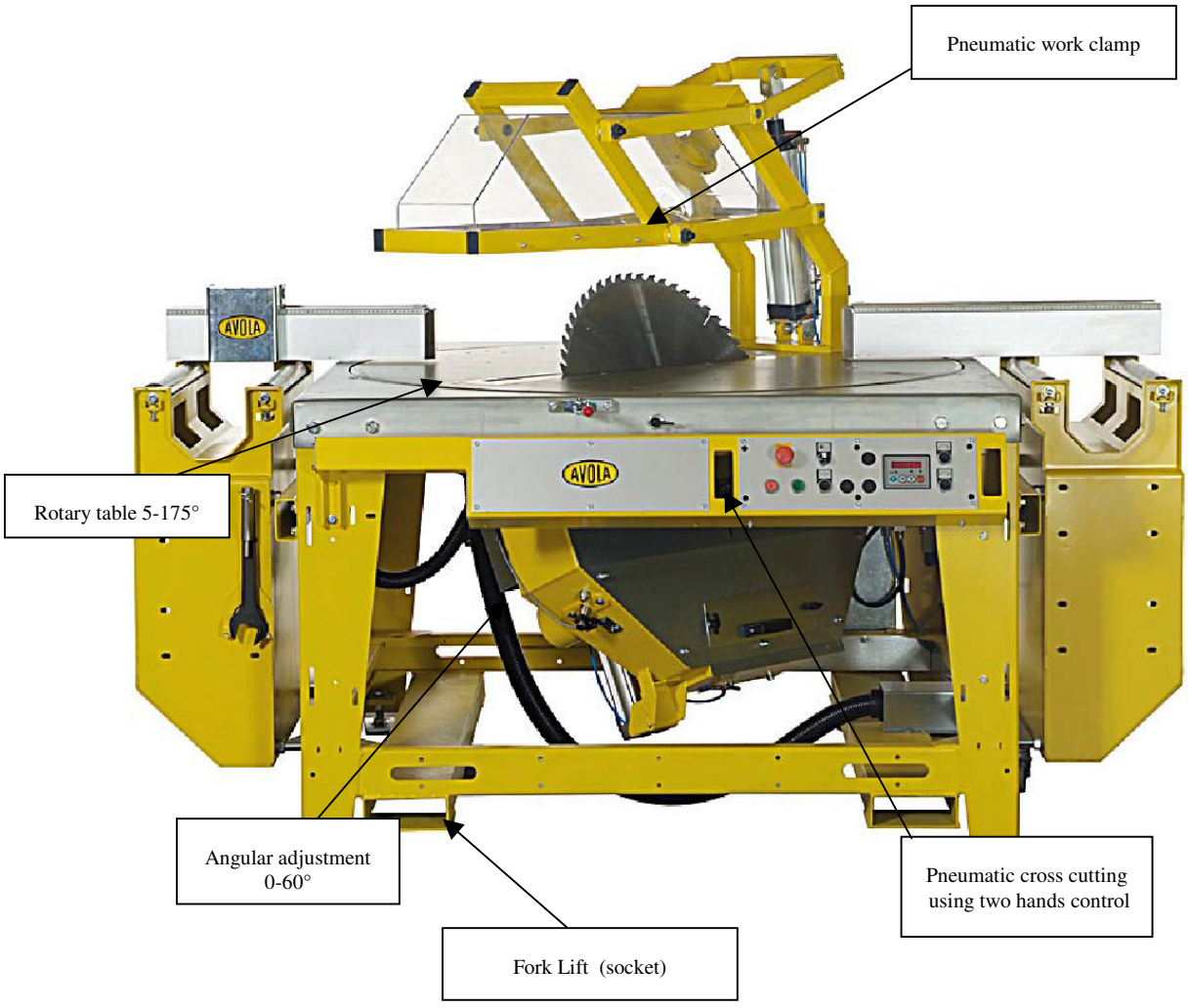
translation form German 04.01.2010

Operating Instructions
For the
Revolving Table Cross Cut Saw

(Circular Saw Bench)

GAMA 65 K



Contents

Product Description

1. Intended use

The Revolving Table Cross Cut Saw GAMA is intended for the following only:

- Working wood and similar materials

The machine is not designed to be used for purposes other than those listed here – this would be an illicit use of the machine! In particular, the following are forbidden:

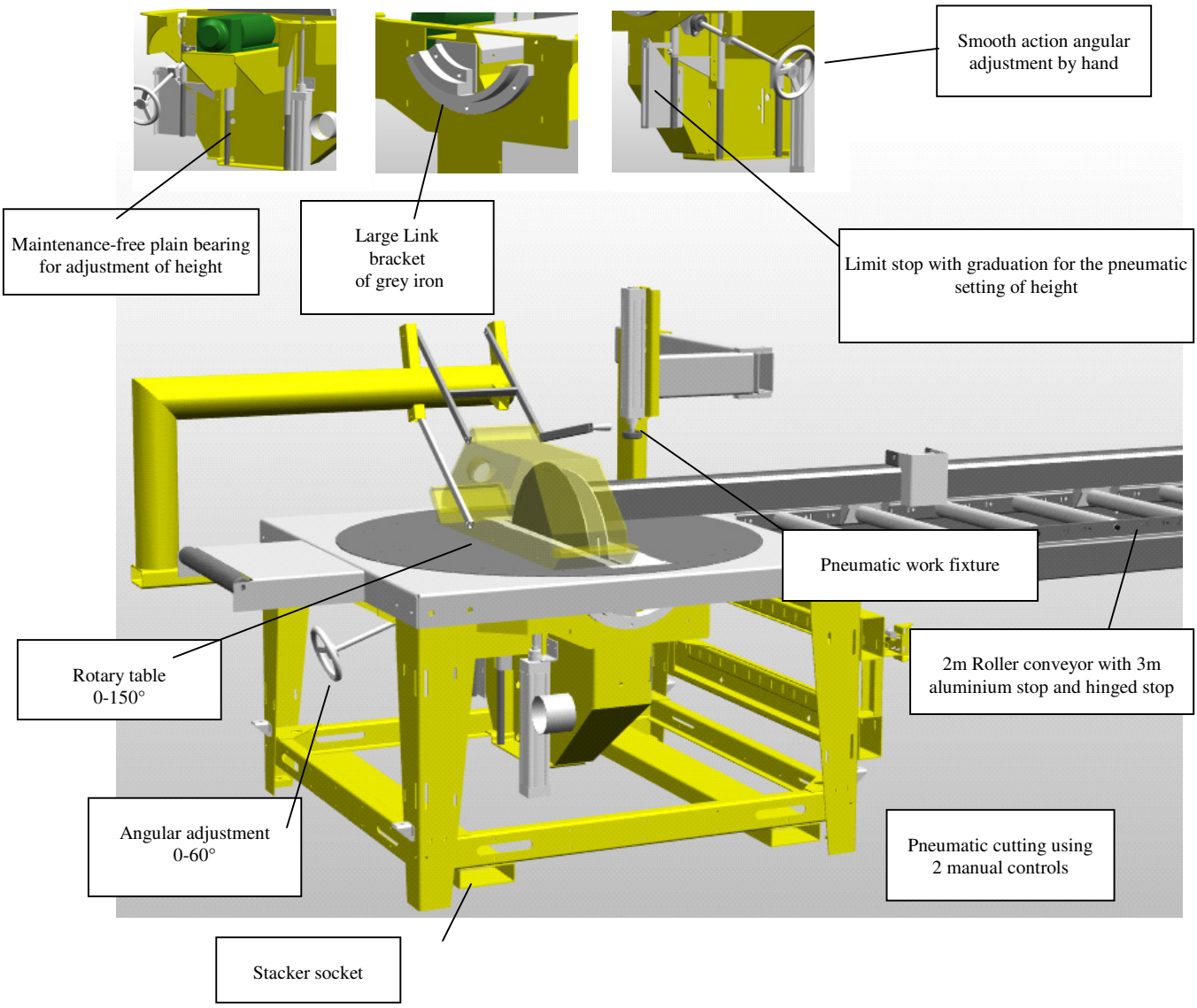
- Machining metals or plastic materials

The permitted sizes indicated in the section Technical Data in this chapter, in respect of materials to be machined, also in any other technical specifications, must be strictly adhered to.

Danger

If the Revolving Table Cross Cut Saw is used for purposes contrary to the ones defined here, a sure operation of the machine cannot be guaranteed. The operator, not the manufactuer, will be responsible in respect of personal injury and damage to property caused by improper use of the machine!

2. Structure and functioning of the Revolving Table Cross Cut Saw GAMA 65 S



3. Description of the functions

The Gama 65 S Revolving Table Cross Cut Saw is driven by an electric motor.

Standard equipment:
For the model Gama 65 S

- The saw blade is covered by a protective hood.
- 2m Roller conveyor on right, fitted to machine table, has lateral travel
- Longitudinal stop 3000mm long, longotudinal shifting.
- Pneumatic elevation adjustment and square-cutter
- Elevation stop mechanical, using a locking screw
- Mechanical angular adjustment of the blade, to max. 30°
- Mechanical limit stop on the swing member
- (Saw) blade
- Work clamp for square-cutting using a pneumatic cylinder
- Rotary table moving through 0°-150°, stepless fixing using clamps with index every 15° in the range 0-150°.

Optional:

- Angular adjustment, electric, with digital display of angle. This display is incorporated in the operator's console.

Pneumatic work clamp cylinder

- For the left only if the machine is fitted with hood (i.e. not with blade guard). The clamp cylinder can be operated only with the two-hands control provided, slacken the cylinder using its own key. The clamp cylinder may be adjusted as follows: square to split-cutting direction, and swivelling round a vertical axis about a pivot located at the front.

Laser

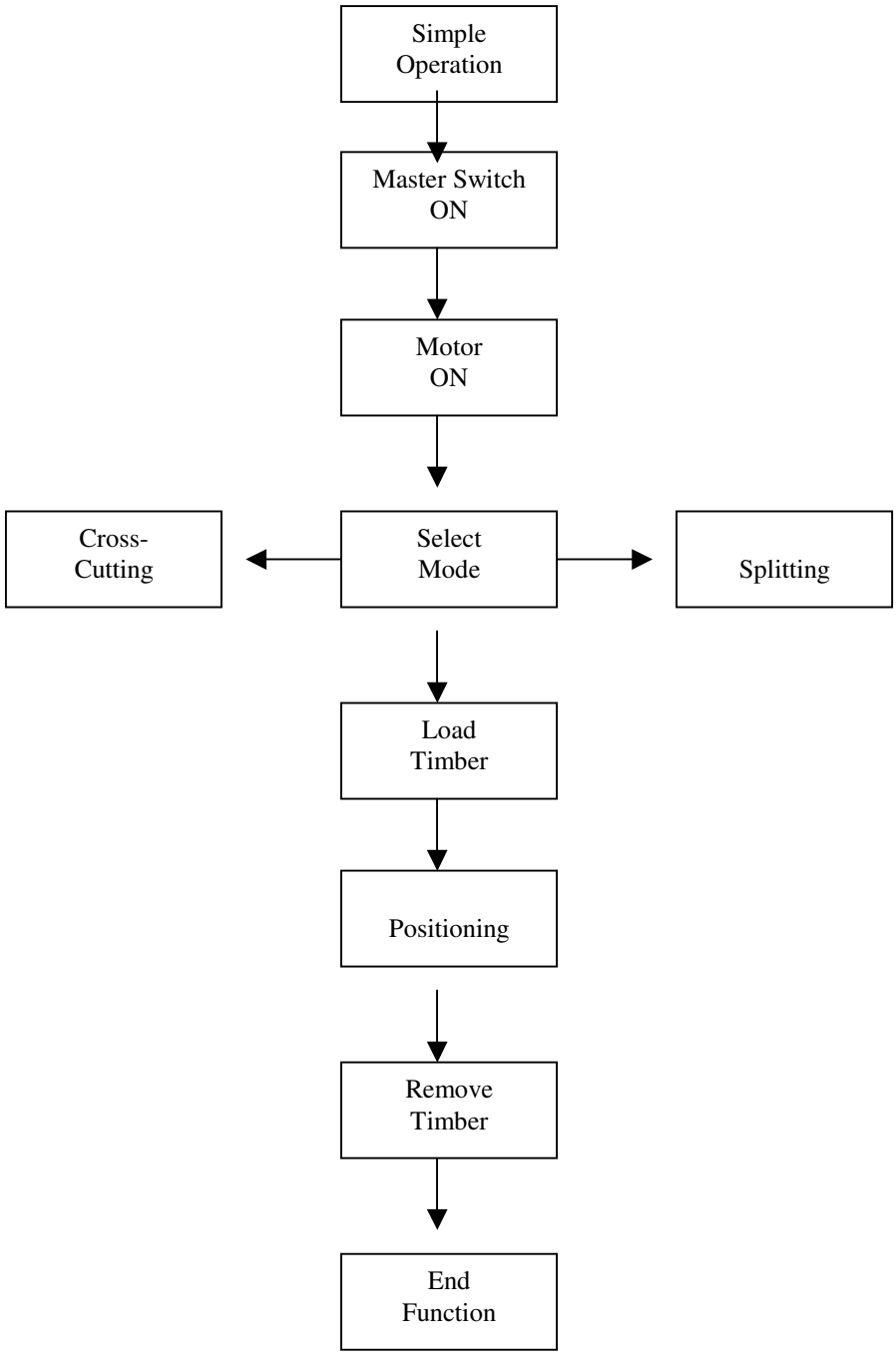
- The built-in laser is fitted underneath the table, inside the unit housing. (ON/OFF switch on the control panel)

Roller conveyor

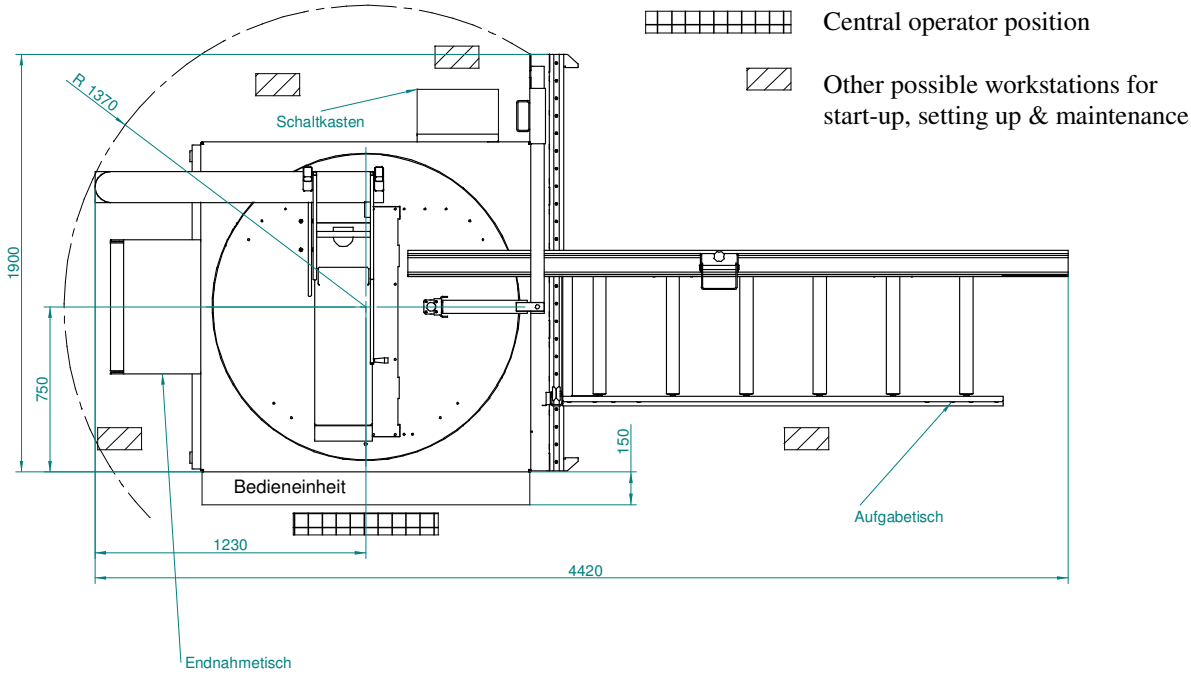
- For the left and right there are available laterally-shiftable roller conveyor extensions of 2 or 3 m length.

Sequence of functions

Splitting and cross-cutting



Possible operator workstations



Safety Equipment

The safety equipment:

- Safety hood,
- Protective box
- Riving knife
- Two-hand control
- The emergency OFF switch effects only a normal stopping of the machine. The power supply is not interrupted!
- Safety switch on the protective box effects emergency OFF, if the box is opened.
  The power supply is not interrupted!

• 4. Technical Data

Technical data	Unit	65 S
Drive		Direct
Motor output P2,S1**	kW	7,5
Current/type	Volt	400 / DS
Rated current	A	15,2
Frequency	HZ	50
Appliance plug		CEE532/6h
Fuses, slow-blow	A	32
Speed n, idling	Rpm	3000
Cutting speed	m/s	93
Blade hole	mm	30
∅ Blade min/max.	mm	550/650
Cutting height 90°	mm	246
45°	Mm	164
30°	Mm	113
Table size L/B/H	mm	1500x1500x900
Weight	kg	1000
Knife thickn.	mm	4,7
Knife suitable for ∅ blade min/max.	mm	550/700
Guide slot width	mm	13
Sount pressure at workstation	dB	95,6 92,2
Acoustic power ISO 3746	dB	107,5 109,1
∅ Suction connection total	mm	160
Air volume (exhaust)	m^3/h	1500
Partial vacuum at 20,5 m/s	Pa	1500
Comp. Air (min.)	bar	6
Air volume (compr.air)	L/min	500

** Power taken from DIN VDE 0530; S1
P1 = Input power
P2 = Output power
Subject to techn. alterations

EU Declaration of Conformity

in the meaning of EU Machinery Guideline (**2006/42/EG**)

We hereby declare that the under-mentioned machine, by reason of its design and type, and the version marketed by us, complies with the governing safety and health requirements laid down in the relevant EU-Guideline(s).
This declaration will no longer be valid should the machine by altered without our knowledge.

Description of the machine:	Revolving Table Cross Cut Saw
Maschinentyp:	
Machine - No.	
Relevant EU Guidelines:	EU-Machiney Guidelines (2006/42/EG) version: 17.05 2006 EU-Guideline electromagnetic compatibility (2004//108/EG)
Applied harmonised norms, In particular	EN 1870-5 + 10
Competent office:	Fachausschuss Holz Prüf- und Zertifizierungsstelle im BG- Prüfzert Kenn-Nummer 0392 Vollmoellerstraße 11 D- 70563 Stuttgart-Vaihingen
Number of EG-Model design certification	091128
addres of the factory	AVOLA Maschinenfabrik A. Volkenborn GmbH & Co.KG Heiskampstraße 11 D- 45527 Hattingen
Documentation	AVOLA Maschinenfabrik Dirk Strauch Heiskampstraße 11 D- 45527 Hattingen
authorized representative	Dirk Strauch, technischer Leiter, Prokurist
Hattingen, den 30.11.2009	ppa. D. Strauch

General Safety Instructions

Operator's Duty to Take Care

The GAMA Revolving Table Cross Cut Saw has been designed and built taking into account a hazard analysis, and after careful selection of the harmonised standards that are to be adhered to, and other technical specifications. The machine therefore complies with the state of the art and ensures the greatest possible measure of safety while being operated.

Design changes to the machine are allowed only after written permission by the manufacturer has been obtained.

The safety of the machine in use may only be warranted, if all requisite action has been undertaken. It is the responsibility of the operator of the machine to effect the necessary planning and implementation.

In particular, the operator must ensure the following:

- The machine is used only for the intended purpose (see the section „Intended Use" in the chapter „Product Information")
- The machine is operated only when it is in a proper functional condition and that the safety equipment is regularly checked
- There is protective equipment available for operating, maintenance and repair work personnel, and this is worn
- The operating instructions may be found in intact and legible state at the machine site
- Only suitable qualified and authorised personnel are allowed to operate the machine, or effect repairs and maintenance
- The personnel are regularly given instruction on all matters appertaining to protection of labour and environmental protection, and they are familiar with the operating instructions and the safety instructions mentioned therein
- None of the safety and warning notices fitted to the machine have been removed, and they are fully legible.

Specific safety instructions and symbols used

The following operating instructions contain specific safety instructions, to make people aware of the inherent risks in using the machine. Such residual risks represent dangers for

- Persons
- Product and machine
- Environment

The symbols usd in the operating instructions are intended to make you aware of the safety aspects!

This sign indicates possible danger to persons.
(Mortal Danger, Danger of Injury)

Danger

This sign warns you to look out, as the machine, the stock or the environment could be damaged.

BEWARE

The main object of the safety instructions is to obviate injury to persons.

If a safety notice is accompanied by this triangle with the warning „Danger“, this could also mean danger to the machine, the stock, or the environment.
If a safety notice is accompanied by the triangle with the warning „Beware“ an injury to perople is not likely.

These symbols are not meant as a substitute for the text. So you should read all of the text!

This sign does not dennote a safety instruction, rather just information to assist better understanding of the machine processes.

Fundamental safety instructions for normal operation

The machine is to be operated only by suitable trained and authorised persons, who are familiar with the operating instructions and who are able to work accordingly!

Before you swith the machine on, check to see that only authorised persons are on the work site and that no one could be hurt by the machine starting up!

Before starting a production run, look for any signs of damage and make sure that the machine will be running in tip top condition! Report any shortcomings to your foreman!

Before starting a production run, remove stock/objects, not needed for the production, from the working area of the machine!

Before commencing production, make sure that all safety equipment is installed and not damaged!

Safety

Safety instructions for the operator

- The Revolving Table Cross Cut Saw may be used only for the purpose intended. The operator must ensure that all persons involved with the operation and maintenance of the machine have read and understood, and can obey, the operating instructions, especially those pertaining to safety. While the machine is in operation none of the safety guards are to be removed or rendered ineffective.

- Only suitable trained or semiskilled workers aged 18 or over are allowd to operate wordworking machinery. Trainees and semiskilled persons or persons receiving just a general education may work on the machine only if accompanied by an experienced person.

- If the Revolving Table Cross Cut Saw is operated in a closed room, the machine must be connected to a shavings exhaustor pursuant to TRGS. A machine not having a shavings exhaustor is to be operated in the open only.

- The push-stick/handle for sliding wood is to be used, if the distance between the saw blade and longitudinal stop is less than 120 mm, or if the parts to be produced are narrower or shorter than 120 mm.

- The push-stick must be used, so that your hands are nowhere near the blade.

- Push-sticks must be 400 mm long , 80 -100 mm wide and 15 - 20 mm thick. Sliding shims are to be used for machining narrow work, so that the work can be pressed against the stop, should this be required.

- If it is not possible to do the work with a properly adjusted riving knife and top protective hood then suitable alternative protective devices and work guides must be used.

- Chase cutting may be carried out on machines only if the table raises and lowers the blade, and suitable anti-kick devices are present, which may be fixed to the stop or the table. The protecting hood must be located above the blade and lie on the work. The blade is then raised through the work to the correct height, the cutting executed and the blade lowered down again, before the work is removed.

- The machine must be installed on a sure base. An uneven floor must be levelled.

- Suitable general or local lighting must be provided.

- The starting material and the worked pieces should be stored near the normal workstation of the operator.

- Before operating the Revolving Table Cross Cut Saw the operator must look to see that no person or objects are located in the danger zone of the machine.

- It is not allowed to clean or troubleshoot while the motor is running. In such cases the power supply must be switched off and locked shut.

  You are not allowed to undertake any kind of alteration or conversion work to the machine that could affect safety, without first getting permission from the supplier! This applies also to the installation and the adjusting of additional safety equipment.

Important for the operator

- Wear ear protection, to reduce the likelihood of loss of hearing.
- Wear respiratory protection, to reduce the danger of breathing in injurious dust.
- Wear gloves when handling the blade (if at all possible saw blades to be treansported inside a tool carrier).
- Switch the machine off, if it is to be left unattended.
- In transit, obey the instructions of the manufacturer.
- Machine flaws, including its protective equipment and saw blades, to be reported as soon as they are detected.
- Learn how to do safe cleaning, repairs and regular removal of chips and dust to reduce the risk of fire.
- Follow the instructions of the manufacturer for the operation, adjusting and repairing of saw blades.
- Choose the correct riving knife, depending on the thickness of the blade.
- Note the maximum speed indicated on the blade.
- Use only correctly sharpened blades.
- Make sure that only saw collars are used as recommended by the manufacturer, i.e. for the intended use.
- Never remove chips or other parts from the work from the cutting zone while the machine is running, save with a push-stick.
- Make sure that all separating protecting equipment and other separating equipment necessary for the work cycle, are fitted, are in a good condition and properly maintained.
- Replacement parts must comply with the technical requirements laid down by the manufacturer. This condition will always be met in the case of genuine (original) parts.
- Work on electric equipment on the Revolving Table Cross Cut Saw to be carried out only by qualified electricians in accordance with the electrotechnical rules.
- You are not allowed to perform any kind of work procedure that appears to be dangerous!
- Action must always be taken to ensure that the Revolving Table Cross Cut Saw is safe and working properly!
  The machine to be used only if all protecting devices (hood/chip exhauster) are present and in good order!

- Should trouble occur, immediately switch the machine off and lock it! Operational trouble must be seen to immediately!

- If work of maintenance or repairs has to be done on pneumatic or mechanical components, connected to the pneumatic system, the supply of air to the machine must be interrupted and the pneumatic system vented.

- The handle on the protecting hood not to be used as a lifting eye.

Important!

In accordance with prEN1870 the machine may only be used when linked with the slide roller table!

- Only the original AVOLA riving knife wedge to be used. Only when a knife is used will the requirements of EN1870 be met.

  The saw blade must have a kerf of 5,2 mm. If this measure is not reached, the work will get stuck on the knife. The master blade must not be thicker than 4,6 mm.

Residual Risk

The machine is designed and built according to the EG Machinery Guideline and complies with the very strict European safety requirements. However, there still remain certain risks for the operator, listed hereunder.

Risk	Description
Limbs, clothing getting caught	- Long hair - Loose clothing
Destruction of the work, detached work parts	Carbide teeth / cracking / material flaws Wrong assembly during tool change, mounting and setting of the riving knife and the holder
Cutting danger through exposed blade	Cutting the work from the side is possible, wring assembly of the protecting hood
Getting burnt	Overheated work piece
Electric shock	Power supply not cut off during work of repair on the electric system
Dust attacking the respiratory passages	Residual dust content even when dust extraction is okay
Noise attacking the ears	Heavy noise nuisance even though mufflers are worn Noise and acoustic signals indicating trouble are ignored
Dangers of compressed air	Power supply not cut off when work of repair is beng done on the compressed air plant
Control system not behaving properly	Relay contacts have got stuck, when means that active units do not switch off even when EMERGENCY OFF is pressed. In this event zero the master switch and the trouble seen to before the next start-up.

Emissions

Noise emission details

The noise emission figures per prEN1870-5 are as follows:

Acoustic power level [dB(A)] Per EN ISO 3746:1995		**Acoustic power level at workstation [dB(A)] per EN ISO 11202:1996**	
Idling:	107,5	Idling:	92,2
Machining:	109,1	Machining:	95,6

The listed emission figures are subject to a measuring uncertainty excess K = 4 dB(A)
The emission values in respect of the noise pressure level at the workstation were ascertained in departure from ISO 7960 appendix A, as follows;
Tool: HM-Saw blade ∅ 600 mm
Workpiece: chipboard with t =32 mm
The indicated values are emission values and must not be taken to be safe workstation values. Although there is a correlation between emission and immission levels, it cannot just be assumed, whether further precautionary measures are called for or not. Facts that could influence the immission levels at the workplace, contain the duration of the effect, the peculiarity of the work space, other sources of noise etc., e.g. the number of machines and other contiguous circumstances. The permitted immission levels may also vary, from country to country. This information should however allow the user to make a better assessment of the risks and dangers involved.

Dust emission details

Connecting the machine to the exhaust

The machine is equipped with a connecting diameter of 125 mm and 80 mm and must be connected to an exhaust system before it is switched on in an enclosed space.
If the machine is connected to the exhaust using flexible hoses, take care that these hoses are made of hardly inflammable material and are electrostatically earthed.
A minimum air velocity of 20 m/s is necessary at the connect-up on the machine, to make sure the limiting value is always maintained.
The static underpressure at the connect-up of the machine at 20 m/s is ca. 1500 Pa. The required volumetric flow is 1500 m^3/h.

Fundamental safety measures during maintenance and repairs

Keep to the inspection and maintenance intervals prescribed in the operating instructions!

Obey the individual maintenance and repairs instructions contained in these operating instructions!

Close off the working area of the machine from unauthorised persons! Display notices.

Before starting work of maintenance and repair, switch off the master switch for the power supply and lock using a padlock! The key to this lock should be in the possession of the person who carries out the work of maintenance and repair!

If you are replacing heavy machine parts, use suitable lifting tackle and stops/buffers!

Before you start work of maintenance and repair, make sure that parts that have to be touched have already cooled down!

Work on electric equipment

Only a trained electrician is allowed to carry out work on the electrical equipment of the machine!

Always check out the electrical equipment on the machine!

Re-tighten any loose connections!

Damaged lines/cables to be replaced forthwith!

Always keep the switch cabinet closed! Access to this is allowed only for authorised people having a key/tool!

Never hose over switch cabinets and other housings of the electrical equipment for purposes of cleaning!

Working on the hydraulic and pneumatic equipment

Allow only specially trained workers to tend to the hydraulic and pneumatic equipment!

Render the pneumatic and hydraulic equipment on the machine pressure-less before commencing work of maintenance and repair!

Regularly replace hoses used in preventive maintenance, even though no damage can be found!
(Obey the instructions of the manufacturer!)

After work of maintenance and repair but before starting up again

- Check the screwed connection to see that they are tight
- Check that covers/lids, removed from containers, sieves or filters, have been duly returned.

After completion of work of maintenance and repair and before resuming production check that

- All materials, tools and other items needed for doing the work of maintenance and repair have been removed from the working area of the machine
- Any leaks from the machine have been cleaned up.
- The safety equipment on the machine is working okay!

Obey any environment regulations

When you do work on or with the machine, please ensure that statutory obligations as to no litter and orderly re-use/removal are respected!

In particular, substances a threat to water during work of installation, maintenance and repair, such as

- Lubricants and oils
- Hydraulic fluids
- Coolants
- Detergents containing solvents

do not contaminate the floor or get into the sewers!
Such substances must be collected, transported and stored in suitable receptacles, for subsequent disposal!
Sizes, Weight

Gama 65 S
Length x width x height
4560 x 2120 x 1700 mm (see
Installation plan in chapter
Product Description)
Weight
1000 kg

Transport

Beware

The following points need to be obeyed, so that there will be no danger of serious injury to persons or damage to the machine as it is being transported:

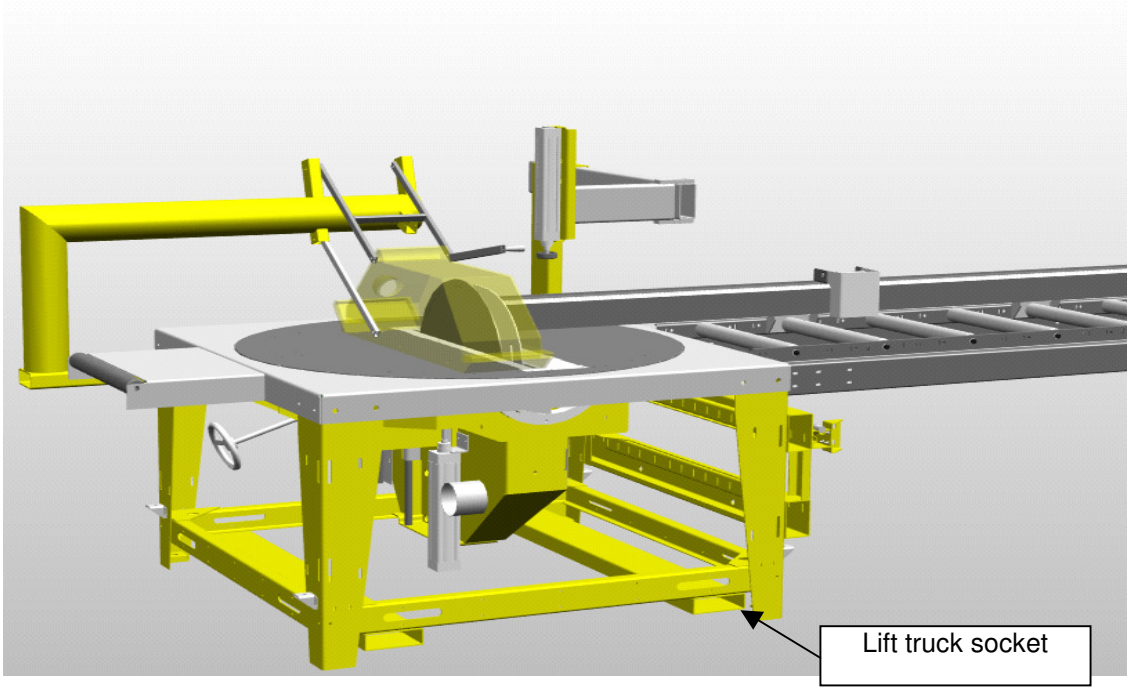
- Work of transport to be carried out only by skilled persons who obey the safety rules.
- The machine may be lifted only at the recognised stopping points.
- Only the indicated load-lifting and stops/buffers to be used for transporting the machine.
- Please read the chapter "General Safety Instructions ".

The machine may be transported using a fork-lift truck.

Beware

To obviate serious injury caused by unsteady position during transport:

- Transport the machine supported by the impact points provided.
- Beware of cables and hoses.



Sizes, weight

Gama 65 S
Length x width x height
4560x2120x1700 mm (See installation plan in the section: Product Description)
Weight
1000 kg

Transport to the installation site

Danger

Beware

When transporting the machine, the following safety instructions must be observed – which will prevdent serious injury to persons, damage to the machine or other kinds of damage.

Work of transportation to be carrie dout only by suitable qualified personnel who observe the safety rules.

- Please follow the instructions as to storage (protect the machine from damp)

- The machine to be lifted only at the points provided for this.

- The position indicated for transporting the machine must be maintained exactly.

- To move the machine, use only fork-lift trucks having a lifting capacity of 2500 kg. The outside size of the fork must be ca. 1200 mm and the length at least 1800 mm.

- When choosing a suitable load-lifting equipment always assume a total weight of 1400 kg.

- A third person should see to it that the road is clear.

- Roads are to be blocked and made secure so that no unauthorised persons can get near the danger zone of the machine.

- Please remember that the transport way takes a permitted loading of 32kg/cm^2.

- Any packaging material to be properly disposed of.

Installation

Danger

When you install the machine, please obey the following safety instructions – this will obviate mortal danger! Try to prevent damage to the machine and other damage to property.

- The work of erection – assembly and installation of the machine – must be effected only by trained personnel who follow the safety rules.
- Please make sure that a permitted floor loading of 32 kg/cm² exists on the site.
- Before commencing the working of erection check to see that there is no transit damage suffered by the machine.
- Make sure that only authorised persons are present in the working area and that no other persons are endangered by the work of erection.
- All machine connections – cables, hoses and pipelines – to be installed so that there will be no danger of tripping.
- When laying out the cables/hoses/lines the radii of bending must be strictly adhered to.
- Follow closely the handling instructions (e.g. earth, ...) in respect of the parts endangered by static charges.
- Do not use compressed air / detergents containing solvents for cleaning the machine.
- Please also read the section "General Safety Instructions ".

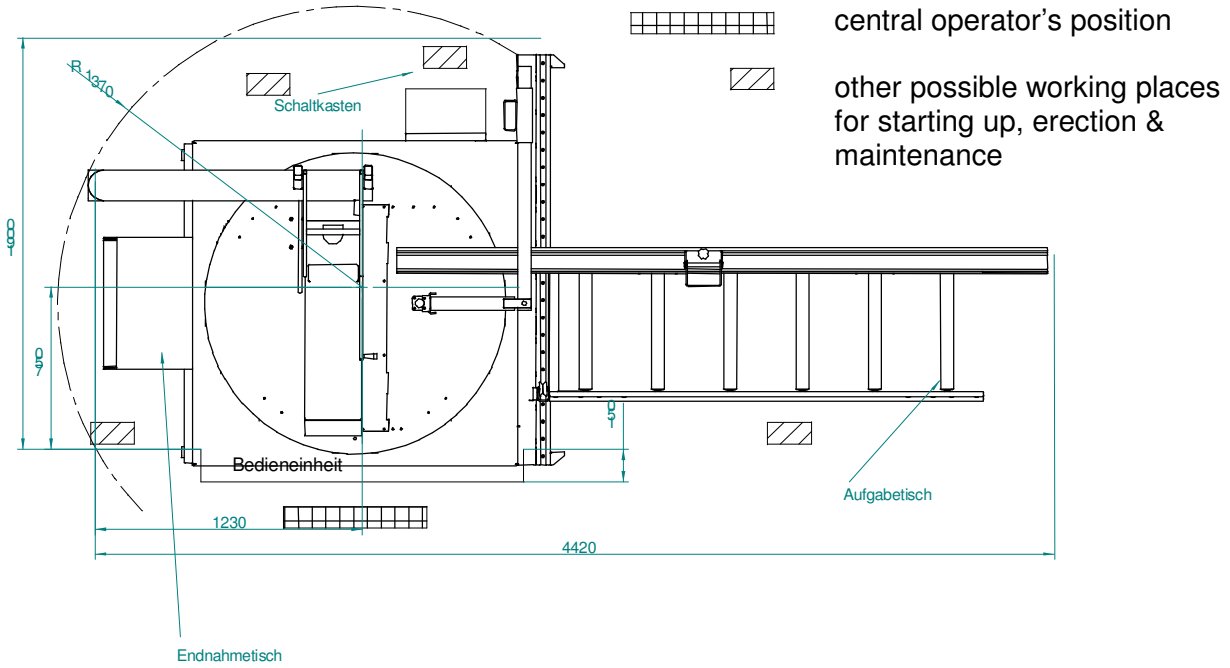
Beware

To ensure trouble-free operation of the machine do the following:

- Prepare the site so that the machine will be fully horizontal on a flat surface!
- Fit the connections with care and check for tightness!

Environmental conditions for the site

Space required, erection arrangement:



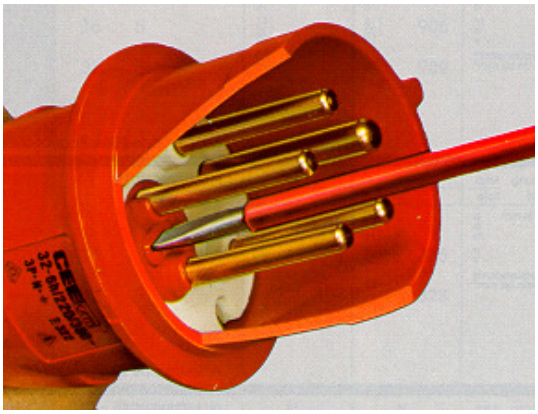
Electrical Installation

Beware

The machine is to be connected up only by trained and authorised electricians!

Installed loads
To connect up, you will need 3 Phase 400V, 50 Hz, neutral and earth conductors!
The machine has a CEE plug (Gama 65 S= 32 Ampere,). The connecting side of the Gama 65 S must be fitted with 32 Ampere slow-blow fuse.

If the machine has three-phase equipment check the rotational direction of the motor by switching on quick time. If the rotational direction is wrong de-couple the appliance plug from the machine. Inside the plug there is a phase inverter, which will enable you to easily change the direction of rotation. The phase inverter is actuated using a suitable screwdriver, by turning the round red plate, on which are fitted two pins, round 180°.



Compressed air connection

Beware

The master (main) switch does not disconnect the machine from the compressed air system.

The machine has to be operated using an air pressure of 6 bar (min.)! The air pressure has to be set on the service unit when the machine is commissioned and checked daily before beginning work!

Putting the machine into service

Checks to be made prior to commissioning

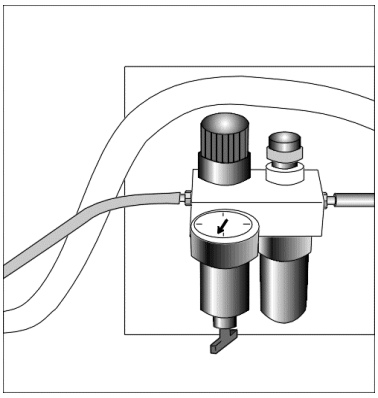
- Connect up the supply and discharge lines
- The following sequence of checks to be undertaken before the machine is commissioned:

1. Electrical connections

Check that all of the requisite electrical connections are plugged in and that the plugs are not loose!

If the supply of compressed air is from a separate compressor, this needs to be connected up too!

2. Air connection / Maintenance unit



1. **Check to see that the air hose is connected to the service unit, and is not loose!**
2. **Check that the display reads 6 bar operating pressure!**

Once the machine has been commissioned, but before it is put to productive use, you should check that all of the safety equipment is in good order!

Check the functioning of the safety equipment

Danger

To prevent death, and injuries to persons and/or damage to the machine:

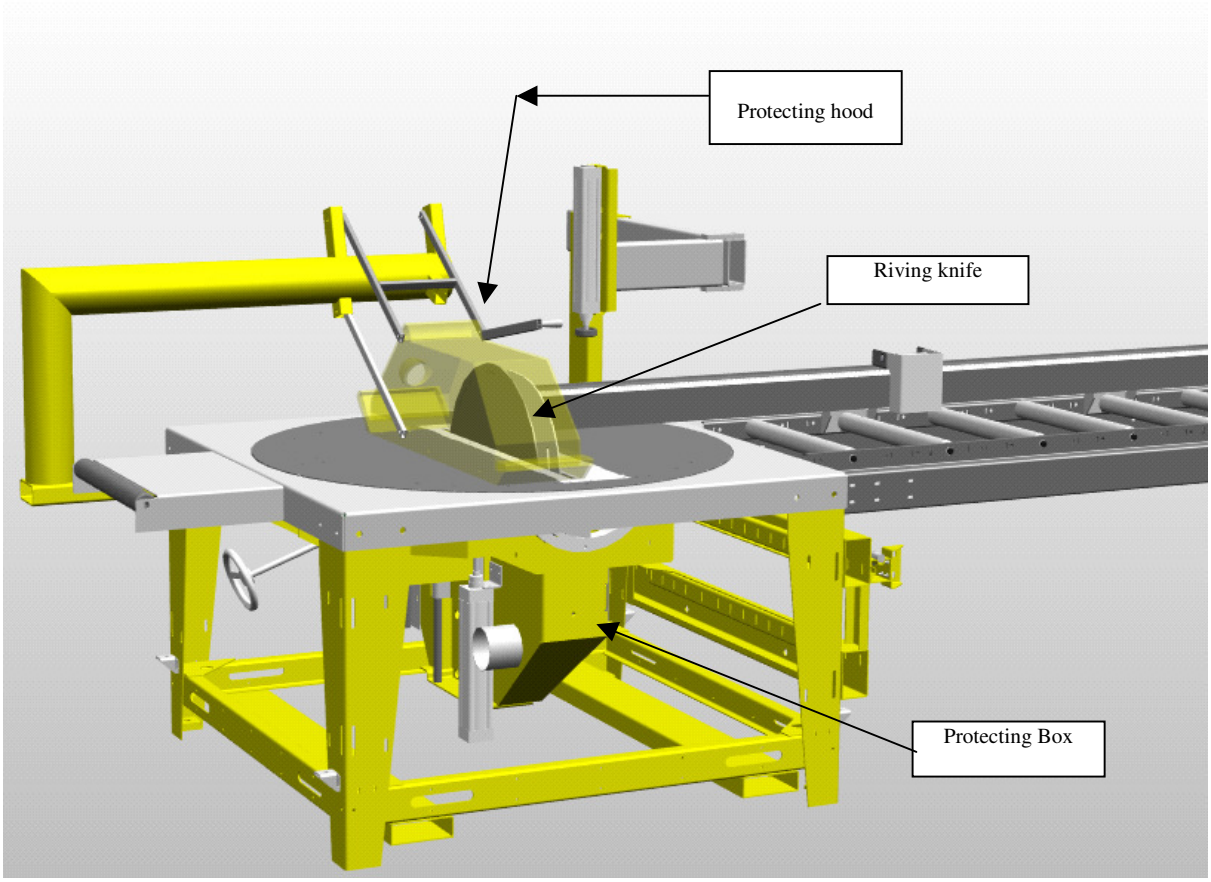
- **The safety equipment to be checked over, one after the other, for proper function, i.e. before the machine is commissioned, before start-up after a lengthy down time, also daily – before work commences!**

Only after all connections have been checked over may the machine be started up, to test the function of the safety equipment.

Danger

To prevent machine damage, injury or death of persons, before start-up ensure the following:

- **That nobody is working on the machine and no unauthorised persons are hanging around in the working area of the machine!**
- **That no tool or other item is on the machine table!**

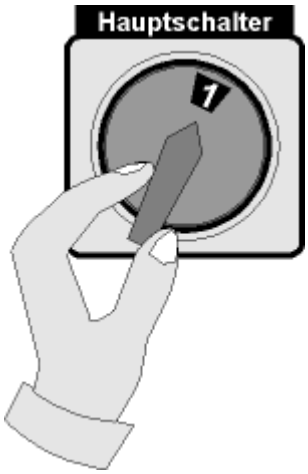


Safety equipment	Type of inspection	Function / result of operation
Protecting hoods	Visual check	Polycarbonate and frame okay
Protecting boxes	Visual check	Protecting boxes and covers are there Safety switch works
Riving knife	Visual check	Knife there Measure the setting see page 54
Two hands control	Actuate the two-hands switch	If the blade runs, the clamp cylinder descends on the work and only when the pressure is built up – correct setting on the rotary switch – is the square cutting begun

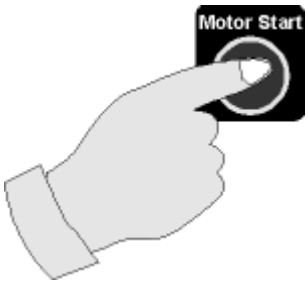
Danger

Only when it is a sure thing that all of the safety devices are working okay, may the machine be put into service!

Starting the machine for the first time



1. **Switch the main switch on.**



2. **Press the key “Motor Start” (blade runs).**

The machine is to be started for the first time by a service technician of AVOLA or their local agents. All functions of the machine will be tested and all cutting variations performed.

Operation

The following safety procedures must must be carried out – so as to obviate mortal danger and injury to persons, damage to the machine and to other property.

DANGER

achine on, carry out the following checks:

- Protective equipment,
  - Emergency off switch,
  - Riving knife (wedge),
  - (Saw) blade,
- The following points to be checked at least once every day:
  - Power supply connections
  - Supply lines
  - Display instruments
  - Table insert
  - Condition of the protecting hood

After the machine has been switched off, the following steps are alwasys to be carried out:

- Turn main switch to OFF and lock it
- Switch off the supply of compressed air

- Observe the operating instructions in respect of the operator positions on the machine.

- The machine may only be operated from the assigned working stations.

- While the machine is in operation only **one** operator is allowed on the machine. This includes the roller conveyors.

- After an emergency disconnection, the machine needs to be secured against being inadvertently switched back on again by an outside person.

- If the machine is to be switched off and left unattended for a lengthy period, then the master switch must be locked, so that it cannot be turned on again.

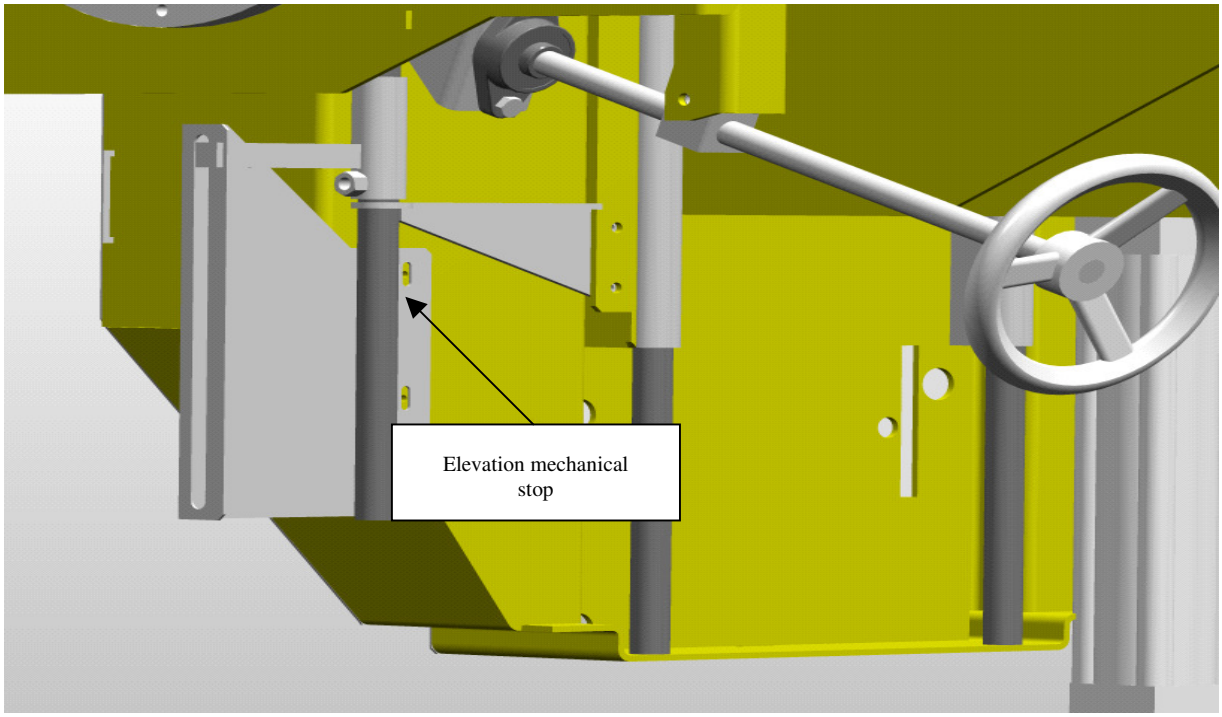
Please also read the chapter "General Safety Instructions".

Setting the machine up

After the machine has been connected up electrically and pneumatically, and it is a sure thing that all of the safety equipment is in perfect order, work may commence using the machine.

Elevation adjustments

The adjustment of elevation for the operation of slitting is effected using a pneumatic cylinder. This function is active only when the blade is stationary. The desired elevation is set beforehand, using a mechanical stop and then the blade is raised by pneumatic means using the keys.



Square-cutting

Square cutting is achieved using a pneumatic cylinder. The function is active only when the blade is running. The work is clamped by a cylinder using the two-hand control. When the set clamping pressure is reached the cutting is initiated.

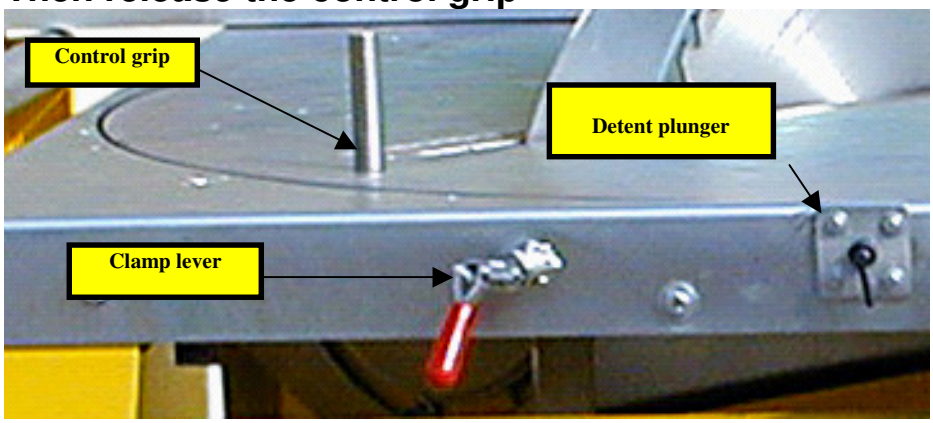
Adjusting the rotary table

It is possible to turn the saw blade from the position of longitudinal cutting counterclockwise 0° to 150°. The rotary table has a graduation, this in turn having a fixed ratchet with pitch 15° (0-150°). On being turned, the rotary table engages in these positions when the pawl is out. There are also fixed engagements at 180° and 270°.

Turning the rotary table:

- Release the clamp lever and catch on the machine table
- Move the table to the desired position, using the control grip

Then release the control grip



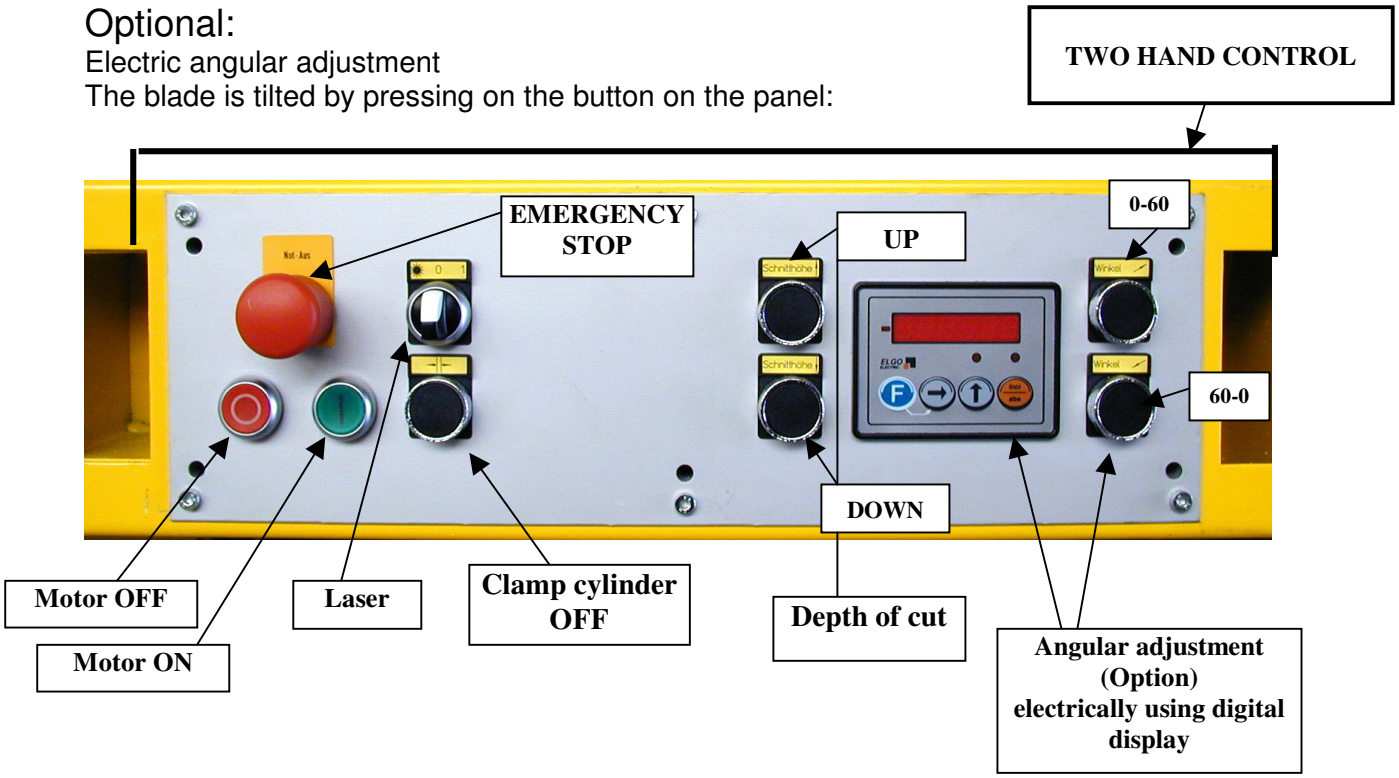
Angular adjustment

Underneath the machine table there is a handwheel which can be used to adjust the angle of the blade (90°-30°).

Optional:

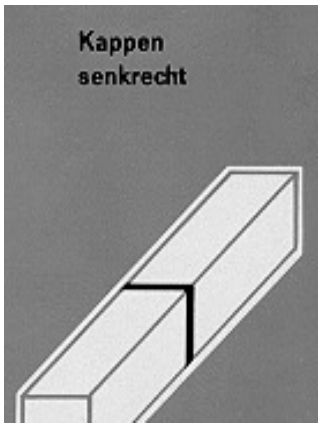
Electric angular adjustment

The blade is tilted by pressing on the button on the panel:



Cutting operation

Cross Cutting (vertically)



During cross cutting the the table is fixed in the 90° position. The work is placed on the longitudinal stop and automatically clamped and then cross cut by operating the two-hand control.

Cross-cut

Set the blade to the desired height and fix it (possible only with a table setting of 90°). Place the work piece on the longitudinal stop behind the blade, and move it toward the blade together with the sideways-moving feeding disk, for cutting to length.

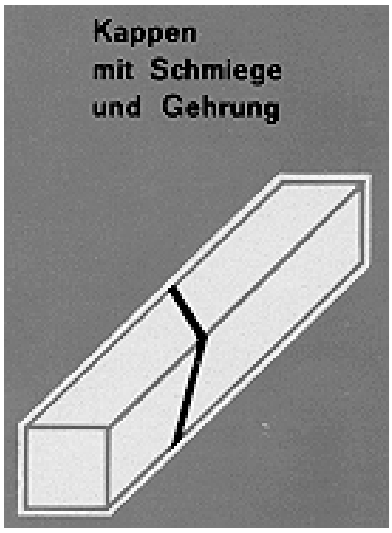
Cross Cutting off / cutting to size using tilted blade

Tilt the blade to the required angle. The work is lopped or cut to size, as described above.

Metre cutting (vertical cross cutting with mitre)

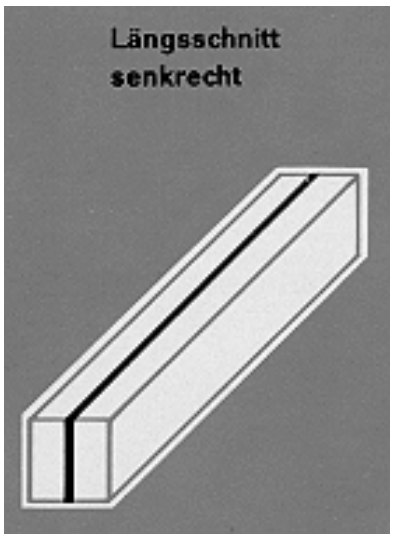
Set the table to the desired degrees to the longitudinal stop and lock. Place the work piece on the longitudinal stop and cut it by raising the blade to mitre.

Shift (cross cutting with bevel and mitre)



Set the blade as for mitre cutting, but also tilt to the desired angle. Put the work piece on the longitudinal stop and trim by raising the blade.

Slitting (vertical longitudinal cut)



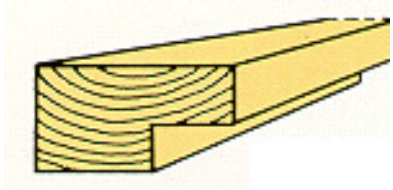
Set the blade to the desired height and parallel to the longitudinal stop and lock. Set the longitudinal stop to the desired distance to the blade.

Pass the work piece forwards along the stop. Use the push stick for the last 120 mm; the same when the distance between blade and stop is less than 120 mm. When slitting, the stop must be pushed in its longitudinal direction, so that its end is level with the elevation of the blade centre.

Slitting with tilted blade (longit. cut with bevel)

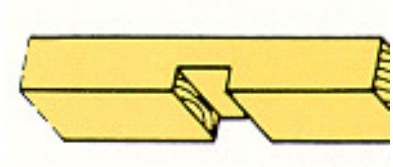
Set as for slitting, but with the blade tilted to the desired angle, with the blade tilted to the desired angle.

Rebating, groove cutting in longit. direction



Set the saw blade to the desired elevation and parallel with the stop. Bring the stop to the desired distance from the blade, and lock it. For the hidden cut the knife wedge must be set lower than the blade. Pass the work piece forwards along the stop. Use the push stick for the last 120mm; the same when the distance between the blade and the stop is less than 120mm. Repeat this procedure while shifting the longitudinal stop, to obtain the desired groove/rebate width.

Rebating / grooving in cross direction



Set the rotary table to 90° and the saw blade to the desired elevation. When rebating, make sure that the work is always on the blade side and the ejection on the side facing away from the blade. Put the work piece on the stop in the desired position, and move the stop toward the saw blade. Repeat this procedure until the desired groove/rebate moving the work piece to its stop.

To split the piece the table must be zeroed.

- Set the saw blade to the desired elevation and parallel with the stop. Bring the stop to the required distance from the blade, and lock it.

Troubleshooting

If the machine does not start up, or if operating trouble occurs, bring in the experts to see to maintenance and repair.

Operators must inform their foremen. On no account must they try to remedy electrical trouble themselves!

Danger

To obviate mortal danger of electric shock:

- **Qualified and authorised personnel must do work on the electrics!**
- **Operators may rectify things themselves, if these are obviously to do with operator's or maintenance errors!**

The following table lists trouble likely to occur:

Kind of trouble	**Cause / operational or maintenance error**	**Action taken**
Machine does not start up	Master switch is off	Check switch positions, switch control main switch back on
Machine does not start up	Unintentional initiation of a safety cut-off	Unlock the EMERGENCY OFF switch The machine will then be ready.
Clamp cylinder does not work	Air pressure has fallen below 5 bar	Check and possibly correct on the control panel the operating air pressure. If you cannot corect the pressure on the panel, bring in the maintenance people!
Blade does not go up	The operating air pressure falls below 5 bar	Check the air setting on the maintenance unit; correct if necessary. If you cannot correct the operating air pressure on the panel, bring in the maintenance and repairs experts!

The following safety instructions must be followed when you are rectifying trouble on the machine – this will obviate serious injury to persons, damage to the machine and other property damage.

- Work on the electrical equipment must be done by trained electricians.

- Please follow any special instructions (e.g. earth, ...) as they appertain to components prone to electrostatic charges.

- Please also read the chapter "General Safety Instructions ".

Maintenance/repairs

The following points need to be respected, so as to obviate mortal danger or damage to the machine:

(Underneath are some examples)

- Clear the area assigned for maintenance work.

- Switch off all sources of voltage and secure the voltage sources from being switched back on again.

- Make all units airless.

- Use only parts that show on our replacement parts list.

- Installing the wrong replacement parts or wearing parts can cause serious damage to the machine.

- Inadvertent switching back on of power sources can cause serious injury and material damage.

- You can get injured by uncovered sharp parts/tools/blades.

- Electrical Cables not laid properly (e.g. radius of bend too small) can be the cause of scorching or burning cables

- Electronic components can get damaged just by static charges.

- Swapped connections mean wrong rotational direction of the motor – resulting in serious damage to the machine.

- Wrong wiring can destroy electric/electronic components.

- Wrongly set screw tghtening torques can be cause of serious injuries to persons and damage to the machine.

- Unsecured manual operation means increased likelihood of injury due to squashing/shearing/pinching.

- Work of repair should be done only by authorised experts.
- The accident prevention regulations must be obeyed.

- All work on the electrical equipment to be done by skilled electricians, without exception.

Please also read the chapter "General Safety Instructions".

- Table inserts damaged by lateral excursions of the saw blade must be exchanged for new ones in accordance with EN 1870.
- The ball bearings of the motor have permanent lubrication for approximately 5.000 - 8.000 hours of operation.
- For the machining of wood and similar materials on Revolving Table Cross Cut Saws may only be used suitable steel blades pursuant to EN 847-1.
  The the use of cracked and/or misshapen blades or HSS saw blade is forbidden. Cracked or misshapen blades must be scrapped, to prevent them being used again.
- The motor has an automatically operating brake which is designed to bring the blade to rest within ten seconds after shutdown. In the absence of current, the motor shaft will turn only against the resistance of the brake when applied. The brake will be automatically released as soon as the motor is switched back on.
  The brake lining is subject to slight wear, depending on duration of operation, number of switching

actuations and gyrating mass of the circular blade. This wear is noticeable by the length of the braking time. So if you notice that the duration of brake application lasts for longer than ten seconds the worn lining must be exchanged for a new one, this pursuant EN 1870. If the machine is operated with a worn brake this could mean that the brake becomes completely defunct.

- Every machine has a motor protecting switch having various functions, all of which ensure only relative protection. If the motor protection switch is triggered it signifies an overload situation, an electrical fault in the supply network or to do with the machine. The fault must be rectified before the machine is switched back on. Repeated re-connections after the switch has triggered will damage the motor and will invalidate the warranty.
- The protective motor switch has an undervoltage release (also called no-voltage release). This ensures that the switch is zeroed when there is no voltage and cannot switch back on if there is no current.
- Three protectors (also called thermal sensors) are built into the winding, to protect the motor from overheating. These contacts open in response to overheating and disconnect the control current supply to the low voltage release until such time as the motor has cooled down sufficiently, and the protective contacts are able to close again. The cooling down time may be as much as 30 minutes. Only then may the switch reconnect. The switch also has an over current protection.
- The factory has already set the ampere setting of the motor protecting switch to suit the current input of the motor (also called rated current of the motor).
  On the switch there is a device which allows you to attach a padlock. This blocks the toggle switch in the OFF position, so safeguarding the machine against authorised usage.
- The following steps are recommended for reducing the emissions of noise during idling and load operation, and for the sake of protection of the environment:

Do not use saw blades of inferior quality, because these are generally too thin and consequently unstable and generate a penetrating high-pitch tone during idling. Screeching saw blades should not be used and should be replaced. You should use a small blade having gullet tooth system and small number of teeth of grade chrome vanadium steel (CV/A) or better, with sintered tools tips (HM/A). Replace a blunt blade in good time for a sharp one, and make sure that CV/A blades have a sufficient set of teeth.
For the sake of environmental protection, it is important to know that circular saw machines must have the least possible emission of noise at the front and rear (radial direction) and the strongest to the right hand and to the left (axial direction). So if certain objects (residential areas, schools, hospitals, etc.) are to be protected you should take into account this factor when you are installing the machine.
To reduce noise pollution AVOLA can supply upon request special sintered carbide tipped muffled circular saw blades HM/A/SG (see also the special leaflet).

PLEASE NOTE!
If the chips container has got obstructed, the supply of power to the machine must be disconnected before the blocked box is cleaned up. Pull the plug out! or lock off isolator!

Lubrication

Profile rail guides must be lubricated with grease or oil. The recommendations of the lubricant manufacturer should be followed. You should check out the miscibility of various kinds of lubricant. Lubricating oils based on mineral oil of the same grade (e.g. CL) of similar viscosity (not much difference) are miscible. Greases are miscible if their basic oil is the same as the thickening type. The viscosity of the basic oil must be similar. The NGLI class may be differing by no more than 1 step. The first-time packing with grease in the factory uses a lithium based saponified grease NGLI – consistency class 2. Regular lubrication every 100 kilometres of running is recommended.

The warranty

The period of warranty is 12 months**,** as of the day of supply. The obligation and liability of the manufacturer under the warranty become invalid should the customer effect changes to the machine, install wrong or extraneous components, use the machine illicitly, use the machine with defective or worn parts, should parts of the machine be missing or incorrectly adjusted. Illicit use, conversions or additions to the machine would in any case require the written consent of the manufacturer: AVOLA Maschinenfabrik, A. Volkenborn GmbH & Co. KG, in 45527 Hattingen, Ruhr.

Wearing parts are not included in the warranty.
Wearing parts are parts which are subject to wear and tear during normal use of the machine. The wearing time cannot be prognosed; this depends on how the machine is used. Wearing parts are to be maintained, adjusted, and possibly replaced as specified in the operating instructions. Normal wear and tear cannot be the basis for making a claim.

- Feed and drive elements, such as racks, gears, pinions, spindles, spindle nuts, spindle bearings, cords, chains, sprockets, belts
- Seals, cables, hoses, packings, plugs, couplings and switches for pneumatics, hydraulic, water, electricity, fuel
- Guide elements , such as guide beads, guide bushes, guide rails, rollers, bearings, slip protection coverings
- Clamping elements of fast-separating systems
- Plain and roller bearings, not running in an oil bath
- Rotary shaft seals and sealing elements
- Brakes
- Control potentiometers and manual switching elements
- Fuses, lights
- Aids, resources
- Fastening elements, such as dowels, anchors, bolts
- Filters, all kinds
- Driving rollrs, guide rollrs and roller linings
- Runnings wheels, driving wheels
- Product conveyer rollers
- Drills, parting-off tools, cutting tools
- Table shims

Assembly Instructions, Motor Brake Gama 65 S

- Switch the motor off and disconnect from the mains / lock off isolator.
- Remove cutting tools and the like, for reasons of safety
- The motor brake is located on the B side of the motor, behind the fan hood.
- For dismantling, this must be unbolted.
- Remove circlip from shaft, then remove the fan using an extractor.
- Loosen the four bolts (M6) and remove the megneto-electric brake.
- Detach brake lead from rectifier
- Remove the brake
- Install new brake, in reverse order (air gap 0,3mm)
  Connect up half-wave rectifier to 400 V-mains, as shown on the terminal board diagram
- Push fan onto shaft
- Up-date the terminal board diagram
- Complete the driver
- Check the duration of brake application (max. 10s)

Note:
Only competent technical personnel are allowed to effect work of adjustment or maintenance pursuant to the safety rules governing electro-technical plant (e.g. electric workshops)!

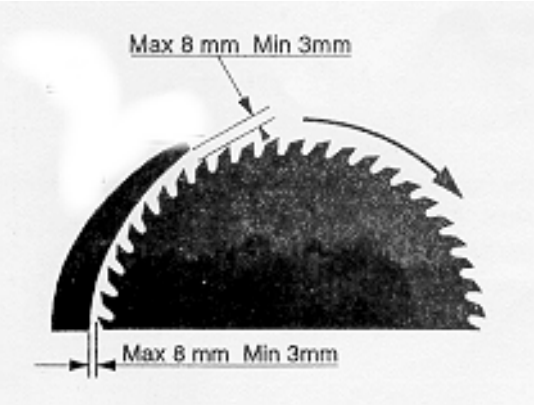
Re-adjusting the brake
To effect re-adjustment of the brake torque, screw in or out the three Allen (hex) screws, the air gap should be 0,3mm.

Description of blade change

To change the blade, switch the machine off and pull off the coupling or lock off main isolator from the appliance plug, so that the machine is completely disconnected from the mains. Move the motor with blade downwards. Open the protective box lid and take lid off. The tension nut on the blade has a left-handed thread; that is, in the rotational direction of the blade. To stop the motor shaft from turning when the tension nut is loosened/tightened, always use the steady that is provided for this purpose. Insert the pegs of the steady into the holes on the movable flange. Re-tighten the tension nut after every change of blade. Return the protective box lid.

Setting the riving knife wedge

If the diameter of the blade is altered the knife will need another setting. Loosen the nut, then adjust the wedge. It must be possible to adjust the wedge so that its top can reach at least the highest point on the blade periphery. The distance to the blade and the wedge must not exceed 8 mm anywhere.



Changing the saw blade

- Disconnect the power supply to the machine by removing the coupling / or locking off isolator.
- Scew off the protecting box lid
- Slacken the tension nut using the steady and the single-ended spanner. Push the steady into the holes of the movable flange. Slacken the tension nut using the single-ended spanner **(note: left handed thread)**. Take the nut and flange off the shaft.
- Put new blade **(caution: do not cut yourself, note the arrow) onto the shaft** (make sure it fits okay). Push the loose flange and the tension nut onto the shaft and righten up **(note: left-handed thread).**
- Re-set any wedge/riving knife
- Bolt down box lid
- Fold back the protective hood and adjust if necessary (there must be a gap of 3mm between the inside of the hood and the saw blade)
- Re-insert the coupling, Connect to the power supply
- Check to see that the rotational direction is correct (3-phase current), by switching on for a short time.

Note about the saw blade

Grade of steel:
Chrome vanadium steel (CV) or carbide tipping (HM)

Tooth shape:
Rake teeth (A) with large spacing 35 - 40 mm for cross and longitudinal cut. Ripping tooth (B) only for precision work.

Miscellaneous:
Use thick blades if possible, because thin blades are not stable enough and can make a screeching noise at idling speed. Blades that sing should not be used. The speed of AVOLA saws is around 3000 rpm. The blades to be tensioned must match this speed. Wrongly stretched blades will flutter. The standard bore is 30 mm, The fit is H7. Exact balancing is important, so re-sharpen by machine not by hand, including the tooth root and tooth back. Do not alter the original tooth shape. The width of the set of teeth should be about 60 % of the thickness of the blade; Example: thickness 3 mm + set of teeth 1,8 mm = width of set of teeth 4,8 mm.

Re-sharpening:
Re-sharpen only by machine. It is best to use the services of a specialised sharpening firm, which can collect your blunt blades and bring them back properly set and sharpened.

The most common errors with circular saw blades:
1. **Side striking** / **causes:**
a) Wrong tension with regard to speed of machine,
b) Stock thickness too little
c) Loss of tension following overheating, gumming up and burns through blunt tips, wrong re-sharpening or set of teeth too little.
Consequence: Formation of cracks

2. Out-of-balance / **causes**:
a) Different tooth root depths or tooth tip heights, e.g. due to manual re-sharpening.
b) The tooth base on cheap blades often has fluctuating depth, or the stock thickness is not uniform.
c) Blade has height striking, because the bore is greater than 30 mm, fit H7.
Consequences: Poor stability of the machine, poor cutting pattern, short cutting life, overheating, gumming up, burns, loss of tension, side banging, cracks, motor overloading.

3. **Wrong set of teeth, e.g. non-uniform or too weak:**
Consequences: Short cutting life, overheating, gumming up, burns, loss of tension, cracks, overloading of the motor.

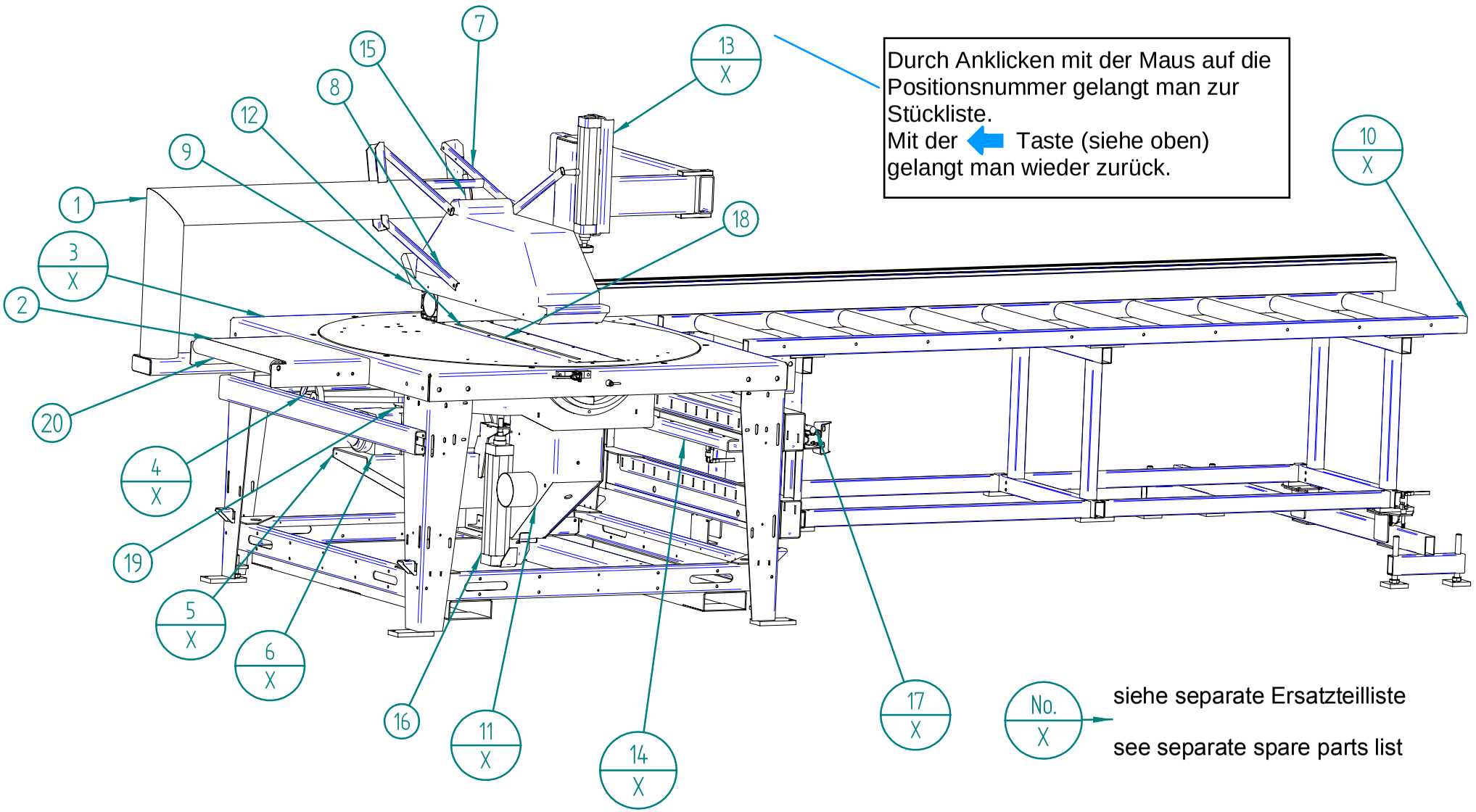
4. Wrong tooth shape re-sharpened:
Consequence: as 3 above

5. **Sawing with blunt tips**:
Consequences: as 3 above

6. **Sawing with gummed-up blades** / **causes**:
Gummi deposit is caused by sawing using blunt or wrongly re-sharpened or poorly set or unbalanced or knocking blades.
Consequence: as 3 above
Remedy: Remove gummi deposit using diesel oil.

Adjusting the protecting hood carrier, protecting hood

- The protecting hood carrier is fastened underneath the machine table. The distance between the saw blade and the shackle may be changed, by slackening the two bolts (SW30) underneath the machine table. The protecting hood should be set so that there is a gap of 3mm width between the inside of the hood and the saw blade.



AVOLA

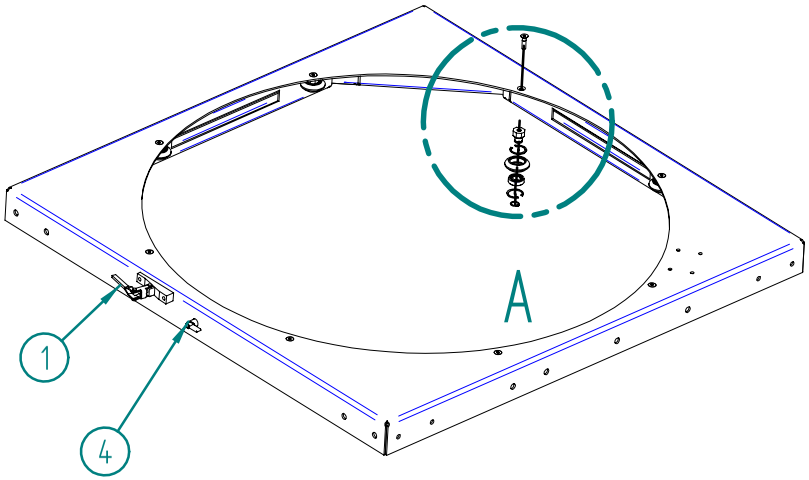
Gama 65 S, K, A

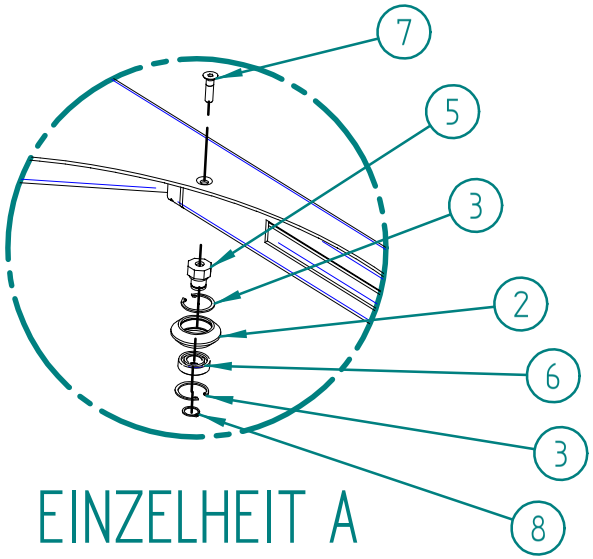
Ersatzteilliste
Spare parts list

Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35101_240	Schutzhaubenträger_Gama
2	1	35261_240	Tischverlängerungsplatte_Gama_S
3	1	35015_140	Maschinentisch
4	1	35241_240	Schrägverstellung_Gama_S
5	1	35245_240	Höhenverstelleinrichung_Gama_S
6	1	35249_240	Antriebseinheit_Gama_65_S
7	1	35104_231	Parallellenker_Griffteil_Gama.asm
8	1	35102_240	Parallellenker_fuer_Schutzhaube_Gama
9	1	35105_232	Schutzhaube
10	1	35625_240	Rollenbahn_R600_3M
11	1	35235_230	Schutzkasten_Gama_s
12	1	35063_242	Tischeinlage_75
13	1	35086_240	Pneumatische Werkstückspannvorrichtung
14	1	35505_240	Seitenverfahrvorrichtung_Gs_r
15	1	05137	Gasdruckfeder_400N_60_UT
16	1	05401	Zylinder ISO 6431 CIL 120S500320CP
17	1	35136_240	Führungsschiene
18	1	05217	Kreissägeblatt
19	1	01423	Spindelmutter_40x40x50
20	1	35700	Tragrolle 600

Optionen / Options

Pos.	Menge	Zeichnungs.Nr.	Bezeichnung
100	1	355553	Spannschutzhaubenvorrichtung
105	1	35659	Elektrischer_Drehteller_Antriebseinheit
110	1	35241	Schrägverstellung_Gama_S
111	1	35519	Gama_S_Spindelhubgetriebe



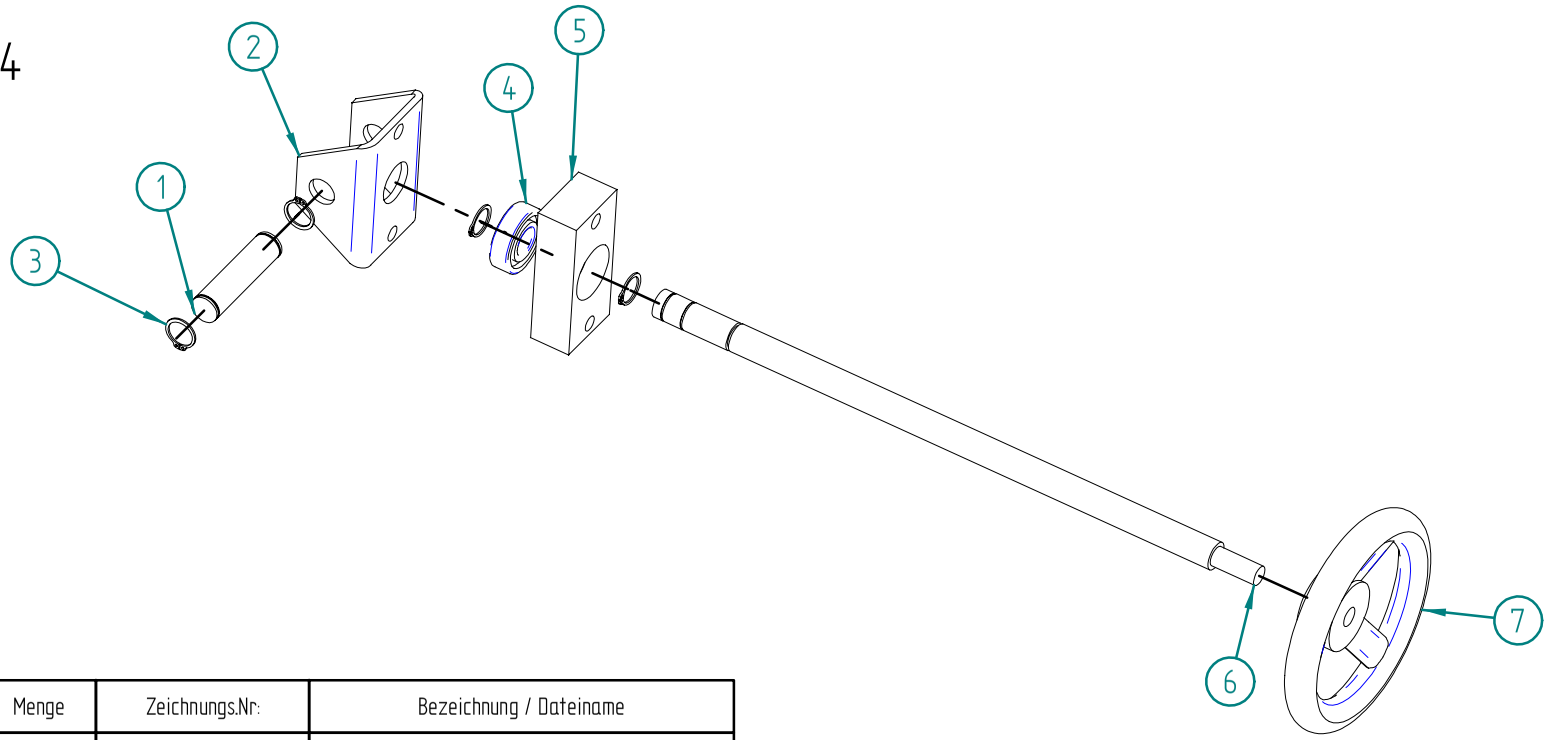


EINZELHEIT A

Pos. 3

Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	05019	Schubstangen Spanner_604 - MM
2	1	35038_242	Drehkranzrolle
3	2	04317	Sicherungsring DIN 472 - 42x1,75
4	1	05181	Rastriegel
5	1	35037_243	Exzenterzapfen_Führungsring
6	1	04442	Rillenkugellager DIN 625-1 6004 20x42x12
7	1	04222	Senkschraube DIN 7991 - M10x40
8	1	04556	Sicherungsring DIN 471 20x1,2

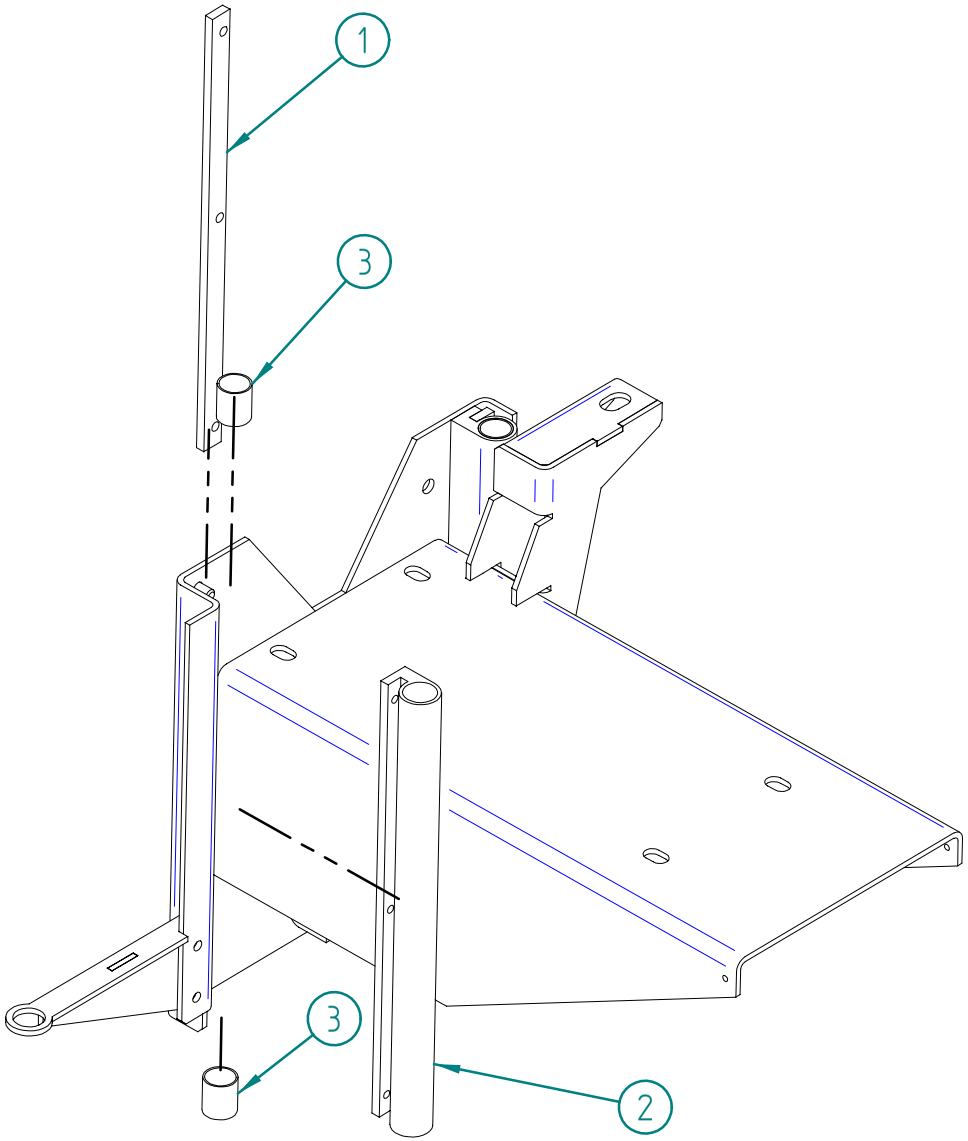
Pos. 4

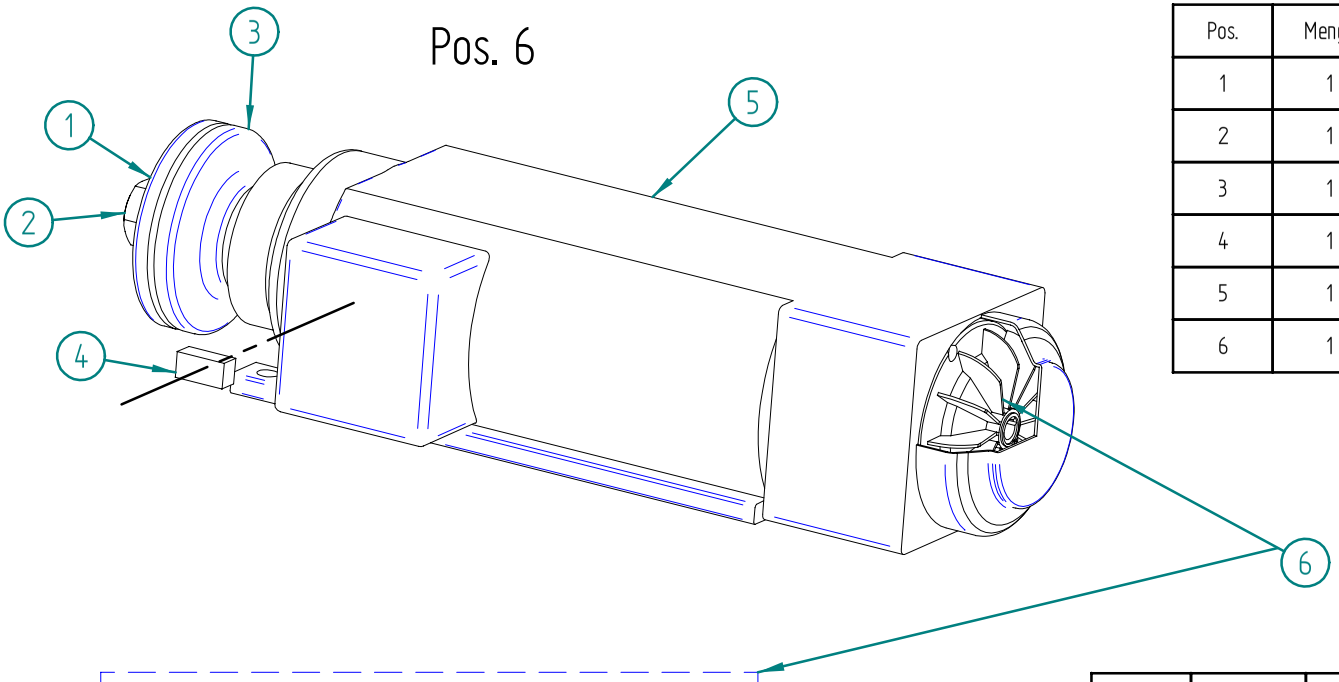


Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35093_242	Bolzen_20_74
2	1	35242_240	Flanschlagerzapfen
3	1	04556	Sicherungsring DIN 471 20x1,2
4	1	04447	Rillenkugellager DIN 625-1 6204 20x47x14
5	1	35502_240	Flanschlager_20_47
6	1	35251_240	ScVe_Spindel
7	1	35716	Handrad_160

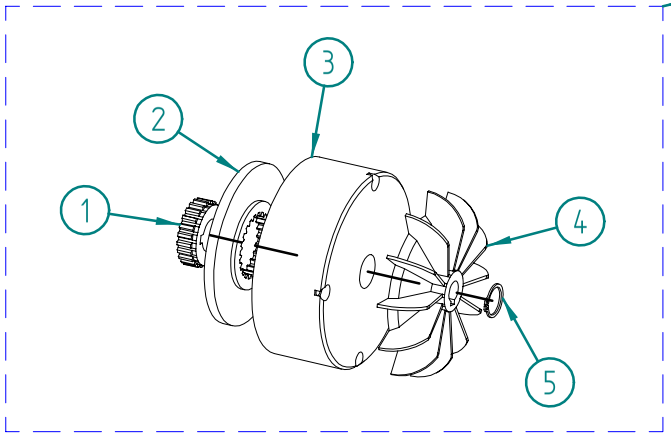
Pos. 5

Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35529	HoVe_GS_Bef_Gelenklagerbuchse
2	1	35287_240	Alu_Gleitlagerbuchse
3	2	04620	Gleitlager_25_28_32





Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35707	Losflansch_140
2	1	35753	Sechskantmutter ISO 4032 - M27
3	1	35708	SPANNFLANSCH FEST 140/35 D.
4	1	06104	Gleichrichter
5	1	35709	ANTRIEBSMOTOR 7,5 KW
6	1	35739	MAGNETBREMSE KOMPL. M16K



Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35736	Nabe_16
2	1	35732	Bremsrotorscheibe
3	1	35745	Bremsspule_16
4	1	35733	LÜFTER 1-178 FÜR K75-L TYP 1-711
5	1	04556	Sicherungsring DIN 471 20x1,2

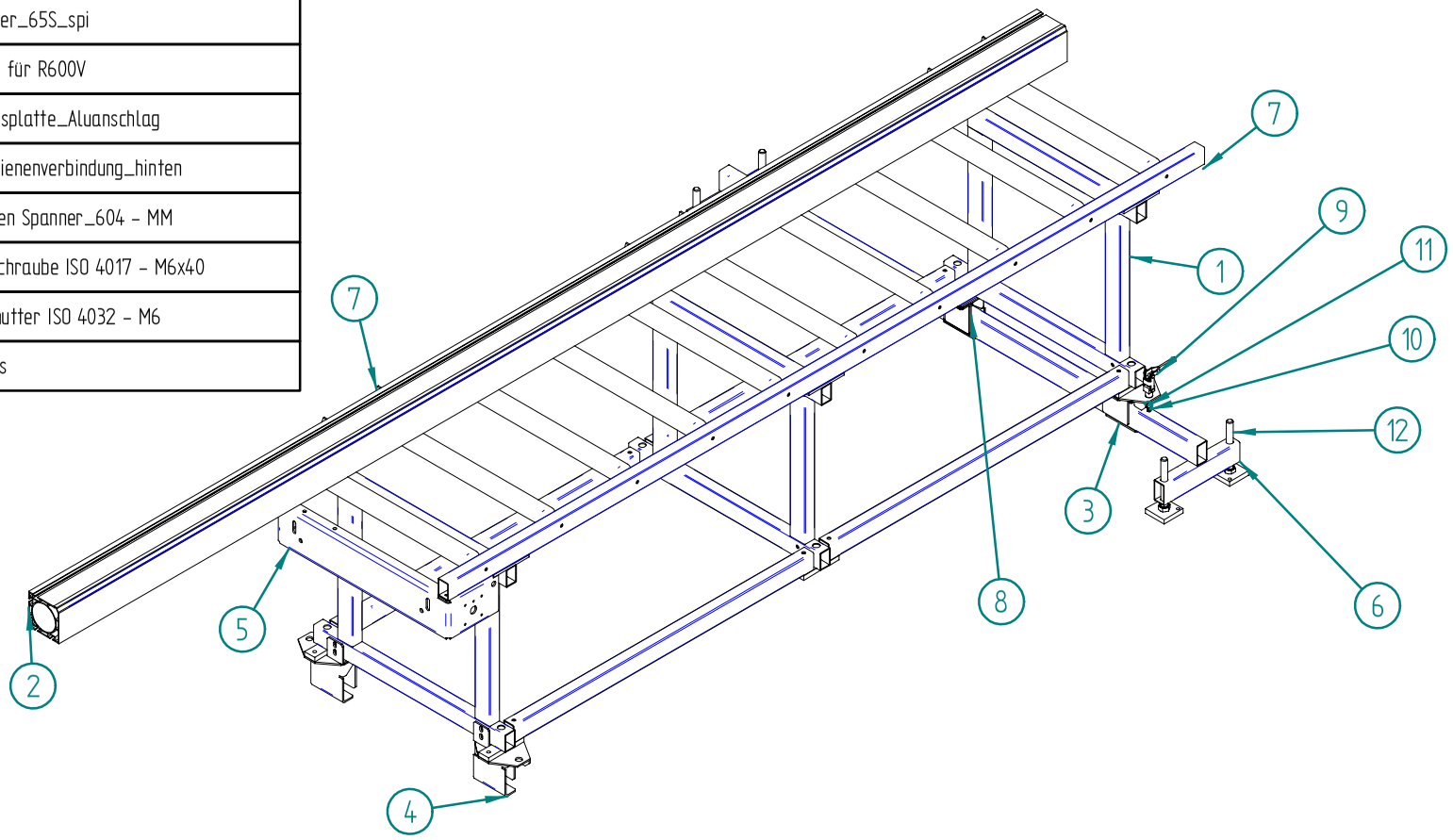
AVOLA

Gama 65 S, K, A

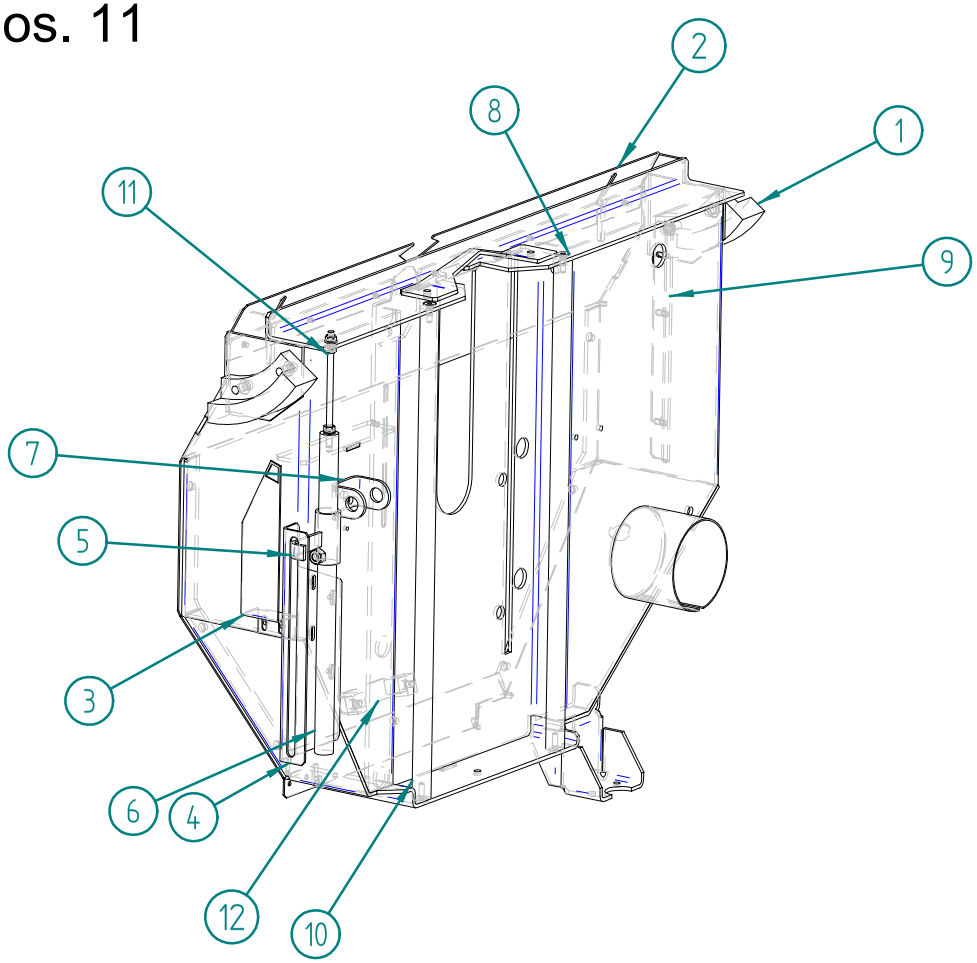
Ersatzteilliste
Spare parts list

Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35756	Rollenbahn_R600_VF_3M_RL
2	1	35154_241	Alu-Profil 120x120
3	2	35522	RB_Laufschienen_Verbindung
4	2	35522	RB_Laufschienen_Verbindung_spiegel
5	1	35525	RB_Verbinder_65S_spi
6	1	35615	Laufschiene für R600V
7	3	35050	Befestigungsplatte_Aluanschlag
8	1	35853	RB_Laufschienenverbindung_hinten
9	1	05019	Schubstangen Spanner_604 - MM
10	1	04003	Sechskantschraube ISO 4017 - M6x40
11	1	04327	Sechskantmutter ISO 4032 - M6
12	4	35008	Nivellierfuss

Pos. 10

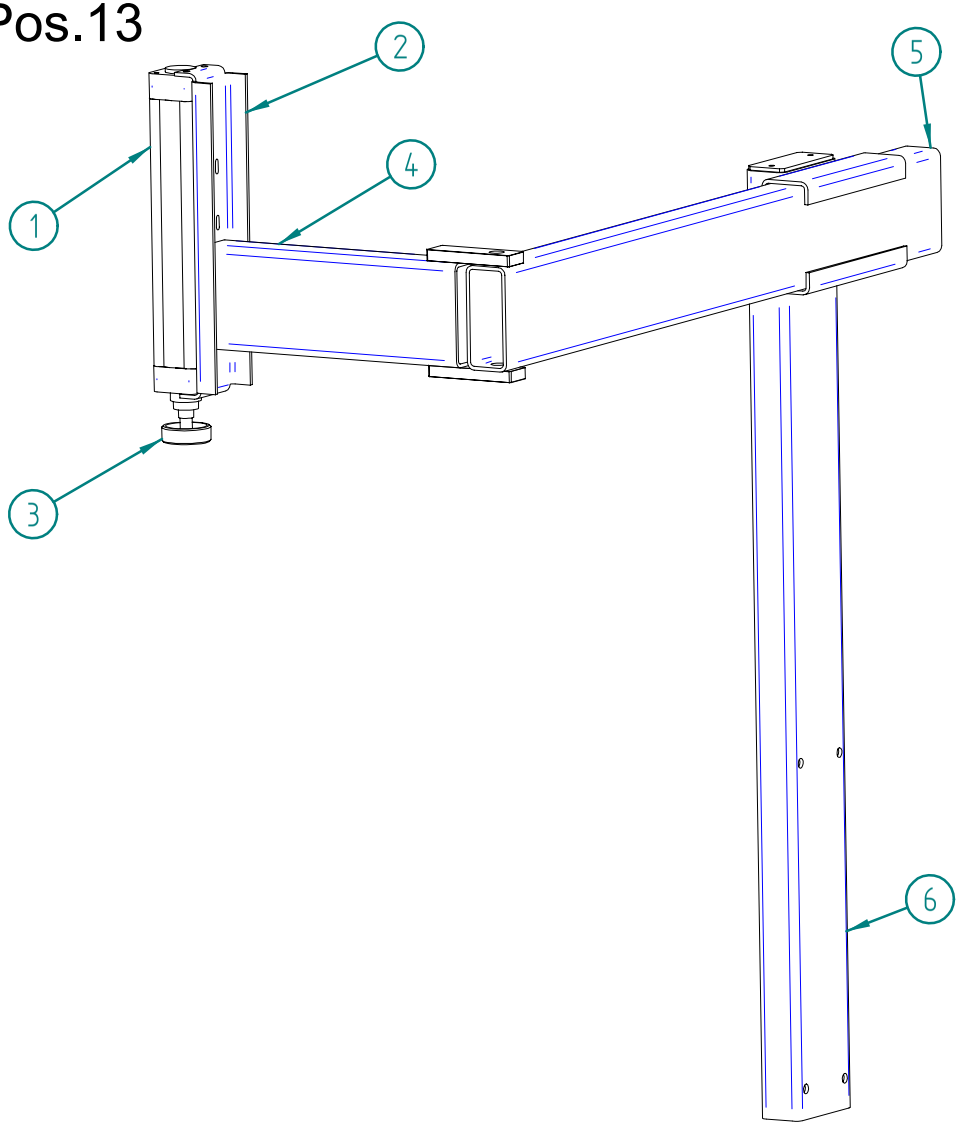


Pos. 11



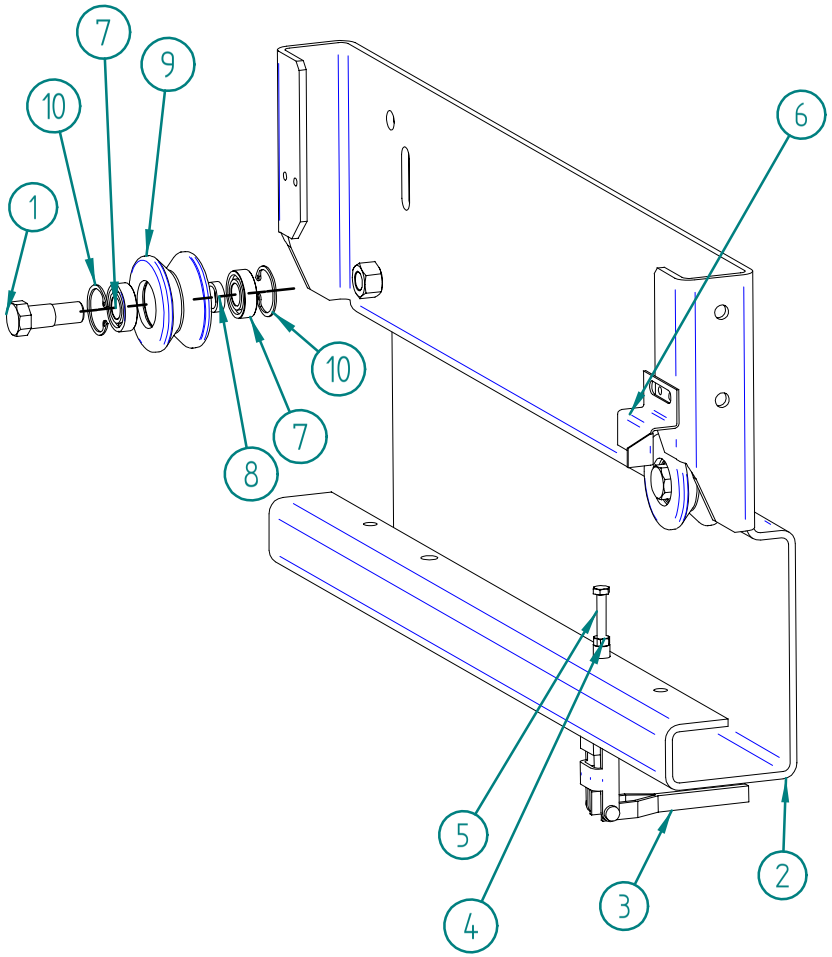
Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35141_232	Nutsekment
2	1	35237_240	ScKa_Alu_Leiste
3	1	35504_240	Gs_Winkelpfeil
4	1	35244_240	ScKa_Hoehenskala_GS
5	1	35161_242	Höhenklemmeinheit_Gama
6	1	35020_241	Führungsstange_25x440
7	1	35240_240	Zapfen_U61x10
8	1	04214	Senkschraube DIN 7991 - M8x16
9	1	35030	Spaltkeilfuehrung
10	1	35238_240	HoVe_Gs_Rundführung_25x676
11	1	35254	Gewindestange_M8x160
12	1	Ganter	Griff_118

Pos.13



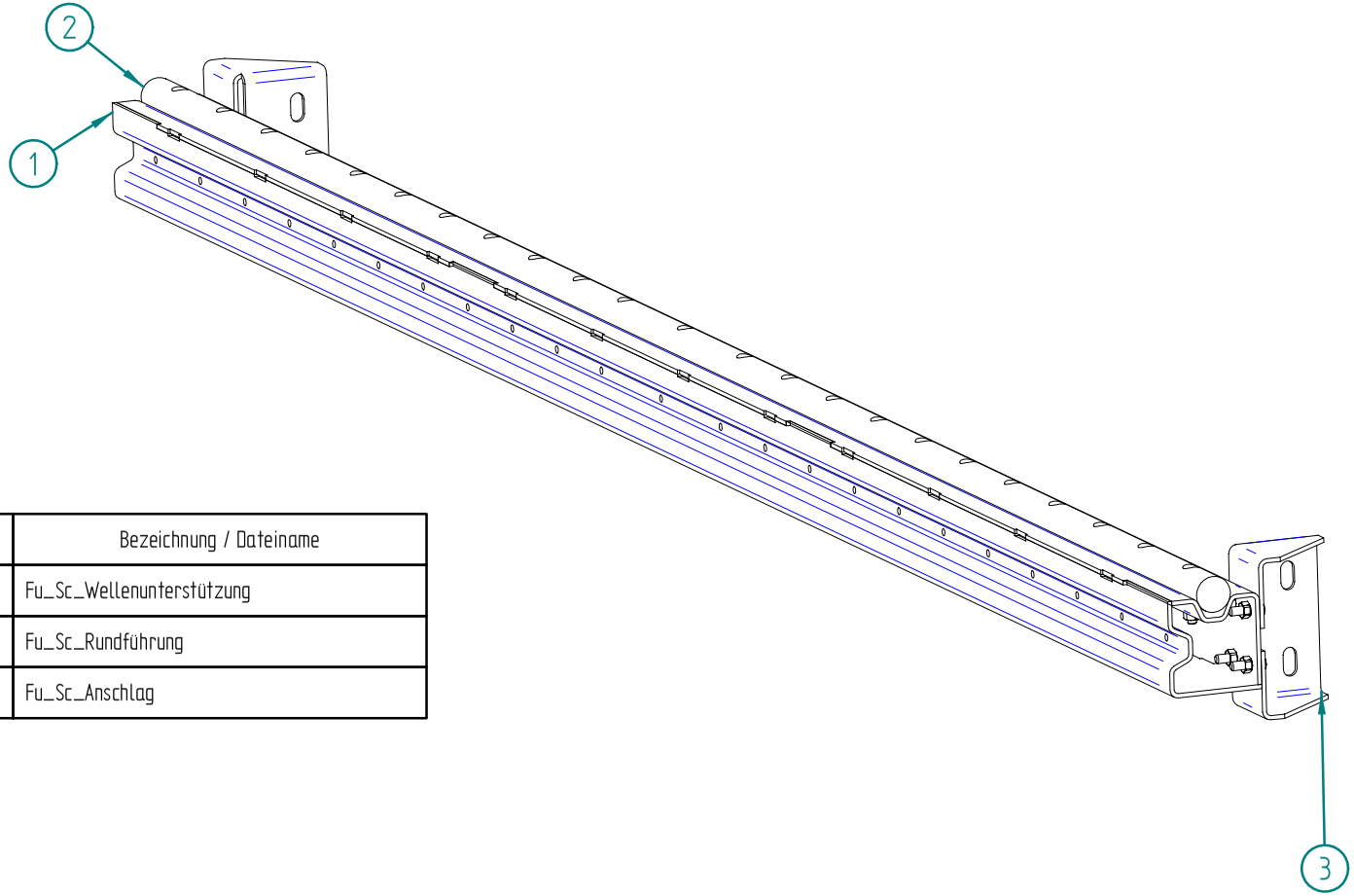
Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	05401	Pneumatikzylinder_6431_50_320.par
2	1	35152_242	Fusswinkel_zylinder_50_320
3	1	02447	Lagerschale_STS.par
4	1	35084_240	PnSp_Gelenkstueck
5	1	35085_240	PnSp_Hohlprofil_Horizontal
6	1	35470_231	Gama_Schutzhaubenträger_links

Pos. 14



Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	04107	Paßschraube_DIN 610_M14x40
2	1	35506_240	SeVe_Gs_R_Rollenblech
3	1	05019	Schubstangen Spanner_604 - MM
4	1	04327	Sechskantmutter ISO 4032 - M6
5	1	04003	Sechskantschraube ISO 4017 - M6x40
6	1	35539_240	Pfeil_GS_GR_Seite
7	2	04456	Rillenkugellager DIN 625-1 6002 15x32x9
8	1	35074_240	Distanzring_20_15_5,4
9	1	35072_240	Fuehrungsrolle
10	2	04309	Sicherungsring DIN 472 - 32x1,2

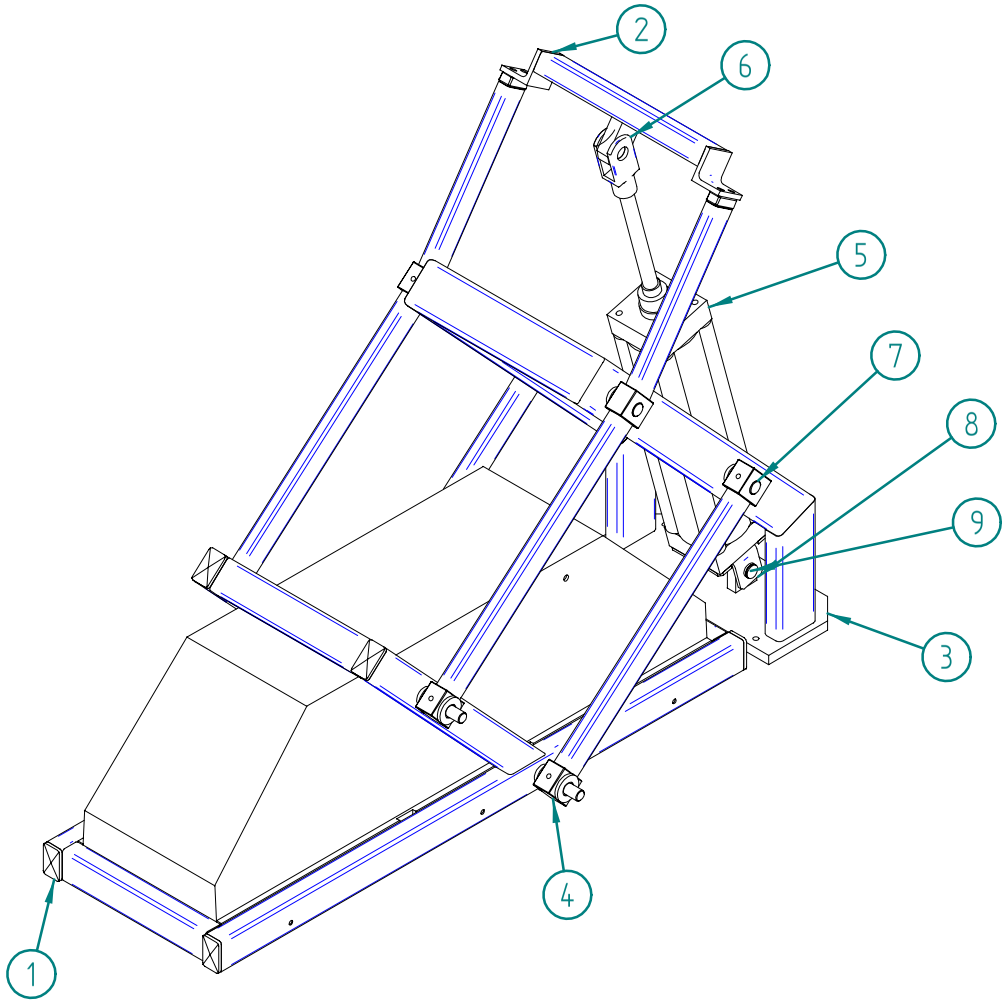
Pos. 17



Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35137_240	Fu_Sc_Wellenunterstützung
2	1	35159_240	Fu_Sc_Rundführung
3	1	35138_240	Fu_Sc_Anschlag

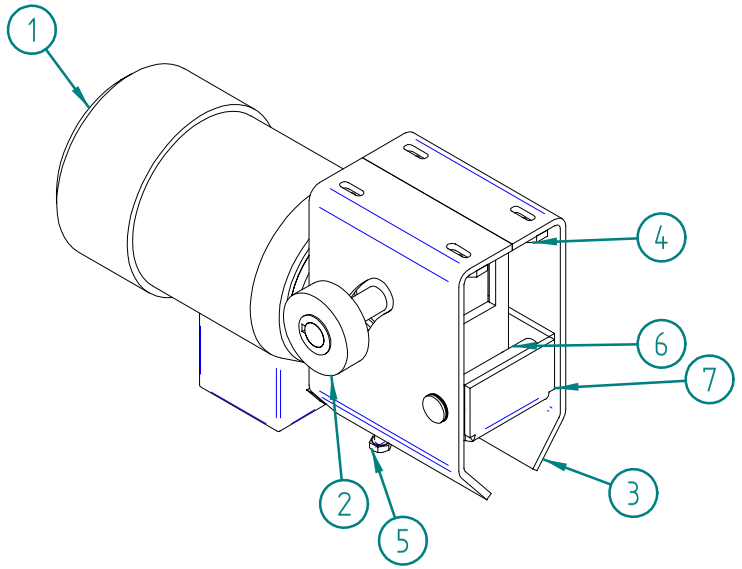
Pos. 100

Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35555_240	Spannschutzhaube
2	1	35558_240	Gama_Spannparallellenker
3	1	35560_240	Gama_Spannschutzhaubenträger
4	1	35562_240	Gama_Parallellenker
5	1	05400	Zylinder ISO 6431 CIL 120S800320CP
6	1	35561	Gabelkopf_80
7	1	35563_240	Achse_20_420
8	1	35095_241	Gabel_Zylinder_80
9	1	35026_243	Bolzen_20_101

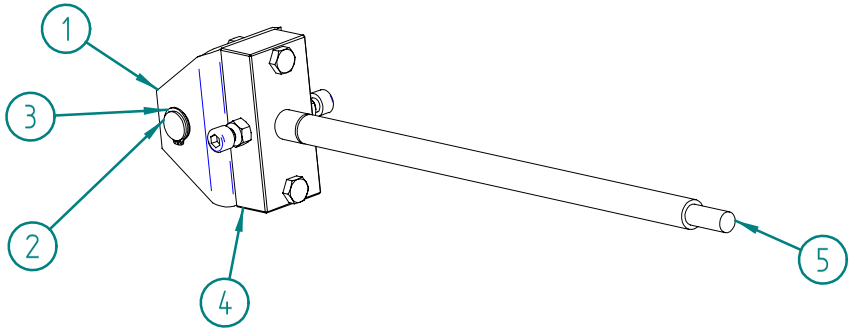


Pos. 105

Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35762	Getriebemotor_5AP71_4_MU040
2	1	35763	Antriebsrad_E_Drehteller
3	1	35662	E_D_A_Wippentischplatte
4	2	35552	E_D_A_W_Gewindeblech
5	1	04046	SKT Schraube M8x35
6	1	35026	Bolzen_20_97
7	1	35661	Wippenmotorplatte
8*	1	35703	Feder
9*	1	35663	Bundbolzen_35_25_16
10*	1	04328	Sechskantmutter M8

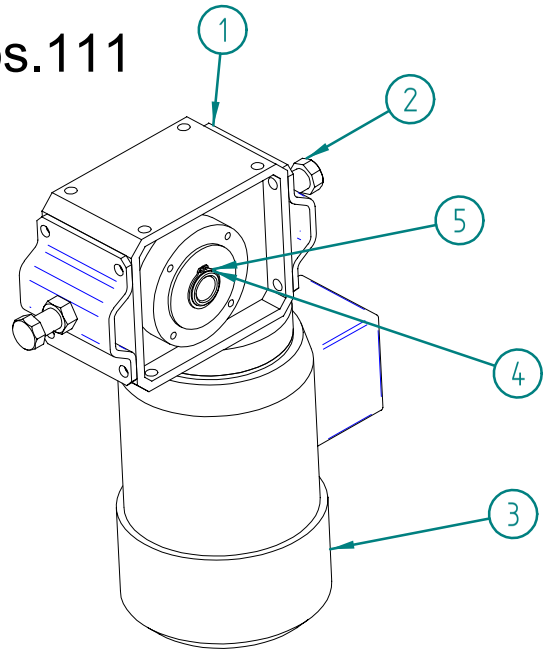


Pos. 110

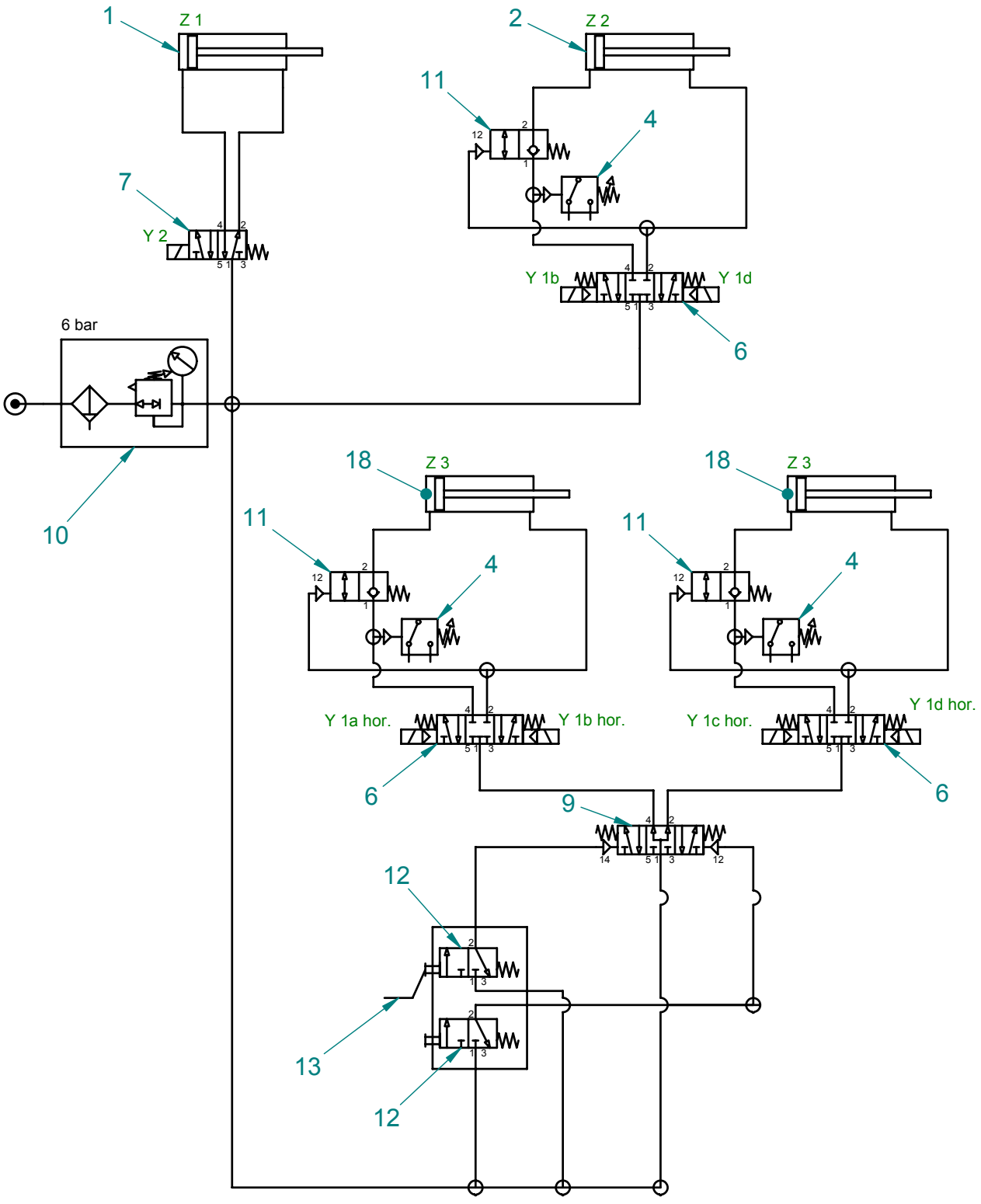


Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35242_240	Flanschlagerzapfen
2	1	35093_242	Bolzen_20_74
3	1	04556	Sicherungsring DIN 471 20x1,2
4	1	35518_240	Spannblock_50x30
5	1	35251_240	ScVe_Spindel

Pos.111



Pos.	Menge	Zeichnungs.Nr:	Bezeichnung / Dateiname
1	1	35520_240	Gama_S_Flanschplatte_M14
2	1	04107	Paßschraube_DIN 610_M14x40
3	1	35805	Getriebemotor_5AP71_4_MU050
4	1	35507_240	Gewindemutter_TR20-L
5	1	04323	Sicherungsring DIN 471 - 25x1,2

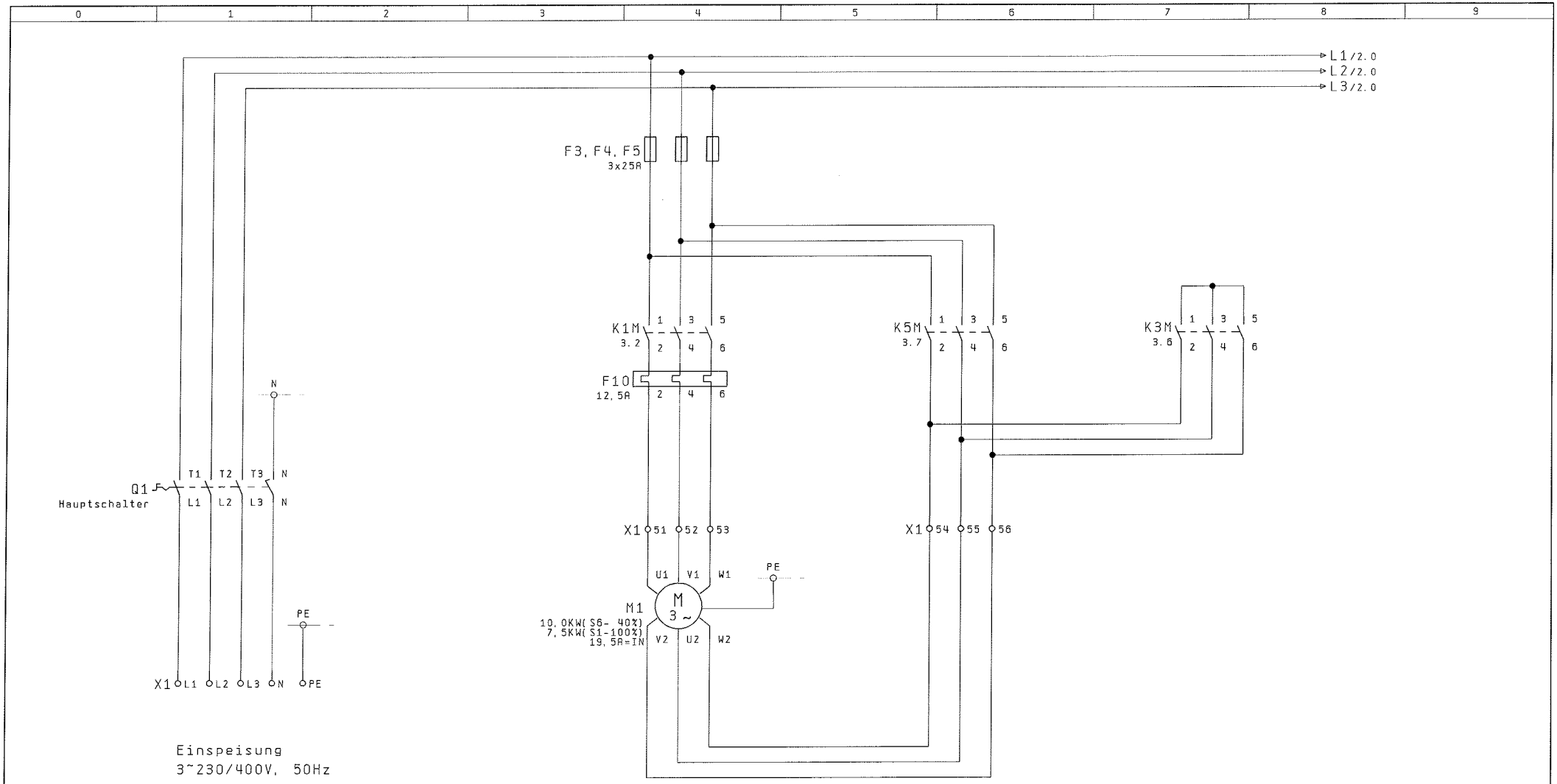


CAM Info		Allgemein-toleranzen		Massstab:	Gewicht:
Pfadname:		ISO 2768 - m		Werkstoff:	
Dateiname:					
			Datum	Name	Bezeichnung:
		Bearb.:	16.06.2008	strauch	Pneumatikplan Gama 65 K + 2xhor. Spannzylinder
		Gepr.:			
		Norm:			
		Pfad: Z:\user\Daten\Zeichnugen_3d\teile\Pneumatikteile\Pneumatikplan\Pneumatikplan_Gama_65k_2xhorz.dft			
		AVOLA Maschinenfabrik		Zeichnung - Nr.: 00895-00-09-00-01	Blatt 1
				Artikel - Nr.:	2 Bl.
Änderung	Datum			Ers. für:	

Stückliste

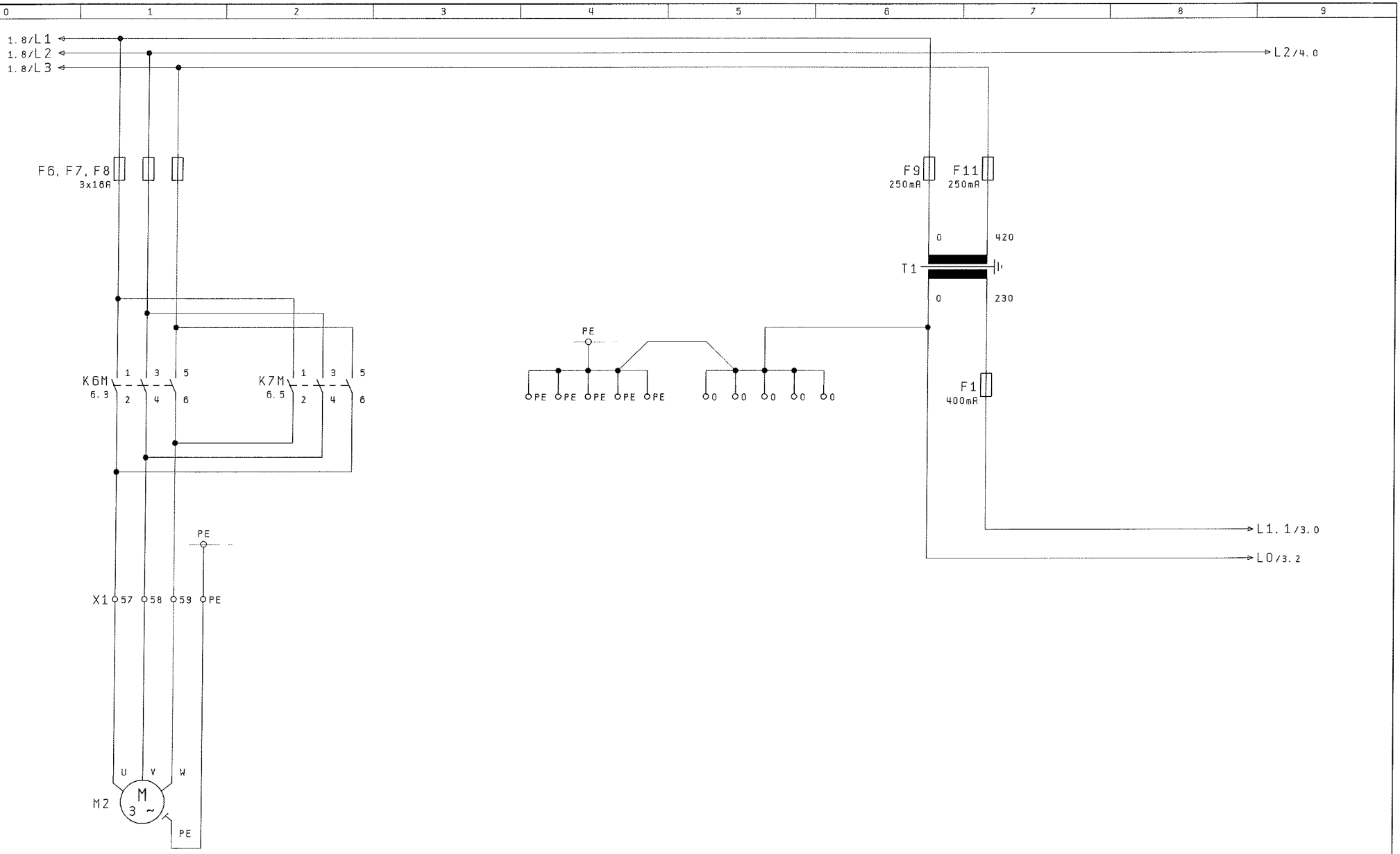
Pos.:	Menge:	Einheit:	Bezeichnung 1:	Bezeichnung 2:	Artikel-Nr.:
1	1	Stk.	ZYLINDER Pneu. D=63, Hub=320	PA61240-0320	05403
2	1	Stk.	ZYLINDER Pneu. D=80, Hub=320	1200800320 AP	05400
4	3	Stk.	DRUCKSCHALTER 230 VOLT	MWPE WD 1/8'	05439
6	3	Stk.	VENTIL 5/3 Wege, 1/8', OCM	7010012200 PNV26 PNS OC	05512
	6	Stk.	SPULE 22 D=8 5VA-220VAC	W0215000031	05445
	6	Stk.	STECKER Standard	W0970510011	05446
7	1	Stk.	VENTIL 5/2 Wege, 1/4', monostabil	7020021100 SOV35 SOS OO	05521
	1	Stk.	SPULE 22 D=8 5VA-220VAC	W0215000031	05445
	1	Stk.	STECKER Standard	W0970510011	05446
9	1	Stk.	VENTIL 5/3 Wege, 1/8', PC M	7010012300 PNV26 PNS PC	05513
10	2	Stk.	FILTERREGLER SKILLAIR 200	3683008	05449
11	3	Stk.	STOP-VENTIL, 1/4'	W6001011106	05501
12	2	Stk.	VENTIL 3/2 Wege, 1/8', NC VME-1	W3501000100 Push-In	05505
13	1	Stk.	SCHALTER VRM-313 N	W0351000033	05443
	1	Stk.	ADAPTER VMA-1-00	0351000050	05435
18	1	Stk.	ZYLINDER Pneu. D=63, Hub=650	1210630650CN	05463
			Funktion		
Z1			**Kappen**		
Z2			**Spannschutzhaube**		
Z3			**horizontale Spannzylinder**		

CAM Info Pfadname: Dateiname:		Allgemein-toleranzen ISO 2768 - m		Massstab:	Gewicht:
				Werkstoff:	
			Datum / Name	Bezeichnung:	
		Bearb.:	16.06.2008 strauch	Pneumatikplan Gama 65 K + 2xhor. Spannzylinder	
		Gepr.:			
		Norm:			
		Pfad: Z:\user\Daten\Zeichnugen_3d\teile\Pneumatikteile\Pneumatikplan\Pneumatikplan_Gama_65k_2xhorz.dft			
		AVOLA Maschinenfabrik		Zeichnung - Nr.: 00895-00-09-00-01 Artikel - Nr.:	Blatt 2 2 Bl.
Änderung	Datum			Ers. für:	



2

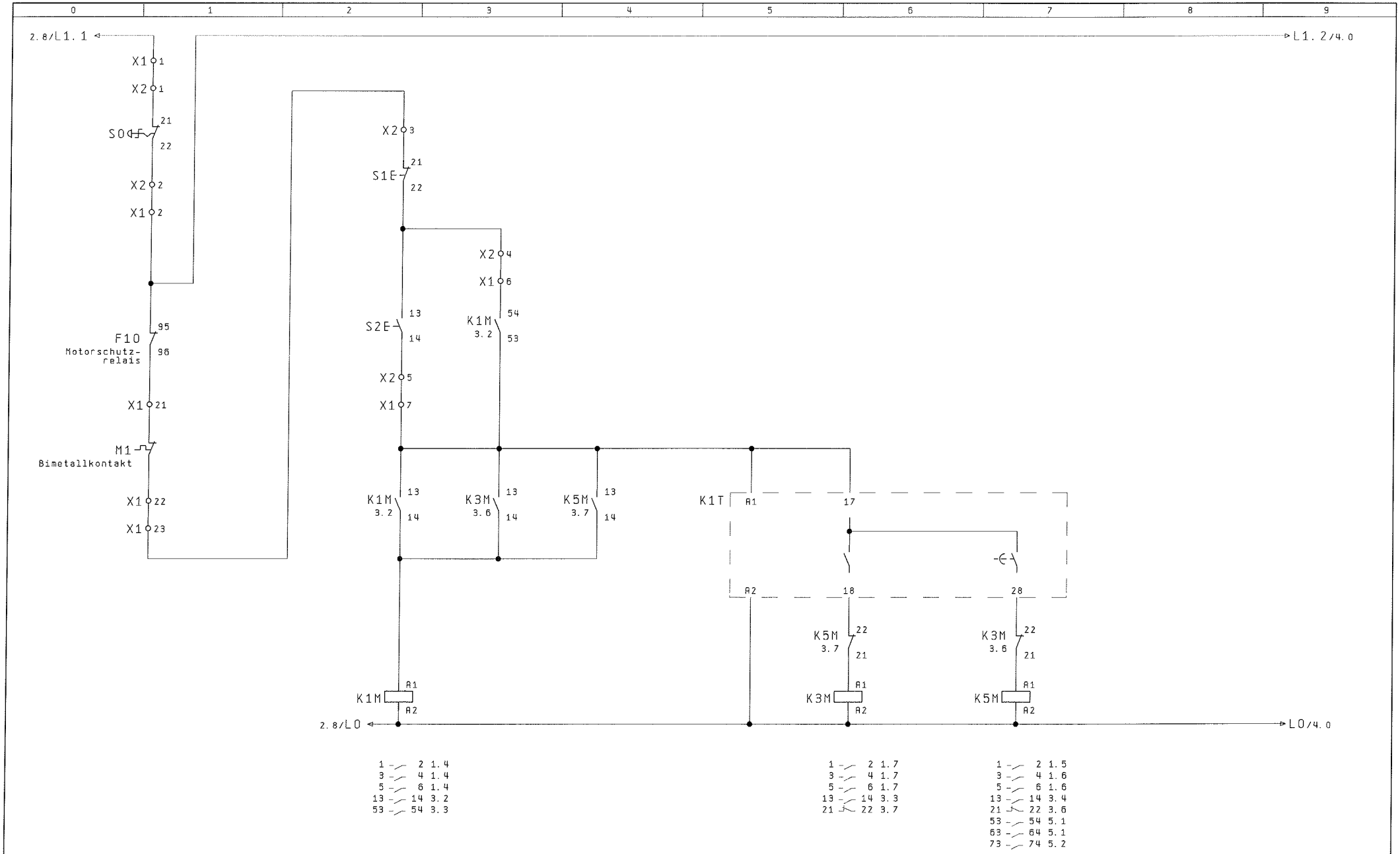
			Datum		Schaltgeraete-Vertrieb Gummersbach	S. R. 02. 2011	Einspeisung 230/400V Motor Säge / Stern Dreieck	ST 348/4.hor	Bl. 1
			Bearb.	Thomas Kroll					6 Bl.
			Gepr.	18. Feb. 2011					
Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.		



Schrägverstellung

1 3

			Datum		Schaltgeraete-Vertrieb Gummersbach	S. R. 02. 2011	M2 Schrägverstellung	ST 348/4. hor	= +
			Bearb.	Thomas Kroll					
			Gepr.	18. Feb. 2011					Bl. 2
Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.		6 Bl.



			Datum		Schaltgeraete-Vertrieb Gummersbach		S. R. 02. 2011	ST 348/4.hor	=
			Bearb.	Thomas Kroll					+
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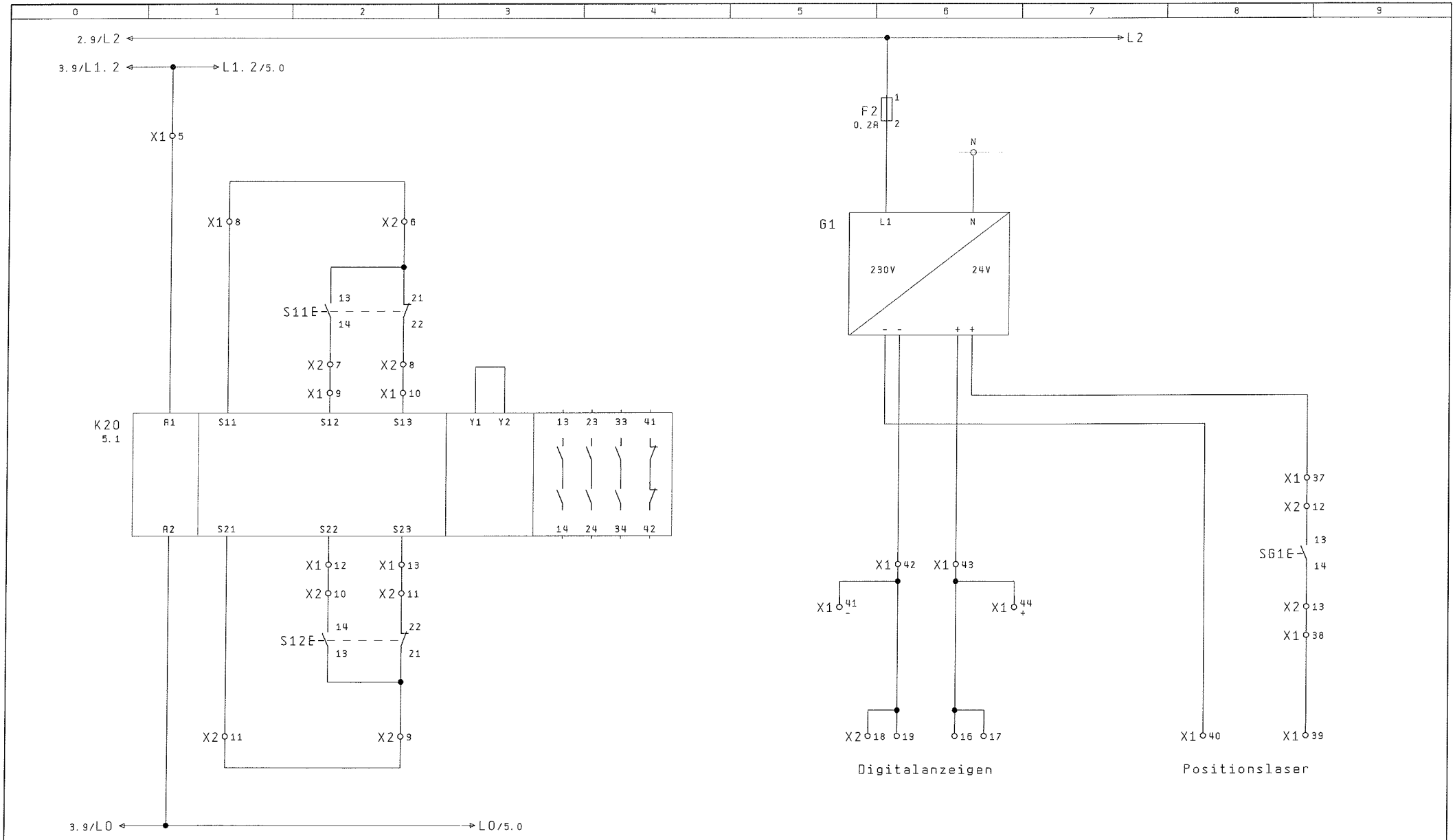
Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.		6 Bl.



3 5

			Datum		Schaltgeraete-Vertrieb Gummersbach		S. R. 02. 2011	ST 348/4. hor	=
			Bearb.	Thomas Kroll					+
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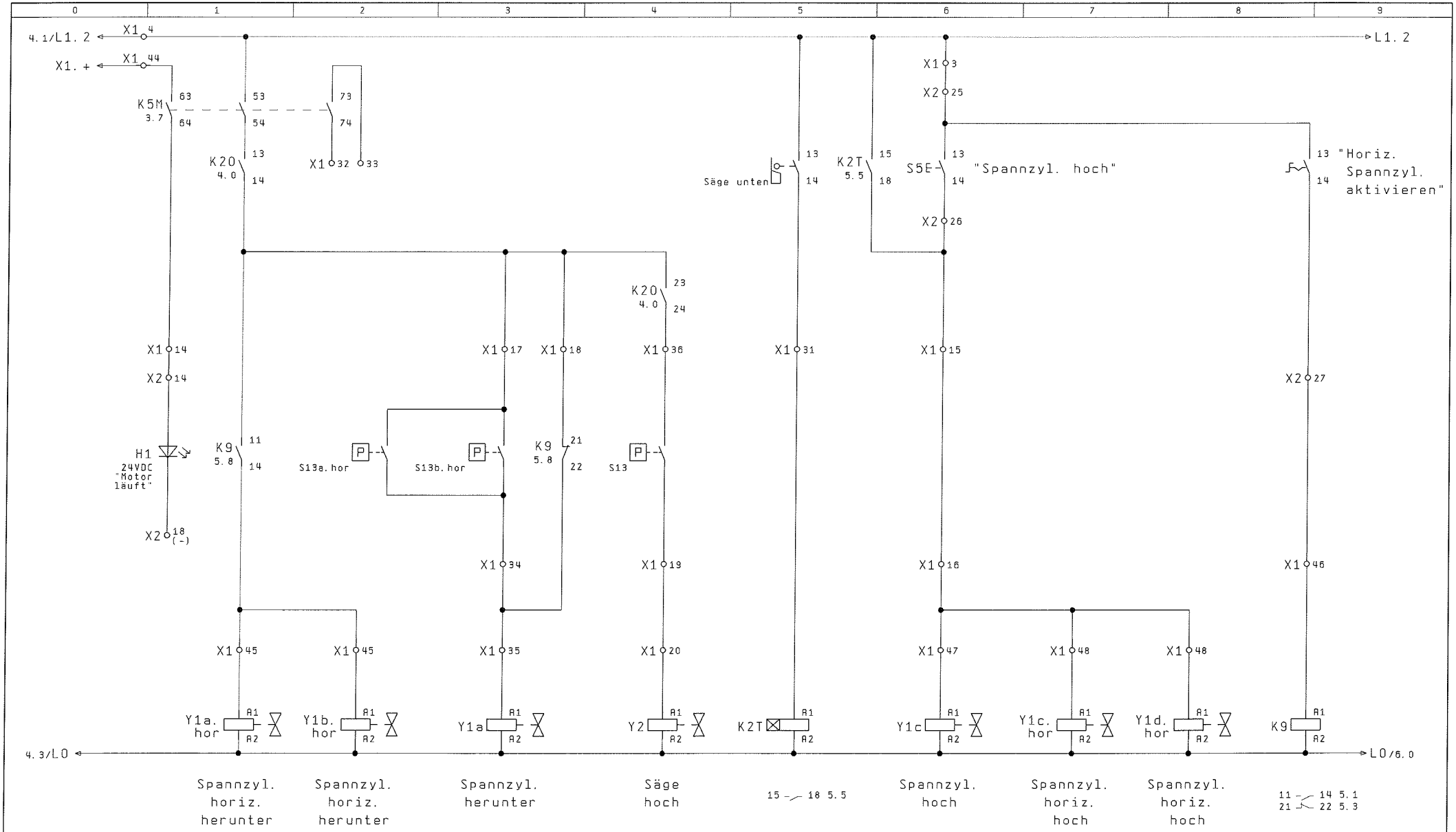
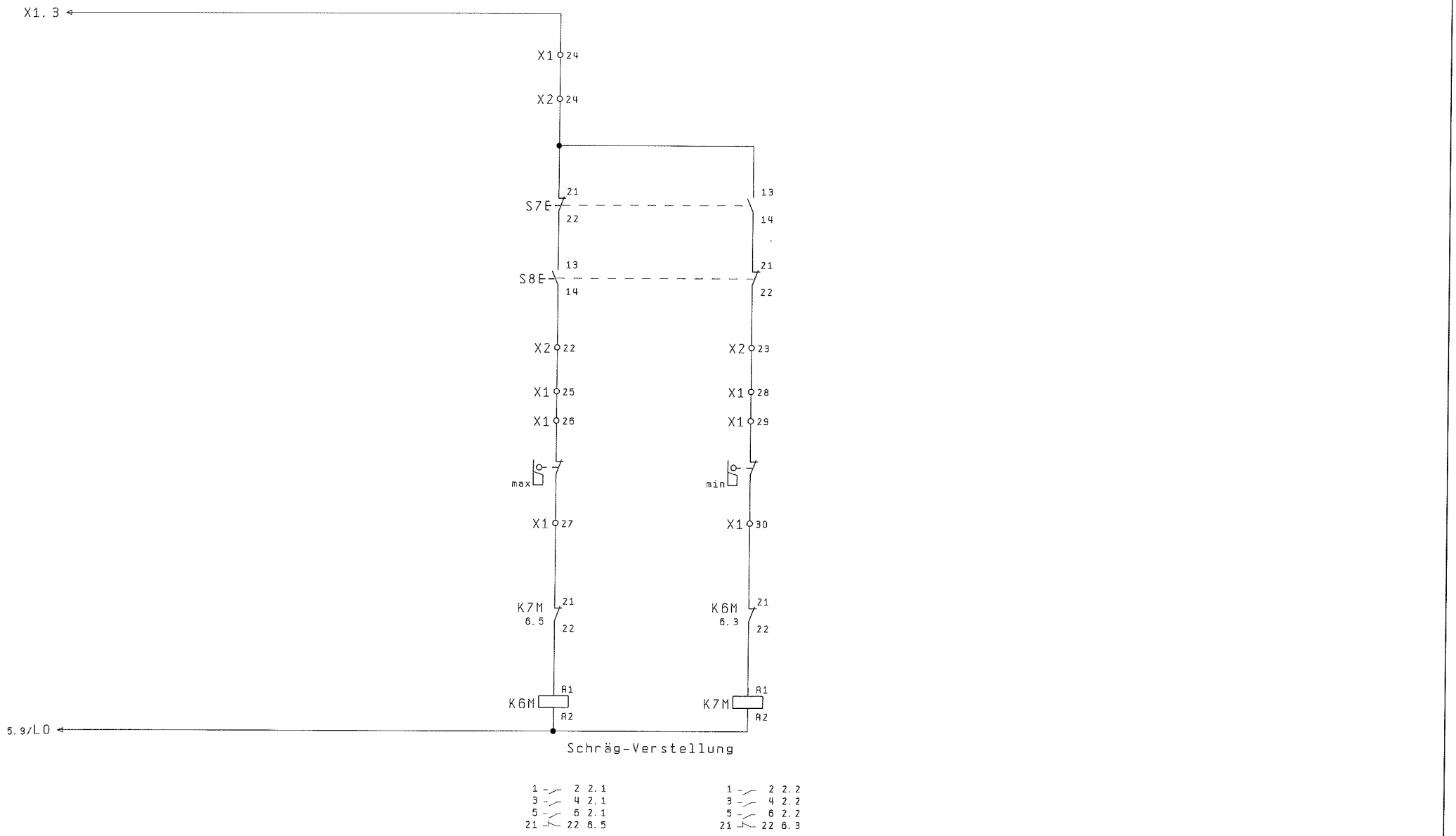
Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.		6 Bl.



			Datum		Schaltgeraete-Vertrieb Gummersbach		S. R. 02. 2011	ST 348/4. hor	=
			Bearb.	Thomas Kroll					+
			Gepr.	18. Feb. 2011					81. 5
Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.		6 81.



5

			Datum		Schaltgeraete-Vertrieb Gummersbach		S. R. 02. 2011	Schräg-Verstellung	ST 348/4. hor
			Bearb.	Thomas Kroll					
			Gepr.	18. Feb. 2011					
Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.		Bl. 6 / 6 Bl.

Z54 & Z56 Series

Programmable Position Indicators

Series 54: For use with Encoders
Series 56: For use with MX magnetic scale

ELGO - Electric - GmbH
Measure - Control - Position
Carl - Benz - Straße 1, D-78239 Rielasingen
phone.: 0049-7731/93 39 - 0, Fax: 2 88 03
Internet: www.elgo.de, Mail: info@elgo.de

Doku Art. Nr. 799000101

Essential Features

The Series 54 / 56 programmable position indicators are available with either a 5 digit 13mm high LCD display, a 5 digit 14mm red LED display, or 6 digit 10mm red LED display. The indicators incorporate the following features :

- Input of required datum value by means of the front buttons
- Robust foil covered buttons and compact plastic enclosure
- Can be operated from the batteries or from external power supply
- Memory on power down
- Designed to operate from encoder or magnetic scale feedback
- Setting of multiplication factor for display
- Incremental and absolute measurement
- Programming of features using front buttons
- 5 or 6 Digit display with +/- symbol, LED or LCD.
- Inch/metric selection.
- Display extinguished after 10 sec to save battery.
- Datum offset available.
- External inputs.

The Range available is as follows :-

Series 54 single axis indicator available in LED or LCD display formats. Suitable for encoder feedback.

Series 56 single axis indicator available in LED or LCD display formats. Suitable for MX magnetic scale feedback.

MX Magnetic Scale

The MX Scale is a non-contact magnetic linear measuring device used extensively with the ELGO simple positioning and display product range. The MX scale usually consists of three components :-

MB20.50.xx,xm	- Magnetic tape, available to lengths of 25m.
MS17.60.03,0m	- Sensing head incorporating feedback cable.
MC	- Signal translator which generates a quadrature feedback signal identical to an encoder.

In the case of the above indicators, the MC has been incorporated (where appropriate) into the indicators. The addition of this extra circuit board accounts for the additional cost of the MX scale option and the reason why, due to physical restrictions, the 56 series requires an external NG20 power supply.

Operation

These indicators may be fully controlled from four simple push buttons:-

Function select

Must be pressed with another button to select required function.
Pressed on its own, returns from selected function to operation, and stores edited value to RAM.

Twin Datum

When pressed on its own, adds the Datum Offset to the actual position. Press again to subtract.

Certain machines, such as panel saws with turnover stops, require two datums with a fixed offset that can be readily toggled.

Incremental / Absolute operation

When pressed on its own, switches between absolute and incremental operation.

In many applications dimensions are given on drawings, which are relative dimensions. Most position indicators display only the absolute position and it is necessary to calculate the new absolute position

e.g. 1928.7 + 325.9 = 2254.6

This is laborious and can lead to errors.

This can be avoided by the use of this range of indicators. The operator can select

= "Incremental". This sets the display to zero. Operator can now move 325.9 and re-select

= "Absolute" (the display now reads 2254.6)

Setting Datum

When pressed together, immediately sets the pre-programmed datum position to the display.

This is only possible if the configuration register is set to **(XXXX0)**
(See user adjustments, for random setting of Datum).

Display Extinguish - 56 series (for battery life saving)

The counter and/or display may be extinguished in a number of ways.
The method required must be chosen in the config register.

User Adjustments

Edit Datum and Datum Offset

It is only possible for the operator to edit the Datum and Datum Offset, if the editing feature is unlocked in the configuration register. **(XXX0X)**

NB The Datum and Offset values incorporate any decimal places set in the configuration (See later)

Edit Datum programmed value

Press both buttons for three seconds, allows the editing of the datum value. Range (00000 to + 99999)

Setting display to any value

Instead of having a fixed datum, the display can be set to any value desired and count from there. This is made possible by setting the Config register to XXX01.

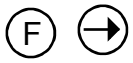
Press both buttons for three seconds, any value may now be set in the normal way.

Edit datum Offset

Press both buttons for three seconds, allows the editing of the Datum Offset . Range (00000 to + 99999)

Edit Datum +/- 1 bit

The indicator provides the facility for the operator to make small adjustments to the actual value of display to take care of minor machine variations. This is only possible when the configuration register is set to **(XXXX2)** NB: Setting of datum as above is not possible, when this feature is selected.

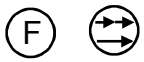
 Press both buttons for three seconds, any value may now be set in the normal way.

subtracts one bit/press,

adds one bit/press, to the displayed value.

Edit Flexible Multiplier

It is only possible to edit the Flexible Multiplier if the editing feature is unlocked in the configuration register. **(XX0XX)**

 for three seconds, allows the editing of the flexible multiplier
Range X 0.0001 to X 9.9999 (Decimal point is automatically displayed)

 Press the above button on completion of any edit, to store value to RAM and return to operating mode.

Changing Display Value

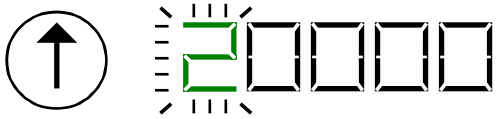
Display manipulation of both the **User Adjustment** and **Configuration** is done using the following method, once the desired function to edit has been accessed.

→ to select the digit to be changed (this flashes)

↑ to increment the digit between 0 and 9.

F stores the value to the internal RAM and returns the indicator to operating mode.

Digit scroll
1 to 9



Digit scroll left to right

N.B.

Where present, the 6th LHS digit should be set to zero. This digit is only used for a +/- symbol.

Counter Configuration

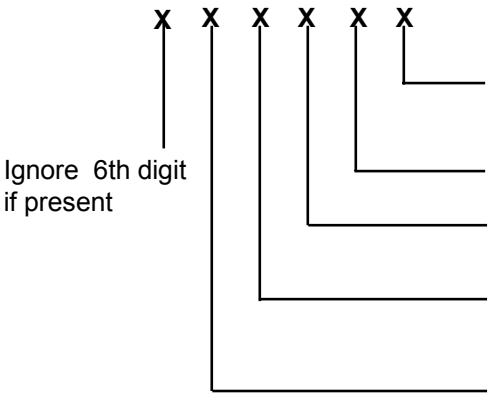
F → ↑ ⇄

Press buttons for three seconds, the Configuration mode is entered.

Conf will be displayed. The configuration file determines the operation of the indicator.

Configuration Register

(F) Pressing the above buttonfor three seconds gives access to the configuration 5 digit register.



Datum Mode
0 - Set datum to stored value
1 - Set as required
2 - Edit datum + or - 1 bit.

Datum / Datum Offset Edit 0 - Unlocked
1 - locked

Multiplier edit 0 - Unlocked
1 - Locked

Datum offset recalled on power up
0 - No
1 - Yes

Series 54 / Encoder feedback only
0 - Differential counting.
1 - Encoder X 1
2 - Encoder X 2
3 - Encoder X 4

OR **Series 56 / Scale feedback only**

Display extinguish
0 - No auto extinguish and no clamp extinguish
* 1 - Total power off / on with F button.
* 2 - Total power off after 5 minutes of inactivity.
* 3 - Extinguish display only, with clamp input
⊙ 4 - Extinguish display only, after 10 seconds of inactivity
* 5 - Extinguish display only, after 30 seconds of inactivity
* 6 - Extinguish display only, after 1minute of inactivity
* 7 - Extinguish display only, after 2 minutes of inactivity

* Only available in 3v version
⊙ Only with LED display

Direction of Count

Press for three seconds gives access to the count direction

to toggle between Up and Down.

Decimal Places

Press for three seconds gives access to the number of decimal places.

to toggle between 1,2 or 3 decimal places.

Inch / Metric Switching

Press for three seconds gives access to either counting in inches or millimetres.
(**Inch** or **nn**).

Press to toggle between these settings

On completion of editing of any section, Press (F) to store value to RAM and return to "Config".

Press all four buttons again for three seconds to return indicator to operating mode.

General Technical Information

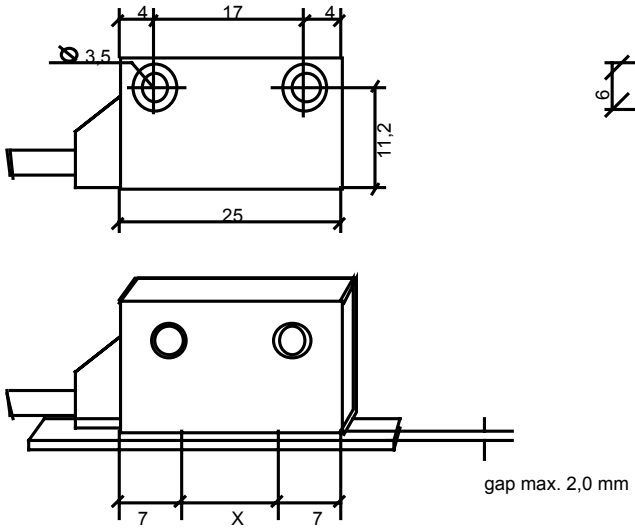
Indicators

Maximum counting frequency	- 10 kHz standard. - 50 kHz option (specify at order stage) - Series 56, 50 kHz standard.
Operating temperature	- 0 to 50 deg.C
Memory against supply failure	- 3 years
Current Consumption of Indicator	- LCD : 100mA operating
exluding Encoder	: 1mA standby
- LED	: 40mA
EE inputs	- PNP only. These provide external contact control of datum and zero reset. (Must be specified at order stage)

Encoders

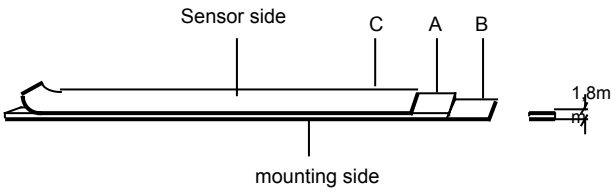
Encoder specification	- 24 volt PNP or push pull.

Sensor - MS17.60.03,0m



Maximum speed of travel	- 5m/sec
Cable length	- 3m standard (up to 25m available)
Operating temperature	- (-5) to (+ 45) deg.C
Sealing	- IP66

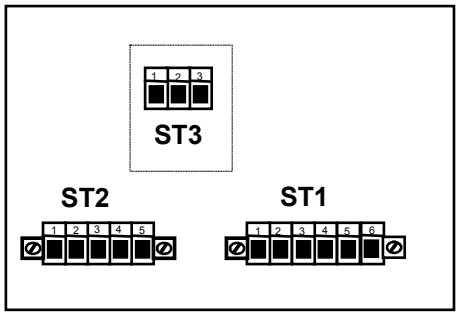
Magnetic Tape – MB20.50.xx,x



Resolution	- +/- 0.1mm
Operating temperature	- (-5) to (+ 45) deg.C
Scale expansion	- 0.000016mm / deg.C X m

Connections

Series 54 (EE Option)



ST1 - Inputs

Pin 1 - Screen
Pin 2 - 0 volts } dc input for
Pin 3 - +24 volts } 024 versions
Pin 4 - Offset
Pin 5 - Datum } Option EE
Pin 6 - Reset to zero } Pull up to 24v to activate

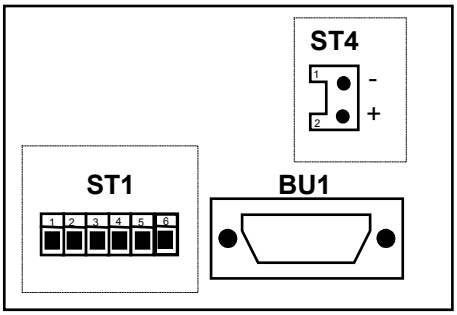
ST2 - Encoder

Pin 1 - 0 Volts
Pin 2 - +24 Volts dc
Pin 3 - Channel A
Pin 4 - Channel B
Pin 5 - Screen

ST3 - Power supply (Only for 110/ 230 Volt ac Versions)

Pin 1 - L
Pin 2 - N
Pin 3 - E

Series 56



Power Supply

ST1 - 024 version. or **ST4 - 003 version**

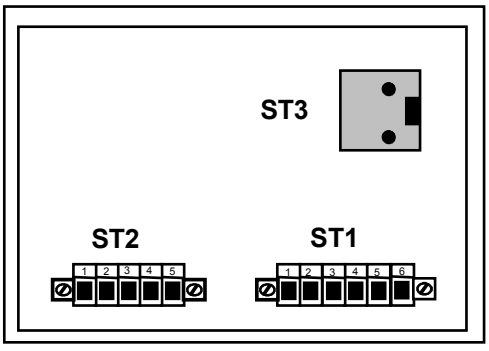
Pin 1 - (-) } 24 volts dc
Pin 2 - (+) }
Pin 3 - E
Pin 4 - Datum } Option EE
Pin 5 - Offset }
Pin 6 - +24v output }

Pin 1 - (-) } Battery
Pin 2 - (+) }

BU1 - Scale feedback connector

See MX Scale manual.

Series 54 AG (EE Option)



ST3 - AC input

Pin 1 - L
Pin 2 - N
Pin 3 - E

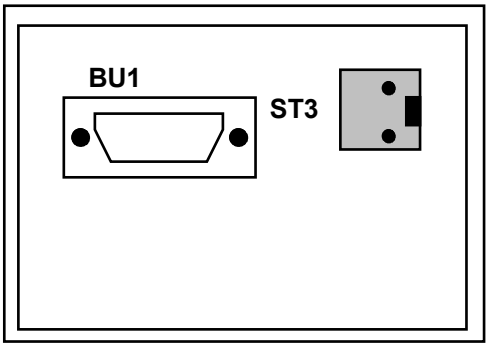
ST2 - Encoder

Pin 1 - 0 volts
Pin 2 - +24 volts dc
Pin 3 - Channel A
Pin 4 - Channel B
Pin 5 - Screen

ST1 - Inputs

Pin 1 - Screen
Pin 2 - 0 volts
Pin 3 - +24 volts output
Pin 4 - Offset } Option EE
Pin 5 - Datum }
Pin 6 - Reset to zero } Pull up to 24v to activate

Series 56 AG



ST3 - AC input

Pin 1 - L
Pin 2 - N
Pin 3 - E

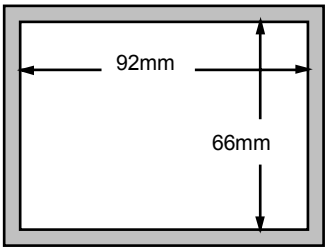
BU1 - MX magnetic scale

See MX Scale manual

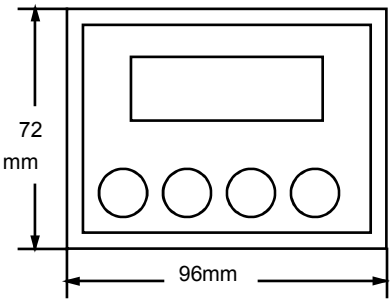
Dimensions

Panel Mounting Series 54 and 56

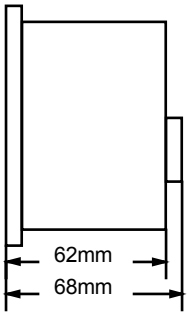
Cut Out dimensions



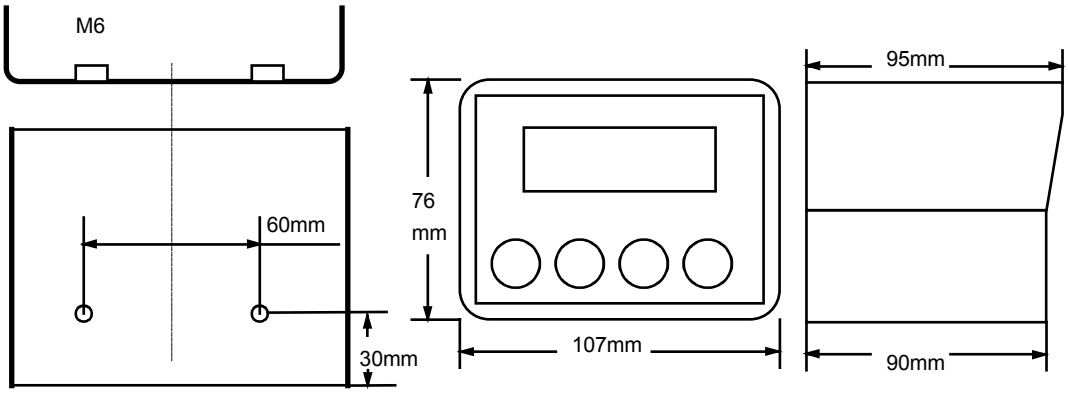
Outline Dimensions



Side View

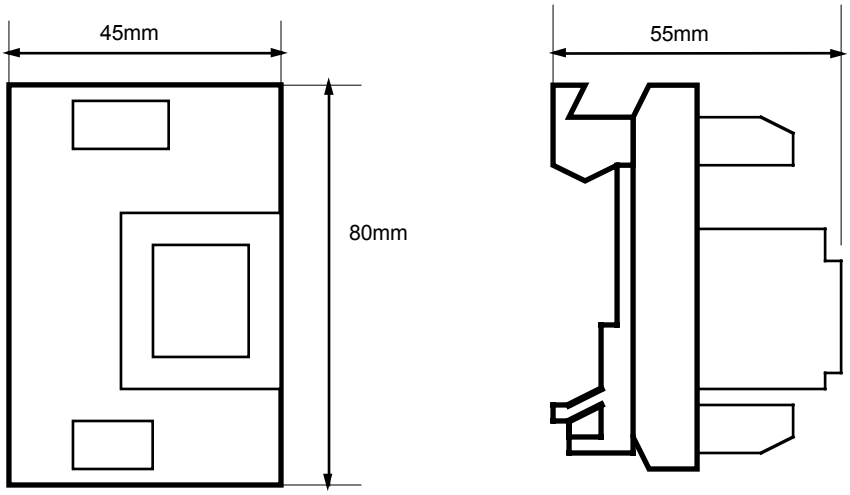


AG Enclosure Mounting Series 54 and 56



Depth 160mm with connector

NG20.0 Power Supply



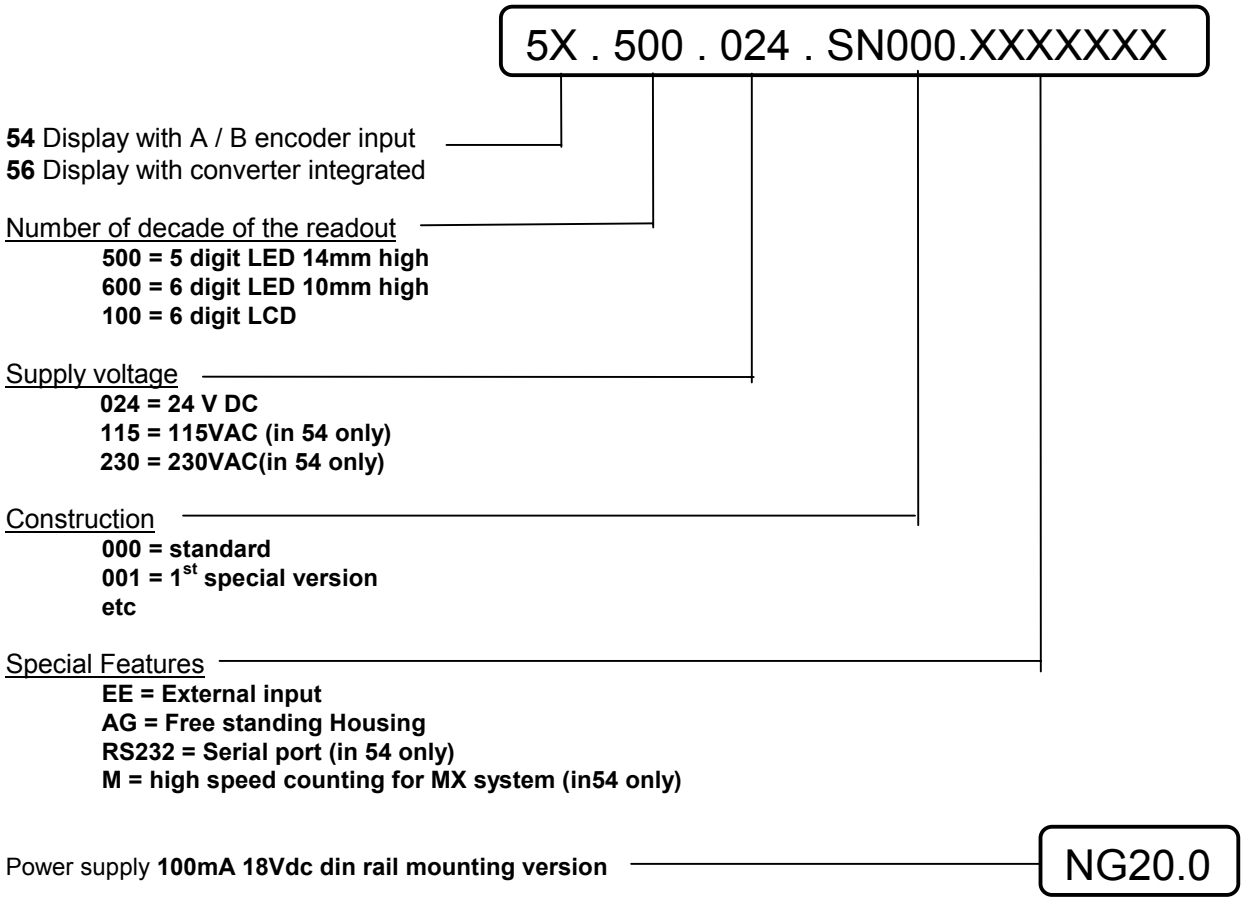
Series	Display			Power Supply				Options	
	600	500	100	003	024	110	230	AG	EE
54	■	■			■	■	■		■
	■	■				■	■	■	■
			■		■	■	■		■
			■			■	■	■	■
56	■	■		■	■				
	■	■				○	○		▲
	■	■				■	■	■	▲
			■	■	■				
			■			○	○		▲
			■			■	■	■	▲
74	■				■	■	■	■	▲
76	■				■	■	■	■	▲
75	■				■	■	■	■	▲

○ For 56 series indicators to operate on 110/230 v ac, use the 024 version and order a separate NG20.0 power supply.
AG versions always include NG20.0 mounted inside the enclosure.

▲ 2 external inputs only available.

For **AG** Version 230 or 110 v operation must be specified at order stage.

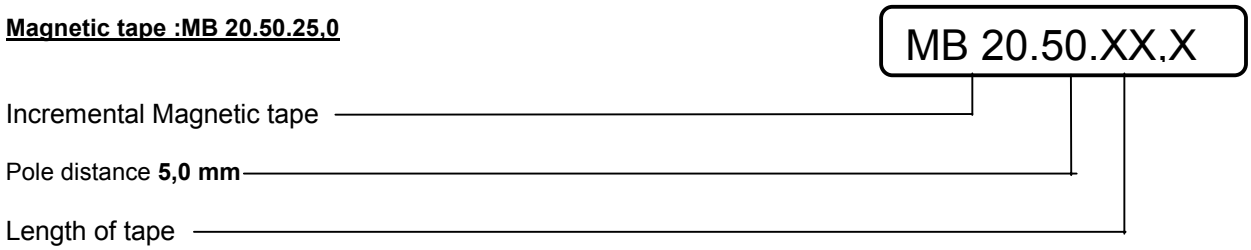
Type designation of 54/56 series



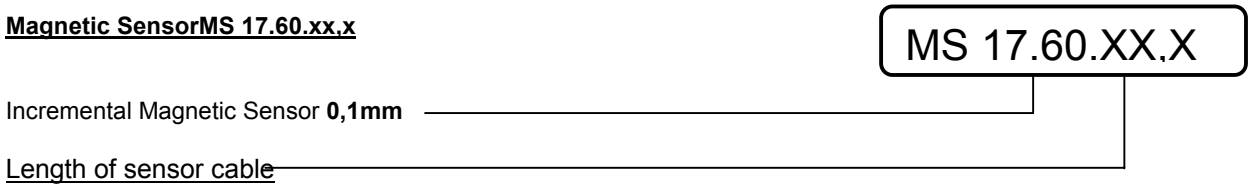
Power supply **100mA 18Vdc din rail mounting version** — NG20.0

Accessories 56

Magnetic tape :MB 20.50.25,0



Magnetic SensorMS 17.60.xx,x



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Damages verifiably not caused by ELGO Electric GmbH and due to improper handling are excluded from any guarantee e.g. by applying faulty voltage, diffusion of liquid into the interior of the engine, using force, scratching

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