

Series **Ergonomic**



Ergonomic 320.250 GH

Operating instructions

**Before transporting and using the machine,
please read the instructions thoroughly!**

Seriové číslo / Serien Nummer / Serial Number _____

Service and information

Your BOMAR dealer:

Direct BOMAR contact:

BOMAR spol. s r.o.
Těžební 1236/1
62700 Brno
Czech Republic, EU

telefon: +420 – 533 426 100
fax: +420 – 533 426 109
e-mail: info@bomar.cz
www: <http://www.bomar.cz>

We are available:

Mondays to Fridays

7⁰⁰ – 16⁰⁰

Version:

1.04 / Mar. 2010

rev. 1

BOMAR, spol. s r.o. © – Subject to modifications and amendments.

EC Declaration of Conformity

1) We

BOMAR, spol. s r.o.
Těžební 1236/1
627 00 Brno, The Czech Republic
Id.no: 48908827

declare herewith,

that the following designated device based on its conception and construction as well as the design launched by us meets the relevant basic safety requirements of the decrees of the government. In the event of any device modification not approved by us this declaration shall lose its validity.

Name: **Band Saw**

Type range: **Ergonomic 320.250 GH (GH-F)**

Serial number:

Manufacturer: **BOMAR, spol. s r.o., Těžební 1236/1, 627 00 Brno**

Product data:	Determination:	For cross dividing and cutting of rolled and towed bars and profiles made of steel, stainless steel, non-ferrous metals and plastics.	
	Description:	stand, table, cutting unit with the arm, saw band and drive, control panel	
		Hydraulic	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
		Control system	yes <input type="checkbox"/> no <input checked="" type="checkbox"/> / semiautomat
Technical data:	cutting rate	GH: 40/80 m/min, GH-F: 20–120 m/min	
	cutting angle	0° – 60°	
	Total dimensions in mm (l×w×h)	1670×1166×1239 mm	
	weight	385 kg	
	Supply voltage	400 V, total power requirement	2 kW,

The applied decrees of governments:

No. 24/2003 Coll. (Directive 98/37/EC)

No. 616/2006 Coll. (Directive 2004/108/EC)

No. 17/2003 Coll. (Directive 2006/95/EC)

The applied harmonized standards,

National standards and technical specifications: ČSN EN ISO 12 100-2:2004, ČSN EN 13 898:2004, ČSN EN ISO 13857:2008, ČSN EN 55 011 ed.2:2007, ČSN EN 61000-6-4 ed.2:2007, ČSN EN 60204-1 ed.2:2007

The product is safe on condition of the common and determined usage.

The conformity judging was performed according to §12, par. 3, let. a), of the Law no. 22/1997 Coll. as amended

2) ²⁾ The declaration of conformity was carried out in the cooperation with the TÜV SÜD Czech s.r.o., Novodvorská 994, 142 21 Prague 4 – Czech Republic, Identification number: 63987121 - Inspection body no. 4002

The inspection certificate no. 01.074.556/09/07/02/0 was issued.

BOMAR, spol. s r.o.
Těžební 1236/1, 627 00 Brno
Czech Republic
IČO: 48908827
DIČ: CZ48908827



Alfred Pichlmann, managing director

Point of issue, datum

Name and function
of the responsible subject

Signature

Name of person responsible for assembling the technical documentation : Adam Urban

1) Name, address and identification number of the subject issuing the conformity declaration (producer of importer)

2) The authorized or accredited body co-operating on the conformity judging



If the equipment is installed without safety equipment offered by BOMAR, spol. s r.o or its agents and used by the customer (or buyer) then EC declaration loses validity.
EC Declaration of conformity is valid only if customer (buyer) installed the BOMAR safety equipment with the machine or with some other with equivalent safety device in accordance with current applicable regulations and standards.
All machine elements and components that were built into the device by BOMAR, spol. s r.o have been declared "identical" to a safety device, as offered by BOMAR, spol. s r.o or its agents.

Content

1. SAFETY NOTES7

1.1. Machine determination.....	8
1.2. Protective suit and personal safety.....	8
1.3. Safety notes for machine operator.....	9
1.4. Safety notes for the servicing and repairs.....	9
1.5. Safety notes for the servicing and repairs on hydraulic unit.....	10
1.6. Safety machine accessories.....	10
1.6.1. Total Stop.....	10
1.6.2. Arm cover.....	10
1.6.3. Band saw cover.....	10
1.6.4. Saw band stretching and rupture inspection.....	11
1.7. Safety notes for the cooling.....	11
1.7.1. Instructions for first help.....	11
1.8. Umístění štítku stroje / Maschinenschild position / Position of machine label.....	12
1.9. Umístění bezpečnostních značek / Verteilung der Sicherheitszeichen / Position of safety symbols.....	13

2. MACHINE DOCUMENTATION15

2.1. Technická data / Technische Daten / Technical data.....	16
2.2. Rozměrové schéma / Aufstellzeichnung / Installation diagram.....	17
2.3. Popis / Beschreibung / Description.....	18
2.4. Transportation and stocking.....	19
2.4.1. Conditions for transportation and stocking.....	19
2.4.2. Transport and stocking preparations.....	19
2.4.3. Transport and stocking.....	19
2.4.4. Transportní schéma / Transport schema / Transport scheme.....	20
2.5. Activation.....	21
2.5.1. Machine working conditions.....	21
2.6. Band saw unpacking and assembling.....	21
2.6.1. Machine installing and levelling.....	21
2.6.2. Machine disposal after lifetime.....	21
2.6.3. First run of the power pack.....	22
2.6.4. Filling the reservoir with hydraulic oil.....	22
2.6.5. Kotevní plan / Verankerungsplan / Grounding plan.....	23
2.7. Electrical connection.....	24
2.7.1. Check the direction of the saw band.....	24
2.7.2. Check machine connection into electrical network.....	24
2.8. Filling of the cooling system.....	25
2.9. Check machine function.....	25
2.10. Saw band.....	25
2.10.1. Saw band size.....	25
2.10.2. Selection of the saw band tooth system.....	25
2.10.3. Saw band running-in.....	25
2.10.4. Tables for teeth selection.....	27

3. MACHINE CONTROL29

3.1. Main switch.....	30
3.2. Control panel.....	30
3.2.1. Control panel – for machine without frequency converter.....	30
3.2.2. Control panel – for machine with frequency converter.....	31
3.3. Cutting.....	31
3.3.1. Semiautomatic cycle.....	31
3.4. Cycle breaking.....	32
3.5. Band saw adjusting.....	32
3.5.1. Cutting speed.....	32
3.5.2. Pressure adjusting to the cut.....	32
3.5.3. Setting of the material length.....	33
3.5.4. Optimal adjusting of the guide cubes span.....	33
3.5.5. Angular cut setting.....	34
3.5.6. Brush adjustment.....	35
3.6. Material insertion.....	36
3.6.1. Handling agent selection.....	36
3.6.2. Insertion.....	36
3.6.3. Bundle material cutting.....	36

4. MACHINE SERVICE37

4.1. Saw band dismantling and installation.....	38
4.1.1. Saw band dismantling.....	38
4.1.2. Saw band installation.....	39
4.2. Saw band stretching and inspection.....	39
4.2.1. Saw band stretching.....	39
4.3. Saw band run adjustment on stretching wheel.....	39
4.3.1. Saw band run inspection.....	39
4.3.2. Saw band setting.....	40
4.4. Saw band adjusting.....	40
4.4.1. Hard metal guides adjustment.....	40

4.4.2.	Guide cube adjustment	41
4.4.3.	Adjusting the limit switch of the saw band stretching	41
4.4.4.	Angular stops adjustments	41
4.4.5.	Adjusting of the turning console securing lever	42
4.4.6.	Saw frame lower position stop adjustment	43
4.4.7.	Adjustment of the limit switch of saw frame lower stop point	43
4.4.8.	Adjustment of the regulating pressure to the cut	44
4.4.9.	Adjustment of a throttle valve	45
4.4.10.	Brush adjustment	45
4.5.	Cooling agents and chips disposal	46
4.5.1.	Coolant device inspection	46
4.5.2.	Chips disposal	46
4.6.	Hydraulic, greases and oils	47
4.6.1.	Gearbox oils	47
4.6.2.	Lubricant greases	47
4.6.3.	Lubrication	48
4.6.4.	Hydraulic oils	48
4.6.5.	Hydraulic unit service	49
4.7.	Machine cleaning	49
4.8.	Worn pieces replacement	50
4.8.1.	Hard metal guides replacement	50
4.8.2.	Saw band guiding rollers replacement	50
4.8.3.	Round brush replacement	52
4.8.4.	Stretching wheel replacement	53
4.8.5.	Driving wheel replacement	55
4.8.6.	Cooling pump replacement	56

5. ZÁVADY / TROUBLESHOOTING59

5.1.	Mechanical problems	60
5.2.	Electric problems	62
5.3.	Hydraulic problems	63

6. SCHÉMATA / SCHEMAS / SCHEMATICS.....65

6.1.	Elektrická schémata / Elektroschemas / Wiring diagrams – bez frekv. měniče / ohne Frequenzumrichter / without frequency convertor – 3x400 V/50 Hz, TN-C-S	66
6.2.	Elektrické schéma / Elektroschema / Wiring diagrams – frekv. měnič / Frequenzumrichter / Frequency convertor – 3x400 V/50 Hz, TN-C-S	71
6.3.	Hydraulické schéma / Hydraulikschema Hydraulic diagrams	76

7. VÝKRESY SESTAV PRO OBJEDNÁNÍ NÁHRADNÍCH DÍLŮ / ZEICHNUNGEN FÜR BESTELLUNG DER ERSATZTEILE / DRAWING ASSEMBLIES FOR SPARE PARTS ORDER79

7.1.	Ergonomic 320.250 GH	80
7.2.	Kusovník / Stückliste / Piece list – Ergonomic 320.250 GH	81
7.3.	Rameno / Sägerahmen / Saw arm	82
7.4.	Kusovník / Stückliste / Piece list – Rameno / Sägerahmen / Saw arm	83
7.5.	Rameno / Sägerahmen / Saw arm	84
7.6.	Kusovník / Stückliste / Piece list – Rameno / Sägerahmen / Saw arm	85
7.7.	Konzola / Konzole / Console	86
7.8.	Kusovník / Stückliste / Piece list – Konzola / Konzole / Console	87
7.9.	Svěrák / Schraubstock / Vice	88
7.10.	Kusovník / Stückliste / Piece list – Svěrák / Schraubstock / Vice	89
7.11.	Napínání / Spannung / Tensioning	90
7.12.	Kusovník / Stückliste / Piece list – Napínání / Spannung / Tensioning	91
7.13.	Vedení pásu / Sägebandführung / Belt guide	92
7.14.	Kusovník / Stückliste / Piece list – Vedení pásu / Sägebandführung / Belt guide	93
7.15.	Vodící kostka / Führungsklotz / Guiding cube	94
7.16.	Kusovník / Stückliste / Piece list – Vodící kostka / Führungsklotz / Guiding cube	95
7.17.	Vodící kostka / Führungsklotz / Guiding cube	96
7.18.	Kusovník / Stückliste / Piece list – Vodící kostka / Führungsklotz / Guiding cube	97
7.19.	Válec zvedací / Hebezyylinder / Lifting cylinder	98
7.20.	Kusovník / Stückliste / Piece list – Válec zvedací / Hebezyylinder / Lifting cylinder	99
7.21.	Podstavec / Untersatz / Base	100
7.22.	Kusovník / Stückliste / Piece list – Podstavec / Untersatz / Base	101
7.23.	Doraz / Anschlag / Lenght Stop	102
7.24.	Kusovník / Stückliste / Piece list – Doraz / Anschlag / Lenght Stop	103
7.25.	Chlazení / Kuhlung / Cooling	104
7.26.	Kusovník / Stückliste / Piece list – Chlazení / Kuhlung / Cooling	105
7.27.	Válec / Zylinder / Roller	106
7.28.	Kartáč / Bürste / Brush	107

1. **Safety notes**

The operating instructions must be read by the person, who keeps in touch with the machine before transportation, installation, using, servicing, repair, stocking or removal!

The operating instructions include relevant information. The operator must familiarise himself with the install and operation, safety notes and machine servicing, because reliability and service life must be reached. The operating instructions must avoid risks, which are linked to work on the machine. Before transporting and using of the machine, please read the instructions thoroughly!

Attention!

*The operating instructions must be available at the machine!
Keep the operating instructions in good condition!*

1.1. Machine determination

The band saws **Ergonomic 320.250 GH and Ergonomic 320.250 GH-F** is determined for cutting and shortening of rolled bars and drawn bars and profiles from steels, stainless steels, non-ferrous metals and plastics **with cutting angles from 0° to 60°**.

Combustible materials are excepted for cutting! Any other usage and operation outside this range are unauthorized and the manufacturer/supplier does not accept any responsibility for any damages resulting from such misuse. **The operator has full responsibility!**

The machine is equipped with safety and protective guarding for operator and machine protection. Nevertheless, this safety and protective guarding cannot prevent injury. Service personnel must read this chapter and comprehend it, before he starts to work on the machine. **Always keep instructions about work safety!** Service personnel must take into account other aspects of the risk, which refer to the ambient conditions and the material.

Attention!

Consider the safety signs on the machine. Do not remove or damage them!

1.2. Protective suit and personal safety

Wear tight fitting overalls! Loose fitting clothes may be caught with machine parts and cause serious injury.

Wear protective gloves! Material cuts and saw band have sharp edges and may cause serious injuries.

Attention!

*Gloves you can use only at working material replacement (saw band)! The machine and accessories must be inactive!
If the machine is running, you must not wear gloves! It is dangerous, because some parts of the machine can catch gloves!*

Wear protective shoes with non-skid soles! The unsuitable shoes may cause balance loss and following injury. Falling work pieces may cause serious injuries too.

Wear protective goggles! Chips and cooling liquid may damage your eyes.

Always wear ear protections! Most of the machines emit up to 80 dB and may damage your hearing.

Do not wear jewellery and always tie back long hair! Moving machine parts can catch jewellery or loose hair and may cause serious injuries.

Operate the machine only when you are fit enough to work. Illnesses or injuries diminish concentration. Avoid machine work, which may compromise the safety of you and your colleagues!

1.3. Safety notes for machine operator

Attention!

*Machine can be operated by person older than 18 years!
Machine can be operated only person physically and mentally fit
for this activity*

Machine can be operated only by one person. Machine operator is responsible for presence of other persons by the machine.

Keep instructions and orders about work safety!

Read the operating instructions, before you start to work on the machine! Keep the operating instructions in good condition!

Close covers before the machine starting and check, if the covers are not damaged. Damaged covers must be repaired or changed. Do not start the machine, if the cover is removed! Check, if the electric cables are not damaged.

Attention!

Do not connect the machine to electricity if the covers are removed. Do not touch the electrical equipment.

- Do not hold the material for clamping to the vice and for cutting!
- Do not operate with the buttons and the switches on the control panel, when you have gloves!
- For machine starting take care, that there is nobody in the working area of the machine (it means in the working area of the vice, the saw band, the saw arm etc.).
- In no circumstances touch the rotating elements.
- Work on the machine only when the machine is in good condition!
- Check at least once in a shift, if the machine is not damaged. If the machine is damaged, you must bring the machine in order and you must inform your superior!
- Keep your working area clean! Ensure sufficient lighting in the working area.
- Take off the spilt water or the oil from the floor and dry it. Do not touch the cooling liquid with bare hands! Do not set the nozzle of the cooling liquid, when the machine is started on
- Do not remove the chips from the working area of the machine, when the machine is started on!
- Do not use the compressed air for the machine cleaning or for the chips removing!
- Use the protective instruments for chips removal!

1.4. Safety notes for the servicing and repairs

Attention!

Only a qualified professional can carry out the servicing and repairs of the electric equipment! Take special care during the work with electrical equipment. High voltage shock can have fatal consequences! Always keep notes about work safety! Otherwise, there is possibility of heavy injury!

Switch off the main switch and lock it, before you start service work! Otherwise, there is possibility of hazardous machine starting.

Only qualified person can do the servicing and repairs. For parts changing, use only parts, which are identical with the originals. Otherwise, there is possibility of health hazard. Use only recommended type of the hydraulic oils and oils and lubricants!

Do not remove or do not lock the limit switches or safety equipments! Any use of the saw, accessories or machine parts other than that intended by the BOMAR, spol. s r.o. company is not permitted. The guarantee on this product will be afterward lost and BOMAR, spol. s r.o. takes no responsibility for caused damages.

1.5. Safety notes for the servicing and repairs on hydraulic unit

Compliance with the the principles of cleanliness is basic requirement for trouble-free operation of hydraulic equipment. Hydraulic components are products made with high accuracy, and any contamination leads to a reduction lifetime or even malfunction. The consequences are very difficult to remove and expensive.

Always use clean tools. Parts and fasteners, which are part of a hydraulic circuit, never put away the dirty surface. The best cleaning agent is crepe paper, because the fibers of the cleaning cloths can also cause malfunction.

Protective cap from the threaded chamber remove just before the assembly of the unit.

Hoses and pipes before mounting flush with gasoline or other cleaning agent and blow compressed air.

All fittings must be properly tightened. However, do not raw power.

1.6. Safety machine accessories

The machine is equipped with safety accessories. It protects the operator from injuries and the machine before damage. The safety accessories are blocking accessories, emergency switches and covers. Check once in a week the function of the safety accessories. If the safety accessories are functionless, you must stop work and repair or change the safety accessories.

Enhanced risk!

Do not come into or intervene in the cutting area. Otherwise, there is possibility of heavy injury.

1.6.1. Total Stop

TOTAL STOP button is for emergency switch–off the machine in case defect or health hazard. By pressing **TOTAL STOP** button is interrupted the supply of the electrical power.

If any damages or fault appears, immediately press TOTAL STOP button! Release the pressing button is possible by twisting of the upper part of the button.

1.6.2. Arm cover

If the cover is opened during operation, the limit switch is opened and the band saw is stopped. The band saw is not possible start in set mode.



The band saw is stated to the operation, when the cover is closed!

1.6.3. Band saw cover

It covers the visible area of the saw band from guiding cube to the frame.



Never turn-ON saw band when cover is not mounted!

1.6.4. Saw band stretching and rupture inspection

This device checks the saw band tension and causes immediate machine stop if the band incidentally ruptures.



The device includes a limit switch. Its adjustment is described in chapter „Servicing and adjusting“. Check the switch carefully and periodically – adjust it if necessary.

1.7. Safety notes for the cooling

Attention!

- *When handling cooling agents always wear hazardous fluid-proof gloves!*
- *Wear protective goggles!*
- *Cooling liquid can get in contact with your eyes and may cause permanent severe injuries*

1.7.1. Instructions for first help

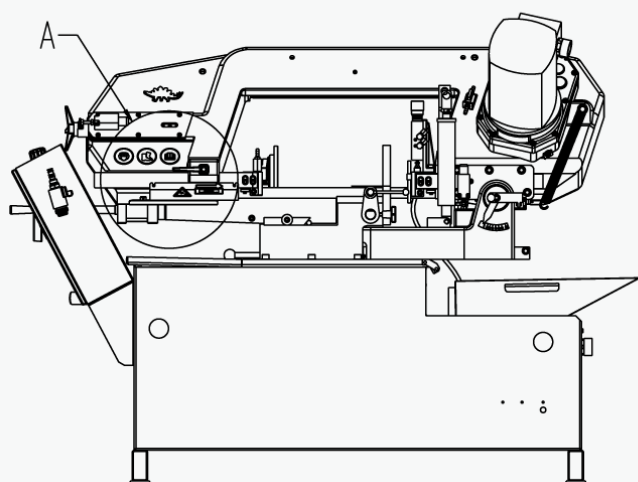
1. Pull off and safely remove polluted, soaked clothing.
2. For breathing, go out in the fresh air or look for first aid treatment.
3. Wash with water or use crèmes for contact with the skin.
4. Flush with water for eyes and look for first aid treatment.
5. For swallowing, drink a lot of water and induce vomiting. Look for medical help.

**1.8. Umístění štítku stroje /
Maschinenschild position /
Position of machine label**



Machine label is placed on saw band base.

1.9. Umístění bezpečnostních značek / Verteilung der Sicherheitszeichen / Position of safety symbols



PO:

Noste pevnou pracovní obuv
Tragen Sie Sicherheitsschuhe
Wear fixed protective shoes



CZ:

Přečíst návod k použití
Bedienungsanleitung lesen
Read the operating instructions



OBS:

Noste ochranné brýle a sluchátka
Tragen Sie eine Schutzbrille und
Gehörschutz
Wear protective goggles
and headphones



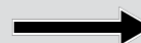
NR:

Nebezpečí říznutí
Schnittgefahr
Cutting or severing hazard



SP:

Směr pohybu
Bewegungsrichtung
Direction of motion

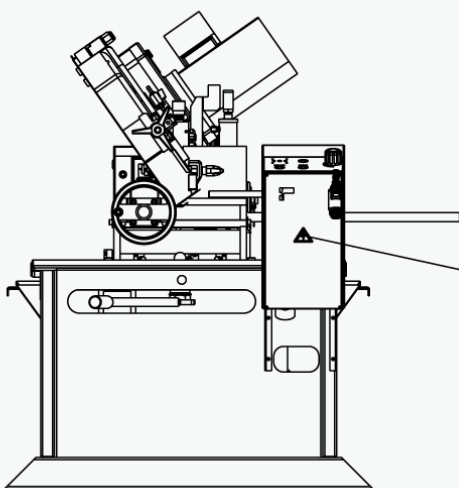
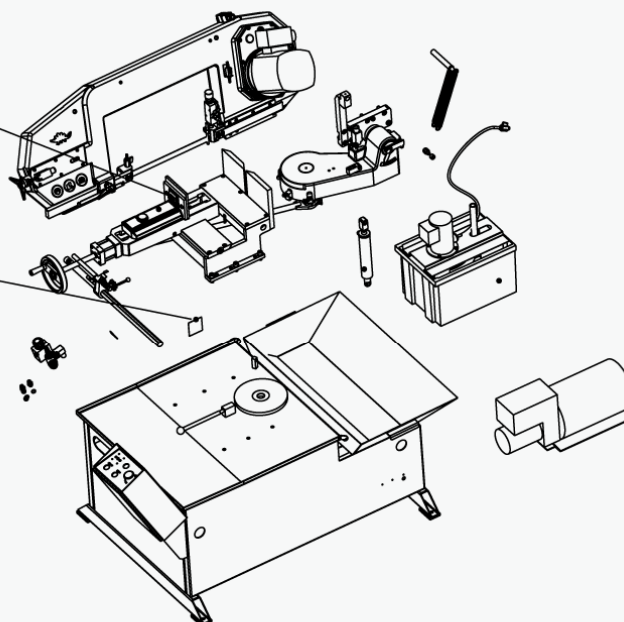


NSS

Nebezpečí stlačení svérákem
Pressungsgefahr
Crushing hazard by vice



Štítek stroje
Maschinenschild
Machine label



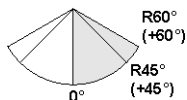


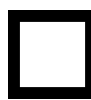
NE

Nebezpečí úrazu
elektrickým proudem
Verletzungsgefahr vom
elektrischen Strom
Electrical hazard



2. **Machine documentation**

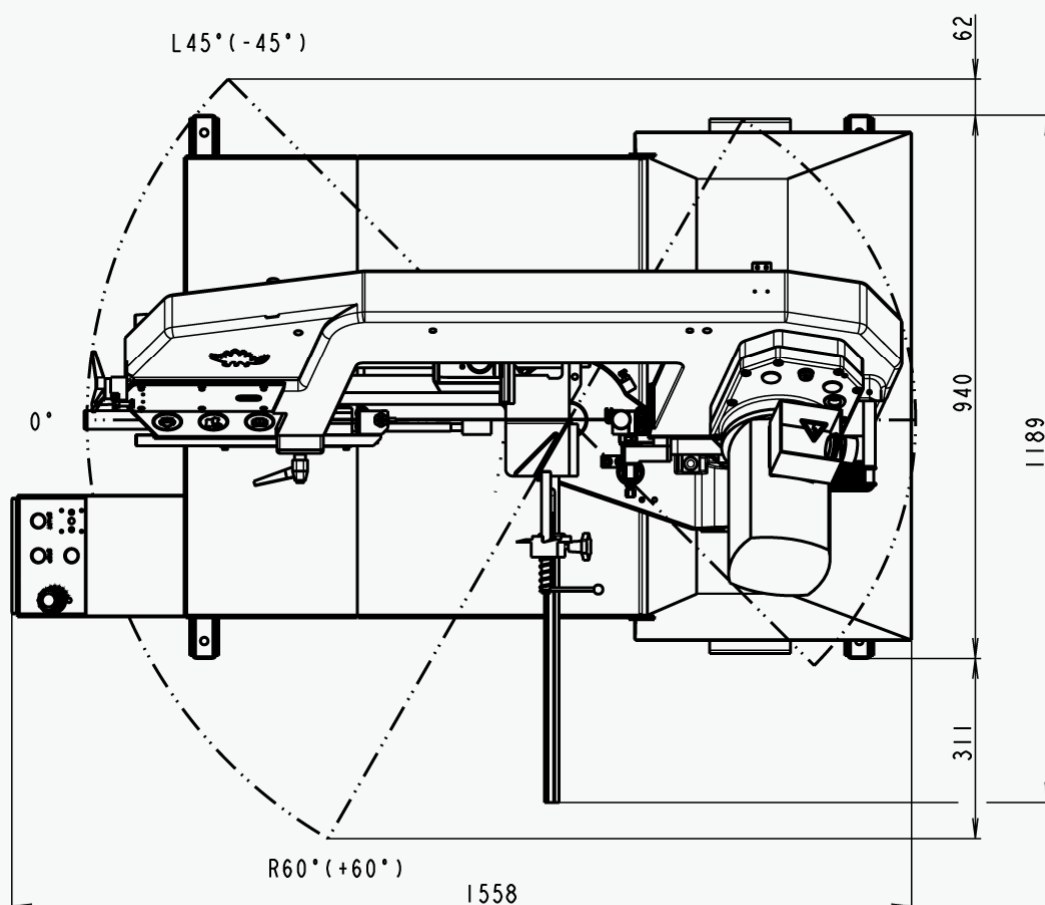
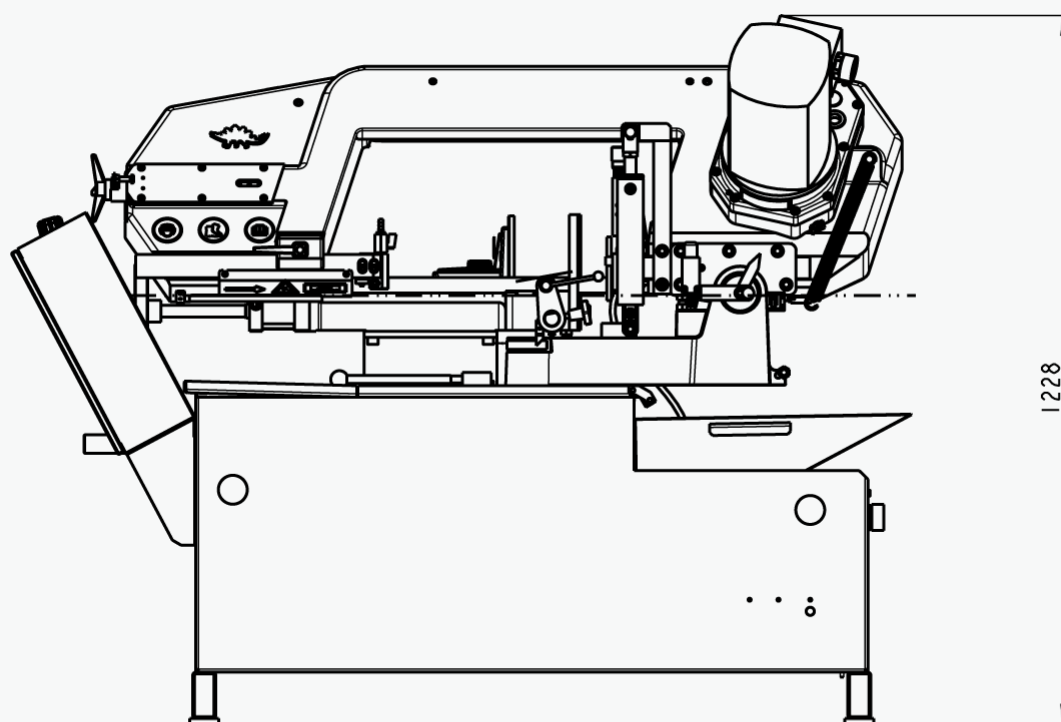
2.1. Technická data / Technische Daten / Technical data

Hmotnost stroje / Maschinengewicht / Machine weight:	
Hmotnost / Gewicht / Weight	385 kg
Rozměry stroje / Maschinengröße / Machine size :	
Délka / Länge / Length	1670 mm
Šířka / Breite / Width	1166 mm
Výška / Höhe / Height	1239 mm
Elektrické vybavení / Elektrische Ausrüstung / Electrical equipment:	
Napájení / Versorgungsspannung / Supply voltage	~ 3x400V, 50Hz, TN-C-S
Příkon / Gesamtschlusswert / Total Input	2 kW
Max.jištění / Max. Vorschaltssicherung / Max. Fuse	16 A
Akustický tlak / Schalldruckpegel / Acoustic pressure:	
Ergonomic 320.250 GH	L _{Aeqv} = 65 dB
Pohon / Atrieb / Drive:	
Typ / Typ / Type	3x400 V
Napájení / Versorgungsspannung / Supply voltage	~ 3x400 V, 50 Hz
Výkon / Leistung / Output	1,5 / 1,1 kW
Jmenovitá otáčky / Motornendrehzahl / Nominal speed	2800 / 1420 min-1
Hydraulické zařízení / Hydraulieinrichtung / Hydraulic equipment:	
• Typ / Type / Type	HYTOS:SMA04-33 / HYKOM:HAH11-4,6
• Výkon / Leistung / Output	3 MPa / 0,25 kW
Chladicí zařízení / Kühlmiteleinrichtung / Cooling equipment:	
Výkon / Leistung / Output	0,09 kW
Obsah nádrže / Volumen vom Kühlmittel / Capacity	12 dm ³
Rozměr pásu / Sägebanddimension / Band size:	
2910x27 (25)x0,90 mm	
Řezná rychlost / Schnittgeschwindigkeit / Cutting speed:	
Standard: 40/80 m/min. Freq. converter: 20–120 m/min	
Řezné rozsahy / Schnittbereiche / Cutting size:	
	
0°	   
R 45°	Ø250 mm 320x170 mm 290x240 mm 240x240 mm
R 60°	Ø220 mm 230x140 mm 200x230 mm 200x200 mm
R 60°	Ø110 mm 130x105 mm 130x105 mm 105x105 mm

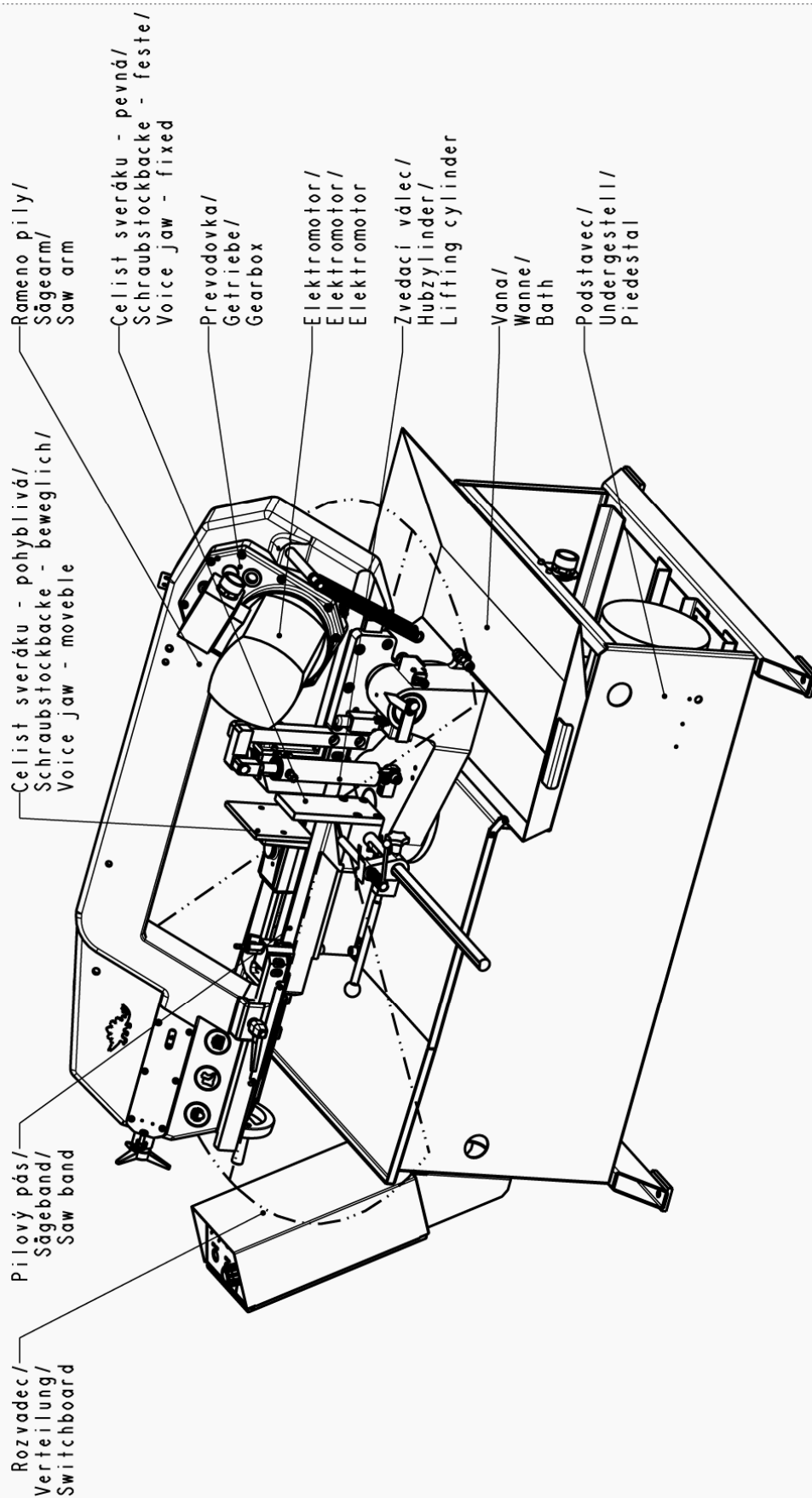
Level of acoustic pressure:

Equivalent level of acoustic pressure A (noise) at operator position are L_{Aeqv} = 65 dB. Mentioned values are levels of emission which doesn't have to represent safe levels. Factors which influence real level of acoustic pressure on machine operator are: working place characteristics, cut material, saw band. These factors have significantly influence on acoustic pressure.

2.2. Rozměrové schéma / Aufstellzeichnung / Installation diagram



2.3. Popis / Beschreibung / Description



2.4. Transportation and stocking

2.4.1. Conditions for transportation and stocking

Keep recommendations for the manufacturers for transportation and stocking! If the recommendations are not kept, damage can occur to the machine.

- Don't use a forklift truck for handling the machine, if you do not have license for it!
- Don't move under suspended loads! Fault in lifting device may cause serious injury.
- Keep a safe distance from the machine during the transport.
- Temperature of the air from -25°C to 55°C , for a *short term* (max. 24 hours) temperature of the air until 70°C
- Do not expose the machine to radiation (for example microwave radiation, ultraviolet radiation, laser radiation, x-ray radiation). Radiation can cause problems with the machine function and deteriorating condition of the isolation.
- Take measures, to prevent damage by dampness, by vibrations and by shakes.

2.4.2. Transport and stocking preparations

Close the vice and thoroughly oil all blank surfaces.

Lower the saw frame to the lowest position.

Make sure to empty the machine of all traces of the cooling agent.

Fasten all loose parts securely to the machine.

Pack and wrap the control desk securely to avoid damage during transport.

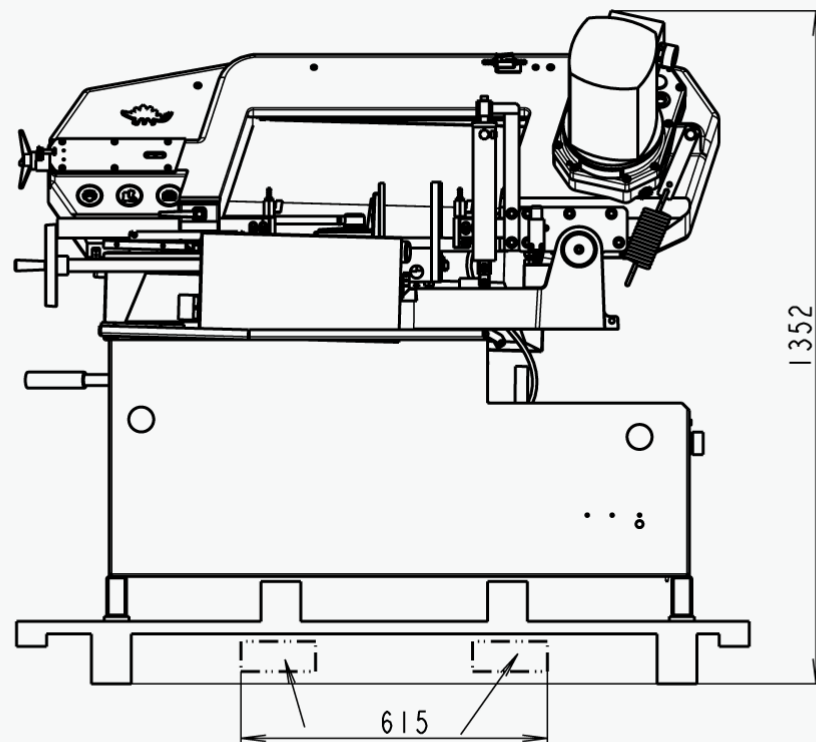
Fix the stickers stating the minimum approximate machine weight to at least five well visible places.

2.4.3. Transport and stocking

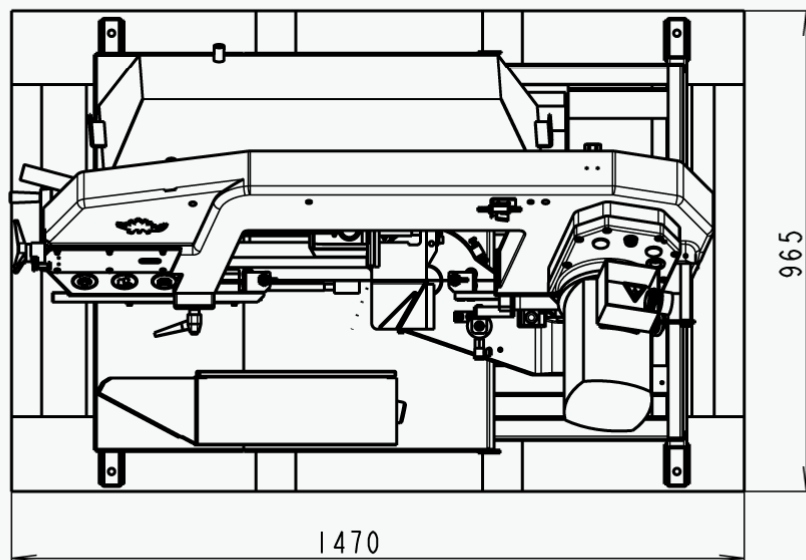
The machine must be secured during transportation. Screw on the palette to the floor of the van or the trailer. Be careful that the machine is not damaged during transportation. Store the machine only under conditions mentioned in the manual, to avoid damage of the machine.

It is forbidden to handle the machine any other way, than it is written in this operating instructions, the machine can be damaged.

2.4.4. Transportní schéma /
Transport schema /
Transport scheme



PROSTOR PRO LYZINY VOZIKU
DIE STELLE FÜR GREIFEN MIT
DEN GABELN DES GABELSTAPLERS
PLACE FOR FORKLIFT'S SKIDES



2.5. Activation

2.5.1. Machine working conditions

Keep the conditions of the manufacturer for machine operating! If recommendations are not kept, damage can occur to the machine.

The manufacturer warrants the correct function of the machine for these conditions:

- At temperature air from **5°C to 40°C**, the temperature average during 24 hours must **not exceed over 35°C**.
- At relative dampness of the air in the extend from 30% to 95% (not concentrate). Altitude lower than 1000 metres.
- Do not expose the machine to the radiation (for example microwave radiation, ultra-violet radiation, laser radiation, x-ray radiation). Radiation can cause problems with the machine function and deteriorating condition of the isolation.

Attention!

If the ambient temperature drops below 15 ° C is required before operating the machine to have switch on hydraulic unit around 10 minutes and then made several motion few times (for example, in manual mode) by all hydraulic cylinders. The reason is to heat hydraulic oil to the operating temperature for proper function of the pressure switches (and choke).

2.6. Band saw unpacking and assembling

Remove the packing from the machine and unpack all parts.

Attention!

Switch off the main switch and lock it, before you start assembly! Otherwise, there is possibility of hazardous machine starting.

If the hydraulic unit is outside the machine (the machine only connected hoses and cables), it needs to be placed and mounted on a solid basis (floors, etc.). The mounting holes are used on the bottom (bases) of the tank.

2.6.1. Machine installing and levelling

Check the floor supporting capacity before machine installing. If the floor capacity does not agree with requirements, you must prepare the necessary base for the machine.

Minimal requirement:

machine weight – Ergonomic 320.250 GH – 385 kg

+ weight of accessories

+ maximum weight of material

- The machine must be levelled at the horizontal position. All feet of the machine must touch with the floor after levelling
- The machine must be levelled by means of the calibrated spirit level. Spirit level is put on the vice area. Set the roller conveyors according to the spirit level.
- For machine levelling, take care that there is sufficient available space for operation, repair work, servicing of the machine and handling the material..
- The machine including appended parts and accessories must be visible from the place of operation.

2.6.2. Machine disposal after lifetime

Blown out all service fluids (cooling liquid, hydraulic oil) into designated reservoir. Dismantle machine into separate parts and dispose them in accordance with valid directives.

2.6.3. First run of the power pack

Before the first run check:

- The direction of the Pump, while run the power pack for max. 2seconds.
- The cooling fan of the motor has to rotate in the same direction as the arrow on the top of the motor cowling indicates.
- In case of wrong rotational direction, the electrical phase in the connection box is to be changed. This check is required after every disconnection from the power source
- Wiring matches with electrical and hydraulic diagrams
- the electric motors (pump and cooler) are properly connected and have the prescribed rotation
- the hydraulic accumulator with nitrogen gas to the specified value
- aux. elements work right (thermometer, level gauge, heater)

First run (Attention – working pressure on securing valve is set by producer in accoring the hydraulic diagram):

- In the short intervals activate an electric pump
- check for leaks and noise
- Bleed the hydraulic circuit
- if possible, test the circuit function with minimum load
- test the electrical equipment
- during operation monitor measuring equipment, noise, height and temperature of oil in the tank
- During this time a careful bleeding off for the whole hydraulic system is necessary. In case there is no bleeder port, the power pack will bleed itself after a while via the air breather on the tank or the return line filter.
- After multiple start-up.

2.6.4. Filling the reservoir with hydraulic oil

Oil regulations and recommendations of the manufacturer in the technical documentation (appendix) are to be carefully observed. For standard power packs we recommend the oiltype OH-HM32 (DIN 51524) of all known oil manufacturers.

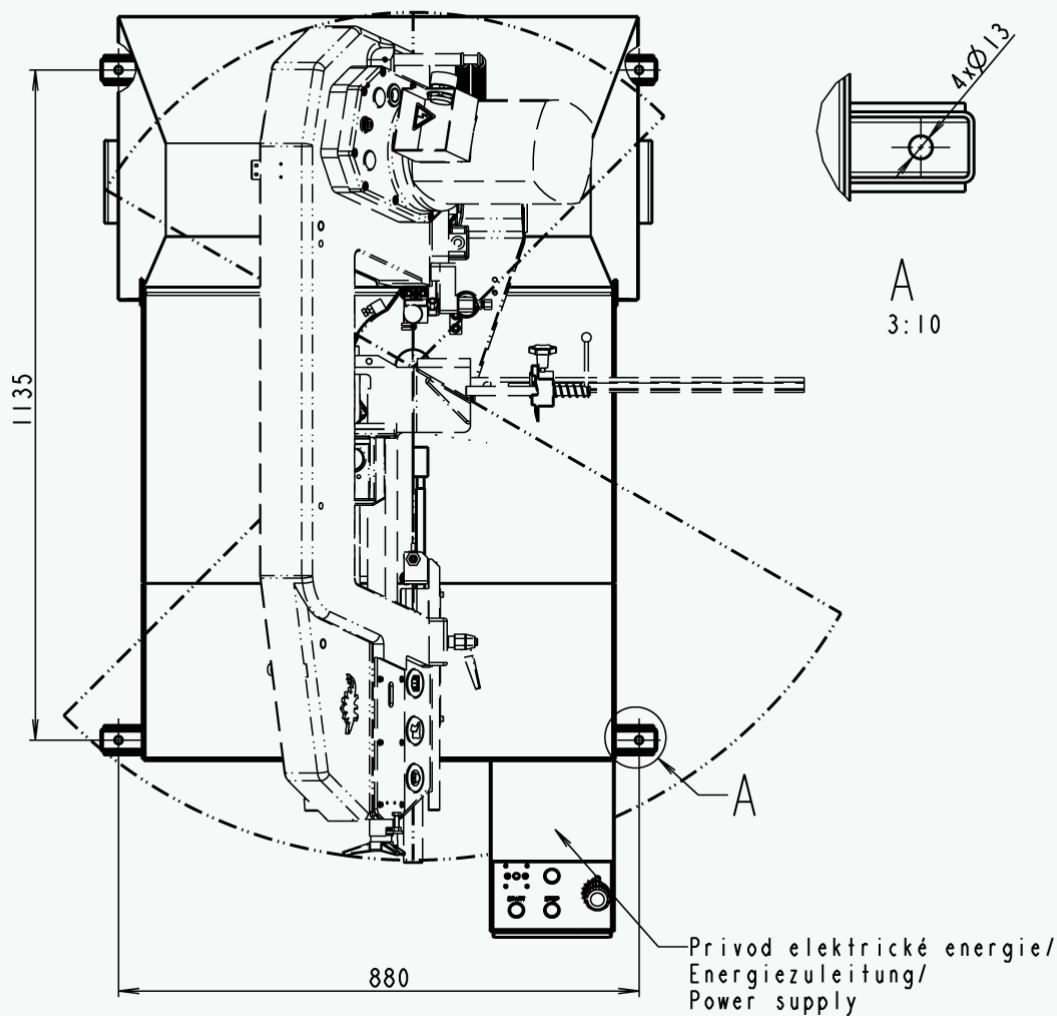
Power packs have to be filled up with clean, pre-filtered oil! The purity of the hydraulic fluid must correspond to the class 10 NAS 1638 (reachable with filter $\beta = 75$)!

Filling from container, such as barrels, buckets, etc. is not recommended or permitted!

The maximum oil level will be shown on the upper marking at the dipstick or the sight level glass. Prevent overfilling. The maximum filling rate of 15 l/min shouldn't be exceed.

Oil type	Kinematic viscosity ν in mm^2/s in relationship to the fluid temperatur					Freezing point
	0°C	20°C	40°C	60°C	80°C	°C
OH-HM 32	220	100	32	15	7	-40
OH-HM 46	400	170	46	18	11	-30
OH-HM 68	700	170	68	26	14	-28
OH-HV 32	180	67	32	17	11	-40
OH-HV 46	350	110	46	25	14	-36

2.6.5. Kotevní plan / Verankerungsplan / Grounding plan



Kotvící materiál / Verankerungsmaterial / Grouding material

- 4x Hmoždina / Dübel / Plug – $\varnothing 12$ mm
- Vrtáno do hloubky / In die Tiefe gebohrt / Drilled to – 140 mm
- Šrouby / Schraube / Screws – 4x M14

Šrouby podložit deskami o min. rozměrech P10×100-100

- Die Schrauben mit Platten mit Minimaldimensionen P10×100-100 unterlegen
- Screw must be bottomed with plates (min. dimensions P10×100-100)

Požadavky na rovinnost podlahy / Anforderungen an die Bodenebenheit / Requirements for floor flatness

± 10 mm / 1 m

2.7. Electrical connection

Attention!

Only a qualified professional must carry out the servicing and repairs of the electric equipment! Take special care during work with electrical equipment. High voltage shock can have fatal consequences! Always keep notes about work safety.

Electrical parameters of the machine:

- Service voltage: $\sim 3 \times 400 \text{ V}$, 50 Hz, TN-C-S
- Total input / Max. fuse: 2 kW / 16 A

Before connecting switch off the main switch of the power supply circuit for the machine and ensure dry place when doing connecting works!

Note:

The values of the crosscut of the conductor and the rated current are in the norms.

Service voltage must agree with the line voltage! Crosscut of the supply line must respond with rated current for max. machine load.

Connect the service cable of the machine on the clamps of the electric distribution.

Note:

The socket with the fork can be used only at the machines with the rated current less than 16 A and total input less than 3 kW.

In case the machine is connected with a direct connection, an extra main switch must be added which can be locked in zero position.

Attention!

In this case the extra main switch becomes primary and the main switch on the machine has only secondary function.

2.7.1. Check the direction of the saw band



After the machine has been successfully connected, briefly switch on the machine and put the driving engine of the band in the running position. The direction must be in accordance with the arrow direction on the saw band cover. In case the direction of the saw band does not match, two phases at the terminal strip must be switched.

2.7.2. Check machine connection into electrical network



Attention!

When you connect the machine to the electrical network observe correct connection of all phases!

ENGINE IN IN HYDRAULIC AGGREGATE CANNOT BE OPERATED WITH REVERSE TURNING MORE THEN 10 SECONDS!!!



2.8. Filling of the cooling system

Prepare the mixture of the water and the cooling liquid. Keep the concentration specified by manufacturer. Shift away the cover from the drainage hole. Fill the mixture of the water and the cooling liquid to the tank of the cooling system. Area of the tank for the cooling liquid is discovered from the chapter *Technical data*.

Let the drainage hole opened and with the sieve during operation, because it secures the right work of the cooling system. Filling the tank with the cooling liquid, take care that the liquid does not drip out of the tank and the tank does not overflowed.

2.9. Check machine function

Check, if the machine or some parts of the machine were not damaged during transport.

Check, if covers are installed and functional. Check by means of the Tenzomat if the saw band is correctly stretched. If it is necessary, you can stretch the saw band according to chapter *Selection and replacement of the saw band*. Values of the saw band stretching are on the Tenzomat. Switch on the main switch and check the motors and systems (saw band drive, hydraulic pump, cooling pump, chips conveyor).

Open and close the main vice. Turn the saw frame of the band saw from one outer position to other outer position. Raise the saw frame to the top position and drop the saw frame to the lowest position.

Start the machine with the cooling pump and let it run without load until the cooling system will be filled with cooling liquid. As soon as the cooling liquid starts to escape from the nozzles of the cooling system, the cooling system is ready for the operation. Carry one cycle of cutting without material. Check, if the machine runs with no irregularities. If all machine functions are right, the machine is ready for operation..

2.10. Saw band

Refit the saw band cover only after you have installed and tightened the saw band.

2.10.1. Saw band size

2910×27 (25)×0,90 mm



2.10.2. Selection of the saw band tooth system

The manufacturers provide the saw bands with constant and variable tooth system. The important factor for selection of the tooth system is length of the cutting canal with respect to the size of the product

1. *Constant tooth system* – the saw band has parallel tooth pitch all over length. This way is suitable for cutting of solid material.

BOMAR for recommended Variable tooth system for band saw.

2. *Variable tooth system* – tooth pitch is variable. Variable tooth system is used for profiled materials and bundle cutting. Variable tooth pitch lowers vibration of the saw band, increases service life of the saw band and quality of the cutting area.

In tables, there are advised type of the tooth system depending on sizes and form of the cutting material.

Footnotes:

Z_pZ – teeth number on one inch S – tooth with zero angle of the teeth K – tooth with positive angle of the teeth

Examples of the tooth system marking:

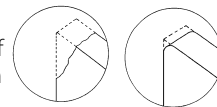
32 S – number „32“ means 32 teeth on one inch (that means constant tooth system), letter „S“ marks teeth with zero angle of the tooth.

4–6 K – number „4–6“ means 4 till 6 teeth on one inch (that means variable tooth system); letter „K“ marks teeth with positive angle of the teeth.

2.10.3. Saw band running-in

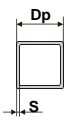
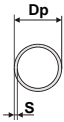
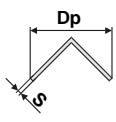
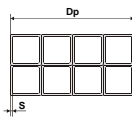
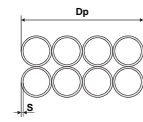
Running-in: Cut the material with the frame lowering reduced to 50% only. When vibrations occur increase or decrease the band speed.

When cutting small pieces run the band until approximately 300 cm² of material has been cut. When cutting large pieces run the band for 15 minutes approximately. When the band has been run, increase the lowering-speed to normal speed. The running in of the saw band avoids micro-breaks on the cutting edges of new saw band ensuing from first excessive stress. This would decrease service life substantially. The optimal running in of the saw band produces ideal rounded cutting edges and therefore the conditions for an optimal service life.

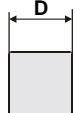
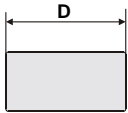
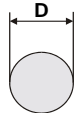
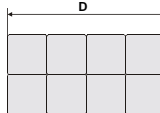
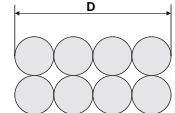


Note: Run regrinding saw bands too.

2.10.4. Tables for teeth selection

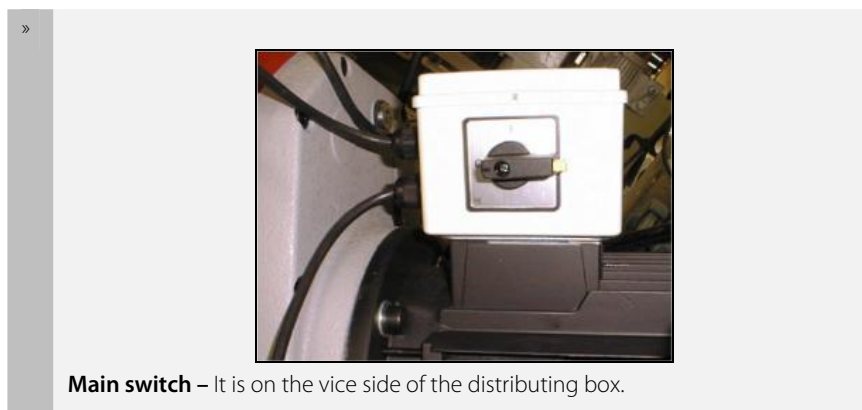
SHAPED MATERIAL (Dp, S = mm)						
						
Note: Table shows tooth system selection for cutting one piece of the profile. For cutting of more pieces of the profiles (bundle), you must think of the size of the wall as double size of the wall of one profile (that means, size „S“ equates to 2xS). In table, there are tooth systems constant and variable.						
Size of the wall S [mm]	Tooth system (ZpZ) Outer diameter of the profile Dp [mm]					
	20	40	60	80	100	120
2	32 S	24 S	18 S	18 S	14 S	14 S
3	24 S	18 S	14 S	14 S	10–14 S	10–14 S
4	24 S	14 S	10–14 S	10–14 S	8–12 S	8–12 S
5	18 S	10–14 S	10–14 S	8–12 S	6–10 S	6–10 S
6	18 S	10–14 S	8–12 S	8–12 S	6–10 S	6–10 S
8	14 S	8–12 S	6–10 S	6–10 S	5–8 S	5–8 S
10	-	6–10 S	6–10 S	5–8 S	5–8 S	5–8 S
12	-	6–10 S	5–8 S	5–8 S	4–6 K	4–6 K
15	-	5–8 S	5–8 S	4–6 K	4–6 K	4–6 K
20	-	-	4–6 K	4–6 K	4–6 K	3–4 K
30	-	-	-	3–4 K	3–4 K	3–4 K
50	-	-	-	-	-	3–4 K

Size of the wall S [mm]	Tooth system (ZpZ) Outer diameter of the profile Dp [mm]					
	150	200	300	500	750	1000
2	10–14 S	10–14 S	8–12 S	6–10 S	5–8 S	5–8 S
3	8–12 S	8–12 S	6–10 S	5–8 S	4–6 K	4–6 K
4	6–10 S	6–10 S	5–8 S	4–6 K	4–6 K	4–6 K
5	6–10 S	5–8 S	4–6 K	4–6 K	4–6 K	3–4 K
6	5–8 S	5–8 S	4–6 K	4–6 K	3–4 K	3–4 K
8	5–8 S	4–6 K	4–6 K	3–4 K	3–4 K	3–4 K
10	4–6 K	4–6 K	4–6 K	3–4 K	3–4 K	2–3 K
12	4–6 K	4–6 K	3–4 K	3–4 K	2–3 K	2–3 K
15	4–6 K	3–4 K	3–4 K	2–3 K	2–3 K	2–3 K
20	3–4 K	3–4 K	2–3 K	2–3 K	2–3 K	2–3 K
30	3–4 K	2–3 K	2–3 K	2–3 K	1,4–2 K	1,4–2 K
50	2–3 K	2–3 K	2–3 K	1,4–2 K	1,4–2 K	1,4–2 K
75	-	2–3 K	1,4–2 K	1,4–2 K	1,4–2 K	0,75–1,25 K
100	-	-	1,4–2 K	0,75–1,25 K	0,75–1,25 K	0,75–1,25 K
150	-	-	-	0,75–1,25 K	0,75–1,25 K	0,75–1,25 K
200	-	-	-	0,75–1,25 K	0,75–1,25 K	0,75–1,25 K

SOLID MATERIAL (D = mm)						
						
Constant tooth system			Variable tooth system			
length of the cut D	tooth system (ZpZ)		length of the cut D	tooth system (ZpZ)		
to 3 mm	32		to 30 mm	10–14		
to 6 mm	24		20–50 mm	8–12		
to 10 mm	18		25–60 mm	6–10		
to 15 mm	14		35–80 mm	5–8		
15–30 mm	10		50–100 mm	4–6		
30–50 mm	8		70–120 mm	4–5		
50–80 mm	6		80–150 mm	3–4		
80–120 mm	4		120–350 mm	2–3		
120–200 mm	3		250–600 mm	1,4–2		
200–400 mm	2		500–3000 mm	0,75–1,25		
300–800 mm	1,25					
700–3000 mm	0,75					

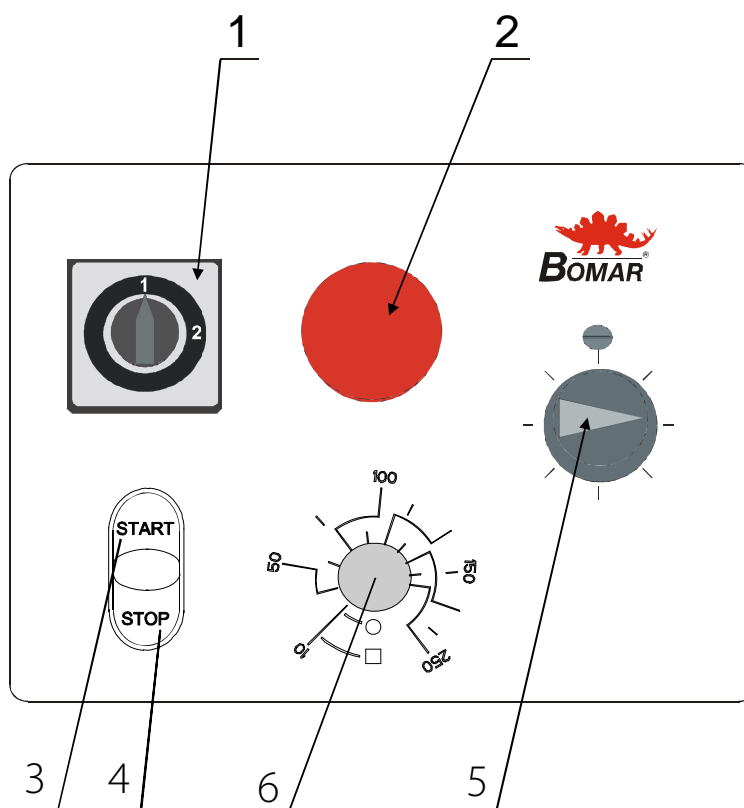
3. **Machine control**

3.1. Main switch



3.2. Control panel

3.2.1. Control panel – for machine without frequency converter

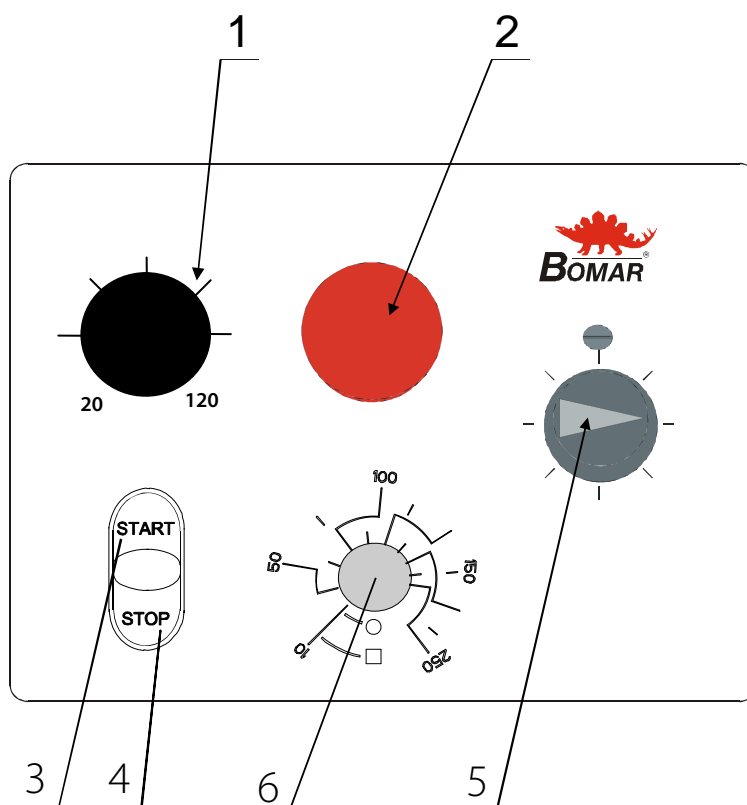


- | | |
|---|--|
| 1 | Switch of the cutting speed
Choice of the cutting speed during cutting (40 or 80 m. min ⁻¹). |
| 2 | TOTAL STOP button
In case of emergency, the machine is stated to the order! |
| 3 | START
It starts the semi-automatic cycle |
| 4 | STOP
It stops the semi-automatic cycle, lifts the saw frame to the top and stops the saw band drive. |
| 5 | Governing valve
Adjust the speed of the arm sinking to the cut by governing valve.
Notice: If you keep closing the throttle valve too tightly, the valve seat may wear off which causes its leakage. Therefore, close the valve always gently. |
| 6 | |

6 Saw arm height setting

You can limit the arm height according to the scale of the control panel.

3.2.2. Control panel – for machine with frequency converter



1 Switch of the cutting speed

Choice of the cutting speed during cutting in range 20–120 m. min⁻¹.

2 TOTAL STOP button

In case of emergency, the machine is stated to the order!

3 START

It starts the semi-automatic cycle

4 STOP

It stops the semi-automatic cycle, lifts the saw frame to the top and stops the saw band drive.

Governing valve

5 Adjust the speed of the arm sinking to the cut by governing valve.

Notice: If you keep closing the throttle valve too tightly, the valve seat may wear off which causes its leakage. Therefore, close the valve always gently.

6 Saw arm height setting

You can limit the arm height according to the scale of the control panel.

3.3. Cutting

3.3.1. Semiautomatic cycle

1. Open the vice jaws by hand wheel.
2. Set the length stop to the desired length of the material.
3. Set the desired cutting angle.
4. Insert the material and pull it to the length stop.
5. Pull vice jaws about 5 mm from the material by hand wheel.
6. Set the saw band speed.
7. Set the speed of the saw frame sinking.

8. Start saw band drive by button **START**. The vice clamps the material. Semi-automatic cycle of the cutting is started.
9. After the material cutting, the saw frame is lifted to the top position, the saw band drive is stopped and the vice is opened.
10. Remove the cut. Now you can repeat whole progress.

Attention

Saw frame sinking is possible to stop by governing valve closing!



*Saw band drive is possible to stop by button **STOP** or by button **TOTAL STOP** in emergency causes during cutting.*

3.4. Cycle breaking

- » • **Button STOP**
Cycle is interrupted by pressing **STOP** button. The arm is lifted to the top position and the saw band drive is stopped.
- » • **Emergency button TOTAL STOP**
In case of the risk, press button **TOTAL STOP**! After pressing **TOTAL STOP** button, saw band drive is immediately broken and the arm sinking is stopped.
- » • **Reactivation**
Turn button **TOTAL STOP** according to the arrows (on the button)
By pressing button **START**, you can start the cycle. The arm is lifted to the top position and the saw band starts the cycle.

3.5. Band saw adjusting

3.5.1. Cutting speed

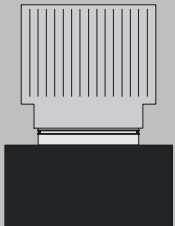
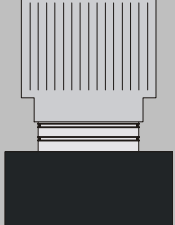
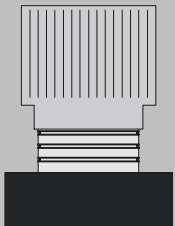
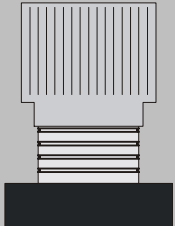
Picture	Description
	<ul style="list-style-type: none"> speed 40 m.min⁻¹ – turn switch no. 1 into position 1 speed 80 m.min⁻¹ – turn switch no. 1 into position 2
	<ul style="list-style-type: none"> Change bansaw speed by frequency converter in range 20–120 m.min⁻¹.

3.5.2. Pressure adjusting to the cut

The band saw ergonomic 320.250 DGH is equipped with cutting pressure regulation on the right guiding cube.

Pressure setting is performed with regulation wheel on the guiding cube..

Downfeed	Description
<i>downfeed pressure is bigger</i>	Screw on the wheel
<i>downfeed pressure is smaller</i>	Screw off the wheel

	<p>One visible neck Solid material over Ø200 mm.</p>
	<p>Two visible necks Solid material to Ø80 - Ø200 mm.</p>
	<p>Three visible necks Pipes and shaped material with surface from 10 - 15 mm. I - shaped material from 200 - 280 mm. Solid material to Ø80 mm.</p>
	<p>Four visible necks Pipes and shapes material with surface to 10 mm. I - shaped material to 200 mm .</p>

3.5.3. Setting of the material length

Release the securing screw, move the length stop on the desired length of the material and fasten the securing screw.



Note:

The length stop makes bounce listel of the material, so that the saw band will be not compressed in the cut. Turn the lever to the arrow direction.

3.5.4. Optimal adjusting of the guide cubes span

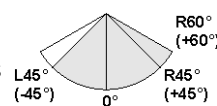
If you want to achieve a smooth and precise cut, it is helpful to position the guide cube as close as possible to the material.

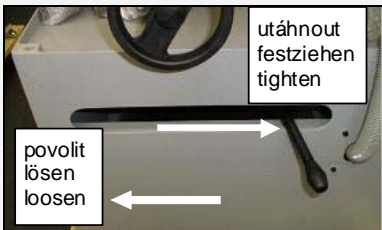

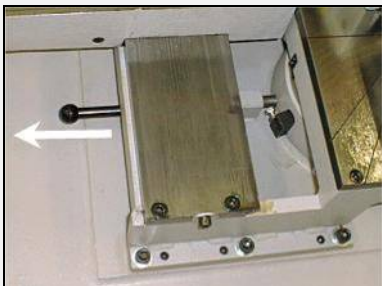


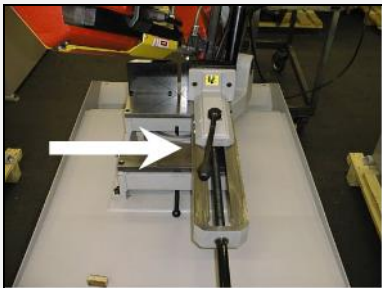
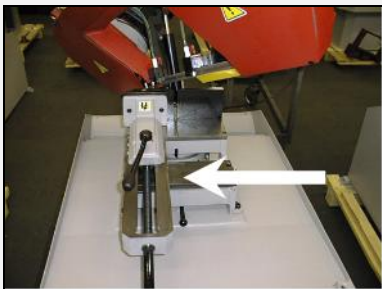
1. Release the lever of the left listel and move left part of the guide apparatus so that the left guide cube edge is as close to the cut material as possible.
2. Lower the frame to the lower position and check the position of the guide cube towards vice loading area. The guide cube must be a distance of at least 10 mm from the vice loading area.
3. Tighten the lever of the gib and check the guide cube setting once more for possible collision with binding table or vice jaw.

3.5.5. Angular cut setting

The cut angle can be varied from 0° to 60° . The angles 0° , $+45^\circ$ and 60° is set by means of the fixed stop.



Pictures	Description
	<ol style="list-style-type: none"> 1. Lift the saw frame and release-securing lever of the console.
	<ol style="list-style-type: none"> 2. Set the desired angle of the cut according to the scale on the turning console.
	<ol style="list-style-type: none"> 3. If you want set the angle of the cut bigger than 45° or less than 0°, you must pull up the stop pivot. 4. Tighten the securing lever of the console.

Pictures	Description
<p>angle $< 0^\circ$</p>  <p>angle $\geq 0^\circ$</p> 	<p>5. Shift the vice according to setting angle of the cutting. Shift the vice to the right for angle of the cut, which is less than 0°, shift the vice to the left for angle of the cut 0° or for angle of the cut, which is bigger than 0°.</p>

Attention!

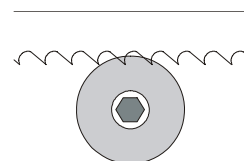
*Moving the moving part of vice must be carried out at arm raised, arm angle is zero and closed jaw vice
Moving part of vice must always be in the rearmost position, otherwise there is a conflict with the housing shoulder vice.*

3.5.6. Brush adjustment

The brush has essential influence on cutting performance, saw band lifetime and lifetime of wheels and hard metal guides and finally cut accuracy. Therefore the brush has to be checked during every shift.



1. Release the tightening screw of the brush so that it is possible to move with the brush.
2. Get the brush closer to the saw band teeth. After the brush is set, its ends must not reach the saw band teeth bottoms..
3. Tighten the screw again and turn on the band driver.
4. If the chip removing brush is correctly fastened the brush moves and turns smoothly with the saw band.



3.6. Material insertion

- Never walk under a suspended load!
- Never climb onto the gravity-roller conveyor!
- Do not hold the material for clamping material to the vice! The vice can cause injury!

3.6.1. Handling agent selection

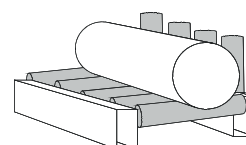
- Use the strong handling agents to lift and transfer the material!
- Handle with the material only with the lift truck or use the suspension strands and the crane!
- Do not use the lift truck or crane in case that you do not have the license to handle with it!

3.6.2. Insertion

Insert material to the vice and ensure that the material cannot move in the vice or fall from the vice after the clamping. If you cut long pieces of the material (for example rod, tube), you must use the roller conveyors for material shifting to the band saw. Contact Bomar for more information about roller conveyors

Make sure the conveyor is long enough and the material cannot tip off the conveyor.

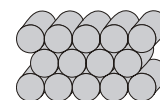
Be especially careful with round materials that it always stays on two vertical rollers and that it cannot fall off the conveyor!



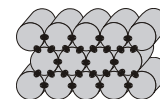
3.6.3. Bundle material cutting

If you want to cut the material in the bundle, there are suggestions for the positioning of bundles

Round material bundle: Take care especially with round material that the bars are put according to the picture. If the bars are put differently, you may have problems with movement.

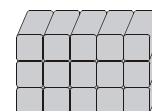


Always weld the material at the rear end of the bundle to secure it from moving.



Before welding always, switch the machine off at the main switch! The magnetic fields, which often occur during welding, may damage the controls!

Square material bundle:



Attention:

Not all material shapes are suitable for bundle cuts. Keep the recommendation of your supplier of the saw bands for material insertion to the bundle.

4. **Machine service**

4.1. Saw band dismantling and installation

4.1.1. Saw band dismantling

1. Lift the saw frame to the top position. Stop the saw frame in top position by control valve.



2. Dismantle yellow protective cover of the saw band. The cover is clamped with two screws.



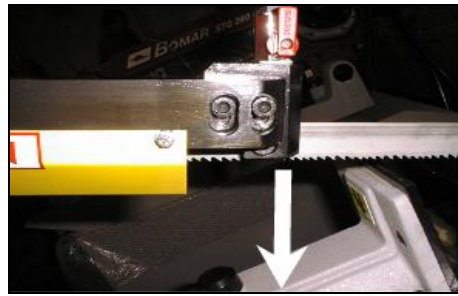
3. Dismantle back covering sheet metal of the saw frame. The covering sheet metal is clamped with two screws with plastic head.



4. Release brush holder and turn it. The brush must not defend saw band dismantling.



5. Turn by stretching star to the left side, release saw band stretching and pull saw band from blade wheels.



6. Pull up the saw band from the guiding cubes.

4.1.2. Saw band installation

1. Prior to installation, clean all track wheels, guide cubes and inner side of the arm thoroughly of all traces of chips and dirt. **Keep in mind the teeth direction when installing the saw band.**
2. Insert new saw band in the guide cubes. Make sure the saw band runs between both guide rollers and it is pushed all the way to the top.
3. Put the saw band on both guide wheels. Make sure that the saw band ridge fit tightly to the wheel rim. Then push the saw band as far back as possible.
4. By turning the stretching star to the right, you will stretch the saw band slightly. Remove the plastic cover of the saw band teeth.
5. Set the brush into the function position and screw up the holder.
6. Install the rear protective cover of the frame.
7. Install the yellow protective cover of the band. The arrow on the cover must match the direction of the arrow on the band. If it does not, turn the band round.

4.2. Saw band stretching and inspection

Right saw band stretching is one of the most important criteria's, which influents accuracy and saw band service life. Stretch the saw bands according to the selected saw band and the band saw. Keep the recommendation of your manufacturer.

4.2.1. Saw band stretching

1. The saw band must not fall from the wheels after setting.



2. Install the Tenzomat on the saw band and secure it with screws.
3. Stretch the saw band until it is stretched to the recommended value.

4.3. Saw band run adjustment on stretching wheel

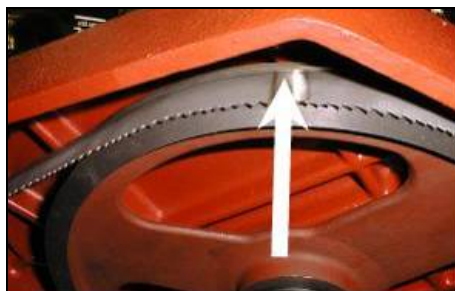
Saw band run on the stretching wheel must be regularly inspected. The inspection has to follow every saw band replacement.

4.3.1. Saw band run inspection

If the run is not correct, the following problems may occur:

- **The saw band falls off the wheel** – The saw band and protective cover can be damaged.
- **The saw band runs on the wheel rim** – The saw band and wheel rim can be damaged.

1. Start and stop saw band drive.
2. Stop the main switch!
3. Open rear cover of the saw frame.
4. Check saw band placing on the wheels.



- If the distance of the rear part of the saw band from wheel rim is **1 mm**, setting is right.
- If the distance is bigger than **1 mm**, or the saw band runs on the wheel rim, saw band run must be set.

4.3.2. Saw band setting

The saw band run is set with screw in the stretching cube on the saw frame. Optimal distance has been determined at **1mm**.



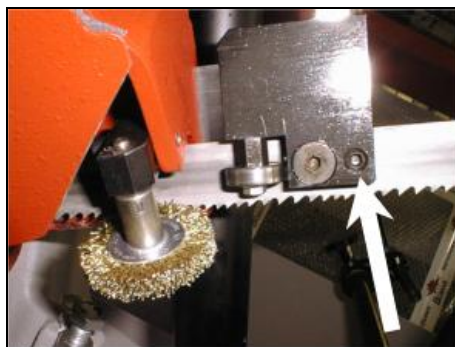
- Turn by screw to the right, the saw band approximates to the stretching wheel rim.
- Turn by screw to the left, the saw band departs from the stretching wheel rim.

Check saw band run again after setting.

4.4. Saw band adjusting

4.4.1. Hard metal guides adjustment

Hard metal guides adjustment is one of the most important criterions which influences cutting accuracy and saw band life. Therefore it is essential to regularly check that hard metal guides adjustment is correct.

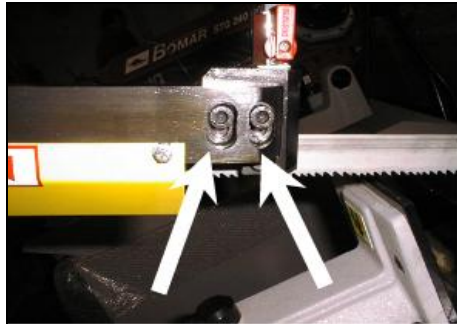


5. Tighten the stop screw on the rear side of guide cube so that the band cannot move.

6. Release the stop screw and at the same time grip the saw band by hand and check if the hard metal guide does not put up to much resistance against the movement of the band. As soon as it is possible to move the band without resistance the hard metal guides are adjusted.

4.4.2. Guide cube adjustment

Cutting quality and saw band life is also dependent on guide cubes adjustment. Therefore this adjustment has to be checked periodically.



1. Loosen both tightening screws of the guide cubes and push it carefully to the band. Make sure the saw band is not bent; otherwise this cube will push on the band and damage it.
2. Fasten both tightening screws again.
3. If the guide cube is correctly adjusted, upper cube edge and the ruler are parallel.

4.4.3. Adjusting the limit switch of the saw band stretching

After the saw band is replaced, the limit switch setting must be checked out. If the limit switch is not set correctly, the band is stretch too much or it is to loose.



1. Stretch the band by means of TENZOMAT–on the optimal value.
2. Release the nut on the stop screw.
3. Start the driving engine. **Two scenarios may occur:**
 - If the engine is switched on, but it does not run, turn the screw to the left until the engine starts to run.
 - If the engine runs turn the screw to the right until it stops to run, then turn the screw shortly to the left until the engine starts to run again.
4. Secure the stop screw with nut and check the switch setting once more.

Attention!

If the band is stretched to the value according the TENZOMAT but the holder of the stop screw is not situated on the boundary of the red and green colour, it is necessary to stick the sticker in the correct place.

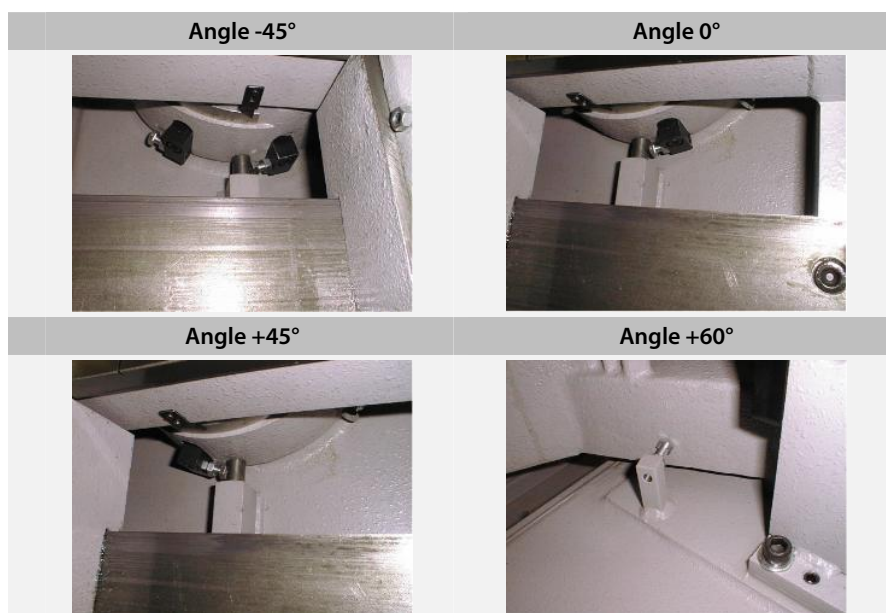
4.4.4. Angular stops adjustments

There are two fixed stops with adjustable screw on the console. The angular stop-points setting have to be periodically inspected to prevent inaccurate angular cuts.



In order to check angular stop settings, turn the arm to the fixed stop and put the protractor on the saw band and vice jaw.

If the angles are not set correctly, release the nut on the stop screw. You can set smaller angles by tightening the screw. You can set larger angles by loosening the screw.



Fasten the nut again and check the angle setting with the protractor according to procedure above.

4.4.5. Adjusting of the turning console securing lever

Manufacturer correctly adjusts the securing lever, but if it does not secure the arm enough, it is necessary to adjust the lever. Check the functionality of this lever periodically; if the console is not correctly fastened, cutting inaccuracy may occur.



- Loosen the screw of the securing lever so that the lever moves slightly and freely



- Move the lever to the left stop point and then tightly fasten the screw.



- Secure the console by moving the lever to the right.

The setting is correct if the saw arm does not move and securing lever does not touch right end of the slot in the base.

4.4.6. Saw frame lower position stop adjustment

The lower stop limits the lowest position of the saw frame. This stop point has to be checked at least once a month. If the lower stop point is wrongly adjusted, the cutting table can be deeply cut or the material will not be cut completely.



1. Move the saw frame to the upper position.
2. Release the nut of the adjusting screw and adjust the stop point by adjusting the screw.
3. Fasten the adjusting screw with the nut again.
4. Set the limit switch of the lower arm position.

4.4.7. Adjustment of the limit switch of saw frame lower stop point

If you have adjusted the lower stop point of the saw frame, the limit switch adjustment inspection is required.

Check setting:

Lower the arm to the lowest position. If the arm lays on the lower stop and the switch reacts, the setting is correct. In other case carry out the switch setting.

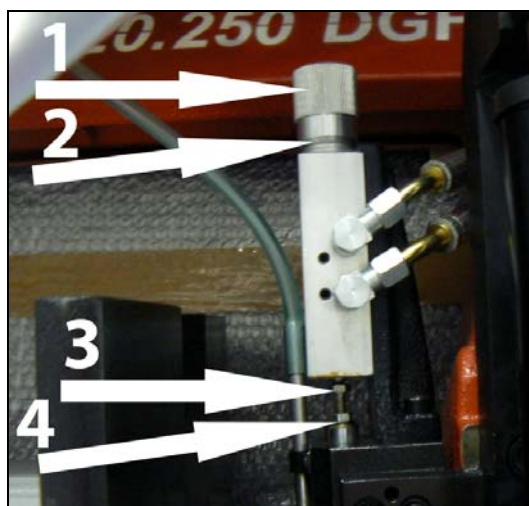


Switch setting:

1. Release the nut of the stop screw and screw down the stop screw.
2. Lower the arm to the lower stop and turn on the band driver.
3. Screw out the stop screw until the band driver stops.
4. Secure the screw with nut again and check the limit switch setting once more.

4.4.8. Adjustment of the regulating pressure to the cut

Set the body of the regulation by adjusting handle(pos.1). It is under the handle. Set it on the second groove. There is visible one neck (pos.2).



Screw the stopper screw (pos. 3) to the maximum, or the valve will be blocked.

Now the frame can be freely moved up only, because the saw frame movement is blocked with the governing valve.

Press button „ saw frame down „ screw on the setscrew.

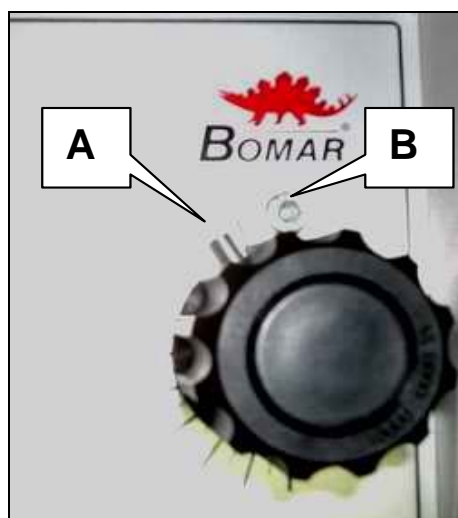
Screw in the stop screw (pos.3) as long as you reach the optimal speed of the frame sinking.

Optimal speed of the frame sinking is between 40-50 sec. from max. lift. Secure the adjusting screw (pos.4) by means of the nut after reaching of the sinking speed.

Switch on the engine of the drive and check speed of the saw frame sinking again.

4.4.9. Adjustment of a throttle valve

Switch off the machine by its main switch. Let the sawing head down at the bottom. Close the throttle valve gently.



The worm screw (pos. A) must be next to the stop (pos. B), when the valve is closed.



Otherwise, you must loosen the worm screw, lift the plastic knob and close the throttle valve to the maximum. Next loosen the worm screw and take off the plastic knob. Put it back so that the worm screw must be next to the stop while the valve is closed. Then tighten the worm screw again.

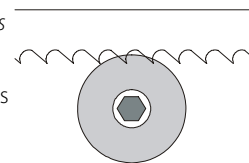
Turn the machine on and test the down-feed control.

4.4.10. Brush adjustment

The brush has essential influence on cutting performance, saw band lifetime and lifetime of wheels and hard metal guides and finally cut accuracy. Therefore the brush has to be checked during every shift.



1. Release the tightening screw of the brush so that it is possible to move with the brush.
2. Get the brush closer to the saw band teeth. **Attention!** After the brush is set, its ends must not reach the saw band teeth bottoms.
3. Tighten the screw again and turn on the band driver. If the chip removing brush is correctly fastened the brush moves and turns smoothly with the saw band.



4.5. Cooling agents and chips disposal

The quality of the cooling agent will deteriorate due to:	If the solution is too weak:	If the solution is too strong:
<ul style="list-style-type: none"> • use of contaminated water • impurity • outside oil contamination (hydraulics, gears) • high operating temperatures • lack of air circulation • wrong concentration 	<ul style="list-style-type: none"> • corrosion protection is diminished • lubrication decreases • microbial attack is more likely 	<ul style="list-style-type: none"> • the cooling ability is decreased • foam behaviour increases • emulsions stability deteriorates • sticky residue develops

4.5.1. Coolant device inspection

The state of the cooling agent has significant influence on the cutting quality and on the operational life of the machine. Lifetime of the cooling liquid is 1 year, after this time we recommend change the cooling liquid. This time is dependent on the degree of pollution cooling liquid (especially with oils) and on the other factors.

Check level of the cooling liquid and function of the pump periodically!

Note:

If the state of the cooling liquid is not satisfactory, the cooling liquid must be changed.

Check the state of the cooling agent according to the following table:

Testing	Interval	Method	Condition	Precaution
Liquid level	daily	visually	too low	after concentration check, refill with water or emulsion
Concentration	daily	refractometer densimeter	too high too low	refill water refill base emulsion
Smell	daily	by sense of smell	unpleasant smell	good ventilation, add biocides or renew coolant
Contamination	daily	by sense of smell	visible oil leaks, sludge fungi	surface cleaning, fix leaks, add biocides or fungicides, or coolant renewal after added system cleanser*
Corrosion-protection	when necessary	visually chip test Herbert-test	insufficient corrosion protection	test stability, if necessary – increase concentration or pH value
Stability	when necessary	refractometer	oiling	add concentrate, enquiries to supplier
Foam reaction	when necessary	shaking test	too much foam, foam disperses too slowly	avoid aeration, increase water hardness, ix with defoamer

* According to manufacturers' instructions

4.5.2. Chips disposal

Chips resulting from cutting operations must be disposed of in accordance with the relevant regulations.

- Let the chips drip excess fluid!
- Fill a watertight container with the chips! Be careful that the container does not leak, because even after a long dripping time, they still contain coolant residue.

- Place the container into the care of a disposal company equipped for the disposal of chips contaminated with cooling liquid. In case the machine is equipped with micro-spray installation, the chips must also be handed over to a disposal company.

4.6. Hydraulic, greases and oils

4.6.1. Gearbox oils

In gearboxes, oil is used for the whole lifetime of the gearbox. We recommend replacing of the filling oil in case of repair.

Use oils with specification DIN 51517 in the gearboxes. Select the viscosity grade ISO VG according to the original oil fill.

Attention:

When replacing, use oils recommended by BOMAR or oils, which has comparable parameters from the other manufacturers. Do not forget, that mineral and synthetic oils must not be mixed!

Recommended oils and quantity according to the type of the band saw

Band saw	Gearbox oil	Capacity
Ergonomic 320.250 GH	Paramo PP7	2,0 l
Swarf conveyor	Shell Tivela S 320	0,075 l

Comparative table of the gearbox oils

Manufacturer	Viscosity grade		
	ISO VG 100	ISO VG 220	ISO VG 320
BP	Energol GR-XP 100	Energol GR-XP 220	Energol GR-XP 320
Castrol	Alpha SP 100 Alpha MW 100	Alpha SP 220 Alpha MW 220	
Elf	Reductelf SP 100	Reductelf SP 220 Reductelf Synthese 220	Reductelf SP 320
Esso	Spartan EP 100	Spartan EP 220	Spartan EP 320
Mobil	Mobilgear 627	Mobilgear SHC 220 Mobilgear 630	Mobilgear 632
ÖMV		PG 220	
Paramo	PP 7	Paramo CLP 220	Paramo CLP 320
Shell	Shell Omala 100	Shell Omala 220 Shell Tivela S 220	Shell Omala 320 Shell Tivela S 320
Total	Carter EP 100	Carter EP 220	Carter EP 320

4.6.2. Lubricant greases

We recommend using lithium based saponified grease, class NGLI-2 for lubrication. Different greases are mixable, if their oil bases and consistence type are identical.


Comparative table of the lubricant greases:

Manufacturer	Type of the lubricant grease
BP	Energol LS - EP
DEA	Paragon EP1
Esso	ETT EGL 3144
	Beacon EP 1
	Beacon EP 2
FINA	FINA LICAL M12
Klüber	Microlube GB0
	Staburags NBU8EP

Manufacturer	Type of the lubricant grease
	soflex Spezial
Optimol	Optimol Longtime PD 0, PD1, PD2
Shell Aseol AG	ASEOL Litea EP 806-077
Texaco	Multifak EP1

4.6.3. Lubrication

There are several placing on the machine, which are necessary to grease periodically. It secures the right function of the machine.

Place	Lubrication
	The upper pivot of the lifting cylinder – drop the oil once a week.

4.6.4. Hydraulic oils

Replace the hydraulic oil once in 2 years, because the oil can deteriorate its properties and cause problems the hydraulic equipment. If the hydraulic system is equipped with filter (2SF 56/48-0,063), replace the filter too.

Use oils with specification DIN 51524-HLP, ISO 6743-4 and viscosity grade ISO VG 46 in hydraulic aggregates. Hydraulic oils quantity – see chapter **Hydraulic oil level check**.

Note:

When replacing, use oils recommended by BOMAR or oils, which has comparable parameters from the other manufacturers. Do not forget, that mineral and synthetic oils may not be mixed!

Comparative table of the hydraulic oils

Manufacturer	Type	Manufacturer	Type
Agip	Oso 46	Ina	Hidraol 46 HD
Aral	Vitam GF 46	Klüber	Lamora HLP 46
Avia	Avilub RSL 46	Hungary	Hidrokomol P 46
Benzina	OH-HM 46	Mobil	Mobil DTE 25
BP	Energol HLP 46	ÖMV	HLP 46
Bulgaria	MX-M/46	Poland	Hydrol 30
Castrol	Hyspin AWS 46	Rumania	H 46 EP
Čepro	Mogul HM 46	Russia	IGP 30
DEA	Astron HLP 4hy6	Shell	Tellus Oil 46

Manufacturer	Type	Manufacturer	Type
Elf	Elfolna 46	Sun	Sunvis 846 WR
Esso	Nuto H 46	Texaco	Rando HD B 46
Fam	HD 5040	Valvoline	Ultramax AW 46
Fina	Hydran 46		

4.6.5. Hydraulic unit service

After 50 hours working time, or the latest 3 month after the first run, the first service should be carried out. This includes:



- checking off all screws and connections, fixing points, tubes and hoses for leakage
- Check hydraulic oil level
- During time of duty the oil temperature shouldn't exceed 60-70°C
- check function of signaling components (thermometer, level gauge, dirty filter indicator)
- Check the adjustment of working pressure

To realise a high reliability of the power pack, the manufacturer lays down following inspection intervals

Interval	daily	weekly	monthly	three monthly	six monthly	annually
Hydraulic fluid						
Level	-	•	-	-	-	-
Temperature	-	•	-	-	-	-
Condition	-	-	•	-	-	-
Change interval	-	-	-	-	-	•
Filter						
Change interval	-	-	-	-	-	-
Other checks						
External Leakages	•	-	-	-	-	-
Contamination	•	-	-	-	-	-
Damages	•	•	-	-	-	-
Noise-(level)	•	-	-	-	-	-
Gauges	-	-	•	-	-	-

4.7. Machine cleaning

Clean the machine from the cooling liquid and impurities after every shift stopping. Conserve the guiding surfaces, mainly.

- Clamping jaws guiding of the main and feeding vice.
- The guiding of the feeder.
- Loading surface of the main, feeding vice, and area under them.
- Threaded bar of the main and feeding vice.

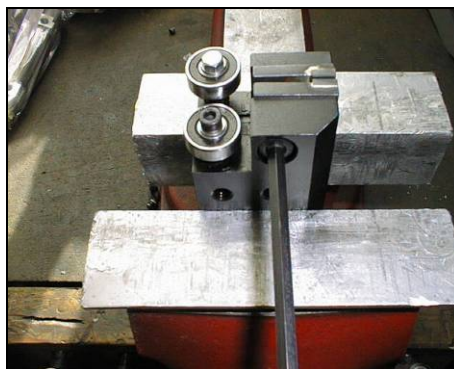
4.8. Worn pieces replacement

4.8.1. Hard metal guides replacement

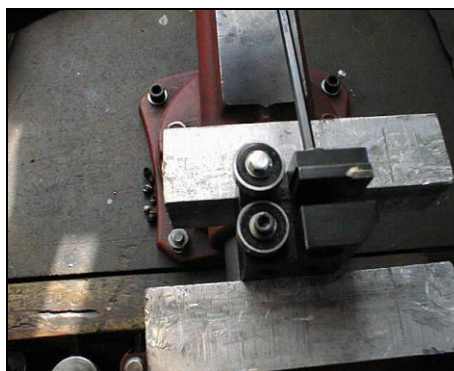
If the hard metal guides cannot be adjusted, they have to be replaced.



1. Remove the hosepipe leading to the cooling agent and dismantle saw band and saw band guiding cube.



2. Fasten the guiding cube to the vice and screw out the screws of both the hard metal desks.



3. Screw out the adjusting screw of the adjustable guiding desk as far from the guide cube so that it is not possible to see it from the inner side.
4. Now insert new hard metal guides and fasten them tightly and fasten the guide cube to the gib.
5. Install the saw band and adjust guide cube and hard metal guides.

Attention!

Vice must have aluminum jaws or should be placed in a vice aluminum product, that avoid damage to the pin during clamping.

4.8.2. Saw band guiding rollers replacement

If the saw band is not sufficiently guided by guiding rollers and/or if the rollers are obviously worn, the rollers should be replaced.

Attention! Guiding rollers must be replaced together on both guide cubes!



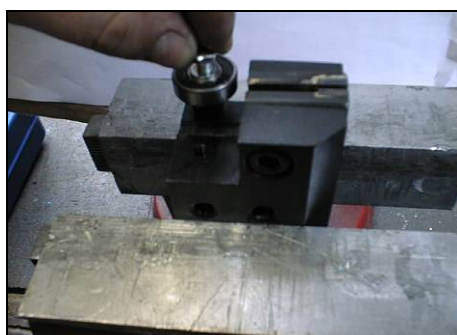
1. Remove the hosepipe leading to the cooling agent and dismantle saw band and saw band guide cube.



2. Grip the guide cube in the vice and screw out both fastening screws of the eccentrics.



3. Pull both guide rollers from their eccentrics.



4. Put new guide rollers on the eccentrics and screw the eccentrics to the guide cube.



5. Now insert a test piece of saw band (cca 15 -- 20 cm) into the guide cube. Adjust both eccentrics so that the band runs in the middle of milled groove. This groove is located between both eccentrics. Guide rollers may not press too much on the band, but they must spin freely.

Optimal distance between band and roller is 0,05mm.

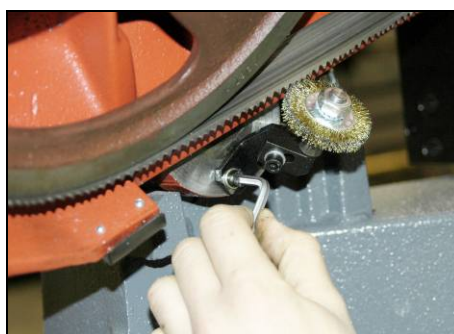
6. Install the cube on the gib. Install the saw band and adjust guiding cubes.

Attention!

Vice must has aluminum jaws or should be placed in a vice aluminum produc, that avoid damage to the pin during clamping.

4.8.3. Round brush replacement

If the chip removing brush is so worn, that it does not fulfil its function, the brush must be replaced.



1. Release the nut of the brush, exchange old brush to new brush and screw on the nut of the brush.
2. Set the brush to the saw band.

4.8.4. Stretching wheel replacement

1. Dismantle the saw band.



2. Screw off the screw of the stretching wheel and pull off the washer.
3. Screw on the auxiliary screw to the shaft of the stretching wheel.



4. Put on the three-leg puller on the stretching wheel and pull off it from the shaft.



5. If the lower bearing stays on the shaft, pull of it from the shaft with two-leg puller. Check both bearings; eventually replace them for a new.



6. Insert the retaining ring to the hole in the new stretching wheel.
7. Insert the bearing to the hole in the wheel and push it to the retaining ring.



8. Clean the shaft and oil it. Install the new stretching wheel on the shaft.



9. Install the distance ring on the shaft and push it to the lower bearing.



10. Install second bearing on the shaft and push it to the distance ring.



11. Install the washer and screw on the stretching wheel.
12. Install the saw band. Wheel replacement is ready.

4.8.5. Driving wheel replacement

1. Dismantle the saw band.



2. Screw of the fastening screw of the driving wheel and pull off the washer.



3. Screw on the auxiliary screw to the driving shaft.



4. Install the three-leg puller on the driving wheel and pull off it from the shaft.



5. Check, if the feather and the driving shaft are not damaged. Contact your supplier for parts replacement.



6. If the shaft and the feather are in good order, clean them, oil them and install them on the driving shaft.



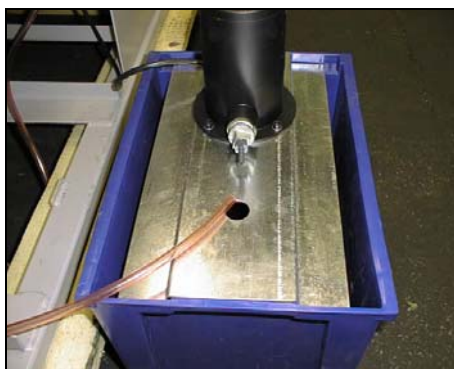
7. Install the washer and screw on the driving wheel.
8. Install the saw band.

4.8.6. Cooling pump replacement

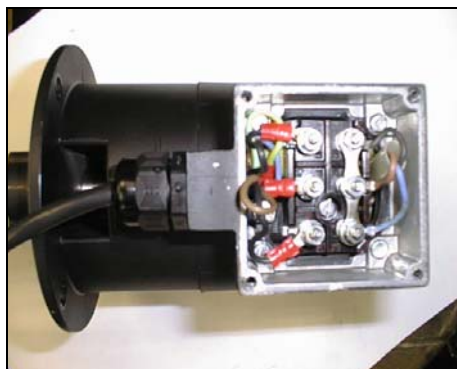
Only a qualified worker can carry out the connection! High-voltage shock may have fatal results.



1. Pull out the cooling agent tank from the machine base as far as possible.



2. Remove the hosepipe leading the cooling agent from the connection on the pump. Unscrew four screws on the cooling pump flange and pull out the pump from the metal sheet holder.



3. Remove the cover of the pump terminal switchboard. Disconnect 4 terminal connectors of the input cables. Cables are identified according to the red clamps.



4. Loosen the bushing and pull the cable out from the pump.



5. Dismantle new pump switchboard cover. Push the cable through the bushing and fasten it.

5. **Závady / Troubleshooting**

5.1. Mechanical problems

Problem	Possible causes	Repair
1. Slanting cut	- Wrongly adjusted hard metal guides.	Set according to the chapter „Servicing and adjustment“
	- Worn hard metal guides.	Replace to the chapter „Worn pieces replacement“
	- Wrongly adjusted cubes of the saw band guiding.	Set according to the chapter „Servicing and adjustment“
	- Worn bearings of the saw band guiding.	Replace according to the chapter „Worn pieces replacement“
	- Wrongly adjusted swarf brush.	Set according to the chapter „Servicing and adjustment“
	- Worn swarf brush.	Replace according to the chapter „Worn pieces replacement“
	- Insufficient saw band stretching.	Rise the saw band stretching and set the limit switch.
	- Wrongly chosen tooth system of the saw band.	Replace the saw band and keep the instructions of manufacturer on new saw band choice.
	- Worn saw band.	Replace the saw band.
	- Wrongly balanced roller conveyor.	Set the roller conveyor.
	- Dirty feeding board.	Cleanse the feeding board from debris, chip and residue material.
	- Guiding arm and guiding cube are loosened.	Clamp the guiding arm.
	- Guiding arm and cube are too far from the material.	Set the guiding cube to the material.
	- Too fast cutting rate.	Lower the material feeding speed.
	- Unexpected oscillation in material quality.	Set the cut and feeding speed to the relevant material.
2. The cut is not cut upon desired angle	- Securing lever is loosened.	Check the securing lever efficiency and carry out its adjustment according to chapter „Servicing and adjustment“.
	- Set angle does not match the cut angle.	Check the angle adjustment with a protractor and possibly set it according to chapter „Servicing and adjustment“.
	- Insufficient saw band stretching.	Stretch the saw band and set the limit switch according to chapter „Servicing and adjustment“.
	- Guiding arm and guiding cube are loosened.	Fasten the guiding arm and the cube.
	- Dirt between material and clamping jaw.	Cleanse the material and mating jaw.
3. Short lifetime of the saw band	- Insufficient saw band stretching.	Raise the tightening of the saw band set the scanner of saw band tightening according to chapter „Servicing and adjustment“.
	- Worn swarf brush.	Check the swarf brush condition and replace it in case of excessive use as described in chapter „Worn pieces replacement“
	- Wrongly adjusted swarf brush.	Check swarf brush adjustment, set it according to chapter „Servicing and adjustment“
	- Over stretched saw band	Lower stretching of the saw band and set the limit switch of the saw band stretching according to chapter „Servicing and adjustment“
	- Wrongly adjusted hard metal guides.	Check the adjustment of the hard metal guides and carry out adjustment as described in chapter „Servicing and adjustment“
	- Worn hard metal guides of the saw band.	Check the condition of the hard metal guide and if it is too worn, replace hard metal guides according to chapter „Worn pieces replacement“

Problem	Possible causes	Repair
	- Worn saw band guide bearings.	Check guiding bearings and if you notice some sort of excessive damage, replace them according to chapter „Worn pieces replacement“
	- Wrongly adjusted guiding cubes of the saw band.	Set guiding cube according to chapter „Servicing and adjustment“
	- Wrongly adjusted down feed and saw band speed.	Adjust the feeding and speed of a saw band according to values published by saw band manufacturer.
	- Different material quality.	Adjust feeding and speed of a saw band according to desired material (try cut-test).
	- Low-class saw band	Replace the saw band (contact your local accessory supplier for more information)
	- Wrongly chosen saw band tooth system.	Replace the saw band and keep instructions of the manufacturer on the choice.
	- Wrongly adjusted tracking.	Check the space between top of a saw band and driving wheel. Perhaps adjust the tracking as described in chapter „Servicing and adjustment“
4. Insufficient cut output.	- Worn saw band.	Replace the saw band and keep instructions of the manufacturer on the choice.
	- Wrong saw band tooth system.	Replace the saw band and keep instructions of the manufacturer on the choice.
	- Wrongly set down feed and speed of a saw band.	Set feed and speed of a saw band according to values published by saw band manufacturer.
5. The cut is not finished.	- Wrongly adjusted lower stop point of the saw frame.	Check lower limit switch and screw.
	- Stop point surface is messed-up.	Cleanse stop point surface of the limit switch from debris and residue material.
6. By choke is not possible turn	- Metal clamps between valve and panel.	Clamps must be removed and put on the shaft O-Ring about 10x2 mm.
	- Metal clams are in body of valve.	Valve must be cleared or changed.
7. Saw band drive cannot be started.	- Pressure switch is adjusted wrong.	Set the pressure switch according to chapter „Servicing and adjustment“
	- Pressure switch is defective.	Replace defective parts of the pressure switch.
8. The saw bands are cracked.	- In stretching wheel is wrong adjusting geometry.	Adjust distance band from recess wheel c.2 mm according to operating instructions.
	- Hard metal plates of circuit saw band are not adjusting.	Hard metal plates of circuit saw band must be adjusting according to operating instructions.
	- Guiding cubes are not adjusting (bearings + hard metal circuit)	Guiding cubes must be adjusting (bearings + hard metal circuit) according to operating instructions.
	- Bearings of guiding cubes are used (rolling elements are damaged or outside ring of bearing has conical form).	Bearings of guiding cubes must be replaced. Bearings must be adjusting according to operating instructions.
9. Damage tooth system of the saw band	- In gripping the lifting cylinder is backlash.	
	- Squeezed pin upper or downer holder of the lifting cylinder.	Exchange complete upper or downer holder of lifting cylinder.
10. The saw is cut downing.	- Geometry of hardmetal guiding cubes is wrong adjusted.	Hardmetal guiding cubes must be adjusted.
	- Bearings of guiding cubes are used.	Bearings of guiding cubes must be replaced.
11. Cleansing of the saw band is not functional.	- Elastic wheel of the brush drive is worn-down.	Elastic wheel of the brush must be changed.
	- Knurling of the driving wheel is worn-down.	Driving wheel must be changed.
	- The shaft of the brush drive is rusted.	The shaft of the brush must be cleaned and oiled.

Problem	Possible causes	Repair
	- The brush position and the brush cover is adjusted wrong – with the brush cannot be turned.	The brush cover must be posed, in order to the brush can be turned.
12. The saw arm periodically rise and fall during the cut; this cause short lifetime of the saw band.	- Backlash in driving wheel lodgement on the shaft.	Change the driving shaft for a long one, new bearings, distance ring, new driving wheel, spring, two covers on the forehead of the shaft + screws.
	- Worn channel for spring.	

5.2. Electric problems

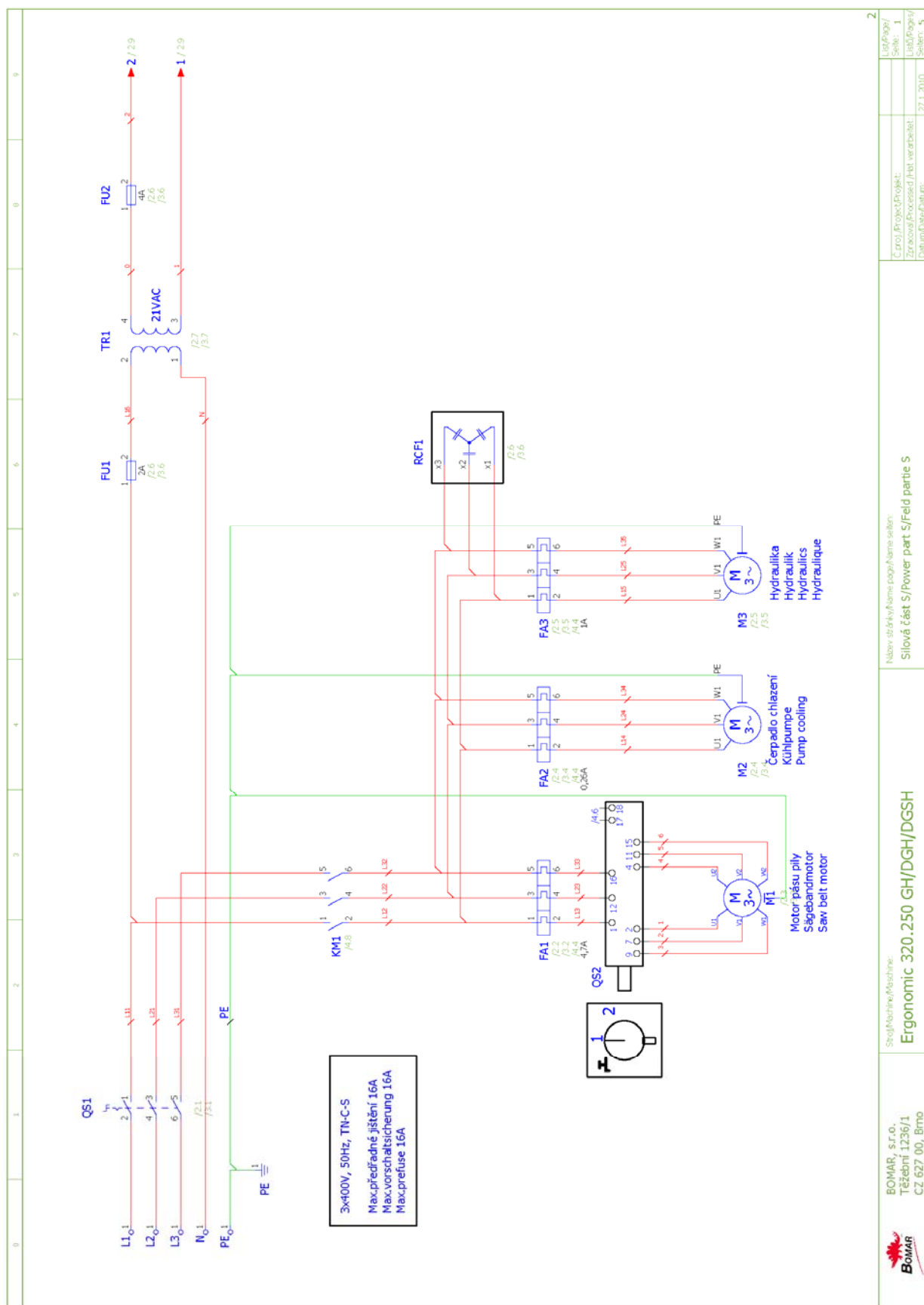
Problem	Possible causes	Repair
1. Machine is not possible start.	- In socket is not voltage	Line voltage must be checked.
	- Transfer relay is closed (thermal protector)	Each FA relay must be checked.
	- Limit switch of saw band stretching, cover of frame or cover of saw band is not started.	Check of saw band stretching and covers closing.
2. When cut is finished, the frame is not raising.	- Bottom limit switch is adjusted wrong.	Bottom limit switch must be adjusted according to chapter ADJUSTING.
	- In hydraulic (pneumatic) ring is error. HYTOS (BOSCH) is not acting to frame uplift.	Function of magnetic valve must be checked, valve must be closed, voltage of clamps and inductor must be checked.
3. Electric motor and pump are without voltage. Between contactor and thermal protector is not voltage.	- Wrong contactor.	Replace contactor of engine.
4. The indicator of speed saw band is not functional.	- Sensor of speed is not adjusted.	Sensor of speed must be adjusted.
	- Defective display	The display must be changed.
	- Wrong sensor – diode of indicator speed is not light.	Sensor must be changed and adjusted.
5. Protector is switched off from engine hydraulic aggregate MA3 sometimes.	- Into hydraulic system is high working pressure.	Service engineer must reduce the pressure in hydraulic system.
6. The hydraulic aggregate cannot be started	Auxiliary contact on thermo-relay FA1 is defective.	Replace the defective contact on motor starter FA1.
7. Hydraulic aggregate is switched on but the saw arm or the main vice is not functional	- Wrong connection of electrical supply. The electrical phases are connected conversely.	The phases must be switched. Only service engineer can do this.
8. Cooling is not active	Lack of cooling agent.	Fill the tank with cooling agent.
	- Thermal relay is defective	Change the thermal relay
	- Input hosepipe is broken or obstructed.	Check the cooling circuit and perhaps cleanse cooling system.
	- Cooling pump protection is defective	Check the protection of cooling pump if need change it.
	- Cooling pump is defective.	Replace the cooling pump.

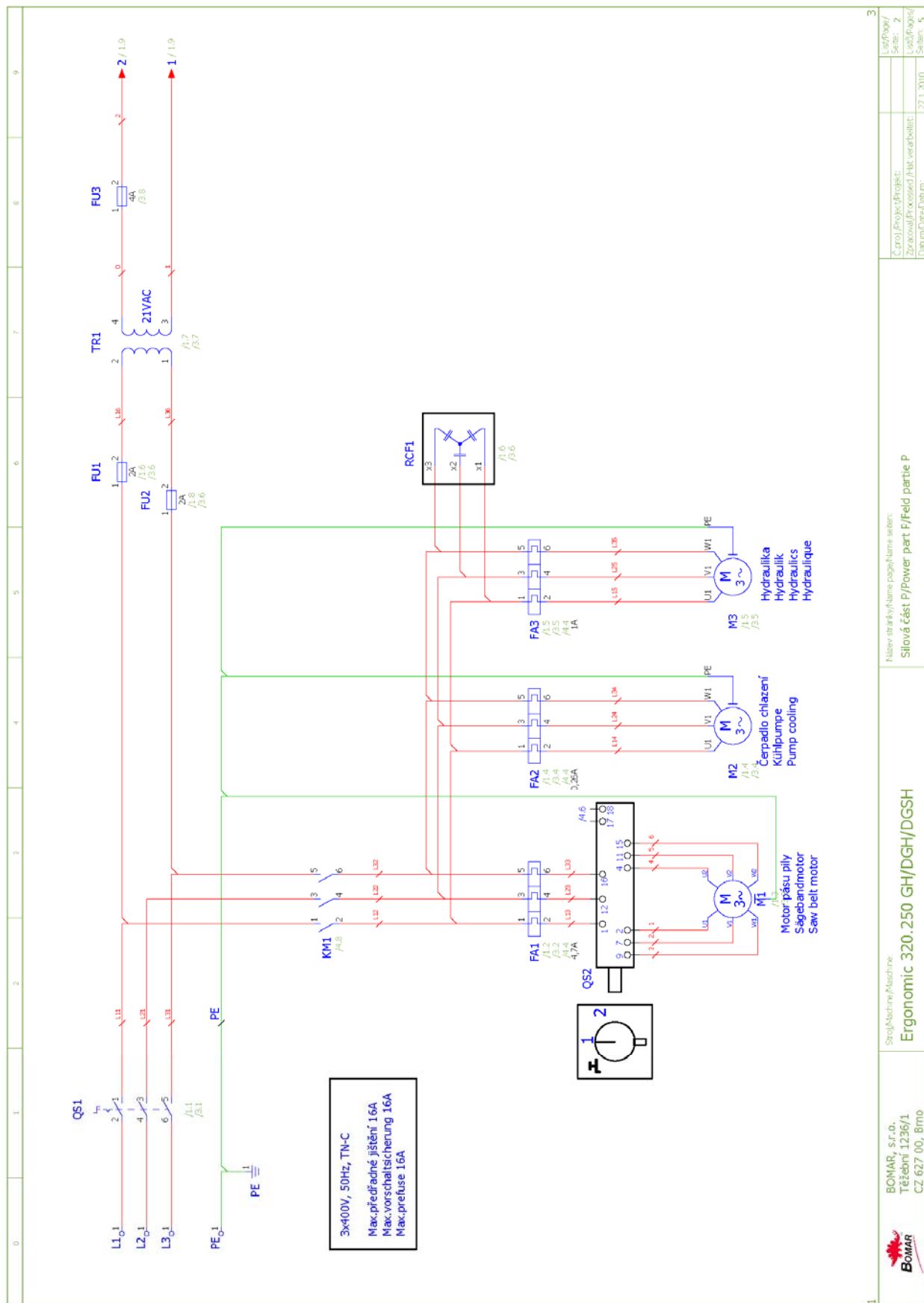
5.3. Hydraulic problems

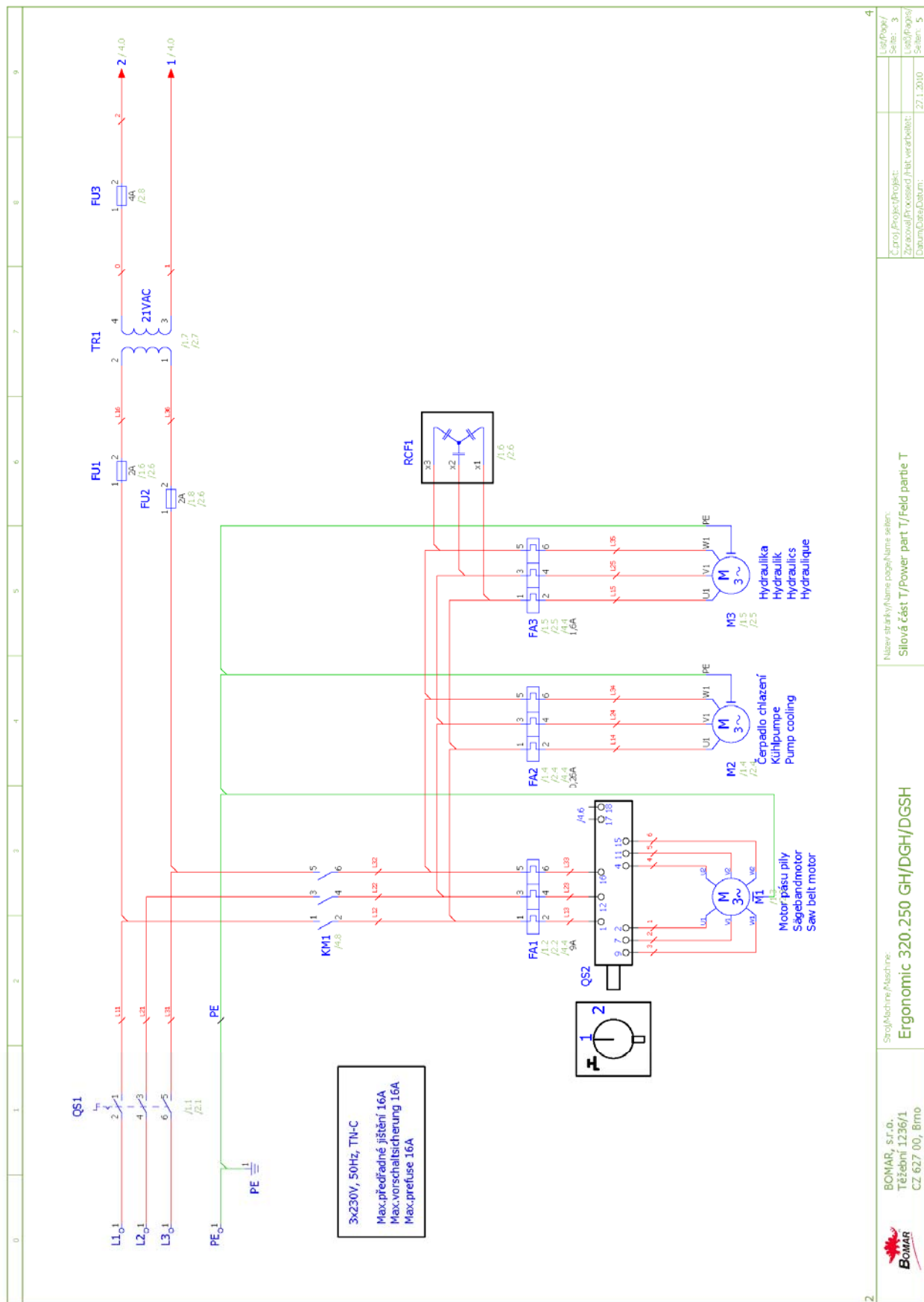
Problem	Possible causes	Repair
1. Hydrogenerator not supplying oil	• reverse rotation	Check the connections of each phase. Reconnect properly connection of the electrical phases.
	• shortage of oil in the tank	Add hydraulic oil
	• Oil viscosity does not correspond prescribed viscosity value	Change hydraulic oil.
	• Hydrogenerator malfunction	Call service
	• Wrong power supply connection.	Check the connections of each phase. Reconnect properly connection of the electrical phases.
2. Hydraulic oil contains bubbles	• Hydraulic circuit is not adequately deaerated	Make deaeration of hydraulic circuit.
	• Low oil level	Add hydraulic oil
	• the pump shaft seals damaged	Call service
3. Increased mechanical noise	• damaged joint drive	Call service
	• damaged or destroyed motor bearings	Call service
	• air intake	Check for leaks.
4. Low pressure, pump supplies oil	• problem in the safety valve	Wrong settings. Check the settings and adjust the safety valve.
	• pump wear	Call service
	• external or internal leakage	Call service
5. Hydrogenerator is seized	• damage by solid particles in oil	Make oil filtration, or call the service.
	• non-prescribed oil	Change hydraulic oil.
	• wrong type of oil	Change hydraulic oil.
	• exceeding the life of the pump	Call service
6. Overheating oil	• cooler malfunction	Check the cooler function or call service.
	• wear the pump, the energy is converted into heat	Call service
7. Hydraulic valve can not be readjusted	• electromagnet has no signal (voltage) - interrupted supply lines	Check again.
	• Electromagnet coil burnt	Replace coil – Call service.
	• spool valve sticking	Replace valve – Call service

6. **Schémata / Schemas / Schematics**

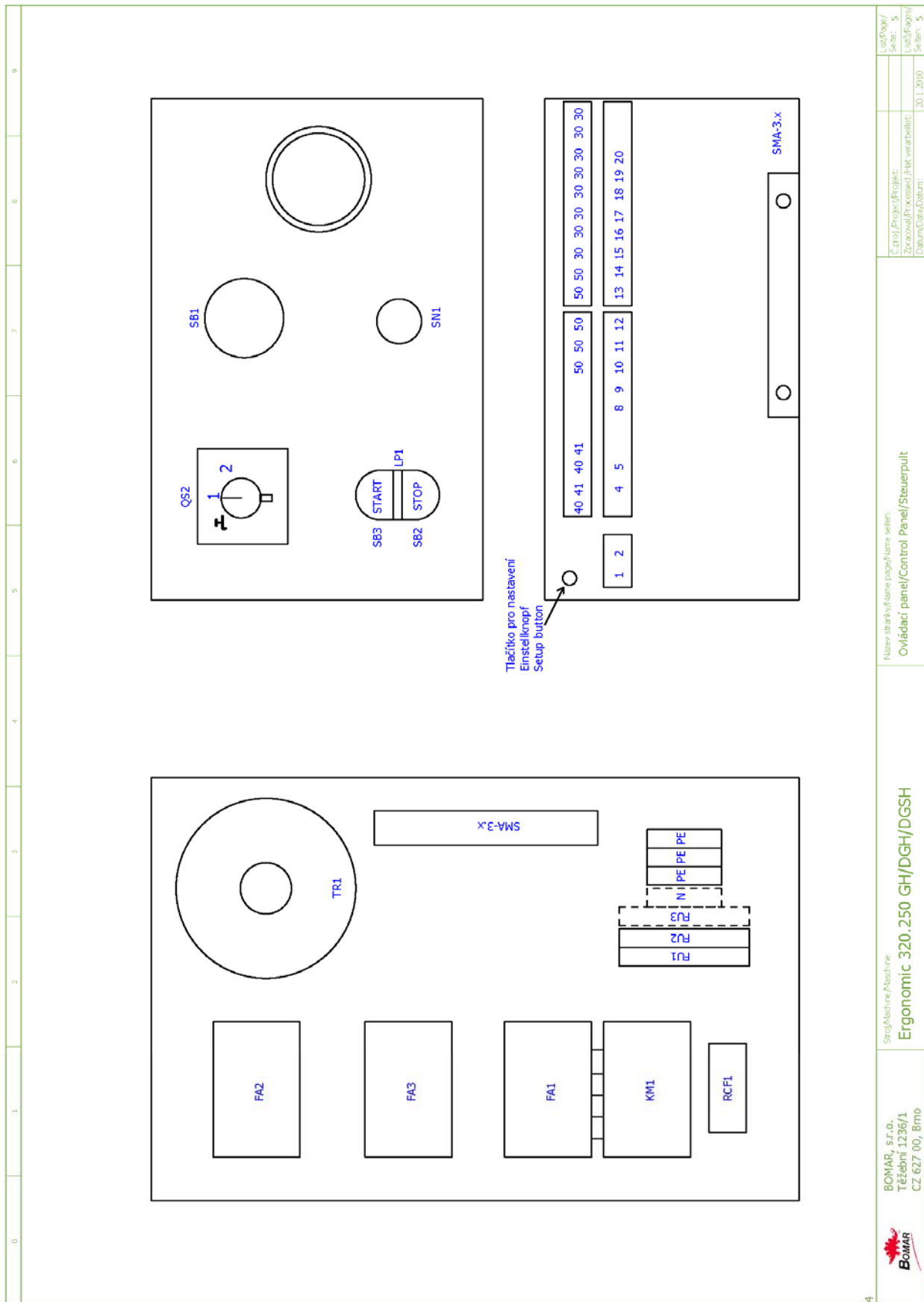
6.1. Elektrická schémata / Elektroschemas / Wiring diagrams – bez frekv. měniče / ohne Frequenzumrichter / without frequency convertor – 3×400 V/50 Hz, TN-C-S

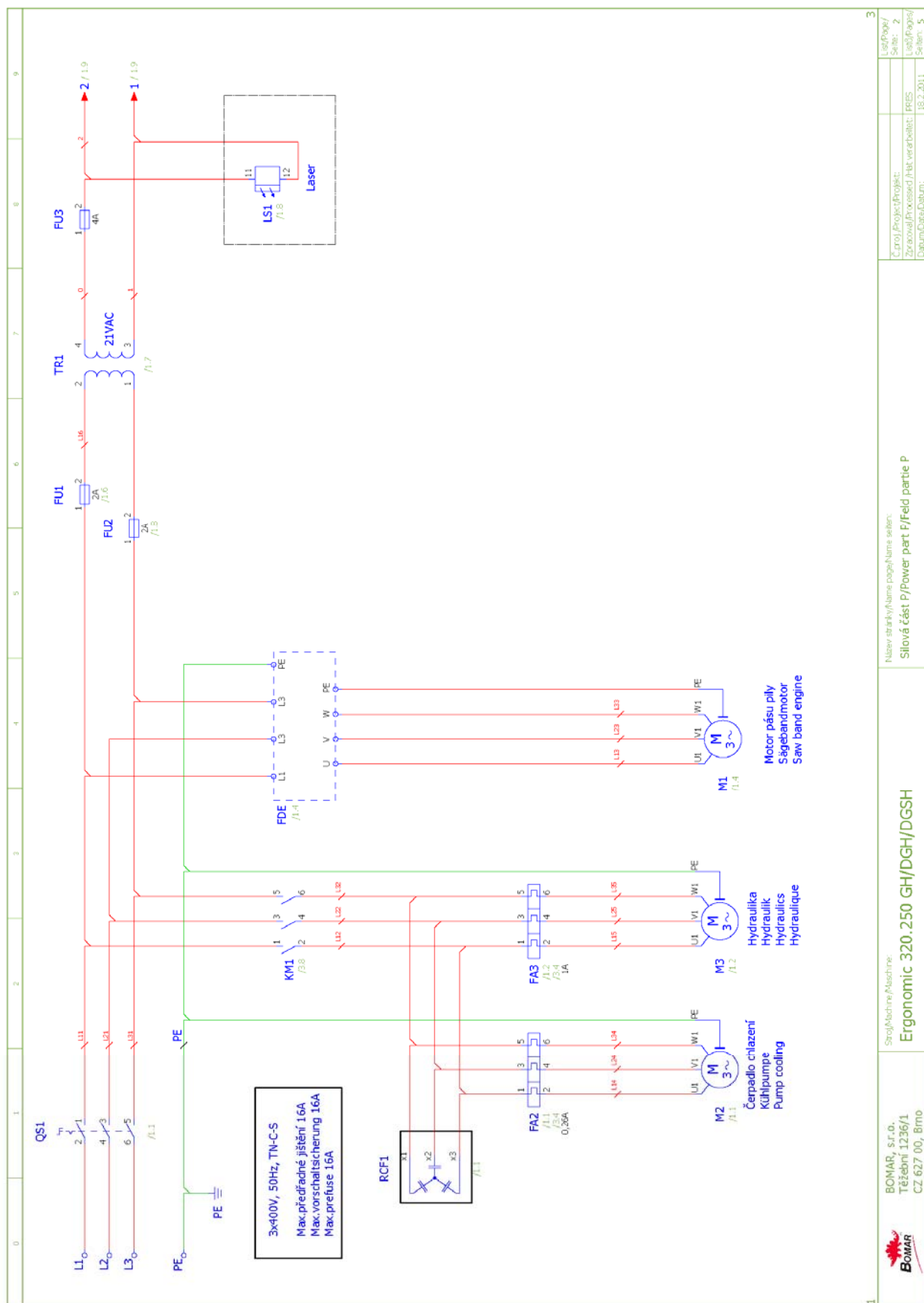


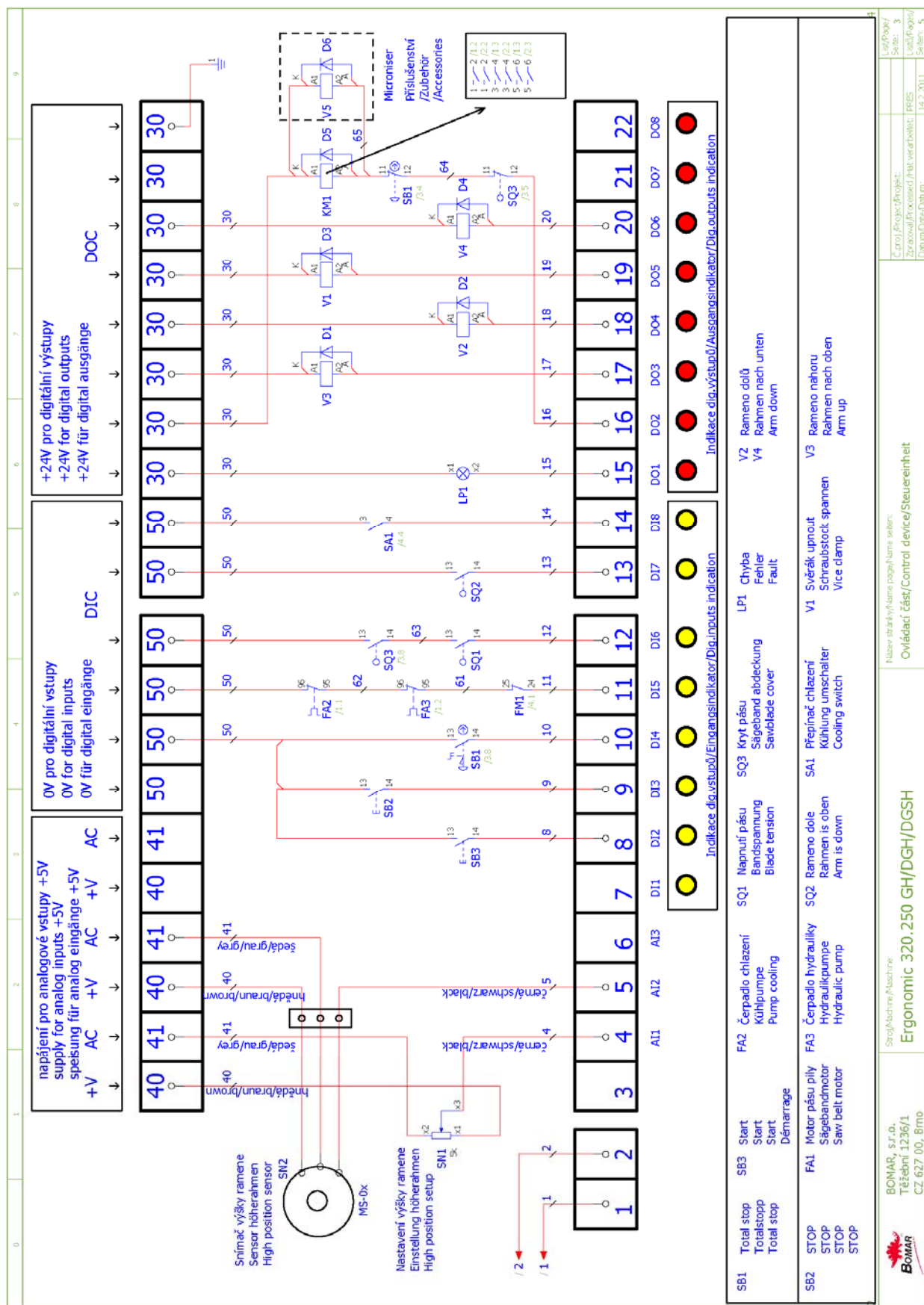














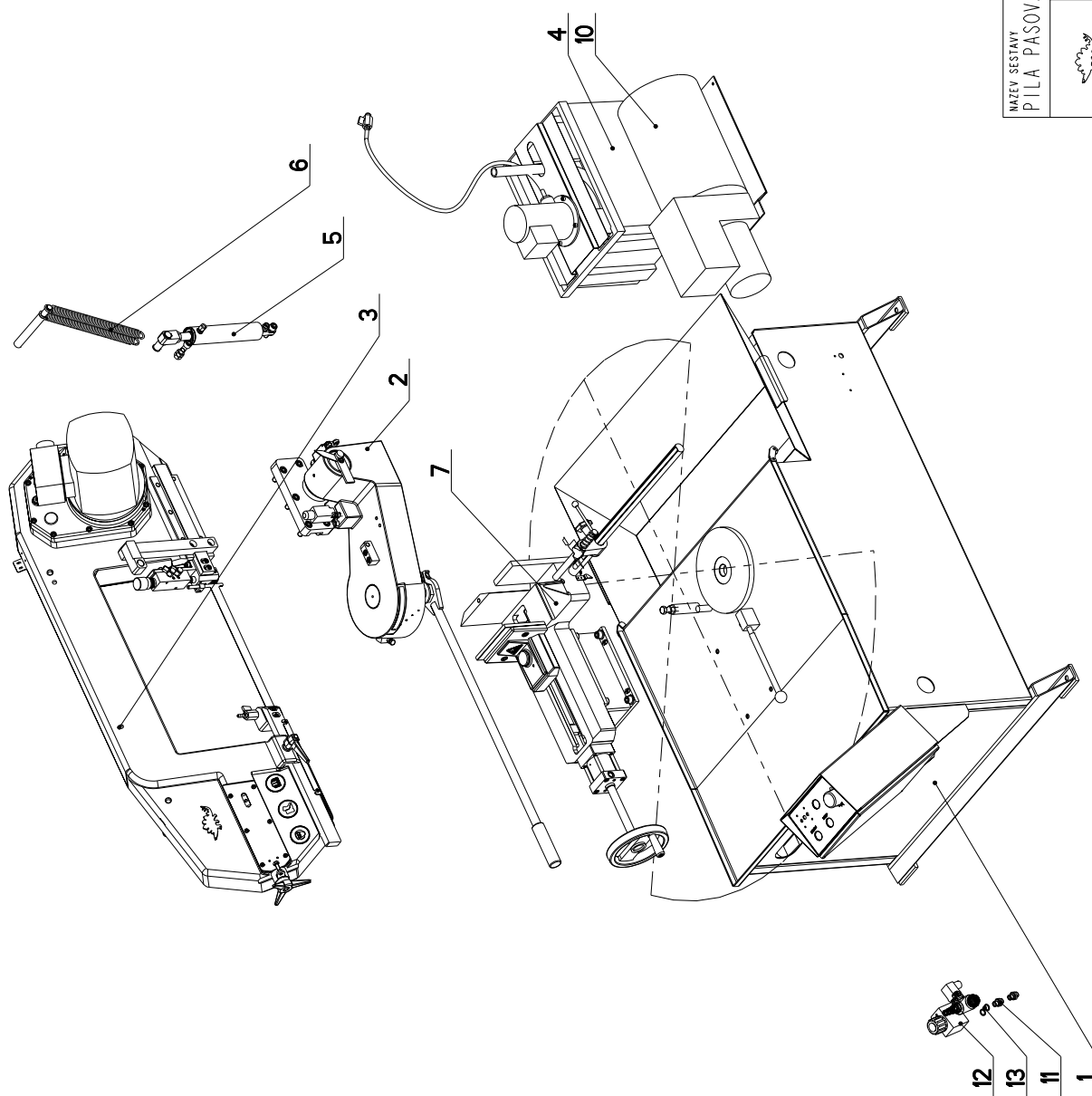


Poz. Pos. Pos.	Název Bezeichnung Item	Typ Hytos	Typ Hykom		Ks Mng. Pcs.
1	Nádrž / Behälter / Tank			12 dm 3 VÁLCOVÁ, PLECH	1
2	Elektromotor / Elektromotor / Electromotor	M A -A L71		0,25k W 400/230V, 50H z	1
3	Hydrogenerátor / Hydraulikgenerator / Hydrogenerator	P 2-3,3L65017		3,3 cm ³ /ot.	1
4	Jednosměrný ventil / Einwegventil / One-way valve	V JZH -06-005-G 1/4			1
5	Přepouštěcí ventil / Bypašventil / By pass valve	V P P 2-04/S -6		Set on 3 MPa	1
6	Sací filtr / Filter / Suction filter	2S F 56/48-0,063		63 μm	1
7	Rozvaděč / Verteilungsventil / Distributor	R P E K 1-03G 2R 11/02400E 1K 1	M D1L-TA /10N-D24K 1	24V DC	1
8	Rozvaděč / Verteilungsventil / Distributor	R P E K 1-03G 3Z11/02400E 1K 1Z2	M D1L-S 1/10N-D24K 1	24V DC	1
9	Nalévací zátka / Einfüllspund / Fill stopper	L1.0406-101			1
10	Stop Ventil / Stop-Ventil / Stop Valve	555-0607		92.153.013	1
11	RE G ULA CE	K O S TK A : 251.218			1
12	Válec zvedací / Hebezyylinder / Lifting cylinder	D40/D20-130		2-ČINNÝ	1
13	Válec svěráku / Schraubstockzylinder / Vice cylinder	D50/D24-6		1-ČINNÝ	1

7. Výkresy sestav pro objednání náhradních dílů / Zeichnungen für Bestellung der Ersatzteile / Drawing assemblies for spare parts order

- Při objednávání náhradních dílů vždy uvádějte: typ stroje (např. practix Ergonomic 320.250 GH) , výrobní číslo (např. 125) a rok výroby (např. 1999).
- In die Bestellung der Ersatzteile führen Sie immer an: Maschinentyp (z. B. Ergonomic 320.250 GH), Serien Nr. (z. B. 125) und Baujahr (z. B. 1999).
- For spare parts order, you must always to allege: type of machine (for example Ergonomic 320.250 GH), serial number (for example 125, see cover page) and year of construction (for example 1999).

7.1. Ergonomic 320.250 GH



NAZEV SESTAVY PILA PASOVA	CISLO SESTAVY 201.0500-200	STROJ Erg 250GH
Konstruoval: VINOHRADSKY		
Datum: 25. 01. 2010		
Meritko: 1:10		

12 13 11 1

1 1 1 2

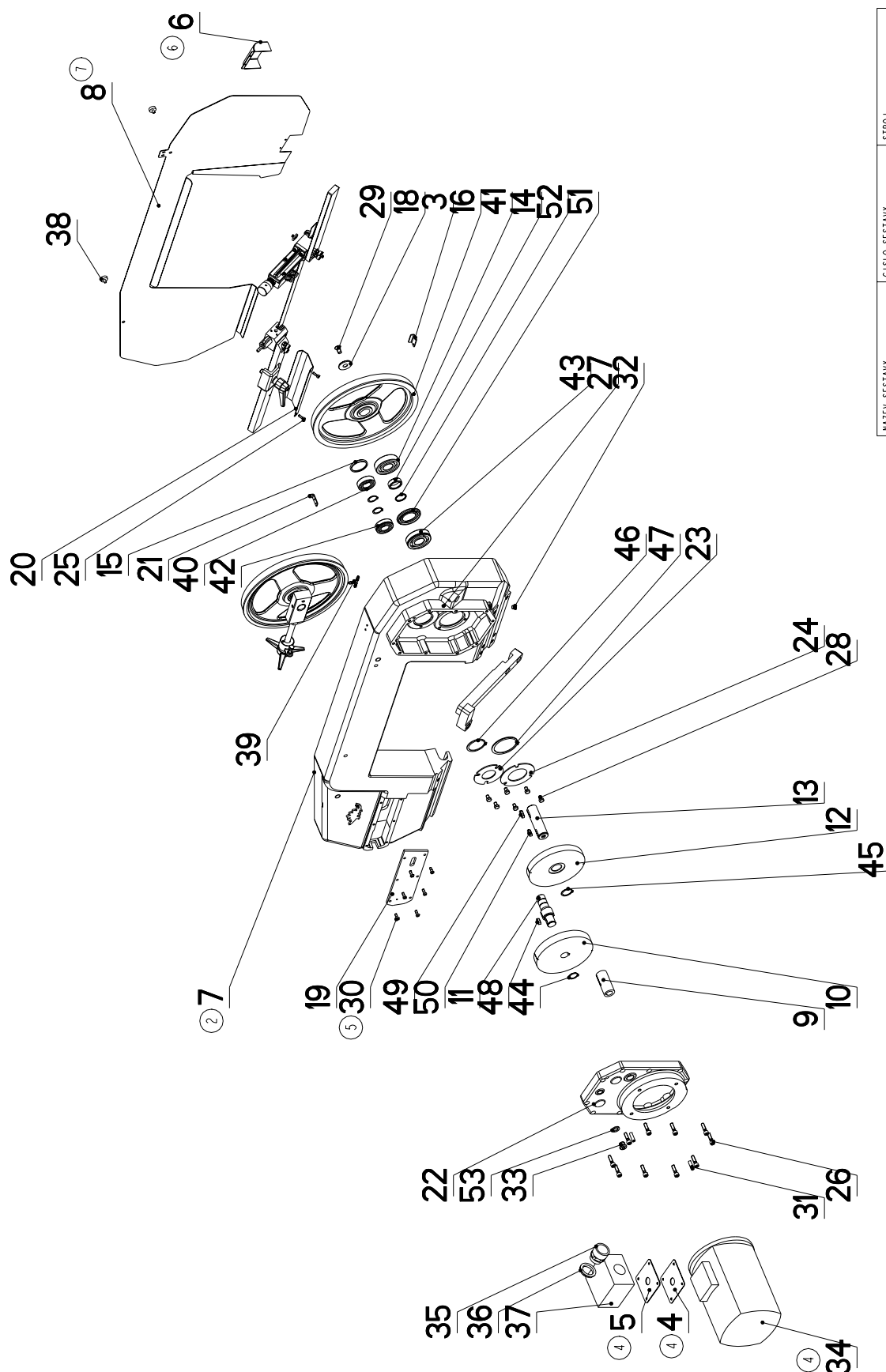
7.2. Kusovník / Stückliste / Piece list – Ergonomic 320.250 GH

Číslo Sestavy 201.0500-200		Ver. I	Název sestavy PILA PASOVA/BAND SAW/BANDSÄGE	
Poz.	Objednávací číslo	Ver.	Název položky	Ks
1	201.0501-500	4	PODSTAVEC / BASE / UNTERSATZ	1
2	201.0502-200	2	KONZOLA OTOCNA / TURNABLE CONSOL / DREHKONSOLE	1
3	201.0504-400	4	RAMENO / SHOULDER / SÄGERAHMEN	1
4	201.0506-000	0	CHLAZENÍ / COOLING / KÜHLUNG	1
5	201.0507-910	0	VALEC ZVEDACÍ / LIFTING CYLINDER / HEBEZYLINDER	1
6	201.0514-700	0	PRUŽINA / SPRING / FEDER	1
7	201.1103-000	0	SVERAK / VICE / SCHRAUBSTOCK	1
8	31.0104-026	0	SAMOLEPKA / STICKER / AUFKLEBER	1
9	31.0599-803	0	STÍTEK / LABEL / SCHILD	P 0.5 x 65
10	92.001.001	0	AGREGAT HYDRAULICKÝ / HYDRAULIC GENERATOR / HYDRAULIKAGREGAT	731-0434
11	92.002.003	0	SROUBENÍ PRÍME / DIRECT BOLTING / GERADE VERSCHRAUBUNG	2
12	92.153.013	0	VENTIL / VALVE / VENTIL	HYTOS 555-0607
13	96.082.002	0	TESNENÍ / SEALING / DICHTUNG	KROUZEK CU 13/17
14	99.900.039	0	SAMOLEPKA / STICKER / AUFKLEBER	1
15	99.900.040	0	SAMOLEPKA / STICKER / AUFKLEBER	1
16	99.900.045	0	SAMOLEPKA / STICKER / AUFKLEBER	1
17	99.900.047	0	SAMOLEPKA / STICKER / AUFKLEBER	1
18	99.900.048	0	SAMOLEPKA / STICKER / AUFKLEBER	1
19	99.900.049	0	SAMOLEPKA / STICKER / AUFKLEBER	1
20	99.900.053	0	SAMOLEPKA / STICKER / AUFKLEBER	1

1 92.152.001 ZRUSIT Z ks. STROJE ergonomic 250GH
NAHAZUJE 92.153.013.
201.0214-200 ZRUSIT Z ks. STROJE ergonomic 250GH
NAHAZUJE 201.0514-700 12.7.2004 VINOHRADSKY

2 ZM.Z ks.STROJE ZRUSIT PODSTAVEC 201.0501-000 A NAHRADIT JEJ CÍSELEM 201.0501-500.
4.6.2008 VINOHRADSKY

7.3. Rameno / Sägerahmen / Saw arm

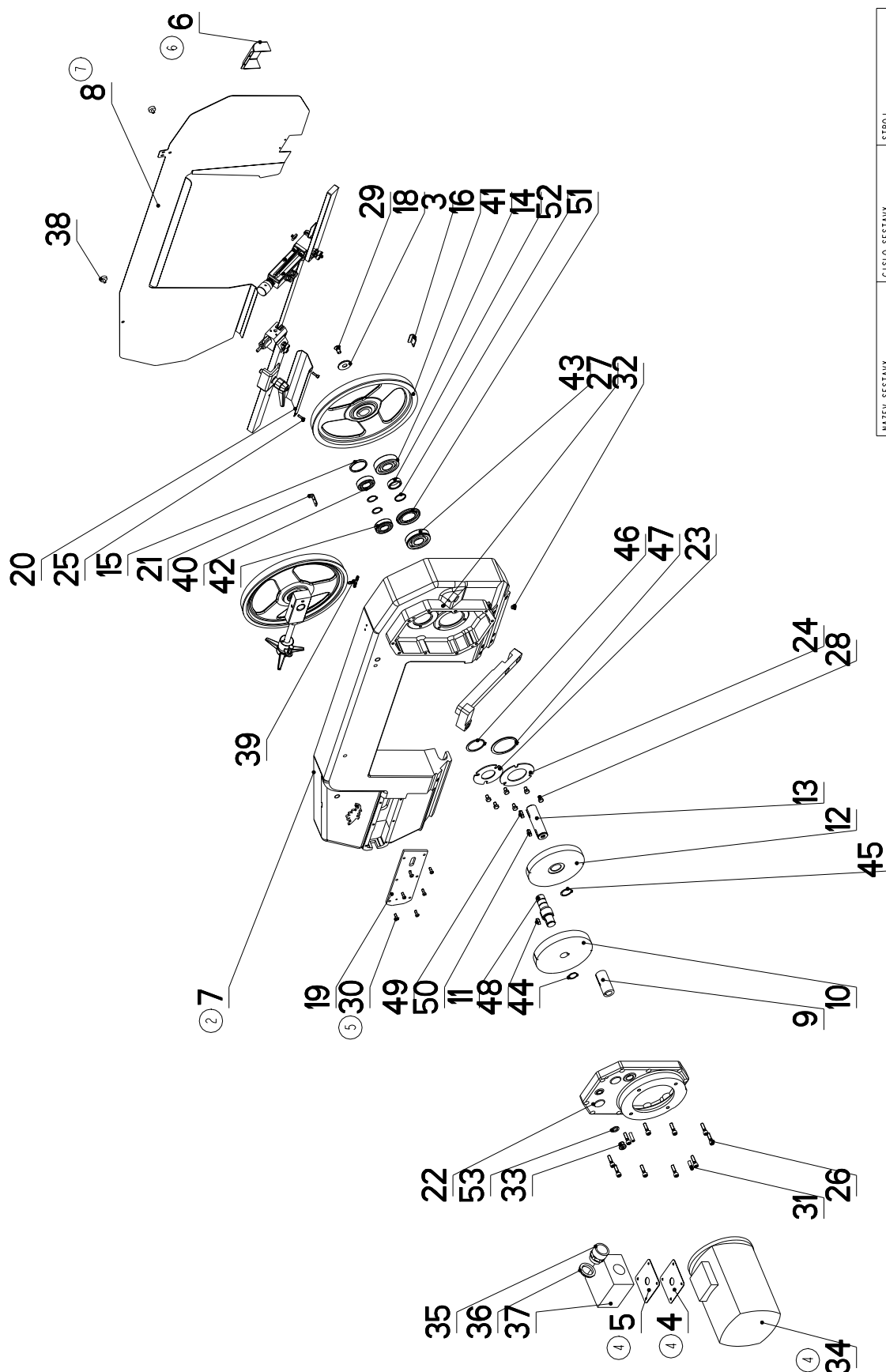


NAZEV SESTAVY RAMENO	CÍSLO SESTAVY 201.0504-400	STROJ STG 250GP/GH
Konstruoval: STASTNY		
Datum: 12. 04. 2010		
Měřítko: 1:10		

7.4. Kusovník / Stückliste / Piece list – Rameno / Sägerahmen / Saw arm

Cislo Sestavy 201.0504-400		Ver. 7	Nazev sestavy RAMENO/SHOULDER/SÄGERAHMEN		
Poz.	Objednaci cislo	Ver.	Nazev polozky	Rozmer	Ks
1	201.0508-000	0	NAPINANI / TENSIONING / SPANNUNG		1
2	201.2810-000	0	VEDENI PASU / BELT GUIDE / SÄGEBANDFÜHRUNG		1
3	30.0104-029	0	UCHYTKA / CLIP / HALTER	P 2- 36	1
4	30.0504-010	4	DESKA ELEKTRO / ELECTRIC BOARD / PLATINE	P 1.5 - 95	1
5	30.0504-011	0	GUMA / RUBBER / GUMMI	TL.2-95	1
6	30.0504-604	0	KRYT / COVER / ABDECKUNG	P 1.5x84	1
7	30.0504-751	0	RAMENO / SHOULDER / SÄGERAHMEN	80.0504-701	1
8	30.0504-753	1	KRYT NAPINANI / TENSIONING COVER / BANDSPANNUNGSABDECKUNG	P 1.5-492	1
9	30.0505-002	0	PASTOREK / PINION / RITZEL	d 35	1
10	30.0505-003	1	KOLO OZUBENE / COG WHEEL / ZAHNRAD	D 176	1
11	30.0505-004	1	HRIDEL / SHAFT / WELLE	D40	1
12	30.0505-005	0	KOLO OZUBENE / COG WHEEL / ZAHNRAD	D 180	1
13	30.0505-007	1	HRIDEL / SHAFT / WELLE	TYC 35	1
14	30.0505-009	1	KROUZEK / RING / RING	Tr 44,5x8	1
15	30.0505-013	0	ZATKA / PLUG / STOPFEN	d 55	1
16	30.0505-701	0	KOLO HNACI / DRIVE WHEEL / ANTRIEBSRAD		1
17	30.0507-401	1	DRZAK / HOLDER / HALTER		1
18	30.0508-002	0	PODLOZKA / WASHER / UNTERLEGSCHEIBE	d 40	1
19	30.0704-007	2	KRYT NAPINANI / TENSIONING COVER / BANDSPANNUNGSABDECKUNG	VYPALEK	1
20	30.0704-021	1	KRYT PASU / BELT COVER / BANDABDECKUNG	P 1.5-101	1
21	30.0704-032	2	PRILOZKA / STRAP / LASCHE	P 2 - 15	1
22	30.0705-001	1	VIKO / COVER / DECKEL	ODLITEK	1
23	81.0105-007	0	PRILOZKA / STRAP / LASCHE	P2.5-90	1
24	81.0505-010	0	PRILOZKA / STRAP / LASCHE	P 2.5- 108	1
25	90.001.25.009	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M5x16	2
26	90.001.25.034	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M8x30	10
27	90.004.20.001	0	SROUB STAVECI / ADJUSTMENT BOLT / STELLSCHRAUBE	SROUB M6x8	1
28	90.005.55.013	0	SROUB 6HRANNY / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M8x12	6
29	90.011.27.008	0	SROUB ZAPUSTNY / COUNTERSINK BOLT / SENKSCHRAUBE	SROUB M10x20	1
30	90.013.27.008	5	SROUB PULKULATY / HALF ROUND BOLT / HALBRUNDSCHRAUBE	M6x16	6
31	90.302.02.002	0	KOLIK KUZELOVY / TAPER PIN / KEGELBOLZEN	KOLIK 8x30	2
32	90.400.52.001	0	ZATKA / PLUG / STOPFEN	M10x1	1
33	90.400.52.002	0	ZATKA / PLUG / STOPFEN	M16x1.5	1
34	91.001.007	0	ELEKTROMOTOR / ELECTRIC MOTOR / ELEKTROMOTOR		1
35	91.071.004	0	VYVODKA / BUSHING / TÜLLE	VYVODKA	1
36	91.072.007	0	MATICE / NUT / MUTTER	MATICE	1

7.5. Rameno / Sägerahmen / Saw arm



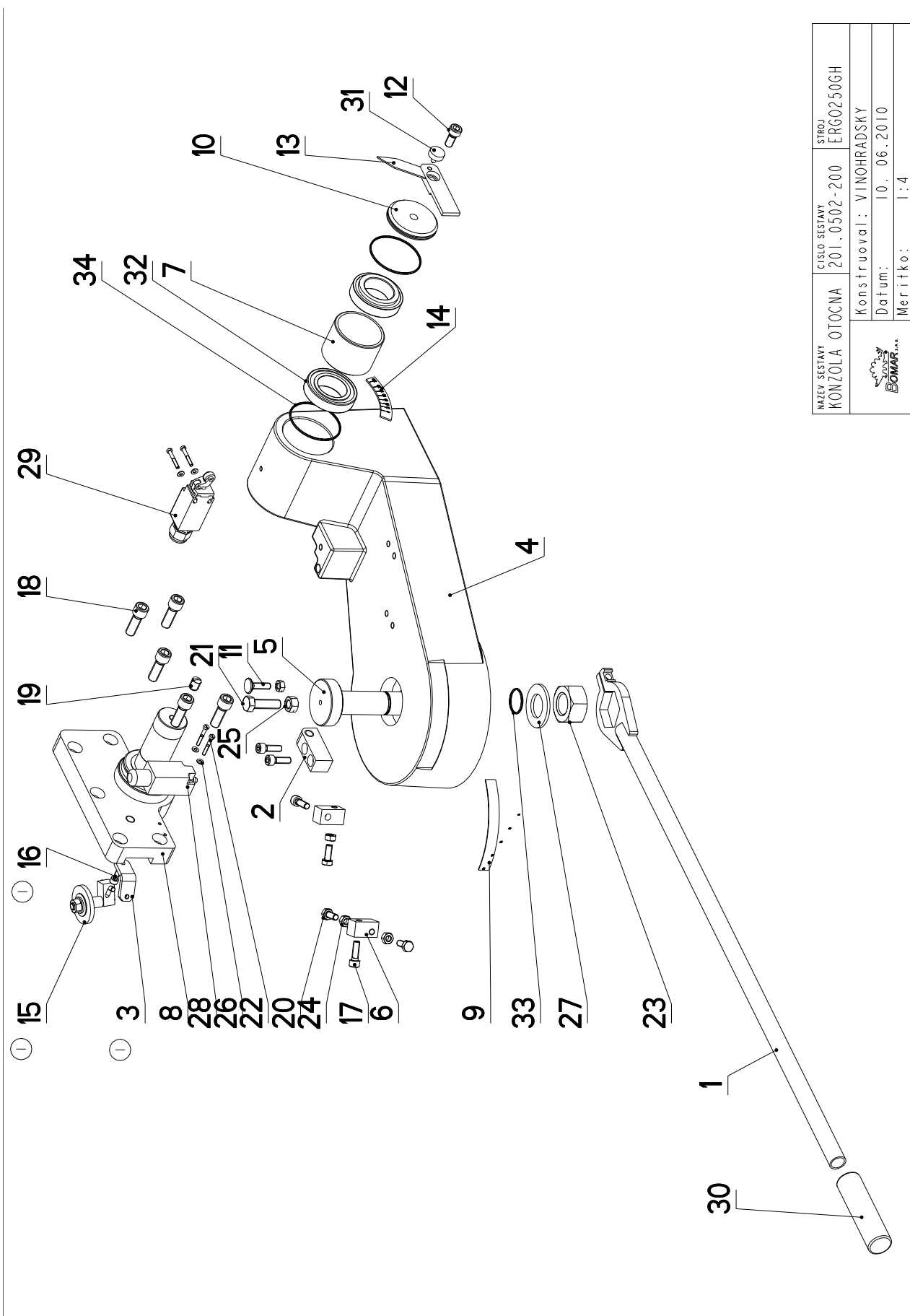
NÁZEV SESTAVY RAMENO	CÍSLO SESTAVY 201.0504-400	STROJ STG 250GP/GH
Konstruoval: STASTNY		
Datum: 12. 04. 2010		
Meritko: 1:10		

7.6. Kusovník / Stückliste / Piece list – Rameno / Sägerahmen / Saw arm

Císlo sestavy 201.0504-400		Ver. 7	Název sestavy RAMENO / SHOULDER / SÄGERAHMEN	
Poz.	Objednávací číslo	Ver.	Název položky	Ks
37	91.190.004	0	KRABICE ELEKTRO / ELECTRO BOX / ELEKTRODOSE	1
38	94.007.002	0	SROUB / BOLT / SCHRAUBE	2
39	94.200.001	0	REDUKCE / REDUCTION / ADAPTOR / REDUKTION	1
40	95.001.018	0	LOŽISKO / BEARING / LAGER	6205 2RS
41	95.001.025	0	LOŽISKO / BEARING / LAGER	6306 2RS
42	95.003.002	0	LOŽISKO / BEARING / LAGER	6205AN
43	95.003.003	0	LOŽISKO / BEARING / LAGER	6306AN
44	95.800.012	0	KROUZEK POJIST.VNEJS / OUTSIDE SAFETY RING / SICHERUNGSRING AUßEN	POJISTNY KROUZEK 25
45	95.800.013	0	KROUZEK POJIST.VNEJS / OUTSIDE SAFETY RING / SICHERUNGSRING AUßEN	POJISTNY KROUZEK 30
46	95.800.019	0	KROUZEK POJIST.VNEJS / OUTSIDE SAFETY RING / SICHERUNGSRING AUßEN	POJISTNY KROUZEK 52
47	95.800.026	0	KROUZEK POJIST.VNEJS / OUTSIDE SAFETY RING / SICHERUNGSRING AUßEN	POJISTNY KROUZEK 72
48	95.810.006	0	PERO / SPRING / FEDER	PERO 8X7X20
49	95.810.007	0	PERO / SPRING / FEDER	PERO 8X7X25
50	95.810.023	0	PERO / SPRING / FEDER	PERO 8X7X22
51	95.830.005	0	GUFERO / GIT SEAL / DICHTUNG	GUFERO 40X72X7
52	96.002.034	0	KROUZEK O DYNAMICKY / DYNAMIC O RING / O-RING DYNAMISCH	30X2
53	96.081.001	0	KROUZEK TESNICI / SEAL RING / DICHTUNGSRING	23x15x3

1. ZRUSENA SOUCAST 30.0504-004 A NAHR. 30.0504-010 , ZRUSENA SOUCAST 0504-005 A NAHR. 30.0504-011. 24.10.2005 SLEZACKOVA
2. VYMENA RAMENE A KRYTU RAMENE, ZRUS.SOU.30.0504-701 A NAHR. 30.0504-751,ZRUS.SOU.0504-702 A NAHR. 30.0504-752. 558/ZM281 16.10.2006 SLEZACKOVA
3. ZRUSEN MOTOR 91.001.007 A NAHR. 91.001.129,ZRUS.GUMA A TESNENI 30.0504-010,30.0504-011 A NAHRAZENO 30.0504-012,30.0504-013. 318/ZM295 10.9.2008 SLEZACKOVA
4. VYMENA MOTORU - ZRUS.MOTOR CINSKY 91.001.129 A NAHR.MOTOREM EMP SLAVKOV 91.001.007,ZRUS.PLECH ELEKTRO 30.0504-012 A NAHR. PLECHEM 30.0504-010, ZRUS.GUMA 30.0504-013 A NAHR.GUMOU 30.0504-011. 061/ZM085 25.3.2009 SLEZACKOVA
5. ZRUS.KARTACEK 201.0704-100,PRIDAN KRYT KARTACKU 30.0504-603,ZRUS.SROUB IMBUS M6x16 (90.001.25.017) A NAHRAZEN SROUBEM S PULKULATOU HLAVOU M6x16 (90.013.27.008). 182/ZM211 26.11.2009 SLEZACKOVA
6. ZRUS.KRYT KATACKU 30.050-603 A NAHRAZEN 30.0504-604. 052/ZM050 22.2.2010 SLEZACKOVA
7. ZRUSEN KRYT RAMENE 30.0504-752 A NAHRAZEN 30.0504-753. 036/ZM095 12.4.2010 SLEZACKOVA

7.7. Konzola / Konzole / Console



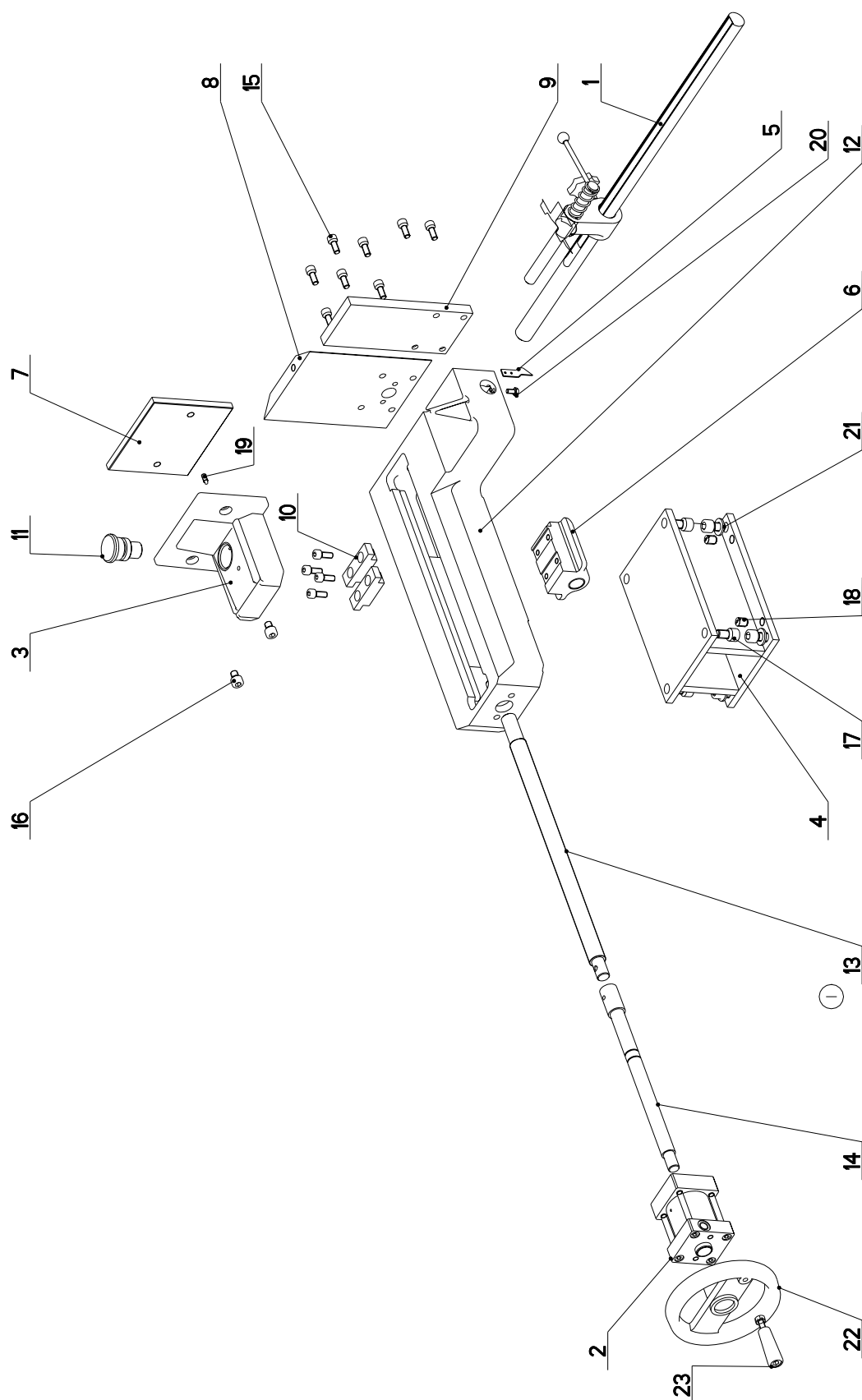
NAZEV SESTAVY KONZOLA OTOCNA	CISLO SESTAVY 201.0502-200	STROJ ERG0250GH
Konstruoval: VINOHRADSKY		
Datum: 10. 06. 2010		
Meritko: 1:4		

7.8. Kusovník / Stückliste / Piece list – Konzola / Konsole / Console

Číslo Sestavy 201.0502-200		Ver. 2	Název sestavy KONZOLA OTOCNA/TURNABLE CONSOL/DREHKONSOLE		
Poz.	Objednací číslo	Ver.	Název položky	Rozměr	Ks
1	30.0502-004	0	PAKA / LEVER / HEBEL	SVARENO	1
2	30.0507-912	0	DRŽAK / HOLDER / HALTER	HR 20x25	1
3	30.0614-603	0	DRŽAK / HOLDER / HALTER	HR20x5	1
4	30.0702-001	2	KONZOLA / CONSOLE / KONSOLE		1
5	30.0702-002	2	CEP / LUG / BOLZEN	M30x173	1
6	30.0702-006	0	DORAZ / STOP PIECE / ANSCHLAG	TYC 20x20	2
7	30.0702-008	0	POUZDRO / SLEEVE / BÜCHSE	TR 70x5	1
8	30.0702-010	1	DRŽAK / HOLDER / HALTER		1
9	30.0702-011	0	STUPNICE / SCALE / SKALA	PI-15	1
10	30.0702-012	0	VÍKO / COVER / DECKEL	ø 70	1
11	30.0702-013	0	SROUB / BOLT / SCHRAUBE	M8	1
12	30.0914-001	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M10X20	1
13	30.0914-017	0	UKAZATEL / INDICATOR / ZEIGER		1
14	30.0914-018	0	MERITKO / MEASURE / SKALA	84.094-018	1
15	201.0104-100	0	KARTAC / BRUSH / BÜRSTE		1
16	90.001.25.017	0	SROUB IMBUS CERNÝ / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M6x16	1
17	90.001.25.033	0	SROUB IMBUS CERNÝ / ALLEN HEAD BOLT / IMBUSSCHRAUBE	8x25	4
18	90.001.25.059	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M12X35	5
19	90.002.20.017	0	SROUB STAVECI / ADJUSTMENT BOLT / STELLSCHRAUBE	SROUB M12X16	1
20	90.005.55.015	0	SROUB 6HRANNÝ / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M8X20	3
21	90.005.55.034	0	SROUB 6HRANNÝ / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M12X40	1
22	90.012.50.007	0	SROUB / BOLT / SCHRAUBE	SROUB M4X30	4
23	90.100.25.001	0	MATICE / NUT / MUTTER	MATICE _ M30	1
24	90.100.55.005	0	MATICE / NUT / MUTTER	MATICE _ M8	4
25	90.100.55.007	0	MATICE / NUT / MUTTER	MATICE _ M12	1
26	90.150.50.002	0	PODLOŽKA / WASHER / UNTERLEGSCHIEBE	PODLOŽKA 4,3	4
27	90.150.50.XXX	0	PODLOŽKA / WASHER / UNTERLEGSCHIEBE	PODLOŽKA 31	1
28	91.173.007	0	SPINAC KONCOVÝ / END SWITCH / ENDSCHALTER	-RIWK	1
29	91.173.008	0	SPINAC KONCOVÝ / END SWITCH / ENDSCHALTER		1
30	94.004.502	0	RUKOJET / HANDLE / GRIFF	D22	1
31	94.007.002	0	SROUB / BOLT / SCHRAUBE		1
32	95.300.002	0	LOŽISKO KUZELÍK / BEARING / LAGER	32008AX	2
33	96.001.008	0	KROUZEK O STATICKÝ / STATIC O RING / O-RING STATISCH	26x2	1
34	96.001.018	0	KROUZEK O STATICKÝ / STATIC O RING / O-RING STATISCH	63x2	2

I. PRIDAN KARTACEK 201.0704-100, DRŽAK 30.0514-603, SROUB M6x16 (90.001.25.017. 183/ZM211 29.10.2009 SLEZACKOVA

7.9. Svěrák / Schraubstock / Vice



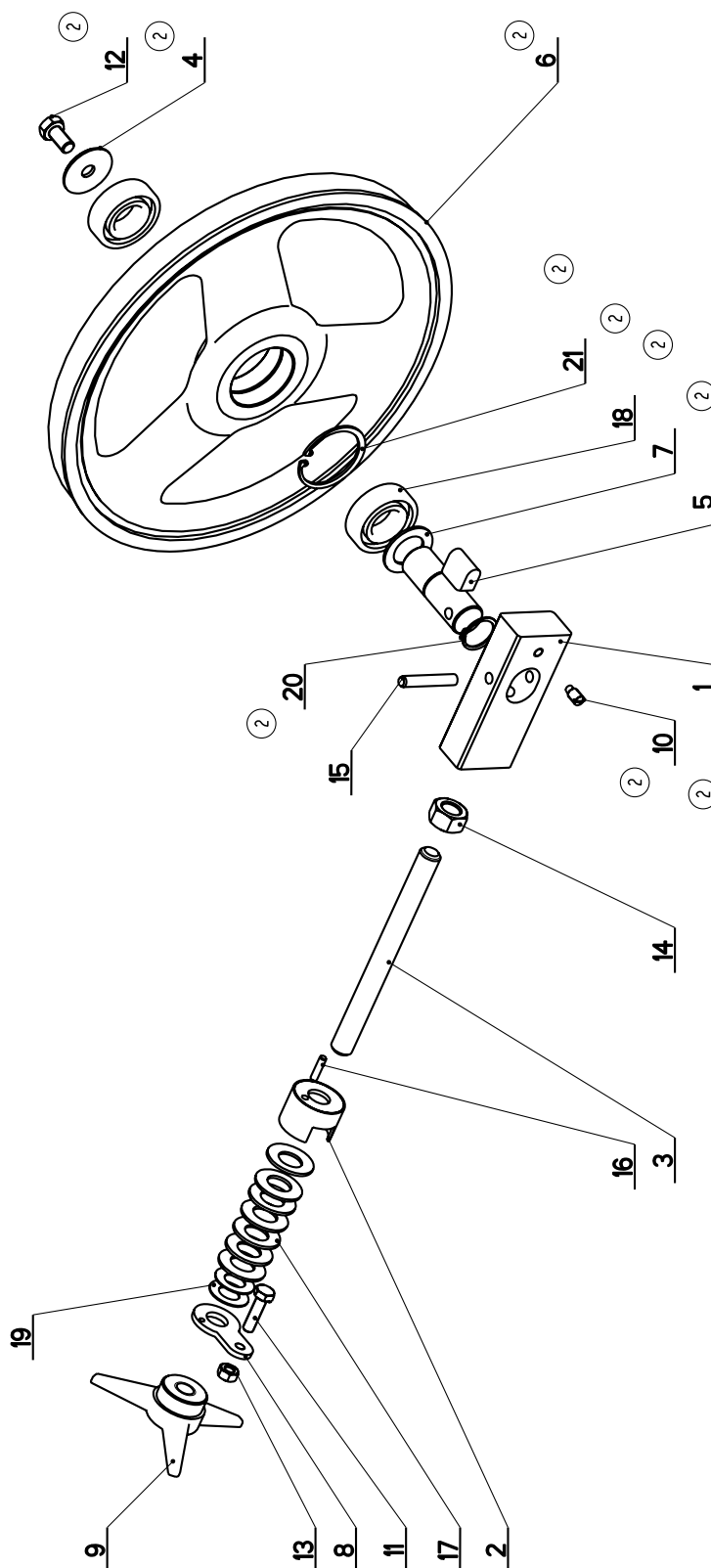
NÁZEV SESTAVY SVĚRÁK	ČÍSLO SESTAVY 201.1103-000	STROJ STG-250GH
Konstruoval:		
Datum: 10. 06. 2010		
Meritko: 1:5		

7.10. Kusovník / Stückliste / Piece list – Svěrák / Schraubstock / Vice

Číslo Sestavy 201.1103-000		Ver. 0	Název sestavy SVERAK/VICE/SCHRAUBSTOCK		
Poz.	Objednací číslo	Ver.	Název položky	Rozměr	Ks
1	201.0703-100	0	DORAZ / STOP PIECE / ANSCHLAG		1
2	201.3307-000	0	VALEC / ROLLER / ZYLINDER		1
3	30.0703-002	3	CELIST / JAW / BACKE		1
4	30.0703-009	0	KONZOLA / CONSOLE / KONSOLE		1
5	30.0703-011	0	UKAZATEL / INDICATOR / ZEIGER	P 1.5 - 12	1
6	30.0703-015	2	MATICE / NUT / MUTTER	ODLITEK	1
7	30.0703-018	0	DESKA / BOARD / PLATTE	HR 130x10	1
8	30.0703-019	0	CELIST / JAW / BACKE	HR 150x20	1
9	30.0703-020	0	CELIST / JAW / BACKE	HR 90x15	1
10	30.0703-004-1	1	VEDENÍ / GUIDE / BACKENFÜHRUNG	20x20	2
11	30.0903-005	1	CEP / LUG / BOLZEN	d 40	1
12	30.1103-001	3	SVERAK / /	ODLITEK	1
13	30.1103-102	0	SROUB / BOLT / SCHRAUBE	d 25	1
14	30.3307-008	1	PRODLOUŽENÍ / EXTENSION / VERLÄNGERUNG	d 25	1
15	90.001.25.032	0	SROUB IMBUS CERNÝ / ALLEN HEAD BOLT / IMBUSSCHRAUBE	8x20	15
16	90.001.25.043	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M10x12	2
17	90.001.25.056	0	SROUB IMBUS CERNÝ / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M12x20	8
18	90.002.20.017	0	SROUB STAVEC / ADJUSTMENT BOLT / STELLSCHRAUBE	SROUB M12x16	4
19	90.004.20.003	0	SROUB STAVEC / ADJUSTMENT BOLT / STELLSCHRAUBE	SROUB M6x16	1
20	90.005.55.006	0	SROUB 6HRANNÝ / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M6x12	1
21	90.150.50.007	0	PODLOŽKA / WASHER / UNTERLEGSCHLEIBE	PODLOŽKA 13	4
22	94.010.001	0	KOLEČKO / WHEEL / ROLLE		1
23	94.010.002	0	RUKOJET / HANDLE / GRIFF		1

I. VÝMENA SROUBU , ZRUS.SOUČ.30.0903-007 A NAHR. 30.1103-102. 303/ZM320 10.8.2007 SLEZACKOVA

7.11. Napínání / Spannung / Tensioning



NÁZEV SESTAVY NAPÍNÁNÍ	CÍSLO SESTAVY 201.0508-000	STROJ ERGO 250GA
Konstruoval:		
Datum: 06. 11. 2009		
Meritko: 33:100		

7.12. Kusovník / Stückliste / Piece list – Napínání / Spannung / Tensioning

Cislo Sestavy 201.0508-000		Ver. 0	Nazev sestavy NAPINANI/TENSIONING/SPANNUNG		
Poz.	Objednaci cislo	Ver.	Nazev polozky	Rozmer	Ks
1	30.0104-002	0	HRANOL / BLOCK / PRISMA	HR 50x 30	1
2	30.0104-004	2	DRZAK / HOLDER / HALTER		1
3	30.0303-005	0	SROUB / BOLT / SCHRAUBE	M16	1
4	30.0505-011 (2)	0	PODLOZKA / WASHER / UNTERLEGSCHIEBE	TYC 40	1
5	30.0508-004 (2)	0	CEP NAPINANI / TENSIONING LUG / SPANNUNGSBOLZEN		1
6	30.0508-701 (2)	4	KOLO NAPINACI / TENSIONING WHEEL / UMLENKRAD		1
7	30.0702-023 (2)	0	KROUZEK DISTANCNI / DISTANCE RING / DISTANZRING		1
8	30.0704-025	3	DRZAK / HOLDER / HALTER	P 4x 36	1
9	31.0104-006	0	HVEZDICE / STAR WHEEL / STERN	PLAST	1
10	90.004.20.008 (2)	0	STAV SR S CIP / ADJUSTMENT BOLT / STELSCHRAUBE	SROUB M8X16	1
11	90.005.55.017	0	6 HR SROUB ZIN / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M8X30	1
12	90.005.55.023	0	6 HR SROUB ZIN / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M10X20	1
13	90.100.55.005	0	MATICE DIN 934 / NUT / MUTTER	MATICE _ M8	1
14	90.100.55.008	0	MATICE DIN 934 / NUT / MUTTER	MATICE _ M16	1
15	90.300.02.012	0	KOLIK VALC. KAL. / PIN / BOLZEN	KOLIK 8X50	1
16	90.303.02.008	0	KOLIK PRUZNÝ / PIN / BOLZEN	KOLIK 5X20	1
17	90.350.02.002	0	PRUŽINA TALIROVA / DISC SPRING / TELLERFEDER	35,5X18,3X2,0X2,8	7
18	95.001.018 (2)	0	LOŽISKO / BEARING / LAGER	6205 2RS	2
19	95.750.001	0	KROUZEK KU / KU RING / KU-RING	16x1	2
20	95.800.012	0	KROUZEK POJIST.VNEJS / OUTSIDE SAFETY RING / SICHERUNGSRING AUßEN	POJISTNY KROUZEK 25	1
21	95.801.009 (2)	0	SEGR DIRA / INSIDE SAFETY RING / SICHERUNGSRING INNEN	POJISTNY KROUZEK 52	1

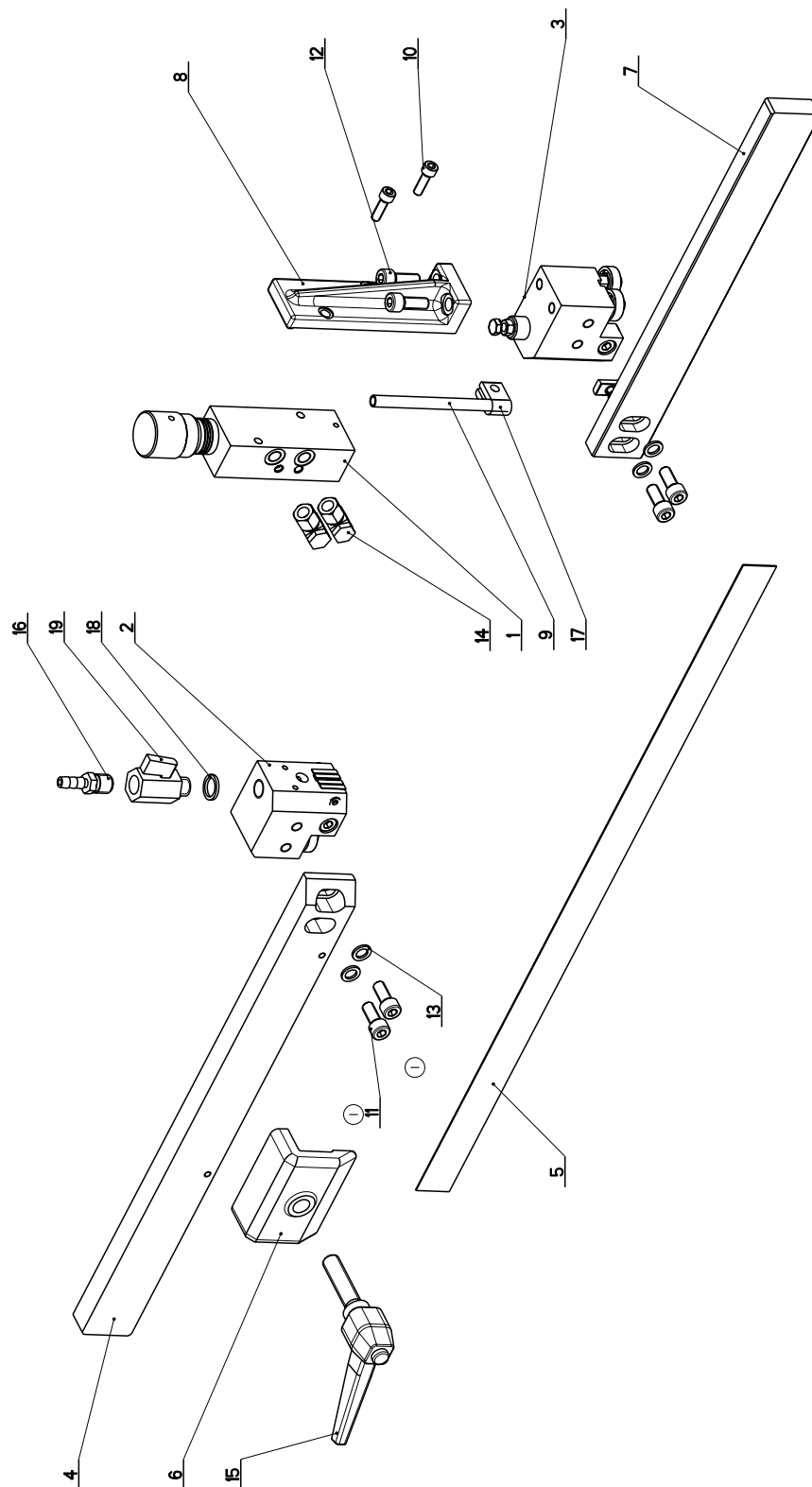
① ZMENA 30.0702-023 NA 30.0508-006, 0508-701 NA 0508-102, 0508-004 NA 0508-007, 0104-002 NA 0508-008, 95.001.018 NA 95.001.036 0505-011 NA 0508-002, 95.801.009 NA 95.801.010 14.5.2004 URICAR

2.ZRUSENA ZMENA 1. NEBYLA REALIZOVANA. 266/ZM255 28.7.2008 SLEZACKOVA

① ZMENA 30.0702-023 NA 30.0508-006, 0508-701 NA 0508-102, 0508-004 NA 0508-007, 0104-002 NA 0508-008, 95.001.018 NA 95.001.036
0505-011 NA 0508-002, 95.801.009 NA 95.801.010 14.5.2004 URICAR

2.ZRUSENA ZMENA 1. NEBYLA REALIZOVANA. 266/ZM255 28.7.2008 SLEZACKOVA

7.13. Vedení pásu / Sägebandführung / Belt guide



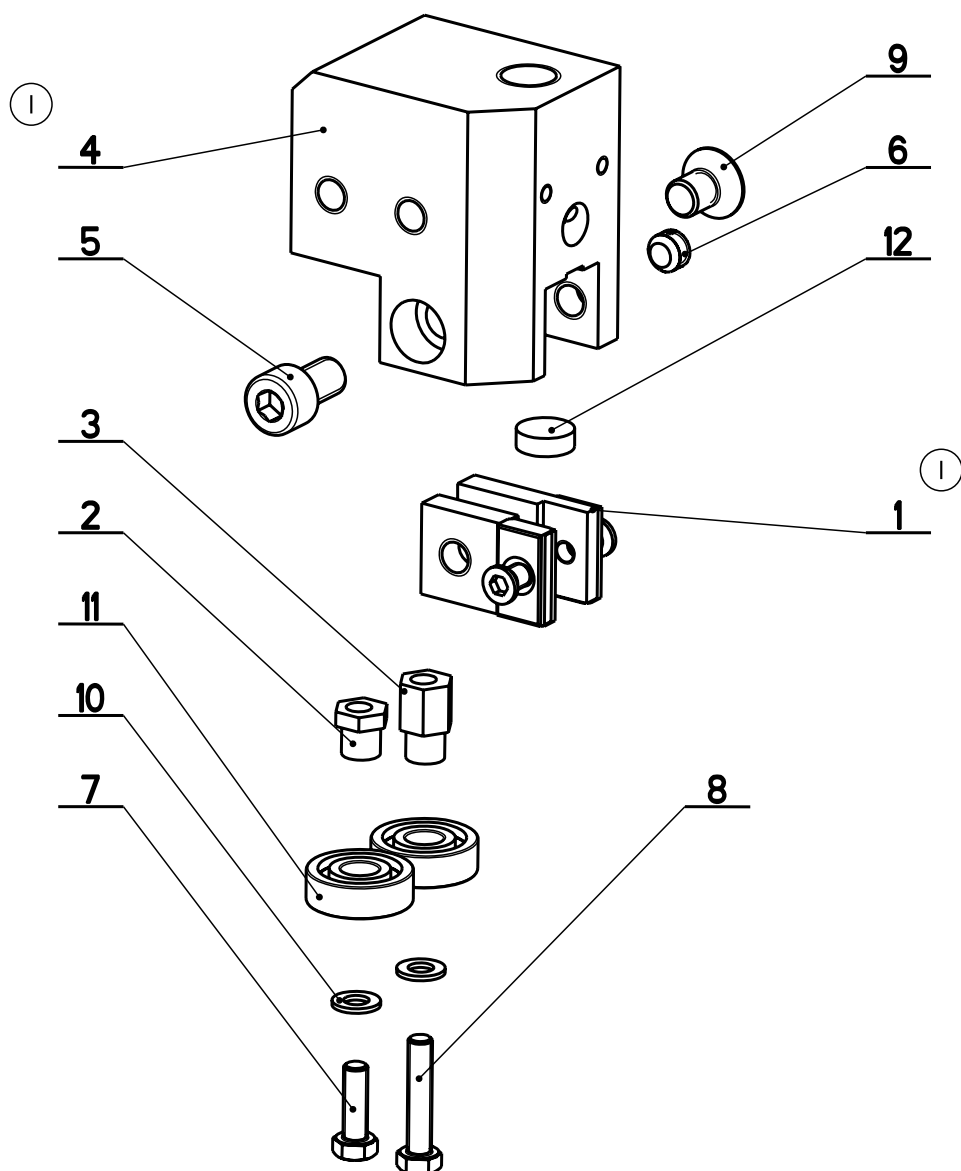
NAZEV SESTAVY VEDENÍ PÁSU	CÍSLO SESTAVY 201.2810-000	STROJ STG 240A/GA
KONSTRUKTOŘ BOMAR		
Datum: 27. 11. 2009		
Měřítko: 1:2		


7.14. Kusovník / Stückliste / Piece list – Vedení pásu / Sägebandführung / Belt guide

Císlo Sestavy 201.2810-000		Ver. 0	Název sestavy VEDENÍ PASU/BELT GUIDE / SÄGEBANDFÜHRUNG	
Poz.	Objednací číslo	Ver.	Název položky	Ks
1	251.218	0	REGULACE PRÍTLAKU / PRESSURE REGULATION / SCHNITTDRUCKREGULATION	1
2	201.0110-100	0	KOSTKA VODICI / LEAD CUBE / FÜHRUNGSKLOTZ	1
3	201.2810-200	0	KOSTKA VODICI / LEAD CUBE / FÜHRUNGSKLOTZ	1
4	30.0104-015	0	LISTA / TRIM / LEISTE	TYC 40x20
5	30.0504-961	0	PAS PÍLOVÝ / SAW BELT / SÄGEBAND	2910x25(71)x0.90
6	30.0704-010	0	UPÍNKA / FASTENER / SPANWEISEN	ODLITEK
7	30.0704-014	0	LISTA / TRIM / LEISTE	TYC 40x15
8	30.2804-001	0	DRŽÁK / HOLDER / HALTER	1
9	30.3510-004	0	TRUBKA / TUBE / ROHR	TR 8x 1
10	90.001.25.018	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M6x20
11	90.001.25.032	1	SROUB IMBUS CERNÝ / ALLEN HEAD BOLT / IMBUSSCHRAUBE	8x20
12	90.001.25.104	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M8x22
13	90.163.00.002	1	PODLOŽKA / WASHER / UNTERLEGSCHEIBE	PODLOŽKA 8
14	92.003.104	0	SROUBENÍ / BOLTING / VERSCHRAUBUNG	607002
15	94.008.009	0	PAKA UPÍNACÍ / ATTACHMENT LEVER / SPANNHEBEL	M12x50
16	94.202.002	0	REDUKCE / REDUCTION / ADAPTOR / REDUKTION	GES 6/R1/4"
17	94.204.001	0	DRŽÁK / HOLDER / HALTER	1
18	96.080.001	0	KROUZEK / RING / RING	17.8x13.5x2
19	99.260.001	0	VENTIL / VALVE / VENTIL	1

I. PRID. 4xPODLOŽKA NORD LOCK M8 90.163.00.002, ZRUS. 4xSROUB M8x16 A NAHRZEN SROUBEM M8x20 . 161/ZM148 13.5.2008 SLEZACKOVA

7.15. Vodící kostka / Führungsklotz / Guiding cube



NAZEV SESTAVY KOSTKA VODICI	CISLO SESTAVY 201.0110-100	STROJ STG-240
	Konstruoval:	
	Datum: 06. 11. 2009	
	Meritko: 4:5	

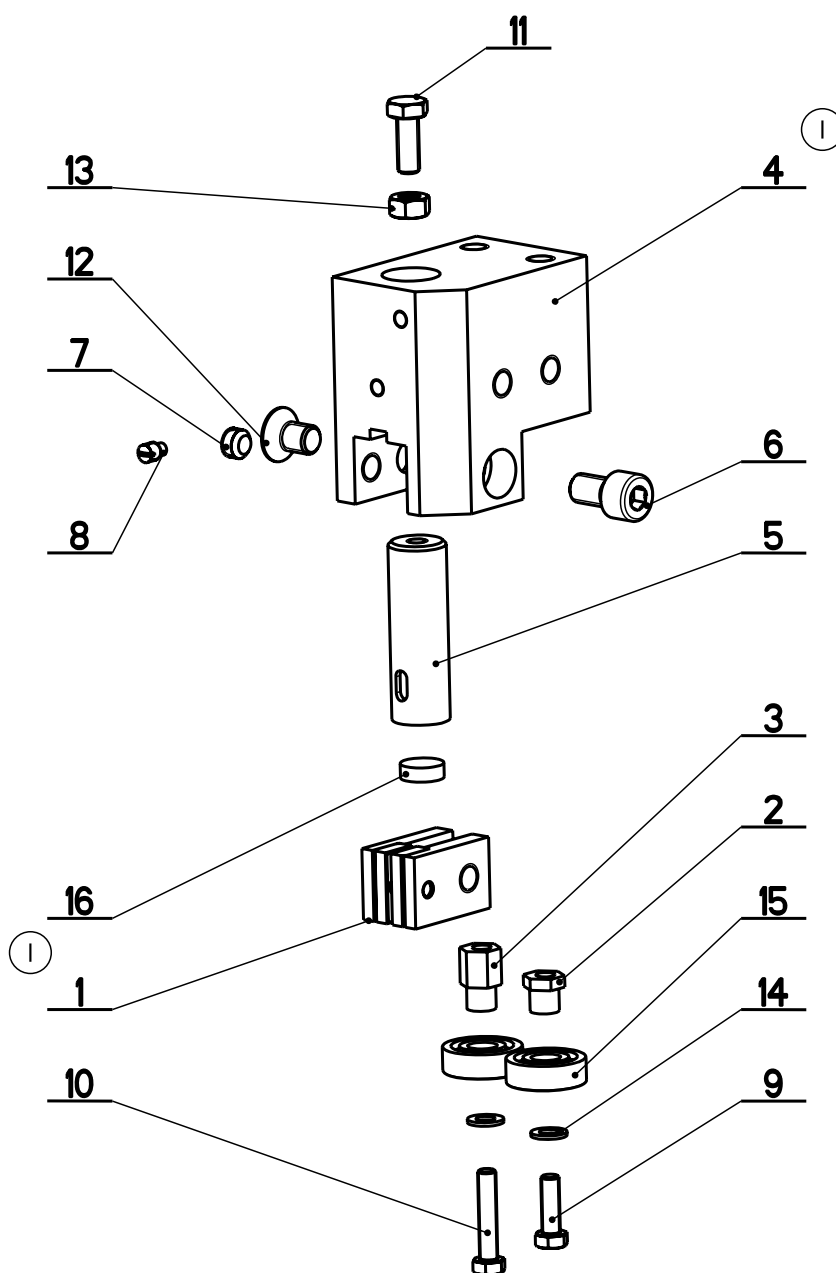
7.16. Kusovník / Stückliste / Piece list –
Vodící kostka / Führungsklotz / Guiding cube

Cislo Sestavy 201.2810-200		Ver. 0	Nazev sestavy KOSTKA VODICI/LEAD CUBE/FÜHRUNGSKLOTZ		
Poz.	Objednací číslo	Ver.	Nazev položky	Rozmer	Ks
1	201.0104-021	0	DRZAK / HOLDER / HALTER		2
2	30.0104-018	0	EXCENTR / CAM / EXZENTER	SK10	1
3	30.0104-019	0	EXCENTR / CAM / EXZENTER	SK10	1
4	30.2804-012	0	KOSTKA VODICI / LEAD CUBE / FÜHRUNGSKLOTZ	HR 60x40	1
5	30.3510-002	0	DRZAK TVRDOKOVU / POA HOLDER / HM-HALTER	TYC 16	1
6	90.001.55.082	0	SROUB IMBUS ZINEK / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M8X14	1
7	90.002.20.009	0	STAVECI S KUZEL / ADJUSTMENT BOLT / STELLSCHRAUBE	SROUB M8X6	1
8	90.004.20.017	0	STAV SR S CIP / ADJUSTMENT BOLT / STELLSCHRAUBE	SROUB M5X8	1
9	90.005.55.003	0	6 HR SROUB ZIN / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M5X16	1
10	90.005.55.005	0	6 HR SROUB ZIN / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M5X25	1
11	90.005.55.007	0	6 HR SROUB ZIN / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M6X16	1
12	90.011.27.007	0	SROUB ZAPUSTNY / COUNTERSINK BOLT / SENKSCHRAUBE	SROUB M8X12	1
13	90.100.55.004	0	MATICE DIN 934 / NUT / MUTTER	MATICE - M6	1
14	90.150.50.003	0	PODLOZKA DIN125 / WASHER / UNTERLEGSCHEIBE	PODLOZKA 5.3	2
15	95.001.001	0	KUL. LOZ. I RADE / BEARING / LAGER	608 2RS	2
16	99.040.002	0	TVRDOKOV / HARD METAL / HM-SEGMENT	d 12	1

I. ZRUS. KOSTKA 30.2804-002 A NAHR. 30.2804-012, ZRUS. DRZAK 30.0104-020 A NAHR. 201.0104-021. 340/ZM343 16.10.2008 SLEZACKOVA

1. ZRUS. KOSTKA 30.2804-002 A NAHR. 30.2804-012. ZRUS. DRŽÁK 30.0104-020 A NAHR. 201.0104-021. 340/ZN343 16.10.2008 SLEZACKOVA

7.17. Vodící kostka / Führungsklotz / Guiding cube



NAZEV SESTAVY KOSTKA VODICI	CISLO SESTAVY 201.2810-200	STROJ STG 240A/GA
	Konstruoval:	
	Datum: 06. 11. 2009	
	Meritko: 3:5	

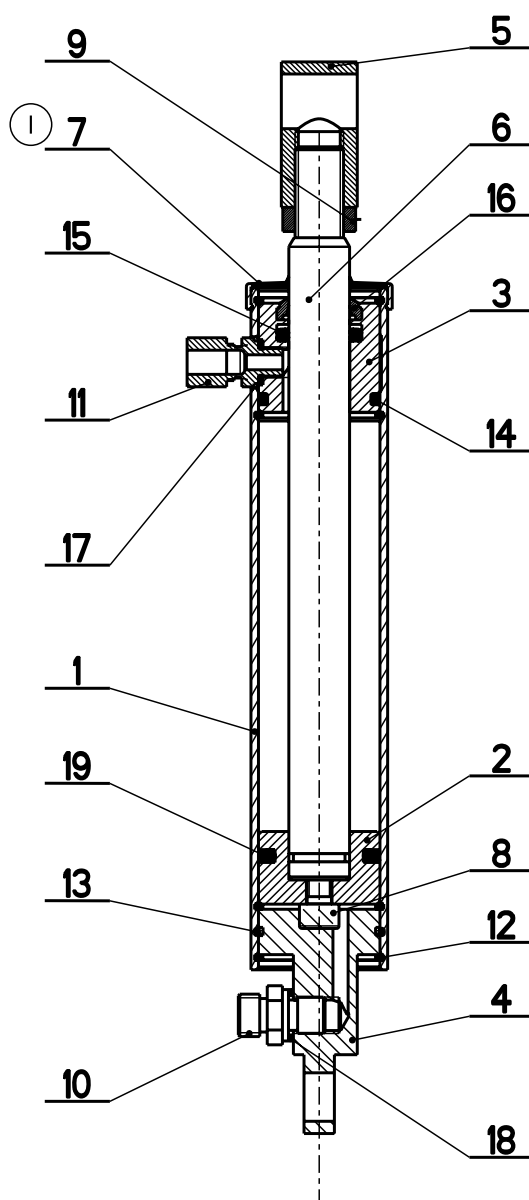
7.18. Kusovník / Stückliste / Piece list –
Vodící kostka / Führungsklotz / Guiding cube


Číslo Sestavy 201.0110-100		Ver. 0	Název sestavy KOSTKA VODICÍ / LEAD CUBE / FÜHRUNGSKLOTZ		
Poz.	Objednací číslo	Ver.	Název položky	Rozměr	Ks
1	201.0104-021	0	DRŽÁK / HOLDER / HALTER		2
2	30.0104-018	0	EXCENTR / CAM / EXZENTER	SK10	1
3	30.0104-019	0	EXCENTR / CAM / EXZENTER	SK10	1
4	30.0104-032	0	KOSTKA VODICÍ / LEAD CUBE / FÜHRUNGSKLOTZ	TYC 60x40	1
5	90.001.55.082	0	SROUB IMBUS ZINEK / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M8x14	1
6	90.002.20.009	0	STAVEČÍ S KUZEL / ADJUSTMENT BOLT / STELLSCHRAUBE	SROUB M8x6	1
7	90.005.55.003	0	6 HR SROUB ZIN / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M5x16	1
8	90.005.55.005	0	6 HR SROUB ZIN / 6 SIDED BOLT / SECHSKANTSCHRAUBE	SROUB M5x25	1
9	90.011.27.007	0	SROUB ZAPUSTNÝ / COUNTERSINK BOLT / SENKWSCHRAUBE	SROUB M8x12	1
10	90.150.50.003	0	PODLOŽKA DIN125 / WASHER / UNTERLEGSCHIEBE	PODLOŽKA 5.3	2
11	95.001.001	0	KUL. LOŽ. I RADE / BEARING / LAGER	608 2RS	2
12	99.040.002	0	TVRDOMOV / HARD METAL / HM-SEGMENT	d 12	1

I. ZRUŠENA SOUC. 30.0104-020 A NAHR. 201.0104-021. 297/272 12.8.2008 KRPEC

I. ZRUSENA SOUC. 30.0104-020 A NAHR. 201.0104-021. 297/272 12.8.2008 KRPEC

7.19. Válec zvedací / Hebezyylinder / Lifting cylinder



NAZEV SESTAVY VALEC ZVEDACI	CISLO SESTAVY 201.0507-910	STROJ 240DGP,GH
	Konstruoval: ZAJIC	
	Datum: 25. 03.2010	
	Meritko: 1:2	

7.20. Kusovník / Stückliste / Piece list – Válec zvedací / Hebezyylinder / Lifting cylinder

Cislo Sestavy 201.0507-910		Ver. I	Nazev sestavy VALEC ZVEDACI/LIFTING CYLINDER/HEBEZYLINDER		
Poz.	Objednaci cislo	Ver.	Nazev polozky	Rozmer	Ks
1	30.0507-901	2	VALEC / ROLLER / ZYLINDER	TR 45/40H8	I
2	30.0507-902	0	PIST / PISTON / KOLBEN	d 40	I
3	30.0507-903	2	VIKO / COVER / DECKEL	TYC 45	I
4	30.0507-911	0	DRZAK / HOLDER / HALTER	d 40	I
5	30.0807-006	0	DRZAK / HOLDER / HALTER	TYC 25x25	I
6	30.2807-003	0	PISTNICE / PISTON ROD / KOLBENSTANGE	d20	I
7	31.0507-905	0	VIKO / COVER / DECKEL		I
8	90.001.25.032	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	8x20	I
9	90.101.55.003	0	MATICE / NUT / MUTTER	MATICE M16	I
10	92.002.001	0	SROUBENI PRIME / DIRECT BOLTING / GERADE VERSCHRAUBUNG	G 1/4"	I
11	92.002.102	0	SROUBENI PRIME / DIRECT BOLTING / GERADE VERSCHRAUBUNG	S-GEV-8LLR	I
12	95.801.005	0	KROUZEK POJIST.VNITR / INSIDE SAFETY RING / SICHERUNGSRING INNEN	POJISTNY KROUZEK 40	4
13	96.001.010	0	KROUZEK O STATICKY / STATIC O RING / O-RING STATISCH	36x2	I
14	96.002.017	0	KROUZEK O DYNAMICKY / DYNAMIC O RING / O-RING DYNAMISCH	34x3	I
15	96.041.002	0	KROUZEK TESNICI / SEAL RING / DICHTUNGSRING	20/28x4	I
16	96.060.002	0	KROUZEK STIRACI / SCRAPER RING / ABSTREIFRING		I
17	96.082.001	0	TESNENI / SEALING / DICHTUNG	KROUZEK CU 10/14	I
18	96.082.002	0	TESNENI / SEALING / DICHTUNG	KROUZEK CU 13/17	I
19	96.900.002	0	TESNENI KOMBINOVA NE / COMBINATION SEALING / KOMBIDICHTUNG		I

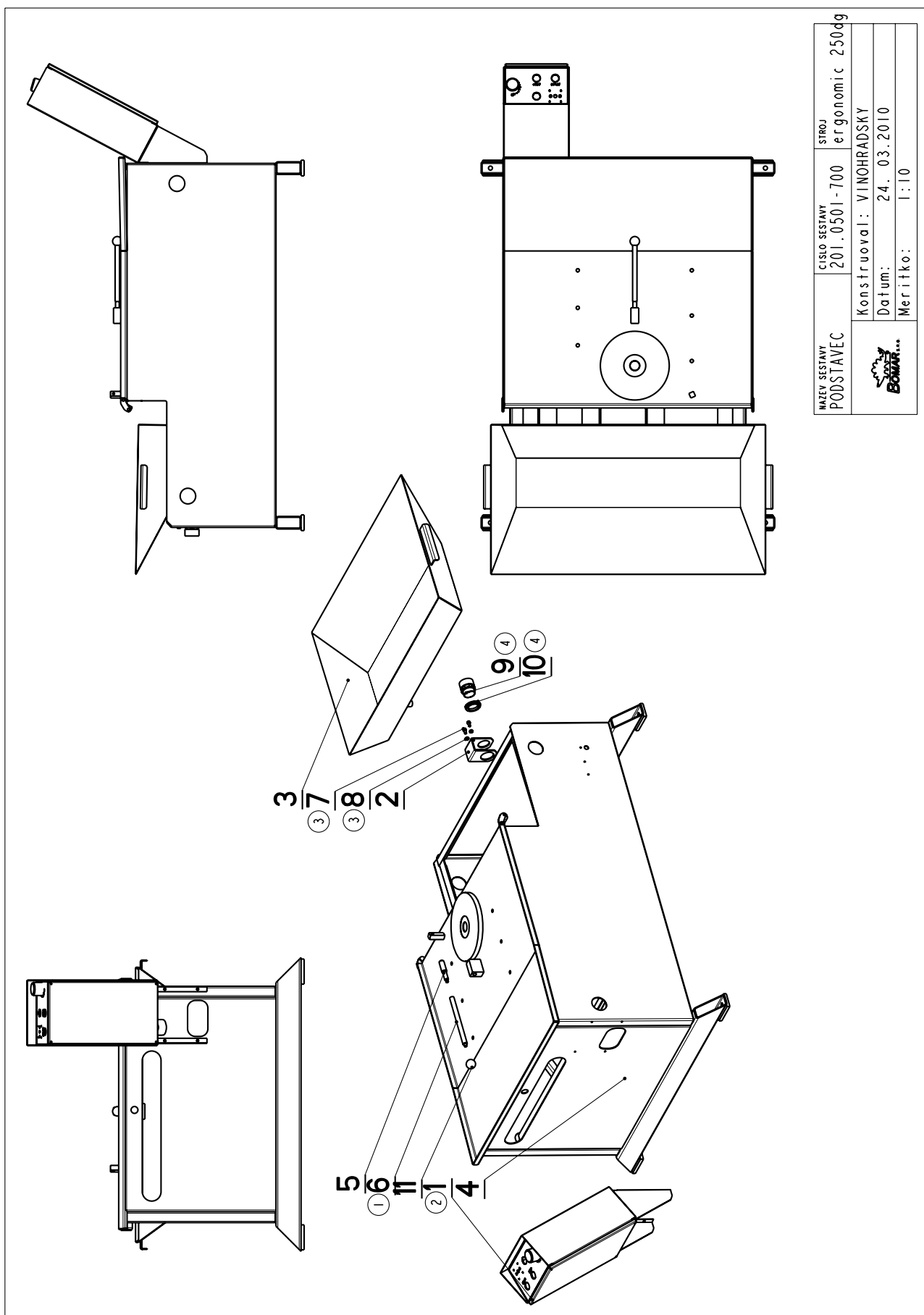
I.DOPL.31.0507-905,12.1.04 STATNY

Cislo Sestavy/Number of assembly/Nummer der Baugruppe; Verze (Ver.)/Version/Version; Nazev sestavy/Assembly title/Name der Baugruppe; Pozice (Poz.)/Position/Position;

I. DOPL. 31.0507-905, 12.1.04 STASTNY

Cislo Sestavy/Number of assembly/Nummer der Baugruppe; Verze (Ver.)/Version/Version; Název sestavy/Assembly title/Name der Baugruppe; Pozice (Poz.)/Position/Position;
Objednací číslo/Purchase order number/Bestellnummer; Název položky/Volume title/Name der Position; Rozměr/Stock size/Abmessung

7.21. Podstavec / Untersatz / Base



7.22. Kusovník / Stückliste / Piece list – Podstavec / Untersatz / Base

Cislo Sestavy 201.0501-700		Ver. 4	Název sestavy PODSTAVEC / BASE / UNTERSATZ	
Poz.	Objednací číslo	Ver.	Název položky	Ks
1	201.0513-000 (2)	0	OVLADACÍ PANEL / CONTROL PANEL / BEDIENPULT	1
2	30.0501-003	1	DRŽÁK / HOLDER / HALTER	P3 - 60
3	30.0501-602	1	VANNA / TANK / WANNE	1
4	30.0501-701	5	PODSTAVEC / BASE / UNTERSATZ	1
5	30.0701-016	0	DORAZ / STOP PIECE / ANSCHLAG	d 16h9
6	30.1003-004 (1)	0	NASTAVEC / EXTENSION / ANSATZ	d 14
7	90.001.25.016 (3)	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M6x12
8	90.100.55.004 (3)	0	MATICE / NUT / MUTTER	MATICE - M6
9	91.071.004 (4)	0	VYVODKA / BUSHING / TÜLLE	VYVODKA
10	91.072.007 (4)	0	MATICE / NUT / MUTTER	MATICE
11	94.001.002	0	HLAVICE / HEAD / KOPF	1

1. PRIDAN NADSTAVEC 30.1003-004. 403/ZM393 14.11.2008 SLEZACKOVA

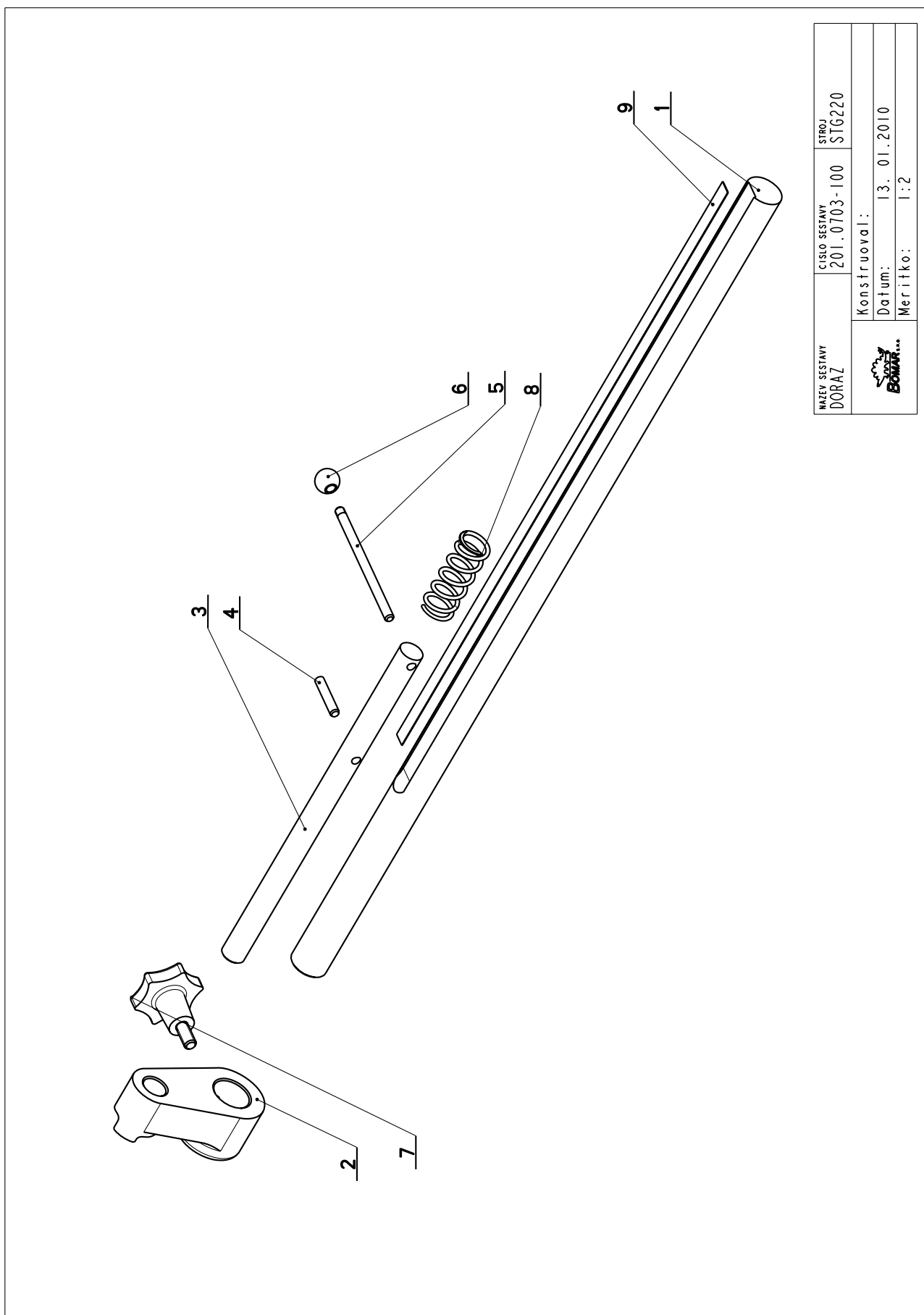
2. ZM. POLOHY OVLADACÍHO PANELU 201.0513-000. 048/ZM069 9.3.2009 SLEZACKOVA

3. ZRUS. 2xSROUB M5x6 (90.001.25.006) A NAHR. 2xSROUB M6x12 (90.001.25.016), PRID. 2xMATICE M6 (90.100.55.004).
115/ZM135 10.6.2009 SLEZACKOVA

4. ZRUS. VYVODKA PG36 (91.071.005) A NAHR. VYVODKOU PG29 (91.071.004), ZRUS. MATICE PG36 (91.072.008)
A NAHR. MATICI PG29 (91.072.007). 133/ZM163 20.7.2009 SLEZACKOVA

Cislo Sestavy/Number of assembly/Nummer der Baugruppe; Verze (Ver.)/Version/Version; Název sestavy/Assembly title/Name der Baugruppe; Pozice (Poz.)/Position/Position;
Objednací číslo/Purchase order number/Bestellnummer; Název položky/Volume title/Name der Position; Rozměr/Stock size/Abmessung

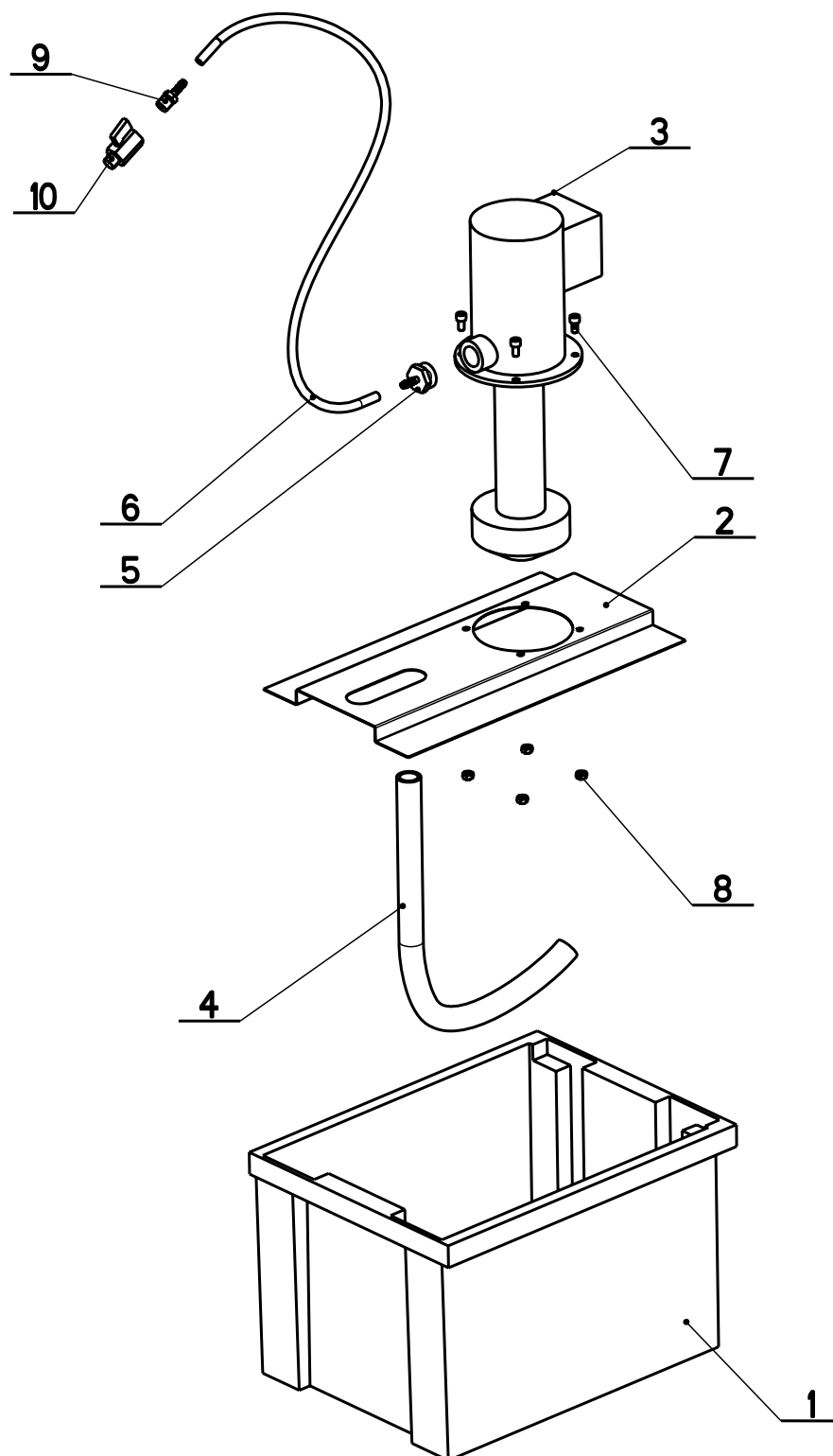
7.23. Doraz / Anschlag / Lenght Stop




7.24. Kusovník / Stückliste / Piece list – Doraz / Anschlag / Lenght Stop

Cislo Sestavy 201.0703-100		Ver. 0	Nazev sestavy DORAZ/STOP PIECE/ANSCHLAG		
Poz.	Objednaci cislo	Ver.	Nazev polozky	Rozmer	Ks
1	30.0703-010	0	TYC / POLE / STANGE	d25	1
2	30.0703-013	0	TELESO DORAZU / STOP BODY / ANSCHLAGKÖRPER	ODLITEK	1
3	30.1003-101	1	TYC / POLE / STANGE	d 16	1
4	90.300.02.006	0	KOLIK VALCOVY KALENY / CYLINDRICAL PIN TEMPERED / ZYLINDERSTIFT GEHÄRTET	KOLIK 6x32	1
5	30.0703-016	1	PAKA / LEVER / HEBEL	d6	1
6	94.001.001	0	RUKOJET / HANDLE / GRIFF	M6 PRUMER 16	1
7	94.006.001	0	SROUB / BOLT / SCHRAUBE	M8x17	1
8	31.0304-013	0	PRUZINA / SPRING / FEDER	2.5x21.5x60x7	1
9	99.120.001	0	PRAVITKO / RULER / SKALENBANDMAß	0.5m	1

7.25. Chlazení / Kuhlung / Cooling



NAZEV SESTAVY CHLAZENÍ	CÍSLO SESTAVY 201.0506-000	STROJ STG-120
	Konstruoval: ZAJIC	
	Datum: 20. 01. 2010	
	Meritko: 17:100	

7.26. Kusovník / Stückliste / Piece list – Chlazení / Kuhlung / Cooling

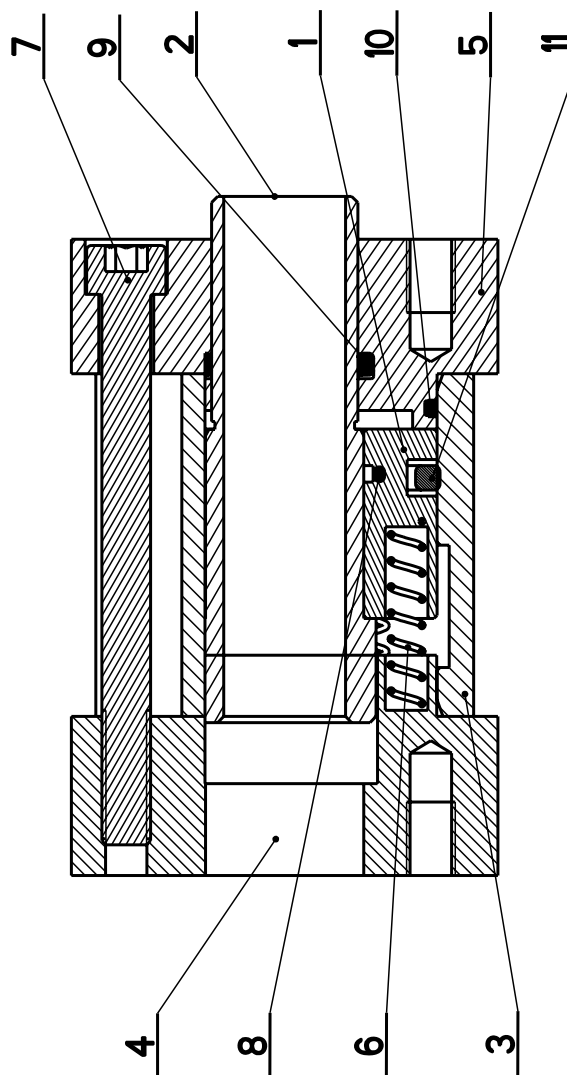
Císto Sestavy 201.0506-000		Ver. 0	Název sestavy CHLAZENÍ/COOLING/KÜHLUNG		
Poz.	Objednací číslo	Ver.	Název položky	Rozměr	Ks
1	94.403.001	0	MADRZ / CONTAINER / BEHÄLTER	POLYPACK	1
2	30.0506-001	3	VÍKO / COVER / DECKEL	P 0.8 - 249	1
3	91.020.006	0	CERPADLO CHLAZENÍ / COOLING PUMP / KÜHLMITTEL PUMPE	3COA 2-22	1
4	42.020.003	0	HADICE / HOSE / SCHLAUCH	19x3	1
5	94.202.005	0	REDUKCE / REDUCTION / ADAPTOR / REDUKTION	3/4"-6	1
6	42.020.001	0	HADICE / HOSE / SCHLAUCH	6x1.5	1
7	90.001.25.016	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M6x12	4
8	90.100.55.004	0	MATICE / NUT / MUTTER	MATICE - M6	4
9	94.202.002	0	REDUKCE / REDUCTION / ADAPTOR / REDUKTION	REDUKCE 6/R1/4"	1
10	99.260.001	0	VENTIL / VALVE / VENTIL	VENTIL KULOVÝ	1

7.27. Válec / Zylinder / Roller

Cislo Sestavy 201.3307-000	Ver. 0	Nazev sestavy VALEC/ROLLER/ZYLINDER			
Poz.	Objednaci cislo	Ver.	Nazev polozky	Rozmer	Ks
1	30.3307-001	0	PIST / PISTON / KOLBEN	d 55	1
2	30.3307-002	0	PISTNICE / PISTON ROD / KOLBENSTANGE	d 30	1
3	30.3307-003	0	VALEC / ROLLER / ZYLINDER	d 62/d50H8	1
4	30.3307-004	0	VIKO / COVER / DECKEL	HR 70 x 70	1
5	30.3307-005	0	VIKO / COVER / DECKEL	HR 70x70	1
6	31.3307-007	0	PRUZINA / SPRING / FEDER	1x6x32x17.5	8
7	90.001.25.078	0	SROUB IMBUS / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M8x90	4
8	96.001.008	0	KROUZEK O STATICKY / STATIC O RING / O-RING STATISCH	26x2	1
9	96.002.012	0	KROUZEK O DYNAMICKY / DYNAMIC O RING / O-RING DYNAMISCH	24x3	1
10	96.002.019	0	KROUZEK O DYNAMICKY / DYNAMIC O RING / O-RING DYNAMISCH	46x2	1
11	96.020.005	0	KROUZEK TESNICI / SEAL RING / DICHTRINGSRING	39.2x5.33	1

The drawing is a technical cross-section of a roller assembly. It shows a central roller (1) mounted on a shaft (2). The roller is supported by a housing (3) which contains a spring (6) and a seal ring (11). The assembly is secured with bolts (7) and covers (4, 5). The drawing includes various hatching patterns to indicate different materials and cross-sections.

Cislo Sestavy/Number of assembly/Nummer der Baugruppe; Verze (Ver./Version/Versioin; Nazev sestavy/Assembly title/Name der Baugruppe; Pozice (Poz./)Position/Position;
Objednaci cislo/Purchase order number/Bestellnummer; Nazev polozky/Volume title/Name der Position; Rozmer/Stock size/Abmessung



Cislo Sestavy/Number of assembly/Nummer der Baugruppe; Verze (Ver.)/Version/Version; Název sestavy/Assembly title/Name der Baugruppe; Pozice (Poz.)/Position/Position;
Objednací číslo/Purchase order number/Bestellnummer; Název položky/Volume title/Name der Position; Rozměr/Stock size/Abmessung

7.28. Kartáč / Bürste / Brush

Číslo Sestavy 201.0704-100		Ver. 0	Název sestavy KARTAC/BRUSH/BÜRSTE		
Poz.	Objednací číslo	Ver.	Název položky	Rozměr	Ks
1	30.0104-022	0	DRŽÁK / HOLDER / HALTER	HR 16x16	1
2	30.0704-029	0	HRDEL / SHAFT / WELLE	d 14	1
3	31.0704-031	0	KARTAC / BRUSH / BÜRSTE		1
4	90.150.50.006	0	PODLOŽKA DIN125 / WASHER / UNTERLEGSCHIEBE	PODLOŽKA 10,5	1
5	90.100.55.006	0	MATICE / NUT / MUTTER	MATICE - M10	1
6	90.150.50.004	0	PODLOŽKA / WASHER / UNTERLEGSCHIEBE	PODLOŽKA 6,4	1
7	95.800.001	0	KROUZEK POJIST.VNEJŠ / OUTSIDE SAFETY RING / SICHERUNGSRING AUßEN	POJISTNÝ KROUZEK 6	1
8	90.001.25.019	0	SROUB IMBUS ČERNÝ / ALLEN HEAD BOLT / IMBUSSCHRAUBE	M6x25	1

7
2
3
4
5

8
6
1

