



# Operating Manual

Version 1.0.2

## Surface grinding machine

**OPTIgrind®**  
**GT 25**

Part no. 3111025

**OPTIgrind®**  
**GT 30**

Part no. 3111030

**OPTIgrind®**  
**GT 40**

Part no. 3111040



GT25



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## Preface

Dear customer,

Thank you very much for purchasing a product made by OPTIMUM.

OPTIMUM metal working machines offer a maximum of quality, technically optimum solutions and convince by an outstanding price performance ratio. Continuous enhancements and product innovations guarantee state-of-the-art products and safety at any time.

Before commissioning the machine please thoroughly read these operating instructions and get familiar with the machine. Please also make sure that all persons operating the machine have read and understood the operating instructions beforehand.

Keep these operating instructions in a safe place nearby the machine.

### Information

The operating instructions include indications for safety-relevant and proper installation, operation and maintenance of the machine. The continuous observance of all notes included in this manual guarantee the safety of persons and of the machine.

The manual determines the intended use of the machine and includes all necessary information for its economic operation as well as its long service life.

In the paragraph "Maintenance" all maintenance works and functional tests are described which the operator must perform in regular intervals.

The illustration and information included in the present manual can possibly deviate from the current state of construction of your machine. Being the manufacturer we are continuously seeking for improvements and renewal of the products. Therefore, changes might be performed without prior notice. The illustrations of the machine may be different from the illustrations in these instructions with regard to a few details. However, this does not have any influence on the operability of the machine.

Therefore, no claims may be derived from the indications and descriptions. Changes and errors are reserved!

Your suggestion with regard to these operating instructions are an important contribution to optimising our work which we offer to our customers. For any questions or suggestions for improvement, please do not hesitate to contact our service department.

**If you have any further questions after reading these operating instructions and you are not able to solve your problem with a help of these operating instructions, please contact your specialised dealer or directly the company OPTIMUM.**

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## 1 Safety

This part of the operating instructions

- explains the meaning and use of the warning notes included in these operating instructions,
- defines the intended use of the surface grinding machine,
- points out the dangers that might arise for you or others if these instructions are not observed,
- informs you about how to avoid dangers.

In addition to these operating instructions, please observe

- the applicable laws and regulations,
- the statutory provisions for accident prevention,
- the prohibition, warning and mandatory signs as well as the warning notes on the surface grinding machine.

Always keep this documentation close to the surface grinding machine.

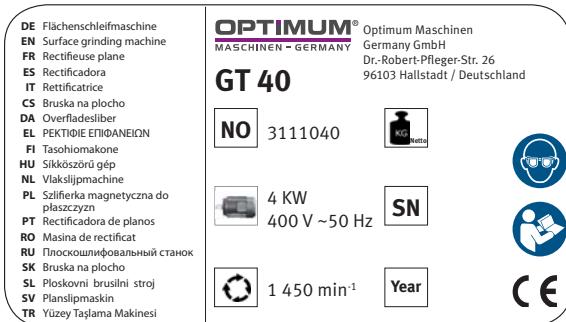
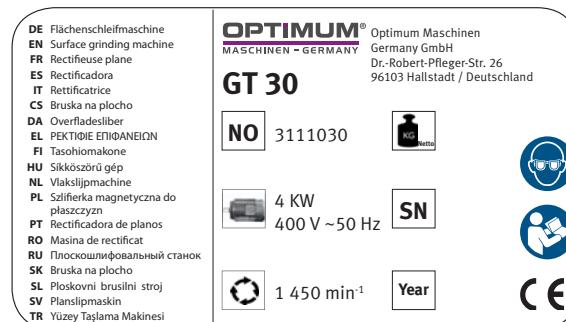
### 1.1 Glossary of symbols

provides further instructions

calls on you to act

- listings

### 1.2 Rating plate





## 1.3 Safety instructions (warning notes)

### 1.3.1 Classification of hazards

We classify the safety warnings into different categories. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Symbol	Alarm expression	Definition / consequence
	DANGER!	Impending danger that will cause serious injury or death to people.
	WARNING!	A danger that can cause serious injury or death.
	CAUTION!	A danger or unsafe procedure that can cause personal injury or damage to property.
	ATTENTION!	Situation that could lead to damage to the surface grinding machine and the product as well as to other damage. No risk of injury to persons.
	INFORMATION	Practical tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In case of specific dangers, we replace the pictogram with



general danger

with a warning of

injury to hands,

hazardous electrical voltage,

Risk of impact, danger of crushing

### 1.3.2 Other pictograms



Activation forbidden!



Do not step into the machine!



Do not extinguish with water!



Do not clean with compressed air!



Wear safety shoes!



Use ear protection!



Wear protective glasses!



Wear protective gloves!



Warning: biological hazard!



Warning: suspended loads!



Warning of oxidizing substances!



Caution, danger of explosive substances!



Warning: danger of slipping!



Protect the environment!



Contact address

## 1.4 Intended use

### WARNING!

If the surface grinding machine is not used as intended,

- this may result in hazards for personnel,
- the surface grinding machine and other material assets of the operator may be endangered,
- the function of the surface grinding machine may be affected.



The surface grinding machine is used exclusively for precision grinding of plane steel work-pieces. The surface grinding machine must only be installed and operated in a dry and well-ventilated areas. The machine integrated coolant system is only intended for water-miscible cooling lubricants.

The surface grinding machine is designed and constructed for use in non-explosive environments.

If the surface grinding machine is used in any way other than described above, modified without authorization of Optimum Maschinen Germany GmbH, then the surface grinding machine is being used improperly.

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee or CE conformity will expire, if any constructive, technical or procedural changes are not performed by the company Optimum Maschinen Germany GmbH.

It is also part of intended use that you

- comply with the performance limits of the surface grinding machine,
- observe the operating instructions,
- the inspection and maintenance instructions are observed.

### WARNING!

Extremely severe injuries due to non-intended use.



It is forbidden to make any modifications or alterations to the operating parameters values of the surface grinding machine. They could pose an accident hazard to persons and cause damage to the surface grinding machine.

## 1.5 Reasonably foreseeable misuse

Any use other than that specified under "Intended use" or any use beyond that described will be deemed non-intended use and is not permissible.

Any other use must be discussed with the manufacturer.



Only metallic, cold and non-flammable materials may be machined with the surface grinding machine.

In order to avoid misuse, it is necessary to read and understand the operating instructions before first commissioning.

Operators must be duly qualified.

### 1.5.1 Avoiding misuse

#### INFORMATION

The surface grinding machine with step motor control is built to comply with EMC Class C2 to EN 61800-3. The control and drive components of the surface grinding machine are approved for industrial and commercial use in industrial supply networks. Use in public supply networks requires a different configuration and/or additional measures.



#### WARNING!

**The class C2 (machine tools) is not intended to be used in residential facilities, where the power is supplied via a public low voltage supply system. In these areas, it may be difficult to guarantee electromagnetic compatibility due to conducted and emitted interference.**



- Regular balancing of the grinding wheel. For this purpose, a balancing device is supplied with the surface grinding machine.
- Adaptation of the oscillating speed and the transverse feed to the material and the work-piece.
- Mount the workpiece firmly and vibration-free on the electromagnet.
- Risk of fire and explosion due to the use of flammable materials or cooling lubricants.  
Before processing inflammable materials (e.g. aluminium, magnesium) or using inflammable auxiliary materials (e.g. spirit), you need to take additional preventive measures in order to avoid health risks.

#### WARNING!



**Risk of breakage of the grinding wheel or workpieces being thrown away.**

**The magnetizable workpiece must always be attached to the electromagnet in a plane and fixed manner. Check the secure fastening.**

- Use cooling and lubricating agents to increase the durability of the grinding wheel and to improve the surface quality.
- Clamping the workpiece on a clean and undamaged clamping surface on the electromagnet.



## Overview of the EMC categories:

### Categorie C1

- required limit values Class B Group 1 according to EN 55011

### Categorie C2

- Required limit values class A Group 1 according to EN 55011, Installation by EMC experts and warning:  
“This is a product of category C2 according to EN 61800-3. This product may cause radio interference in a residential area. In this case, it may be necessary for the operator to take appropriate action.”

### Categorie C3

- Required limit values class A group 2 according to EN 55011, whereby these limit values are below those of class A group 1, plus warning: “This type is not suitable for connection to a public low-voltage network supplying residential buildings. When connecting to a public low voltage network, radio frequency interference is expected.”

This machine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Categorie	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>
Environment	Residential area Business area Industrial area		Industrial area	
Voltage / Current	< 1000 V			> 1000 V
EMC knowledge	no requirement			
	Installation and commissioning by an EMC expert			

## 1.6 Dangers that can be caused by the surface grinding machine

The surface grinding machine was tested for operational safety. The construction and type are state of the art.

Nevertheless, there is still a residual risk, because the surface grinding machine works with

- rotating parts,
- electrical voltage and currents,
- an automatic feed,
- a limited NC control.

We have minimized the risk to people's health from these hazards through design and safety technology.

If the surface grinding machine is operated and maintained by insufficiently qualified personnel, hazards can arise from the surface grinding machine due to incorrect operation or improper maintenance.

## INFORMATION

Everyone involved in the assembly, commissioning, operation and maintenance must

- be duly qualified,
- and strictly follow these operating instructions.



In the event of improper use

- there may be a risk to personnel,
- can endanger the surface grinding machine and other material assets,
- the functionality of the grinding machine may be compromised.

Always switch off the surface grinding machine and disconnect it from the mains, when cleaning or maintenance work is carried out.

## WARNING!

The surface grinding machine may only be used with fully functional safety devices. Disconnect the surface grinding machine immediately, whenever you detect a failure in the safety devices or when they are not fitted!



All additional parts of the machine which had been added by the customer need to be equipped with the prescribed safety devices.

This is your responsibility being the operating company! ↗ Safety devices on page 13

## 1.7 Qualification of personnel

### 1.7.1 Target group

This manual is addressed to

- the operating companies,
- operators having sufficient specialist knowledge,
- the maintenance personnel.

Consequently, the warning notes refer both to the use of the surface grinding machine and to its maintenance.

Determine clearly and explicitly who will be responsible for the different activities on the surface grinding machine (operation, setting up, maintenance and repair). Please note the name of the responsible person into an operators's log.

## INFORMATION

Unclear responsibilities constitute a safety risk!



Always lock the main switch after switching off the surface grinding machine. This will prevent it from being used by unauthorized persons.

The qualifications of the personnel for the different tasks are mentioned below:

### Operator

The operator has been instructed by the operating company regarding the assigned tasks and possible risks in case of improper behaviour. The user may only carry out tasks that exceed normal operation if this is stated in these instructions and the operator has explicitly entrusted him with the task.

### Qualified electrician

With professional training, knowledge and experience as well as knowledge of respective standards and regulations, qualified electricians are able to perform work on the electrical system and recognise and avoid any possible dangers.

Qualified electricians have been specially trained for the working environment, in which they are working and know the relevant standards and regulations.

### Qualified personnel

Due to their professional training, knowledge and experience as well as knowledge of relevant regulations, qualified personnel are able to perform the assigned tasks and to independently recognise and avoid any possible dangers.

### Instructed person

Instructed persons were instructed by the operating company regarding the assigned tasks and any possible risks of improper behaviour.



## 1.7.2 Authorized personnel

### INFORMATION

Sufficient expertise is required for working on the surface grinding machine. Without the necessary training, nobody may work on the machine, even for a short time.



### WARNING!

Inappropriate operation and maintenance of the surface grinding machine constitutes a danger for the personnel, objects and the environment.



**Only authorized personnel may operate the surface grinding machine!**

Persons authorized to operate and maintain should be trained technical personnel and instructed by the ones who are working for the operating company and for the manufacturer.

### Obligations of the operating company

- train the personnel,
- instruct the personnel in regular intervals (at least once a year) on
  - all safety regulations relevant to the surface grinding machine,
  - operation of the surface grinding machine,
  - generally accepted engineering standards.
  - possible emergency situations,
- checking the level of knowledge of the personnel,
- documentation of the trainings/instructions in an logbook,
- require personnel to confirm participation in training/instructions by means of a signature,
- checking whether the personnel is working safety and risk-conscious and observes the operating instructions.
- define and document the inspection deadlines for the machine in accordance with the Factory Safety Act and perform an operational risk analysis in accordance with the Work Safety Act.

### Obligations of the operator

- have obtained a training regarding the handling of the surface grinding machine,
- keep an operator's log,
- before taking the machine in operation
  - have read and understood the operating manual,
  - be familiar with all safety devices and instructions.

Additional requirements apply for work on the following machine components:

- Electric components or operating materials: They must only be performed by a qualified electrician or person working under the instructions and supervision of a qualified electrician.

## 1.8 Operator positions

The operator position is in front of the surface grinding machine on the control panel.

### CAUTION!

**Risk of impact and crushing due to the oscillating movement of the table. Pay attention to people passing the machine by an maximum oscillating speed set and/or protect the oscillation area with suitable measures.**



## 1.9 Safety devices

The surface grinding machine must only be operated with fully functional safety devices.

Stop the surface grinding machine immediately if there is a failure on the safety device or becomes ineffective.



It is your responsibility!

If a safety device has been deactivated or is defective, the surface grinding machine can only be used again if you

- have eliminated the cause of the fault and
- you have verified that there is no danger to personnel or objects.

## WARNING!

**If you bypass, remove or override a safety device in any other way, you are endangering yourself and other persons working with the surface grinding machine. The possible consequences include:**

- injuries due to tools, workpieces or fragments hereof which are flying off at high speed,
- contact with rotating or moving parts,
- fatal electrocution,
- pulling-in of clothes.



## WARNING!

**Although the isolating safety devices provided and delivered with the machine are designed to reduce the risks of coolants, workpieces being ejected or parts of tools, breaking off grinding wheel or workpieces breaking off, they cannot eliminate these risks completely. Always work carefully and observe the limit values of the grinding process.**



The surface grinding machine features the following safety devices:

- a lockable master switch,
- an emergency stop button,
- a protective cover on the grinding wheel with position switch
- A coolant splash guard around the grinding table.

### 1.9.1 Lockable master switch

In the "0" position, the lockable master switch can be secured against accidental or non-authorised switching on by means of a padlock.

The power supply is interrupted by switching off the master switch.

Except for the areas marked by the pictogram in the margin. In these areas there might be voltage, even if the master switch is switched-off.

## WARNING!

**Dangerous voltage even if the master switch is switched off.**

The areas marked by the pictogram might contain live parts, even if the master switch is switched off.





### 1.9.2 Emergency stop button

#### CAUTION!

Only press the emergency-stop button in a genuine emergency. You may not use the emergency stop button to stop the machine during normal operation. The life time of the emergency stop button is not designed for operational shut-down of the machine.



#### CAUTION!

Depending on the mass moment of inertia the grinding wheel continues to rotate for a while.



The emergency stop button switches off the control voltage and thus stops the drives. Turn the knob to the right to unlock and release the emergency stop button.

The emergency stop switch is used to stop the surface grinding machine in an emergency.

After pressing the button, turn the knob of the switch to the right in order to be able to switch the machine on again via the push button <SB1>, control voltage on.

### 1.9.3 Control-related safeguarding

#### WARNING!

If you bypass a control device, you endanger yourself and other people working on the surface grinding machine.



- injuries due to tools, workpieces or fragments hereof which are flying off at high speed,
- contact with rotating parts,
- fatal electrocution,
- pulling-in of clothes.

If, in exceptional cases (e.g. electrical repairs), you briefly bypass a control device, you must constantly monitor the surface grinding machine during this time.

### 1.9.4 Prohibition, warning and mandatory signs

#### INFORMATION

All warning and mandatory signs must be legible. They must be checked regularly.



### 1.10 Safety check

Check the surface grinding machine at least once per shift. Inform the person responsible immediately of any damage, defects or changes in the operating function.

Check all safety devices

- at the beginning of each shift (when the machine is operated continuously),
- once per day (during one-shift operation),
- once per week (when operated occasionally),
- after all maintenance and repair work.

Check whether the prohibition, warning and instruction signs and the markings on the surface grinding machine

- are legible (clean them, if necessary)
- and complete (replace them, if necessary).



#### INFORMATION

Organise the checks according to the following table;



General check		
Equipment	Check	OK
Protective housing on the grinding wheel	Not damaged and functional	
Signs, Markings	Installed and legible	
Grinding wheel	Grinding wheel pulled off ?	
Grinding wheel with flange	Balanced ?	
Date:	Checked by (signature):	

Functional check		
Equipment	Check	OK
Emergency-stop push button	After actuating the emergency stop switch, the surface grinding machine must switch off.	
Protective cover grinding wheel	The grinding wheel drive can only be switched on when the protective cover is closed.	
Date:	Checked by (signature):	

## 1.11 Personal protective equipment

For certain work, personal protective equipment is required.

Protect your face and your eyes: Wear a safety helmet with facial protection when performing work where your face and eyes are exposed to hazards.

Wear protective gloves when handling pieces or tools with sharp edges.

Wear safety shoes when you assemble, disassemble or transport heavy components.

Use ear protection if the noise level (emission) in the workplace exceeds 80 dB (A).

Before starting work make sure that the required personnel protective equipment is available at the work place.

### CAUTION!

**Dirty or contaminated personnel protective equipment can cause illness. They must be cleaned after each use and at least once a week.**





## 1.12 Safety during operation

### WARNING!

**Before switching on the surface grinding machine, make sure that no persons are endangered and no objects are damaged.**



Avoid any unsafe work methods:

- The instructions mentioned in these operating instructions have to be strictly observed during assembly, operation, maintenance and repair.
- Do not work on the surface grinding machine if your ability to concentrate is reduced for any reason, such as the influence of medication.
- Clamp the workpiece securely and firmly on the table using the electromagnet before you switch on the surface grinder.
- During the NC-controlled operation of the surface grinding machine, the operator must not leave the operator's station.
- The surface grinding machine may only be used for grinding metal workpieces. No combustible material or material made of wood or plastic may be used.
- Only use personnel with experience in surface grinding to operate and maintain the surface grinding machine.
- The Operating Instructions must be read before using the surface grinding machine for the first time.
- Before the grinding process, check the grinding wheel and its correct direction of rotation. Let the grinding wheel run freely for about 5 minutes.
- Before starting the surface grinding machine, ensure sufficient safety clearance between the workpiece and the grinding wheel.
- The area around the surface grinding machine must be kept clean and dry. Remove waste and material removal.
- Use the electromagnetic clamping device to fix the workpiece, clean the clamping device before fixing the workpiece, regrind if scratches occur.
- Never leave the surface grinding machine unattended during operation. Switch off the surface grinding machine before leaving.
- After switching off the spindle motor, let the grinding wheel run out freely. Never brake the grinding wheel with your hand, the honing device or other objects.
- Never readjust the coolant supply during wet grinding. Switch off the coolant supply before switching off the spindle motor.

## 1.13 Safety during maintenance

Inform the operators in good time of any maintenance and repair works.

Report all safety-relevant changes to the surface grinding machine or its operating behaviour. Any changes must be documented, the operating instructions updated and machine operators instructed accordingly.

## 1.14 Switching off and securing the surface grinding machine

Switch off the surface grinding machine at the main switch before starting maintenance and repair work.

Use a padlock to prevent the switch from being turned on without authorization and keep the key in a safe place.

All machine parts as well as all dangerous voltages are switched off.

Excepted are only the positions which are marked with the adjoining pictogram. These positions may be live, even if the main switch is switched off.

Attach a warning sign to the surface grinder.



**WARNING!**

Live parts and moves of machine parts can injure you or others dangerously!

Take extreme care if you do not switch off

the surface grinding machine by turning off the master switch due to required works  
(e.g. functional control).



## 1.14.1 Using lifting equipment

**WARNING!**

The use of unstable lifting and load suspension gear that might break under load can cause severe injuries or even death. Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities responsible for your company.

Check that the lifting and load-suspension equipment are of sufficient load-bearing capability and are in perfect condition. Fasten the loads carefully. Never walk under suspended loads!

## 1.14.2 Mechanical maintenance

Remove or install protection safety devices before starting or after completing any maintenance work; this include:

- covers,
- safety instructions and warning signs,
- grounding cables.

If you remove protective or safety devices, re-fit them immediately after the completing the work.

Check if they are working properly!

## 1.15 Accident report

Inform your supervisors and Optimum Maschinen Germany GmbH immediately in the event of accidents, possible sources of danger and any actions which almost led to an accident (near misses).

There are many possible causes for "near misses".

The sooner they are notified, the quicker the causes can be eliminated.



## INFORMATION

We draw your attention to specific hazards when carrying out work with and on the surface grinding machine in the description of this work.

## 1.16 Electronics

Have the machine and/or the electric equipment checked regularly. Immediately eliminate all defects such as loose connections, defective wires, etc.

A second person must be present during work on live components to disconnect the power in the event of an emergency. Disconnect the machine immediately if there is a malfunction in the power supply!

Comply with the required inspection intervals in accordance with the factory safety directive, operating equipment inspection.

The operator of the machine must ensure that the electrical systems and operating equipment are inspected with regards to their proper condition, namely,

- by a qualified electrician or under the supervision and direction of a qualified electrician, prior to initial commissioning and after modifications or repairs, prior to recommissioning
- and at certain intervals.



The intervals must be set so that foreseeable defects can be detected in a timely manner, when they occur.

The relevant electro-technical rules must be followed during the inspection.

The inspection prior to initial commissioning is not required if the operator receives confirmation from the manufacturer or installer that the electrical systems and operating equipment comply with the accident prevention regulations, see conformity declaration.

Permanently installed electrical systems and operating equipment are considered constantly monitored if they are continually serviced by qualified electricians and inspected by means of measurements in the scope of operation (e.g. monitoring the insulation resistance).

## 1.17 Inspection deadlines

Define and document the inspection deadlines for the machine in accordance with § 3 of the Factory Safety Act and perform an operational risk analysis in accordance with § 6 of the Work Safety Act. Also use the inspection intervals in the maintenance section as reference values.

## 1.18 Clamping devices for workpieces and tools

### ATTENTION!



**Attention when taking over existing clamping devices. Please thoroughly check that the clamping device is appropriate for your surface grinding machine.**

- Only use clamping devices with a complete inherent rigidity.
- After collision damage, consult the manufacturer of the clamping device to obtain information on possible further use of the clamping device.
- Correctly insert the workpiece and make sure that the machine is proper working condition.

## 1.19 Environmental protection and water conservation

Your surface grinding machine is a HBV-System according to §19g Water Resources Act (System for the use of water hazardous substances)



When operating, shutting down or dismantling the surface grinding machine or parts thereof, the requirements of the Water Resources Act (WHG) must be observed. Detailed information regarding this can be found in the Ordinance on Installations for the Handling of Substances Hazardous to Water (VAwS).

## 1.20 Hydraulic system

The system is under a pressure of up to 10 MPa (100 bar). The hydraulic system is used for table movement to the left and right.

### WARNING!



**Serious injuries from hydraulic liquid escaping under high pressure!**

**Possible loss of the eyesight!**

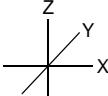
**Make sure that the hydraulic system is depressurised before opening a component or a pipe. Wear protective goggles and protective clothing when working on the hydraulic system.**

**The hydraulic system might still be under pressure, even after the central power supply of the machine is switched off.**

**If you have got hydraulic fluid in your eyes, rinse them immediately with plenty of water. Immediately seek medical assistance.**



## 2 Technical data

	GT25	GT30	GT40
Surface grinding table Table length x width	254 x 508 mm	305 x 635 mm	406 x 813 mm
T - slot size / number	14 mm / 1	14 mm / 1	14 mm / 3
Electric magnetic clamping plate	250 x 500 mm	300 x 600 mm	400 x 800 mm
max. load grinding table including electro-magnetic clamping plate	180 kg	270 kg	500 kg
max. workpiece size	508 x 254 x 350 mm	635 x 305 x 405 mm	813 x 406 x 405 mm
maximum distance spindle center - grinding table	450 mm	580 mm	580 mm
Oscillation speed of the table	5 - 25 m/min	5 - 25 m/min	5 - 25 m/min
Maximum oscillation in X axis	560 mm	765 mm	830 mm
Maximum travel in Y axis	275 mm	340 mm	420 mm
step less cross feed (Y axis)	0.1 - 8 mm	0.1 - 8 mm	0.1 - 8 mm
	990 mm/min	990 mm/min	990 mm/min
Rapid traverse adjustment in the Y axis			
Scale division on handwheel	0.02 mm	0.02 mm	0.02 mm
Step widths of the rapid traverse feed in Z axis	0,005   0,01   0,02   0,03   0,04   0,05	0,005   0,01   0,02   0,03   0,04   0,05	0,005   0,01   0,02   0,03   0,04   0,05
Rapid traverse adjustment in the Z axis	480 mm/min	480 mm/min	480 mm/min
Scale division on handwheel	0.005 mm	0.005 mm	0.005 mm
Constant spindle speed at ~50Hz connection	2850 rpm	1450 rpm	1450 rpm
Constant spindle speed at ~60Hz connection	3450 rpm	1750 rpm	1750 rpm
Grinding wheel peripheral speed at ~50 Hz connection	33 m/s	27 m/s	27 m/s
Grinding wheel peripheral speed at ~60 Hz connection	37 m/s	32 m/s	32 m/s
Size of the grinding wheel	Ø 200 x 20mm , shaft Ø 31.75	Ø 350 x 40 , shaft Ø 127 mm	Ø 350 x 40mm , shaft Ø 127
Grain size of the grinding wheel	46	46	46
Type of grinding wheel	Corundum grinding wheel		
Coolant tank capacity	0.052 m³	0.1 m³	0.1 m³
Coolant pump	70 W	90 W	90 W
Delivery height	4m	5m	5m
Flow rate	11 l/min	33 l/min	33 l/min
Hydraulic motor	0.75 kW	2.2 kW	2.2 kW

GT25\_GT30\_GT40\_GB\_2.fm



	GT25	GT30	GT40
Grinding wheel drive motor	2.2 kW	4 kW	4 kW
Height adjustment drive motor of grinding wheel	0.5 kW	0.5 kW	0.5 kW
Transverse axis drive motor	40 W	40 W	40 W
Total connected load	3.7 kW	7.5 kW	7.5 kW
Supply voltage	400 V	400 V	400 V
Mains frequency	~ 50 Hz	~ 50 Hz (~60Hz)	~ 50 Hz (~60Hz)
required footprint	Installation plan on page 26		
Work area	Keep a work area of at least one metre around the machine free for operation and maintenance.		
Sound pressure level at 1 m distance from the machine and 1.60 m above the ground. (~50Hz connection)	76 - 79 dB(A)		
Net weight	1900 kg	3000 kg	3600 kg
Operating material	60 litres of hydraulic oil ISO VG32	100 litres of hydraulic oil ISO VG32	100 litres of hydraulic oil ISO VG32
Hydraulic oil Lubricant on page 157			
Central lubrication Lubricant on page 157	slideway oil ISO VG 32 , approx. 4 litres	slideway oil ISO VG 32 , approx. 4 litres	slideway oil ISO VG 32 , approx. 4 litres
abrasive fluid (coolant)	52 litres	100 litres	100 litres

## INFORMATION SOUND PRESSURE LEVEL

The specified numerical value represents the emission level and does not necessarily a safe working level. Although there is a correlation between the level of noise emission and the level of noise exposure, it cannot be used reliably to determine whether or not further protective measures are necessary. Factors influencing the actual level of exposure of workers include the characteristics of the work area and other noise sources, i.e. the number of machines and other processes taking place nearby, and the length of time an operator is exposed to the noise. Furthermore, the permissible exposure level may vary from country to country. However, this information enables the user of the machine to make a better assessment of the hazards and risks.



## CAUTION!

Depending on the overall noise exposure and the basic threshold values, machine operators must wear appropriate hearing protectors.





## 3 Delivery, interdepartmental transport, assembly and commissioning

### 3.1 Notes on transport, installation, commissioning

Improper transport, installation and commissioning is liable to accidents and can cause damage or malfunctions to the machine for which we do not assume any liability or guarantee.

Transport the scope of delivery secured against shifting or tilting with a sufficiently dimensioned industrial truck or a crane to the installation site.

#### WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box.



Note the total weight of the machine. The weight of the machine is indicated in the "Technical data" of the machine. When the machine is unpacked, the weight of the machine can also be read on the rating plate.

Only use transport devices and load suspension gear that can hold the total weight of the machine.

#### WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load-bearing capacity and that it is in perfect condition.



Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company. Fasten the loads properly.

#### 3.1.1 General risks during internal transport

##### WARNING: TILTING DANGER!



The machine may be lifted unsecured by a maximum of 2 cm.

Employees must be outside the danger zone, i.e. the reach of the load.

Warn employees and advise them of the hazard.

Machines may only be transported by authorized and qualified persons. Act responsibly during transport and always consider the consequences. Refrain from daring and risky actions.

Gradients and descents (e.g. driveways, ramps and the like) are particularly dangerous. If such passages are unavoidable, special caution is required.

Before starting the transport check the transport route for possible danger points, unevenness and faults.

Danger points, unevenness and disturbance points must be inspected before transport. The removal of danger spots, disturbances and unevenness at the time of transport by other employees leads to considerable dangers.

Careful planning of interdepartmental transport is therefore essential.



## 3.2 Assembly and commissioning

### INFORMATION

The surface grinding machine is pre-assembled. The delivery takes place in several transport boxes. After unpacking and transport to the installation site, individual components of the surface grinding machine must be assembled and joined together.



## 3.3 Unpacking the machine

Install the machine close to its final position before unpacking. The machine is delivered in several packages. If a package shows signs of possible transport damage, take appropriate precautions not to damage the machine when unpacking. If damage is discovered, the carrier and/or shipper must be notified immediately so the necessary steps can be taken to register a complaint.

Examine the complete machine carefully and check whether all materials, such as shipping documents, instructions and accessories have been delivered with the machine.

### 3.3.1 Standard accessories

- Electromagnet on grinding table
- external hydraulic power unit with oil cooler
- Table enclosure as splash guard when used
- Levelling feet, set screws and lock nuts
- Test report machine accuracy
- Operating instructions in printed form

### 3.3.2 Optional accessories:

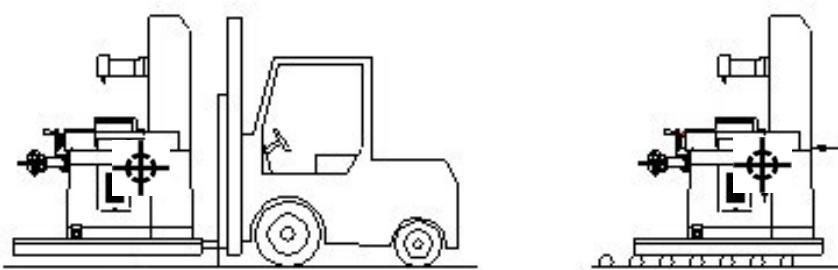
- Magnetic filter and paper band filter, article no. 3112000 MPS1

### 3.3.3 Load stop in unpacked condition

The machine can be lifted underneath the machine base with a forklift or pallet truck. For transport, the surface grinding machine must be secured on the loading area in accordance with regulations. All loose parts must either be firmly attached to the machine, separately secured or stowed in a separate, secure container.

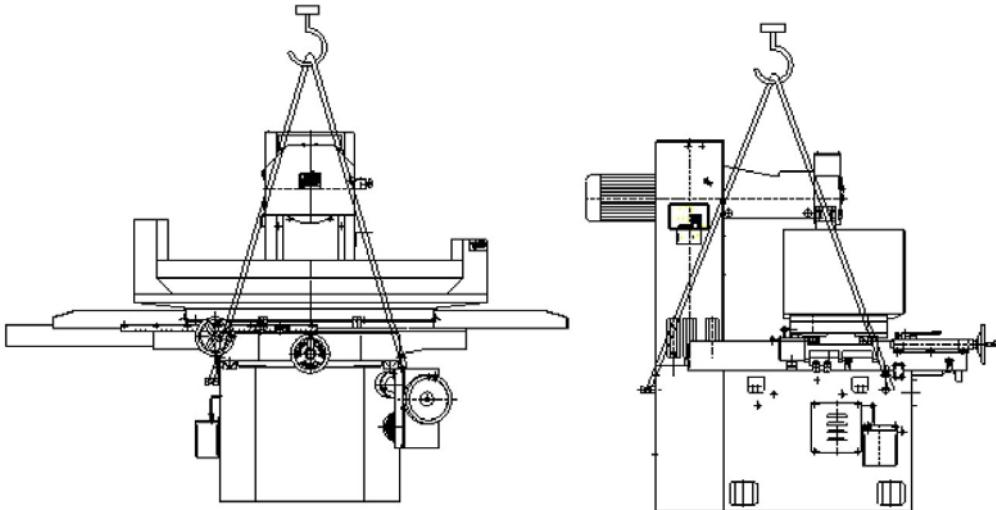
The surface grinding machine may only be loaded and unloaded by qualified personnel.

Loading and unloading using a forklift truck: The machine may only be lifted by the base frame. Pay attention to the indicated weight and the load centre of gravity.





For lifting with a crane, first mount the transport bolts on the base of the machine. Then attach the steel cables to the bolts and hook.



Pay particular attention when transporting with a crane:

- Raise the machine at the lowest possible speed.
- Make sure the machine is balanced.
- Cover the machine in places where contact with the transport cables may occur.
- The transport cables must not touch the machine saddle to avoid damaging the saddle guides.
- During transport, no persons may stay closer than 2 metres to the machine.

During transport of the machine with a forklift truck or crane, there must be no stops or movements of the machine.

### 3.4 Set-up and assembly

#### ATTENTION!

Before you set up the machine, have the load-bearing capacity of the ground checked by a specialist. The floor or the hall ceiling must bear the weight of the machine plus all additional parts and units, as well as operators and stored materials. If necessary, the foundation must be reinforced.



### 3.5 Installation site requirements

When using liquid grinding additive or coolant lubricant:

In order to achieve sufficient safety against falls by slipping, the accessible area in the mechanical machining zone of the machine must be equipped with a slip resistance. The slip resistant mat and/or the slip resistant floor must be at least R11 according to BGR 181.

The used shoes must be suitable for being used in those machining areas. The accessible areas must be cleaned.

Design the working area around the surface grinding machine according to the local safety regulations.

The work area for operation, maintenance and repair must not be restrictive.

#### INFORMATION

In order to achieve high levels of functionality and machining accuracy, as well as a long service life of the machine, the set-up location should meet certain criteria.





## The following points should be noted:

- The machine must only be installed and operated in a dry and well-ventilated place.
- Avoid places near machines generating chips or dust.
- The installation site must be free from vibrations also at a distance of presses, planing machines, etc.
- The ground must be suitable for the surface grinding machine. Make sure that the floor has sufficient load-bearing capacity and is level.
- The ground must be prepared in such a way that any coolant used cannot penetrate into the ground.
- Any parts sticking out such as stops, handles, etc. have to be secured by measures taken by the customer if necessary in order to avoid endangering persons.
- Provide enough space for set-up and operating personnel and material transport.
- Also bear in mind accessibility for installation and maintenance works.

## INFORMATION

The main switch of the surface grinding machine must be freely accessible.



## ATTENTION!

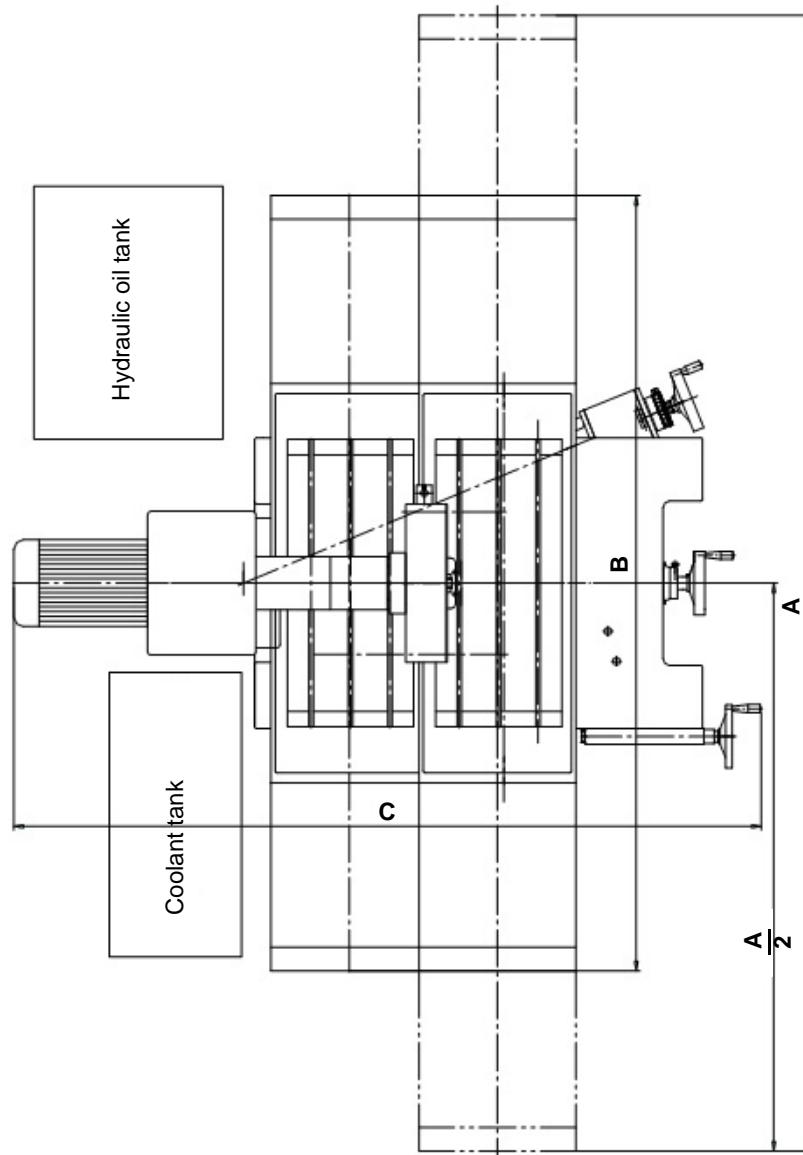
Ensure that only experienced personnel transport, set up and install the machine.





## 3.6 Installation plan

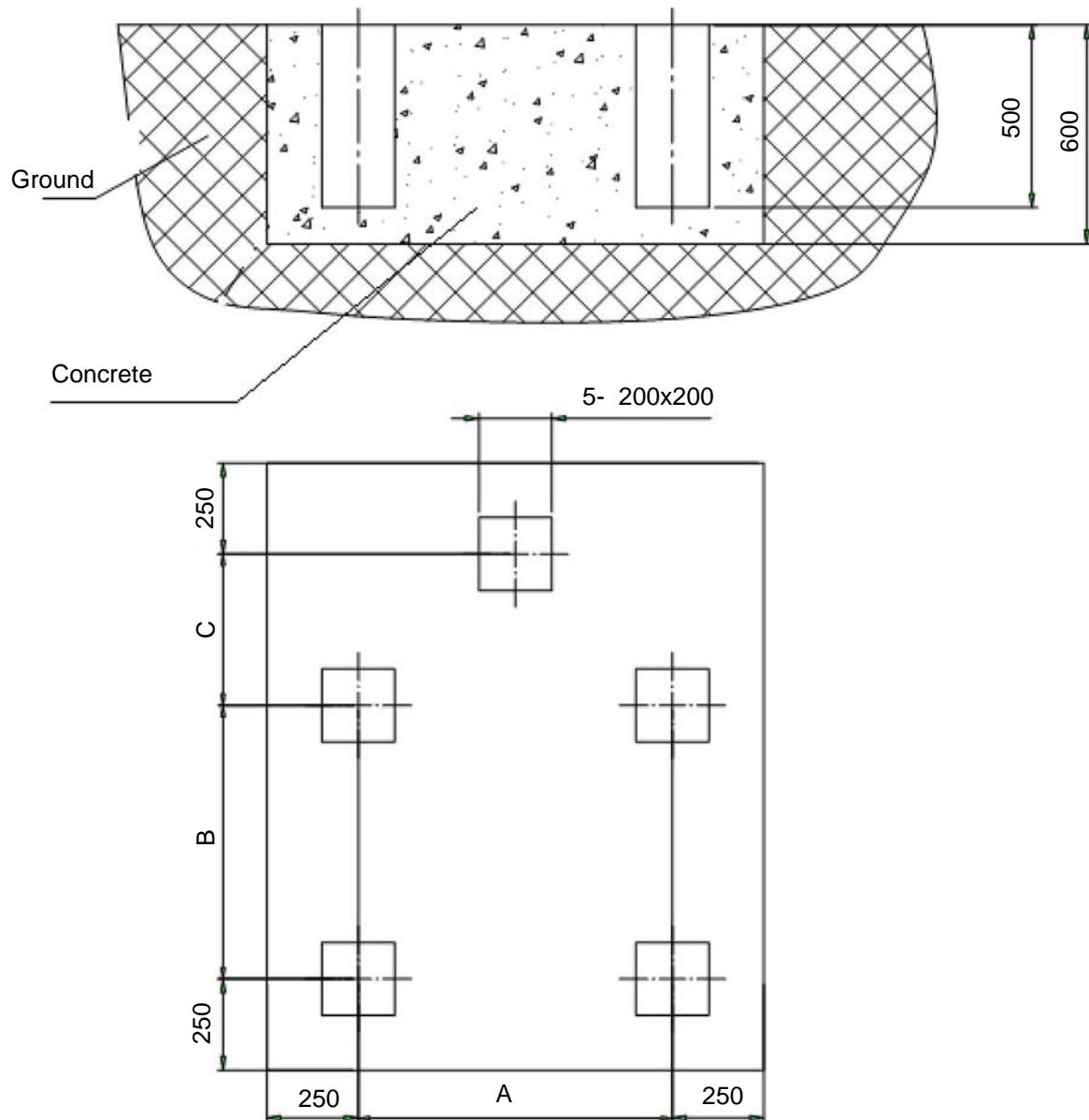
Floor space [mm]



	<b>GT25</b>	<b>GT30</b>	<b>GT40</b>
A	2250 mm	2800 mm	3600 mm
B	1720 mm	2085 mm	2630 mm
C	2150 mm	2200 mm	2400 mm



### 3.6.1 Anchored mounting



	GT25	GT30	GT40
A	640 mm	760 mm	860 mm
B	540 mm	550 mm	750 mm
C	428 mm	415 mm	415 mm

Anchor bolts, flat steels and set screws are not included in the delivery.

#### ATTENTION!

Insufficient stiffness of the foundation leads to superimposition of vibrations between the surface grinding machine and the foundation (resonant frequency of the components). Critical oscillations during oscillating movements of the grinding table are reached very quickly if the overall system is not sufficiently rigid and lead to poor grinding results.





## Assembly

- Core holes with a diameter of 150 to 200mm and a depth of 500mm are drilled on a light foundation.
- The prepared 5 pcs. Attach flat steel (200x200) with the anchor bolts so that they are aligned with the anchoring points.
- Raise the machine from the floor and centre in the inner drill holes with the anchor screws.
- Roughly align the machine.
- Fill the drill holes with concrete and allow to set.
- Align the machine with the set screws and tighten the anchor bolts.

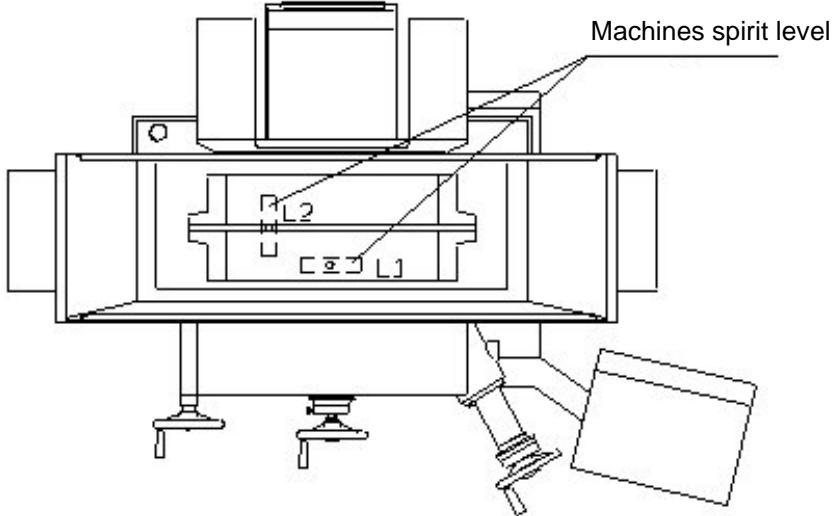
### 3.6.2 Free mounting

Use the supplied levelling feet, set screws and lock nuts to set up and align the surface grinder on them.

### 3.6.3 Aligning the machine

When the machine is in your position, the levelling is carried out according to the following description.

- Clean table
- Place the machine spirit level (0.02mm/m) once in longitudinal direction and once in transverse direction on the working table.
- Position the table in the middle and align the machine with the set screws until the machine spirit level indicates a level position.
- Move the table in all directions, simultaneously aligning the machine with the adjusting screws until a value of 0.02 mm/m is read off the machine spirit level.
- Adjust the adjusting screws until their tension does not change the levelling.
- Use the nuts to tighten the set screws or the anchor bolts and check the levelling again.



Check the levelling again after the first week of machine operation at the latest. A new machine must be aligned every week. If the alignment remains stable, the alignment can be checked every 6 months and readjusted if necessary.

### 3.7 Removing the transport locks

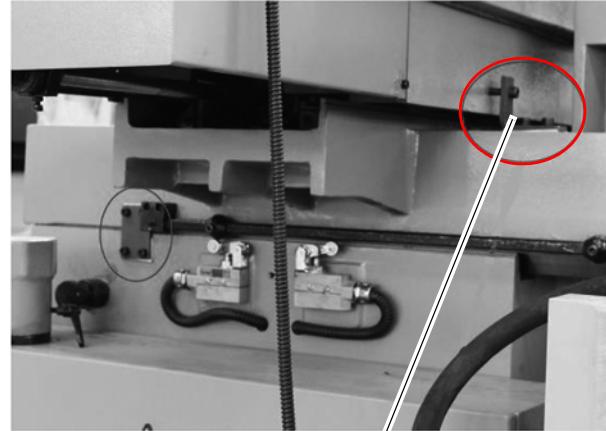
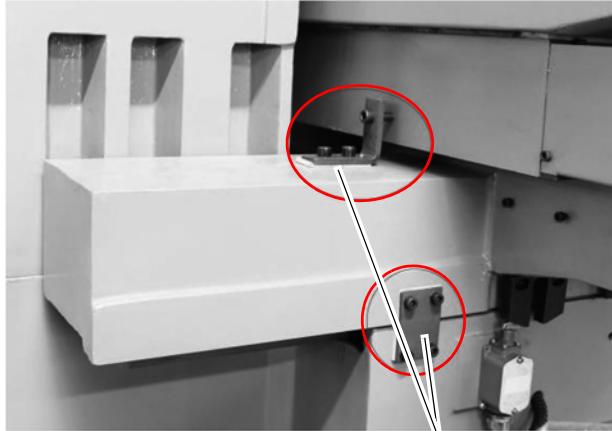
In order to prevent damage during transport, the moving machine parts were locked with transport securing plates.



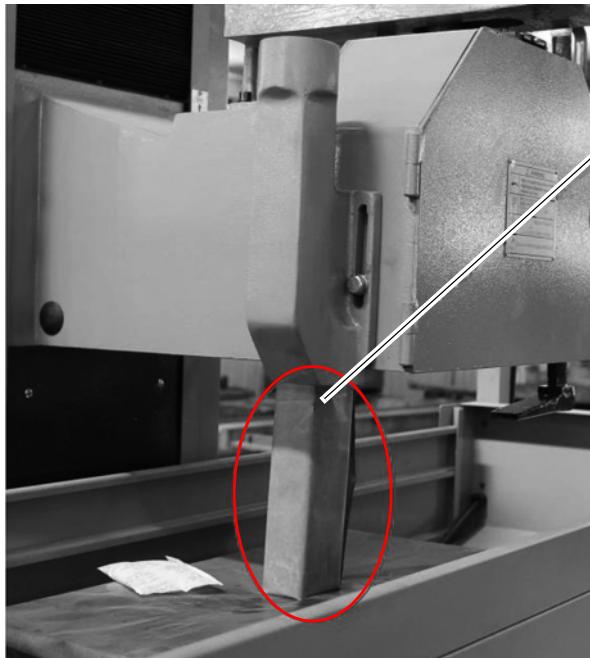
When the surface grinding machine is in its final position, the transport lock must first be removed.

## INFORMATION

Save the removed transport protection plates for later reuse. In case of loss, contact the dealer or manufacturer for replacement.



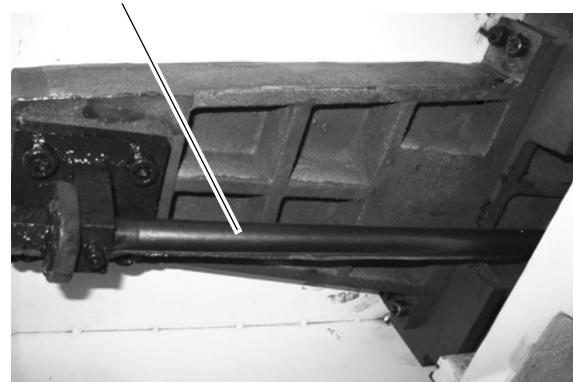
Remove fastening bolts and plates for fixing the machine saddle and worktable.



Move the grinding head and remove the wooden block.

Remove the anti-rust paper covering the hydraulic piston rod.

Clean the guide.

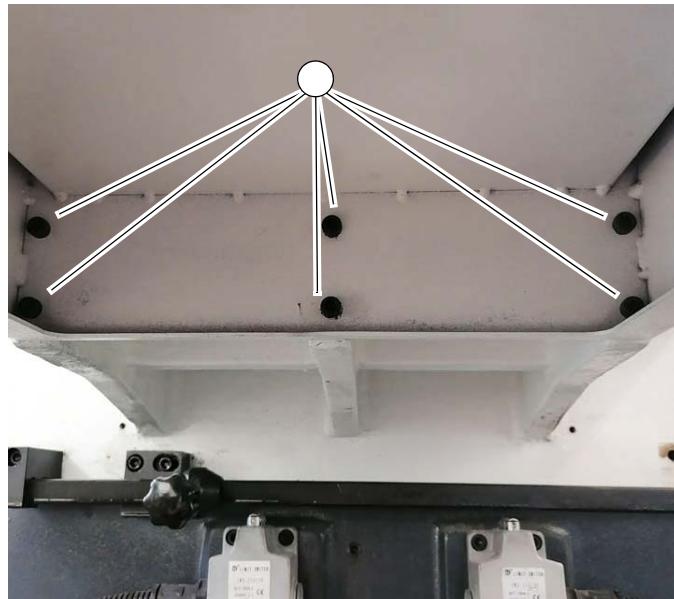




### 3.8 Installation of the collecting trays on GT40

For the transport of the GT40, the collecting trays (3) were dismantled on both sides.

Fix the collecting trays to the machine body again with the enclosed M6 hexagon bolts.



### 3.9 Cleaning the machine

#### ATTENTION!

**Do not use compressed air to clean the machine.**



Your new surface grinding machine must be completely cleaned after unpacking in order to ensure that the moving parts and sliding surfaces cannot be damaged during operation of the machine. Before delivery, all bare parts and sliding surfaces of each unit are lubricated accordingly in order to protect them against rust in the period before commissioning. Remove all wrappings and clean all surfaces with a degreaser to soften and remove protective greases and coatings.

Wipe all surfaces with a clean cotton cloth.



### 3.10 Top up central lubrication

The machine has a central lubrication system.

Fill the container with slideway oil up to the "MAX" mark.

When the machine is in operation, the oil pump supplies the slideway oil to all lubrication points simultaneously at the entered time interval (2) in minutes and the entered time period (1) in seconds.

Suitable slideway oil is ISO VG 32 or ISO VG 68.

☞ Lubricant on page 157

#### SET button

To reset the pump or cancel the alarm.

To set the time duration and interval:

- Press and hold SET key for 2 seconds to set the pump operating time (shown on the display as ACT)  
The adjustable running time of the pump is 1 to 999 seconds.

To set the interval:

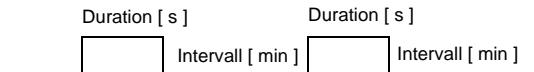
- Press and hold the SET key again for 2 seconds to set the pump interval duration (displayed on the screen as INT).  
The adjustable interval time is 1 to 999 minutes.
- Press and hold the button a third time for 2 seconds to complete the setting.

#### Rst button

The same function as the SET button to cancel the alarm.



## Procedure



After switching on the control voltage, the system starts the oil supply and automatically repeats the operating time and interval. When the pump is running this is indicated by a green LED. The red LED lights up for the duration of the interval.

- The flashing of ErO means that there is not enough oil.
- The flashing of ErP indicates abnormal pressure.
- If Ers flashes, it means that the system is overloaded.

## INFORMATION



The higher the viscosity, the thicker the oil. The viscosity itself is not a quality characteristic, but in connection with central lubrication systems it is suitable for adjusting a possibly too low or too high slideway oil consumption without changing the interval and duration.

Make sure that the slideway oil used matches your process abrasive (coolant).

ISO VG 32 has a center point viscosity of 32 mm<sup>2</sup>/s at 40°C .

ISO VG 68 has a center point viscosity of 68 mm<sup>2</sup>/s at 40°C .

The shortest interval time should not be less than 2 minutes. After setting, press the SET button to confirm.

The interval and duration have already been set appropriately by the factory before delivery.

## ATTENTION!



**The central lubrication prevents the so-called stick-slip effect, or the effect known as stick-slip or jerk-slip between solids. Well-known examples are creaking doors or rattling windscreen wipers. Make sure that no slipping occurs after some time if the lubrication interval is changed.**



### 3.10.1 Central lubrication supply points

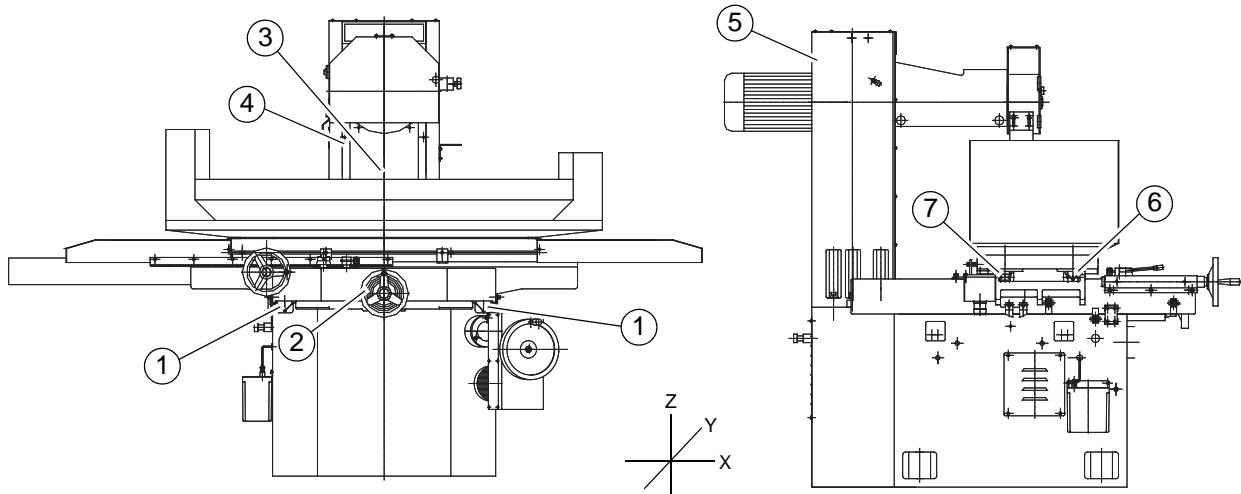


Abb.3-1:

Item	Lubrication point	Lubricant	Interval and duration
1	Dovetail guide Y-axis		
2	Spindle of cross feed in Y axis		
3	Lifting spindle and spindle nut in Z axis		
4	Front guideway of the column in Z axis		only jointly adjustable
5	Rear guideway of the column in Z axis	Slideway oil ISO VG 32 or ISO VG 68	
6	Dovetail guide table in X axis		
7	Guide rail of table in X axis		



### 3.11 Connecting the hydraulic system

The hydraulic unit supplies the hydraulic cylinder below the table with pressure oil for the pendulum table movement during the grinding process.

Connect the hydraulic hose lines of the hydraulic unit to the surface grinding machine. P = pressure line ; T = return line.

The factory-set hydraulic pressure at the hydraulic pump is 3 MPa (30 bar).



#### Hydraulics diagram:

- ☞ GT25 - Hydraulik - Hydraulic on page 97
- ☞ GT30 - Hydraulik - Hydraulic on page 108
- ☞ GT40 - Hydraulik - Hydraulic on page 119



### 3.11.1 Fill in hydraulic oil

The hydraulic oil is filled in via the filler cap (1) on the oil tank.

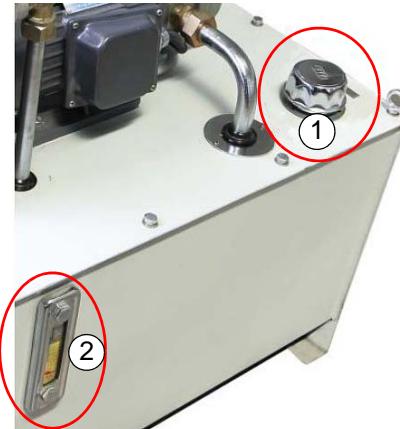
Fill in oil until the mark (2) on the tank is reached.

Capacity GT25 = 60 litres

Capacity GT30 ; GT40 = 100 litres

Usable hydraulic oil **ISO VG32**, see Lubricant on page 157

The system pressure of the hydraulic pump is already set at the factory. The hydraulic system is self-venting. Passing the hydraulic circuit several times by pendulum movement of the table accelerates the self-ventilation.



### 3.12 Coolant circuit

#### ATTENTION!

The surface grinding machine was painted with a one-component lacquer. Take this criterion into account when selecting your cooling lubricant.



Optimum Maschinen Germany GmbH does not accept any guarantee for consequential damage caused by unsuitable process abrasives. The flashpoint of the emulsion must be higher than 140°C.

When using non-water-miscible cooling lubricants (oil content > 15%) with a flashpoint, ignitable aerosol air mixtures might develop. There is a danger of explosion.

Fill the container (2) of the coolant circuit with your process abrasive.

- The total filling quantity in the circuit must not exceed the height of the sedimentation tank for the grinding sludge (4).

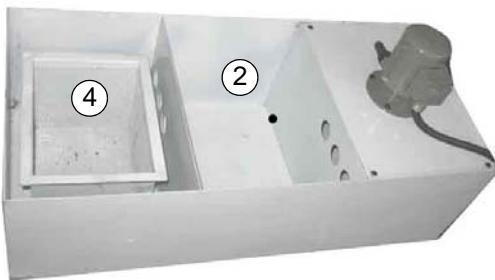


Abb.3-2:

- hydraulic power pack (1)
- Container cooling circuit (2)
- Tank Central lubrication (3)

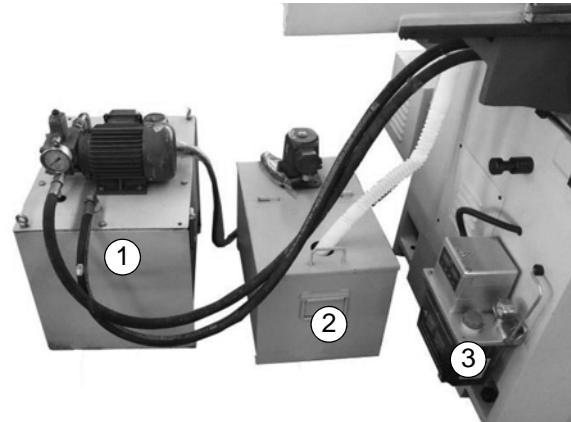


Abb.3-3:

- Coolant supply hose (5)
- Ball valve (6)
- Adjusting screw for positioning the coolant nozzle (7)
- Coolant nozzle (8)

## INFORMATION

To clean the table, the hose (5) with ball valve (6) can be pulled off.

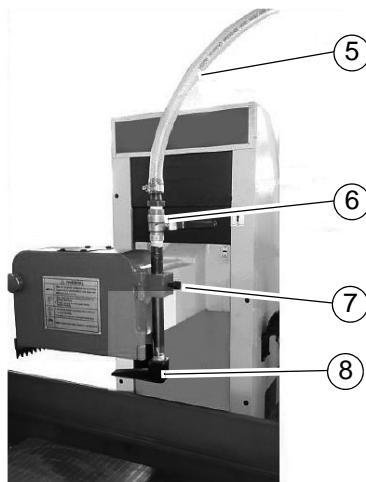


Abb.3-4:

- Connect the coolant return hose (9) to the surface grinding machine and feed it into the coolant tank (2). The attachment takes place by means of hose clamps.

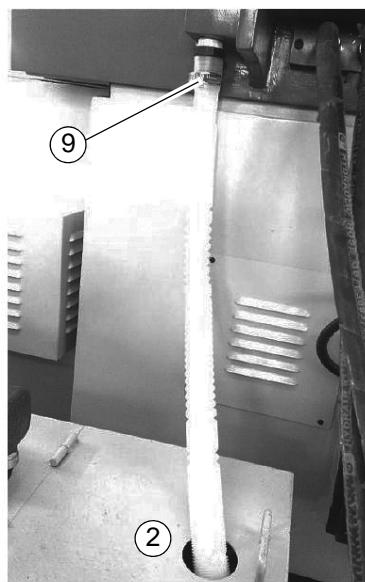


Abb.3-5:



Connect the coolant supply hose (10) to the pump of the coolant tank.

The attachment takes place by means of hose clamps.

By immersion in hot water the hose can be widened and better attached.



### GT30

A coolant collector (10) must also be attached to the surface grinding machine GT30 with two screws.



### 3.13 Electrical connection

#### CAUTION!

Must only be worked on by a qualified electrician or person working under the instructions and supervision of a qualified electrician.



The grinding wheel must rotate clockwise.

If the grinding wheel rotates in the wrong direction, the grinding wheel can become detached from the shaft during the grinding process.

If necessary, two phase connections in the switch cabinet must be exchanged. The guarantee will become null and void if the machine is connected incorrectly.

#### CAUTION!



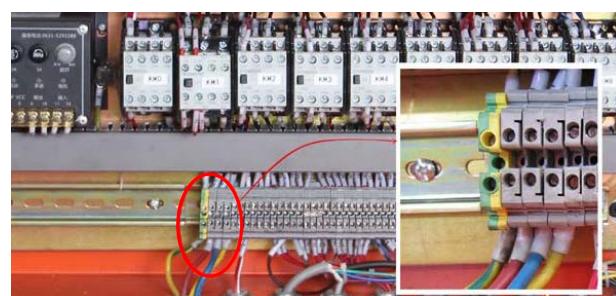
Arrange the machine's connection cable in such a way that it will not cause a tripping hazard.

Please verify if the type of current, voltage and protection fuse correspond to the values specified. A protective earth ground wire connection must be available.

When the surface grinding machine is connected to a ~60Hz mains supply, the speed of the grinding wheel increases 1.2 times. ☺ Technical data on page 20

Check whether the peripheral speed of the grinding wheel used is permitted for this.

- Main Fuse 32A.

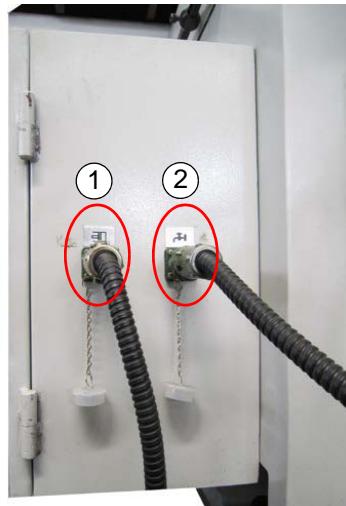




### 3.13.1 Electrical connection of hydraulic and coolant pump

The connection points of the external devices are located on the side of the control cabinet.

- hydraulic power pack (1)
- Coolant pump (2)



### 3.14 First commissioning

Qualification of personnel on page 12

#### WARNING!

First commissioning may only take place after proper installation.

When the surface grinding machine is first put into operation by inexperienced personnel or inexperienced users, you endanger people and equipment. We do not accept any liability for damages caused by incorrectly performed commissioning.



#### ATTENTION!

Before commissioning the machine, all bolts, fastenings and protections must be checked and retightened as necessary!



#### ATTENTION!

Before putting the machine into operation, the fill levels must first be checked.



- Hydraulic power unit
- Coolant
- Central lubrication

Make sure that the slideway oil reaches the lubrication points.

### 3.14.1 Warming up the machine

#### ATTENTION!

If the surface grinding machine, in particular the grinding spindle, is immediately operated under grinding load when it has cooled down, it may be damaged. A machine that has cooled down, such as may occur immediately after transport, should therefore be warmed up first for the first 20 minutes without grinding load.





## 4 Operation

The operation and surface grinding can be done manually or NC controlled.

In manual surface grinding, the grinding wheel is infeeded after each surface grinding pass via a servo motor using the electronic handwheel, or via pushbuttons on the control panel in jog mode. The oscillation distance of the table to the left and to the right is set by adjustable end stops, which cause the hydraulic cylinder to reverse the direction via the hydraulic hand lever valve. The speed of this oscillation is infinitely adjustable with this hand lever valve. The oscillation is only possible if the electromagnet on the grinding table has been switched on beforehand. The speed of the transverse movement in the transverse axis is infinitely variable via a controller on the operating panel. The corresponding distance with return path in the transverse axis to the rear and to the front is set via trip cams.

In NC-controlled operation, the grinding wheel is automatically infeeded after each surface grinding pass in the Y axis according to the entered number of infeeds. The <HMI> (Human Machine Interface) is a touch panel for entering the number of infeeds in the NC control and for displaying information.

### 4.1 Safety

The surface grinding machine must only be operated under the following conditions:

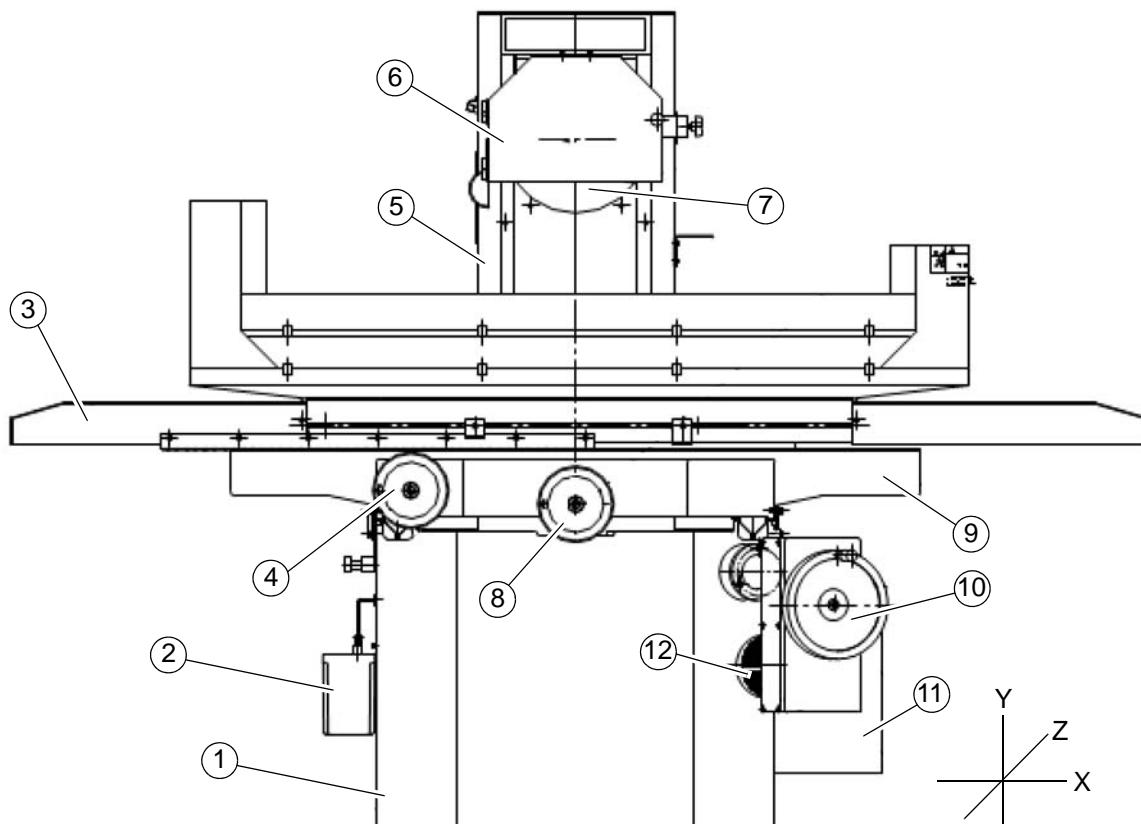
- The surface grinding machine is in proper working order.
- The surface grinding machine is used as intended.
- The operating instructions are observed.
- All safety devices are installed and activated.

Eliminate or have all malfunctions rectified promptly. In the event of malfunctions, shut down the surface grinding machine immediately and secure it against unintentional or unauthorised commissioning. Notify the person responsible immediately of any modification.

☞ Safety check on page 15 , ☞ Safety during operation on page 17



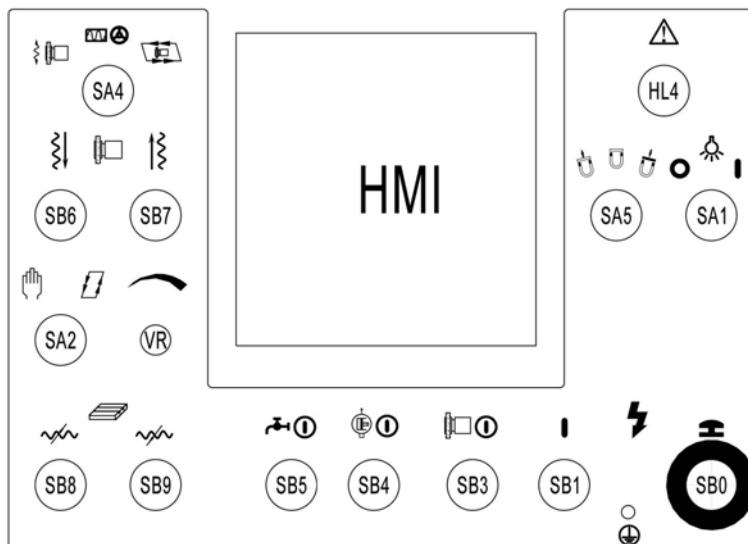
## 4.2 Control and indicating elements



Item	Designation	Item	Designation
1	Base	2	Lubricant pump, central lubrication
3	Collecting tray	4	manual movement, handwheel for table movement in X axis
5	Column	6	Cover for grinding wheel
7	Grinding wheel	8	manual movement, handwheel for cross feed in Z axis
9	Table carrier ( saddle )	10	Y axis infeed, not applicable with electronic handwheel
11	Electrical cabinet	12	Y axis servo motor



### 4.3 Control panel



Item	Designation	Item	Designation
SA4	Selector switch for operating mode, traversing of grinding head <input type="radio"/> Jog mode <input type="radio"/> electronic handwheel <input type="radio"/> automatic (HMI)	SA2	Table crossfeed selector switch <input type="radio"/> manual <input type="radio"/> automatic
SB6	SA4 = Jog mode <input type="radio"/> Lowering the grinding head in Jog mode. SA4 = electronic handwheel <input type="radio"/> Traversing with the electronic handwheel SA4 = automatic (HMI) <input type="radio"/> Start of the NC controlled sequence of the entered values in the <HMI	SB8	SA2 = automatic <input type="radio"/> Feed button for table transverse adjustment to the rear SA2 = manual <input type="radio"/> Rapid traverse button for table transverse adjustment to the rear
SB7	SA4 = Jog mode <input type="radio"/> Lifting the grinding head in jog mode	SB9	SA2 = automatic <input type="radio"/> Feed button for table transverse adjustment to the front SA2 = manual <input type="radio"/> Rapid traverse button for table transverse adjustment to the front



Item	Designation	Item	Designation
SB3	Grinding wheel button motor ON/OFF	VR	Controller for infinitely variable speed in the transverse axis
SB1	Control On / Operation indicator light	SB4	Table oscillation button ON/OFF (hydraulic pump)
SA5	Electromagnet switch ON/OFF	SB0	Emergency stop button
HL4	Alarm light	SB5	Coolant pump ON/OFF button
HMI	Input screen, information screen	SA1	Work lamp ON/OFF switch

#### 4.4 Grinding table oscillation

**WARNING!**

**Never try to engage the handwheel for manual movement in the X axis when the hydraulic oscillation is active.**



Controller for infinitely variable speed in the longitudinal grinding area.

The oscillation and the speed of the table is switched on and controlled by means of the hydraulic hand lever valve. Switch on the hydraulic pump. The electromagnet must be switched on first.

The table automatically moves alternately to the left and right.



#### 4.5 Selector switch for operating mode

The operating mode selector switch SA4 is used to select the infeed mode of the grinding wheel.

The switch has three switching positions.

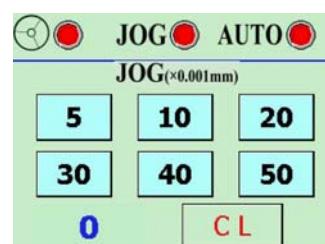
- Jog mode of the grinding wheel up and down using the push buttons <SB6> and <SB7>.
- Displacement or infeed of the grinding wheel up and down with the electronic handwheel.
- Displacement or infeed of the grinding wheel is automated in NC operation.

#### 4.6 Push buttons for grinding head up and down in Jog mode

The step size per keystroke in jog mode <SE4> with the keys <SB6> and <SB7> can be selected in <HMI>.

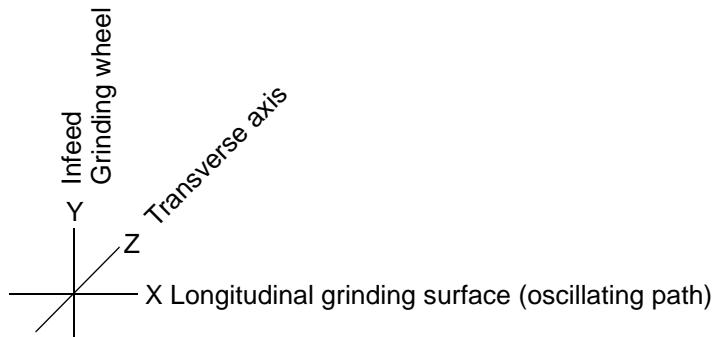
The possible step sizes are: 0,005 | 0,01 | 0,02 | 0,03 | 0,04 | 0,05mm

- 5 = 0,005 mm
- 10 = 0,01 mm
- 20 = 0,02 mm
- 30 = 0,03 mm
- 40 = 0,04 mm
- 50 = 0,05 mm





## 4.7 Setting up the oscillating path and the traverse path in the transverse axis



### 4.7.1 Transverse axis - Z axis

→ Position the trip cams (1) according to the desired travel range.

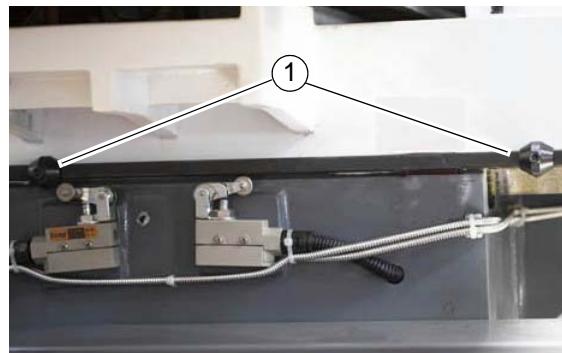


Abb.4-1: Trip cams transverse axis

### 4.7.2 Oscillation, longitudinal axis - X axis

Position the trip cams (1) according to the desired oscillation range.

Speed see: Grinding table oscillation on page 42

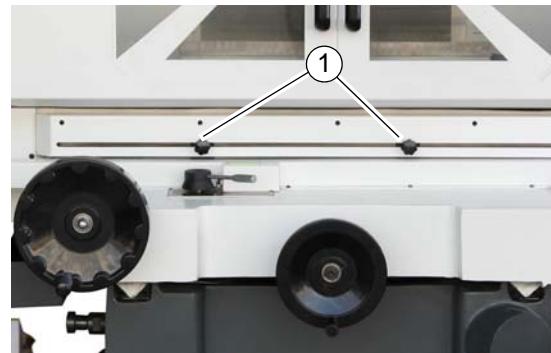


Abb.4-2: Trip cams longitudinal axis

## 4.8 Manual surface grinding

For manual surface grinding, the grinding wheel is infeeded by means of the electronic handwheel or in Jog mode with pushbuttons after each pass in the transverse axis.

Push buttons for grinding head up and down in Jog mode on page 42

### INFORMATION

The grinding wheel can only be started when the grinding wheel cover is closed.





## 4.8.1 Electronic hand wheel

→ Set switch SA4 on the control panel to "electronic handwheel".

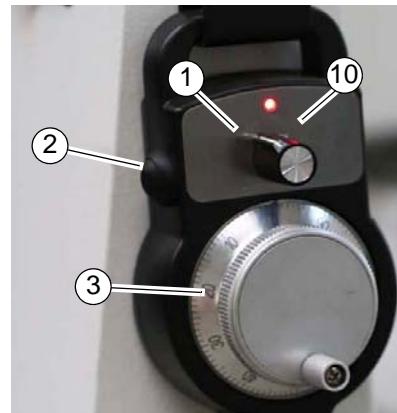
The electronic handwheel (3) is used for manual infeed of the grinding wheel. The lateral enabling switch (2) must be pressed to enable infeed with the electronic handwheel.

Step factor OFF: Electronic handwheel is switched off.

Step factor 1: One pulse on the electronic handwheel corresponds to a travel distance of 0.005mm

Step factor 10: One pulse on the electronic handwheel corresponds to a travel distance of 0.05mm.

The actual infeed is read off the DRO.



### INFORMATION

The maximum possible travel speed with the electronic handwheel in step factor 1 is limited to 300mm/min. In step factor 10 the maximum possible traversing speed is 700mm/min.

Use the Jog mode with the pushbuttons on the control panel to position the grinding wheel to the desired position. The switch <SA4> must be set to <Jog mode>. The step size per key press is selectable in the <HMI>.

☞ Push buttons for grinding head up and down in Jog mode on page 42

## 4.8.2 Switching on the crossfeed

→ Switch on the control voltage.

→ Set switch <SA2> to <automatic>

→ Press <SB8> or <SB9>.

The table automatically moves forward and backward alternately.

To set the speed 0.1 - 8 mm turn the "VR" control clockwise for infinitely variable traversing speed in the transverse axis.

Travel range see: ☞ Transverse axis - Z axis on page 43





#### 4.8.3 Switching on the oscillation

→ Switch on control voltage at the operating panel with <SB1>.



→ Switch on the electromagnet on the control panel with <SA5> and wait a little.



→ Switch on the hydraulic pump on the control panel with <SB4>.



Switching on and speed see: Grinding table oscillation on page 42 ; Travel range see: Oscillation, longitudinal axis - X axis on page 43

#### 4.9 Automatic surface grinding

##### CAUTION!

**During surface grinding in NC operation there are potential hazards and the operator must not leave the surface grinding machine while the program is running.**



Even in NC operation, the operator must remain on the surface grinding machine.



##### INFORMATION

The grinding wheel can only be started when the grinding wheel cover is closed.

#### 4.9.1 Input screen - Display screen

The control panel <HMI> (Human Machine Interface) is a touch panel (touch screen) for entering work data and displaying information.



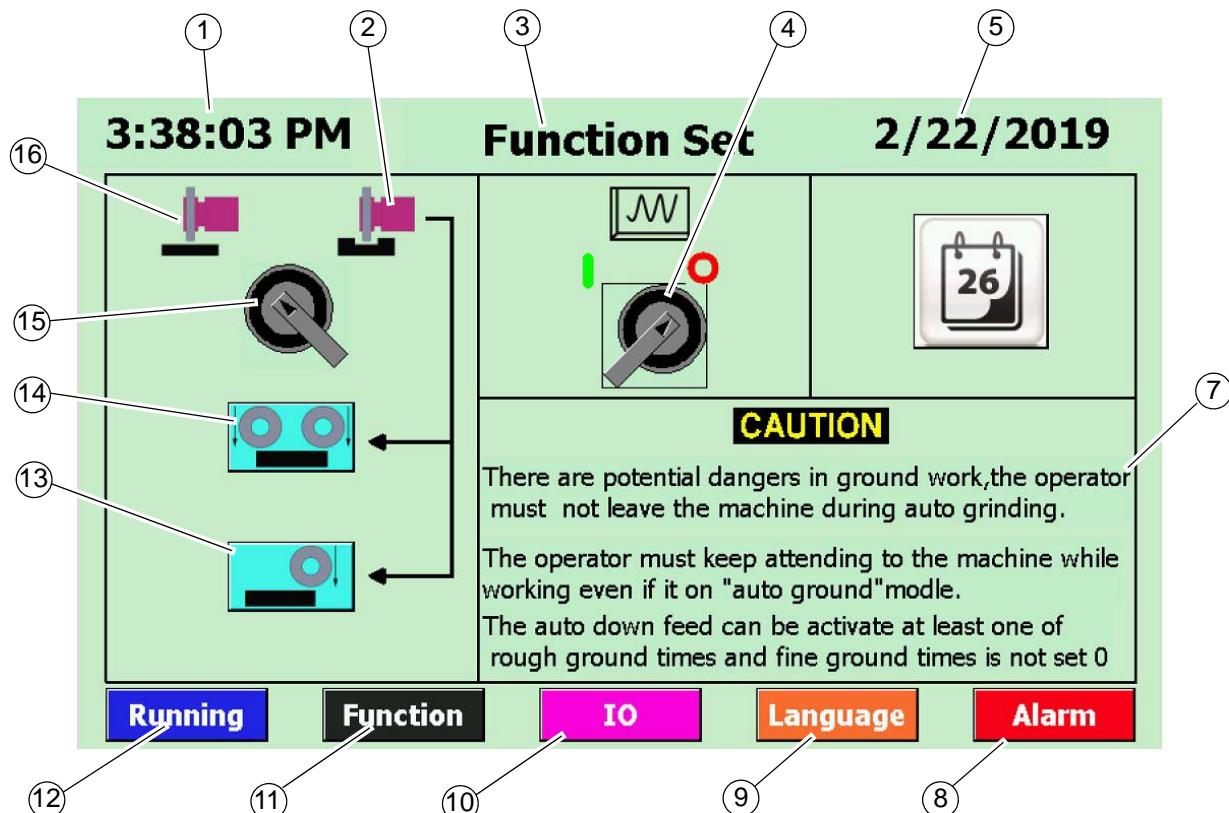
##### ATTENTION!

**Do not touch the touch panel with sharp-edged or heavy objects to prevent damage to the screen surface. High-frequency radiation can cause errors on the screen display.**



##### INFORMATION

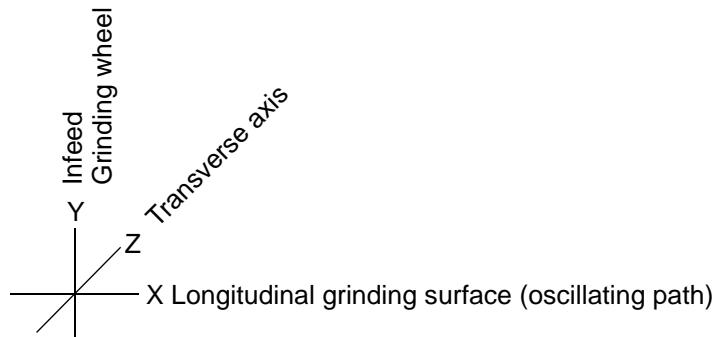
If the communication between <HMI> and the NC control is interrupted, the variable value on the <HMI> is replaced by a hash character "#". As soon as the communication is established again, the variable value is reset.



Pos.	Designation	Item	Designation
1	Display time	2	Plunge grinding
3	Active menu display	4	Electromagnet and hydraulic pump ON/OFF condition
5	Date display	7	Information field
8	Alarm Menu	9	Menu language
10	Menu Input / Output Status displays	11	Menu Function
12	Menu Running	13	Feed one side
14	Feed two sides	15	Grinding type selection
16	Surface grinding		

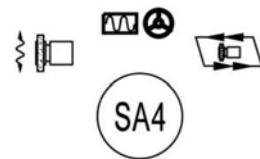


#### 4.9.2 Surface grinding NC sequence program



The NC sequence program for the surface grinding mode is started by setting the operating mode selector switch <SA4> to automatic <HMI>.

Press push button <SB6> to start the sequence program.



##### Symbol meaning:

- Rapid
- electronic handwheel
- automatic <HMI>

##### INFORMATION

Cancelling the NC operation is only possible with the emergency stop button or by switching off the master switch.



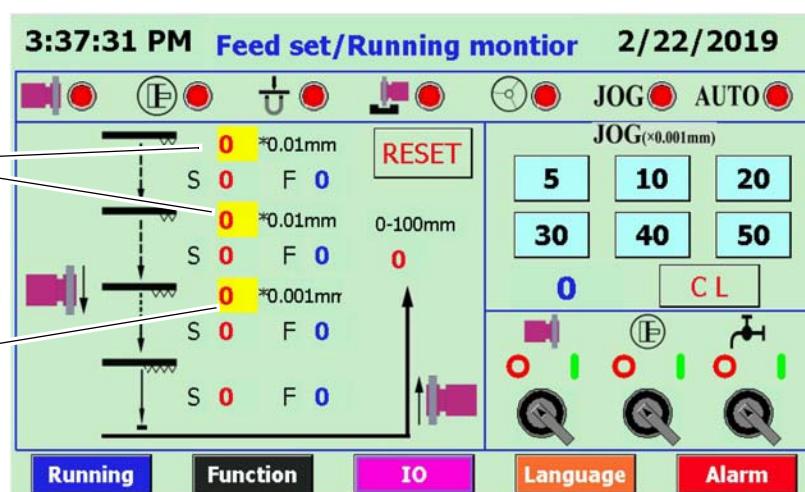
##### Steps in the HMI

The automatic downward feed of the grinding wheel can be activated by at least one rough grinding number (1) if the fine grinding number (2) is not set to 0.

In the automated surface grinding mode, the grinding wheel is automatically infeed after each pass in the transverse axis. This requires entries for the number of coarse grindings (1) and at least one fine grinding (2).

After completion of the entered number of sequence steps, "sparking out" occurs without infeed of the grinding wheel. The grinding head is then raised and the hydraulic pump is switched off to stop the oscillating movement of the table.

GT25\_GT30\_GT40\_GB\_4.fm





### 4.9.3 Plunge grinding NC sequence program

**CAUTION!**

**Risk of breaking the grinding wheel!**

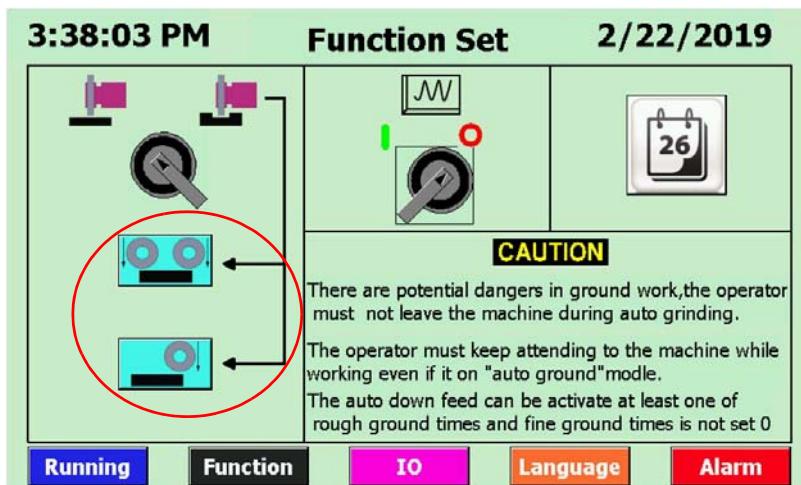
The transverse axis feed in automated plunge grinding is switched off. An adjustment in the transverse axis must not be made with the handwheel.



There is only infeed of the grinding wheel in the Y axis.

The automatic downward feed of the grinding wheel can be activated by at least one rough grinding number if the fine grinding number is not set to 0.

The function "Infeed on one side only" or "Infeed of the grinding wheel on both sides" after each oscillating movement can be selected in the <HMI>. This function can only be used for plunge grinding.



After completion of the entered sequence steps, "sparking" occurs without infeed of the grinding wheel. The grinding head is then raised and the hydraulic pump is switched off to stop the oscillating movement of the table.

The NC sequence program for plunge grinding is started by setting the operating mode selector switch <SA4> to <automatic <HMI>>

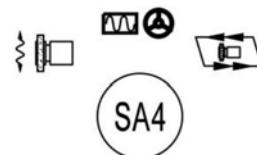
Press push button <SB6> to start the sequence program.

#### Symbol meaning:

- Rapid
- electronic handwheel
- automatic <HMI>

#### INFORMATION

Cancelling the NC operation is only possible with the emergency stop button or by switching off the master switch.





## 4.10 Switching on the machine

### INFORMATION

For safety reasons, the hydraulic pump can only be switched on if the electromagnet has been switched on beforehand. If for some special operations it is necessary to work without an electromagnetic chuck (electromagnet), this function can be temporarily disabled in the <HMI>. Condition electromagnet and hydraulic pump on page 53



The protective cover of the grinding wheel must be closed so that the grinding wheel drive can be started.

- Let the machine run warm. Warming up the machine on page 38
- Close the protective cover of the grinding wheel.
- Switch on the main switch.
- Check that the emergency stop button is not pressed or unlocked. Turn the emergency stop button to the right in order to release the push button.
- Switch on control voltage.
- Switch on the electromagnet.

### CAUTION!

**Risk of material damage and personal injury!**



If the workpiece is less than 12 mm thick, the workpiece can detach itself from the magnet and injure people. The material thickness of the workpiece must be at least 12 mm.

- Switch on the hydraulic pump.

### 4.10.1 Switching the grinding wheel on

Was the grinding wheel balanced? Balancing the grinding wheel on page 51



### CAUTION!

Ensure that the grinding wheel is located at a sufficient distance above the workpiece before you start surface grinding.

- Press push button <SB3>.



## 4.11 Switching the machine off

- Turn off the main switch.
- Switch off the surface grinding machine at the main switch in case of a longer standstill and secure the machine against being switched on again. Switching off and securing the surface grinding machine on page 17

### 4.11.1 Resetting the NC sequence control, switching off

- Press emergency stop switch.



## 4.13 Power failure, Restoring readiness for operation

- Switch on control voltage.
- Switch on the electromagnet.
- Switch on hydraulic pump.

## 4.14 Mounting the grinding wheel

The grinding wheel included in shipment is a corundum grinding wheel with a grain size of 46. The maximum permissible peripheral speed of this grinding wheel is 35m/s in balanced condition.

The mounting flange (1) of the grinding wheel has balancing weights (2) which can be moved around the circumference to correct the unbalance. The number of balancing weights can be reduced and clamped in the appropriate place.

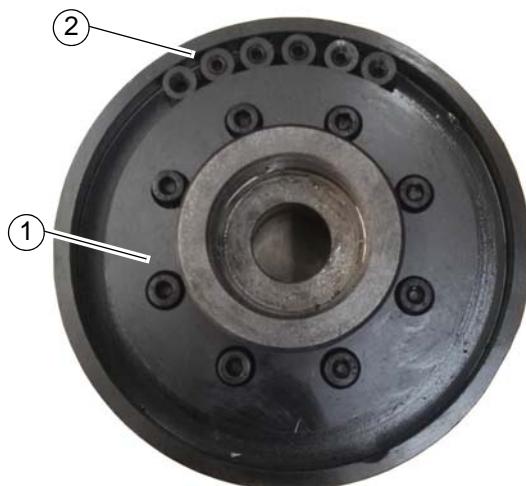
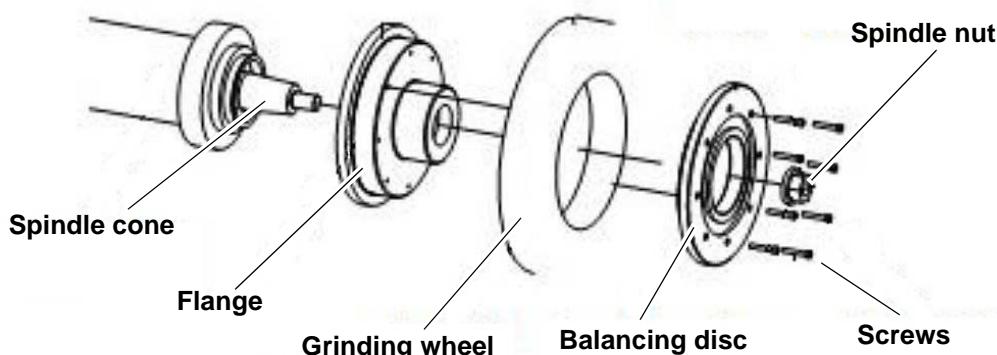


Abb.4-3: Mounting flange grinding wheel GT30

### 4.14.1 Mounting the grinding wheel on the flange

#### INFORMATION

The grinding wheel included in shipment is already mounted on the flange.

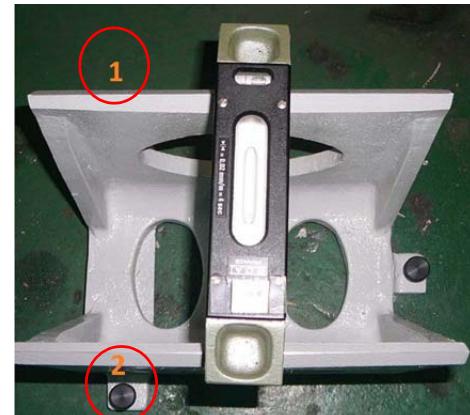


- Place the grinding wheel on the flange.
- Screw on the balancing disc.



#### 4.14.2 Balancing the grinding wheel

First the balancing device is aligned. The balancing device is placed on a firm, clean surface. A machine spirit level is placed on the running surfaces. The device is aligned with screws 1 and 2.

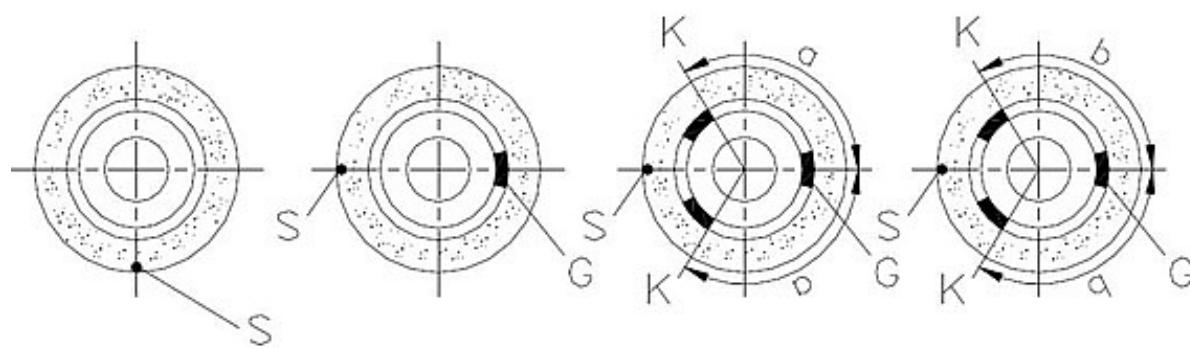
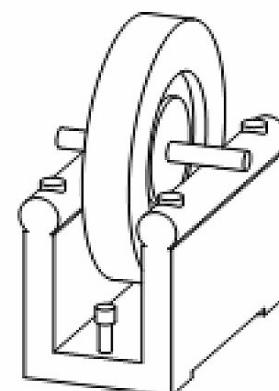


The spirit level is now positioned diagonally on the running surfaces of the device and the device is aligned in this plane by means of screw 3.



The mandrel included in the scope of delivery is inserted into the flange of the grinding wheel.

The grinding wheel rolls out and stops with the centre of gravity at the lowest point - please mark this point - "S" in the figure below.



A balancing weight of the side opposite to "S" is placed on the flange "G".

The disc is turned 90° and released to determine which side is lighter ("S" or "G").

Two balancing weights are used on the lighter side of the flange "K".

The disc is turned 90° again and released. If the disc does not roll, the balancing is finished.



If the disc continues to move, the two weights "K" must be moved symmetrically to the "S-G" axis in the corresponding direction. Repeat this step until the disc stops moving.

#### 4.14.3 Mounting the grinding wheel with flange on the spindle

- Clean and lightly oil the spindle cone (1).

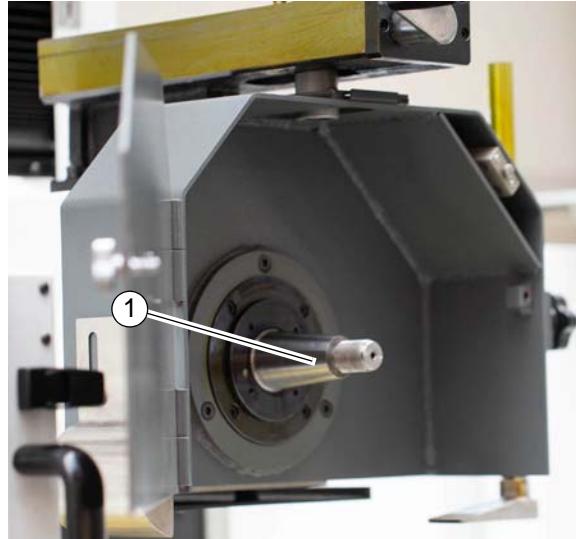


Abb.4-4: GT25

- Clean the cone in the flange and place the grinding wheel with flange on the spindle cone and fasten it with the spindle nut using the key (2).

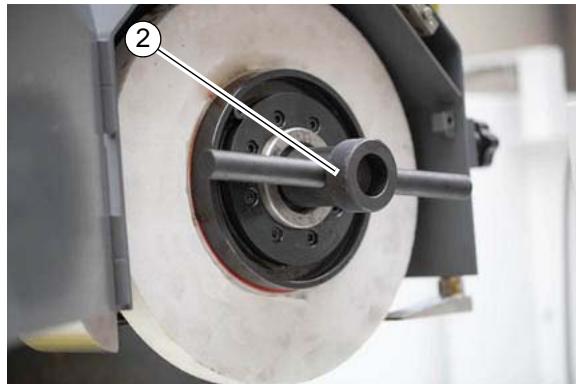
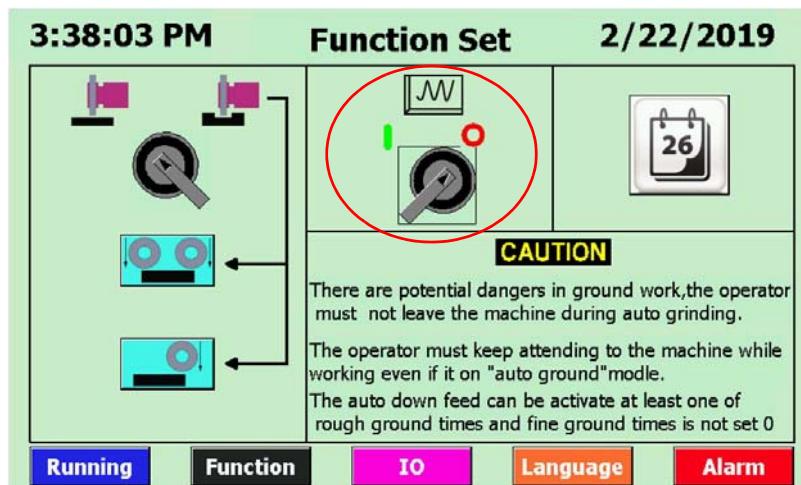


Abb.4-5: GT25



## 4.15 Condition electromagnet and hydraulic pump

The oscillation of the table by means of the hydraulics can only be activated if the electromagnet is switched on first. If for some special operations it is necessary to work without an electromagnetic chuck (electromagnet), this function can be temporarily disabled in the <HMI>.

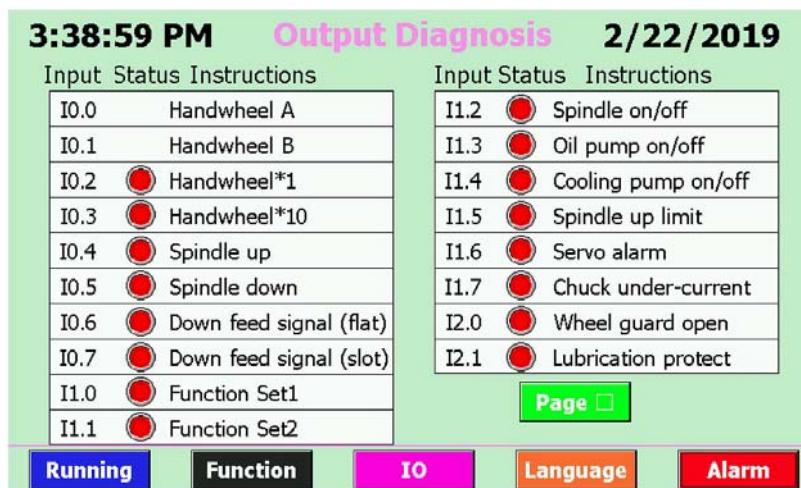


## 4.16 Displays in the HMI

This menu is used for testing and maintenance. The operator can monitor the input and output conditions of the keys. The grey colour means 0 and green means 1 . For a special signal (normally closed) red means 0 and green means 1.

The two diagnostic pages are only available for testing and maintenance, the update time is about 1 second.

### 4.16.1 Output signals





## 4.16.2 Input signals

**Input Diagnosis**

Output Status	Instructions
Q0.0	PLUSE
Q0.1	SIGN
Q0.2	Spindle up
Q0.3	Spindle down
Q0.4	Servo enable
Q0.5	Spindle start
Q0.6	Oil pump start
Q0.7	Servo power on

Output Status	Instructions
Q1.0	Cooling pump start
Q1.1	Slot ground protect
Q1.2	Alarm

Page □

**Running**   **Function**   **IO**   **Language**   **Alarm**

## 4.16.3 Alarm Menu

This menu is used to record alarm information. There are three types of information:

- Warning
- Alarm
- System information

The last alarm is displayed with priority. A serious alarm is represented by an acoustic signal. If too much information accumulates, the earliest information is overwritten. The overwritten alarm record can be confirmed and deleted.

**Alarm Record**

2/25/2019 9:14:58 AM 110001 C  
Change to operating mode 'online'.  
2/25/2019 9:14:58 AM 270006 C  
Project modified: Alarms cannot be restored from the persistent buffer.

▲ ▲ ▶ ▽ □

**Running**   **Function**   **IO**   **Language**   **Alarm**



## 4.17 Selection of a grinding wheel

Factors for the grinding wheel quality:

- Graining
- Binding
- Pores

### Abrasives:

Quartz, corundum, emery, pumice, garnet and natural diamonds.

However, synthetically produced grain materials are mainly used, whose properties can be adjusted by the manufacturing process.

These are corundum ( $\text{Al}_2\text{O}_3$ ), silicon carbide ( $\text{SiC}$ ), cubic boron nitride (CBN) and synthetically produced diamond.

Corundum and silicon carbide belong to the group of conventional, cubic boron nitride and diamond to the ultra-hard grinding materials.

Bonds used in grinding wheels are mainly synthetic resin bonds, ceramic bonds, metallic sintered bonds and electroplated bonds.

However, rubber bonds and bonds made of polyurethane are also used when high surface qualities are required.

### Fillers and additives:

Fillers and supporting grains in resin bonds, which can increase strength, heat resistance and toughness, or solid lubricants such as graphite or pyrite, which among other things reduce the grinding temperatures that arise.

### Factors for the processing quality:

- Material removal - depending on grit size and grinding wheel material
- Bond of the grinding wheel material - stability at high speeds.
- Surface quality - depending on the grit and the grinding wheel material.

Since the grinding wheel material is harder than the workpiece, tool steel and hard alloy steel can also be processed.

Used grinding wheel material dissolves and new material appears on the surface of the grinding wheel.

For good surface quality: Fine grain and hard material.

## INFORMATION

The maximum peripheral speed of the grinding wheel must be higher than the peripheral speed generated by the grinding wheel spindle.



Peripheral speed of the grinding wheel in meters per second:

$$(\text{m} / \text{s}) = 3.14 \times D \text{ (diameter of the disc, mm)} \times N \text{ (spindle speed, rpm)} / 60000$$

### Abrasives and application:

Designation	Code	Colour	Principal application
Abrasive brown	A (GZ)	Brown	For grinding carbon steel, generally alloyed steel, malleable cast iron, hard bronze, etc. Especially for grinding steel without quenched and tempered steel, also for rough grinding.
Abrasive white	WA (GB)	White	Grinding of hardened steel, carbon steel etc. which is no longer intended for rough grinding.



Designation	Code	Colour	Principal application
Abrasive monocrystal-line	SA (GD)	White, canary yellow	Grinding of stainless steel and high strength material.
Abrasive monocrystal-line	MA (GW)	Brown	Grinding of stainless steel and soft iron
Chrome abrasives	PA (GG)	Pink, mauve	Grinding of steel alloys, manganese steel etc., for very smooth running
silicone carbide, black	C (TH)	Black	Grinding of iron, brass soft bronze etc., for soft material.
Silicone carbide, green	GC (TL)	Green	Grinding of hard metal, glass fibre reinforced plastic etc., high strength material.
Diamond	RVD, MBD MP—SD		Grinding of hard metal, glass fibre reinforced plastic as well as ceramic and porcelain material
Boron nitride cubic	CBN	Dark brown	Grinding of steel alloys with chrome, tungsten, cobalt, low wear material.

#### Grain size:

A general grain size of a grinding wheel used for surface grinding is 36 to 60. The grain indicates whether a grinding wheel is coarse, medium, fine or very fine. Grain 100-180, for example, is a fine grain. The numbers (40, 60, 80, 120) indicate the number of meshes per 25.4 mm length of one sieve side of a vibrating sieve. The grain mixture of the abrasives is separated by vibrating screens according to grain size.

The higher the grit number, the finer the grinding wheel.

Grain size	Application area
14 - 24	Grinding steel ingots, grinding iron burrs
36 - 60	Grinding standard surfaces
60 - 100	Fine grinding and edge grinding
120 - 600	fine grinding, honing, screw grinding
Over 180	fine grinding, polishing, mirror finish grinding

#### Hardness grades:

The hardness of a grinding wheel is not the hardness of the individual abrasive grains, but the resistance of the bond to the breaking of the abrasive grains.

With a soft grinding wheel, the abrasive particles break off the wheel slightly. In addition to the binding there is also a fixing grinding function.

In the best case the blunting (grain breakout) and sharpening is balanced in the grinding process. This is an important prerequisite for a better grinding effect.

#### Codes:

A through D: extremely soft

E to G: very smooth



H to K: soft

L to O: medium

P through S: hard

T to Z: extremely hard

Degree	Super soft	Soft 1	Soft 2	Soft 3	M Soft 1	M Soft 2	M 1	M 2	M Hard 1	M Hard 2	M Hard 3	Hard 1	Hard 2	Super Hard
Code	0	G	H	J	K	L	M	N	P	Q	R	S	T	Y

#### Structure:

The structure describes the volume proportion between grain, bond and pore, the distance between the individual abrasive grains. The closer the grains lie together, the denser the structure and the smaller the pores. The structure is given in numbers from 1 to 18. Small numbers indicate small grain spacing, high numbers indicate large grain spacing.

- 1 to 4 ; Tight
- 5 to 7 ; Normal
- 8 to 11 ; Open
- 12 to 18 ; Very open

The loss of the wheel structure has a direct effect on the grinding performance and the grinding quality. During grinding, the pore not only receives grinding dust, but also brings cooling water and air into the grinding area to cool down and reduce heating, deformation and burning of the workpiece. If the pores are large, the proportion of grain per area is reduced and the surface of the grinding wheel becomes rougher. This influences the surface quality during the grinding process. Normally, medium-sized structures are chosen.

#### Bonding:

The function of the bond is to keep the grinding wheel in shape for a long time. The bonding agent on the grinding wheels keeps the abrasive grains at a certain distance from each other. Make sure that the grinding wheel is stable for the grinding process.

- Binding types
  - The glass bond, combines hardness and structure. Very good for precision grinding, for fast material removal.
  - The plastic bond (resin and synthetic resin) is favourable for high-speed rotation and has a certain elasticity. For heavy duty use, ideal for rough grinding.
  - The ceramic bond: for the machining of difficult to machine materials such as PCD or CBN.
  - The rubber bond has elasticity and is favourable for narrow grinding wheels.
  - The metal bond is particularly favourable for producing a grinding wheel whose abrasives are very hard.

#### Pores:

The pores between the abrasive grains and the bond act as cooling lubricant chambers, which also promote the removal of chips during grinding. If the pores are too small, e.g. on inferior grinding wheels, additional friction and a higher temperature will occur. This can lead to damage to the abrasive. By contrast, larger pore spaces allow more coolant to be carried along. This reduces the risk of grinding fire.



## 4.18 Dressing the grinding wheel

To keep the grinding wheel sharp, it must be regularly dressed. There is a dressing device on the grinding head.

The scope of delivery also includes a dressing device which can optionally be attached to the grinding table in the T-slot for dressing the grinding wheel.

### ATTENTION!

**The dressing pin can break easily.**



When dressing, the diamond tool should be guided from the centre of the wheel to the outside. If the tool is guided in the opposite direction (from outside to inside) there is a risk that the grinding wheel or the diamond pin will break.

Ensure that the dressing tool is securely fastened and that the dressing process is vibration-free and free from shocks. This is very important for a good surface quality of the grinding wheel!

### INFORMATION



When the diamond pin is worn out, the diamond pin can be turned by 180°.

Coolant should be added when dressing the grinding wheel. This makes dressing faster and more efficient. The suitable coolant extracts heat and thus increases the service life of the diamond pin. The coolant must always be kept clean!

## 4.19 Operation of central lubrication

☞ Top up central lubrication on page 31

## 4.20 Digital Readout

The grinding machine is equipped with the two axis display DPA31.

The additional function that is possible with the DPA31 when operating on milling machines is not possible on grinding machines. ☞ Operation DPA31 on page 59



## 5 Operation DPA31



3384030



3384031

When the device is switched on, the DRO starts a self-check.

After the self-check is completed, the DRO changes to the normal indicator status.

The DRO displays the last data before it is switched off.

- The selected coordinates and the selected tool.
- The metric or Anglo-American measurement system.
- The last displayed values.

### 5.1 Parameter settings

- Press the key for 3 seconds until the X-axis display shows P-10.
- To cancel an entry, press the button.
- Press button to save an input.



## 5.1.1 Explanation of the Parameters

Meanings of parameters and settings.

Parameters	Axis	Description
P -- 07	X axis	Accuracy of representations on the display: When a higher representational accuracy value than the actual countin-gresolution is set on the display, the representational accuracy value willbe shown accordingly.
P -- 08	Z <sub>0</sub> /Y axis	
P -- 09	Y axis	
P -- 10	X axis	Counting direction: The counting direction of the measurement in the positive or negative direction.
P -- 11	Z <sub>0</sub> /Y axis	
P -- 12	Y axis	0 for a positive counting direction, 1 for a negative counting direction.
P -- 13	X axis	Counting resolution of the respective axis. The unit is 0.1 mm.
P -- 14	Z <sub>0</sub> /Y axis	Relation: <input type="radio"/> 5µm = 50 <input type="radio"/> 2µm = 20 <input type="radio"/> 10µm = 100 The counting resolution set must correspond to the selected measuring-gib or active measuring strip reading device.
P -- 15	Y axis	When a higher representational accuracy value than the actual countin-gresolution is set on the display, the representational accuracy value willbe shown accordingly.
P -- 16	X axis	Correction factor:
P -- 17	Z <sub>0</sub> /Y axis	Linear error compensation coefficient. The value range for linear error compensation coefficients extends from -9.999 to 9.999mm, and gives the value to be adjusted per meter.
P -- 18	Y axis	
P -- 19	Rotation Speed Signal	The target value of the number of pulses per revolution of the rotation-speed signal. The number of impulses per revolution of the rotation speed signal depends on the number of output pulses per revolution of the transducer in use (number of permanent magnets). The greater this value is, the higher will be the resolution of the revolution speed. The range of possible setting values extends from 1 to 3600.
P -- 20		Measurement time: The target value of the time for speed measurement. The maximum set value is 10 (i.e. 1 second) and the minimum set value is 1 (i.e. 0.1 second). The greater this value is, the higher will be the resolution of the revolutionspeed, and the slower this value will be refreshed. The representational accuracy of the rotational speed indicator showndirectly on the display = 600 / (number of impulses per revolution x measurement time)



**Factory Settings:**

<b>Where delivered as a standalone device.</b>	<b>In applied delivery state with machine tool. Please record the values before making any changes.</b>
P -- 13 = 50	P -- 07 =
P -- 14 = 50	P -- 08 =
P -- 15 = 50	P -- 09 =
	P -- 10 =
	P -- 11 =
	P -- 12 =
	P -- 13 =
	P -- 14 =
	P -- 15 =
	P -- 16 =
	P -- 17 =
	P -- 18 =
	P -- 19 =
	P -- 20 =

## 5.2 Description of the Keys

Letter/Symbol on the Key	Name of the key	Function description
	X axis key	To select the X coordinate axis
	Y axis key	To select the Y coordinate axis
	Z0/Y-axis key (3 axes)	To select the Z0/Y coordinate axis



	Plus and minus signs with numerical keys and decimal point	For input of negative or positive signs. For numeric entry. For input of decimal places; decimal point
	Delete key	To clear displayed value of a specific axis or to jump back to coordinate points.
	Enter key	To confirm the data input
	Radius or Diameter	X-axis display when used on lathes
	Shift key Metric / inches	Display of values <ul style="list-style-type: none"> <li>in the metric system</li> <li>in the Anglo-American measurement system</li> </ul>
	Reference marker function	for setting relative coordinates Reference marker function on page 64
	Machine zero point	for setting an absolute zero-point in the coordinate system Machine zero point function on page 64
	Z+Z0 key (3 axes)	For display of the Z+Z0 value Z and Z0 are added
	Programming key	For internal parameter settings Parameter settings on page 59
	The calculator function key	Calculator function on page 65



	Addition	
	Subtraction	Calculator function on page 65
	Multiplication	
	Division	
	Coordinate points along a diagonal line	Functions for milling machines on page 66
	Coordinate points on a circle	Coordinate Points on a Circle or Arc on page 67
	Inclined plane function	Inclined Plane on page 70
	Arc function	Arc on page 71
	Tool data function	Functions for milling machines and lathes on page 74 Recall of tool data on page 74



## 5.3 Reference marker function

Set a zero point with preset axis values. Set a relative coordinate system based on current machine position.

- Press the button to activate the reference marker function.

The LED flashes.

- Press the button to exit from the Reference marker function.

- The set reference mark values are now transferred to the axis display.

### Example:

Setting the values.

After pressing the reference mark function, the following values should be set: 0.500 for the X axis, 10 for the Y-axis, and 0 for the Z-axis.

Press the following keys in the order shown in order to set these values.



## 5.4 Machine zero point function

For the setting of an absolute zero point.

- Press the button . The LED flashes.

The axis values shown for the current machine position are reset to zero. Values for the axes may also be input where needed.

When the machine zero point is turned off, the previous values are shown again.



## 5.5 Calculator function

Add, subtract, multiply and divide.

- Press button to start the calculator. The LED lights up.

The number field of the rotation speed indicator is used as the input- and result field.

- To exit from the Calculator function, press the button.

### Keys

- to add. to subtract. to multiply.
- to divide.

### Example:

Press the following keys in the order shown in order to divide the number 46.2 by 2, and transfer the result to the Z axis.





## 5.6 Functions for milling machines

### 5.6.1 Coordinate points along a diagonal line

Creates a line within a coordinate system, along which a specified number of uniformly spaced coordinate points are defined.

- The parameters are displayed in the Rotation Speed field.
- The last value entered for each parameter is displayed in the X axis row.
- Enter new values in the Y axis row.

#### Entering the Parameters

Parameters	Description
1 - 1 L_A	Angle of the line on the coordinate axis: X-Y
2 - 1 L_A	Angle of the line on the coordinate axis: Y-Z
3 - 1 L_A	Angle of the line on the coordinate axis: X-Z

Press the key  to select X-Y, Y-Z or X-Z as the coordinate axis.

To enter the angle of the line, use the numeric keys and confirm with the  key.

Parameters	Description
1 - 2 L_d	Length of the line: X-Y
2 - 2 L_d	Length of the line: Y-Z
3 - 2 L_d	Length of the line: X-Z

To enter the length of the line, use the numeric keys and confirm with the  key.

Parameters	Description
1 - 3 L_Po.H	Number of coordinate points: X-Y
2 - 3 L_Po.H	Number of coordinate points: Y-Z
3 - 3 L_Po.H	Number of coordinate points: X-Z

To enter the number of coordinate points, use the numeric keys  
and confirm with the  key.



## Positioning the Coordinate Points

Parameters	Description
1LHo	Coordinate point no.: X-Y
2LHo	Coordinate point no.: Y-Z
3LHo	Coordinate point no.: X-Z

To select the desired coordinate point, press the button.

To select the previous coordinate point, press the button.

Then move the machine axes until the positions of the selected coordinate point show 0.000.

## INFORMATION

Press the button to temporarily interrupt the function. The display returns to the normal



display status. Press the 0 key again to continue with the function.

To exit from the function, press the button.

### 5.6.2 Coordinate Points on a Circle or Arc

Creates a circle or arc within a coordinate system, along which a specified number of uniformly spaced coordinate points are defined.

The set coordinate points on the circle or arc run counter clockwise. Coordinate point 2 is located counter clockwise of coordinate point 1.

- The parameters are displayed in the Rotation Speed field.
- The last value entered for each parameter is displayed in the X axis row.
- Enter new values in the Y axis row.



## Entering the Parameters

Parameters	Description
1 - 1 CCEΠ	Coordinate plane of the circle: X-Y
2 - 1 CCEΠ	Coordinate plane of the circle: Y-Z
3 - 1 CCEΠ	Coordinate plane of the circle: X-Z

To select X-Y, Y-Z or X-Z as the coordinate plane, press the  key.

To enter the midpoint of the circle on the coordinate plane, use the numeric keys and confirm with the  key.

Parameters	Description
1 - 2 C_d	Diameter of the circle or arc in the coordinate plane: X-Y
2 - 2 C_d	Diameter of the circle or arc in the coordinate plane: Y-Z
3 - 2 C_d	Diameter of the circle or arc in the coordinate plane: X-Z

To enter the diameter of the circle or arc, use the numeric keys and confirm with the  key.

Parameters	Description
1 - 3 CΠ.Н	Number of coordinate points: X-Y
2 - 3 CΠ.Н	Number of coordinate points: Y-Z
3 - 3 CΠ.Н	Number of coordinate points: X-Z

To enter the number of coordinate points, use the numeric keys  
and confirm with the  key.

Parameters	Description
1 - 4 5_A	Start angle: X-Y
2 - 4 5_A	Start angle: Y-Z
3 - 4 5_A	Start angle: X-Z

To enter the start angle on the coordinate plane, use the numeric keys  
and confirm with the  key.



Parameters	Description
1 - 5 E_A	End angle: X-Y
2 - 5 E_A	End angle: Y-Z
3 - 5 E_A	End angle: X-Z

To enter the end angle on the coordinate plane, use the numeric keys and confirm with the key.

## Positioning the Coordinate Points

Parameters	Description
1CHo	Coordinate point no.: X-Y
2CHo	Coordinate point no.: Y-Z
3CHo	Coordinate point no.: X-Z

To select the desired coordinate point, press the button.

To select the previous coordinate point, press the button.

Then move the machine axes until the positions of the selected coordinate point show 0.000.

## INFORMATION

Press the button to temporarily interrupt the function. The display returns to the normal display status. Press the 0 key again to continue with the function.

To exit from the function, press the button.





### 5.6.3 Inclined Plane

Creates an inclined plane in a coordinate system such that processes can be carried out on said inclined plane.

- The parameters are displayed in the Rotation Speed field.
- The last value entered for each parameter is displayed in the X axis row.
- Enter new values in the Y axis row.

#### Entering the Parameters

Parameters	Description
1 - 1 CL_A	Angle of the inclined plane on the coordinate plane: X-Y
2 - 1 CL_A	Angle of the inclined plane on the coordinate plane: Y-Z
3 - 1 CL_A	Angle of the inclined plane on the coordinate plane: X-Z

To select X-Y, Y-Z or X-Z as the coordinate plane, press the key.

To enter the angle of the inclined plane, use the numeric keys  
and confirm with the key.

#### Positioning to a Coordinate Point on the Inclined Plane

Parameters	Description
1A_angle entered	Inclined plane: X-Y
2A_angle entered	Inclined plane: Y-Z
3A_angle entered	Inclined plane: X-Z

Then move the machine axes of the plane until the positions of the selected coordinate plane read 0.000.

#### INFORMATION

Press the button to temporarily interrupt the function. The display returns to the normal



display status. Press the 0 key again to continue with the function.

To exit from the function, press the button.



## 5.6.4 Arc

Creates an arc in a coordinate system such that processes can be carried out on said arc.

- The parameters are displayed in the Rotation Speed field.
- The last value entered for each parameter is displayed in the X axis row.
- Enter new values in the Y axis row.

### Entering the Parameters

Parameters	Description
1 - 1 ACE Π	Midpoint of the arc on the coordinate plane: X-Y
2 - 1 ACE Π	Midpoint of the arc on the coordinate plane: Y-Z
3 - 1 ACE Π	Midpoint of the arc on the coordinate plane: X-Z
To select X-Y, Y-Z or X-Z as the coordinate plane, press the  key.	
To enter the end midpoint of the arc, use the numeric keys and confirm with the  key.	

Parameters	Description
1 - 2 5E_d	Radius of the arc on the coordinate plane: X-Y
2 - 2 5E_d	Radius of the arc on the coordinate plane: Y-Z
3 - 2 5E_d	Radius of the arc on the coordinate plane: X-Z
To enter the end radius of the arc, use the numeric keys and confirm with the  key.	



Parameters	Description
1 - 3 0U_S	Machining mode of the arc on the coordinate plane: X-Y
2 - 3 0U_S	Machining mode of the arc on the coordinate plane: Y-Z
3 - 3 0U_S	Machining mode of the arc on the coordinate plane: X-Z

To set machining mode of the arc, use the numeric keys 0 or 1.  
 0 = Machining mode of the arc from the inside.  
 1 = Machining mode of the arc from the outside.

Confirm with the key.

Parameters	Description
1 - 4 CU_d	Milling tool diameter: X-Y
2 - 4 CU_d	Milling tool diameter: Y-Z
3 - 4 CU_d	Milling tool diameter: X-Z

To enter the diameter of the milling tool, use the numeric keys  
 and confirm with the key.

Parameters	Description
1 - 5 S_Po	Start position: X-Y
2 - 5 S_Po	Start position: Y-Z
3 - 5 S_Po	Start position: X-Z

To enter the start position, use the numeric keys  
 and confirm with the key.



Parameters	Description
1 - 6 E_Po	End position: X-Y
2 - 6 E_Po	End position: Y-Z
3 - 6 E_Po	End position: X-Z

To enter the end position, use the numeric keys and confirm with the key.

Parameters	Description
1 - 7 CUF	Machining depth: X-Y
2 - 7 CUF	Machining depth: Y-Z
3 - 7 CUF	Machining depth: X-Z

To enter the machining depth, use the numeric keys and confirm with the key.

### Positioning to a Coordinate Point on the Arc

Parameters	Description
1Po	Position: X-Y
2Po	Position: Y-Z
3Po	Position: X-Z

To select the desired coordinate point, press the button.

To select the previous coordinate point, press the button.

Then move the machine axes until the positions of the selected coordinate point show 0.000. Repeat these steps until the arc has been completely machined.

### INFORMATION



Press the button to temporarily interrupt the function. The display returns to the normal display status. Press the 0 key again to continue with the function.

To exit from the function, press the button.



## 5.7 Functions for milling machines and lathes

### 5.7.1 Tool Data Function

Creates up to 99 tool data sets in relation to the coordinate system.

Usage of the tool data function makes it possible to establish a specific relationship between the tool data in the coordinate system and the displayed values.

#### INFORMATION

The Save function for tool data only works when the Reference Mark function is activated.

☞ Reference marker function on page 64.

Saved values remain even by loss of electric power.



#### Example:

Tool data no. 2 should lie at X = 1.000 and Y = 2.000 to the shown values.

Press the following keys in the order shown in order to input the values X = 1.000 and Y = 2.000 under tool data no. 2.



### 5.7.2 Recall of tool data

#### Example:

The tool data set no. 2 should be used at the currently displayed position.

Press the following keys in the order shown in order to use tool data set no. 2.





## 6 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repair

of the surface grinding machine.

### ATTENTION!

**Properly performed regular maintenance is an essential prerequisite for**

- operational safety,**
- failure-free operation,**
- a long working life of the surface grinding machine and**
- the quality of the products which you manufacture.**



Installations and equipment from other manufacturers must also be in good order and condition.

### 6.1 Operating material

#### 6.1.1 Machine lubricants

Safe operation of the machine is only guaranteed if suitable lubricants are used.  Operating material on page 21

#### 6.1.2 Coolants

In order to avoid interferences during operation the coolant and the slideway oil or grease need to be compatible.

Read also:  Cooling lubricants and tanks on page 84

### INFORMATION



The surface grinding machine was painted with a one-component lacquer. Take this criterion into account when selecting your cooling lubricant.

The company Optimum Maschinen Germany GmbH does not assume any guarantee for subsequent damages due to unsuitable cooling lubricants.

The flashpoint of the emulsion must be higher than 140°C.

When using non-water-miscible cooling lubricants (oil content > 15%) with a flashpoint, ignitable aerosol air mixtures might develop. There is a potential danger of explosion.

### ATTENTION!



**Only the correct selection of suitable combinations of coolants and bed track oils and the correct care and maintenance of the coolant can ensure that no problems such as stick-slip effect or deposits occur.**

The selection of coolants and bed track oils, lubricating oils or greases and their maintenance is determined by the machine user or operator.

Therefore Optimum Maschinen Germany GmbH cannot be held responsible for machine damages caused by unsuitable coolants and lubricants as well as insufficient care and maintenance of the coolant. If you have problems with the coolant and bed track oil or grease, please contact your mineral oil company.

### 6.2 Safety

#### WARNING!

**The consequences of incorrect maintenance and repair work may include:**





- Severe injuries of persons working on the machine,
- Damage to the surface grinding machine.

**Maintenance and repair work on the surface grinding machine must be carried out by qualified technical personnel only.**

## Validation

Check and maintain all safety-relevant stop, control and measuring devices (validation).

## Documentation

Record all tests and works in a operator's log resp. log book.

### 6.2.1 Preparation

#### WARNING!

**Only carry out work on the surface grinding machine, if the master switch is switched off and secured against restarting by means of a padlock.**



☞ Switching off and securing the surface grinding machine on page 17. Attach a warning label.

### 6.2.2 Restarting

Before restarting, run a safety check.

☞ Safety check on page 15



#### WARNING!

**Before starting the surface grinding machine, it is essential that you ensure that this does not constitute a risk to personal safety or damage to the surface grinding machine.**

## 6.3 Repair

### 6.3.1 Customer service technician

For any repair work request the assistance of an authorised customer service technician. Contact your specialist dealer if you do not have customer service's information or contact Stürmer Maschinen GmbH in Germany who can provide you with a specialist dealer's contact information. Optionally, the company Stürmer Maschinen GmbH

Dr.-Robert-Pfleger-Str. 26

D- 96103 Hallstadt

can provide a customer service technician, however, the request for a customer service technician can only be made via your specialist dealer.

If the repairs are carried out by qualified technical personnel, they must follow the indications given in these operating instructions.

Optimum Maschinen Germany GmbH accepts no liability nor does it guarantee against damage and operating malfunctions resulting from failure to observe these operating instructions.

For repairs, only use

- faultless and suitable tools only,
- original parts or parts from series expressly authorised by Optimum Maschinen Germany GmbH.





## 6.4 Inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.

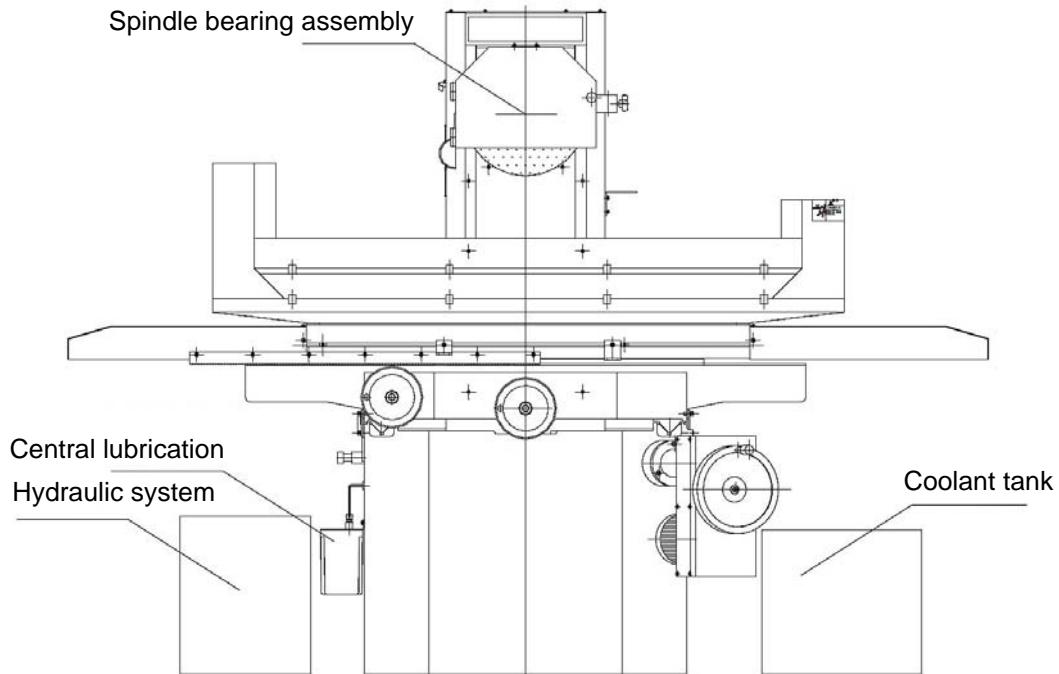
Interval	Where?	What?	How?	Check
Start of work, after each maintenance or repair work	Surface grinding machine	Safety check on page 15		
		Central lubrication	Fill level Top up central lubrication on page 31	
weekly	Sedimentation tank Coolant tank	Grinding sludge	Remove accumulation of grinding sludge. Coolant circuit on page 35	
		Fill level, status control	 <b>CAUTION !</b> The coolant must be checked for concentration, pH value, bacteria and fungal attack at least once a week, even when the machine is not in operation.	
after 3 months then every year	Coolant	PH Value measurement	Check the pH value. If required, replace the cooling lubricant. Cooling lubricants and tanks on page 84 Inspection plan for water-mixed cooling lubricants on page 85	
		Oil change	After 3 months of initial operation, the hydraulic oil of the hydraulic unit must be replaced. Thereafter annually or every two years depending on the condition of the oil.	
	Hydraulic power unit			



Interval	Where?	What?	How?	Check ✓
based on operator's historic values	Coolant circuit	Drain hose	Check the drain hose from the grinding table back into the coolant tank for deposits and blockages.	
Every 1000 operating hours	Electrical cabinet	Cleaning	<p>Although the electrical cabinet is constructed to shut off external air, foreign particles such as dust and dirt may enter the cabinet when the door is open.</p> <p>Accumulation of foreign particles on the printed circuit boards or other electronic components could cause machine malfunction.</p> <p>Clean the inside of the electrical cabinet regularly.</p> <p>Remove dust inside electrical cabinet with a vacuum cleaner. Do not use compressed air to clean the electrical cabinet.</p> <p>Never touch circuit boards or parts around the connector. Also avoid hitting these parts with the vacuum.</p> <p>We recommend that the electrical cabinet is cleaned every 1000 operating hours.</p>	
based on operator's historic values in accordance with German DGUV (BGV A3)	Electronics	Electrical inspection	<ul style="list-style-type: none"> <li>☞ Obligations of the operating company on page 13</li> <li>☞ Electronics on page 18</li> <li>☞ Validation on page 76</li> </ul>	



## 6.5 Filling points, operating equipment



Position	Lubricants	Interval	Designation
Central lubrication	Oil for guides	daily	slideway oil ISO VG 32
Hydraulic system	Hydraulic oil	Every month	Hydraulic oil ISO VG 32
Spindle bearing assembly	Bearing grease	never	The spindle bearing is permanently lubricated.
Cooling system	Coolant	according to test plan	☞ Inspection plan for water-mixed cooling lubricants on page 85



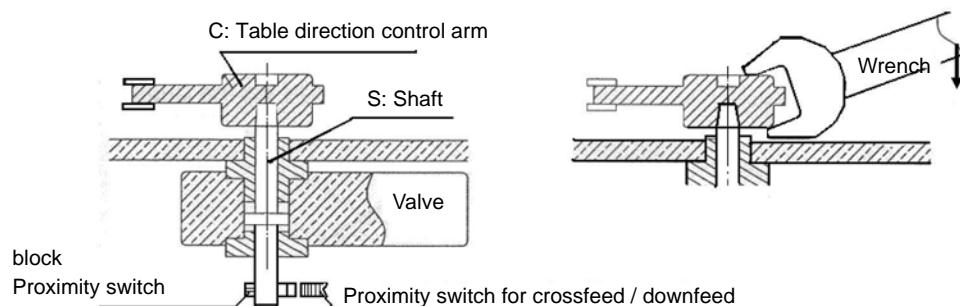
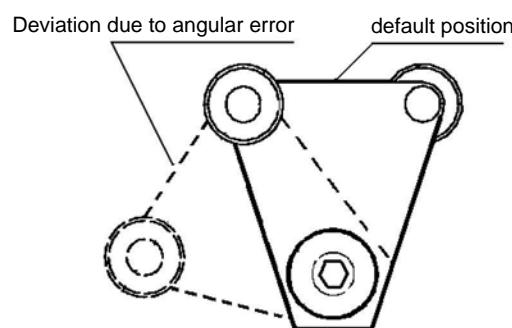
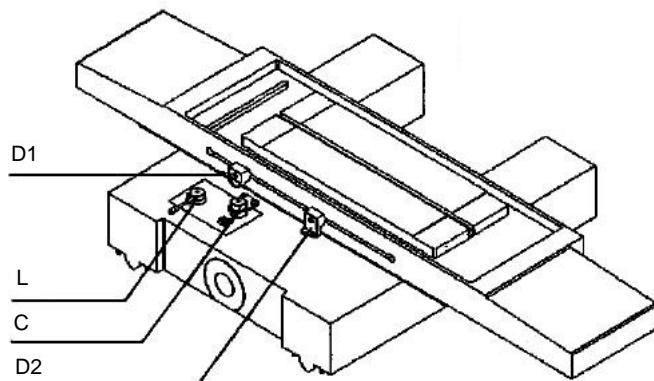
## 6.6 Directional arm for oscillation

The position of the table direction control arm can be readjusted:

If the directional stop D1/D2 hits the table directional control arm C because of an operating error or if the control arm has been in operation for a long time, the control arm may lose the correct position and the table may not move automatically.

In this case the position of the control arm must be adjusted as follows:

- D1 / D2 - Stop reversal
- L - Speed lever
- C - Table direction control arm





## Procedure

### CAUTION!

**Do not trap fingers between the table direction control arm and the stops!**



- Set speed lever L to the "STOP" position to stop the table feed.
- Slide the stops D1 and D2 away from the table direction control arm C.
- Use an open-end wrench to push the table direction control arm C off the axis S. Turn the S axis until the proximity switch block touches the proximity switch and the red lamp lights up (on-switch). Thus the axis S is in the correct position. Then reset the table direction control arm C to the S axis.
- Turn the speed lever L with your left hand until the table moves at low speed. Turn the table direction control arm C with your right hand about 15-20 degrees to the right and left. This should move the table to the right and left accordingly. If this is not the case, reset the table direction control arm C to a different position on the axis and test the table movement direction accordingly until you find the correct position for the table direction control arm.

## INFORMATION

If the table does not move smoothly, there may be air in the hydraulic line.

Also check whether the slideway oil of the central lubrication system reaches the lubrication points. ☐ Central lubrication supply points on page 33



To get the air out of the pipe, move the table for a moment at high pendulum speed.



## 6.7 Hydraulic system

### 6.7.1 Inspection and exchange of hydraulic hoses

Hydraulic hoses are used in almost any machine or system with hydraulically controlled components, especially where rigid pipes cannot be used for the energy transfer.

Hydraulic hoses pose a particular danger due to faulty insertion, ageing, wear and tear, damage and other reasons. It is therefore necessary to check the hydraulic hoses before commissioning and regularly thereafter and replace them, if they are damaged or worn.

These requirements arise from regulations concerning health and safety at the workplace.

For warranty purposes and to ensure safe function, work equipment (machines and systems) including the hydraulic hoses in hydraulic systems must be inspected. The legal basis for the inspections are set out in the Factory Safety Directive, BetrSichV, which substantiates the guidelines in the Work Safety Act ArbSchG for the operators of work equipment.

Newly purchased machines must comply with the European guidelines, which are documented in conformity declarations and by CE markings. The hydraulics used in your machine fulfil the requirements according to guideline EN ISO 4413. This does not mean that there is any guarantee that newly purchased machines with this label are without safety defects. Furthermore, work equipment may be faulty due to transport, after a move and/or improper new assembly.

Machines and their hydraulic hoses must therefore be inspected after their proper assembly.

This so-called inspection "for proper assembly and safe functioning" must be initiated by the operator after assembly prior to commissioning or before re-commissioning; this used to be called a "first inspection".

In addition, machines and their hydraulic hoses are subject to "damaging influences" and/or wear and tear. Work equipment must nevertheless be safe before each start of work.

The operator therefore has to identify potential dangers, assess their risks, determine protective measures for safe provision and use and ensure compliance with these measures. Protective measures include, for example, the inspection and exchange of hydraulic hoses.

The work equipment must be regularly checked for "safe provision and use"; this used to be referred to as "repeated inspection". These inspections must also be initiated by the operator.

Both the type and scope of inspection as well as the inspection periods must be determined by the operator in accordance with para. 3 BetrSichV and are part of the documentation of their operational risk analysis in accordance with para. 6 ArbSchG, similar to the results of the inspections conducted.

### 6.7.2 Personnel qualified to inspect hydraulic systems

A qualified person as defined by the Factory Safety Directive is a person who due to their professional training, professional experience and recent professional activity has the necessary expert knowledge to inspect hydraulic hoses and have authority to act independent from instructions during the inspection (BetrSichV para. 2 sect. 7 and TRBS 1203).

Whilst there is no specific requirement profile for "qualified persons" with regard to special inspection tasks in connection with hydraulic hoses, the general requirements according to TRBS 1203 must be fulfilled by the qualified person.



## 6.8 Cooling lubricants and tanks

### CAUTION!

The cooling lubricant can cause diseases. Avoid direct contact with cooling lubricant or parts covered in cooling lubricant.



Cooling lubricant circuits and tanks for water-cooling lubricant mixtures must be completely emptied, cleaned and disinfected as needed, but at least once per year or every time the cooling lubricant is replaced.

If fine chips and other foreign matters are accumulated in the coolant tank, the machine can no longer be correctly supplied with coolant. Furthermore, the lifetime of the coolant pump is reduced.

When processing cast iron or similar materials generating fine chips, cleaning the coolant tank more often is recommended.

### Limit values

The cooling lubricant must be replaced, the cooling lubricant circuit and tank emptied, cleaned and disinfected if

- the pH value drops by more than 1 based on the value during initial filling. The maximum permissible pH value during initial filling is 9.3
- there is a perceivable change in the appearance, odour, floating oil or increase of the bacteria to more than 10/6/ml
- there is an increase in nitrite content to more than 20 ppm (mg/l) or nitrate content to more than 50 ppm (mg/l)
- there is an increase in the N-nitrosodiethanolamine (NDELA) to more than 5 ppm (mg/a)

### CAUTION!

Comply with the manufacturer's specifications for mixture ratios, hazardous substances, e.g. system cleaners, including their permissible minimum use times.



### CAUTION!

Since the cooling lubricant escapes under high pressure, pumping out the coolant by using the existing cooling lubricant pump via a pressure hose into a suitable tank is not recommended.



### ENVIRONMENTAL PROTECTION



During work on the cooling lubricant equipment please make sure that

- collector tanks are used with sufficient capacity for the amount of liquid to be collected.
- liquids and oils should not be spilled on the ground.

Clean up any spilled liquid or oils immediately using proper oil-absorption methods and dispose of them in accordance with current statutory environmental regulations.

### Collect leakages

Do not re-introduce liquids spilled outside the system during repair or as a result of leakage from the reserve tank, instead collect them in a collecting container for disposal.

### Disposal

Never dump oil or other substances which are harmful to the environment into water inlets, rivers or channels. Used oils must be delivered to a collection centre. Consult your supervisor if you do not know where the collection centre is.



### 6.8.1 Inspection plan for water-mixed cooling lubricants

Company: No.: Date: used cooling lubricant			
size to be checked	Inspection methods	Inspection intervals	Procedure and comment
noticeable changes	Appearance, odour	daily	Find and rectify causes, e.g. skim off oil, check filter, ventilate cooling lubricant system
pH value	Laboratory techniques electrometric with pH meter (DIN 51369) Local measurement method: with pH paper (Special indicators with suitable measuring range)	weekly <sup>1)</sup>	if pH value decreases > 0.5 based on initial filing: Measures in accordance manufacturer's recommendations > 1.0 based on initial filing: Replace cooling lubricant, clean cooling lubricant circulation system
Usage concentration	Manual refractometer	weekly <sup>1)</sup>	Method results in incorrect values with tramp oil content
Base reserve	Acid titration in accordance with Manufacturer's recommendation	as required	Method is independent of tramp oil content
Nitrite content	Test sticks method or laboratory method	weekly <sup>1)</sup>	> 20 mg/L nitrite: Replace cooling lubricant or part or inhibiting additives; otherwise NDELA (N-nitrosodiethanolamine) in the cooling lubricant system and in the air must be determined > 5 mg/L NDELA in the cooling lubricant system: Replacement, clean and disinfect cooling lubricant circulation system, find nitrite source and, if possible, rectify.
Nitrate/nitrite content of the preparation water, if this is not removed from the public grid	Test sticks method or laboratory method	as required	Use water from the public grid if there is water from the public grid has > 50 mg/l nitrate: Inform the waterworks

<sup>1)</sup> The specified inspection intervals (frequency) are based on continuous operation. Other operational conditions can result in other inspection intervals; exceptions are possible in accordance with Sections 4.4 and 4.10 of the TGS 611.

Editor:

Signature:

## 7 Ersatzteile - Spare parts

### 7.1 Ersatzteilbestellung - Ordering spare parts

Bitte geben Sie folgendes an - *Please indicate the following :*

- Seriennummer - *Serial No.*
- Maschinenbezeichnung - *Machines name*
- Herstellungsdatum - *Date of manufacture*
- Artikelnummer - *Article no.*

Die Artikelnummer befindet sich in der Ersatzteilliste. *The article no. is located in the spare parts list.* Die Seriennummer befindet sich am Typschild. *The serial no. is on the rating plate.*

### 7.2 Hotline Ersatzteile - Spare parts Hotline



+49 (0) 951-96555 -118

ersatzteile@stuermer-maschinen.de



### 7.3 Service Hotline

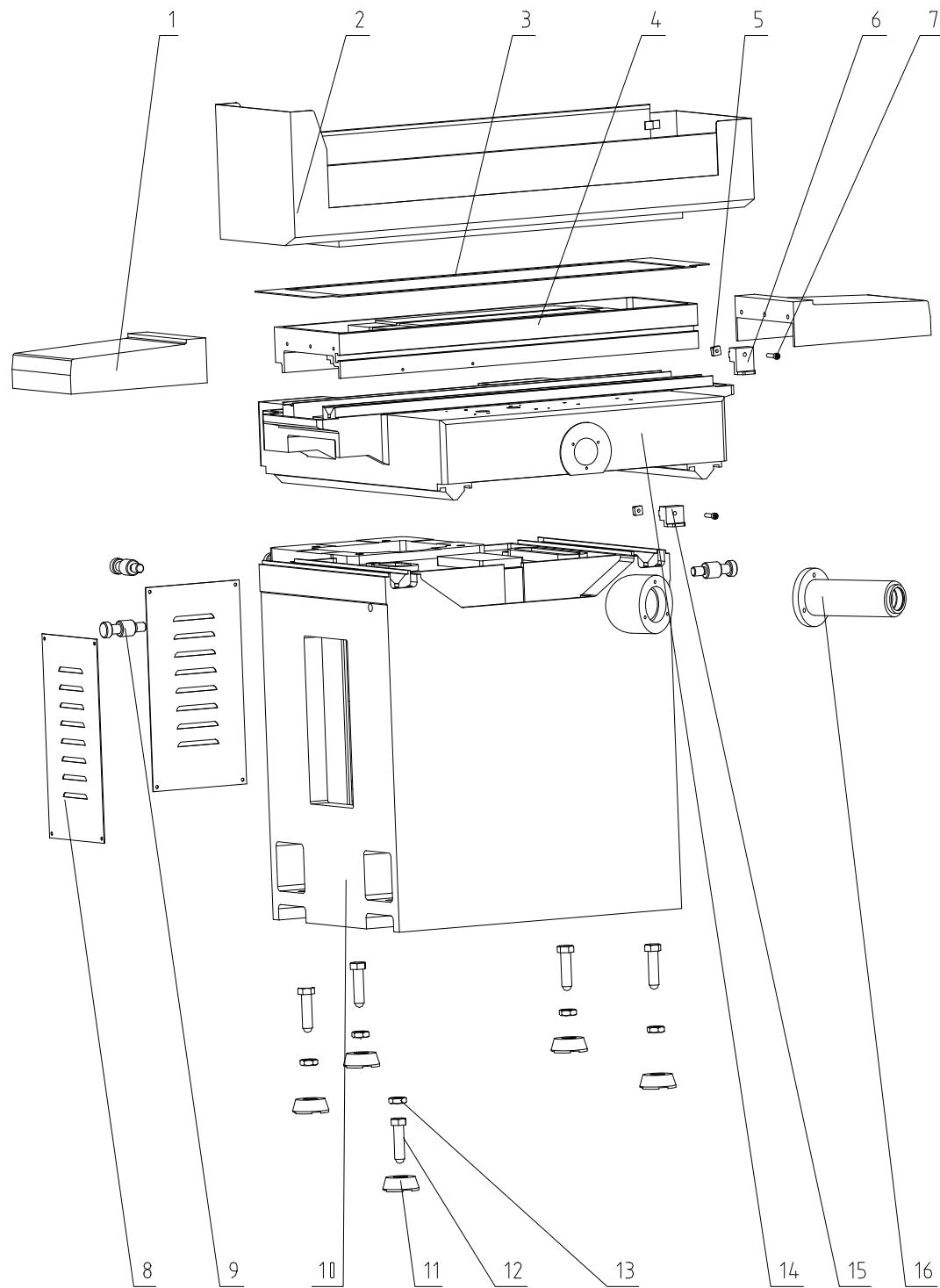


+49 (0) 951-96555 -100

service@stuermer-maschinen.de



#### 7.4 GT25 - Tischbaugruppe - Table assembly



Ersatzteileliste Tischbaugruppe - Table assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Linker und rechter Schutz	Left and right guard	2	FSG2550R-04-100(for GT25)	03111025101
2	Spritzschutz	Splashing guard	1	FSG-2050R-04-302(for GT25)	03111025102
3	Wasserdichtes Kissen	Water-proof cushion	1	FSG-2050R-04-305(for GT25)	03111025103
4	Arbeitstisch	Work table	1	FSG-2050R-04-100(for GT25)	03111025104
5	Vierkantmutter	Square nut	2		03111025105
6	Rechter ADJ-Grenzblock	Right limit ADJ block	1	FSG-2550R-04-102	03111025106
7	Innensechskantschraube	Hexagon socket screw	2	M8x40/J21-9B	
8	Abdeckung links	Cover left	1	Left: FSG3063R-01-319	03111025108L
	Abdeckung rechts	Cover right	1	Right: FSG2550R-01-310	03111025108R
9	Hebezeug	Hoisting set	4	FSG2550R-01-311	03111025109
10	Maschinenbett	Machine bed	1	FSG-2550R-01-100(for GT25)	03111025110
11	Nivellierungsscheibe	Leveling wedge	5	FSG-2550R-01-105	03111025111
12	Nivellierschraube	Leveling screw	5	FSG-2550R-01-302	03111025112
13	Sechskantmutter	Hexagon nut	5	M22/J11-1B	03111025113
14	Sattel	Saddle	1	FSG-2550R-03-100(for GT25)	03111025114
15	Linker ADJ-Grenzblock	Left limit ADJ block	1	FSG-2550R-04-101	03111025115

### 7.5 GT25 - Säulenbaugruppe - Column assembly

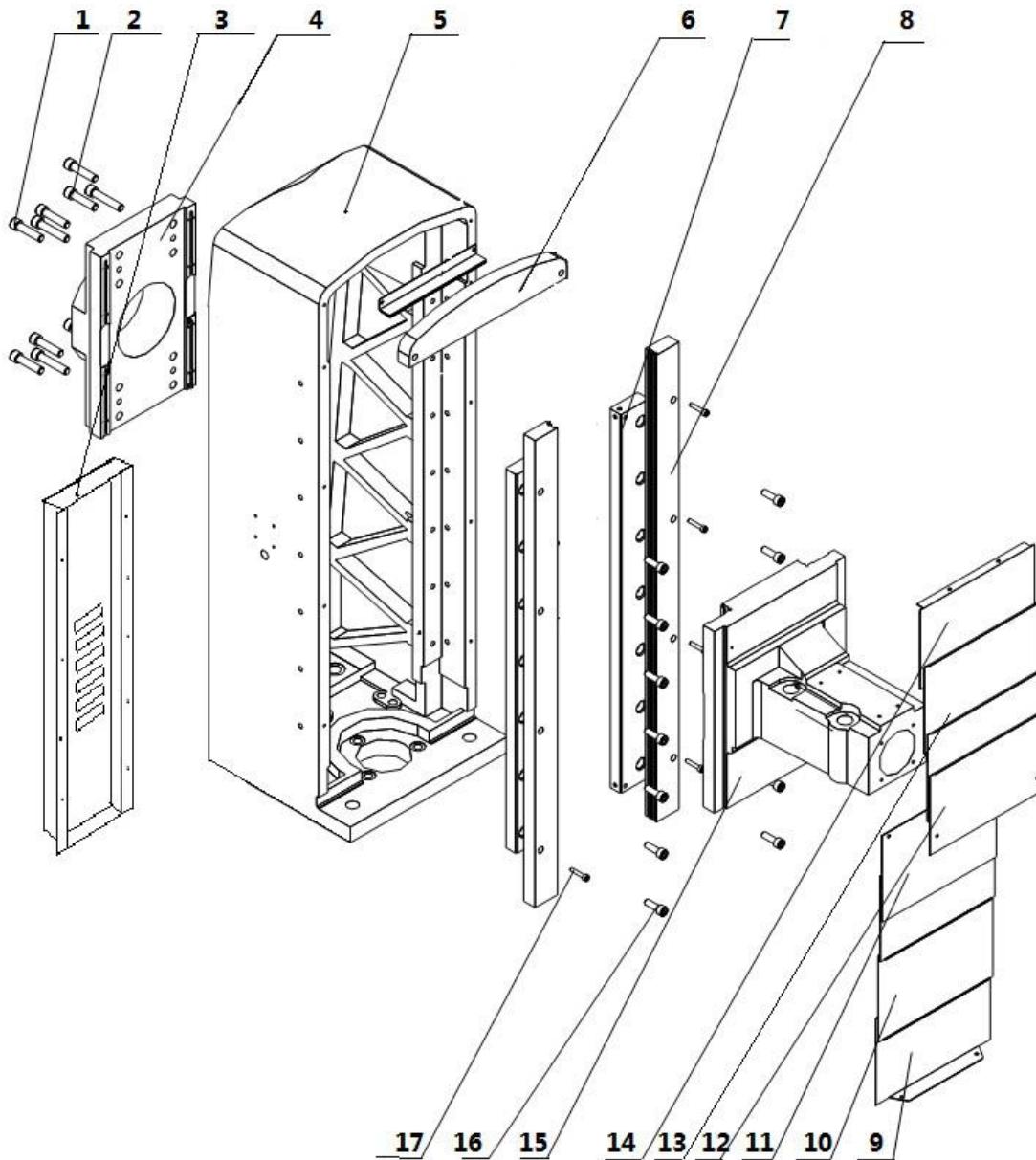


Abb.7-2:

Ersatzteileliste Säulenbaugruppe - Column assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Sechskantschraube	Hexagonal socket bolt	8	M12x50	
2	Sechskantschraube	Hexagonal socket bolt	4	M12x60	
3	Rückseitige Säulenschutzabdeckung	Column rear guard	1	FSG-2550R-02-308	03111025203
4	Motor Befestigungsplatte	Motor fixed plate	1	FSG-2550R-02-102	03111025204
5	Säule	Column	1	FSG-2550R-02-101	03111025205
6	Oberer Klemmstreifen	Upper clamping strip	1	FSG-2550R-02-103	03111025206
7	Stahlführung	Steel guide way	2	FSG-2550R-02-301	03111025207
8	Führungsplatte	Guide plate	2	FSG-2550R-02-200	03111025208

9	Staubschutzabdeckung	Dust-proof plate	1	FSG-2550R-02-307	03111025209
10	Staubschutzabdeckung	Dust-proof plate	1	FSG-2550R-02-306	03111025210
11	Staubschutzabdeckung	Dust-proof plate	1	FSG-2550R-02-305	03111025211
12	Staubschutzabdeckung	Dust-proof plate	1	FSG-2550R-02-304	03111025212
13	Staubschutzabdeckung	Dust-proof plate	1	FSG-2550R-02-303	03111025213
14	Staubschutzabdeckung	Dust-proof plate	1	FSG-2550R-02-302	03111025214
15	Spindelgehäuse	Spindle housing	1	FSG-2550R-02-100	03111025215
16	Innensechskantschraube	Hex. Socket screw	10	M6x30	
17	Innensechskantschraube	Hex. Socket screw	14	M10x30	

## 7.6 GT25 - Manuelle Längstischbewegung - Manual longitudinal table movement

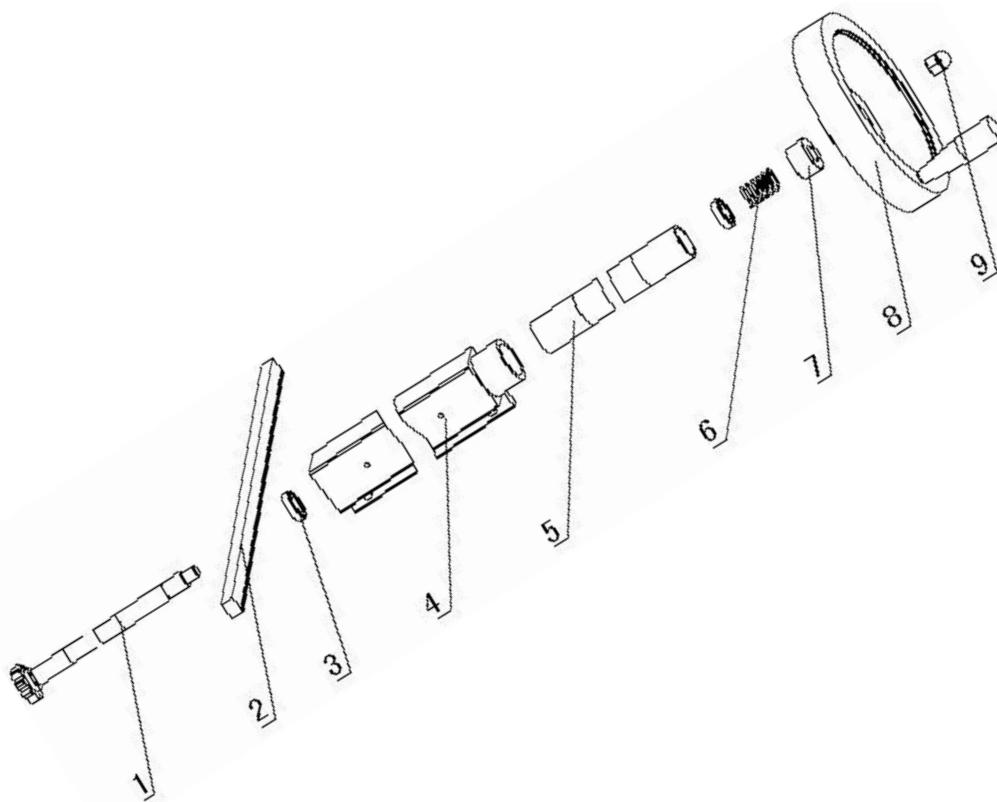


Abb. 7-3:

Ersatzteileliste Manueller Längstischvorschub - Table longitudinal manual feed parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Verzahnte Welle	Gear shaft	1	FSG2050R-23-302(for GT25)	03111025301
2	Zahnstange	Rack	1	FSG-2550R -30-300(for GT25)	03111025302
3	Rillenkugellager	Deep-furrow ball bearing	2	61204?2Z(17x30x7)GB/T276-94	040612042Z
4	Wellenhalterung Längsvorschub manuell	Manual shaft bracket on longitudinal	1	FSG-2550R -23-101(for GT25)	03111025304
5	Angetriebene Wellenhülse	Driven shaft sleeve	1	FSG-2550R -23-304(for GT25)	03111025305
6	Feder	Spring	1	FSG-2050M-23-306	03111025306
7	Kupferhülse	Copper sleeve	1	FSG-2050M-23-202	03111025307
8	Handrad	Hand wheel	2	FSG-2050M-10-503(for GT25)	03111025308

9	Hutmutter	Acorn nut	1	M12/J13-2B	03111025309
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## 7.7 GT25 - Baugruppe Quervorschub - Cross feed assembly

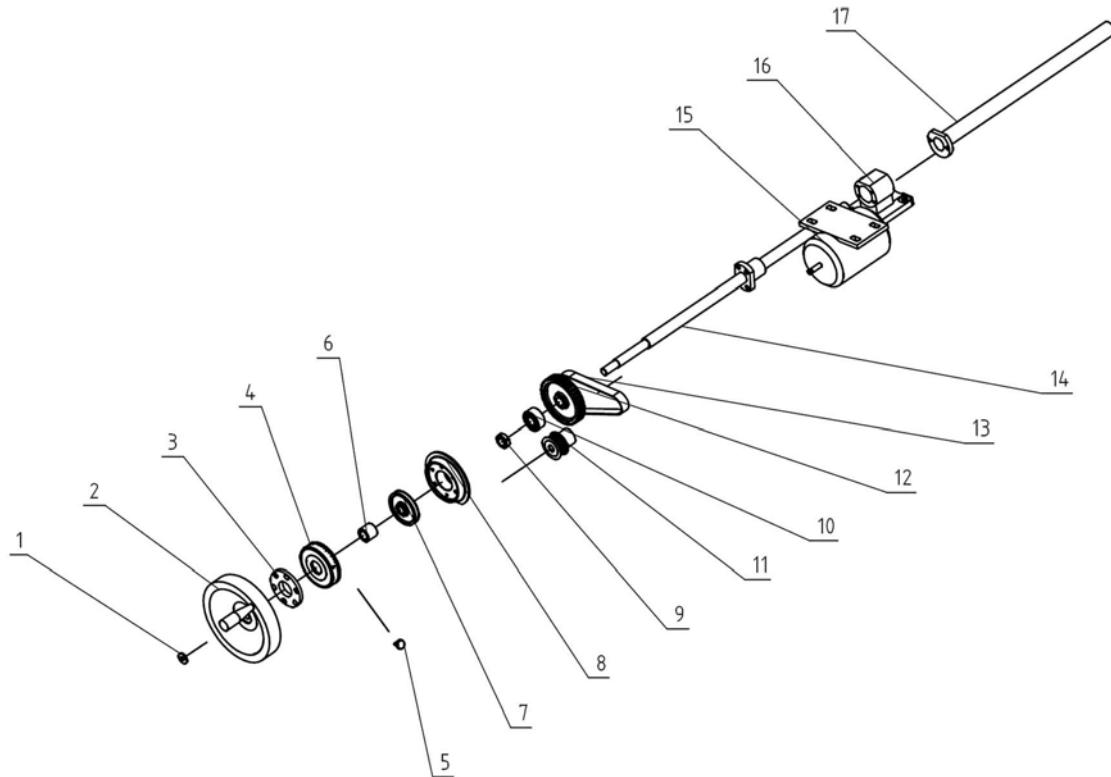


Abb. 7-4:

Ersatzteileliste Baugruppe Quervorschub - Cross feed assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Scheibe	Washer	1	FSG-4080R-23-313	03111025501
2	Handrad	Hand wheel	1	FSG-2050M-23-503(for GT25)	03111025502
3	Lagerdeckel	Bearing cover	1	FSG-2050M-23-302	03111025503
4	Vorschub-Wählscheibe	Feed dial	1	FSG-4080R-23-316	03111025504
5	Rändel-Stellschraube	Knurling set screw	1	M818-10-312	03111025505
6	Abstandhalter	Spacer	1	FSG-4080R-23-307	03111025506
7	Hülse	Sleeve	1	FSG-2050M-23-304	03111025507
8	Zifferblatt mit Nonius	Vernier dial plate	1	FSG-4080R-23-104	03111025508
9	Rundmutter	Round nut	1	M20x1.5/J14-4B	03111025509
10	Lager	Bearing	1	3204A (47x20x20.6)/GB/T292-94	0403204A
11	Kleine Zahnscheibe	Small timing pulley	1	FSG-2050M-23-106	03111025511
12	Große Zahnscheibe	Big time pulley	1	FSG-2050M-23?105	03111025512
13	Zahnriemen	Timing belt	1	187L075/GB11616-89	03111025513
14	Spindel Quervorschub	Cross lead screw	1	FSG-2550R-23-300(for GT25)	03111025514
15	Motor Quervorschub	Cross feed motor	1	KT516 0.04kW	03111025M5
16	Halterung für Vorschubmutter	Feed nut bracket	1	FSG-4080R-23-101	03111025516
17	Sichere Abschirmung Spindel Quervorschub	Cross lead screw safe shield	1	FSG-2550R-23-310(for GT25)	03111025517

## 7.8 GT25 - Hubeinrichtung - Elevating assembly

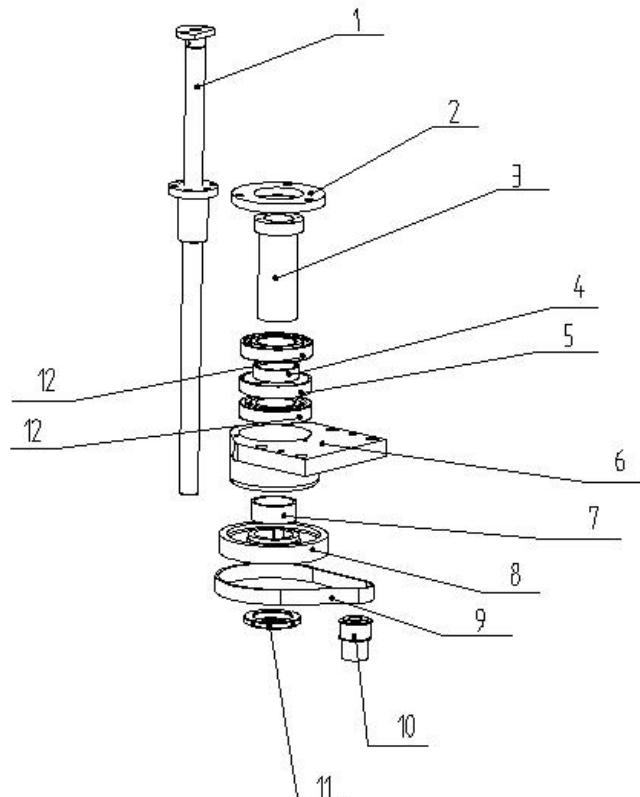


Abb. 7-5:

Ersatzteileliste Hubeinrichtung - Elevating assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Hubschraube	Elevating screw	1	FSG2550NC2-10-300(for GT25)	03111025601
2	Endkappe	End cap	1	FSG4080NC2-10-301	03111025602
3	Hublager	Elevating bearing	1	FSG4080NC2-10-307	03111025603
4	Interner Federring	Internal spring ring	1	FSG4080NC2-10-302	03111025604
5	Externer Federring	External spring ring	1	FSG4080NC2-10-303	03111025605
6	Übertragungs-Verbindungsplatte	Transmission connection board	1	FSG4080NC2-10-101	03111025606
7	Hülse	Bushing	1	FSG4080NC2-10-304	03111025607
8	Zahnscheibe	Time pulley	1	FSG4080NC2-10-103	03111025608
9	Zahnriemen	Time belt	1	270L100/GB11616-89	03111025609
10	Kleine Riemscheibe	Small pulley	1	FSG4080NC2-10-104	03111025610
11	Rundschraube Verriegelung	Locking round screw	1	M65x2/YSR	03111025611
12	Winkelkontakt-Lager	Angle contact bearing	2	760213TN1/P4 DB B/GB/T 292-94 (65x120x23)	03111025612

## 7.9 GT25 - Hydraulikzylinder - Hydraulic cylinder

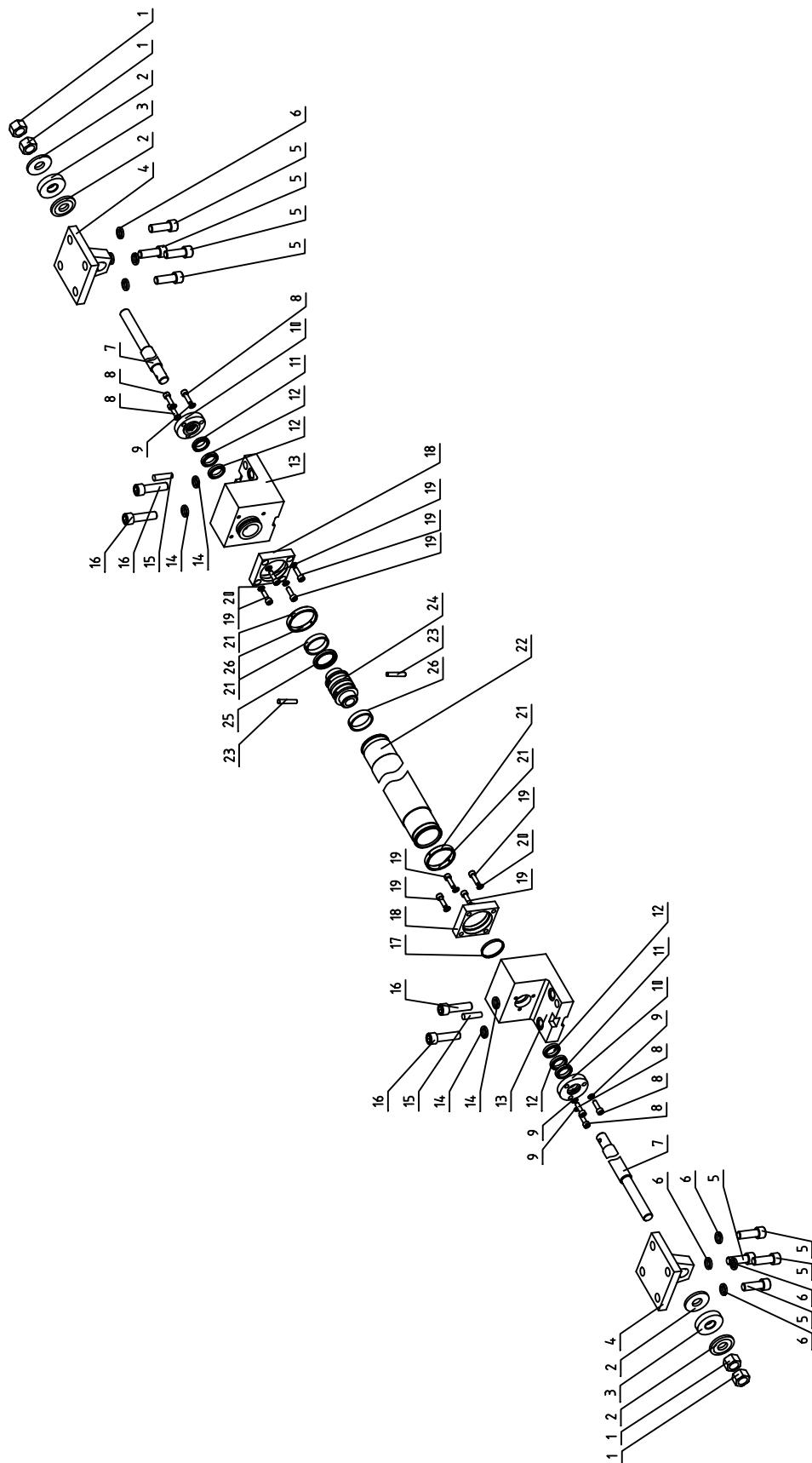


Abb. 7-6:

Ersatzteileliste Hydraulikzylinder - Hydraulic cylinder parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Sechskantmutter	Hexagonal nut	4	M16x1.5/J11-1B	
2	Unterlegscheibe	Washer	4	SG-4080AHR-53-300	03111025702
3	Kissen	Cushion	2	SG-4080AHR-53-500	03111025703
4	Angetriebene Basis	Driven base	2	SG-4080AHR-53-301	03111025704
5	Innensechskantschraube	Socket head cap screw	8	M12x40/J21-9B	
6	Federscheibe	Spring washer	8	12/J54-1B	
7	Kolbenstange	Piston rod	2	SG2550AHR-53-301(for GT25)	03111025707
8	Innensechskantschraube	Socket head cap screw	6	M6x20/J21-9B	
9	Federscheibe	Spring washer	6	6/J54-1B	
10	Endkappe	End cap	2	SG-4080AHR-53A-301	03111025710
11	Staubdichter Ring	Dust-proof ring	2	AD48-20x28x5.3	03111025711
12	Y-förmiger Ring	Y-shaped ring	4	MA30-20x28x6.3	03111025712
13	Halterung für Hydraulikzylinder	Hydraulic cylinder bracket	2	SG-4080AHR-53A-100	03111025713
14	Federscheibe	Spring washer	4	12/J54-1B	
15	Kegelstift	Taper pin	2	8x35/41-2B	03111025715
16	Innensechskantschraube	Socket head cap screw	4	M12x40/J21-9B	
17	O-förmiger Ring	O-shaped ring	2	40/G52-2	03111025717
18	Schutzabdeckung	Guard cover	2	SG-4080AHR-53A-304	03111025718
19	Innensechskantschraube	Hexagonal socket screw	8	M6x20/J21-9B	
20	Federscheibe	Spring washer	8	6/J54-1B	03111025720
21	Ring	Ring	2	SG-4080AHR-53A-303	03111025721
22	Hydraulikzylinder	Hydraulic cylinder	1	SG2550AHR-53-300(for GT25)	03111025722
23	Kegelstift	Taper pin	2	6x30/41-2B	03111025723
24	Kolben	Piston	1	SG-4080AHR-53A-305	03111025724
25	Hermetischer Ring	Hermetic ring	1	K30-40A	03111025725
26	Führungsring	Guide ring	2	FUR02-8.1x2.5-40-D24	03111025726

## 7.10 GT25 - Spindleinheit - Spindle unit

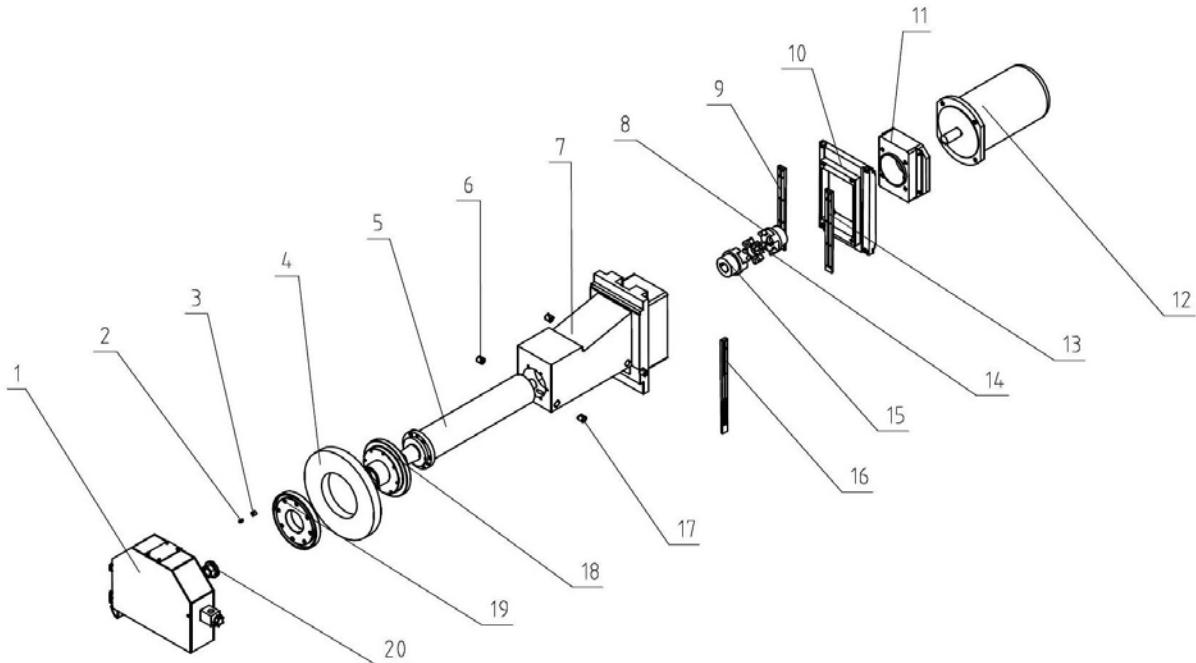
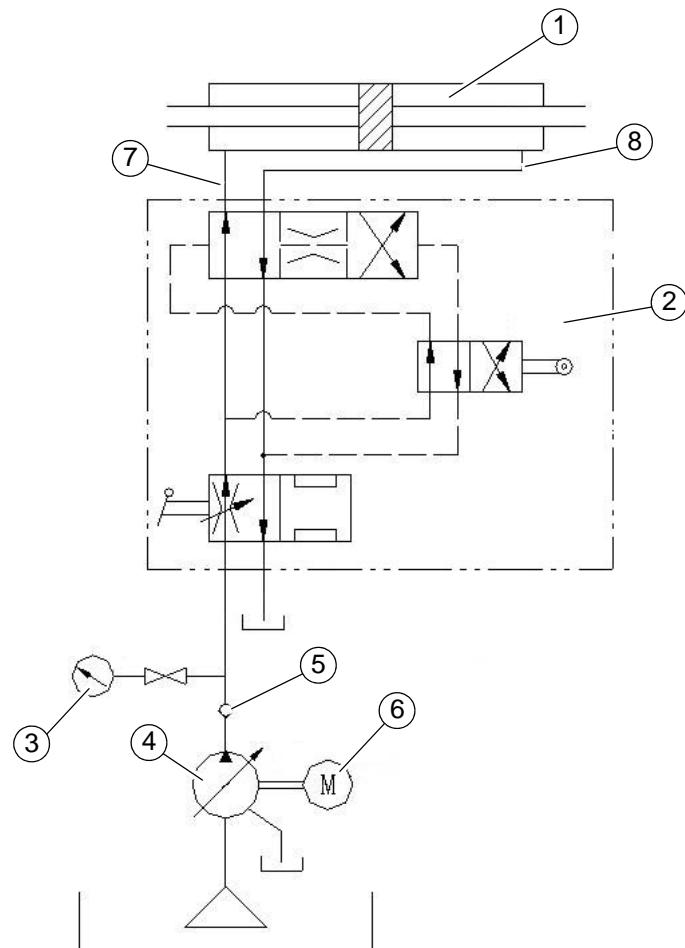


Abb. 7-7:

Ersatzteileliste Spindleinheit - Spindle unit parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Schleifscheiben Schutzabschirmung	Grinding wheel shield	1		03111025801
2	Sicherungsschraube	Lock screw	3		03111025802
3	Ausgleichsgewicht	Balancing block	3		03111025803
4	Schleifscheibe	Grinding wheel	1	Corundum grinding wheel grain size 46 Korundschleifscheibe Korn 46	03111025804
5	Spindel	Spindle	1		03111025805
6	Verschluss	Plug	2		03111025806
7	Spindelgehäuse	Spindle housing	1		03111025807
8	Kupplung Motorwelle	Coupling connect to motor shaft	1		03111025808
9	Leiste	Gib			03111025809
10	Klemmplatte	Clamping plate	1		03111025810
11	Motor-Montageflansch	Motor assembling flange	1		03111025811
12	AC-Motor	AC motor	1		03111025M1
13	Leiste	Gib	1		03111025813
14	Kunststoffeinsatz	Plastic insert	1		03111025814
15	Kupplung mit der Spindel verbinden	Coupling connect to the spindle	1		03111025815
16	Leiste	Gib	1		03111025816
17	Verschluss	Plug	1		03111025817
18	Radflansch	Wheel flange base	1		03111025818
19	Radflansch-Klemmscheibe	Wheel flange clamping cover	1		03111025819
20	Kontermutter	Lock nut	1		03111025820

## 7.11 GT25 - Hydraulik - Hydraulic

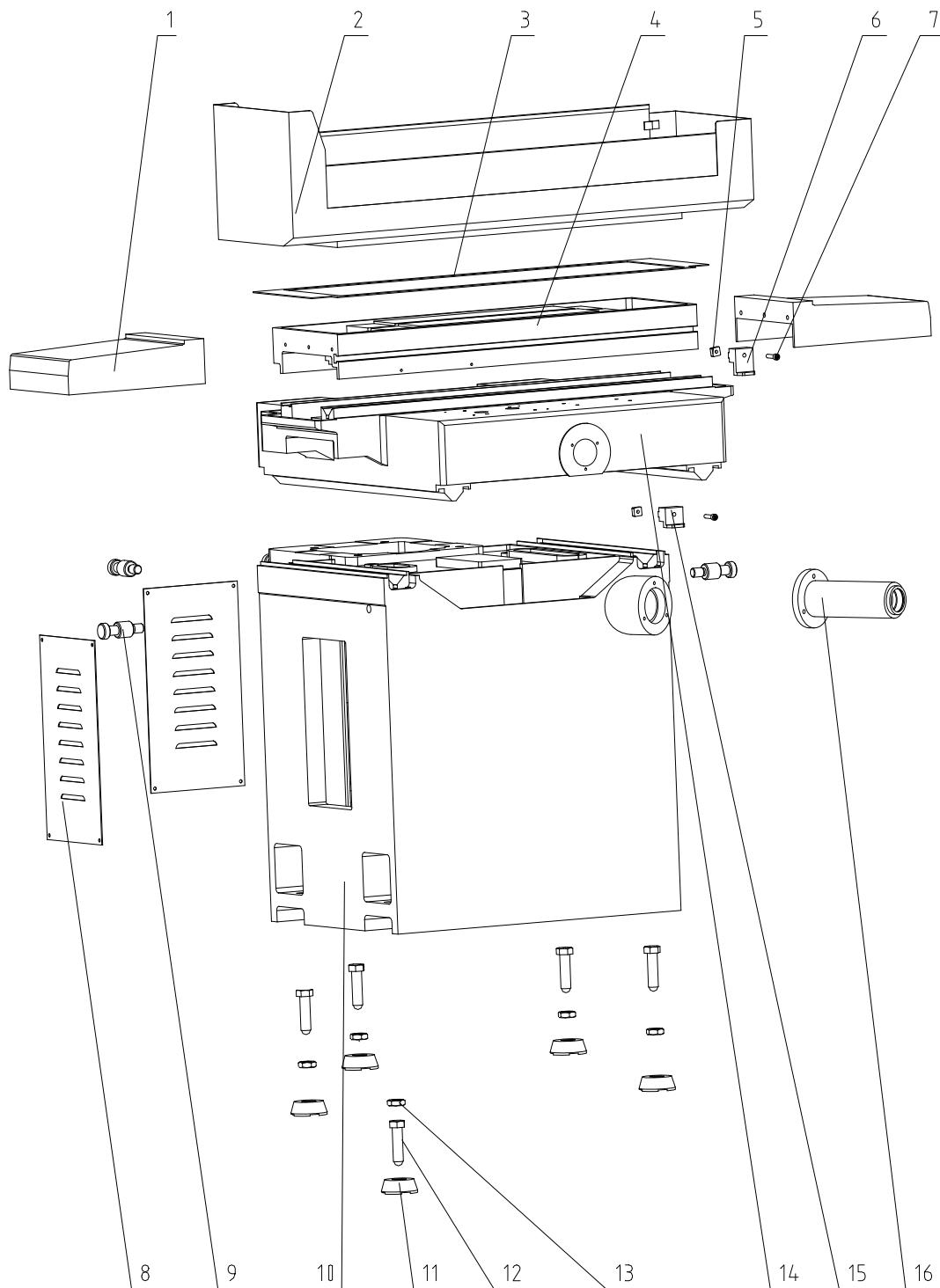


Ersatzteileliste Hydraulikaggregat - Hydraulic unit parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Hydraulikzylinder	Hydraulik cylinder	1	SG2550AHR-53-300(for GT25)	03111025722
2	Richtungs- und Geschwindigkeitsventil	Direction and speed valve	1		031110251202
3	Manometer	Manometer	1		031110251203
4	Hydraulikpumpe	Hydraulic Pump	1		031110251204
5	Rückschlagventil	Check valve	1		031110251205
6	Motor	Motor	1	0.75 Kw	03111025M2
7	Hydraulikschlauchleitung	Hydraulic hose	1	18 MPa	031110251207
8	Hydraulikschlauchleitung	Hydraulic hose	1	18 Mpa	031110251208

## 7.12 GT25 - Wegmesssystem - Path measuring system

Ersatzteileliste GT25 - Wegmesssystem - Path measuring system parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Digitale Wegmessanzeige	DRO	1	DPA 31	
2	Kugelmessleiste Y-Achse	Ball scale bar Y axis	1		03111025902
3	Kugelmessleiste Z-Achse	Ball scale bar Z axis	1		03111025903
4	Anschlusskabel Kugelmessleiste Y-Achse	Connection cable ball scale bar Y axis	1		03111025904
5	Anschlusskabel Kugelmessleiste Z-Achse	Connection cable ball scale bar Z axis	1		03111025905

### 7.13 GT30 - Tischbaugruppe - Table assembly



Ersatzteileliste Tischbaugruppe - Table assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Linker und rechter Schutz	Left and right guard	2	FSG3063R-04-100(for GT30)	03111030101
2	Spritzschutz	Splashing guard	1	FSG-3063R-04-302(for GT30)	03111030102
3	Wasserdichtes Kissen	Water-proof cushion	1	FSG-3063R-04-305(for GT30)	03111030103
4	Arbeitstisch	Work table	1	FSG-3063-R-04-100(for GT30)	03111030104
5	Vierkantmutter	Square nut	2		03111030105
6	Rechter ADJ-Grenzblock	Right limit ADJ block	1	FSG-2550R-04-102	03111025106
7	Innensechskantschraube	Hexagon socket screw	2	M8x40/J21-9B	
8	Abdeckung links	Cover left	2	Left: FSG3063R-01-319	03111025108L
	Abdeckung rechts	Cover right		Right: FSG2550R-01-310	03111025108R
9	Hebezeug	Hoisting set	4	FSG2550R-01-311	03111025109
10	Maschinenbett	Machine bed	1	FSG-3063R-01-100(for GT30)	03111030110
11	Nivellierungsscheibe	Leveling wedge	5	FSG-2550R-01-105	03111025111
12	Nivellierschraube	Leveling screw	5	FSG-2550R-01-302	03111025112
13	Sechskantmutter	Hexagon nut	5	M22/J11-1B	03111025113
14	Sattel	Saddle	1	FSG-3060R-03-100(for GT30)	03111030114
15	Linker ADJ-Grenzblock	Left limit ADJ block	1	FSG-2550R-04-101	03111025115

### 7.14 GT30 - Säulenbaugruppe - Column assembly

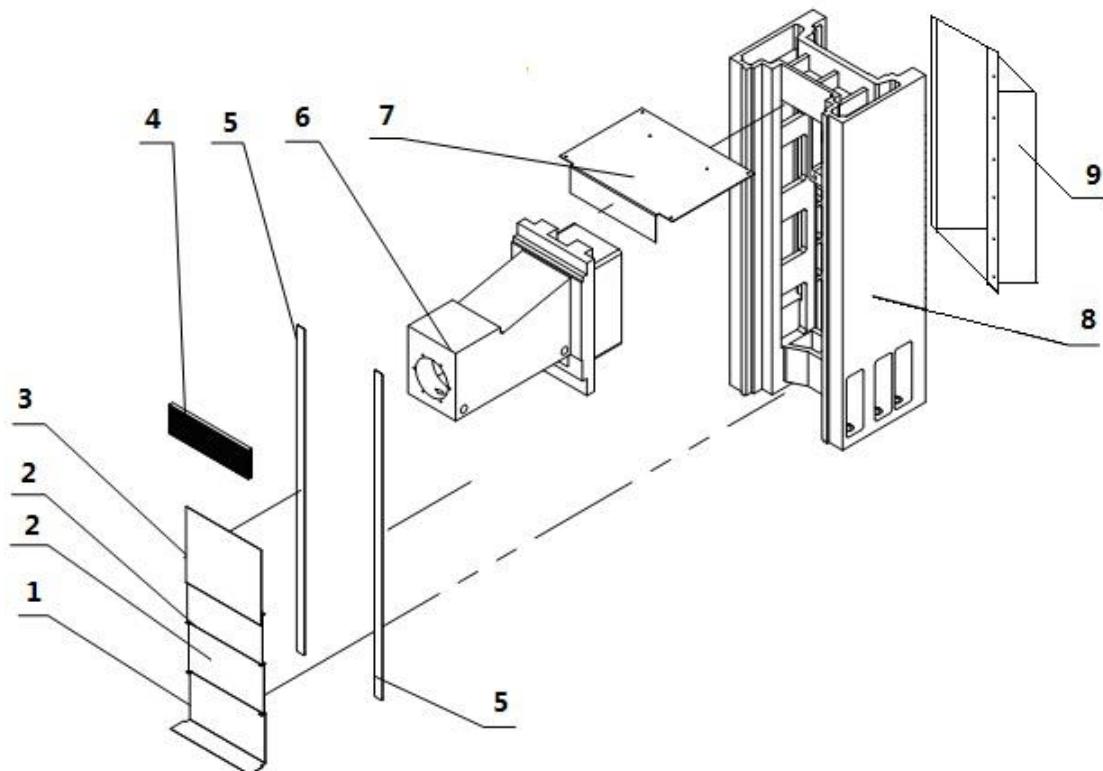


Abb. 7-9:

Ersatzteileliste Säulenbaugruppe - Column assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Feste Führung	Fixed Guard	1	FSG4080R-12-300	03111030201
2	Bewegliche Führung	Movable guard	2	FSG4080R-12-304	03111030202
3	Staubschutzabdeckung	Dust-proof plate	1	FSG4080R-12-301	03111030203
4	Plastik Faltenbalg	Bellow Plastic guard	3	FSG4080R-12-500	03111030204
5	Staubschutz Klemmstreifen	Dust-proof clamping strip	2	FSG4080R-12-303	03111030205
6	Schleifspindelgehäuse	Grinding spindle housing	1	FSG4080R-12-101	03111030206
7	Obere Abdeckplatte	Upper cover-plate	1	FSG4080R-12-305	03111030207
8	Säule	Column	1	FSG4080R-12-100	03111030208
9	Hintere Säulenschutzabdeckung	Column rear guard	1	FSG4080R-12-108	03111030209

## 7.15 GT30 - Manuelle Längstischbewegung - Manual longitudinal table movement

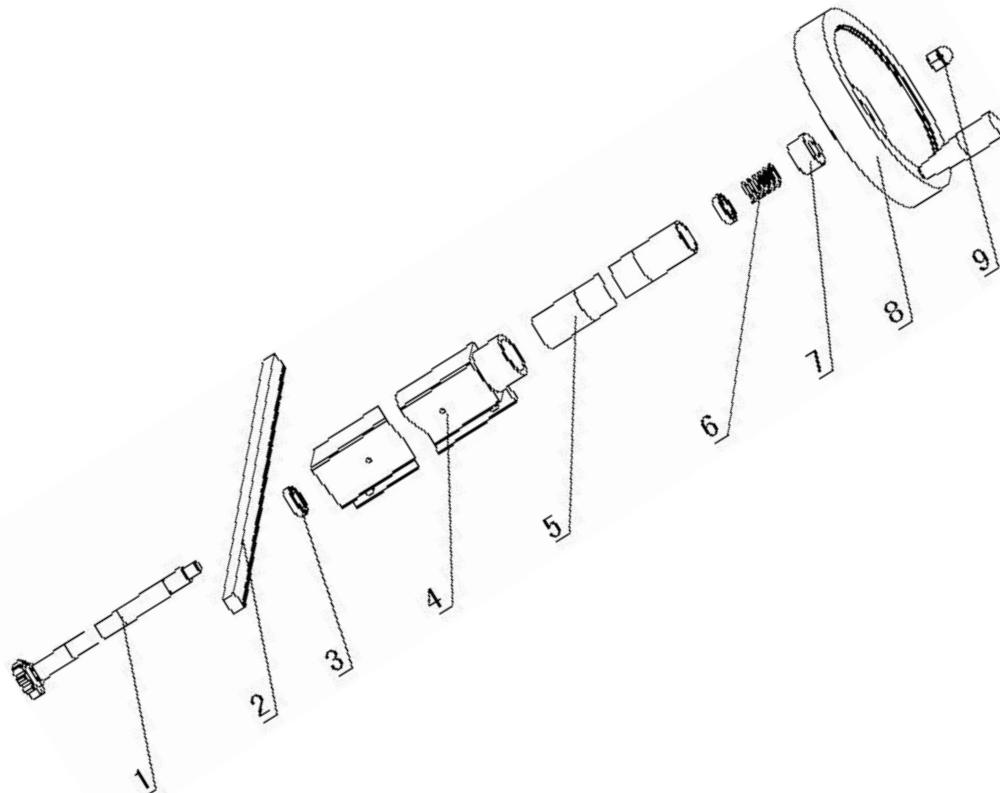


Abb.7-10:

Ersatzteileliste Manueller Längstischvorschub - Table longitudinal manual feed parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Verzahnte Welle	Gear shaft	1	FSG-4080R-23-305(for GT30/40)	03111030301
2	Zahnstange	Rack	1	FSG-3063R -30-300(for GT30)	03111030302
3	Rillenkugellager	Deep-furrow ball bearing	2	61204?ZZ(17x30x7)GB/T276-94	040612042Z
4	Wellenhalterung Längsvorschub manuell	Manual shaft bracket on longitudinal	1	FSG-4080R -23-103(for GT30/40)	03111030304
5	Angetriebene Wellenhülse	Driven shaft sleeve	1	FSG-4080R -23-311(for GT30/40)	03111030305
6	Feder	Spring	1	FSG-2050M-23-306	03111025306
7	Kupferhülse	Copper sleeve	1	FSG-2050M-23-202	031112025307
8	Handrad	Hand wheel	2	FSG-4080R -10-503(for GT30/40)	03111030308
9	Hutmutter	Acorn nut	1	M12/J13-2B	03111025309

### 7.16 GT30 - Baugruppe Quervorschub - Cross feed assembly

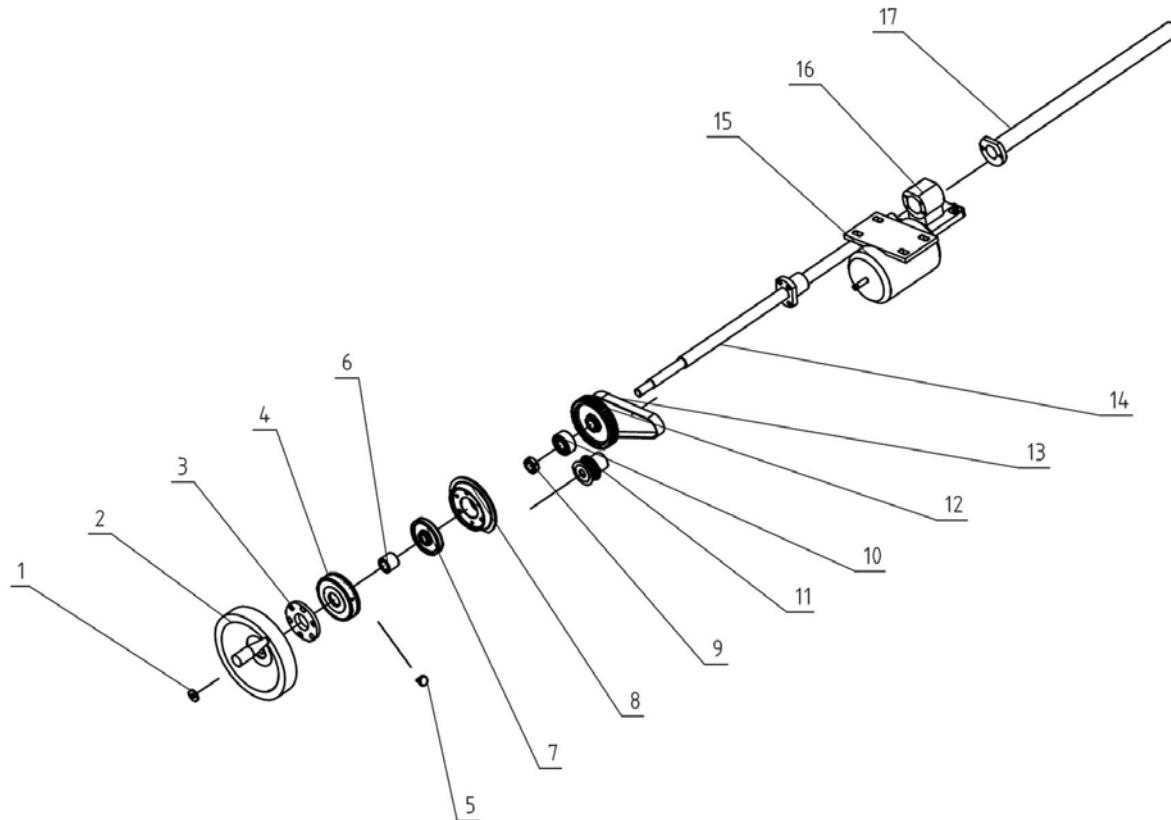


Abb. 7-11:

Ersatzteileliste Baugruppe Quervorschub - Cross feed assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Scheibe	Washer	1	FSG-4080R-23-313	03111025501
2	Handrad	Hand wheel	1	FSG-4080M-23-503(for GT30/40)	03111030502
3	Lagerdeckel	Bearing cover	1	FSG-2050M-23-302	03111025503
4	Vorschub-Wählscheibe	Feed dial	1	FSG-4080R-23-316	03111025504
5	Rändel-Stellschraube	Knurling set screw	1	M818-10-312	03111025505
6	Abstandhalter	Spacer	1	FSG-4080R-23-307	03111025506
7	Hülse	Sleeve	1	FSG-2050M-23-304	03111025507
8	Zifferblatt mit Nonius	Vernier dial plate	1	FSG-4080R-23-104	03111025508
9	Rundmutter	Round nut	1	M20x1.5/J14-4B	03111025509
10	Lager	Bearing	1	3204A (47x20x20.6)/GB/T292-94	0403204A
11	Kleine Zahnscheibe	Small timing pulley	1	FSG-2050M-23-106	03111025511
12	Große Zahnscheibe	Big time pulley	1	FSG-2050M-23-105	03111025512
13	Zahnriemen	Timing belt	1	187L075/GB11616-89	03111025513
14	Spindel Quervorschub	Cross lead screw	1	FSG-3063R-23-300 (for GT30)	03111030514
15	Motor Quervorschub	Cross feed motor	1	KT516 0.04KW	03111025M5
16	Halterung für Vorschubmutter	Feed nut bracket	1	FSG-4080R-23-101	03111025516
17	Sichere Abschirmung Spindel Quervorschub	Cross lead screw safe shield	1	FSG-4080R-23-310(for GT30/40)	03111030517

## 7.17 GT30 - Hubeinrichtung - Elevating assembly

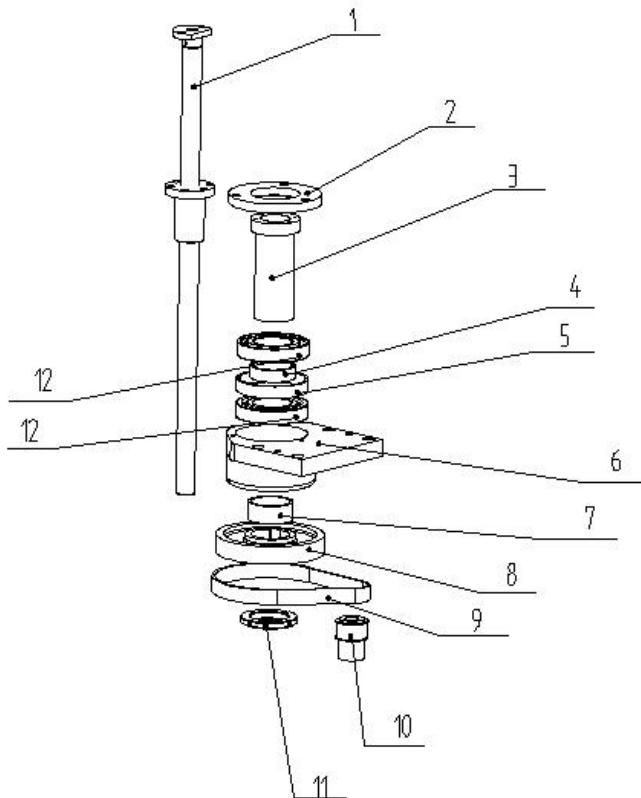
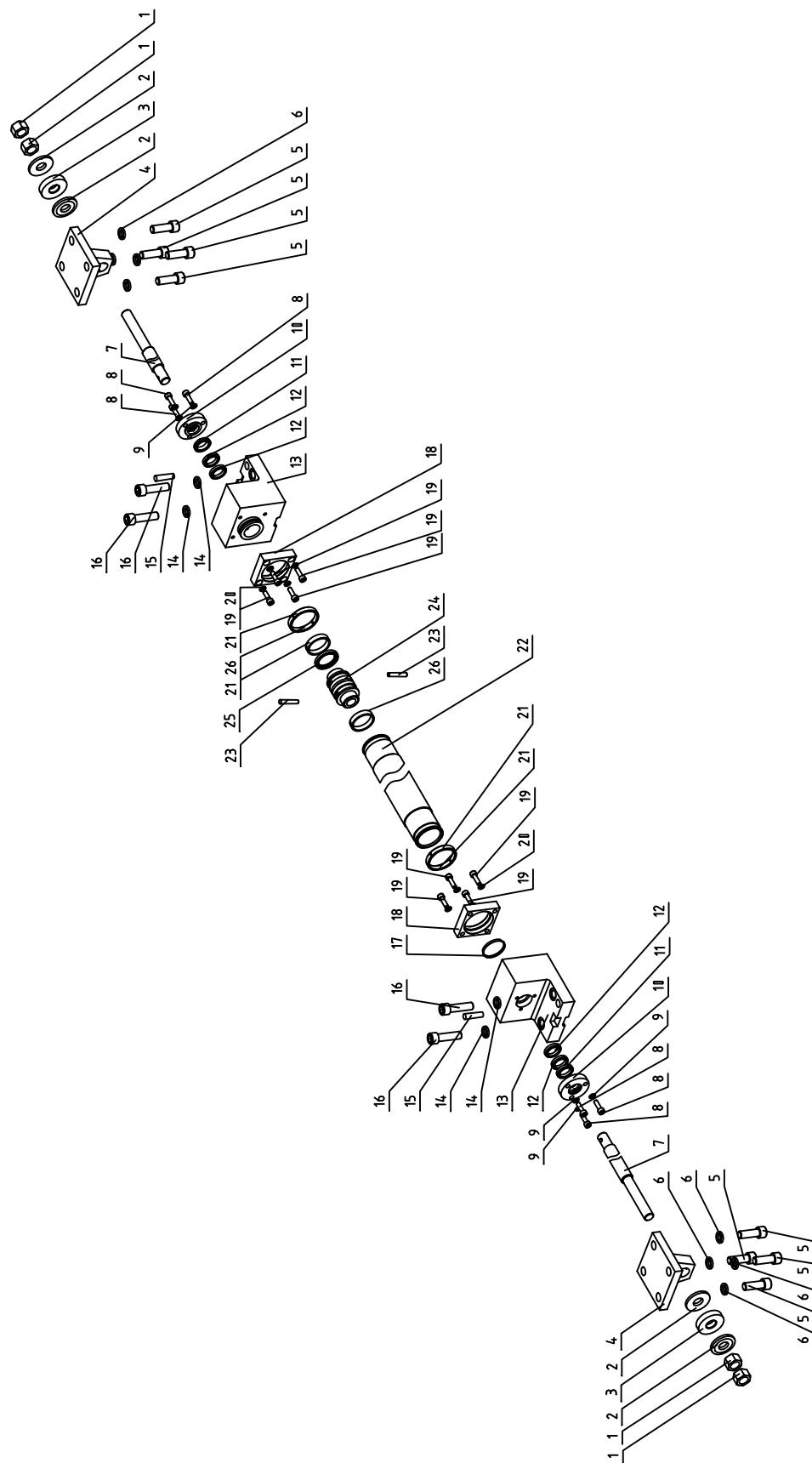


Abb.7-12:

Ersatzteileliste Hubeinrichtung - Elevating assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Hubschraube	Elevating screw	1	FSG3063NC2-10-300(for GT30)	03111030601
2	Endkappe	End cap	1	FSG4080NC2-10-301	03111025602
3	Hublager	Elevating bearing	1	FSG4080NC2-10-307	03111025603
4	Interner Federring	Internal spring ring	1	FSG4080NC2-10-302	03111025604
5	Externer Federring	External spring ring	1	FSG4080NC2-10-303	03111025605
6	Übertragungs-Verbindungsplatte	Transmission connection board	1	FSG4080NC2-10-101	03111025606
7	Hülse	Bushing	1	FSG4080NC2-10-304	03111025607
8	Zahnscheibe	Time pulley	1	FSG4080NC2-10-103	03111025608
9	Zahnriemen	Time belt	1	270L100/GB11616-89	03111025609
10	Kleine Riemenscheibe	Small pulley	1	FSG4080NC2-10-104	03111025610
11	Rundschraube Verriegelung	Locking round screw	1	M65x2/YSR	03111025611
12	Winkelkontakt-Lager	Angle contact bearing	2	760213TN1/P4 DB B/GB/T 292-94 (65x120x23)	03111025612

### 7.18 GT30 - Hydraulikzylinder - Hydraulic cylinder



Ersatzteileliste Hydraulikzylinder - Hydraulic cylinder parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Sechskantmutter	Hexagonal nut	4	M16x1.5/J11-1B	
2	Unterlegscheibe	Washer	4	SG-4080AHR-53-300	03111025702
3	Kissen	Cushion	2	SG-4080AHR-53-500	03111025703
4	Angetriebene Basis	Driven base	2	SG-4080AHR-53-301	03111025704
5	Innensechskantschraube	Socket head cap screw	8	M12x40/J21-9B	
6	Federscheibe	Spring washer	8	12/J54-1B	
7	Kolbenstange	Piston rod	2	SG2550AHR-53-301(for GT25)	03111030707
8	Innensechskantschraube	Socket head cap screw	6	M6x20/J21-9B	
9	Federscheibe	Spring washer	6	6/J54-1B	
10	Endkappe	End cap	2	SG-4080AHR-53A-301	03111025710
11	Staubdichter Ring	Dust-proof ring	2	AD48-20x28x5.3	03111025711
12	Y-förmiger Ring	Y-shaped ring	4	MA30-20x28x6.3	03111025712
13	Halterung für Hydraulikzylinder	Hydraulic cylinder bracket	2	SG-4080AHR-53A-100	03111025713
14	Federscheibe	Spring washer	4	12/J54-1B	
15	Kegelstift	Taper pin	2	8x35/41-2B	03111025715
16	Innensechskantschraube	Socket head cap screw	4	M12x40/J21-9B	
17	O-förmiger Ring	O-shaped ring	2	40/G52-2	03111025717
18	Schutzabdeckung	Guard cover	2	SG-4080AHR-53A-304	03111025718
19	Innensechskantschraube	Hexagonal socket screw	8	M6x20/J21-9B	
20	Federscheibe	Spring washer	8	6/J54-1B	03111025720
21	Ring	Ring	2	SG-4080AHR-53A-303	03111025721
22	Hydraulikzylinder	Hydraulic cylinder	1	SG3063AHR-53A-300(for GT30)	03111030722
23	Kegelstift	Taper pin	2	6x30/41-2B	03111025723
24	Kolben	Piston	1	SG-4080AHR-53A-305	03111025724
25	Hermetischer Ring	Hermetic ring	1	K30-40A	03111025725
26	Führungsring	Guide ring	2	FUR02-8.1x2.5-40-D24	03111025726

### 7.19 GT30 - Spindleinheit - Spindle unit

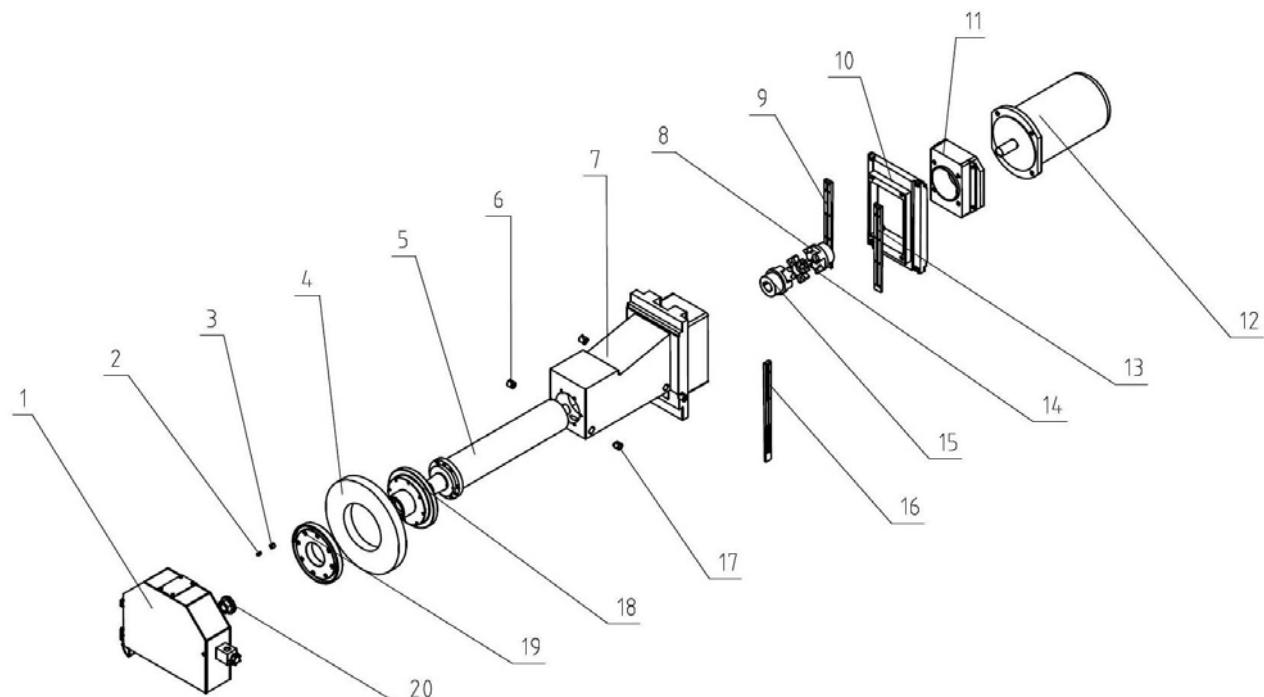
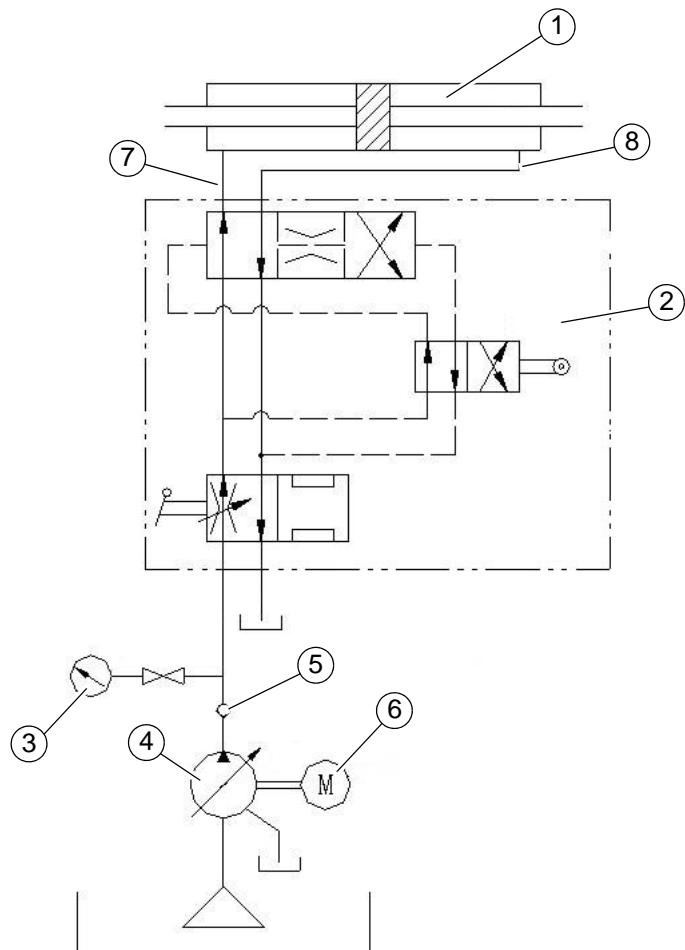


Abb. 7-14:

Ersatzteileliste Spindleinheit - Spindle unit parts list

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Schleifscheiben Schutzabschirmung	Grinding wheel shield	1		03111030801
2	Sicherungsschraube	Lock screw	3		03111030802
3	Ausgleichsgewicht	Balancing block	3		03111030803
4	Schleifscheibe	Grinding wheel	1	Corundum grinding wheel grain size 46 Korundsleifscheibe Korn 46	03111030804
5	Spindel	Spindle	1		03111030805
6	Verschluss	Plug	2		03111030806
7	Spindelgehäuse	Spindle housing	1		03111030807
8	Kupplung Motorwelle	Coupling connect to motor shaft	1		03111030808
9	Leiste	Gib			03111030809
10	Klemmplatte	Clamping plate	1		03111030810
11	Motor-Montageflansch	Motor assembling flange	1		03111030811
12	AC-Motor	AC motor	1		03111030M1
13	Leiste	Gib	1		03111030813
14	Kunststoffeinsatz	Plastic insert	1		03111030814
15	Kupplung an der Spindel	Coupling connect to the spindle	1		03111030815
16	Leiste	Gib	1		03111030816
17	Verschluss	Plug	1		03111030817
18	Radflansch	Wheel flange base	1		03111030818
19	Radflansch-Klemmscheibe	Wheel flange clamping cover	1		03111030819
20	Kontermutter	Lock nut	1		03111030820

## 7.20 GT30 - Hydraulik - Hydraulic



Ersatzteileliste Hydraulikaggregat - Hydraulic unit parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Hydraulikzylinder	Hydraulic cylinder	1	SG3063AHR-53A-300(for GT30)	03111030722
2	Richtungs- und Geschwindigkeitsventil	Direction and speed valve	1		031110301202
3	Manometer	Manometer	1		031110301203
4	Hydraulikpumpe	Hydraulic Pump	1		031110301204
5	Rückschlagventil	Check valve	1		031110301205
6	Motor	Motor	1	2.2 Kw	03111030M2
7	Hydraulikschlauchleitung	Hydraulic hose	1	18 MPa	031110301207
8	Hydraulikschlauchleitung	Hydraulic hose	1	18 Mpa	031110301208

## 7.21 GT30 - Wegmesssystem - Path measuring system

Ersatzteileliste GT30 - Wegmesssystem - Path measuring system parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Digitale Wegmessanzeige	DRO	1	DPA 31	
2	Kugelmessleiste Y-Achse	Ball scale bar Y axis	1		03111030902
3	Kugelmessleiste Z-Achse	Ball scale bar Z axis	1		03111030903
4	Anschlusskabel Kugelmessleiste Y-Achse	Connection cable ball scale bar Y axis	1		03111030904
5	Anschlusskabel Kugelmessleiste Z-Achse	Connection cable ball scale bar Z axis	1		03111030905

## 7.22 GT40 - Tischbaugruppe - Table assembly

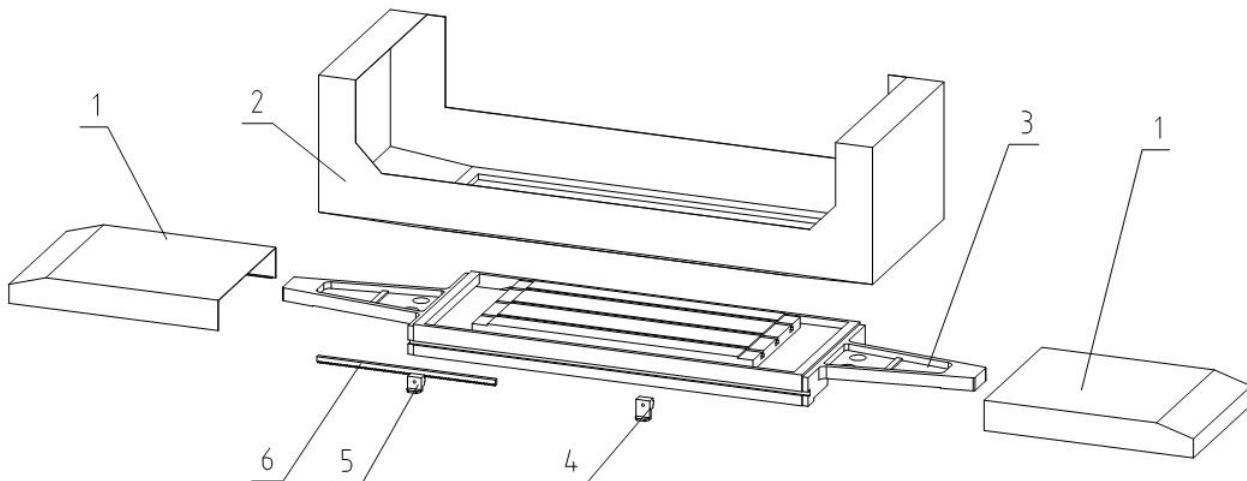


Abb.7-15:

Ersatzteileliste Tischbaugruppe - Table assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Schutzverlängerung Tisch	Table extend guard	2	FSG4080R-30-308	031112040101
2	Spritzschutz	Splashing guard	1	FSG4080R-30-301	031112040102
3	Tisch	Table	1	FSG4080R-30-100	031112040103
4	Rechter Anschlag	Right transverse adjusting dog	1	FSG2050M-30-102	031112025104
5	Linker Anschlag	Left transverse adjusting dog	1	FSG2050M-30-103	031112025105
6	Zahnstange manuelle Bewegung	Table manual feed rack	1	FSG4080R-30-300	031112040106

### 7.23 GT40 - Säulenbaugruppe - Column assembly

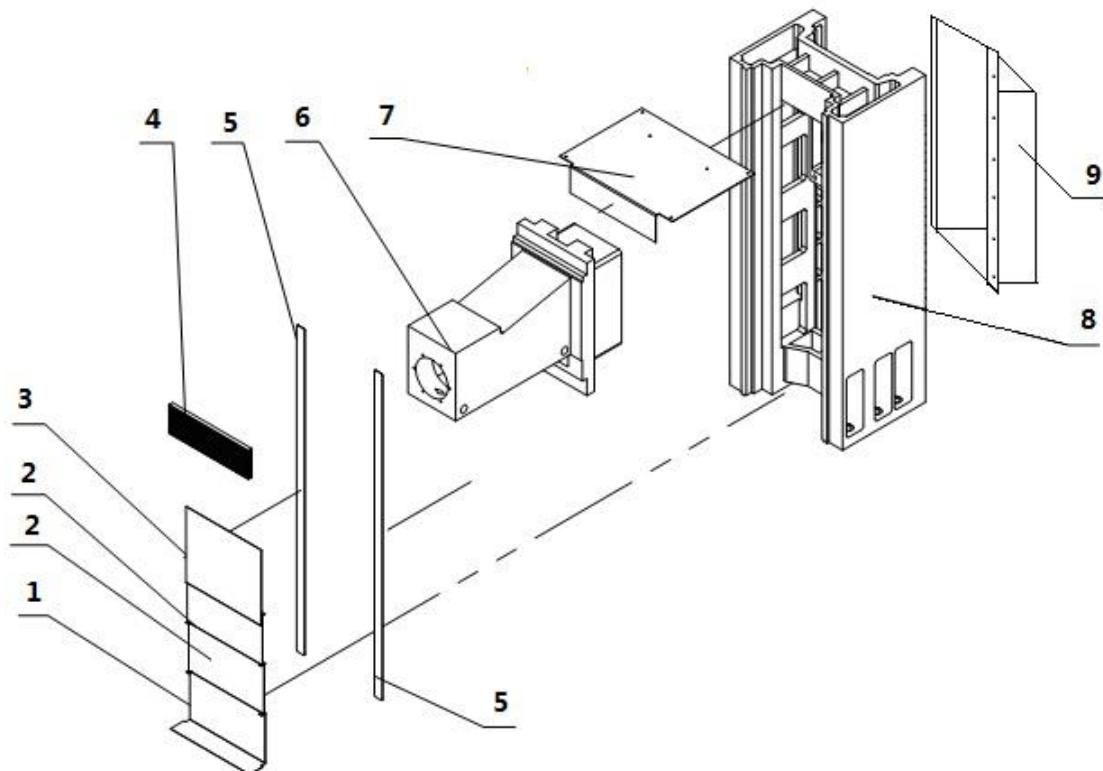


Abb. 7-16:

Ersatzteileliste Säulenbaugruppe - Column assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Feste Führung	Fixed Guard	1	FSG4080R-12-300	031112030201
2	Bewegliche Führung	Movable guard	2	FSG4080R-12-304	031112030202
3	Staubschutzabdeckung	Dust-proof plate	1	FSG4080R-12-301	031112030203
4	Plastik Faltenbalg	Bellow Plastic guard	3	FSG4080R-12-500	031112030204
5	Staubschutz Klemmstreifen	Dust-proof clamping strip	2	FSG4080R-12-303	031112030205
6	Schleifspindelgehäuse	Grinding spindle housing	1	FSG4080R-12-101	031112030206
7	Obere Abdeckplatte	Upper cover-plate	1	FSG4080R-12-305	031112030207
8	Säule	Column	1	FSG4080R-12-100	031112030208
9	Hintere Säulenschutzabdeckung	Column rear guard	1	FSG4080R-12-108	031112030209

## 7.24 GT40 - Manueller Längstischvorschub - Table longitudinal manual feed assembly

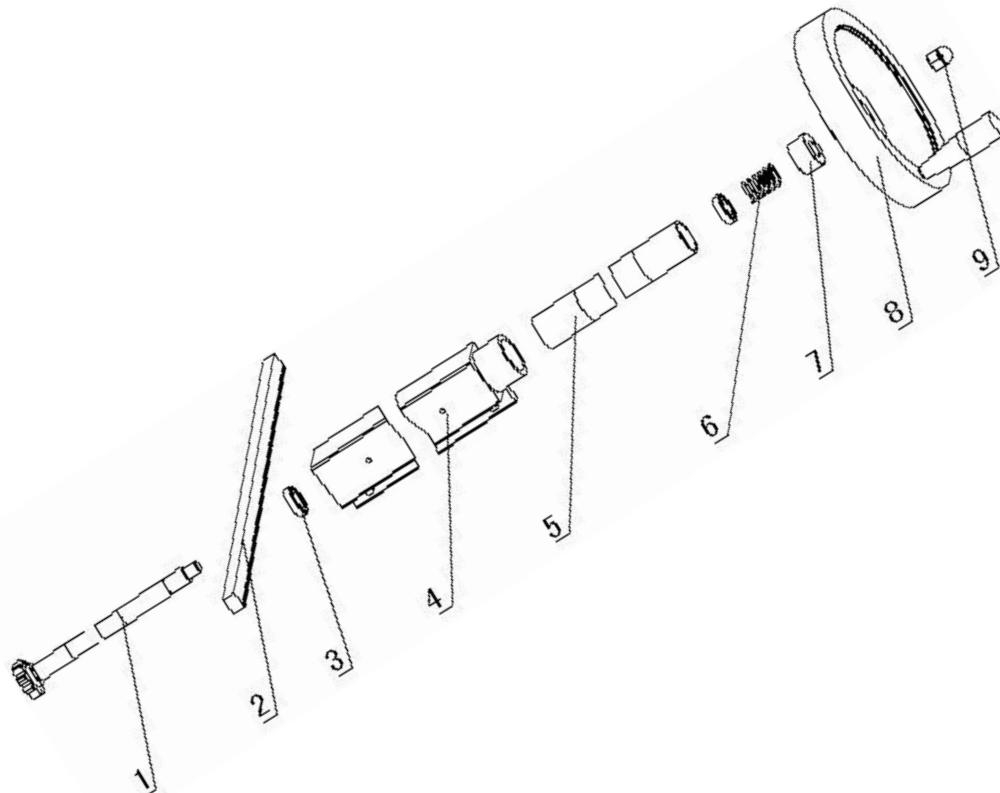


Abb.7-17:

Ersatzteileliste Manueller Längstischvorschub - Table longitudinal manual feed parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Verzahnte Welle	Gear shaft	1	FSG-4080R-23-305(for GT30/40)	031112030301
2	Zahnstange	Rack	1	FSG-3063R -30-300(for GT30)	031112030302
3	Rillenkugellager	Deep groove ball bearing	2	61204 -2Z(17x30x7)GB/T276-94	040612042Z
4	Wellenhalterung Längsvorschub manuell	Manual shaft bracket on longitudinal	1	FSG-4080R -23-103(for GT30/40)	031112030304
5	Angetriebene Wellenhülse	Driven shaft sleeve	1	FSG-4080R -23-311(for GT30/40)	031112030305
6	Feder	Spring	1	FSG-2050M-23-306	031112025306
7	Kupferhülse	Copper sleeve	1	FSG-2050M-23-202	031112025307
8	Handrad	Hand wheel	2	FSG-4080R -10-503(for GT30/40)	031112030308
9	Hutmutter	Acorn nut	1	M12/J13-2B	031112025309

## 7.25 GT40 - Baugruppe Quervorschub - Cross feed assembly

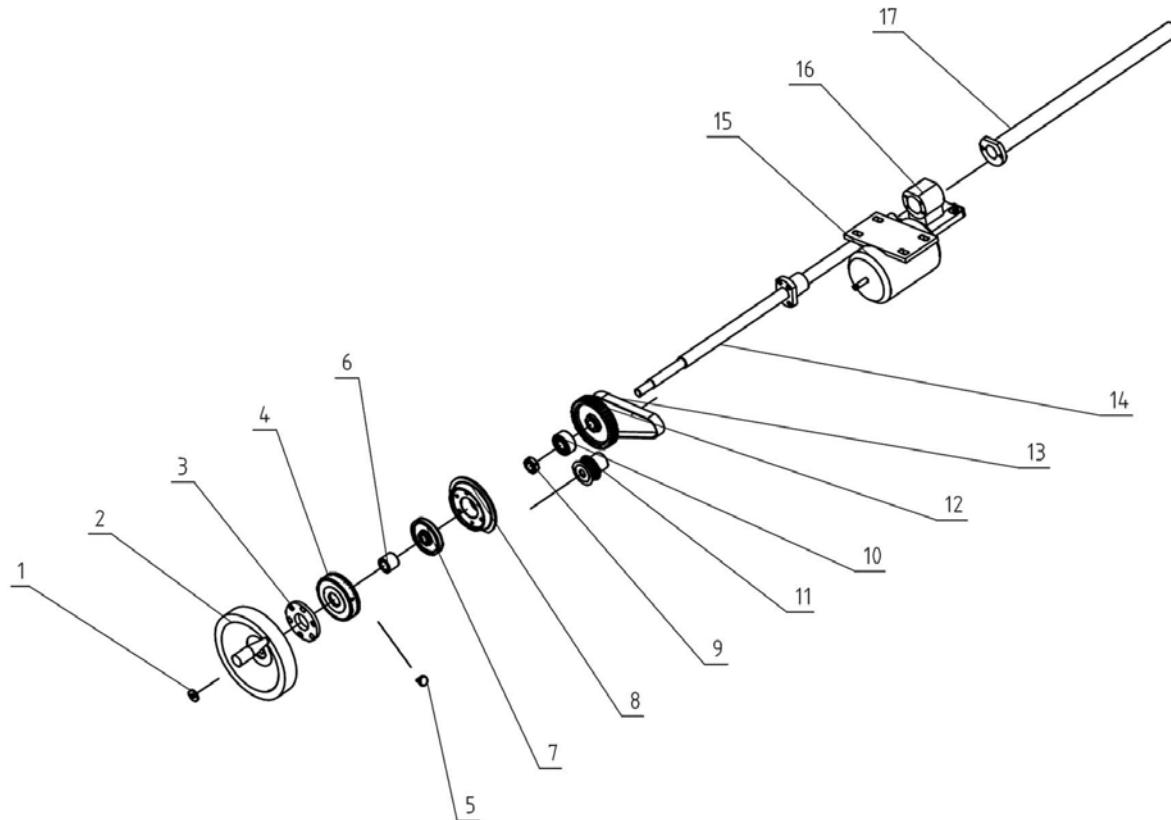


Abb. 7-18:

Ersatzteileliste Baugruppe Quervorschub - Cross feed assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Scheibe	Washer	1	FSG-4080R-23-313	031112025501
2	Handrad	Hand wheel	1	FSG-4080M-23-503(for GT30/40)	031112030502
3	Lagerdeckel	Bearing cover	1	FSG-2050M-23-302	031112025503
4	Vorschub-Wählscheibe	Feed dial	1	FSG-4080R-23-316	031112025504
5	Rändel-Stellschraube	Knurling set screw	1	M818-10-312	031112025505
6	Abstandhalter	Spacer	1	FSG-4080R-23-307	031112025506
7	Hülse	Sleeve	1	FSG-2050M-23-304	031112025507
8	Zifferblatt mit Nonius	Vernier dial plate	1	FSG-4080R-23-104	031112025508
9	Rundmutter	Round nut	1	M20x1.5/J14-4B	031112025509
10	Lager	Bearing	1	3204A (47x20x20.6)/GB/T292-94	0403204A
11	Kleine Zahnscheibe	Small timing pulley	1	FSG-2050M-23-106	031112025511
12	Große Zahnscheibe	Big time pulley	1	FSG-2050M-23-105	031112025512
13	Zahnriemen	Timing belt	1	187L075/GB11616-89	031112025513
14	Spindel Quervorschub	Cross lead screw	1	FSG-4080R-23-300	031112040514
15	Motor Quervorschub	Cross feed motor	1	KT516 0.04KW	031112025M5
16	Halterung für Vorschubmutter	Feed nut bracket	1	FSG-4080R-23-101	031112025516
17	Sichere Abschirmung Spindel Quervorschub	Cross lead screw safe shield	1	FSG-4080R-23-310(for GT30/40)	031112030517

## 7.26 GT40 - Hubeinrichtung - Elevating assembly

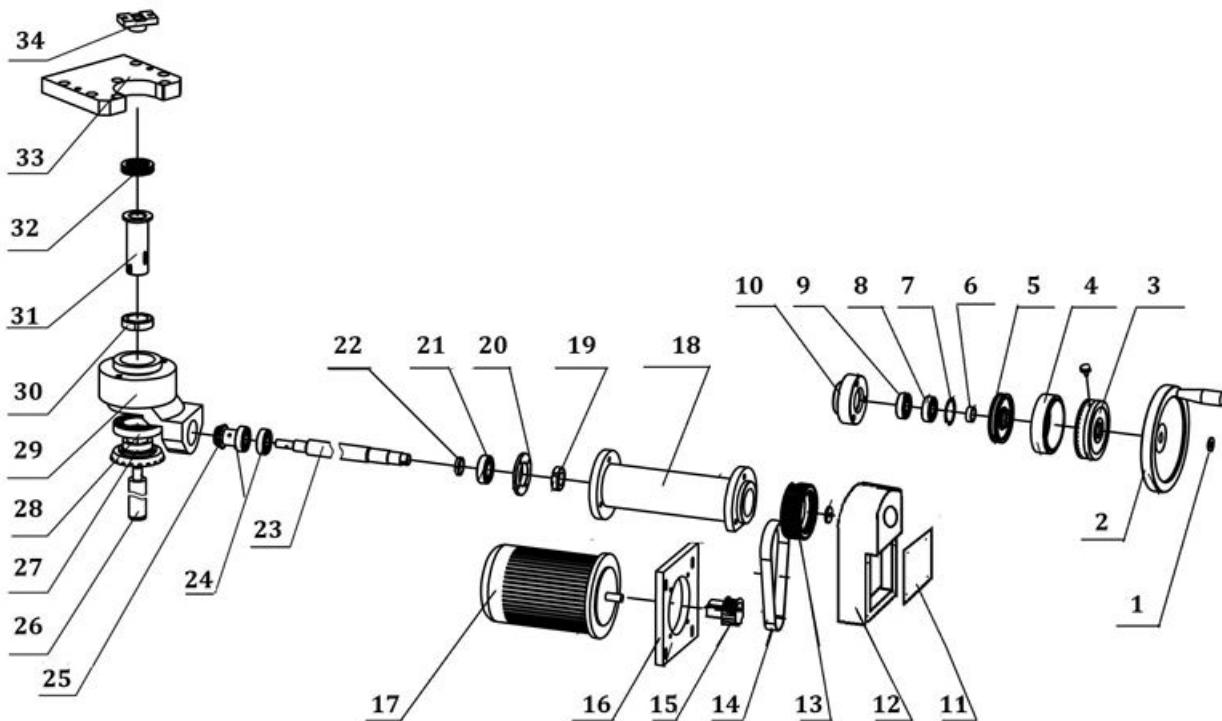


Abb. 7-19:

Ersatzteileliste Hubeinrichtung - Elevating assembly parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Unterlegscheibe	Washer	1	FSG-4080R-23-313	031112040601
2	Handrad	Hand wheel	1	17*250/HY8313.7	031112040602
3	Zifferblatt für vertikalen Vorschub	Vertical feed dial	1	FSG-3063R-10-310	031112040603
4	Skala	Vernier dial	1	FSG-3063R-10-315	031112040604
5	Zifferblatthülse	Dial sleeve	1	FSG-4080R-10-311	031112040605
6	Abstandhalter	Spacer	1	FSG-4080R-10-315	031112040606
7	Haltescheibe	Retaining washer	1	50/GB893.1	031112040607
9	Rillenkugellager	Deep groove ball bearing	2	6204-2Z(20x47x14)GB/T281-94	04062042Z
10	Lagerbasis	Bearing base	1	FSG-4080R-10-314A	0311120406010
11	Abdeckplatte	Cover plate	1		031112040611
12	Übertragungsbox	Transmission box	1	FSG-4080R-10-103	031112040612
13	Vertikale Riemscheibe (groß)	Vertical belt pulley (big)	1	FSG-3063R-10-102	031112040613
14	Zahnriemen	Timing belt	1	203L075/GB11616-89	031112040614
15	Kleine Riemscheibe	Small pulley	1	FSG-3063R-10-307	031112040615
16	Feste Platte für Hubmotor	Fixed plate for lifting motor	1	FSG-3063R-10-102	031112040616
17	Motor	Motor	1	YS71M2-6-B5	031112040617
18	Verlängerungswellenhalterung	Extension shaft bracket	1	FSG-3063R-10-101	031112040618
19	Rundmutter	Round nut	1	M25x1.5/J14-4B	031112040619
20	Lagerdeckel	Bearing cover	1	FSG-3063R-10-304	031112040620

21	Zweireihiges Pendellager (1205)	Double-row self-aligning bearing (1205)	1	1205(25x52x15)GB/T301-95	031112040621
22	Unterlegscheibe	Washer	1	FSG-3063R-10-303	031112040622
23	Vertikale Welle	Vertical shaft	1	FSG4080R-10-302A	031112040623
24	Rillenkugellager	Deep groove ball bearing	2	6204?2Z(20x47x14)GB/T281-94	031112040624
25	Kegelritzel	Bevel pinion	1	FSG-2050M-10-305	031112040625
26	Vertikale Schraube	Vertical screw	1	FSG-4080R-10-303	031112040626
27	Kegelrad	Bevel gear	1	FSG-2050M-10-306	031112040627
28	Rillenkugellager	Deep groove ball bearing	1	6204?Z(55x90x18)GB/T286-94	031112040628
29	Antriebsbasis	Drive base	1	FSG-4080R-10-105	031112040629
30	Rundmutter	Round nut	1	M40x1.5/J14-4B	031112040630
31	Vertikale Mutter	Vertical nut	1	FSG-2050M-10-200	031112040631
32	Drucklager (51108)	Thrust bearing (51108)	1	51108(40x60x13)GB/T301-95	04051108
33	Anschlussplatte	Connecting plate	1	FSG-4080R-10-104	031112040633
34	Oberer Wächter	Top guard	1	FSG-4080R-10-106	031112040634

## 7.27 GT40 - Hydraulikzylinder - Hydraulic cylinder

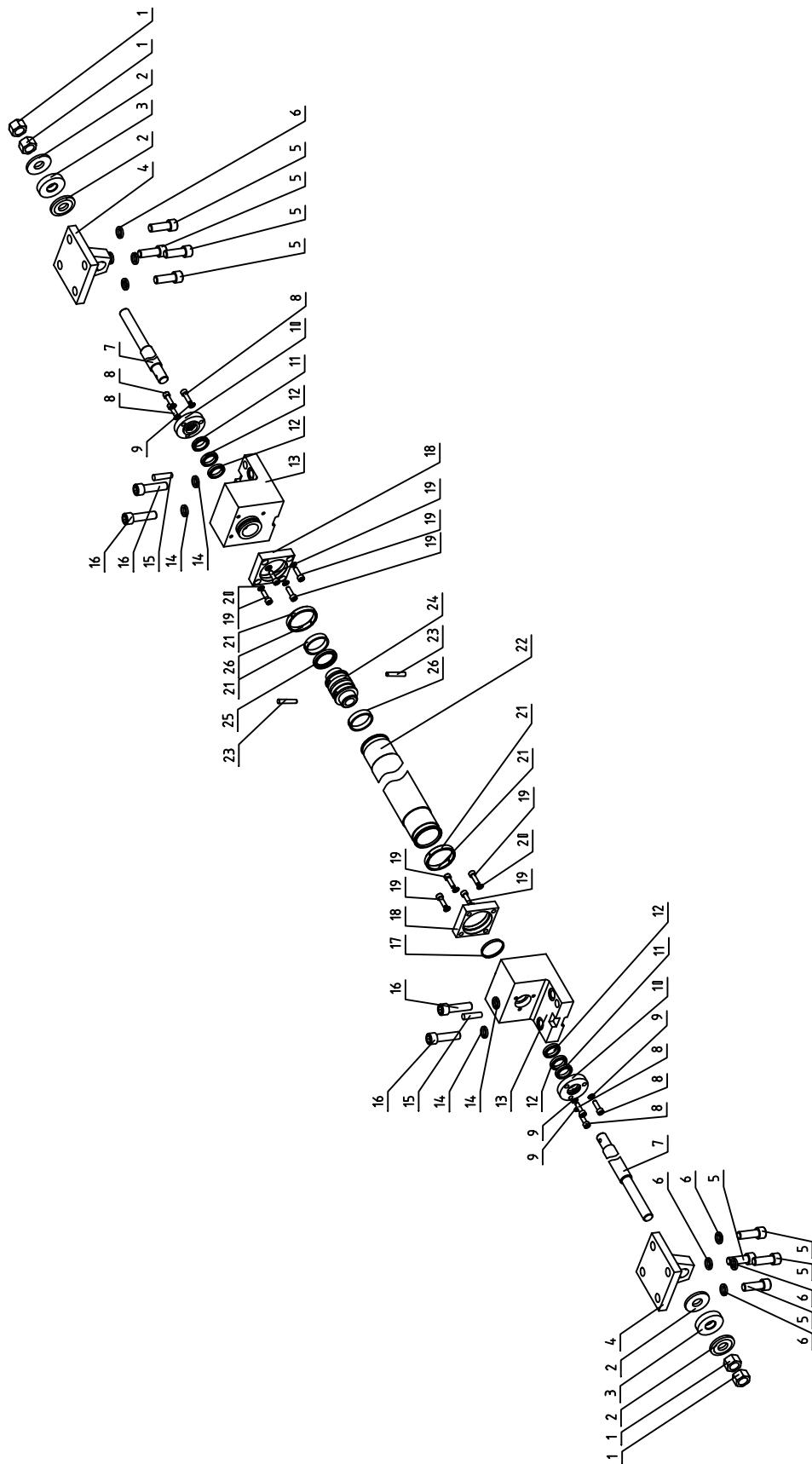


Abb. 7-20:

Ersatzteileliste Hydraulikzylinder - Hydraulic cylinder parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Sechskantmutter	Hexagonal nut	4	M16x1.5/J11-1B	
2	Unterlegscheibe	Washer	4	SG-4080AHR-53-300	031112025702
3	Kissen	Cushion	2	SG-4080AHR-53-500	031112025703
4	Angetriebene Basis	Driven base	2	SG-4080AHR-53-301	031112025704
5	Innensechskantschraube	Socket head cap screw	8	M12x40/J21-9B	
6	Federscheibe	Spring washer	8	12/J54-1B	
7	Kolbenstange	Piston rod	2	SG-4080AHR-53A-302	031112040707
8	Innensechskantschraube	Socket head cap screw	6	M6x20/J21-9B	
9	Federscheibe	Spring washer	6	6/J54-1B	
10	Endkappe	End cap	2	SG-4080AHR-53A-301	031112025710
11	Staubdichter Ring	Dust-proof ring	2	AD48-20x28x5.3	031112025711
12	Y-förmiger Ring	Y-shaped ring	4	MA30-20x28x6.3	031112025712
13	Halterung für Hydraulikzylinder	Hydraulic cylinder bracket	2	SG-4080AHR-53A-100	031112025713
14	Federscheibe	Spring washer	4	12/J54-1B	
15	Kegelstift	Taper pin	2	8x35/41-2B	031112025715
16	Innensechskantschraube	Socket head cap screw	4	M12x40/J21-9B	
17	O-förmiger Ring	O-shaped ring	2	40/G52-2	031112025717
18	Schutzabdeckung	Guard cover	2	SG-4080AHR-53A-304	031112025718
19	Innensechskantschraube	Hexagonal socket screw	8	M6x20/J21-9B	
20	Federscheibe	Spring washer	8	6/J54-1B	031112025720
21	Ring	Ring	2	SG-4080AHR-53A-303	031112025721
22	Hydraulikzylinder	Hydraulic cylinder	1	SG-4080AHR-53A-306	031112040722
23	Kegelstift	Taper pin	2	6x30/41-2B	031112025723
24	Kolben	Piston	1	SG-4080AHR-53A-305	031112025724
25	Hermetischer Ring	Hermetic ring	1	K30-40A	031112025725
26	Führungsring	Guide ring	2	FUR02-8.1x2.5-40-D24	031112025726

## 7.28 GT40 - Spindleinheit - Spindle unit

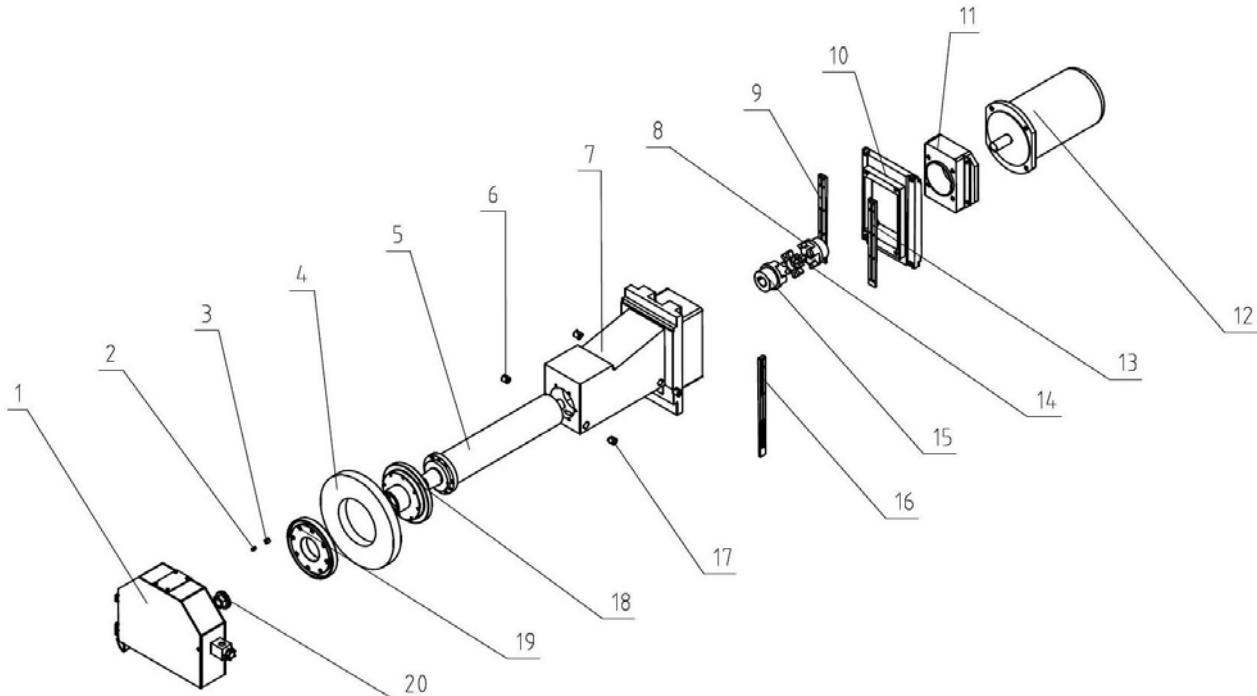
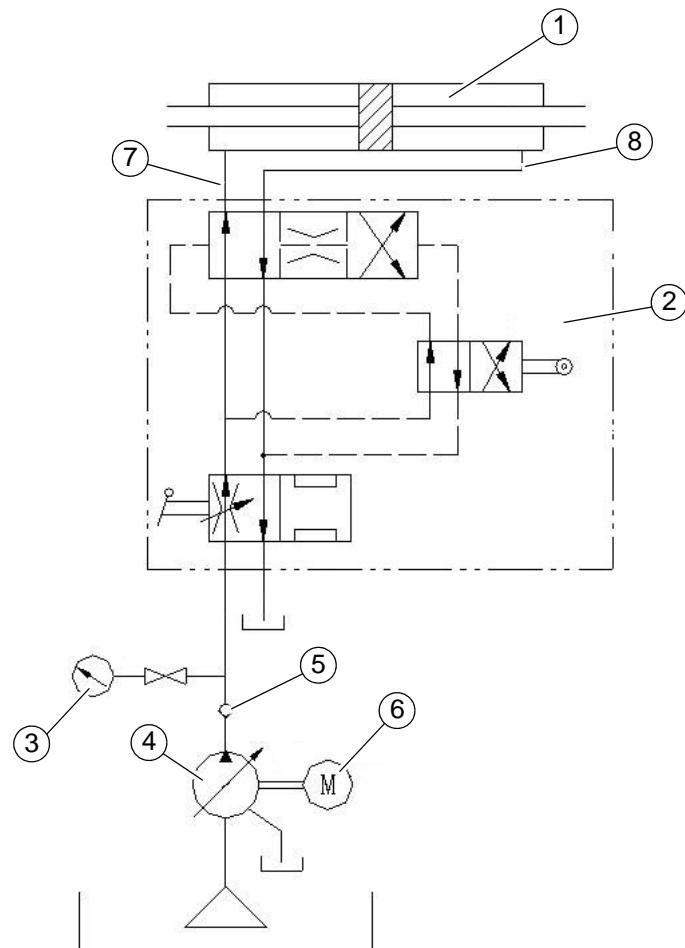


Abb. 7-21:

Ersatzteileliste Spindleinheit - Spindle unit parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Schleifscheiben-Schutzabschirmung	Grinding wheel shield	1		031112030801
2	Sicherungsschraube	Lock screw	3		031112030802
3	Ausgleichsgewicht	Balancing block	3		031112030803
4	Schleifscheibe	Grinding wheel	1	Corundum grinding wheel grain size 46 Korundschleifscheibe Korn 46	031112030804
5	Spindel	Spindle	1		031112030805
6	Verschluss	Plug	2		031112030806
7	Spindelgehäuse	Spindle housing	1		031112030807
8	Kupplung Motorwelle	Coupling connect to motor shaft	1		031112030808
9	Leiste	Gib			031112030809
10	Klemmplatte	Clamping plate	1		031112030810
11	Motor-Montageflansch	Motor assembling flange	1		031112030811
12	AC-Motor	AC motor	1		031112030M1
13	Leiste	Gib	1		031112030813
14	Kunststoffeinsatz	Plastic insert	1		031112030814
15	Kupplung an der Spindel	Coupling connect to the spindle	1		031112030815
16	Leiste	Gib	1		031112030816
17	Verschluss	Plug	1		031112030817
18	Radflansch	Wheel flange base	1		031112030818
19	Radflansch-Klemmscheibe	Wheel flange clamping cover	1		031112030819
20	Kontermutter	Lock nut	1		031112030820

## 7.29 GT40 - Hydraulik - Hydraulic



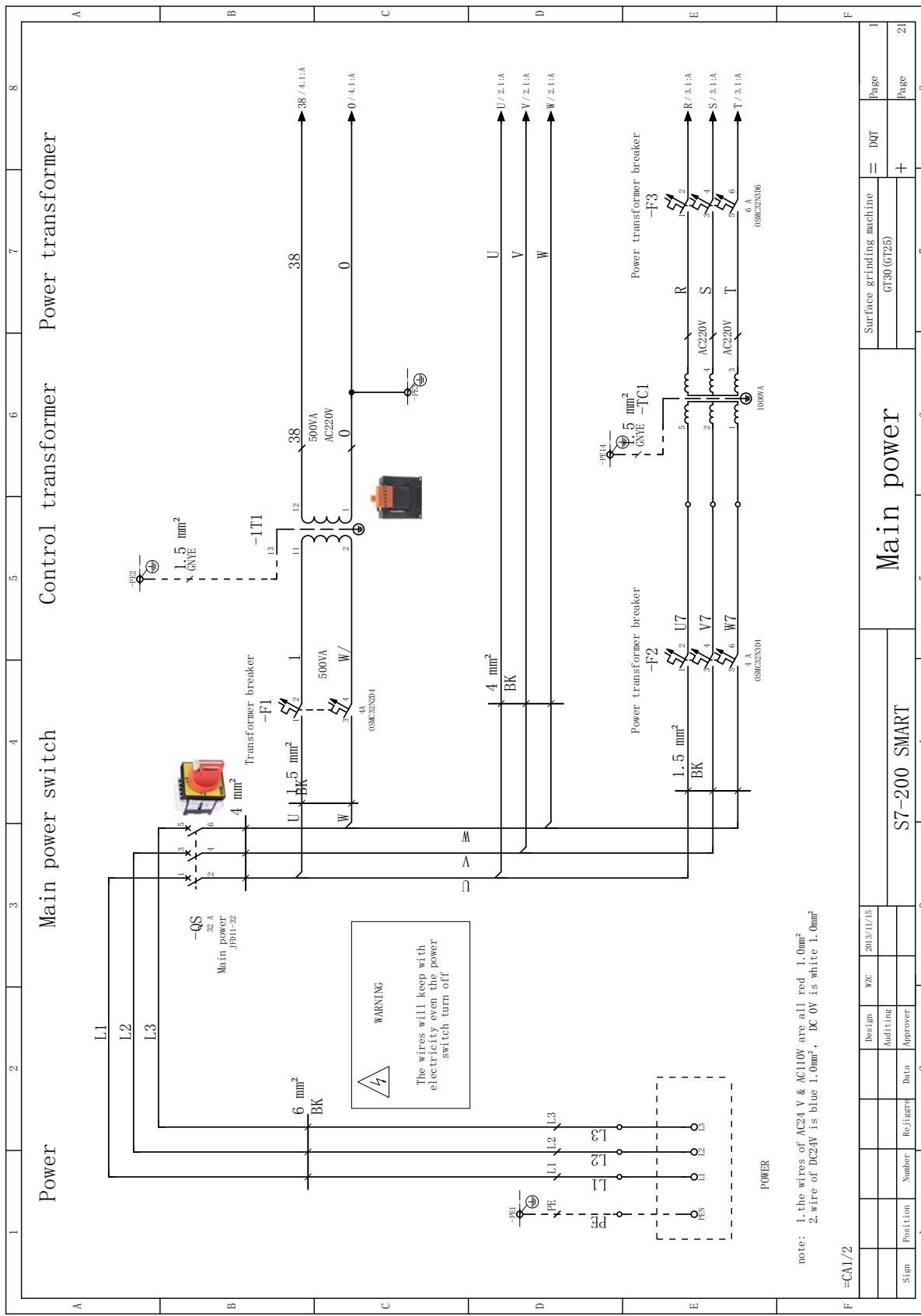
Ersatzteileliste Hydraulikaggregat - Hydraulic unit parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Hydraulikzylinder	Hydraulik cylinder	1	SG-4080AHR-53A-306	031112040722
2	Richtungs- und Geschwindigkeitsventil	Direction and speed valve	1		0311120301202
3	Manometer	Manometer	1		0311120301203
4	Hydraulikpumpe	Hydraulic Pump	1		0311120301204
5	Rückschlagventil	Check valve	1		0311120301205
6	Motor	Motor	1	2.2 Kw	031112030M2
7	Hydraulikschlauchleitung	Hydraulic hose	1	18 MPa	0311120301207
8	Hydraulikschlauchleitung	Hydraulic hose	1	18 Mpa	0311120301208

## 7.30 GT40 - Wegmesssystem - Path measuring system

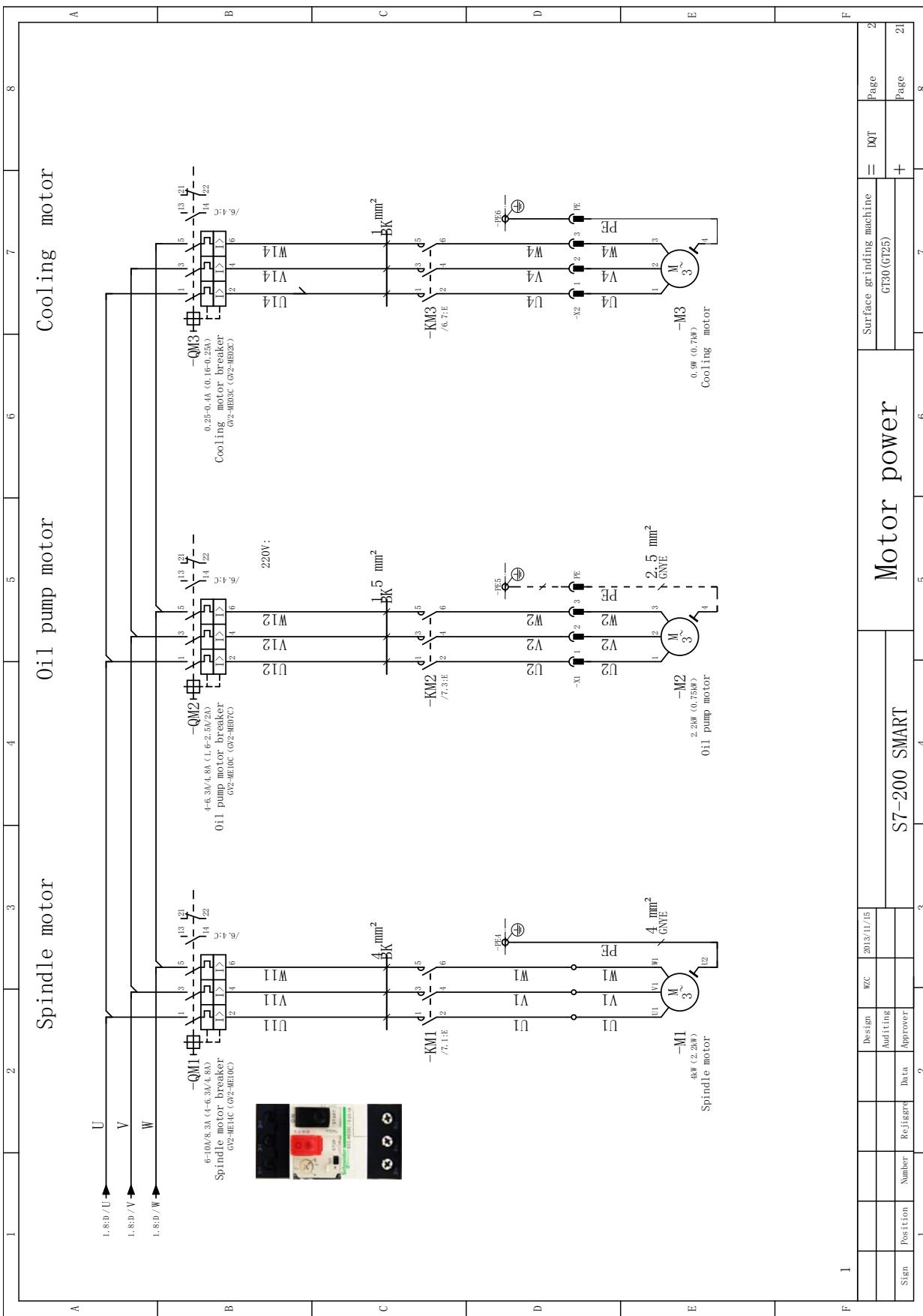
Ersatzteileliste GT30 - Wegmesssystem - Path measuring system parts list					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Part no.
1	Digitale Wegmessanzeige	DRO	1	DPA 31	
2	Kugelmessleiste Y-Achse	Ball scale bar Y axis	1		031112040902
3	Kugelmessleiste Z-Achse	Ball scale bar Z axis	1		031112040903
4	Anschlusskabel Kugelmessleiste Y-Achse	Connection cable ball scale bar Y axis	1		031112040904
5	Anschlusskabel Kugelmessleiste Z-Achse	Connection cable ball scale bar Z axis	1		031112040905

## 7.31 GT25 | GT30 - Schaltplan - Wiring diagram

### 7.31.1 Hauptversorgung - Main power



## 7.31.2 Motoranschluss - Motor power



Sign			Position			Number			Rating			Design			WEC			Audit/ING			Data			Approval			S7-200 SMART			Motor power			Surface grinding machine			= DQT			Page		
1																																									

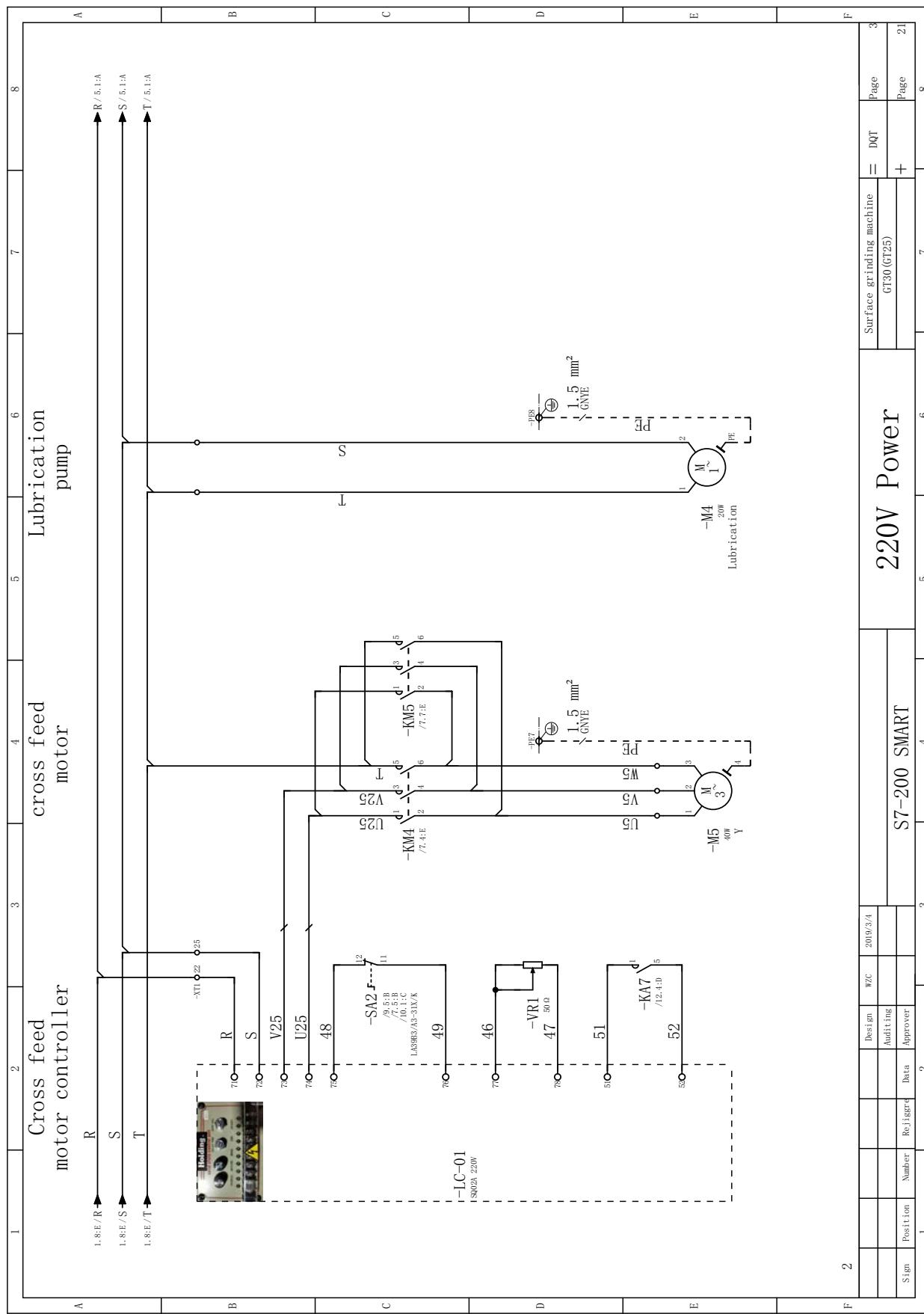
F	1																																			
F																																				

GT25/GT30

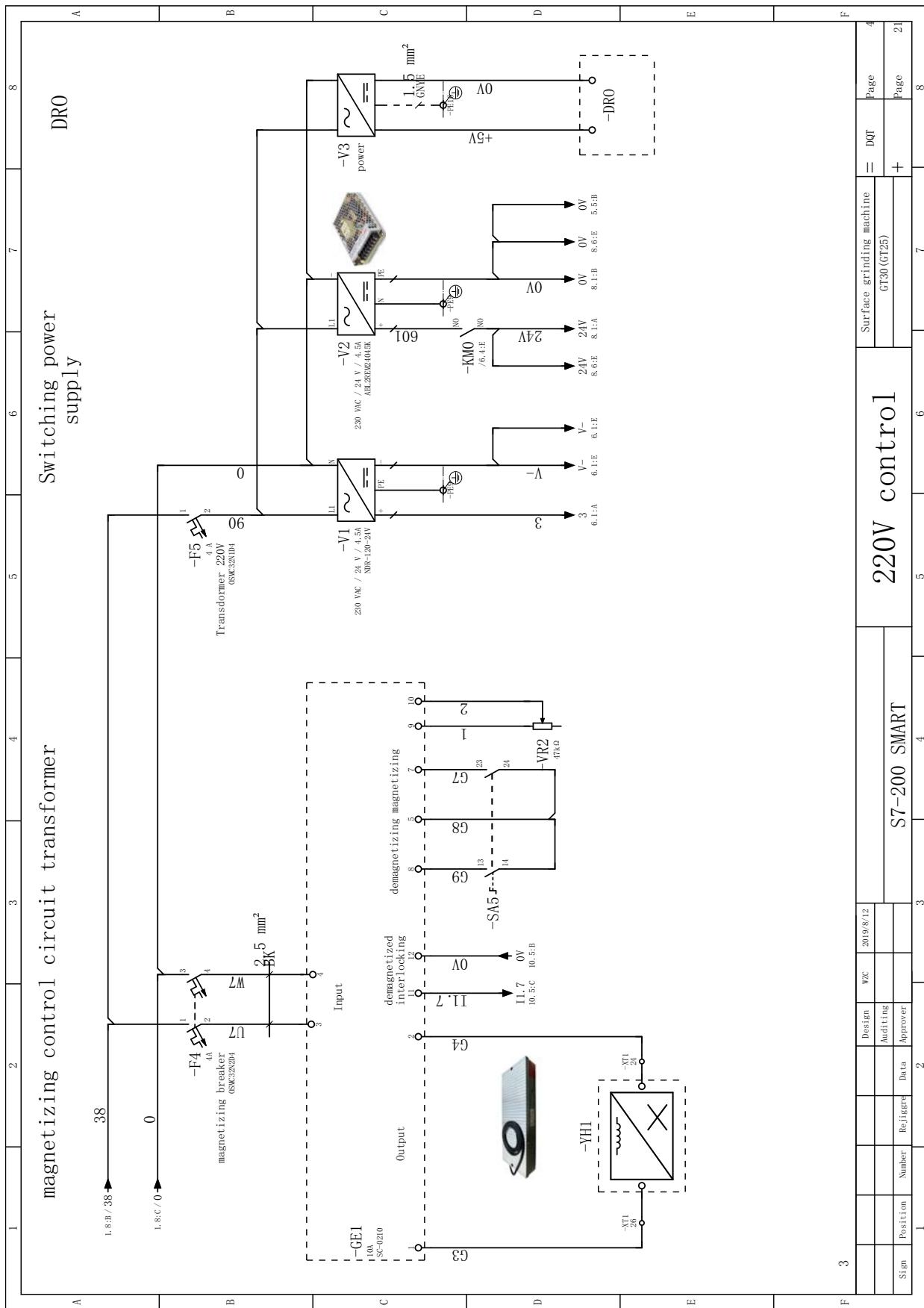
+ Page 21

8

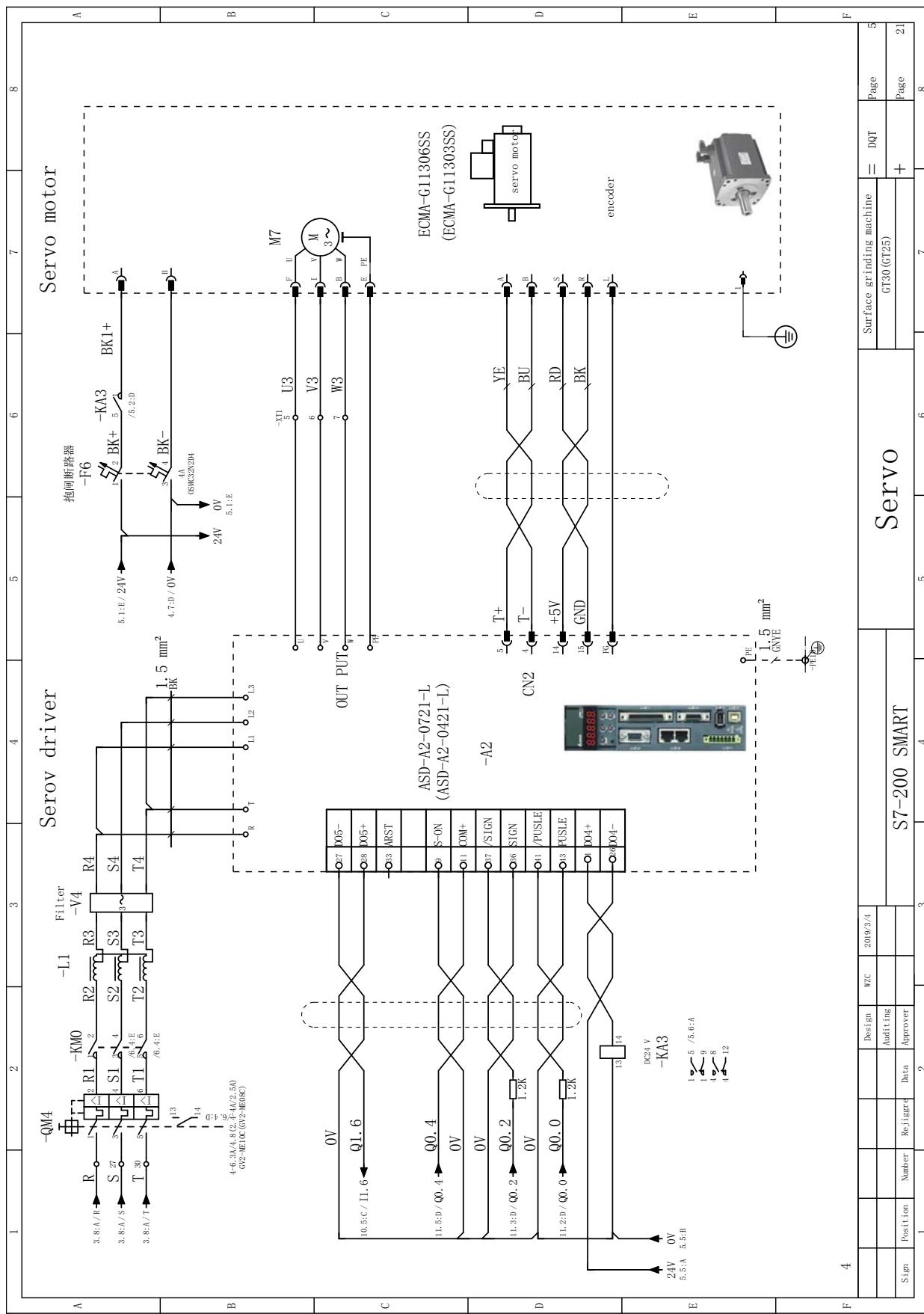
### 7.31.3 220V Leistungsanschluss - 220V power



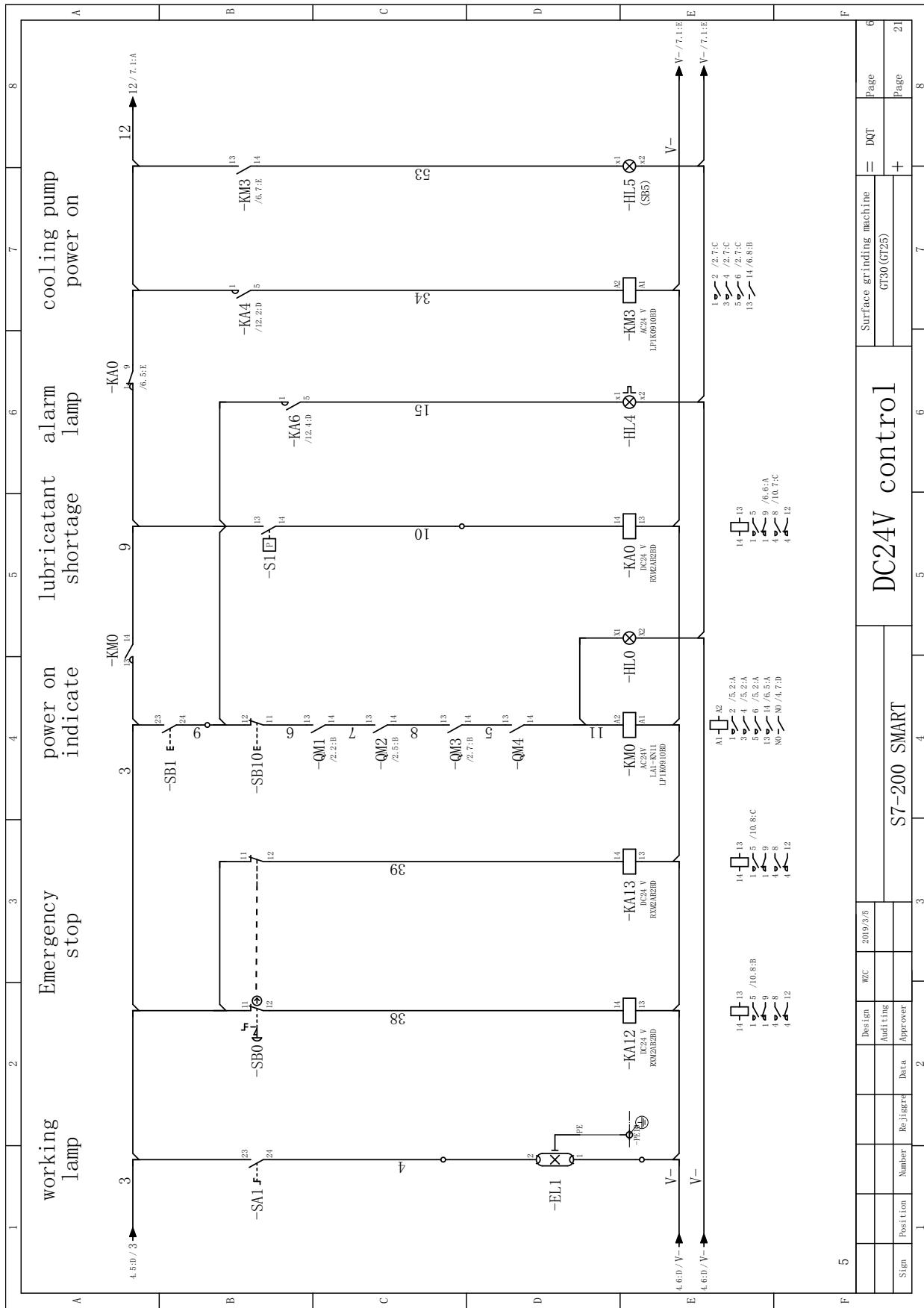
#### **7.31.4 220V Steuerung - 220V control**



### 7.31.5 Servoantrieb - Servo drive

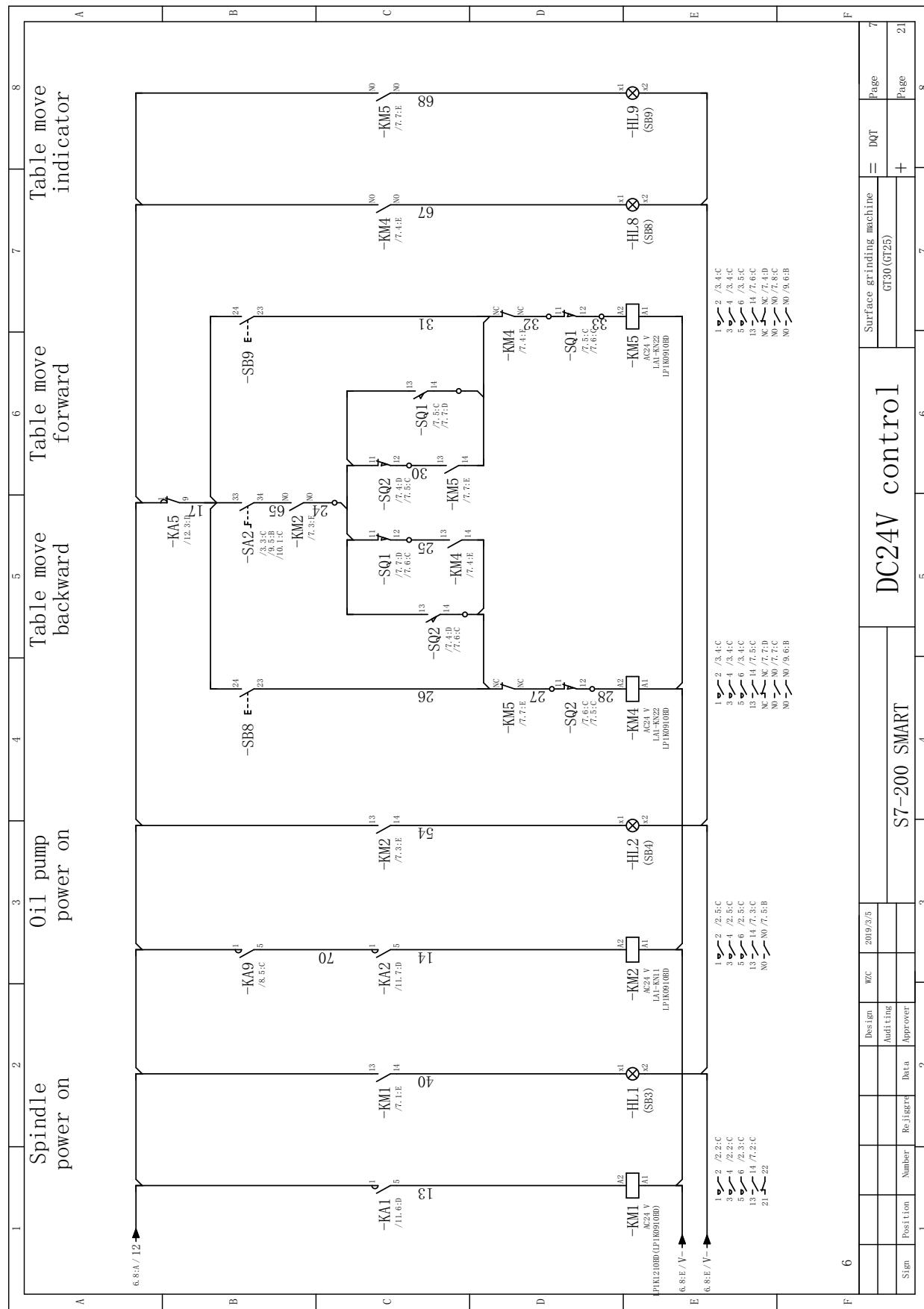


## 7.31.6 24V DC Steuerung - DC 24V control - 1-2

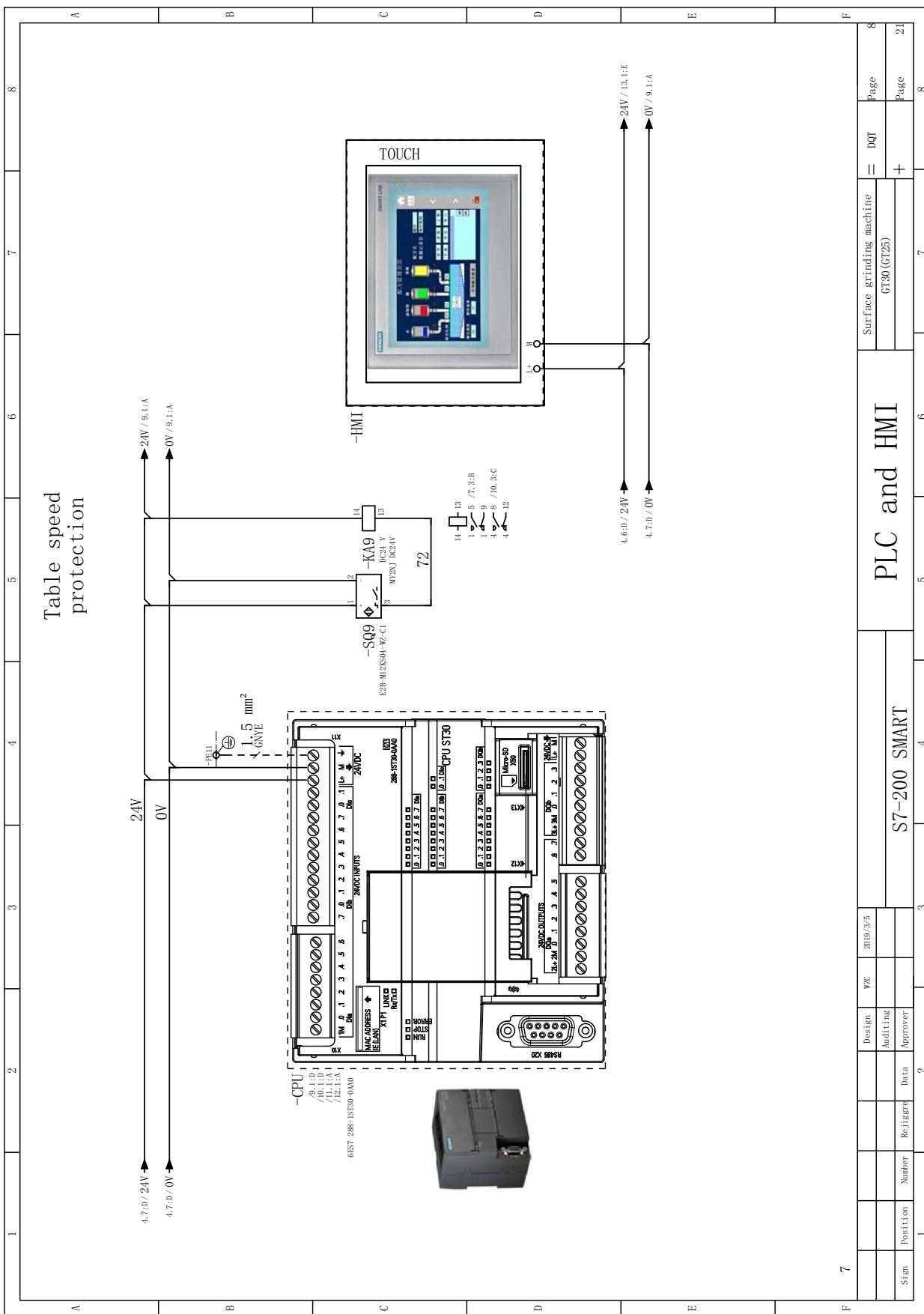


Sign		Position		Number		Reg. no.		Audit no.		Design		W/C		2019/3/5		DC24V control		Surface grinding machine		DQT		Page		
																GT30(GT25)				+		Page		
1				2		3		4		5		6		7		8		9		10		11		12

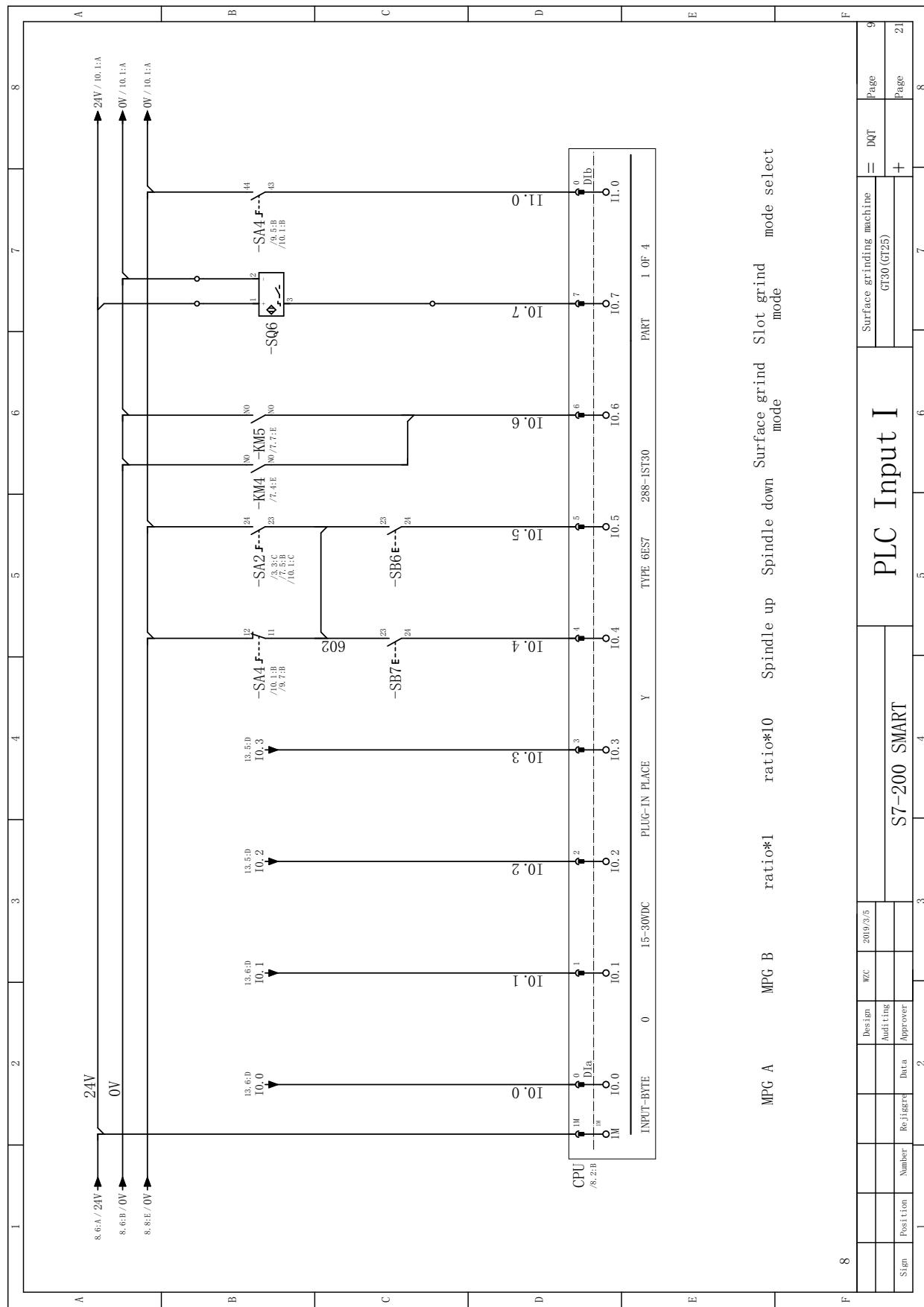
### **7.31.7 24V DC Steuerung - DC 24V control - 2-2**



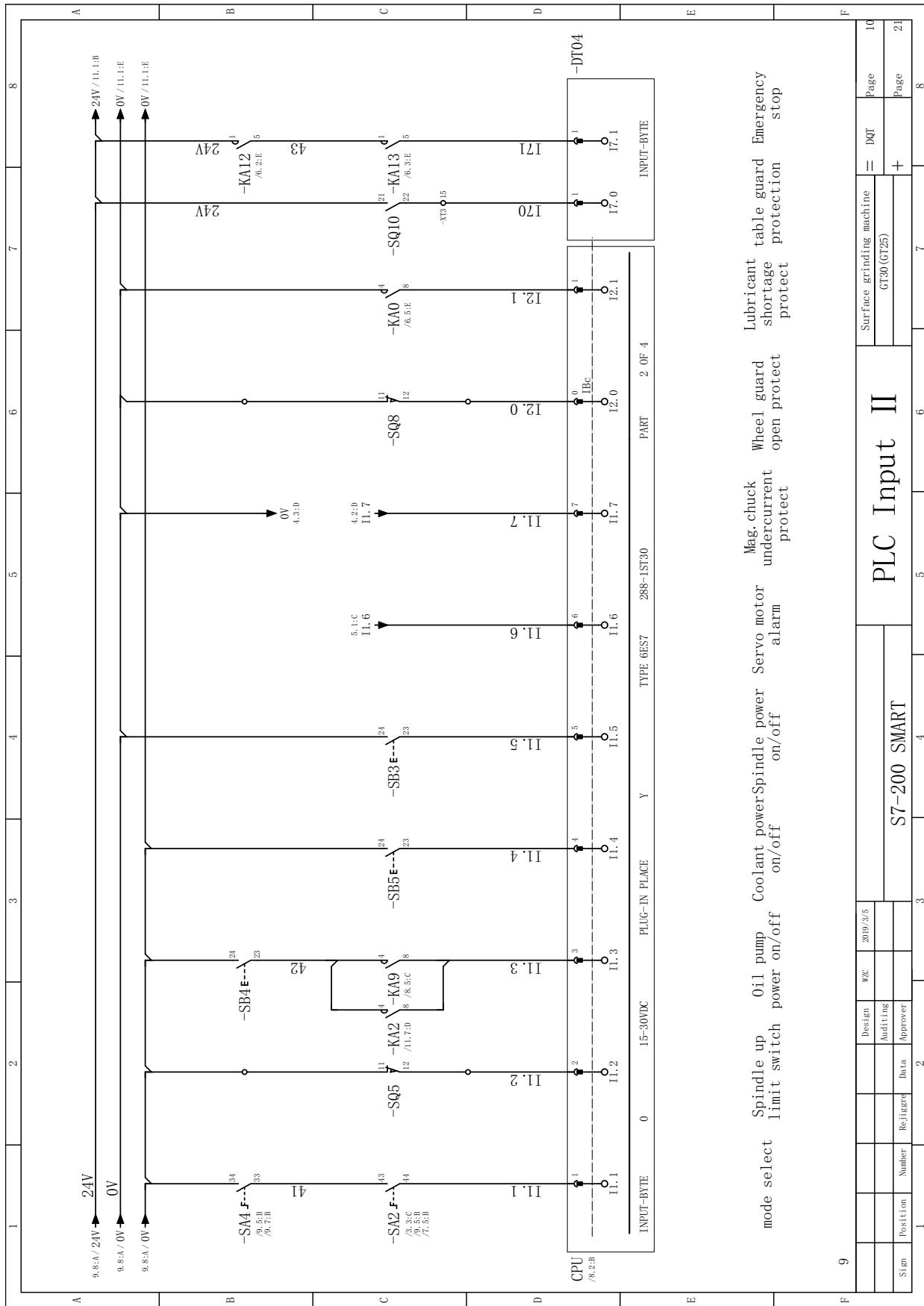
## 7.31.8 PLC and HMI



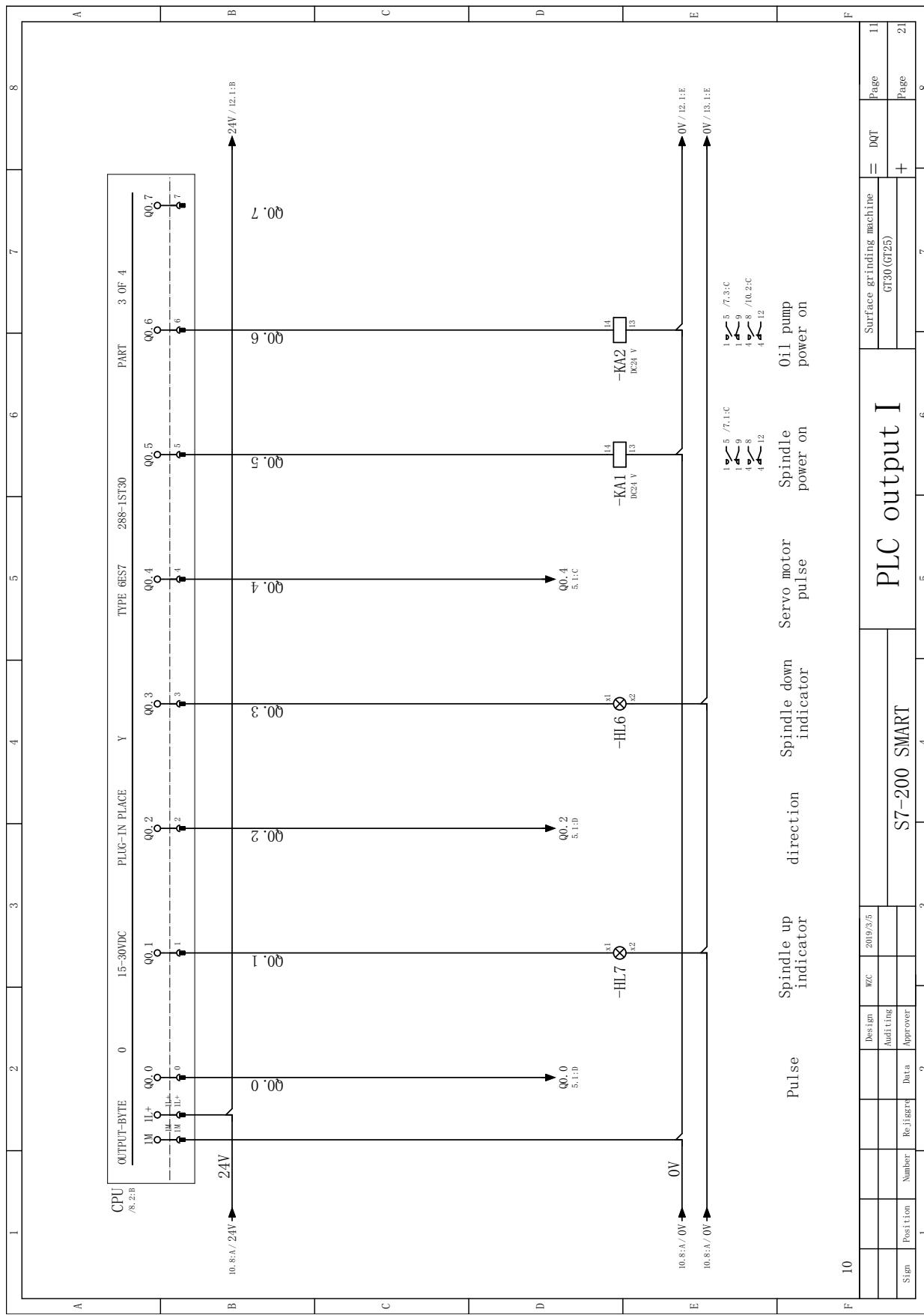
## 7.31.9 PLC Eingang - PLC input - 1-2



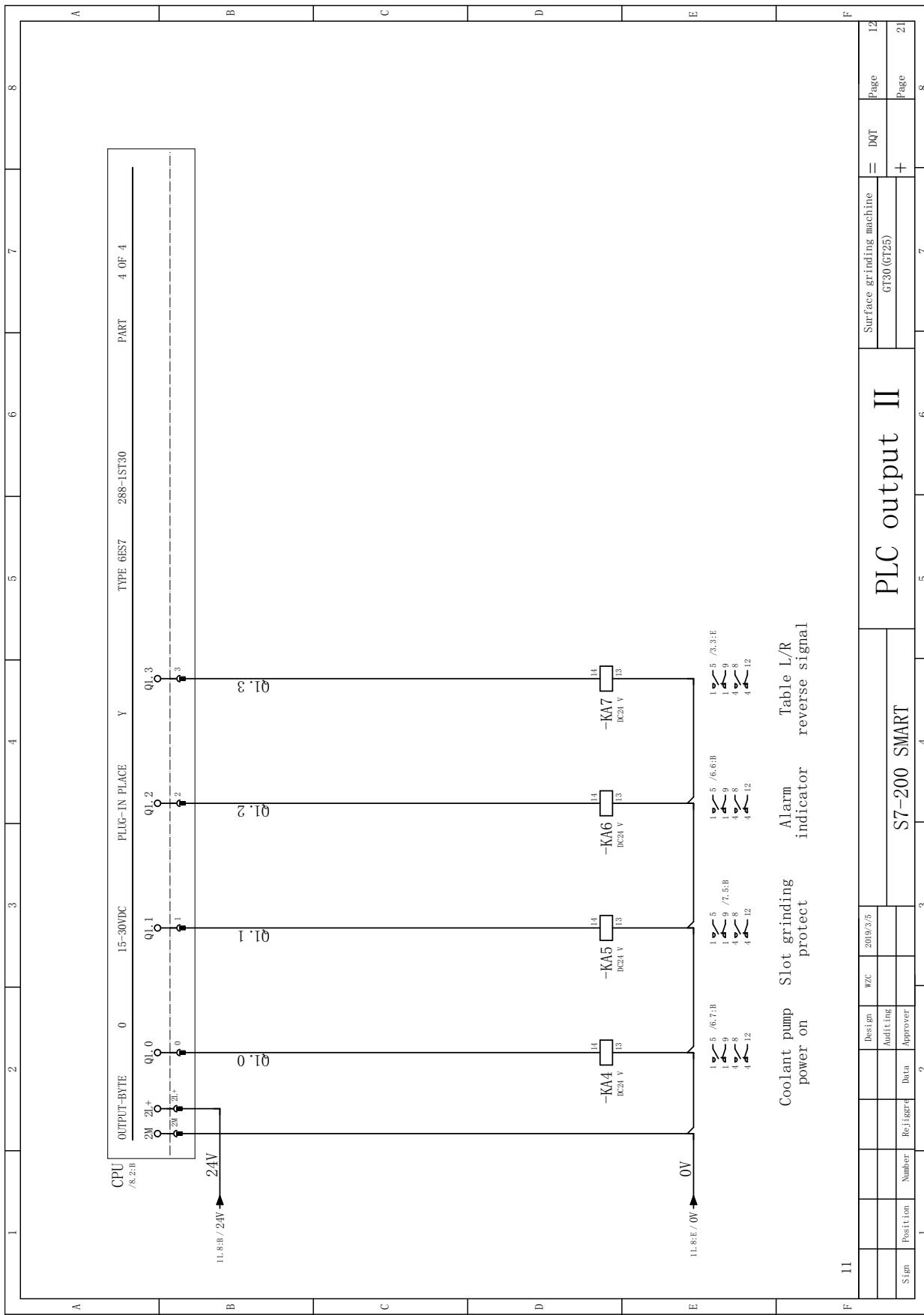
## 7.31.10 PLC Eingang - PLC input - 2-2



### 7.31.11 PLC Ausgang - PLC output - 1-2



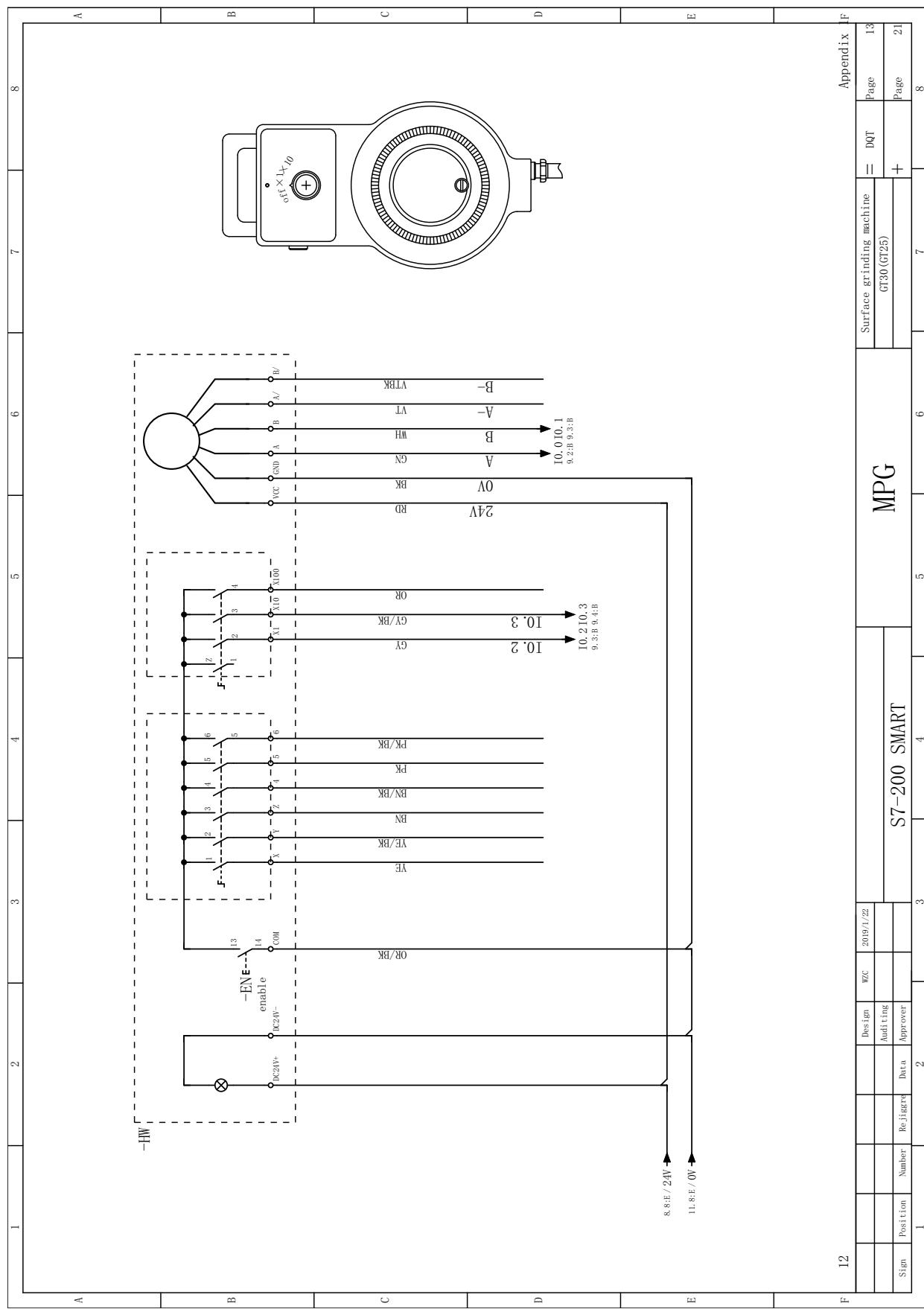
## 7.31.12 PLC Ausgang - PLC output - 2-2



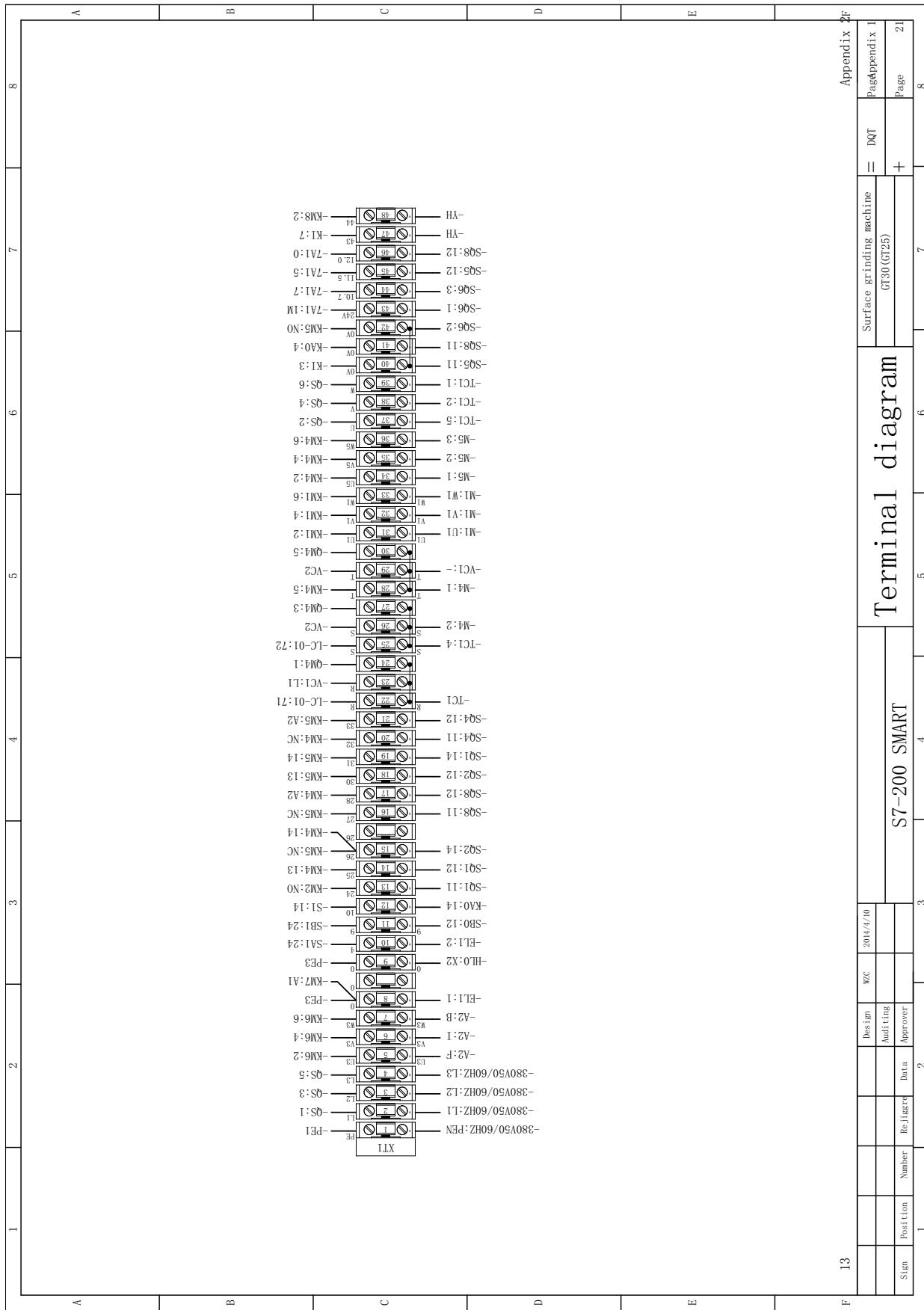
Sign		Position		Number		Design		WZC		2019/3/5		Surface grinding machine		= DGT		Page	
1		1		2		3		4		5		6		7		8	

GT30(GT25)	+	Page
		8

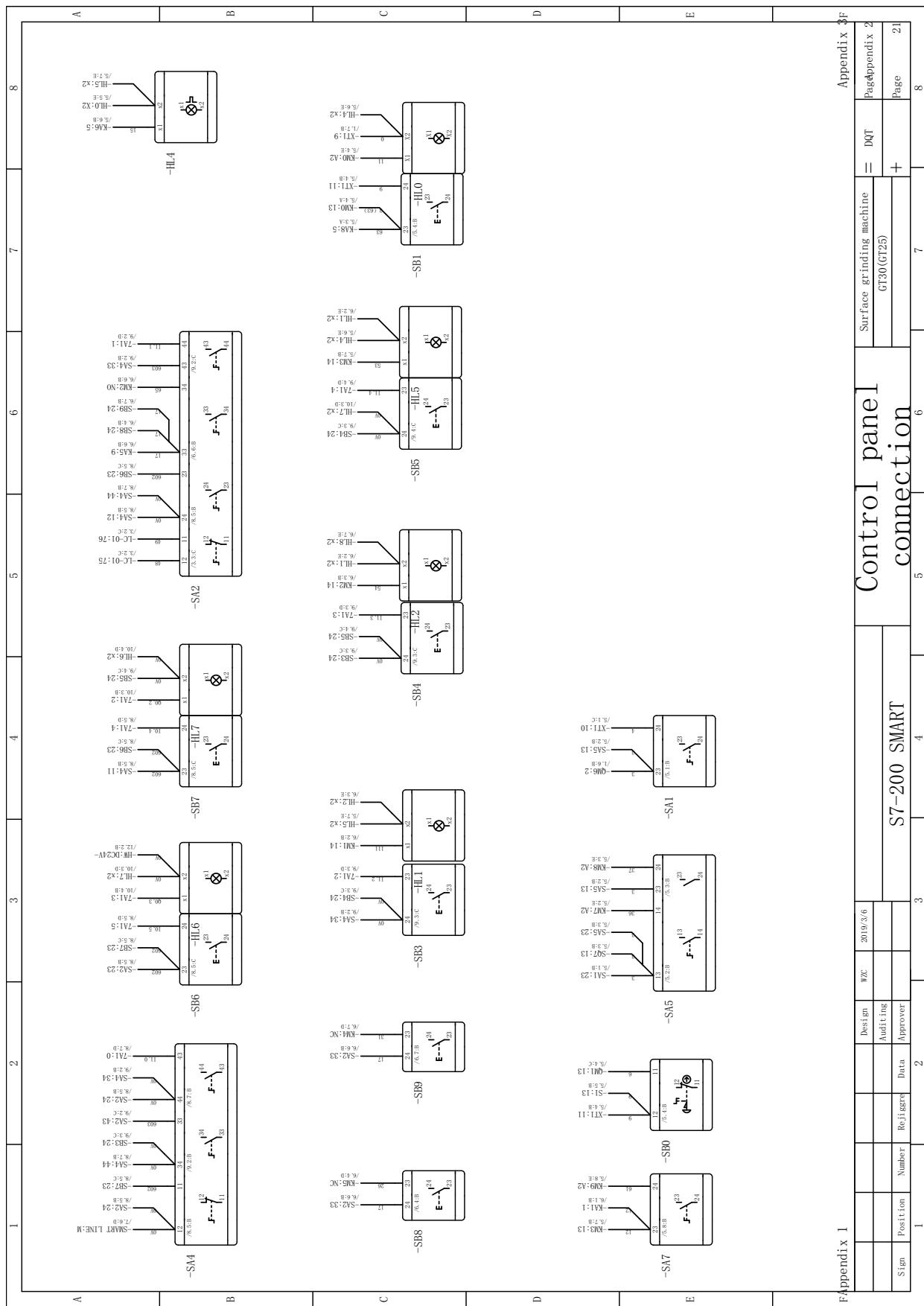
### 7.31.13 Anhang elektronisches Handrad - Appendix machine pulse generator



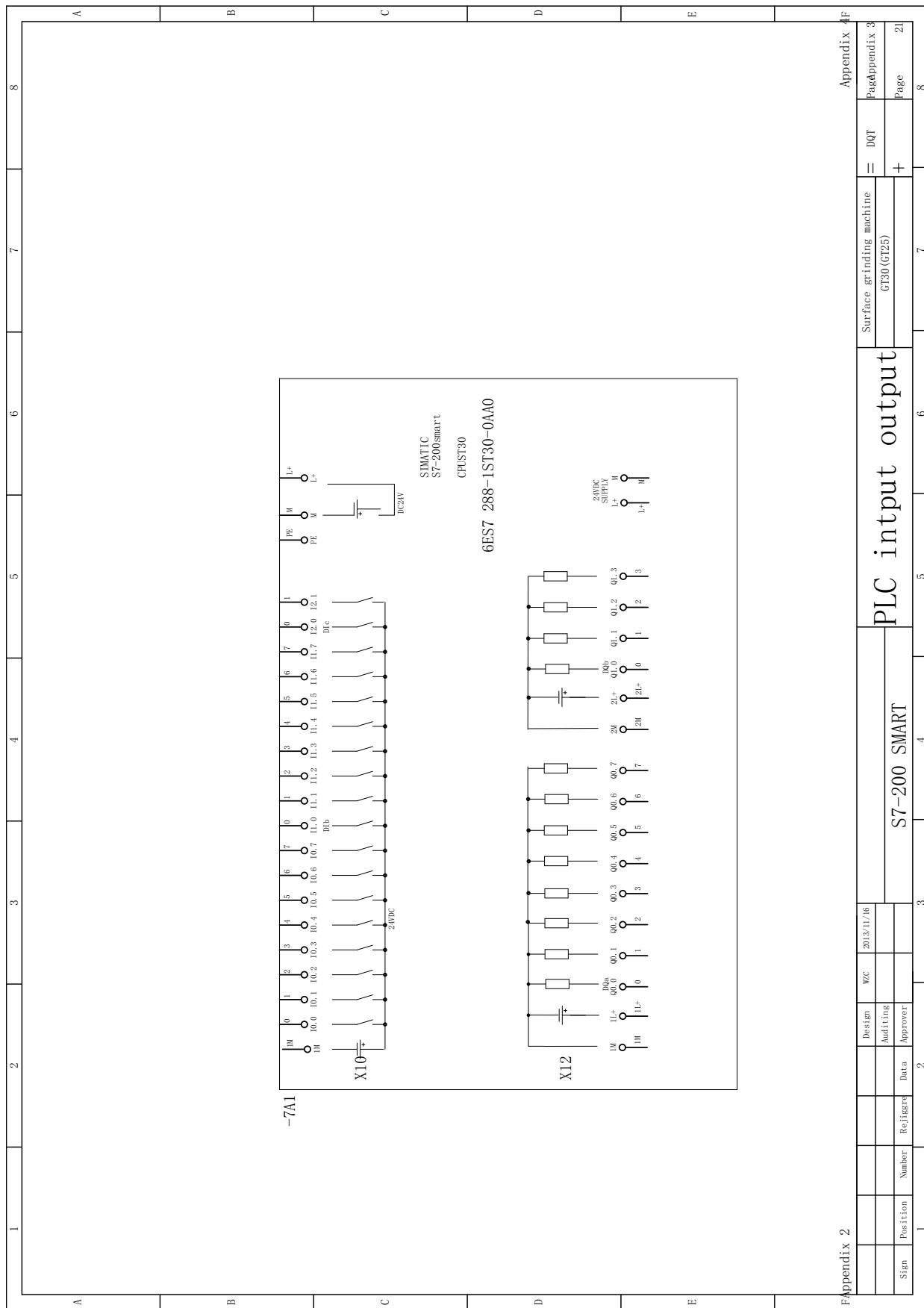
## 7.31.14 Anhang Klemmendiagramm - Appendix terminal diagram



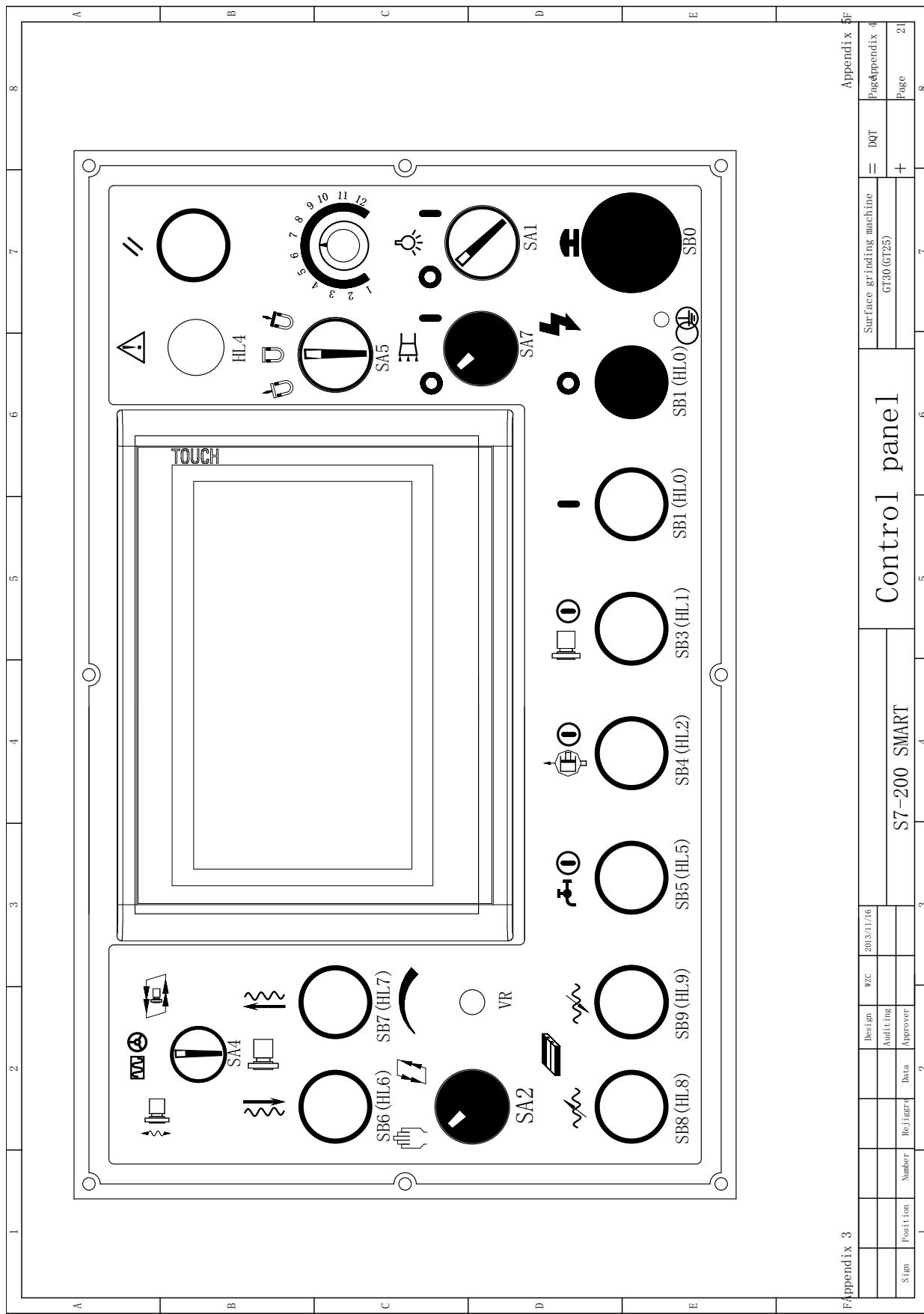
### 7.31.15 Anhang Anschlüsse zum Bedienpanel - Appendix control panel connection



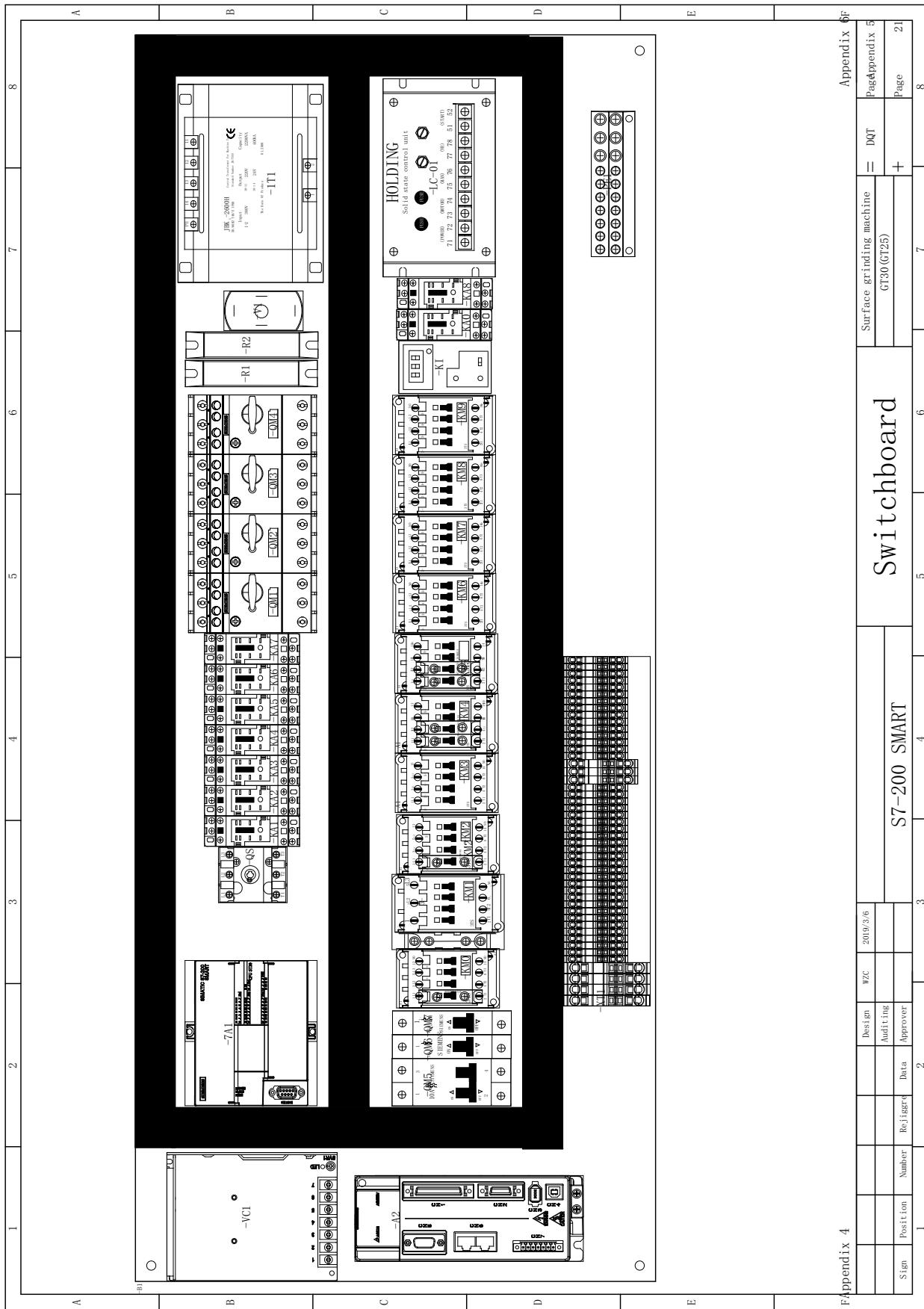
## 7.31.16 Anhang PLC Eingänge / Ausgänge - Appendix PLC Input / Output



### 7.31.17 Anhang Bedienpanel - Appendix control panel



## 7.31.18 Anhang Schaltschrank Einbauorte - Appendix electric cabinet components



Appendix 4

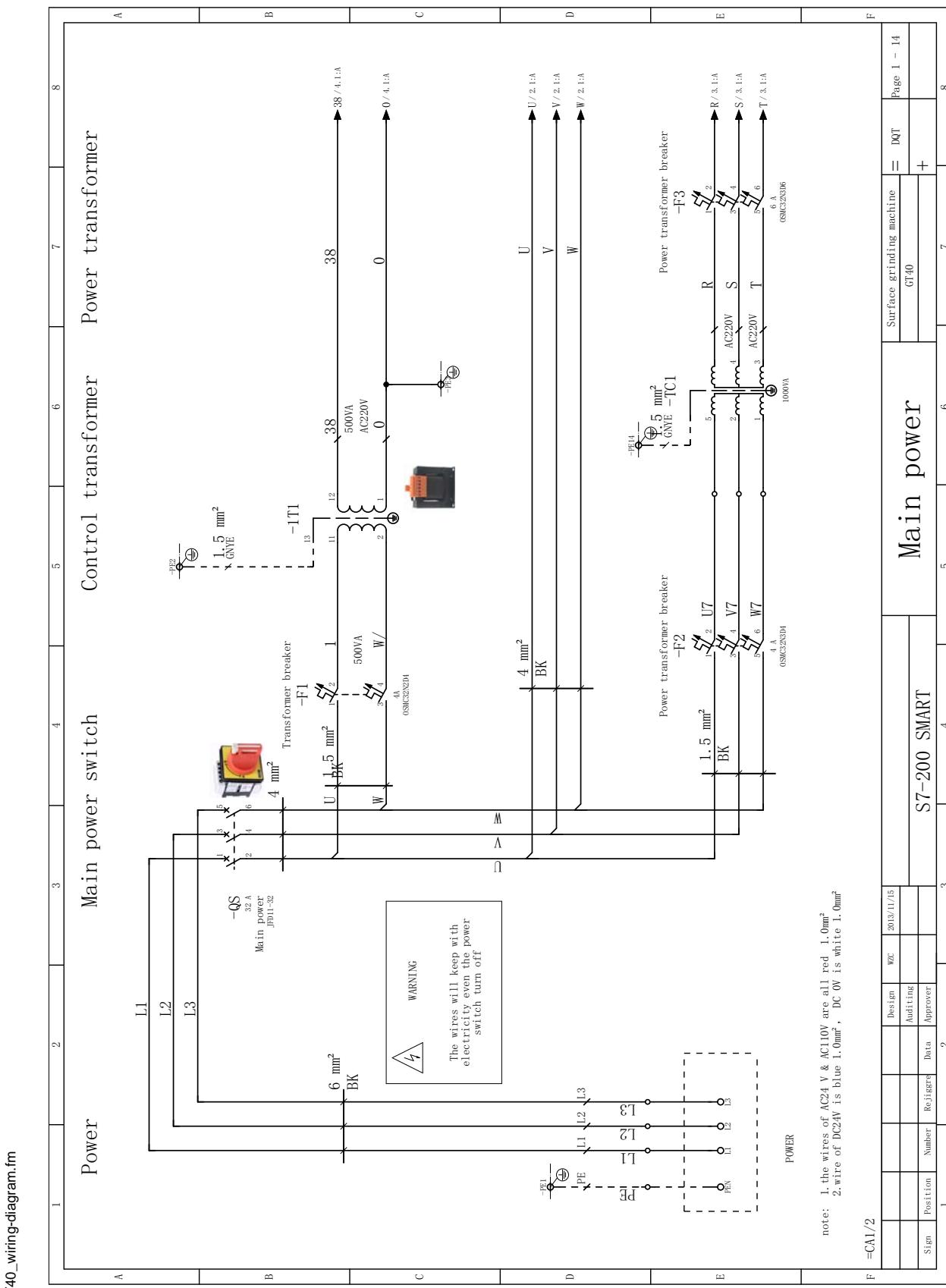
## Ersatzteilliste Elektrik - Electrical spare parts list

GT25 / GT30 - Elektrische Ersatzteile - Electrical spare parts							
Pos.	Beschreibung	Description	Lieferant	Seite	Maschine	Modell (spezifikation)	Artikelnummer
			Supplier	Page	Machine	Model (specification)	Item no.
CPU	CPU	CPU	Siemens	8-C3		6ES7288-1ST30-0AA0	03111025CPU
DT04	IO	IO	Siemens	10-D7		6ES7288-5DT04-0AA0	03111025DT04
HMI	HMI (Eingabe Schnittstelle Maschine)	HMI (human machine interface)	Siemens	8-C7		6AV6648-0CC11-3AX0	03111025HMI
V1	Filter	Filter	Siemens	5-A3		6ES7288-1ST30-0AA0	03111025V1
QS	Hauptschalter	Main switch	Shanghai Jing Feng Electric	1-B3		JFD11-32 (32A)	03111025QS
F1	Schutzschalter Trafo Steuerung	Control Transformer braker	Schneider	1-B4		OSMC32N2D4	03111025F1
F2	Schutzschalter Leistungstrafo	Power transformer braker	Schneider	1-E4		OSMC32N3D4	03111025F2
F3	Schutzschalter Leistungstrafo	Power transformer braker	Schneider	1-E7		OSMC32N3D6	03111025F3
1T1	Transformator Steuerung	Control Transformer		1-B5		500VA / AC 220V	031110251T1
TC1	Leistung Transformator	Power Transformer		1-B6		1000VA / AC 220V	03111025TC1
QM1	Spindel Motorschutzschalter	Spindle motor breaker	Schneider	2-B2	GT25	GV2-ME10C - 4-6.3A / 4.8A	03111025QM1
QM1	Spindel Motorschutzschalter	Spindle motor breaker	Schneider	2-B2	GT30	GV2-ME14C6 - 10A / 8.3A	03111030QM1
QM2	Ölpumpe Motorschutzschalter	Oilpump motor breaker	Schneider	2-B5	GT25	GV2-ME07C - 1.6 - 2.5A / 2A	03111025QM2
QM2	Ölpumpe Motorschutzschalter	Oilpump motor breaker	Schneider	2-B5	GT30	GV2-ME10C - 4 - 6.3A / 4.8A	03111030QM2
QM3	Kühlmittelpumpe Motorschutzschalter	Coolant pump motor breaker	Schneider	2-B7	GT25	GV2-ME02C - 0.16 - 0.25A	03111025QM3
QM3	Kühlmittelpumpe Motorschutzschalter	Coolant pump motor breaker	Schneider	2-B7	GT30	GV2-ME03C - 0.25 - 0.4A	03111030QM3
M1	Spindelmotor	Spindle motor		2-E2	GT25	2.2 Kw	03111025M1
M1	Spindelmotor	Spindle motor		2-E2	GT30	4 Kw	03111030M1
M2	Motor Ölumppe	Oilpump motor		2-E5	GT25	0.75 Kw	03111025M2
M2	Motor Ölumppe	Oilpump motor		2-E5	GT30	2.2 Kw	03111030M2
M3	Motor Kühlmittel	Coolant motor		2-E7	GT25	0,7 kw	03111025M3
M3	Motor Kühlmittel	Coolant motor		2-E7	GT30	0.9 Kw	03111030M3
VR	Potentiometer stufenloser Quervorschub	Potentiometer infinitely variable crossfeed		3-D2			03111025VR
LC01	Motorsteuerung Quervorschub	Cross feed motor controller	Solid State Control	3-B1		SQ02A 220V	03111025LC01
M5	Motor Quervorschub	Cross feed motor		3-E4		40W	03111025M5
M4	Motor Zentralschmierung	Motor central lubrication		3-E6		20W - 220V	03111025M4
F4	Schutzschalter Trafo Elektromagnet	Circuit breaker magnetizing transformer		4-B2		OSMC32N2D4	03111025F4
GE1	Steuerung Elektromagnet	Electromagnet controller		4-C2		10A / SC-0310	03111025GE1
YH1	Elektromagnet	Electro magnet		4-B1			03111025YH1
F5	Schutzschalter Trafos	Transformer circuit breaker	Schneider	4-B5		OSMC32N1D4 (220V)	03111025F5
V1	Gleichspannungstrafo	DC transformer	MeanWell	4-C5		NDR-120-24V 230 VAC / 24 V / 4.5A	03111025V1
V2	Gleichspannungstrafo	DC transformer	Schneider	4-C7		ABL2REM24045K 230 VAC / 24 V / 4.5A	03111025V2
V3	Gleichspannungstrafo DRO	DRO DC transformer		4-C8			03111025V3
DRO	Wegmessanzeige	Digital read out		4-D8		DPA31	03111025DRO
QM4	Schutzschalter Servoantrieb	Servo drive circuit breaker		5-A2	GT25	GV2-ME08C - 2.4 - 4A / 2.5A	03111025QM4
QM4	Schutzschalter Servoantrieb	Servo drive circuit breaker		5-A2	GT30	GV2-ME10C - 4 - 6.3A / 4.8	03111030QM4
A2	Antriebsregelung Servo	Servo drive controller	Delta Electronics	5-D4	GT25	ASD-A2-0421-L	03111025A2
A2	Antriebsregelung Servo	Servo drive controller	Delta Electronics	5-D4	GT30	ASD-A2-0721-L	03111030A2
F6	Motorschutzschalter Servo Motor	Servo motor breaker	Schneider	5-A6		OSMC32N2D4	03111025F6

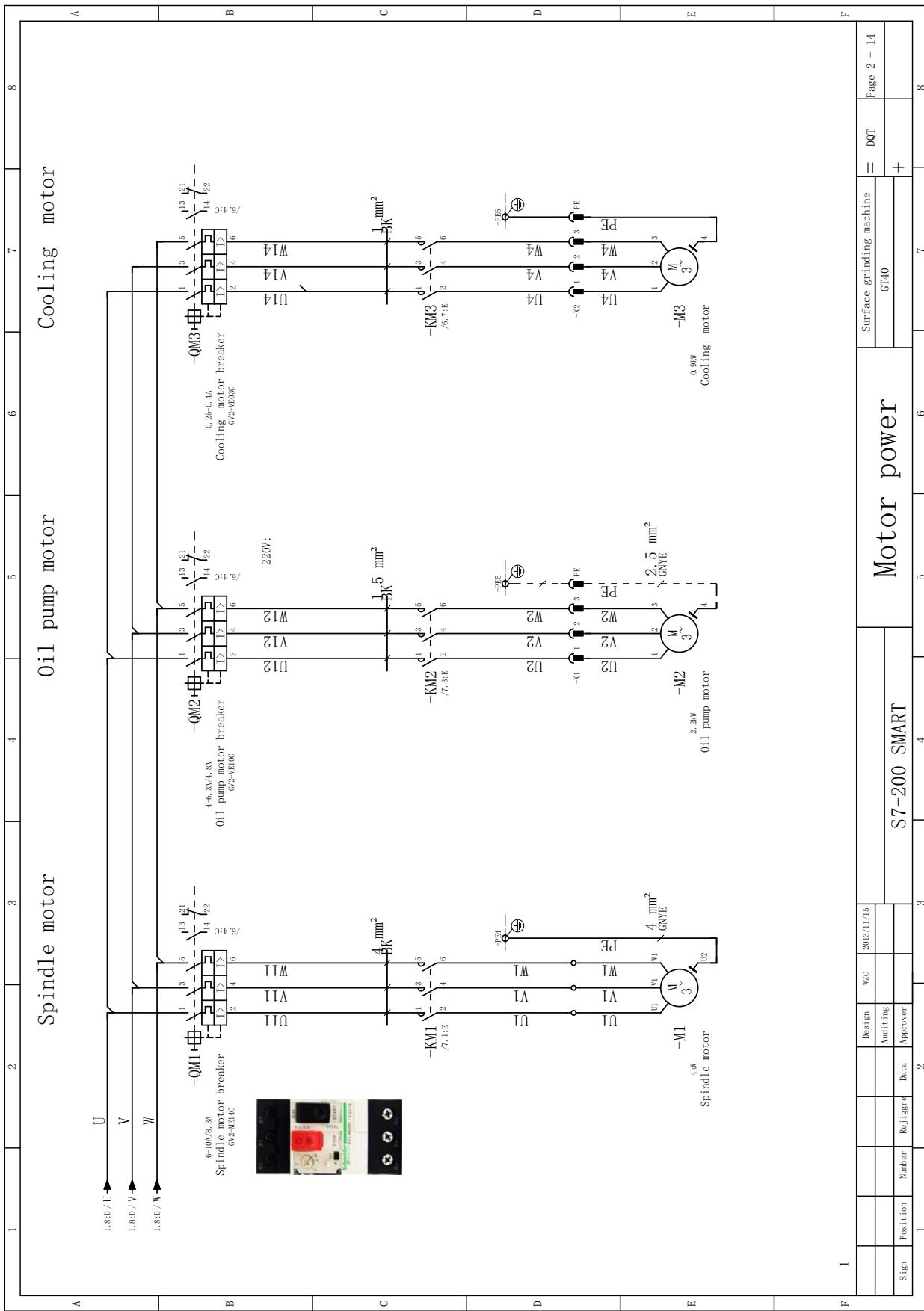
M7	Servo motor	Servo motor	Delta Electronics	5-B7	GT25	ECMA-G11303SS	03111025M7
M7	Servo motor	Servo motor	Delta Electronics	5-B7	GT30	ECMA-G11306SS	03111030M7
EL1	Arbeitsleuchte	Working lamp		6-D1			03111025EL1
SA1	Auswahlschalter Arbeitsleuchte Ein/Aus	Working lamp On/Off selecting knob		6-B1			03111025SA1
SB0	Not-Halt Schalter	Emergency stop switch		6-B3			03111025SB0
KA12	Relais	Relay	Schneider	6-E2			03111025KA12
KA13	Relais	Relay	Schneider	6-E3		RXM2AB2BD	03111025KA13
KA0	Relais	Relay	Schneider	6-E5			03111025KA0
KM0	Schütz	Contactor	Schneider	6-E4		AC24V; LA1-KN11; LP1K0910BD	03111025KM0
KM3	Schütz	Contactor	Schneider	6-E7			03111025KM3
HL4	Alarm Lampe	Alarm lamp		6-E6			03111025HL4
S1	Füllstandsschalter	Lubricant shortage switch		6-B5			03111025S1
SB1	Drucktaster Steuerung Ein / Kontrollleuchte	Power on push button / indicator lamp		6-B4			03111025SB1
HL0	Anzeigeleuchte	Indicator lamp		6-E5			03111025HL0
KM1	Schütz Spindel Ein	Contactor spindle on	Schneider	7-E1	GT25	LP1K1210BD	03111025KM1
KM1	Schütz Spindel Ein	Contactor spindle on	Schneider	7-E1	GT30	LP1K0910BD	03111030KM1
KM2	Schütz Hydraulikpumpe Ein	Contactor Hydraulik oil pump on	Schneider	7-E3		AC24 V LA1-KN11 LP1K0910BD	03111025KM2
HL1	Anzeigeleuchte SB3	Indicator lamp SB3		7-E2			03111025HL1
HL2	Anzeigeleuchte SB4	Indicator lamp SB4		7-E3			03111025HL2
SB8	Drucktaster Eilgang Tisch rückwärts	Table rapid backward move push button		7-B4			03111025SB8
SB9	Drucktaster Eilgang Tisch vorwärts	Table rapid forward move push button		7-B6			03111025SB9
KM4	Schütz	Contactor	Schneider	7-E4		AC24 V LA1-KN22 LP1K0910BD	03111025KM4
KM5	Schütz	Contactor	Schneider	7-E6			03111025KM5
SA2	Auswahlschalter Quervorschub Tisch (Manuell oder Automatik)	Table cross feed mode (Manual or Auto) selecting knob		9-B5		LA39B3/A3-31X/K	03111025SA2
SA4	Auswahlschalter Abwärtsvorschub Schleifkopf (Eilgang, MPG, Auto)	Wheel head down feed mode (rapid, MPG, Auto) selecting knob		9-B4			03111025SA4
SB6	Drucktaster Eilgang Schleifkopf abwärts	Wheel head rapid down push button		9-B4			03111025SB6
SB7	Drucktaster Eilgang Schleifkopf aufwärts	Wheel head rapid up push button		9-B5			03111025SB7
SB4	Drucktaster Hydraulikpumpe Ein/Aus	Hydraulic oil pump Start/Stop push button		10-B2			03111025SB4
SB5	Drucktaster Kühlmittelpumpe Ein/Aus	Coolant pump Start/Stop push button		10-C3			03111025SB5
SB3	Drucktaster Schleifscheibenmotor Ein/Aus	Grind spindle motor Start / Stop push button		10-C4			03111025SB3
SQ8	Schalter Schleifscheibenschutz	Wheel guard protection switch		10-C6			03111025SQ8
SQ5	Endlagenschalter Spindelkopf oben	Spindle head limit switch up		10-C2			03111025SQ5
HL6	Anzeigeleuchte	Indicator lamp		11-E4			03111025HL6
HL7	Anzeigeleuchte	Indicator lamp		11-E3			03111025HL7
SQ9	Induktiver Näherungsschalter	Inductive proximity sensor	Omron	8-C5		E2B-M12KS04-WZ-C1	03111025SQ9

## 7.32 GT40 - Schaltplan - Wiring diagram

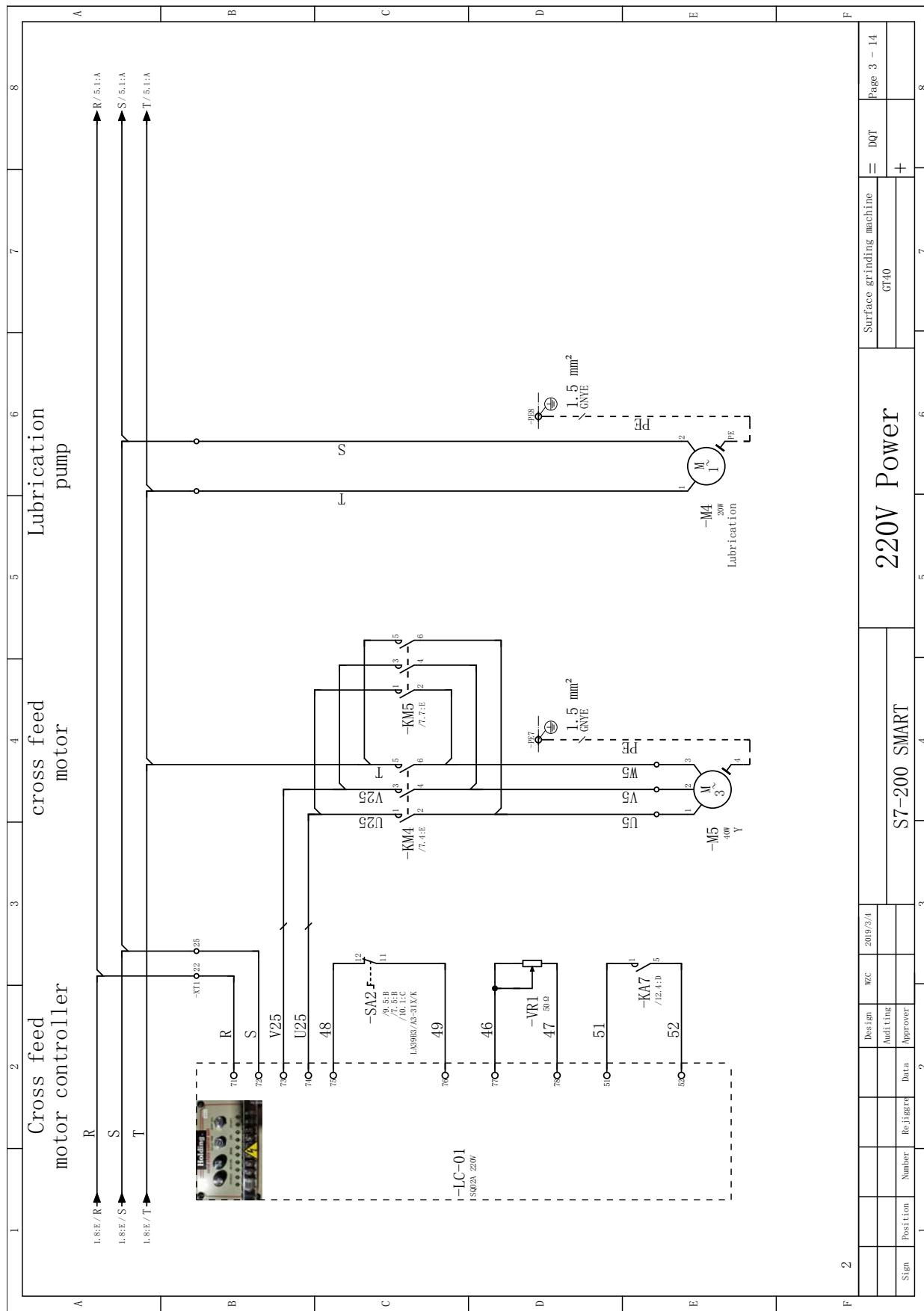
### 7.32.1 Hauptversorgung - Main power



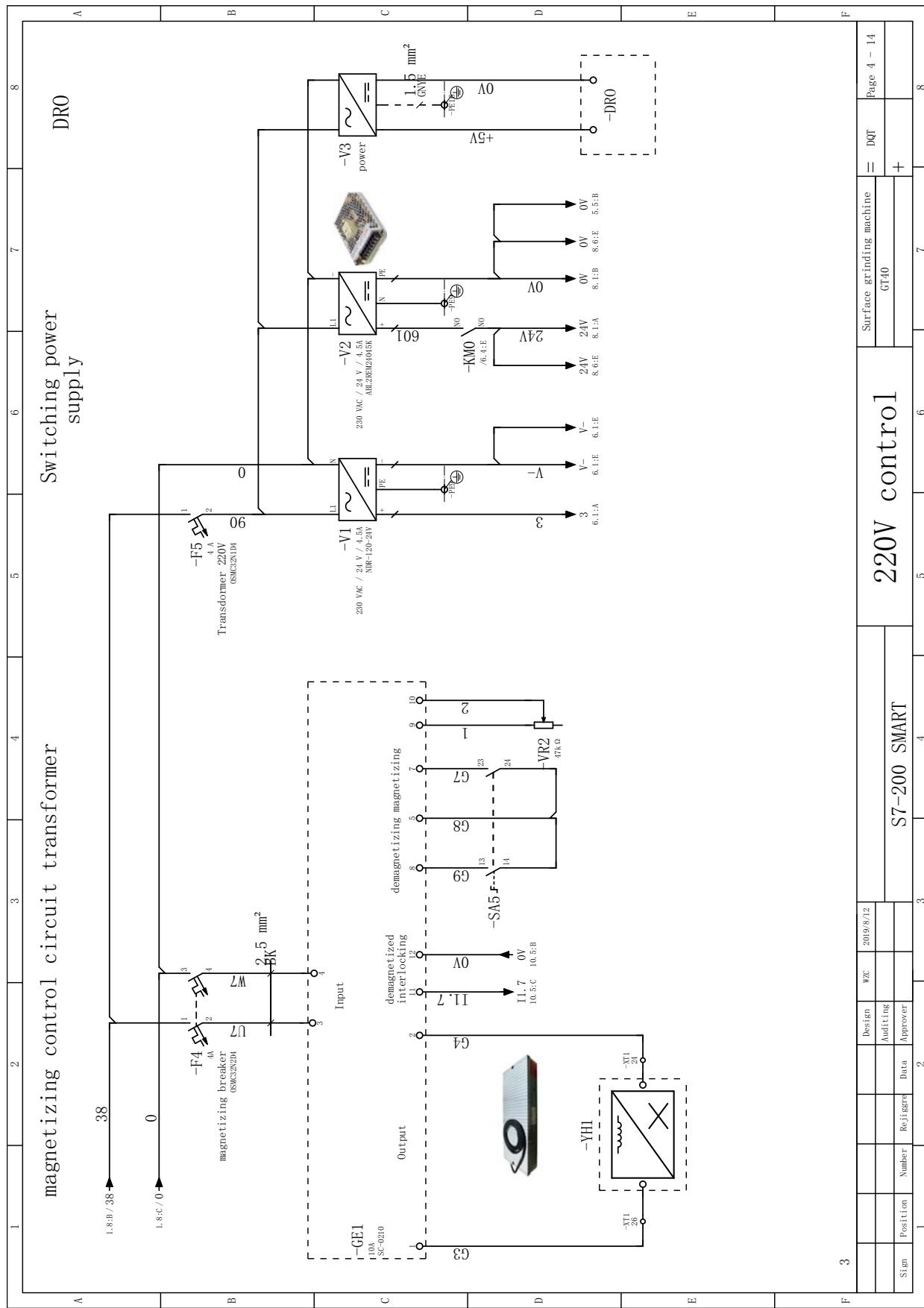
## 7.32.2 Motoranschluss - Motor power



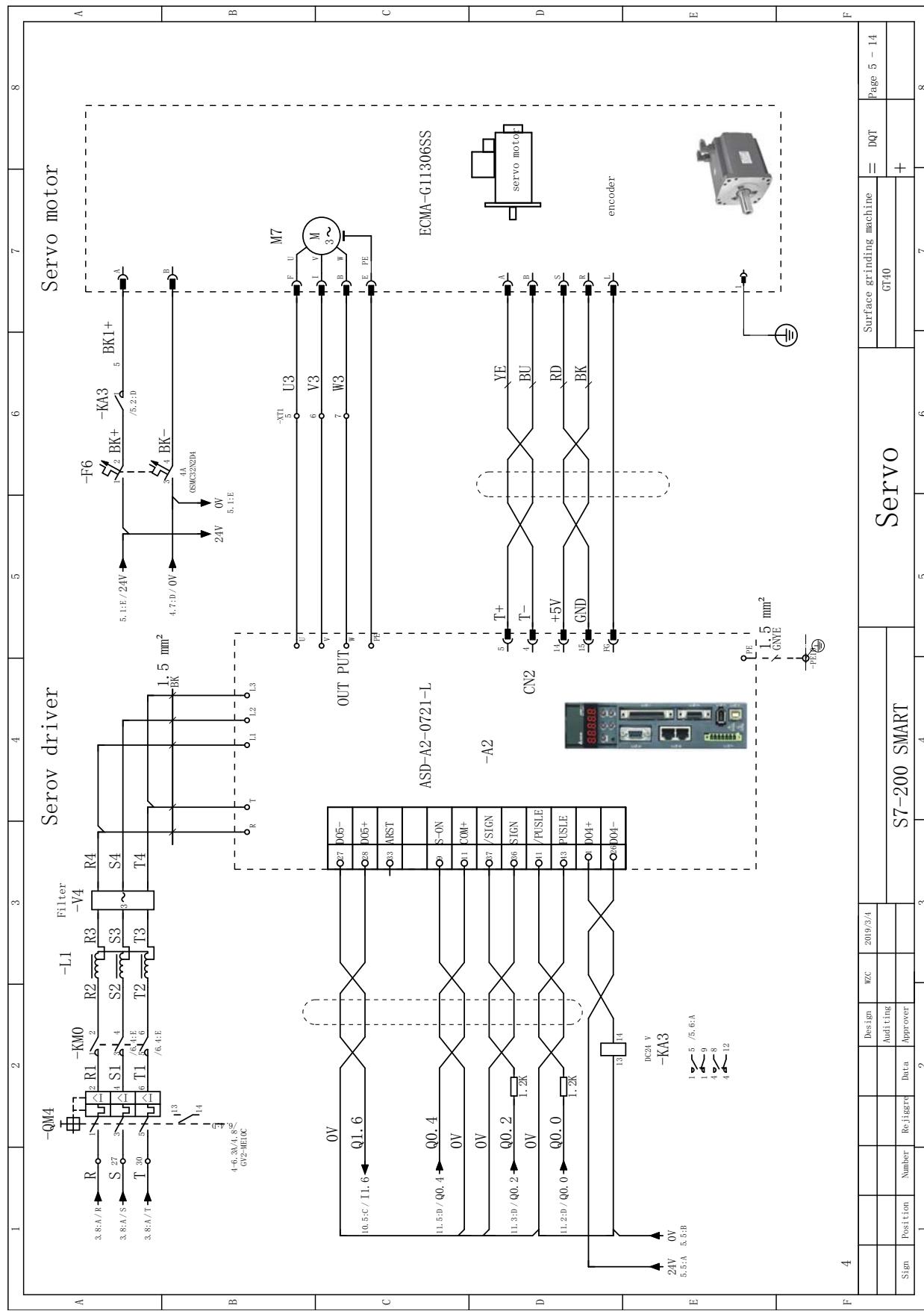
### 7.32.3 220V Leistungsanschluss - 220V power



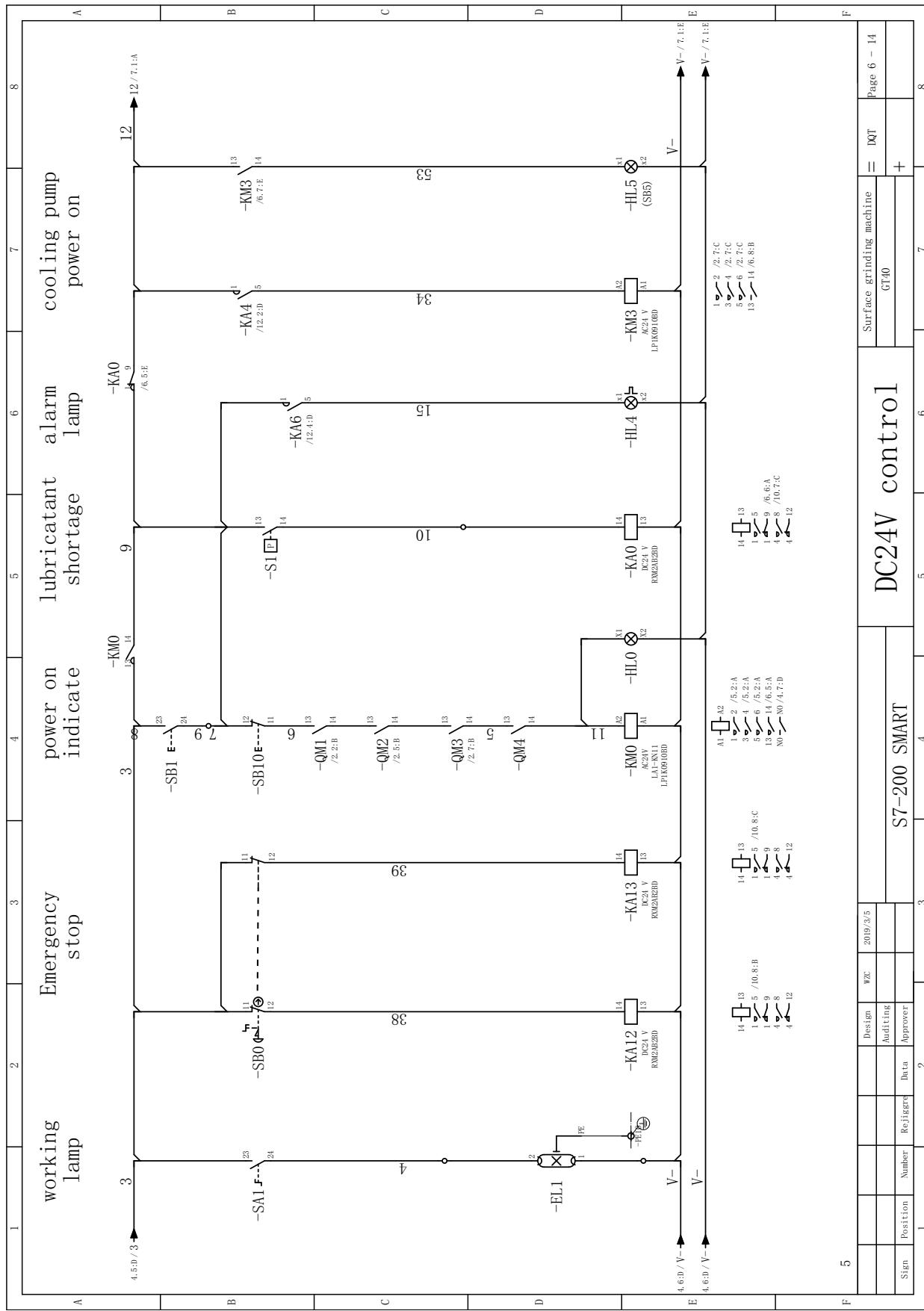
## 7.32.4 220V Steuerung - 220V control



### 7.32.5 Servoantrieb - Servo drive

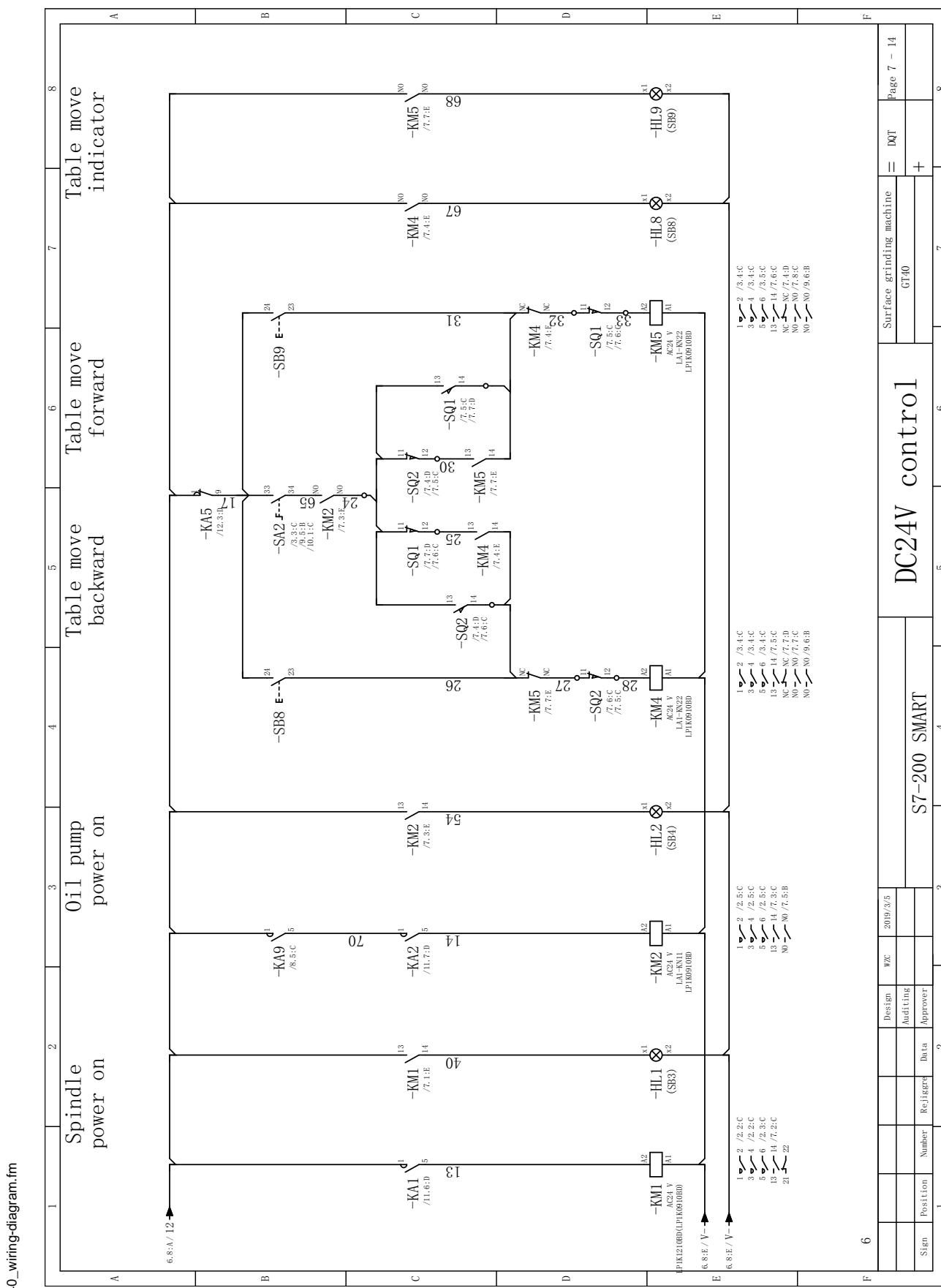


## 7.32.6 24V DC Steuerung - DC 24V control - 1-2

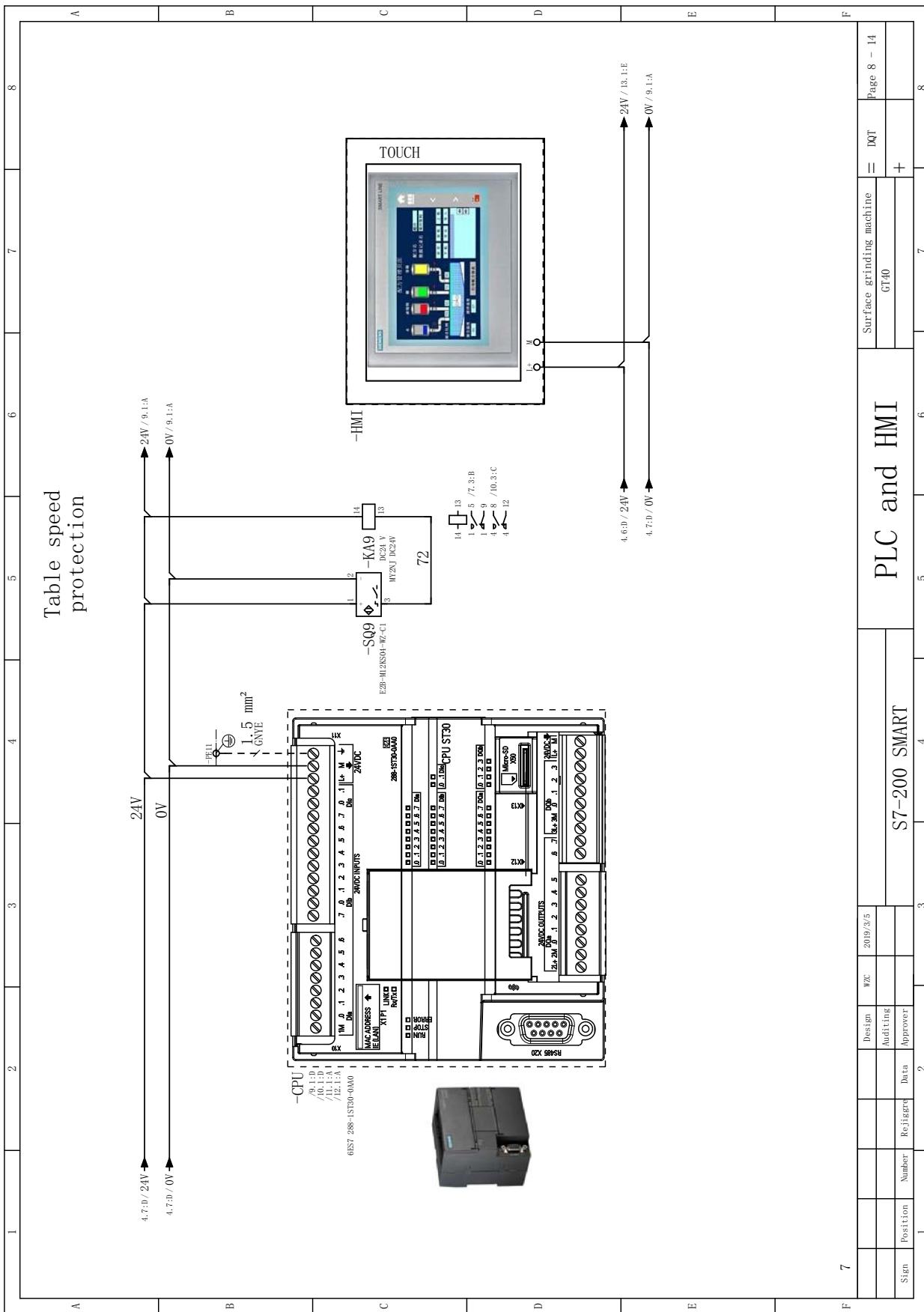


Sign		Position		Number		Design		W/C		2019/3/5		Audit		Data		Registre		Data		Approved		S7-200 SMART		DC24V control		Surface grinding machine		= DCF		Page 6 - 14															
1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20							
GT40		+		7		6		5		4		3		2		1		14		13		12		11		10		9		8		7		6		5		4		3		2		1	

### 7.32.7 24V DC Steuerung - DC 24V control - 2-2

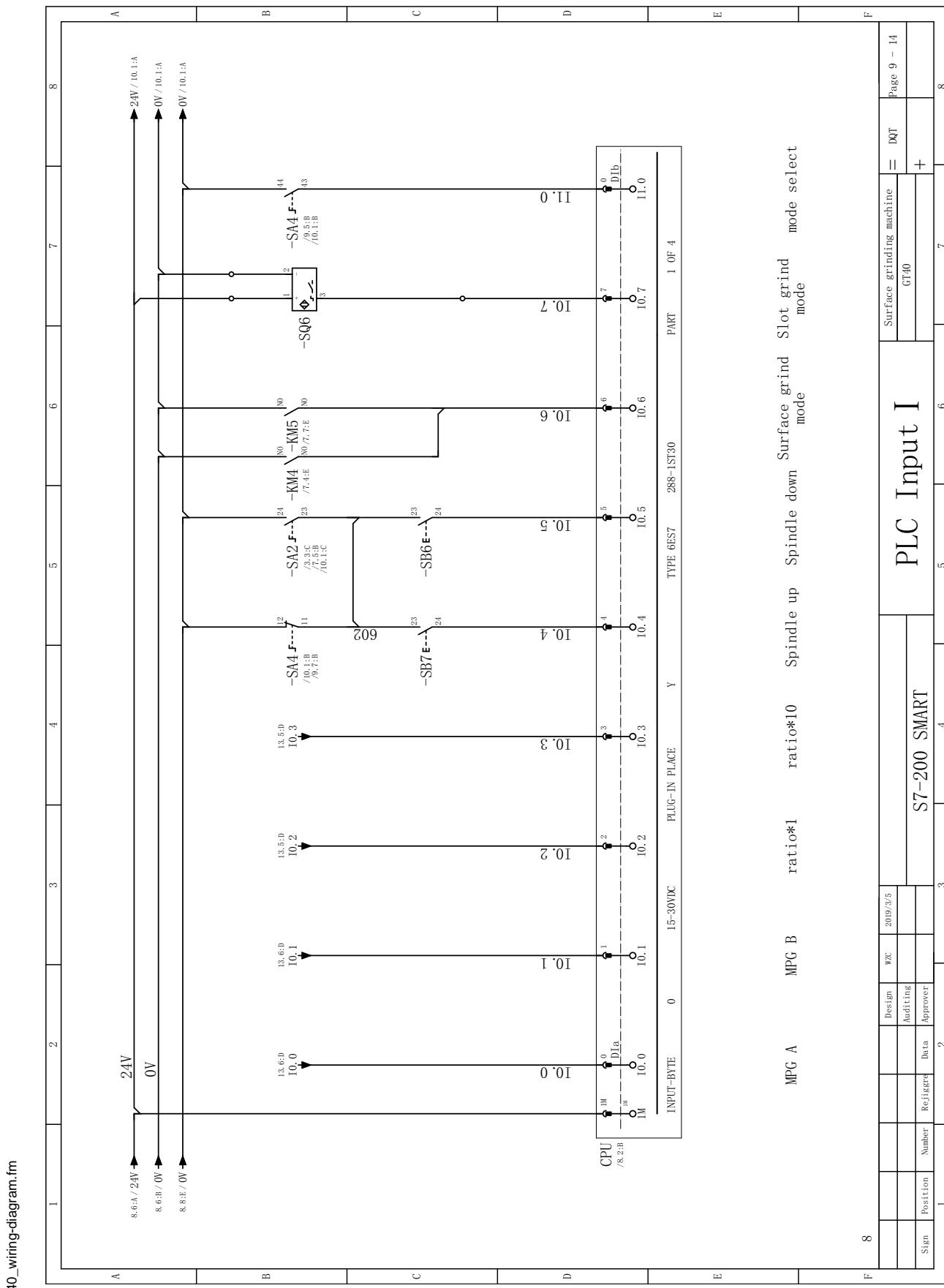


## 7.32.8 PLC and HMI

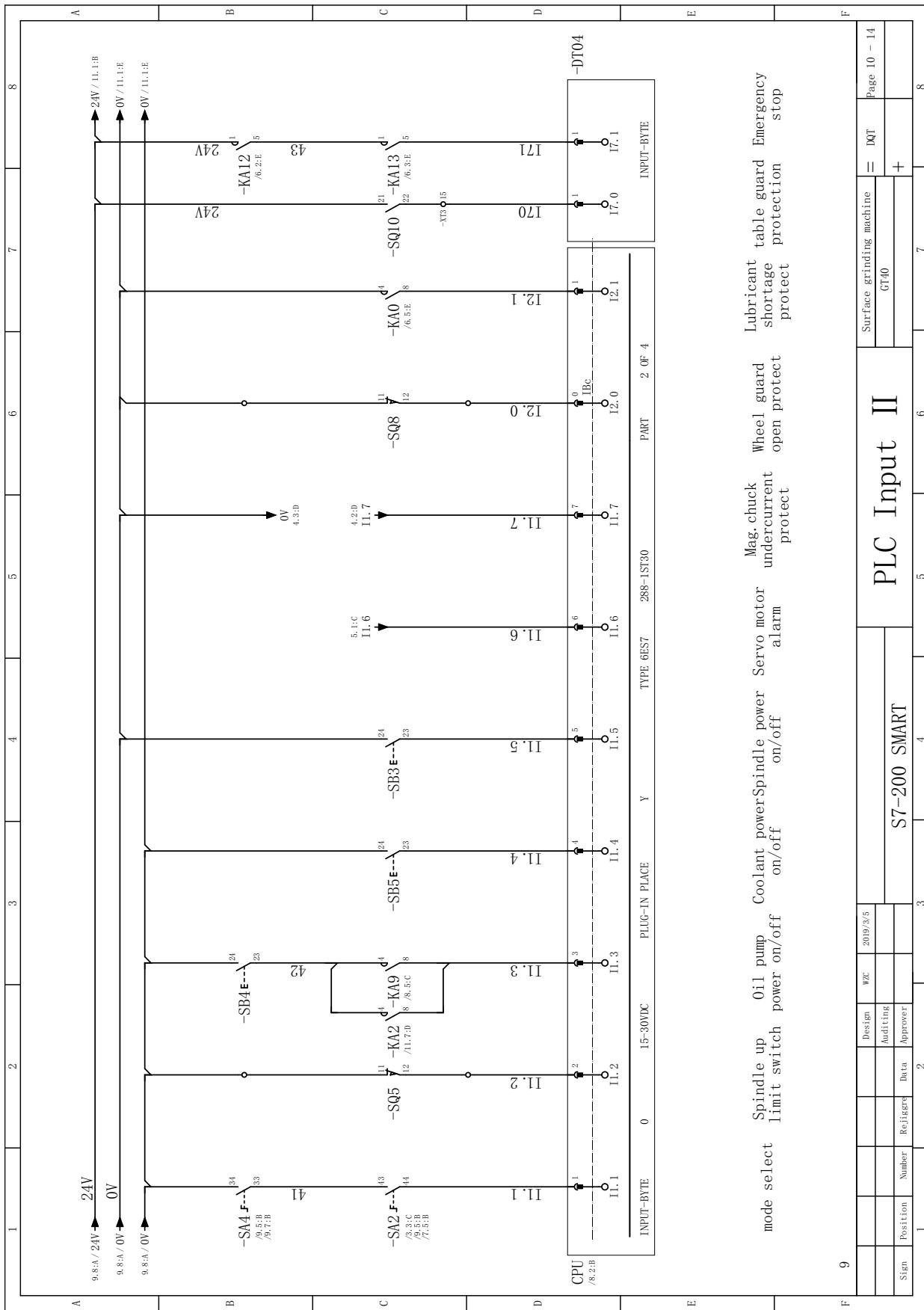


		Design		WZC	2019/3/5	Surface grinding machine		DOF	Page 8 - 14
Sign	Position	Number	Re-Check	Date	Approver	GT40	+		
1						7		8	

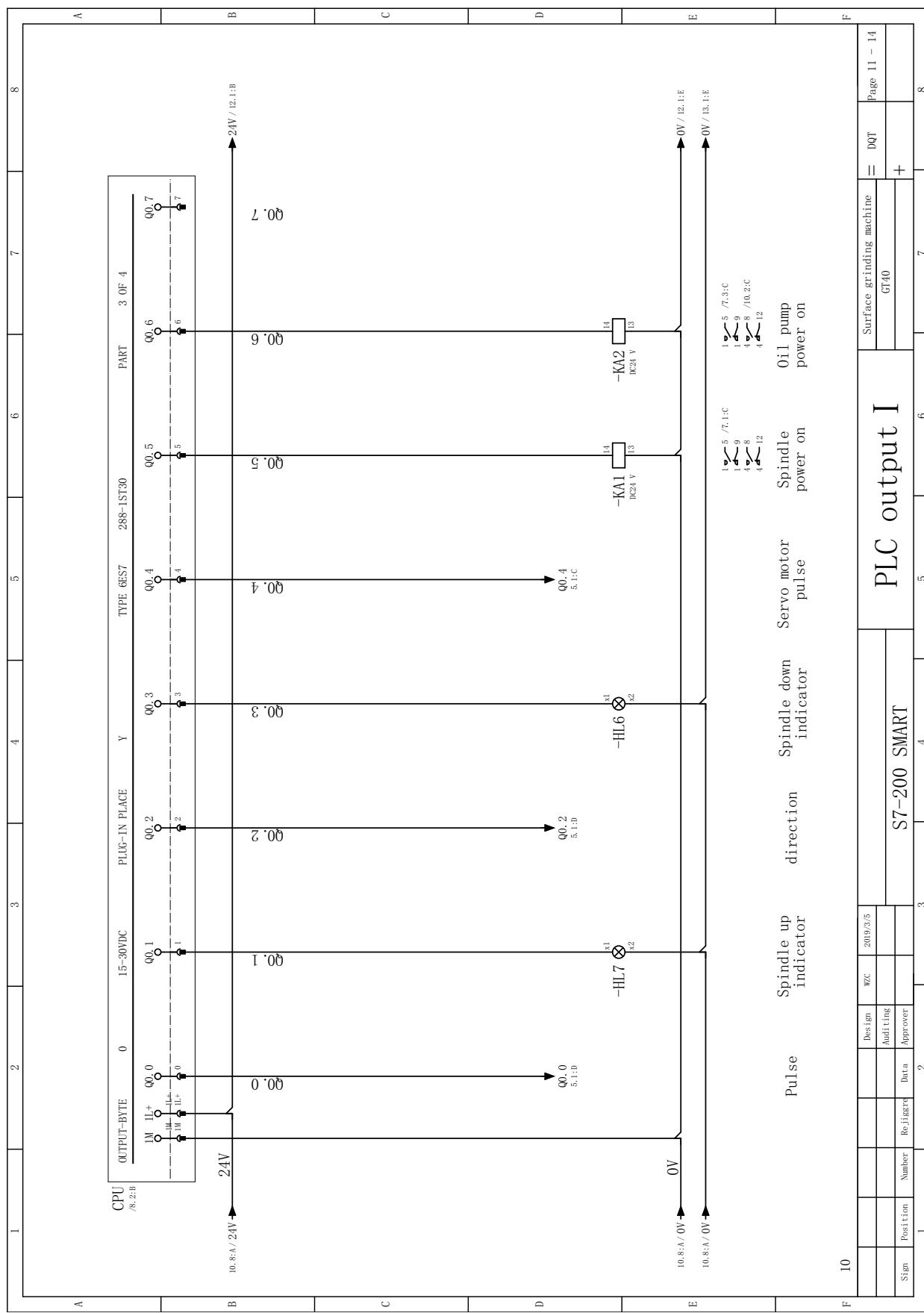
### 7.32.9 PLC Eingang - PLC input - 1-2



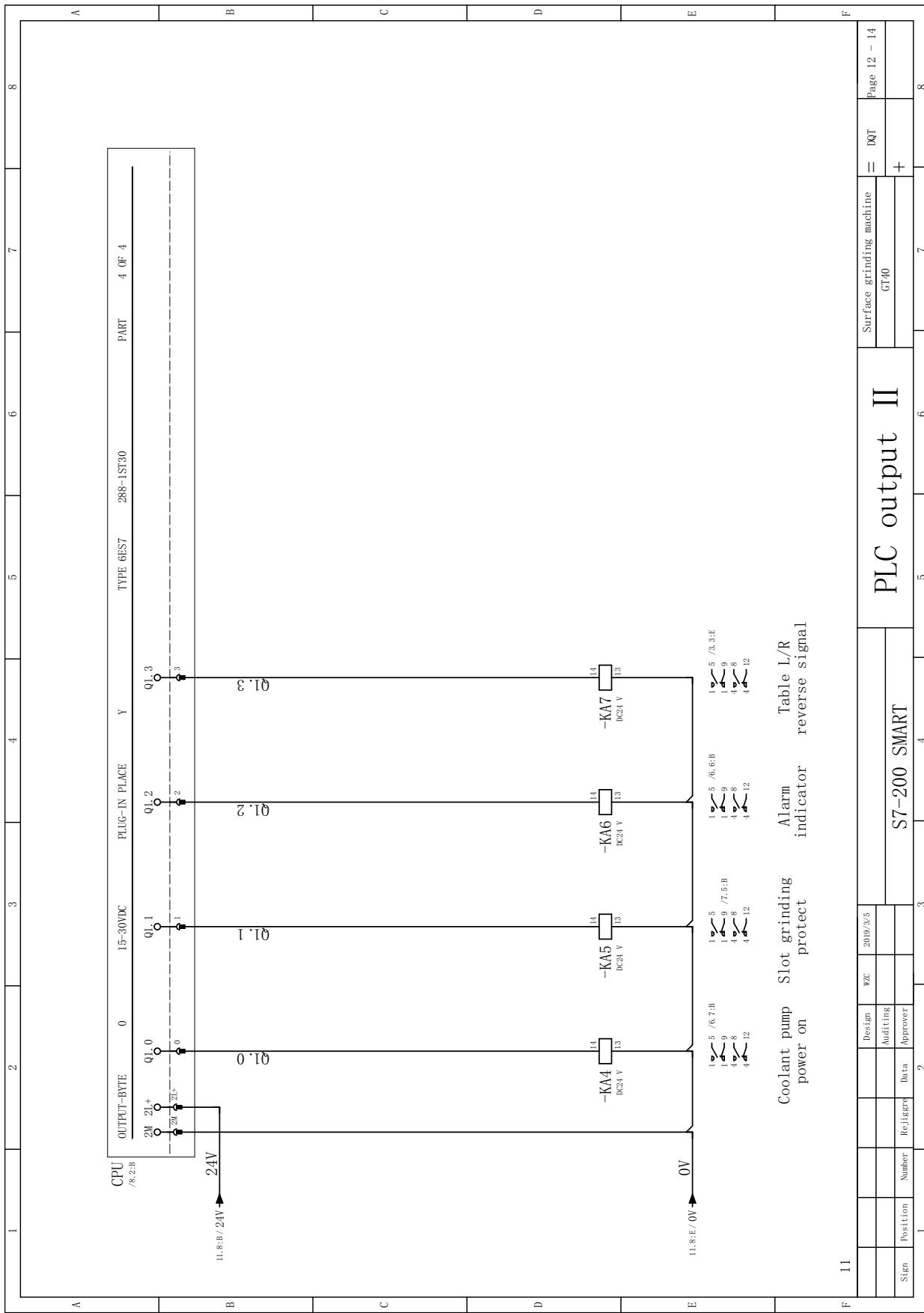
## 7.32.10 PLC Eingang - PLC input - 2-2



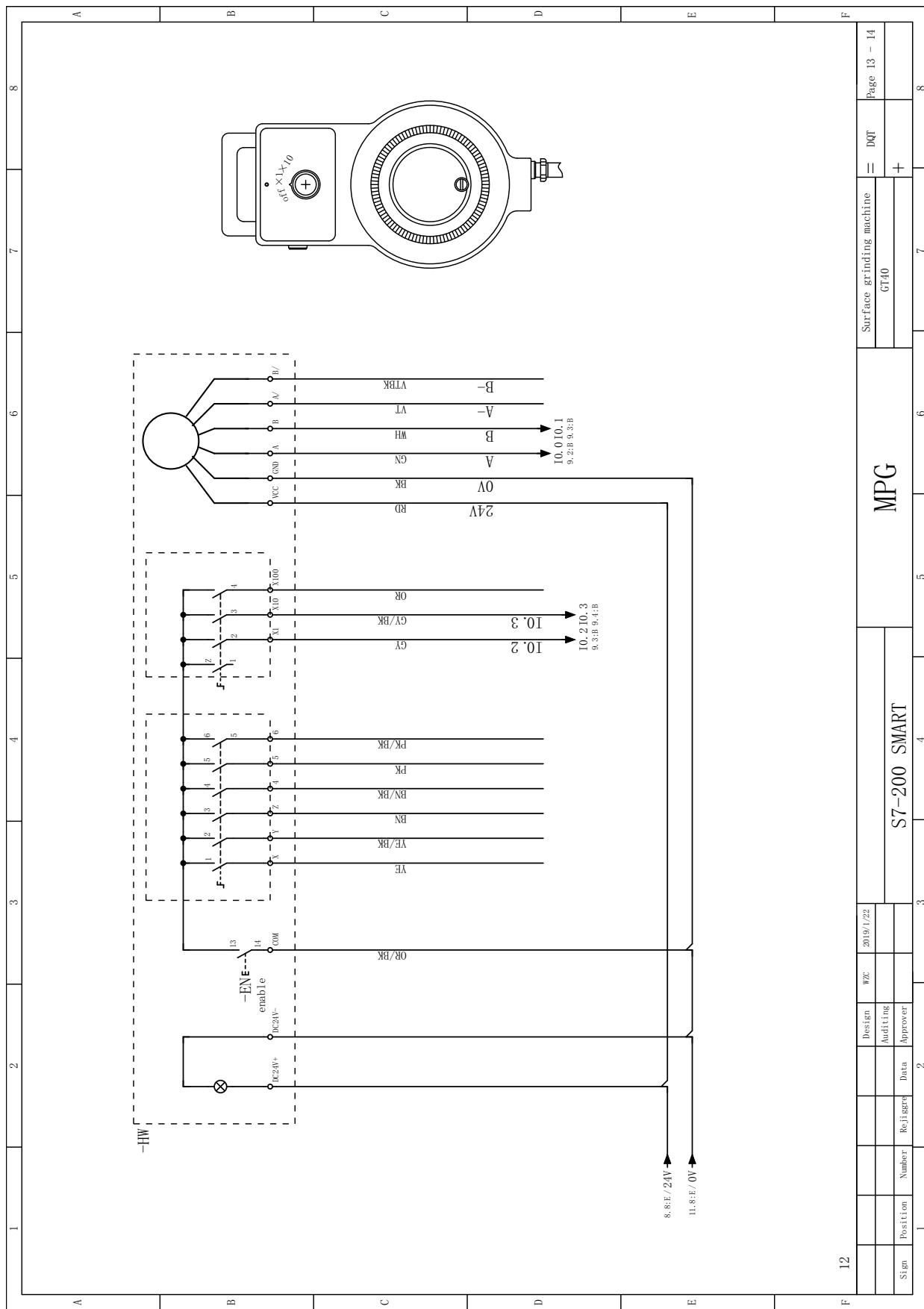
### 7.32.11 PLC Ausgang - PLC output - 1-2



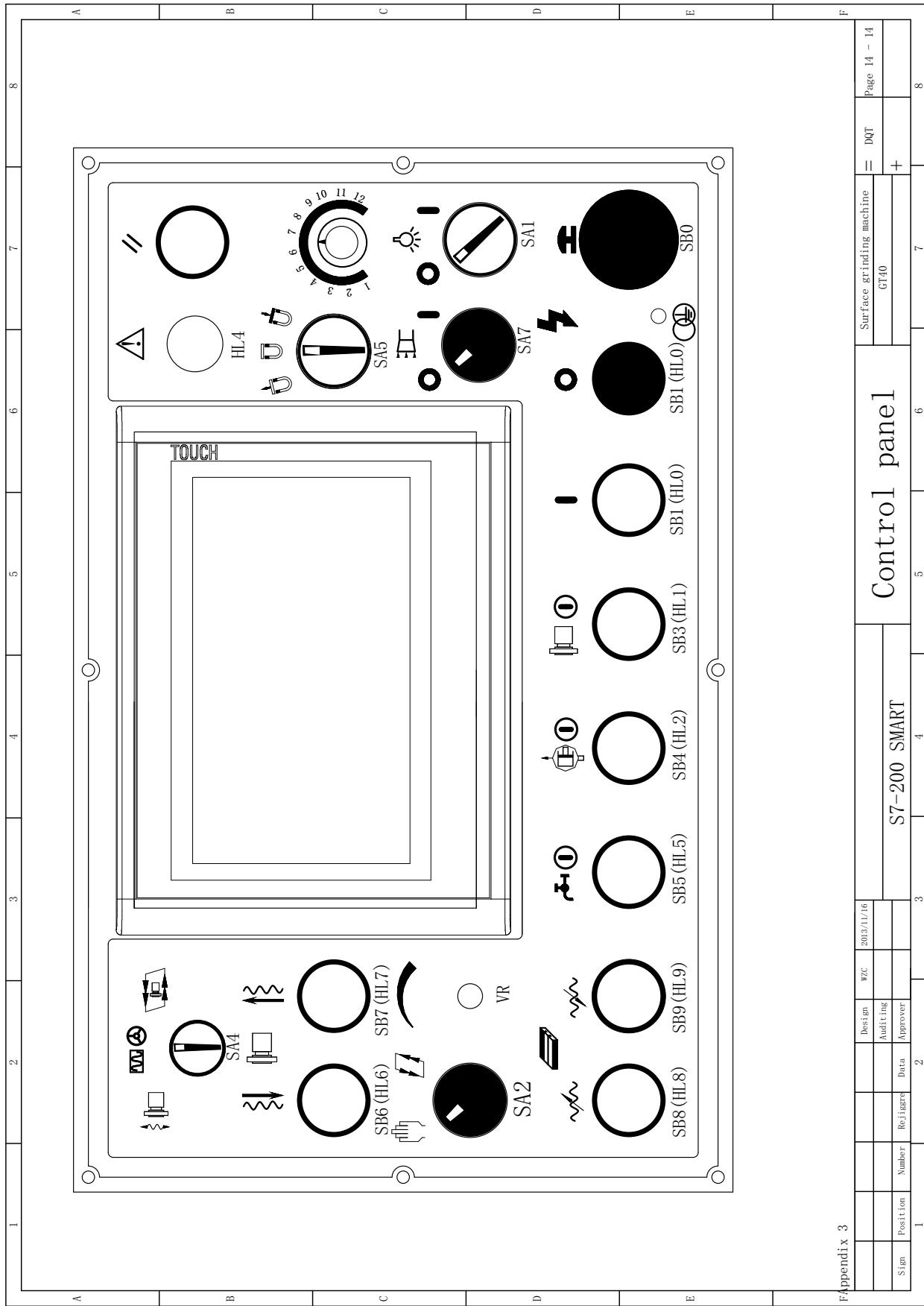
## 7.32.12 PLC Ausgang - PLC output - 2-2



### 7.32.13 Anhang elektronisches Handrad - Appendix machine pulse generator



## 7.32.14 Anhang Bedienpanel - Appendix control panel



Appendix 3

Sign.		Position	Number	Rejigree	Date	Design	WZC	2013/11/16	Control panel		Surface grinding machine	=	DQT	Page 14 - 14
											GT40	+		
1									4	3	7	8		

## Ersatzteilliste Elektrik - Electrical spare parts list

GT40 - Elektrische Ersatzteile - Electrical spare parts							
Pos.	Beschreibung	Description	Lieferant	Seite	Modell (spezifikation)	Artikelnummer	
			Supplier	Page	Model (specification)	Item no.	
CPU	CPU	CPU	Siemens	8-C3	6ES7288-1ST30-0AA0	03111025CPU	
DT04	IO	IO	Siemens	10-D7	6ES7288-5DT04-0AA0	03111025DT04	
HMI	HMI (Eingabe Schnittstelle Maschine)	HMI (human machine interface)	Siemens	8-C7	6AV6648-0CC11-3AX0	03111025HMI	
V1	Filter	Filter	Siemens	5-A3	6ES7288-1ST30-0AA0	03111025V1	
QS	Hauptschalter	Main switch	Shanghai Jing Feng Electric	1-B3	JFD11-32 (32A)	03111025QS	
F1	Schutzschalter Trafo Steuerung	Control Transformer braker	Schneider	1-B4	OSMC32N2D4	03111025F1	
F2	Schutzschalter Leistungstrafo	Power transformer braker	Schneider	1-E4	OSMC32N3D4	03111025F2	
F3	Schutzschalter Leistungstrafo	Power transformer braker	Schneider	1-E7	OSMC32N3D6	03111025F3	
1T1	Transformator Steuerung	Control Transformer		1-B5	500VA / AC 220V	031110251T1	
TC1	Leistung Transformator	Power Transformer		1-B6	1000VA / AC 220V	03111025TC1	
QM1	Spindel Motorschutzschalter	Spindle motor breaker	Schneider	2-B2	GV2-ME14C6 - 10A / 8.3A	03111030QM1	
QM2	Ölpumpe Motorschutzschalter	Oilpump motor breaker	Schneider	2-B5	GV2-ME10C - 4 - 6.3A / 4.8A	03111030QM2	
QM3	Kühlmittelpumpe Motorschutzschalter	Coolant pump motor breaker	Schneider	2-B7	GV2-ME03C - 0.25 - 0.4A	03111030QM3	
M1	Spindelmotor	Spindle motor		2-E2	4 Kw	03111030M1	
M2	Motor Ölpumpe	Oilpump motor		2-E5	2.2 Kw	03111030M2	
M3	Motor Kühlmittel	Coolant motor		2-E7	0.9 Kw	03111030M3	
VR	Potentiometer stufenloser Quervorschub	Potentiometer infinitely variable crossfeed		3-D2		03111025VR	
LC01	Motorsteuerung Quervorschub	Cross feed motor controller	Solid State Control	3-B1	SQ02A 220V	03111025LC01	
M5	Motor Quervorschub	Cross feed motor		3-E4	40W	03111025M5	
M4	Motor Zentralschmierung	Motor central lubrication		3-E6	20W - 220V	03111025M4	
F4	Schutzschalter Trafo Elektromagnet	Circuit breaker magnetizing transformer		4-B2	OSMC32N2D4	03111025F4	
GE1	Steuerung Elektromagnet	Electromagnet controller		4-C2	10A / SC-0310	03111025GE1	
YH1	Elektromagnet	Electro magnet		4-B1		03111025YH1	
F5	Schutzschalter Trafos	Transformer circuit breaker	Schneider	4-B5	OSMC32N1D4 (220V)	03111025F5	
V1	Gleichspannungstrafo	DC transformer	MeanWell	4-C5	NDR-120-24V 230 VAC / 24 V / 4.5A	03111025V1	
V2	Gleichspannungstrafo	DC transformer	Schneider	4-C7	ABL2REM24045K 230 VAC / 24 V / 4.5A	03111025V2	
V3	Gleichspannungstrafo DRO	DRO DC transformer		4-C8		03111025V3	
DRO	Wegmessanzeige	Digital read out		4-D8	DPA31	03111025DRO	
QM4	Schutzschalter Servoantrieb	Servo drive circuit breaker		5-A2	GV2-ME10C - 4 - 6.3A / 4.8	03111030QM4	
A2	Antriebsregelung Servo	Servo drive controller	Delta Electronics	5-D4	ASD-A2-0721-L	03111030A2	
F6	Motorschutzschalter Servo Motor	Servo motor breaker	Schneider	5-A6	OSMC32N2D4	03111025F6	
M7	Servo motor	Servo motor	Delta Electronics	5-B7	ECMA-G11306SS	03111030M7	
EL1	Arbeitsleuchte	Working lamp		6-D1		03111025EL1	
SA1	Auswahlschalter Arbeitsleuchte Ein/Aus	Working lamp On/Off selecting knob		6-B1		03111025SA1	
SB0	Not-Halt Schalter	Emergency stop switch		6-B3		03111025SB0	
KA12	Relais	Relay	Schneider	6-E2		03111025KA12	
KA13	Relais	Relay	Schneider	6-E3	RXM2AB2BD	03111025KA13	
KA0	Relais	Relay	Schneider	6-E5		03111025KA0	
KM0	Schütz	Contactor	Schneider	6-E4		03111025KM0	
KM3	Schütz	Contactor	Schneider	6-E7	AC24V; LA1-KN11; LP1K0910BD		03111025KM3

HL4	Alarm Lampe	Alarm lamp		6-E6		03111025HL4
S1	Füllstandsschalter	Lubricant shortage switch		6-B5		03111025S1
SB1	Drucktaster Steuerung Ein / Kontrollleuchte	Power on push button / indicator lamp		6-B4		03111025SB1
HL0	Anzeigeleuchte	Indicator lamp		6-E5		03111025HL0
KM1	Schütz Spindel Ein	Contactor spindle on	Schneider	7-E1	LP1K0910BD	03111030KM1
KM2	Schütz Hydraulikpumpe Ein	Contactor Hydraulik oil pump on	Schneider	7-E3	AC24 V LA1-KN11 LP1K0910BD	03111025KM2
HL1	Anzeigeleuchte SB3	Indicator lamp SB3		7-E2		03111025HL1
HL2	Anzeigeleuchte SB4	Indicator lamp SB4		7-E3		03111025HL2
SB8	Drucktaster Eilgang Tisch rückwärts	Table rapid backward move push button		7-B4		03111025SB8
SB9	Drucktaster Eilgang Tisch vorwärts	Table rapid forward move push button		7-B6		03111025SB9
KM4	Schütz	Contactor	Schneider	7-E4	AC24 V LA1-KN22 LP1K0910BD	03111025KM4
KM5	Schütz	Contactor	Schneider	7-E6	AC24 V LA1-KN22 LP1K0910BD	03111025KM5
SA2	Auswahlschalter Quervorschub Tisch (Manuell oder Automatik)	Table cross feed mode (Manual or Auto) selecting knob		9-B5	LA39B3/A3-31X/K	03111025SA2
SA4	Auswahlschalter Abwärtvorschub Schleifkopf (Eilgang, MPG, Auto)	Wheel head down feed mode (rapid, MPG, Auto) selecting knob		9-B4		03111025SA4
SB6	Drucktaster Eilgang Schleifkopf abwärts	Wheel head rapid down push button		9-B4		03111025SB6
SB7	Drucktaster Eilgang Schleifkopf aufwärts	Wheel head rapid up push button		9-B5		03111025SB7
SB4	Drucktaster Hydraulikpumpe Ein/Aus	Hydraulic oil pump Start/Stop push button		10-B2		03111025SB4
SB5	Drucktaster Kühlmittelpumpe Ein/Aus	Coolant pump Start/Stop push button		10-C3		03111025SB5
SB3	Drucktaster Schleifscheibenmotor Ein/Aus	Grind spindle motor Start / Stop push button		10-C4		03111025SB3
SQ8	Schalter Schleifscheibenschutz	Wheel guard protection switch		10-C6		03111025SQ8
SQ5	Endlagenschalter Spindelkopf oben	Spindle head limit switch up		10-C2		03111025SQ5
HL6	Anzeigeleuchte	Indicator lamp		11-E4		03111025HL6
HL7	Anzeigeleuchte	Indicator lamp		11-E3		03111025HL7
SQ9	Induktiver Näherungsschalter	Inductive proximity sensor	Omron	8-C5	E2B-M12KS04-WZ-C1	03111025SQ9

Schmierstoffe Lubricant Lubrifiant	Viskosität Viscosity Viscosité ISO VG DIN 51519 mm²/s (cSt)	Kennzeichnung nach DIN 51502							
Getriebeöl Gear oil Huile de réducteur	VG 680	CLP 680	Aral Degol BG 680	BP Energol GR-XP 680	SPARTAN EP 680	Klüberoil GEM 1-680	Mobilgear 636	Shell Omala 680	Meropa 680
	VG 460	CLP 460	Aral Degol BG 460	BP Energol GR-XP 460	SPARTAN EP 460	Klüberoil GEM 1-460	Mobilgear 634	Shell Omala 460	Meropa 460
	VG 320	CLP 320	Aral Degol BG 320	BP Energol GR-XP 320	SPARTAN EP 320	Klüberoil GEM 1-320	Mobilgear 632	Shell Omala 320	Meropa 320
	VG 220	CLP 220	Aral Degol BG 220	BP Energol GR-XP 220	SPARTAN EP 220	Klüberoil GEM 1-220	Mobilgear 630	Shell Omala 220	Meropa 220
	VG 150	CLP 150	Aral Degol BG 150	BP Energol GR-XP 150	SPARTAN EP 150	Klüberoil GEM 1-150	Mobilgear 629	Shell Omala 150	Meropa 150
	VG 100	CLP 100	Aral Degol BG 100	BP Energol GR-XP 100	SPARTAN EP 100	Klüberoil GEM 1-100	Mobilgear 627	Shell Omala 100	Meropa 100
	VG 68	CLP 68	Aral Degol BG 68	BP Energol GR-XP 68	SPARTAN EP 68	Klüberoil GEM 1-68	Mobilgear 626	Shell Omala 68	Meropa 68
	VG 46	CLP 46	Aral Degol BG 46	BP Bartran 46	NUTO H 46 (HLP 46)	Klüberoil GEM 1-46	Mobil DTE 25	Shell Tellus S 46	Anubia EP 46
	VG 32	CLP 32	Aral Degol BG 32	BP Bartran 32	NUTO H 32 (HLP 32)	Klübersynth GEM 4-32 N	Mobil DTE 24	Shell Tellus S 32	Anubia EP 32
Hydrauliköl Hydraulic oil Huile hydraulique	VG 32	CLP 32	Aral Vitam GF 32	BP Energol HLP HM 32	NUTO H 32 (HLP 32)	LAMORA HLP 32	Mobil Nuto HLP 32	Shell Tellus S2 M 32	Rando HD HLP 32
	VG 46	CLP 46	Aral Vitam GF 46	BP Energol HLP HM 46	NUTO H 46 (HLP 46)	LAMORA HLP 46	Mobil Nuto HLP 46	Shell Tellus S2 M 46	Rando HD HLP 46
Getriebefett Gear grease Graisse de réducteur		G 00 H-20	Aral FDP 00 (Na-verseift) Aralub MFL 00 (Li-verseift)	BP Energrease PR-EP 00	FIBRAX EP 370 (Na-verseift)	MICRO-LUBE GB 00	Mobilux EP 004	Shell Alvania GL 00 (Li-verseift)	Marfak 00

Spezialfette, wasserabweisend Special greases, water resis- tant Graisses spéciales, déperlant			Aral Aralub	Energearse PR 9143		ALTEMP Q NB 50 Klüberpaste ME 31-52	Mobilux EP 0 Mobil Gre- serex 47		
Wälzlagperfett Bearing grease Graisse de roulement		K 3 K-20 (Li-verseift)	Aralub HL 3	BP Energearse LS 3	BEACON 3	CENTO- PLEX 3	Mobilux 3	Shell Alva- nia R 3 Alva- nia G 3	Multifak Pre- mium 3
Öle für Gleitbahnen Oils for slideways Huiles pour glissières	VG 68	CGLP 68	Aral Deganit BWX 68	BP Maccurat D68	ESSO Febis K68	LAMORA D 68	Mobil Vactra Oil No.2	Shell Tonna S2 M 68	Way lubri- cant X 68
Öle für Hochfrequenzspin- deln Oils for Built-in spindles Huiles pour broches à haute vitesse	VG 68		Deol BG 68	Emergol HLP-D68	Spartan EP 68		Drucköl KLP 68-C	Shell Omala 68	
Fett für Zentralschmierung (Fließfett) Grease for central lubrica- tion Graisse pour lubrification centrale	NLGI Klasse 000 NLGI class 000		ARALUB BAB 000	Grease EP 000	Shell Gadus S4 V45AC	CENTO- PLEX GLP 500	Mobilux EP 023		Multifak 264 EP 000
Fett für Hochfrequenzspin- deln Grease for Built-in spindles Graisse pour broches à haute vitesse	<p style="text-align: center;">METAFLUX-Fett-Paste (Grease paste) Nr. 70-8508 METAFLUX-Moly-Spray Nr. 70-82 Techno Service GmbH ; Detmolder Strasse 515 ; D-33605 Bielefeld ; (++49) 0521- 924440 ; <a href="http://www.metaflux-ts.de">www.metaflux-ts.de</a></p>								
Kühlschmiermittel Cooling lubricants Lubrifiants de refroidisse- ment	Schneidöl Aquacut C1, 10 L Gebinde, Artikel Nr. 3530030 EG Sicherheitsdatenblatt <a href="http://www.optimum-daten.de/data-sheets/Optimum-Aqua-cut_C1-EC-datasheet_3530030_DE.pdf">http://www.optimum-daten.de/ data-sheets/Optimum-Aqua- cut_C1-EC-datas- heet_3530030_DE.pdf</a>		Aral Emusol	BP Sevora	Esso Kutwell		Mobilcut	Shell Adrana	Chevron Soluble Oil B



## 8 Malfunctions

Malfunction	Possible cause	Solution
Chatter marks as a result of vibrations.	<ul style="list-style-type: none"> <li>The anchoring of the machine is not stable enough.</li> <li>Adjusting screws Lock nuts in the machine base are loose.</li> <li>Work tables do not run smoothly.</li> <li>Grinding wheel does not sit firmly on the flange.</li> <li>Flange is not tight on the spindle.</li> <li>Grinding wheel and flange are not well balanced.</li> <li>Grinding wheel is not homogeneous.</li> <li>Grinding wheel is not well dressed.</li> <li>Too much pressure on the spindle.</li> <li>Transmission of vibrations from neighbouring machines.</li> <li>Connection between motor and spindle is loose or parts are damaged.</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize the anchorage.</li> <li>Check alignment, tighten lock nuts.</li> <li>Slideway oil does not reach the lubrication points.</li> <li>Replace wheel between grinding wheel and flange.</li> <li>Clean contact surfaces, check tightness.</li> <li>Balance grinding wheel and flange.</li> <li>Remove the grinding wheel and balance or replace it.</li> <li>Check position of diamond and puller, replace diamond if necessary.</li> <li>Excessive infeed of the grinding wheel.</li> <li>Improve anchoring of the machine or move the machine to a vibration-free location.</li> <li>Fix or replace connecting parts.</li> </ul>
Flutter marks on the surface of the workpiece	<ul style="list-style-type: none"> <li>Uneven running of the grinding wheel.</li> <li>Grinding wheel too hard or blunt.</li> <li>Vibrations coming from the building or the street.</li> </ul>	<ul style="list-style-type: none"> <li>Voltage phases of the power supply are not uniform.</li> <li>Use a softer or coarser-grained grinding wheel.</li> <li>Use vibration plates or stabilize anchoring.</li> </ul>
Beam pattern	<ul style="list-style-type: none"> <li>Spindle bearing defective, running noises ?</li> </ul>	<ul style="list-style-type: none"> <li>Change spindle bearing</li> </ul>
Comma-shaped lines are created during precision grinding	<ul style="list-style-type: none"> <li>Coolant dirty.</li> <li>Dirt on workpiece.</li> </ul>	<ul style="list-style-type: none"> <li>Clean coolant or use filter.</li> <li>Clean the inside of the grinding wheel cover or replace the grinding wheel.</li> </ul>
burn marks and cracks	<ul style="list-style-type: none"> <li>Grinding wheel too hard.</li> <li>Pendulum speed too high</li> <li>Grinding wheel is dull or smeared.</li> <li>Too much material removal.</li> <li>Ineffective cooling</li> </ul>	<ul style="list-style-type: none"> <li>Use a softer or coarser-grained grinding wheel.</li> <li>Reduce the oscillation speed.</li> <li>Remove the grinding wheel.</li> <li>Reduce crossfeed</li> <li>Use coolant suitable for the grinding wheel and the material to be machined.</li> </ul>
Firing does not work.	<ul style="list-style-type: none"> <li>Machine poorly aligned.</li> </ul>	<ul style="list-style-type: none"> <li>Align the machine.</li> </ul>



Malfunction	Possible cause	Solution
Pendulum movement of the table does not start.	<ul style="list-style-type: none"> <li>Switch on the electromagnet first.</li> <li>Hydraulic pump not working.</li> <li>Air in the hydraulic circuit.</li> <li>Hydraulic pump does not supply oil.</li> </ul>	<ul style="list-style-type: none"> <li>Turn it on.</li> <li>Overload protection triggered?</li> <li>Check oil level, bleed by running through several times.</li> <li>Check the direction of rotation of the motor or top up oil.</li> </ul>
Worktable does not run smoothly.	<ul style="list-style-type: none"> <li>Incorrect hydraulic oil</li> <li>Oil level in hydraulic unit too low, air in the system.</li> <li>Suction filter of hydraulic pump clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Use hydraulic oil ISO VG 32.</li> <li>Top up oil, bleed by running through several times.</li> <li>Suction filter Clean hydraulic pump and replace oil of hydraulic unit.</li> </ul>
Working table does not change the pendulum direction.	<ul style="list-style-type: none"> <li>Directional control arm has detached from the axis for changing direction.</li> </ul>	<ul style="list-style-type: none"> <li>Readjust directional control arm  Directional arm for oscillation on page 81</li> </ul>
Automatic crossfeed does not work.	<ul style="list-style-type: none"> <li>Motor control unit is defective</li> <li>Crossfeed switch is defective</li> </ul>	<ul style="list-style-type: none"> <li>Check terminal.</li> <li>Replace switch.</li> </ul>
Crossfeed only runs in one direction.	<ul style="list-style-type: none"> <li>Perimeter switch is defective or stop bolt is loose.</li> </ul>	<ul style="list-style-type: none"> <li>Fix stop bolt or replace limit switch.</li> </ul>
Magnetisation does not work.	<ul style="list-style-type: none"> <li>Fuse has tripped.</li> <li>Transformer is defective.</li> <li>Switch SA6 is defective.</li> </ul>	<ul style="list-style-type: none"> <li>Replace fuse.</li> <li>Replace transformer.</li> <li>Check switch, replace if necessary</li> </ul>



## 9 Appendix

### 9.1 Copyright

Optimum Maschinen Germany GmbH

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### 9.2 Changes

Any changes in the construction, equipment and accessories are reserved for reasons of enhancement. Therefore, no claims may be derived from the indications and descriptions. Errors excepted!

### 9.3 Change information manual

Chapter	Short note	new version no.
3 ; 4.20	Interdepartmental transport ; DRO	1.0.1
3.8	Installation of the collecting trays on GT40	1.0.2

### 9.4 Product follow-up

We are required to perform a follow-up service for our products which extends beyond shipment.

We would be grateful if you could send us the following information:

- Modified settings
- Experience with the surface grinding machine that is important for other users
- Recurring malfunctions
- Difficulties with the documentation

Optimum Maschinen Germany GmbH

Dr.-Robert-Pfleger-Str. 26  
D-96103 Hallstadt

email: info@optimum-maschinen.de

### 9.5 Liability claims for defects / warranty

Besides the legal liability claims for defects of the customer towards the seller, the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or were promised as part of a single contractual provision.

- Liability or warranty claims are processed at OPTIMUM GmbH's discretion either directly or through one of its dealers.  
Any defective products or components of such products will either be repaired or replaced by components which are free from defects. Replaced products or components become our property.
- The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- Defects resulting from the following circumstances are excluded from liability and warranty claims:
  - Using the product beyond the technical options and proper use, in particular due to overstraining of the machine.
  - Any defects arising by one's own fault due to faulty operations or if the operating manual



is disregarded.

- Inattentive or incorrect handling and use of improper equipment
  - Unauthorized modifications and repairs
  - Insufficient installation and safeguarding of the machine
  - Disregarding the installation requirements and conditions of use
  - atmospheric discharges, overvoltage and lightning strokes as well as chemical influences
- Neither are the following items covered by liability or warranty claims:
- Wearing parts and components which are subject to normal and intended wear, such as V-belts, ball bearings, lighting, filters, seals, etc.
  - Non reproducible software errors
- Any services, which OPTIMUM GmbH or one of its agents performs in order to fulfil any additional warranty are neither an acceptance of the defects nor an acceptance of its obligation to compensate. These services neither delay nor interrupt the warranty period.
- The court of jurisdiction for legal disputes between businessmen is Bamberg.
- If any of the aforementioned agreements is totally or partially inoperative and/or invalid, a provision which nearest approaches the intent of the guarantor and remains within the framework of the limits of liability and warranty which are specified by this contract is deemed agreed.

## 9.6 Storage

### ATTENTION!

**Incorrect and improper storage might result in damage or destruction of electrical and mechanical machine components.**



**Store packed and unpacked parts only under the intended environmental conditions.**

**Follow the instructions and information on the transport box:**

- **Fragile goods**  
**(Goods require careful handling)**



- **Protect against moisture and humid environment**



- **Prescribed position of the packing case (Marking of the top surface - arrows pointing to the top)**



- **Maximum stacking height**



**Example: not stackable - do not stack further packing case on top of the first one.**

Please contact Optimum Maschinen Germany GmbH if the surface grinding machine and accessories have to be stored for longer than three months and under other than the specified ambient conditions.



## 9.7 Advice for disposal / Options of re-use

Please dispose of your equipment in an environmentally friendly manner, by not placing waste in the environment but in a professional manner.

Please do not simply throw away the packaging and later the disused machine, but dispose of both in accordance with the guidelines laid down by your city council/local authority or by an authorised disposal company.

### 9.7.1 Decommissioning

#### CAUTION !

Immediately decommission used machines in order to avoid later misuse and endangering of the environment or of persons.



Cut the connection cable.

Remove all environmentally hazardous operating fluids from the used device.

If applicable remove batteries and accumulators.

Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.

Dispose of machine components and operating fluids using the intended disposal methods.

### 9.7.2 Disposal of new device packaging

All used packaging materials and packaging aids from the machine are recyclable and generally need to be supplied to the material reuse.

The packaging wood can be supplied to the disposal or the reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are passed to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow direct reuse.

### 9.7.3 Disposal of the machine

#### INFORMATION



Please take care in your interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and admitted way.

Please note that the electrical devices comprise a variety of reusable materials as well as environmentally hazardous components. Please ensure that these components are disposed of separately and professionally. In case of doubt, please contact your municipal waste management. If appropriate, call on the help of a specialist waste disposal company for the treatment of the material.

### 9.7.4 Disposal of electrical and electronic components

Please make sure that the electrical components are disposed of professionally and according to the statutory provisions.

The device is composed of electrical and electronic components and must not be disposed of as household waste. According to the European Directive regarding electrical and electronic used devices and the implementation of national legislation, used power tools and electrical machines need to be collected separately and supplied to an environmentally friendly recycling centre.



As the machine operator, you should obtain information regarding the authorised collection or disposal system which applies for your company.

Please make sure that the electrical components are disposed of professionally and according to the legal regulations. Please only throw depleted batteries in the collection boxes in shops or at municipal waste management companies.

## 9.7.5 Disposal of lubricants and coolants

### ATTENTION!

**Please imperatively make sure to dispose of the used coolant and lubricants in an environmentally compatible manner. Observe the disposal instructions of your municipal waste management companies.**



### INFORMATION

**Used coolant emulsions and oils should not be mixed since it is only possible to reuse oils without pre-treatment when they have not been mixed.**



**The disposal instructions for used lubricants are made available by the manufacturer of the lubricants. If necessary, request the product-specific data sheets.**

## 9.8 Disposal through municipal collection facilities

Disposal of used electrical and electronic components

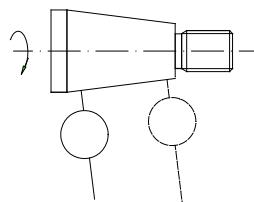
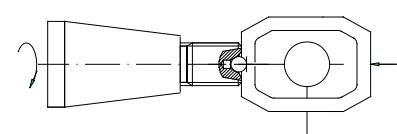
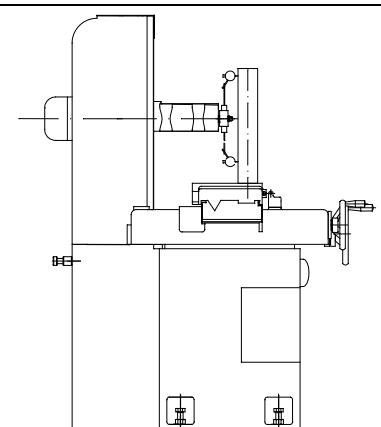
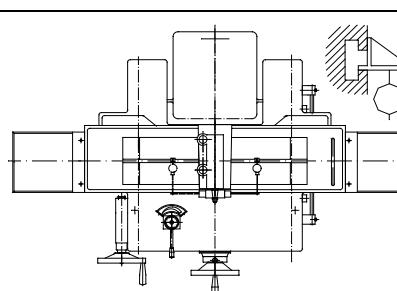
(Applicable in the countries of the European Union and other European countries with a separate collecting system for those devices).

The sign on the product or on its packing indicates that the product must not be handled as common household waste, but that it needs to be disposed of at a central collection point for recycling. Your contribution to the correct disposal of this product will protect the environment and the public health. Incorrect disposal constitutes a risk to the environment and public health. Recycling of material will help reduce the consumption of raw materials. For further information about the recycling of this product, please consult your District Office, municipal waste collection station or the shop where you have purchased the product.

## 9.9 Genauigkeitsbericht - Accuracy report

Der Abschlussbericht der Genauigkeit liegt der Maschine bei. *The final accuracy report is enclosed with the machine.*

No.	Items	Diagram	Permissible deviation	Actual deviation
1	Flatness of the table surface		Full length: 0.01 Local: 0.005/300	
2	a. Parallelism of the table surface to its longitudinal movement b. Parallelism of the table surface to its transverse movement		a. Full length: 0.015 Local: 0.008/300 b. Full length: 0.01	
3	Parallelism of the median slot to the longitudinal movement of table		Full length: 0.015 Local: 0.008/300	
4	Verticality of the table transverse movement to the longitudinal movement		0.03/300	
5	Verticality and straightness of the wheel head up and down to the table surface		0.03/300	

6	Radial run out of the wheel spindle nose		0.004	
7	Axial run out of the wheel spindle		0.004	
8	Parallelism of the spindle center line to the table surface		0.025/300	
9	Verticality of the spindle center line to the medina slot		0.015/300	

## Machining precision

No.	Inspection items	Permissible deviation	Actual deviation	Remark
P1	Grinding five columned test blocks	Tolerance in thickness: 0.005/300		Test pieces are 45#steel $\phi 50$
P2	Grinding completed test block	Tolerance in thickness: 0.005/300		The material test piece is iron HT200, the length is half of table, width is three times of wheel width ,the thickness is 60mm



## **EC - Declaration of Conformity**

according to Machinery Directive 2006/42/EC Annex II 1.A

**The manufacturer / distributor** Optimum Maschinen Germany GmbH  
Dr. Robert-Pfleger-Str. 26  
D - 96103 Hallstadt

hereby declares that the following product

**Product designation:** Surface grinding machine

**Type designation:** GT25 | GT30 | GT40

fulfills all the relevant provisions of the directive specified above and the additionally applied directives (in the following) - including the changes which applied at the time of the declaration.

### Description:

Hand-operated grinding machine with power-driven axes and limited numerical control capabilities.

#### **The following additional EU Directives have been applied:**

EMC Directive 2014/30/EC ; Restriction of the use of certain hazardous substances in electrical and electronic equipment 2015/863/EU

**The following harmonized standards were applied:**

EN ISO 16089:2016-06 - Machine tools – Safety – Stationary grinding machines

EN 60204-1:2014 - Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EN 13849-1:2015 - Safety of machinery - Safety related parts of controls - Part 1: General design principles

EN 13849-2:2012 - Safety of machinery - Safety related parts of controls - Part 2: Validation

EN ISO 12100:2013 - Safety of machinery - General principles for design - Risk assessment and risk reduction

EN 61000-6-2 - Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments

EN 55011:2014-11 - Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement - class A

EN 61000-3-2:2015-03 - Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase)

EN 61000-3-3:2014-03 - Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.

EN ISO 4413 - Hydraulic fluid power — General rules and safety requirements for systems and their components

Name and address of the person authorized to compile the technical file:

Kilian Stürmer, phone: +49 (0) 951 96555 - 800

Kilian Stürmer (CEO, General Manager)  
Hallstadt 2019-05-14

GT25-GT30\_GT40\_CE\_en.fm

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