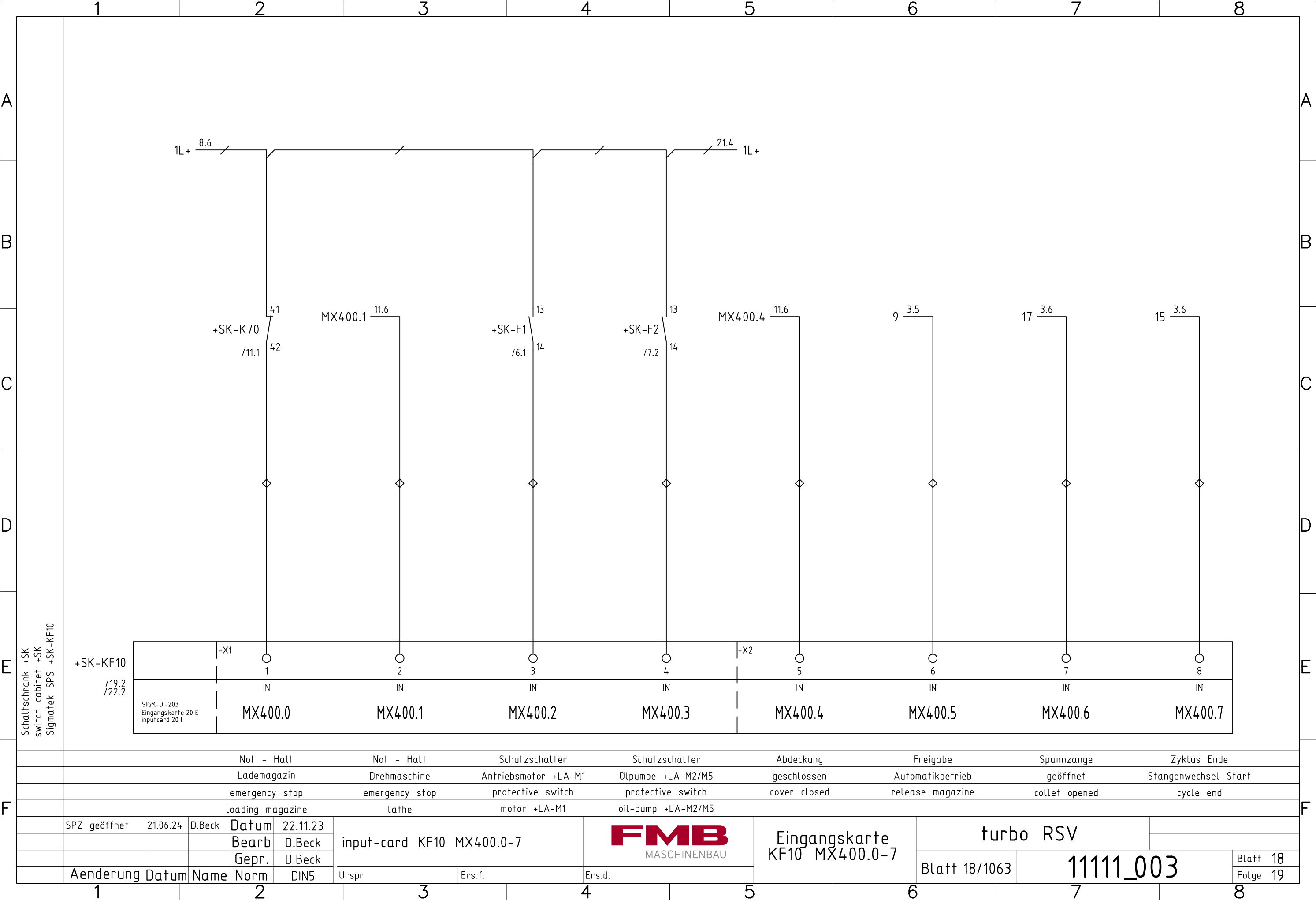
			Datum	22.11.23	check covering loading magazine			Überwachung Verkleidung Lademagazin	turbo RSV			
			Bearb	D.Beck								
			Gepr.	D.Beck								
Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.		Blatt 13/1063	11111_003	Blatt 13	Folge 14

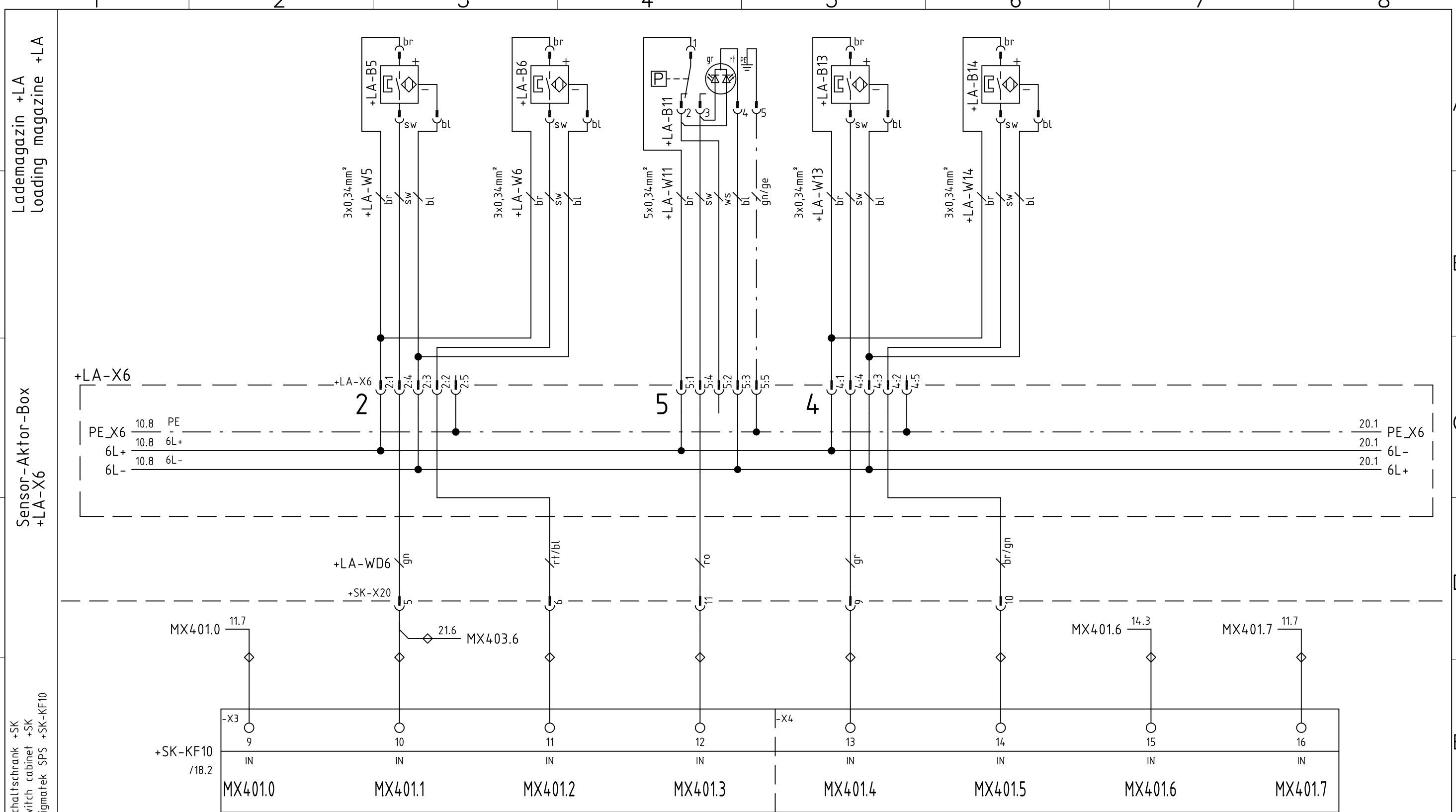




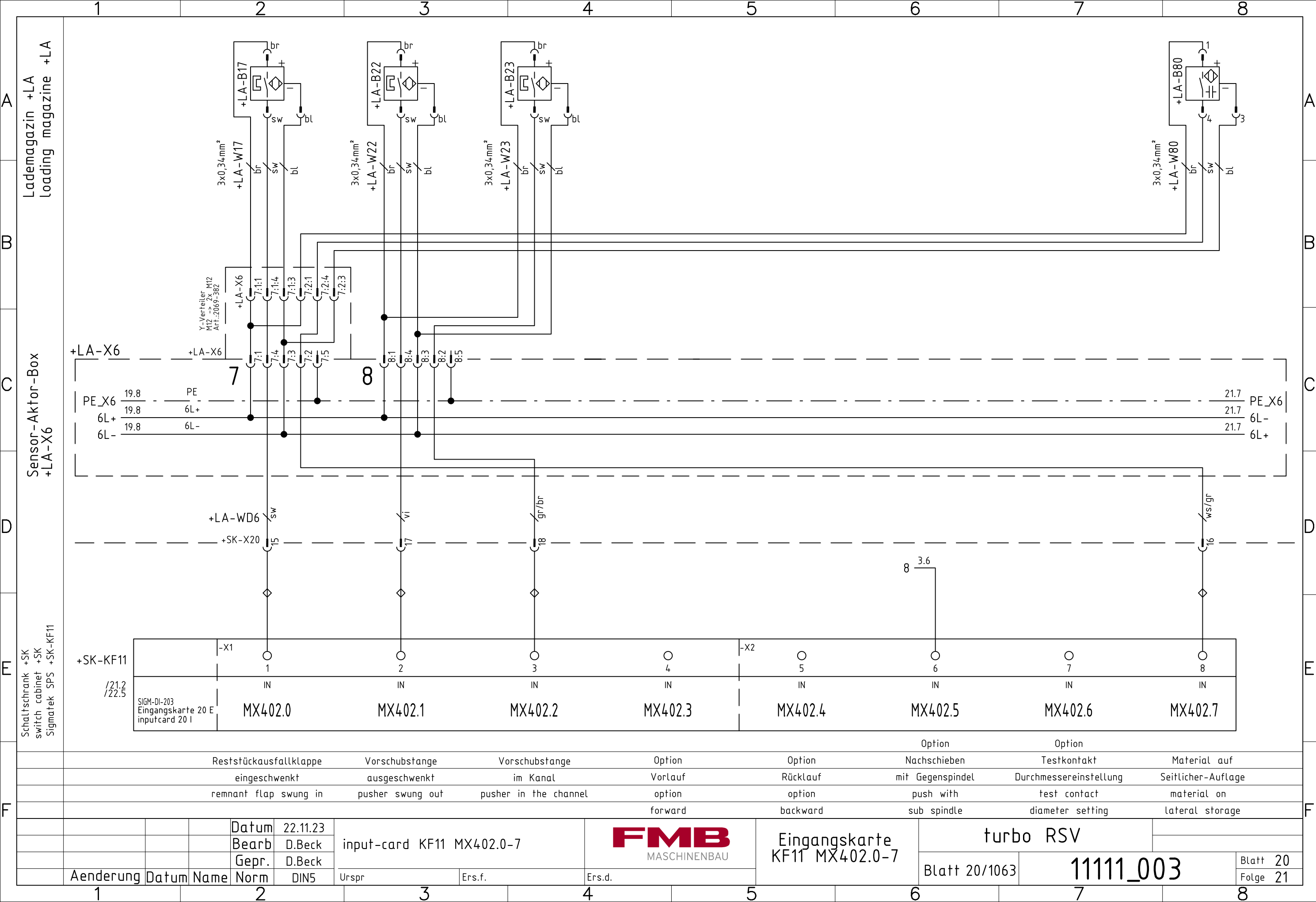


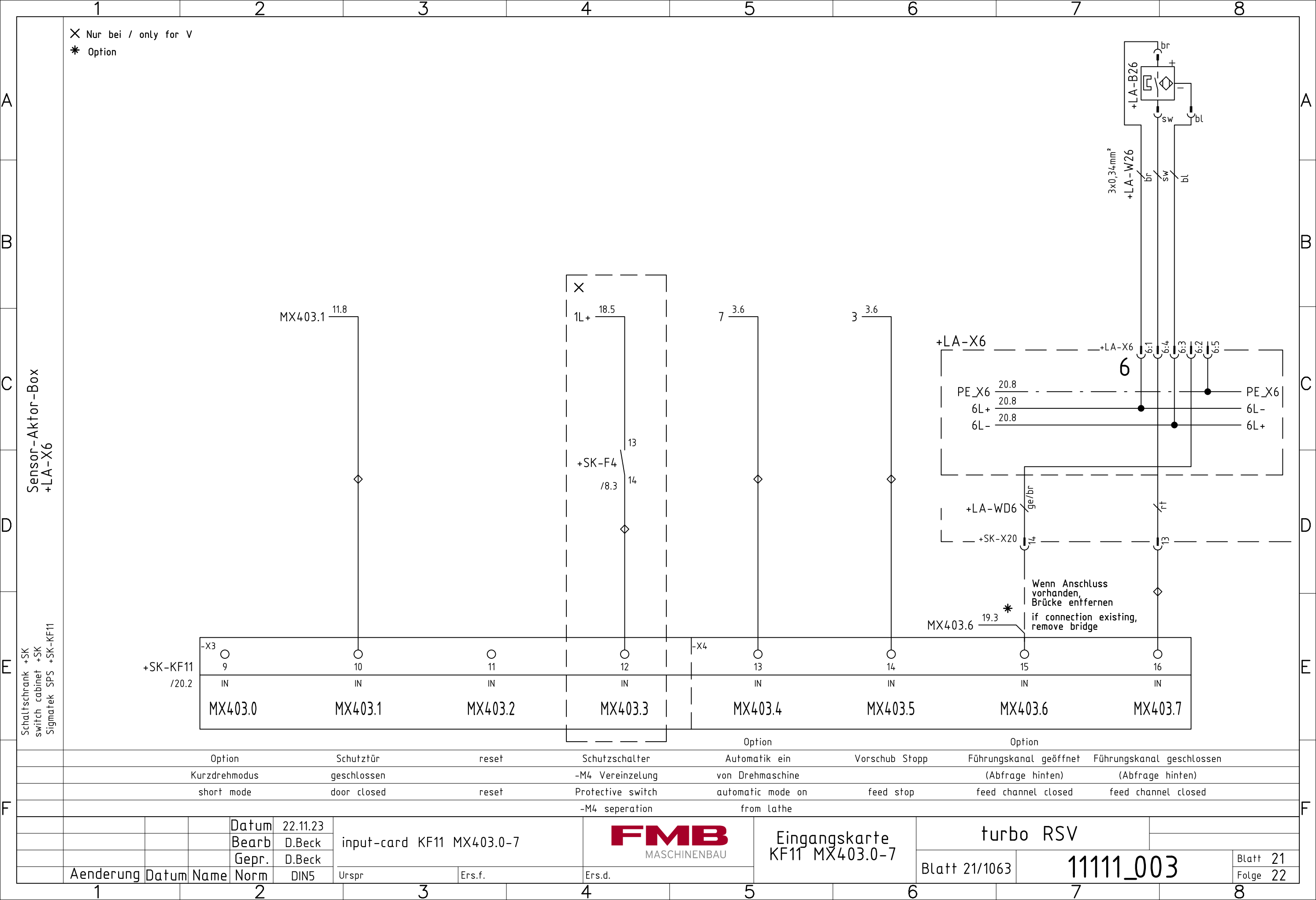




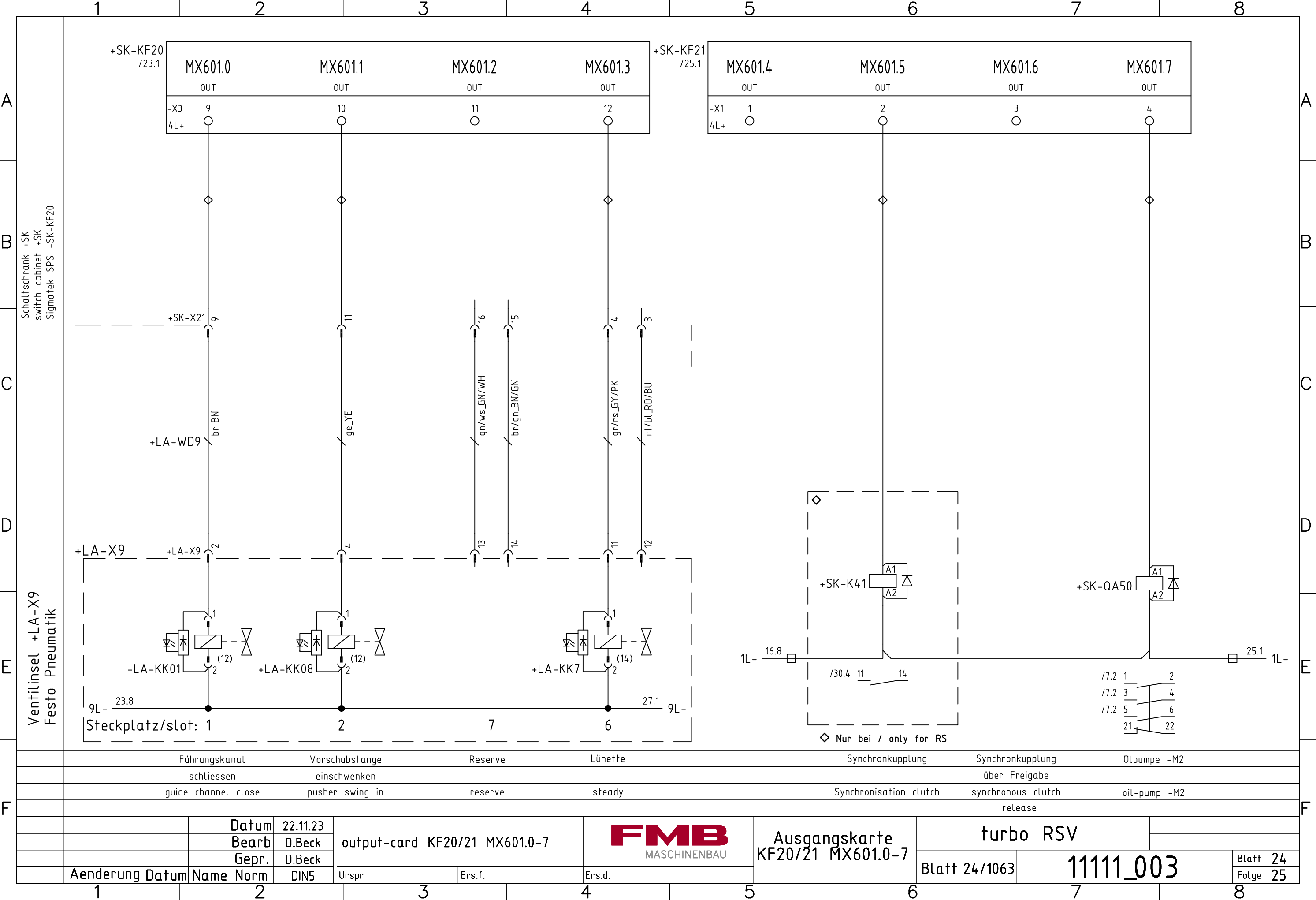


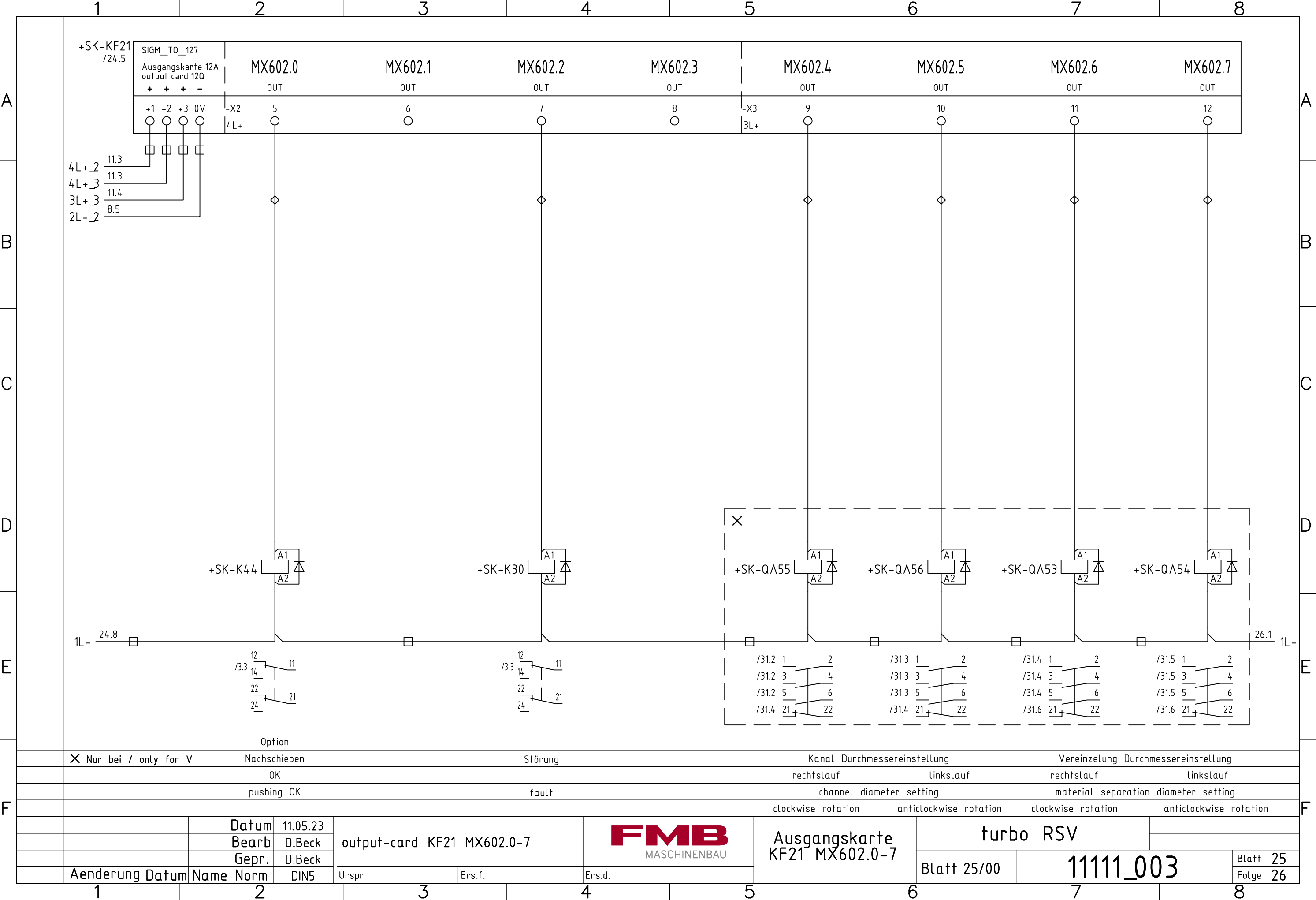
	Kanal geschlossen		Führungskanal geöffnet		Führungskanal geschlossen		Druckschalter		Greifermesser		Greifermesser		Verschiebeeinrichtung		Abdeckung Lünette	
	(Abfrage vorne)		(Abfrage vorne)						geschlossen		geöffnet		-B76 in Position		geschlossen	
	cannel closed		guide channel opened		guide channel closed		pressure switch		gripper blades		gripper blades		shifting device		cover on	
									opened		opened				steady closed	
				Datum	22.11.23	input-card KF10 MX401.0-7				Eingangskarte KF10 MX401.0-7		turbo RSV				
			Bearb	D.Beck												
			Gepr.	D.Beck												
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.			Blatt 19/1063		11111_003			Blatt 19 Folge 20

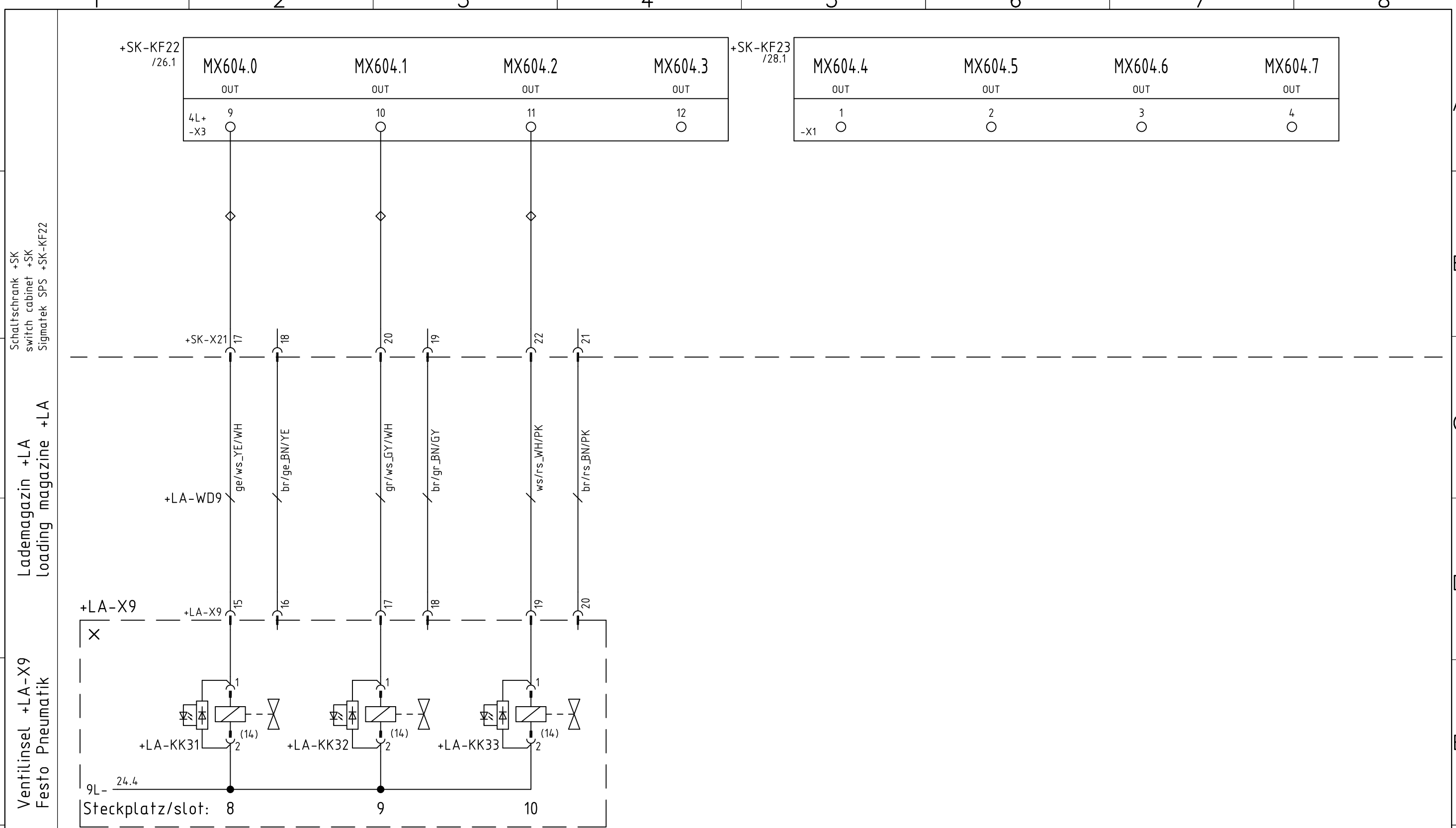




	1	2	3	4	5	6	7	8																									
A									A																								
B									B																								
C									C																								
D									D																								
E	Schaltschrank +SK switch cabinet +SK Sigmatek SPS +SK-KF10/KF11 +SK-KF10 /18.2 <table><tr><td>-X5 ○ 17</td><td>○ 18</td><td>○ 19</td><td>○ 20</td></tr><tr><td>IN</td><td>IN</td><td>IN</td><td>IN</td></tr><tr><td>MX404.0</td><td>MX404.1</td><td>MX404.2</td><td>MX404.3</td></tr></table> +SK-KF11 /20.2 <table><tr><td>-X5 ○ 17</td><td>○ 18</td><td>○ 19</td><td>○ 20</td></tr><tr><td>IN</td><td>IN</td><td>IN</td><td>IN</td></tr><tr><td>MX404.4</td><td>MX404.5</td><td>MX404.6</td><td>MX404.7</td></tr></table>								-X5 ○ 17	○ 18	○ 19	○ 20	IN	IN	IN	IN	MX404.0	MX404.1	MX404.2	MX404.3	-X5 ○ 17	○ 18	○ 19	○ 20	IN	IN	IN	IN	MX404.4	MX404.5	MX404.6	MX404.7	E
-X5 ○ 17	○ 18	○ 19	○ 20																														
IN	IN	IN	IN																														
MX404.0	MX404.1	MX404.2	MX404.3																														
-X5 ○ 17	○ 18	○ 19	○ 20																														
IN	IN	IN	IN																														
MX404.4	MX404.5	MX404.6	MX404.7																														
F									F																								
				Datum	22.11.23	input-card KF10/KF11 MX404.0-7			Eingangskarte KF10/KF11 MX404.0-7	turbo RSV																							
				Bearb	D.Beck																												
				Gepr.	D.Beck																												
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.		Blatt 22/1063	11111_003		Blatt 22 Folge 23																				
	1		2		3		4		5		6	7	8																				



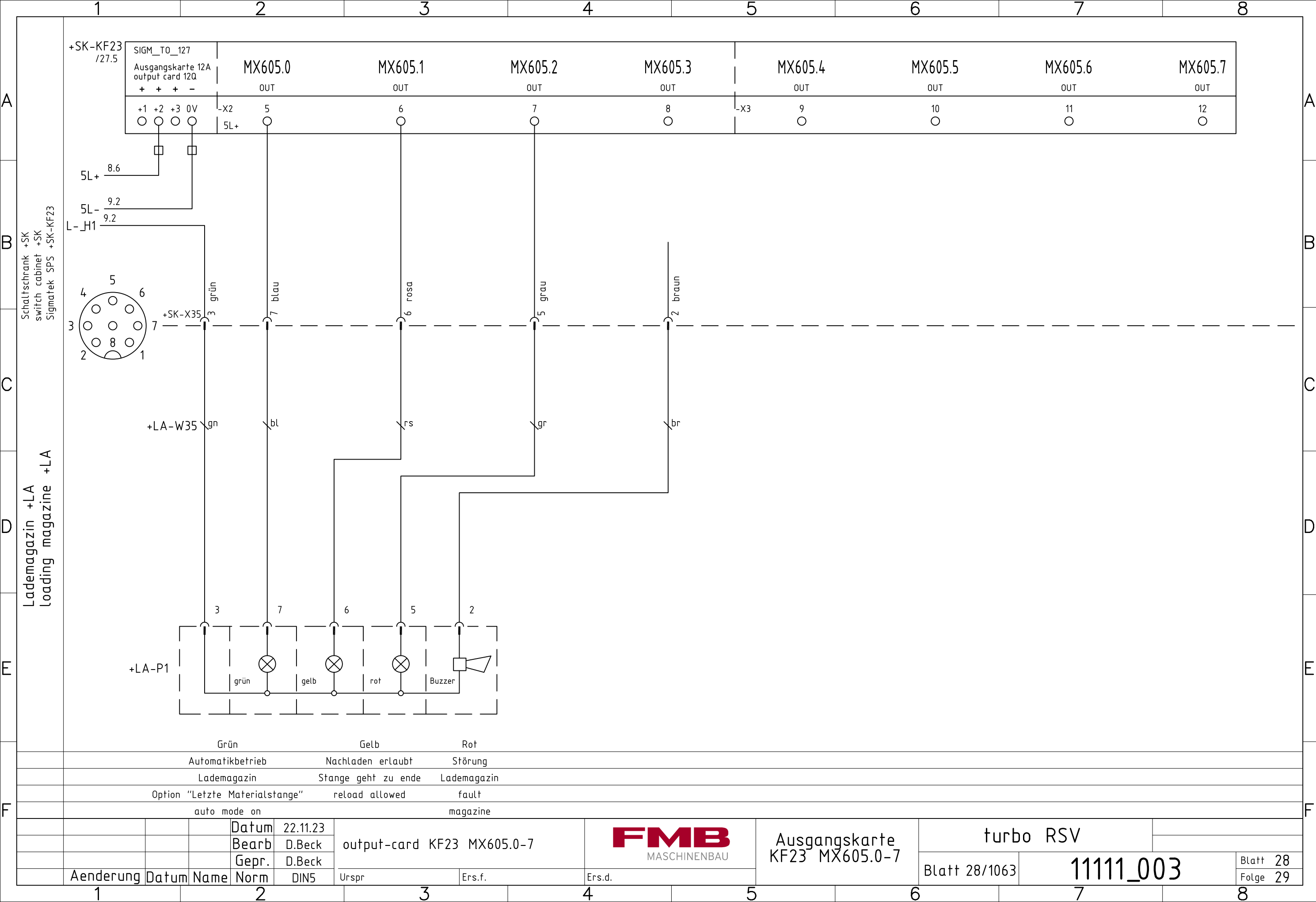


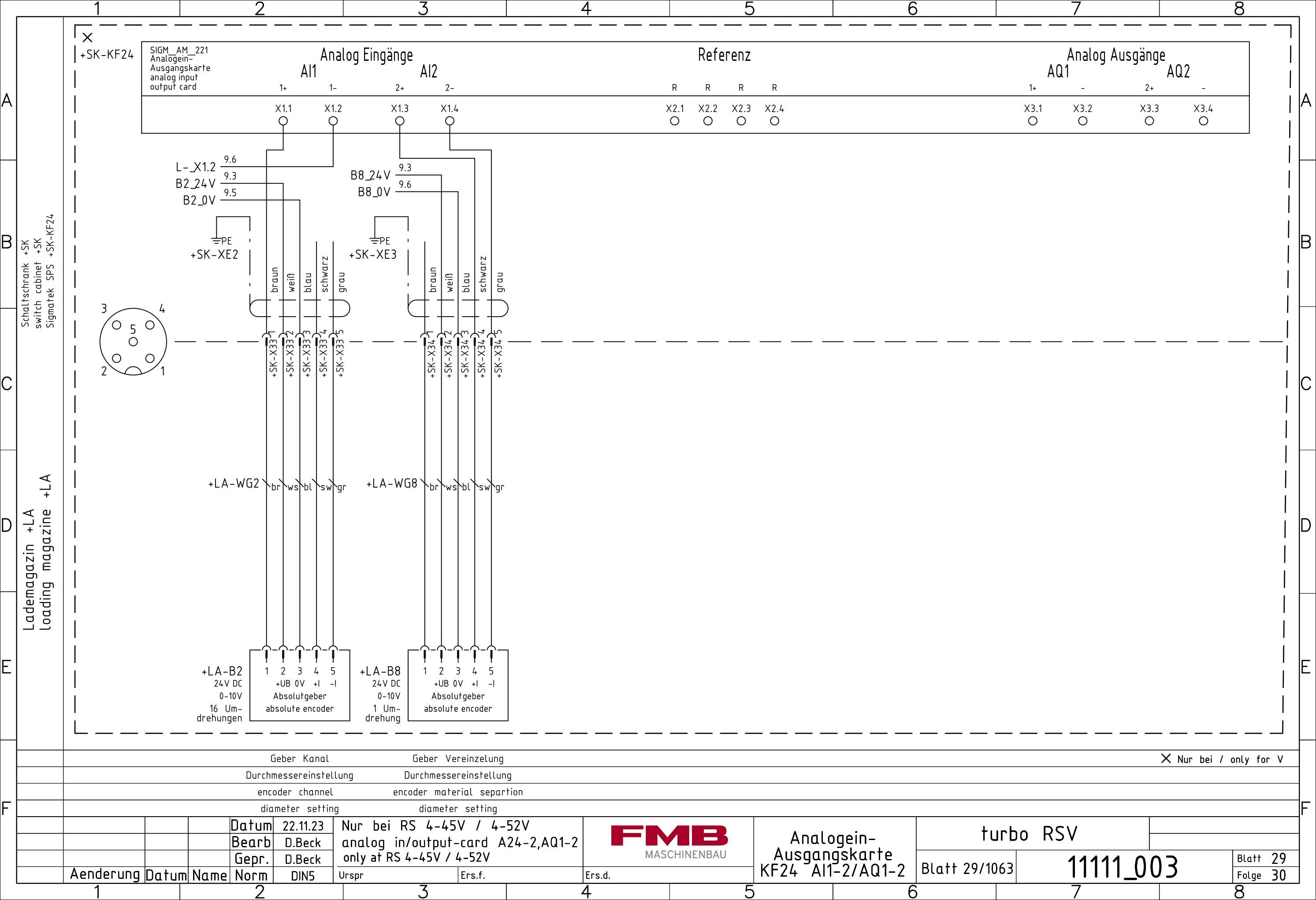


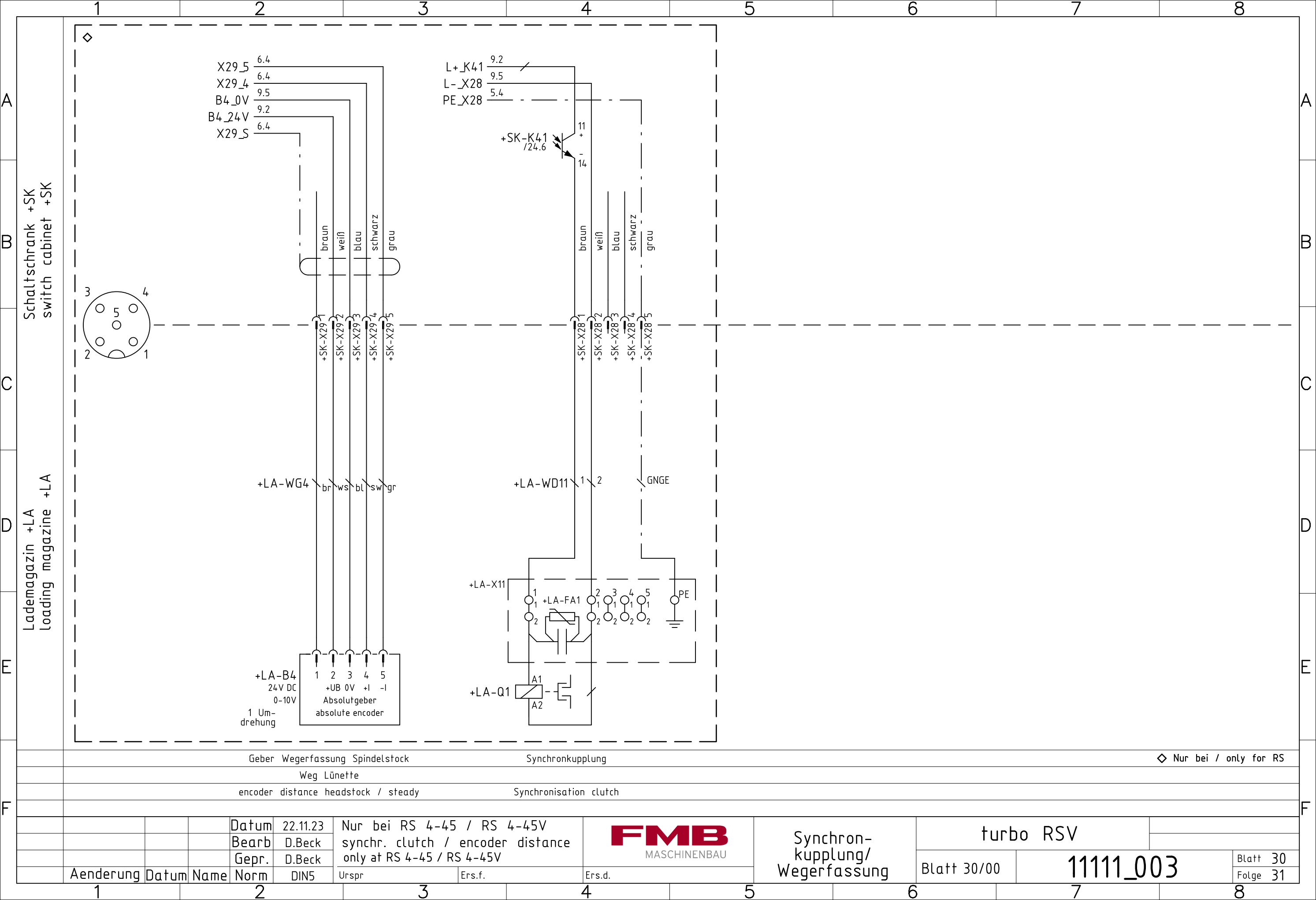
Durchmessereinstellung 1 DurchmesserEinstellung 2 DurchmesserEinstellung 3 X Nur bei / only for V

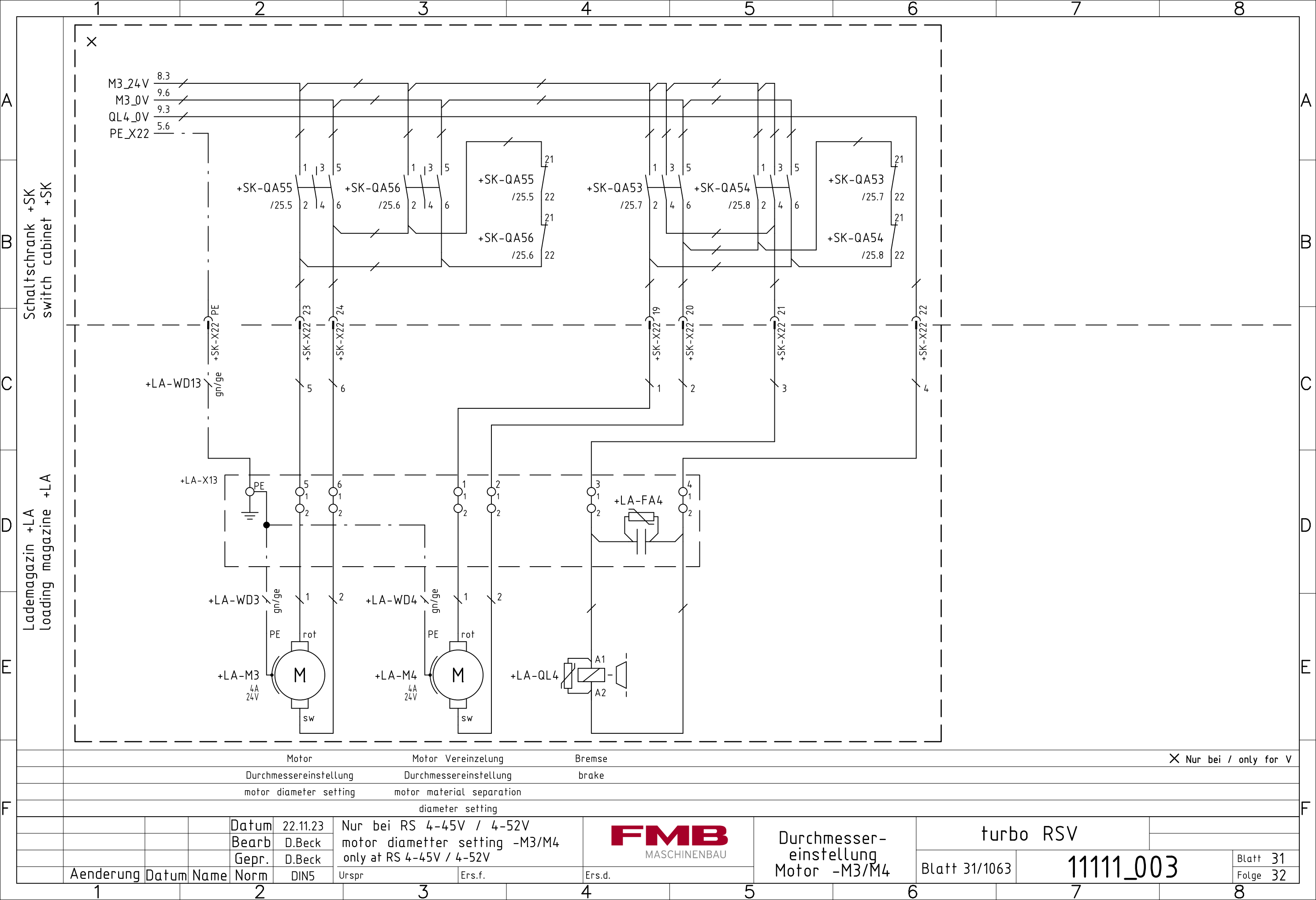
diameter setting 1 diameter setting 2 diameter setting 3

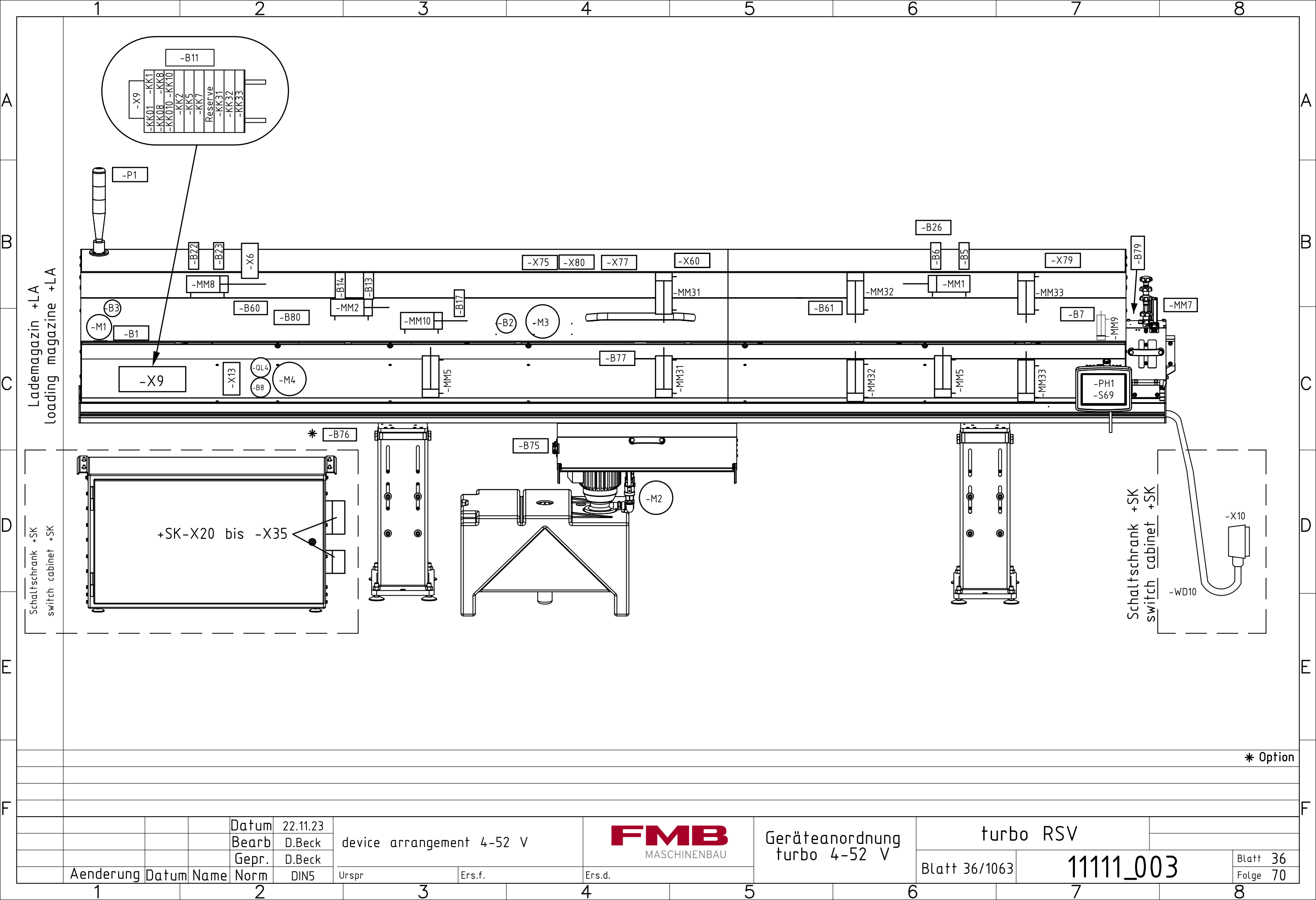
				Datum	22.11.23	Nur für RS 4-45V / 4-52 V input-card KF22/KF23 MX604.0-3 only at RS 4-45V / 4-52 V	FMB MASCHINENBAU	Ausgangskarte KF22/KF23 MX604.0-7	turbo RSV			
				Bearb	D.Beck							
				Gepr.	D.Beck							
	Aenderung	Datum	Name	Norm	DIN5	Urspr	Ers.f.	Ers.d.	Blatt 27/1063	11111_003		Blatt 27 Folge 28











Lademagazin +LA
loading magazine +LA

Schaltschrank +SK
switch cabinet +SK

Schaltschrank +SK
switch cabinet +SK

													* Option				
				Datum	22.11.23	device arrangement 4-52 V					Geräteanordnung turbo 4-52 V		turbo RSV				
			Bearb	D.Beck													
			Gepr.	D.Beck	Urspr								Ers.f.		Ers.d.		Blatt 36/1063
	Aenderung	Datum	Name	Norm	DIN5												

