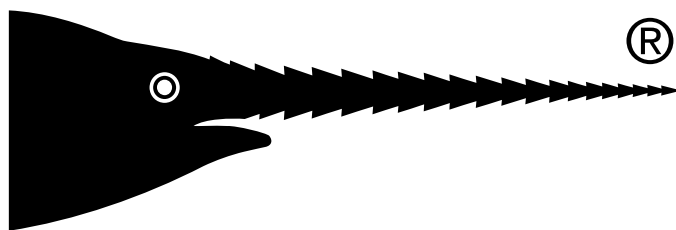
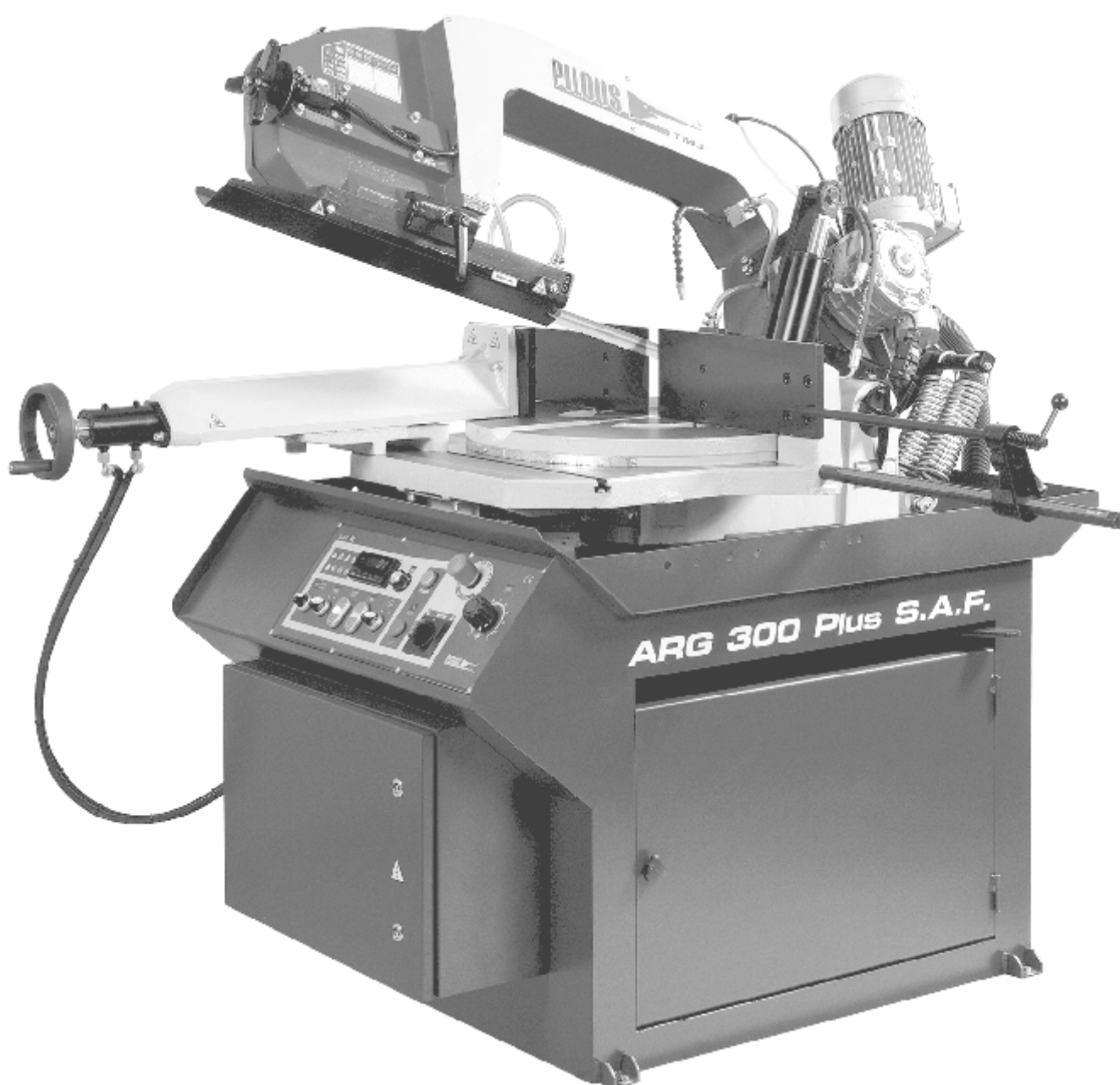


PILOUS



INSTRUCTION MANUAL

ARG 250 S.A.F. • ARG 250 plus S.A.F. • ARG 300 S.A.F.
ARG 300 plus S.A.F. • ARG 330 S.A.F. • ARG 330 plus S.A.F.



Pilous - pasove pily, spol. s r.o., Zelezna 9, 619 00 Brno, Czech Republic
tel.: 00 420 543 25 20 10, fax: 00 420 543 25 20 11, e-mail: pilous@pilous.cz

Dear customer,

thank you for buying our product and we wish you a lot of success with it. For proper machine function please pay an attention to this instruction manual.

Producer: PILOUS-pasove pily, spol. s r.o.
Zelezna 9
619 00 BRNO
CZECH REPUBLIC

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0. In general

This instruction manual provides the users assistance and information about the PILOUS bandsaw and the possibilities of use corresponding to its purpose. The instruction manual contains important instructions for a safe, adequate and economically efficient operation. Observing the operating instructions will prevent hazards, reduce the repair and outage time costs, and increase the machine reliability and life. The instruction manual must always be available at the machine site. The instruction manual must be read and used by the staff entrusted with the machine installation, transport and storage, use/operation, maintenance and disposal. In addition to the instruction manual and the binding rules related to accident prevention valid in the user's country and at the service site. It is also necessary to observe the approved rules for safe and professional work.

Warranty letter - service

Warranty letter is a separate part of the instruction manual.

Warranty period length: see warranty letter.

Terms of warranty letter validity :

- Machine transport, manipulation and storage according to the instruction manual.
- Machine usage, operation and maintenance according to the instruction manual.
- Machine connection to the electrical grid supply according to the instruction manual.

The warranty letter does NOT include :

- The machine user's or third person violent and mechanical machine damage.
- Remediless event (elementary disaster).
- Machine damage during transport.
- Machine storage or placing in wet, chemical or otherwise dangerous environment.

Address any possible comments on the warranty letter by fax, or mail to the address showed on the warranty letter.

Notice for the user:

The seller is obliged to issue warranty letter to the user when the product is dispatched. The warranty letter must be signed and confirmed by the seller's stamp with the date of issue and product serial number. The seller is obliged to introduce the product to the user.

Data needed to apply for the warranty (after warranty) machine repair:

- Machine type
- Warranty letter number (same as machine serial number)
- Warranty letter issue date

0.1. Safety provisions

The machine design complies with the technical status and the approved safety and technical rules. In spite of this the user's or the third persons' health can be endangered and/or the machine or other tangible goods may be unfavorably influenced during the operation of the machine. In order to prevent such hazards it is unconditionally necessary to observe the safety instructions in this instruction manual. These safety instructions must be read and understood by the respective persons before the machine has been put into operation. Failure to observe these instructions may cause serious property damage and damage to health! The safety instructions are marked in this instruction manual with safety symbols / danger spot signs.



Danger spot - be careful!



Dangerous voltage!



Use goggles!



Danger of injury by air-borne particles!



Use ear plugs! A-weighted emission sound pressure level 76 dB(A). A-weighted sound power level emitted by the machinery 91 dB(A).



Danger of injury by press!



Use steel toe boots or work shoes with skid-proof sole!



Danger of injury by slashing!



Use protective gloves!



This instruction manual should be read before the use of the band saw to make sure that it has been understood correctly!

0.2. Scope of use / use by determination

The machine is designed exclusively for normalized metallic materials. Any other use is considered as not adequate to the purpose. The manufacturer is not responsible for damage due to such a risk. The use complying with the purpose includes also observing the operating instructions, checking and maintenance conditions.

Examples of cutting materials: structural steel • case-hardening steel • free-cutting steel • heat treatment steel • antifriction bearing steel • spring steel • tool steel • high-speed steel • copper • brass • cast steel • cast iron • aluminum • plastic materials

0.3. Requirements concerning operators

The machine may only be operated by persons instructed in safety at work and technically trained!

The machine may only be operated if in perfect condition with respect to technical safety. The user is obliged to check the machine for visually ascertainable damages and failures at least once per shift. Any changes, failures and damages of protective covers, changes of the machine behavior endangering the safety should be immediately reported to the superior. Wait for the decision about the repair and the repeated putting into operation. No protective covers may be removed, moved, put out of operation or changed during the machine operation. Otherwise the guarantee claims have no effect. If any protective has to be removed during operation or maintenance, secure the main switch in the „OFF“ position by a padlock or disconnect the bandsaw from the mains.



Only electricians or persons instructed in electrotechnical work and supervised by electrical specialists are allowed to open the electric equipment housings and to work on the electric equipment!

- while working with the machine remove all free clothing and cover long hair
- make sure that all other persons are at least 5 m far away from the saw blade and protect them from chips and possibility of saw blade breaking
- make sure that all persons helping you with know all safety rules
- safety rules must be showed clearly in the working area
- keep your hands far enough from the saw blade and never adjust the saw blade when the engine is on. Switch off the engine and secure it against running before any manipulation with the saw blade

0.4. Requirements concerning machines - safety equipments

CAUTION - DANGER OF INJURY!



**The saw band is not covered in the machining zone!
Wait until the saw band is in standstill before opening the protective covers.
Danger in working zone of the swing arm!
Do not use the machine when tired, overwork, under medicines, drugs or alcohol!**

The horizontal bandsaw is a machine tool. For machining the saw band must penetrate into the workpiece in the metal-cutting zone. The covers protecting against contact with the saw band may therefore be installed only outside the metal-cutting zone.

0.5. Protective Covers

Outside the metal-cutting zone the saw band and the saw band discs are protected against contact. The protective covers may be only removed when the main switch is off and secured against switching on or when the machine is disconnected from the mains. The emergency shut down of the machine is effected by depressing the **TOTAL STOP** push-button. Putting the machine into operation again is only possible after pulling and unlocking the push-button manually.

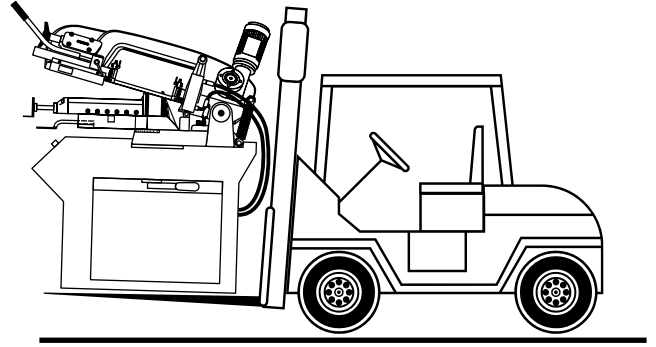
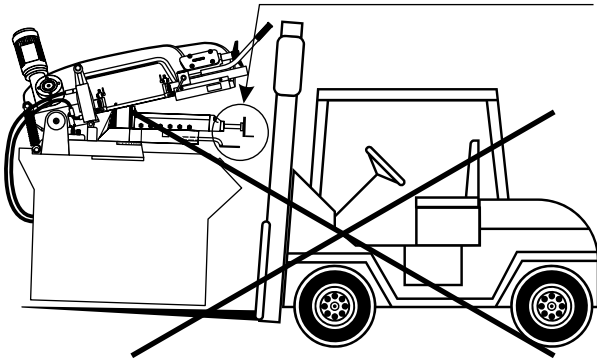


Manual machine cleaning and waste remove while the machine is running is forbidden. The working place must have first aid set. When working with the machine proper work clothes, boots and protective instruments(eyes and ears protections, gloves, proper work boots) must be used. Abide clean air and work space rules.

1. Transport and storage



DANGER OF DAMAGE!



The machine may be transported and lifted only by a fork lift. USING A CRANE IS NOT PERMITTED!

Standard accessories:

- 1 bimetallic saw band M 42 (mounted)
- 1 coolant unit with a metal chips tank
- 1 length stop 500 mm

1.1. Surface Treatment

The machine is provided with a primer and a two-component polyethane varnish. The sliding surfaces are provided with antirust oil. The other machine parts are zinc coated or blackened.

1.2. Packing

The basic element of the package is a wooden frame which according to the kind of dispatch may be crating or an overseas case. Approximately 100 mm clearance should be provided for transport and loading by a fork lift truck. For the transport the machine is packed in a stretching foil protecting against weather influences.

1.3. Installation

Remove the wooden frame. Position the machine at site. Align the machine by a water level and four M12 setting screws in the base corners. Remove anticorrosive protection and dust from the sliding surfaces and apply oil again. Attach the length stop. Make sure that energy supply is connected (see chapter 4.3). Opening the base door, make sure that the coolant discharge pipe has not come off the coolant tank cover and is correctly attached in the tank. Fill the machine tray with the coolant (approx. 15 litre), the fluid will continuously pour into the tank in the base.



Endangering with dangerous matters cannot be excluded when handling coolants. Observe in your own interest the manufacturer's and/or your company's instructions and recommendations/operating instructions related to safe handling with coolants.

1.4. Dismantling

Empty and clean the metal chips tank and the coolant tank. Clean the machine. Provide the sliding surfaces with anticorrosive oil. Make sure that the machine has been disconnected from electrical energy supply. Prepare the swing arm protection for transport. Lift the machine and screw on the wooden frame. Provide a clearance of approx. 100 mm for transport by a fork lift truck. Check whether all protective covers of the machine are screwed on. Enclose the machine accessories.



**CAUTION : Used coolants are special waste!
Disconnecting the machine from the electrical energy supply may be only carried out by electricians!**

1.5. Disposal

When the machine has been definitely put out of operation, it should be disposed of in accordance with the provisions valid in the respective country. We recommend to contact a company specialized in waste disposal.

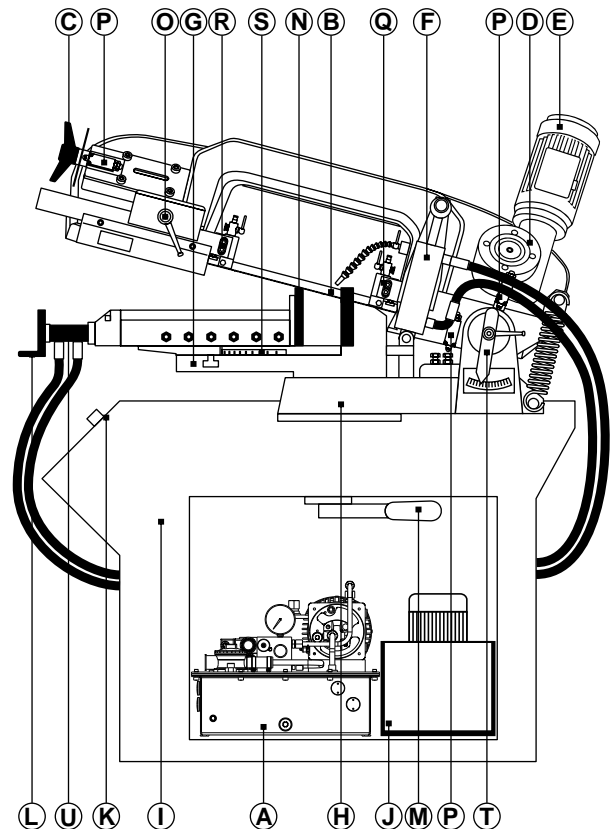
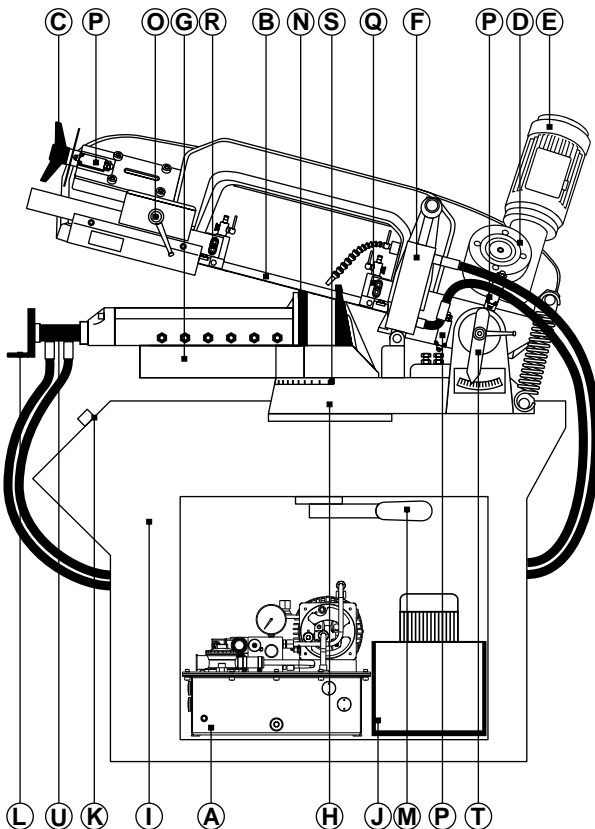
2. Machine data

This horizontal bandsaws are used for cutting different kinds of materials. Hydraulic unit enables vice workpiece clamping, arm down feed into cut, band starting, band stop, arm uplift after cut to set height and vice opening. This complete automatic cycle can be carried out by pressing only one starting button when the saw is in the automatic mode. The arm feed into cut is powered by the hydraulic damper pressure which makes the cutting process more efficient and band saw more productive specially when cutting full materials. All functions may be controlled separately when the saw is in manual mode. Material feed into saw is manual. The vice pressure regulation on the ARG machines is as a standard machine equipment. An endless welded metallic band serves as the cutting tool. The band is tensioned mechanically by a tensioning running wheel. The running wheel is driven by a driving wheel driven via worm gearbox by a two-stage motor (version S.A.) / one-stage motor (version S.A.F.). The saw band in the machining zone is precisely guided in the band guide heads. Outside machining zone a protection by band covers is provided. S.A.F. models are equipped with more powerful engines with frequency inverter which enables smooth speed regulation in the range of 15 - 90 m/min. Optimal cutting speed setting increases the band lifetime, machine productivity and cut accuracy.



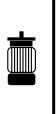





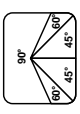











A hydraulic unit	I base	P end switch
B band	J coolant and pump tray	Q fixed bar with band guidance
C band tensioning wheel	K control panel	R moving bar with band guidance
D gear box	L vice hand wheel	S angle scale
E engine	M worktable lever	T uplift limit switch
F oil damper	N moving jaw	U hydraul. Vice cylinder
G vice	O moving bar lock lever	
H revolving worktable		

ARG 250 S.A.F.
ARG 300 S.A.F.
ARG 330 S.A.F.

ARG 250 plus S.A.F.
ARG 300 plus S.A.F.
ARG 330 Plus S.A.F.



3. Technical data

PILIUS 		ARG 250 S.A.F.	ARG 250 plus S.A.F.	ARG 300 S.A.F.	ARG 300 plus S.A.F.
MAIN ENGINE		400 V, 50 Hz 2,2 kW	400 V, 50 Hz 2,2 kW	400 V, 50 Hz 2,2 kW	400 V, 50 Hz 2,2 kW
PUMP ENGINE		400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW	400 V, 50 Hz 0,09 kW
BAND SPEED		15 - 90 m/min	15 - 90 m/min	15 - 90 m/min	15 - 90 m/min
CUTTING RANGE	[mm]	 90°	 45°	 60°	 90°
	∅	250	175	180	110
	a	240	160	170	110
	a x b	290x80	180x90	180x90	110x120
ARM SWING		 90°	 60°	 45°	 90°
SAW BAND SIZE		2710x27x0,9	2710x27x0,9	3110x27x0,9	3110x27x0,9
SAW BAND GUIDING WHEELS DIAMETER		300 mm	300 mm	355 mm	355 mm
VICE WORK HEIGHT		910 mm	910 mm	910 mm	915 mm
OIL INSIDE THE HYDRAULIC SYSTEM		Hydraulic oil PARAMOL HM 46	Hydraulic oil PARAMOL HM 46	Hydraulic oil PARAMOL HM 46	Hydraulic oil PARAMOL HM 46
COOLANT TANK		approx. 15 liters	approx. 15 liters	approx. 15 liters	approx. 15 liters
MACHINE DIMENSIONS		1400x900x1330	1400x900x1330	1600x950x1600	1600x950x1600
MACHINE WEIGHT		445 kg	550 kg	540 kg	645 kg

4. Installation

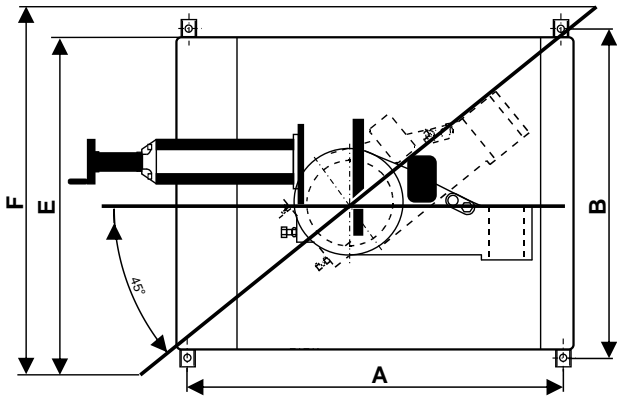
4.1. Space Requirements

The machine may be installed on any suitable even hall floor (concrete surface). Observe the permissible floor load.

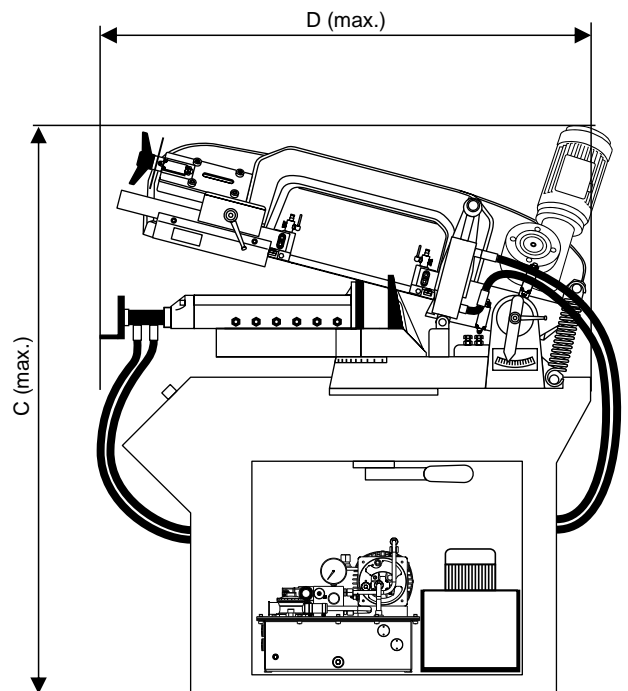
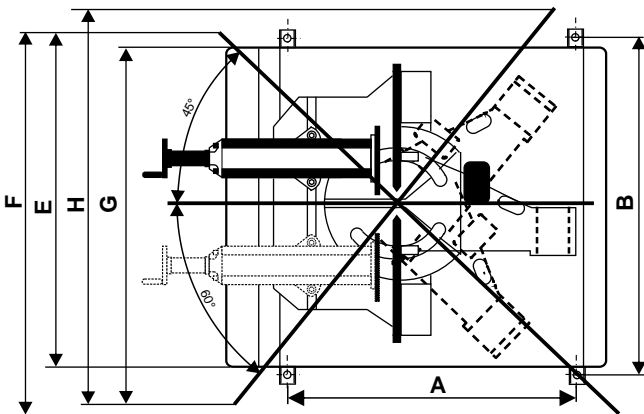
Recommendations / assumptions:

- Allow for sufficient work feed space, work removal and the machine maintenance - the operators' working area should be 1 m around the machine and 0,5 m around the roller conveyor.
- Install roller conveyors and/or a case for cut pieces for a safe handling of work pieces and to prevent endangering by falling cut pieces, if any.
- Install a lifting mechanism for heavy work pieces.
- Provide for good lighting of the workplace.

ARG 250 S.A.F., ARG 300 S.A.F.



ARG 250 plus S.A.F., ARG 300 plus S.A.F.



	ARG 250 S.A.F.	ARG 250 plus S.A.F.	ARG 300 S.A.F.	ARG 300 plus S.A.F.
A	850	850	905	905
B	945	945	1005	1005
C	1940	1945	2040	2040
D	1795	1745	1690	1690
E	1125	1098	1210	1210
F	1200	1098	1270	1270
G	x	1258	x	1335
H	x	1368	x	1430

4.2. Machine installation



Protect the machine against humidity, rain and dust!

The machine may be operated in the ambient temperature between +5° and +40°C. The average temperature must not exceed +35°C over the period of 24 hours. In temperatures below +5°C the conventional coolant should be replaced by a fluid working with respective temperatures.

4.3. Connection to energy supplies



This work may only be carried out by electricians!

Make sure that the voltage of the electrical grid, voltage protection and connection voltage is according to requirements in chapter 3. Technical data. If current protection is installed, it must have the S characteristic (for a frequency converter). When connecting machine into the electrical grid 3NPe, 50 Hz. 400 V, TN-S notice carefully the **colored cables marking** : **L1** Black, **L2** brown, **L3** black, **N** blue, **P/E** yellow/green. **In case of wrong connection of neutral or protective cable the machine electric parts may be damaged and injury by electrical current may occur!** The lead-in cable of machine should be connected to a protected 16A socket, in case of a direct connection to the mains the cable should be provided with a lockable main switch. In case of wrong direction of turning of the motor switch together cables L1 black and L2 brown.




Failure to observe this causes the bandsaw drive motor and the coolant pump running in wrong directions. Possibility of machine destruction!

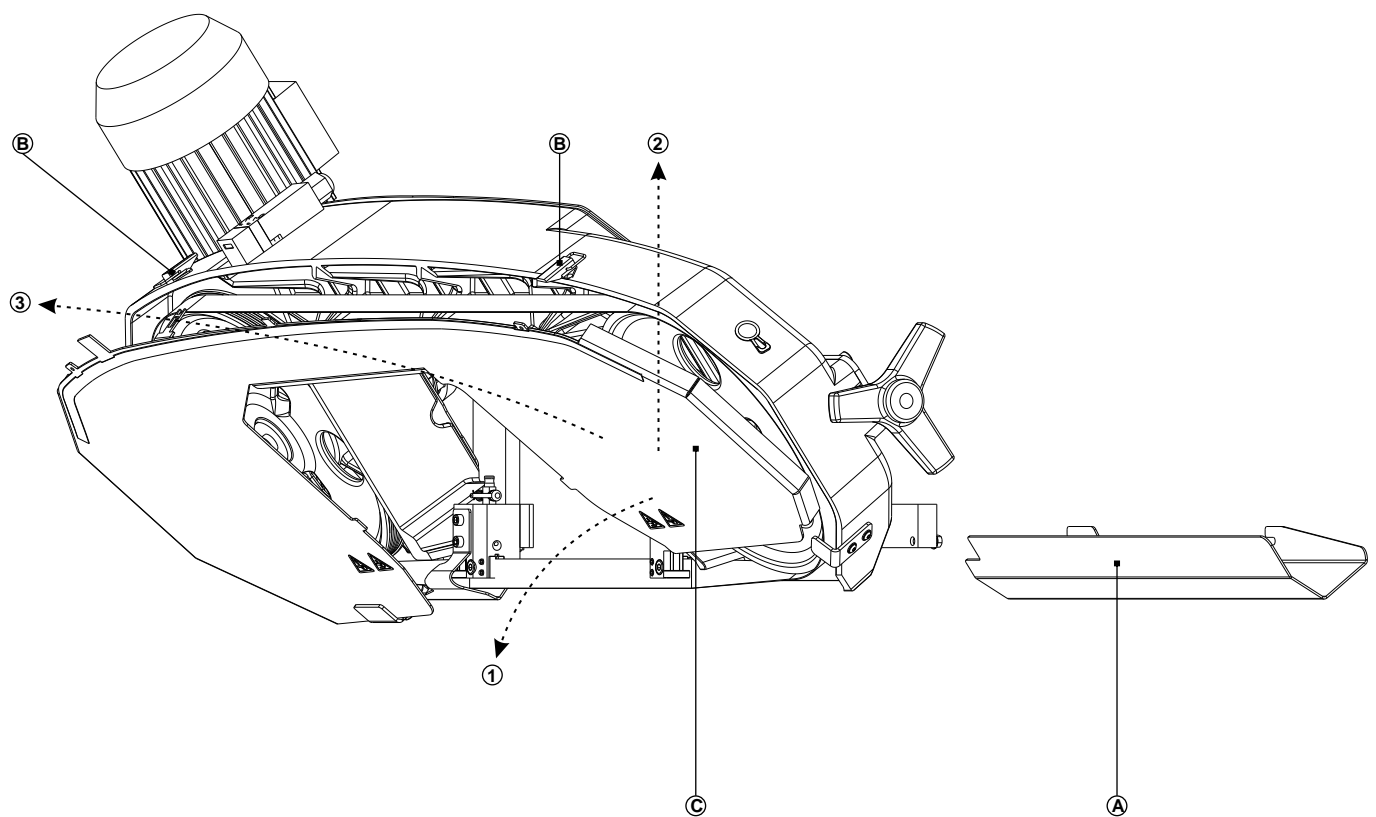
5. Machine description

5.1. Band guide

Before and after the cut the saw band is guided in two guide heads provided with eccentrically arranged bearings enabling an easy setting of the band in comparison with the guiding on moving wheels and guided in the hard-metal guides on both sides and on the upper band edge. The right-hand guide head is fixed. The left-hand guide head mounted on the guide bar is moving and is fed as close as possible to the work. It is provided with a protective cover as far as the machining zone. **The saw band is not protected in the machining zone!**

5.2. Back arm cover removal

The TOTAL STOP button is unblocked. The cutting mode is in the manual position.  When the MAIN SWITCH is ON, press the HYDRAULIC AGGREGATE START button. Close the regulation valve of the damping cylinder (see Chapter 5.9.) and lift the arm into the upper position (see Chapter 5.7.). Press the lowering by the START LOWERING IN MANUAL MODE button. Lower the arm approximately 20 mm above the fixed jaw of the clamp and arrest it with the regulation valve (see Chapter 5.9.) to prevent the lowering of the arm.



Caution! It can only be done when the main switch is off and secured against switching on again or when the machine is disconnected from the mains.
Caution! Danger of injury by the sharp band teeth. Use protective gloves. Do not touch the guide wheels and the band.

Disconnect the machine by the main switch or disconnect the machine from the network. Pull out the cover of the front lath (A) and remove it, nearest broken barriers (B) and the rear cover of the arm (C) tilt (1), lift in the front part (2) pull out the rear cover by moving forward and backward (3).

The rear arm is attached in the opposite manner. Switch on the main switch or connect the machine to the network. The arm is located in the semi-position of terminal switches; therefore, it is necessary to switch the lift of the arm into position 1 and the arm moves into the upper position. Then cutting can start in manual or automatic mode or the arm can be lowered in manual mode by the START LOWERING IN MANUAL MODE button.

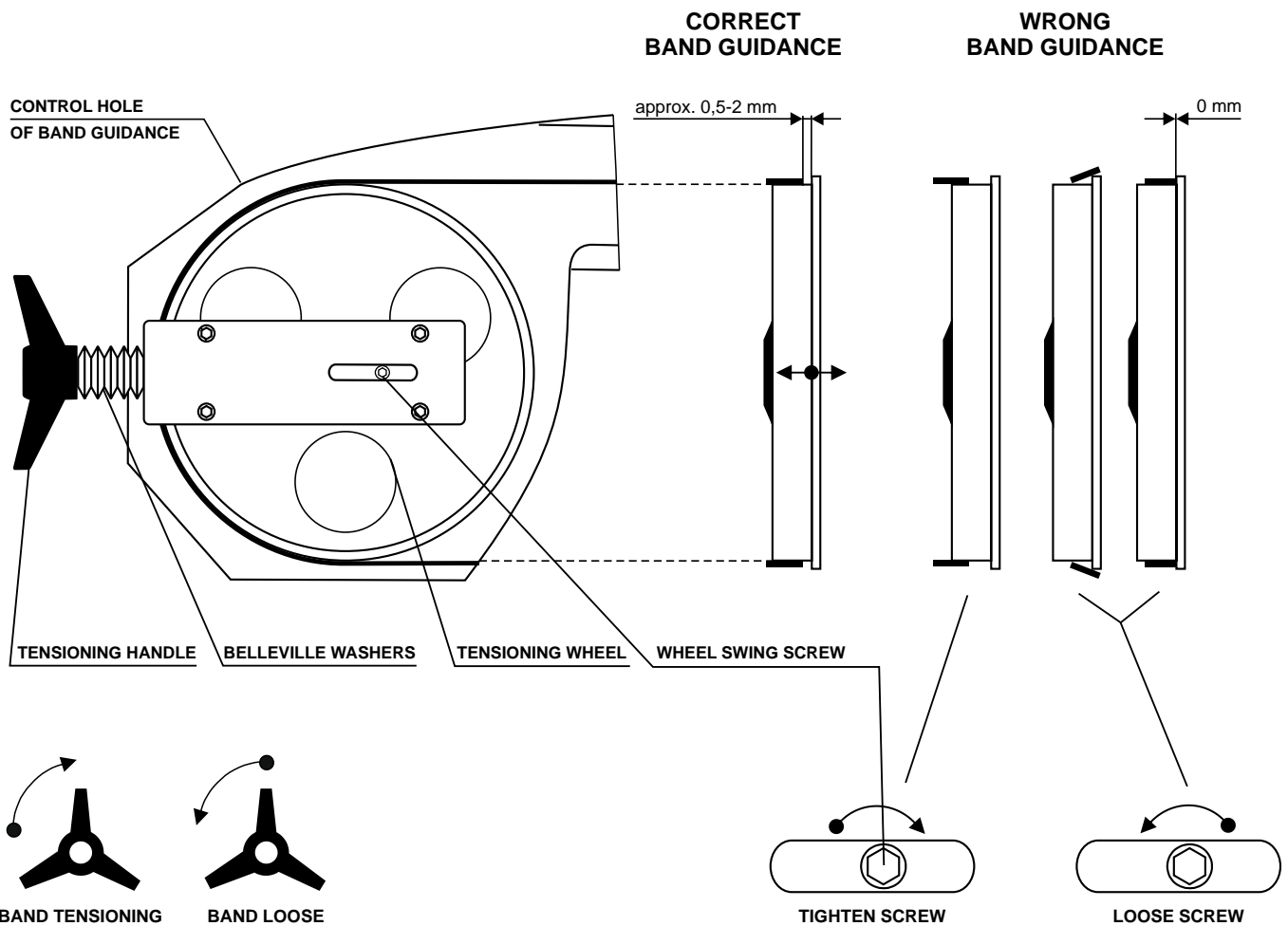
5.3. Band exchange, tensioning and adjustment

To achieve perfect cutting function, surface quality and workpiece correct measures, in time band exchange is needed. Blunt blade may cause higher energy consumption, inclined cuts and cut surface roughness. One of the most important factors for band life time and the cut quality is the band correct and enough tensioning.



Caution! It can only be done when the main switch is off and secured against switching on again or when the machine is disconnected from the mains.
Caution! Danger of injury by the sharp band teeth. Use protective gloves. Do not touch the guide wheels and the band.

Take off the arm rear cover (see Chapter 5.2.). Loosen the tensioning handle and the tensioning wheel and thus the whole band. Take off the band from the running wheels and out of the guide heads (see Chapter 5.4.). Insert the new band in the guide heads. Put saw band on the running wheels and tighten the tensioning handle so that the belleville washers are pressed completely (no light shining through them). Close the band cover, turn ON main switch or connect machine to mains and set the band speed to the minimum. Press start button to run the band so it turns one round. Turn OFF main switch and secure the machine against running again. Open the band cover and check if the band is correctly guided on the running wheels (see picture below). If the band is not correctly set on the running wheels loosen the tensioning handle and with wheel swing screw correct (see picture below). Tighten the tensioning handle again. Close the band cover. Exam the band run again. Turn OFF main switch, open band cover and check the setting of band on the running wheels. According to need repeat this cycle till the band is set on the running wheels properly. For casual checking of blade position can be used CONTROL HOLE OF BAND GUIDANCE. Then close the band cover turn ON main switch and make first cut.



Caution: If the bandsaw is broken, no safety elements of the machine are activated, the machine is under voltage, the aggregate is ON!
Caution: is a risk of injury from the sharp teeth on the bandsaw. Use work gloves.

In the case of a broken bandsaw, switch into manual mode, the switch of the lift of the arm is switched into position 1 and lift the arm with the bandsaw above the cut material. Release the clamping unit with the CLAMPING UNIT switch into the position 0 and remove the cut work piece outside the work table. Using the switch for the lift of the arm, switch into position 0 and after pressing the LOWERING IN MANUAL MODE button, lower the arm approximately 20 mm above the fixed jaw and dismantle the rear cover (see Chapter 5.2.). Replace the belt and attach the rear cover.

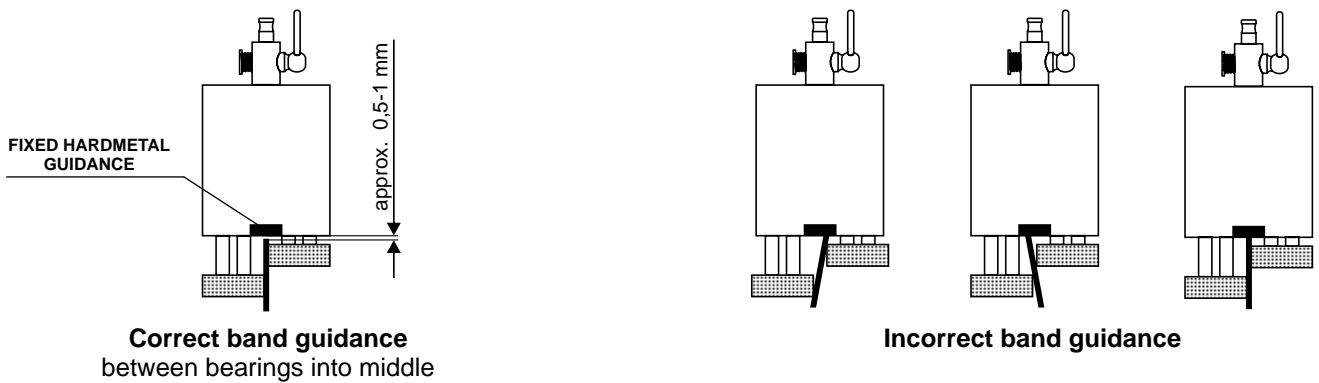
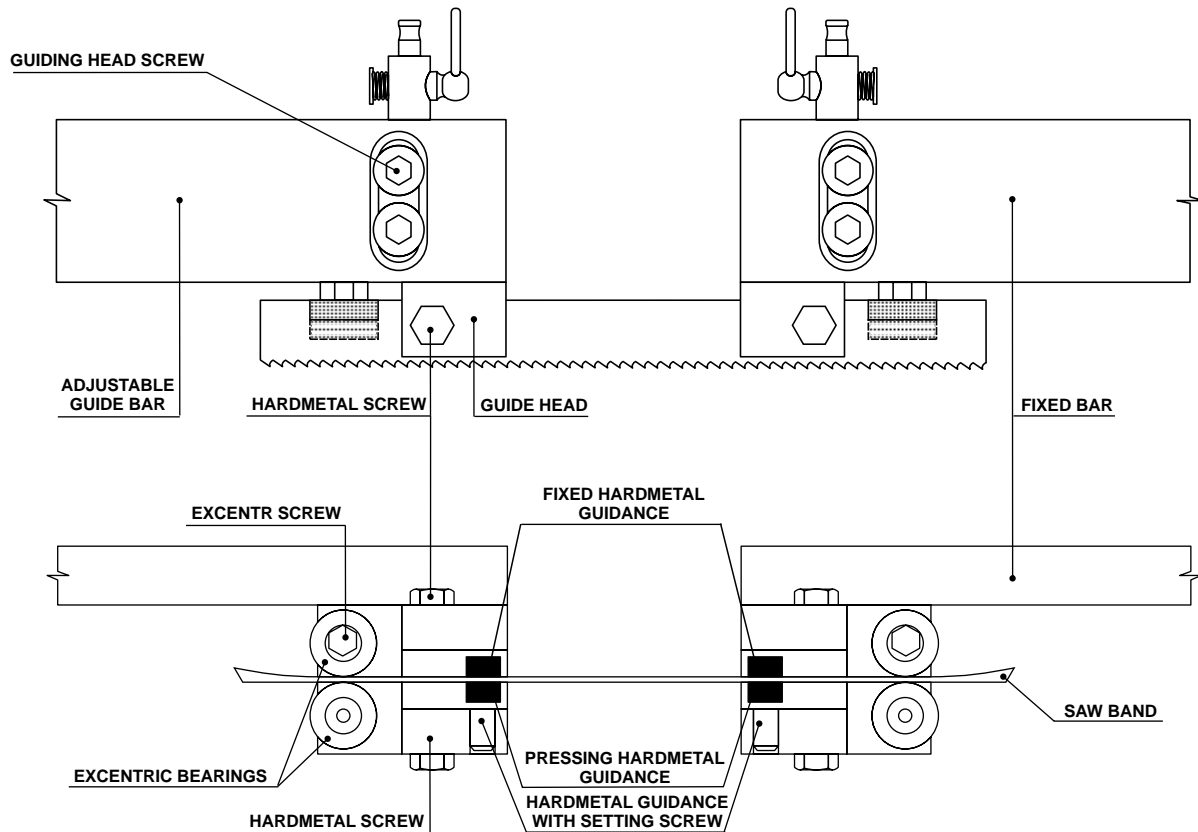
Note: You may use a wooden block and by tapping you can remove the sawblade out of the workpiece.



DO NOT cut the workpiece in the the same cut-groove again! The new sawblade would be damaged too!

5.4. Guide heads - adjustment

The correct adjustment of the bearings and hard-metal guides principally influences the band life and the quality of the cut. The eccentrically arranged bearings of the guide heads must be so set that the band surface is parallel to the surface of the hard-metal plates and that there is minimum clearance between these plates and the band.



Guide Head Setting

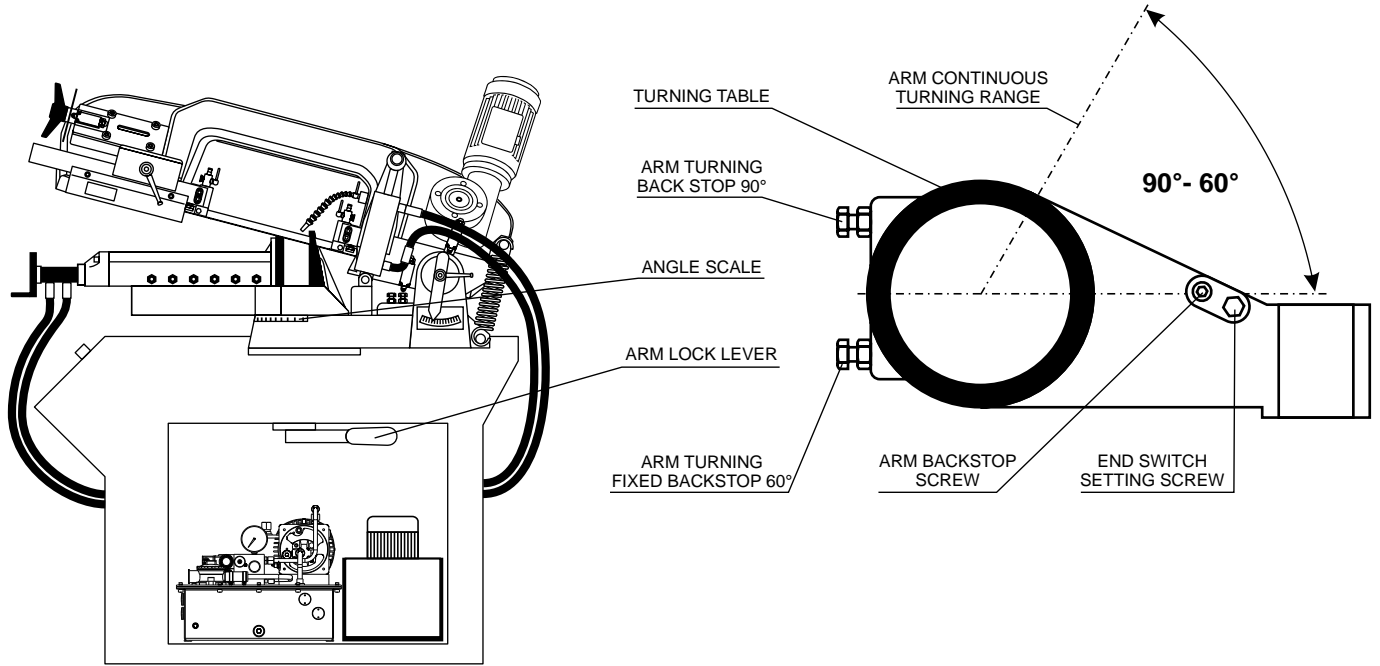
Close hydraulic damper valve (see Chapter 5.9.) and elevate the saw blade approx. 20 mm above the fixed gripping jaw of the vice (see chapter 7.2.). Switch off the master switch, isolate the machine from supply and secure it against restarting. Adjust the moving guide head so that the guide heads are approx. 20 cm from each other. Disconnect the supply hoses of the coolant valves. Unscrew the guide heads gradually from the fixed and moving guide bars, turn them through 180° (bearing and carbide guide upward) and screw to the bars again. Observe the perpendicularity of the guide heads to the bars and the identical height of the guide heads. Check the tightening of the fixed carbide guides. Insert approx. 30 cm of an old saw blade in the guide heads between the carbide guide and the bearings. Set the pressure carbide guides with the width setting screw of the carbide guides so that the saw blade moves without clearance between the carbide guides, but does not seize. When the saw blade is correctly set, adjust the eccentrically arranged bearings to prevent the bearings from "cutting" the saw blade but there must not be big clearance between the bearings. When the saw blade moves, the bearings are carried along by the saw blade. Check all the bolt connections for tightening. Unscrew the guide heads from the bars. Fit the saw blade on the moving wheels, check its correct alignment on the moving wheels and tension the saw blade. Install both guide heads on the saw blade in the space between the bars and adjust their correct position on the bars. Then we move guiding heads up, so that the space between fixed carbide guides and upper part of saw band was approx. 0,5-1mm. In this way, the correct guide head height towards the bars is set. Adjust the guide heads perpendicularly to the bars and tighten them. Close the rear head protective enclosure, switch on the master switch or connect the machine to the network. Carry out a short test run of the saw blade. Switch off the master switch, isolate the machine from supply, open the rear head protective enclosure and check the saw blade fitting on the moving wheels and in guiding heads. Make corrections, if required (see Chapter 5.4.). For casual checking of blade position can be used CONTROL HOLE OF BAND GUIDANCE. Close the rear head protective enclosure, connect the machine to supply, switch on the master switch and hydraulic unit. Carry out the first cut.

5.5. Vice

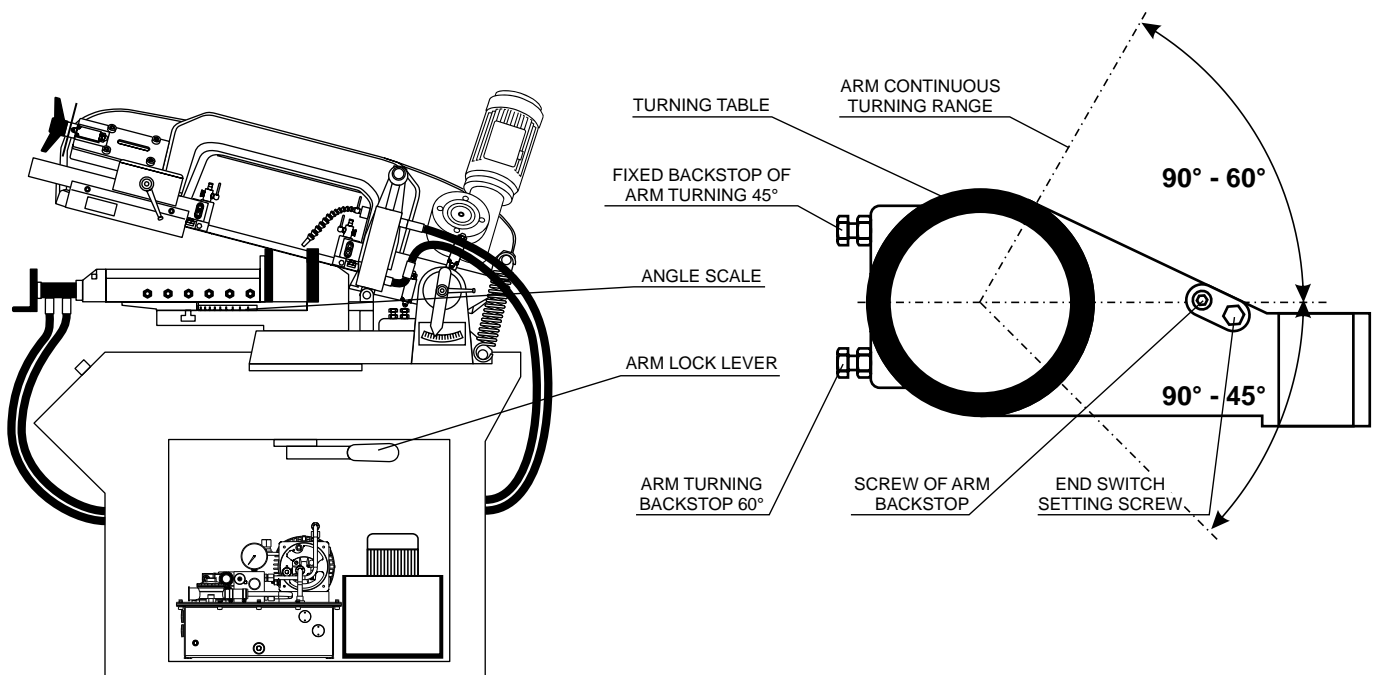
5.5.1. Cutting angles setting

The machine design enables material cutting under angles without manipulation with the material. The material is fixed between moving and fixed vice jaws. The setting of requested angle is done by turning the saw arm after lock lever slacking. The arm should be in down position. The back stop screws stop the arm from turning in the max. Possible angles in types marked as PLUS, the moving vice body can be moved by slacking the screws in the T groove to left or right side according to arm turning direction.

ARG 250 S.A.F., ARG 300 S.A.F.



ARG 250 plus S.A.F., ARG 300 plus S.A.F.



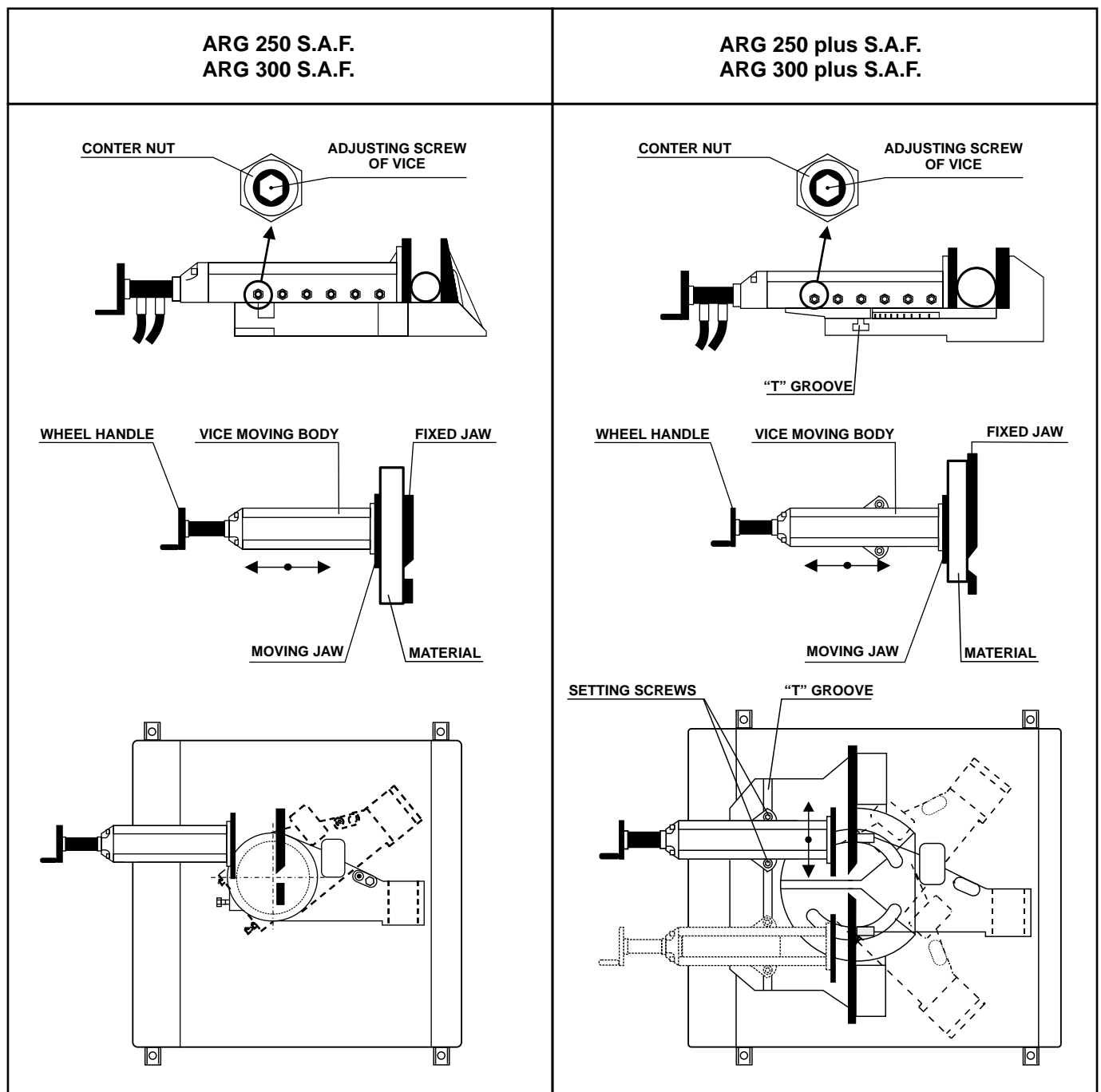
5.5.2. Material clamping

The material is clamped with hydraulic cylinder between the vice fixed and moving jaws by the vice moving part. It is not possible to adjust long pieces with the vice. This operation must be done manually! The clamping vice pressure can be set on the hydraulic unit according to cut material strength (see chapter 5.7.1.)

Raise the arm above the material expected section. Input the material between the clamping jaws and adjust it to parallel position with the fixed clamping jaw and set it to requested length. The clamping jaw of the vice must be closed by manual handle by 3 - 8 mm from the material (the clamping lift of the hydraulic cylinder is 15 mm). According to the mode on which the machine is MANUAL/AUTOMATIC the vice is clamped. **Check if the material is properly clamped - danger of material shoot out during cut!**

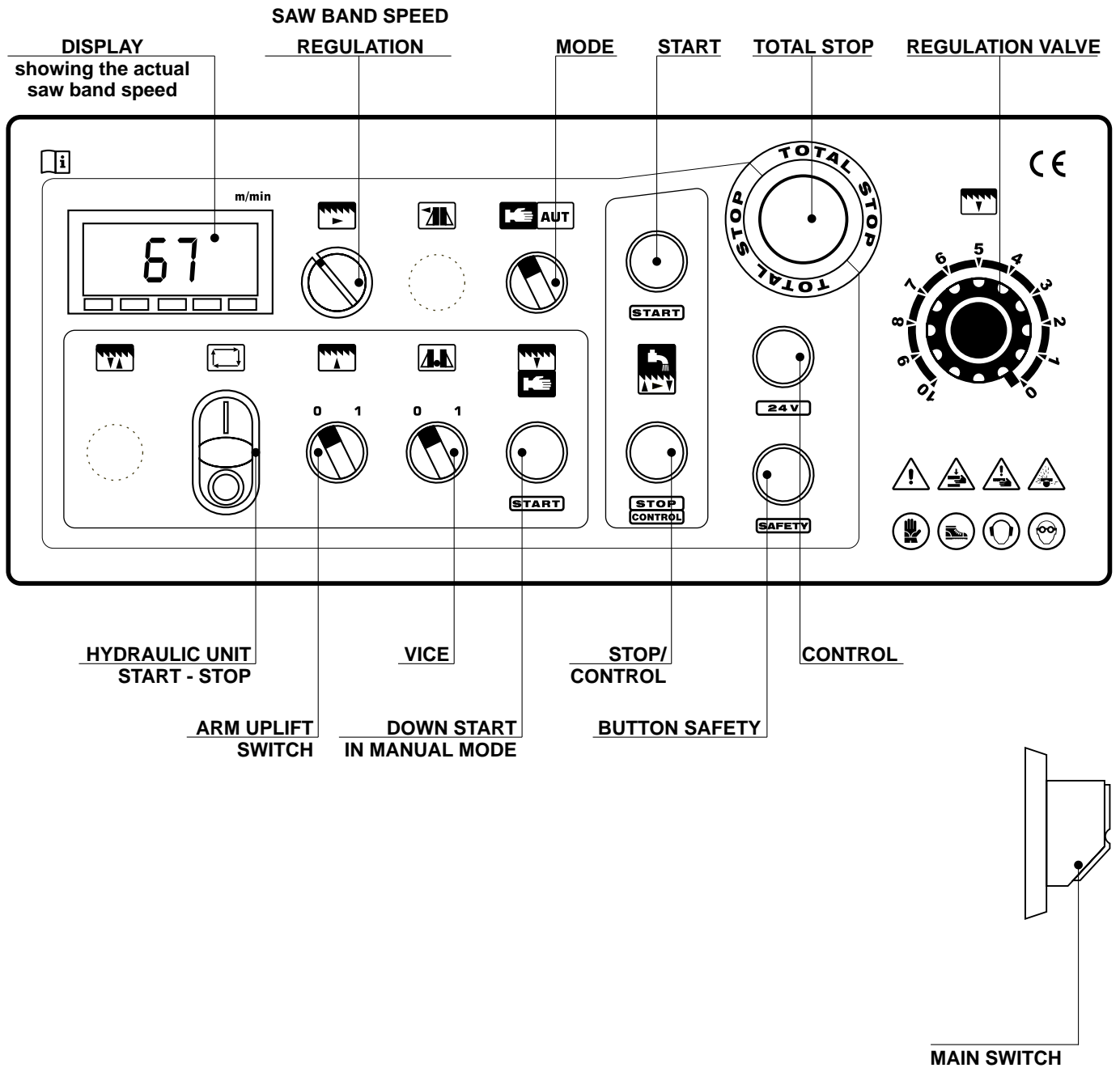
5.5.3. Vice side clearance setting

- ① open the vice to the maximum possible length
- ② loosen lock nut M8 and screws
- ③ start tightening the first screw (starting from the vice jaw) till you feel that you reached the vice ribbon
- ④ secure the lock nut in this position
- ⑤ drift the vice moving part to the same position in which previous screw was adjusted
- ⑥ repeat steps ③, ④, ⑤
- ⑦ continue like above till vice is set



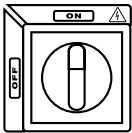
5.6. Control panel

ARG 250 S.A.F., ARG 250 plus S.A.F., ARG 300 S.A.F., ARG 300 plus S.A.F.



Basic functions

MAIN SWITCH



ON

Zapnuto

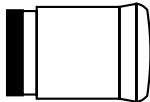
OFF

Vypnuto



Before starting the band drive make always sure that the band is **NOT** in contact with the workpiece.

TOTAL STOP



Emergency stop of the main engine and coolant pump. The machine restart may be done only after manual unblock of the total stop button (by pull or turn)

REŽIM

Switch enables modes switching:



AUT

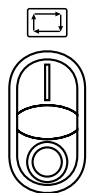
AUTOMAT - In **AUT** mode automatic cycle is started



M A

MANUAL - enables controlling each function separately

HYDRAULICKÝ AGREGÁT START - STOP



HYDRAULIC UNIT - START button when pushed together with main switch switched ON enables the activating of machine electrical and hydraulic systems.
Activation is signalled by a white signal lamp between buttons 0 - 1

PILOVÝ PÁS START/STOP



Green START button

In the AUT mode, the automatic cycle is run – clamping materials, lowering the bandsaw engine and cooling emulsion pump, hydraulic shift of the arm into the cut, lifting of the arm into the adjusted position, disconnection of the bandsaw drive and the coolant pump and the release of the clamping unit. For the functioning of the button, the arm of the saw must be lifted above the clamping route of the terminal switch for termination of the cut, otherwise the bandsaw drive is not activated.



The bandsaw and the cooling emulsion pump are activated in the MANUAL mode. For functioning of the button, the arm of the saw must be lifted above the clamping route of the terminal switch for termination of the cut, otherwise the bandsaw drive is not activated. The clamping unit must be closed.



Red STOP button – serves for stopping the bandsaw engine and pumping the cooling emulsion.

Red button shines – failure of the bandsaw drive (see Chapter 9.)

P EPÍNA ZDVIHU RAMENE



The switch in position 1 automatically lifts the arm of the upper position during each completion of cutting the material.

The switch in position 0 leaves the arm after finishing cutting the material in the lower end position. This enables to set the height of the lift of the arm (see Chapter 7.2.).

If the arm is in the lower position or the arm is between cuts, lift the arm into the upper position by the switch into position 1.

VICE (only in manual mode)



This switch enables vice jaw closing or opening

START (only in manual mode)



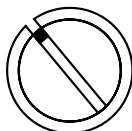
Press the button to start lowering the arm. At the same time, the clamping unit must be closed (switch in position 1)



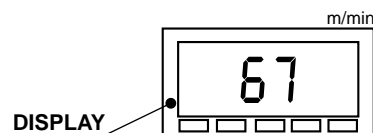
OVLADA RYCHLOSTI PILOVÉHO PÁSU



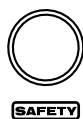
The cutting speed can be fluently changed using the control knob for the bandsaw speed (via the frequency converter) on the control panel



The selected value is regularly displayed (see technical data)



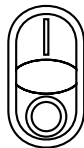
BEZPE NOSTNÍ TLA ÍTKO SAFETY



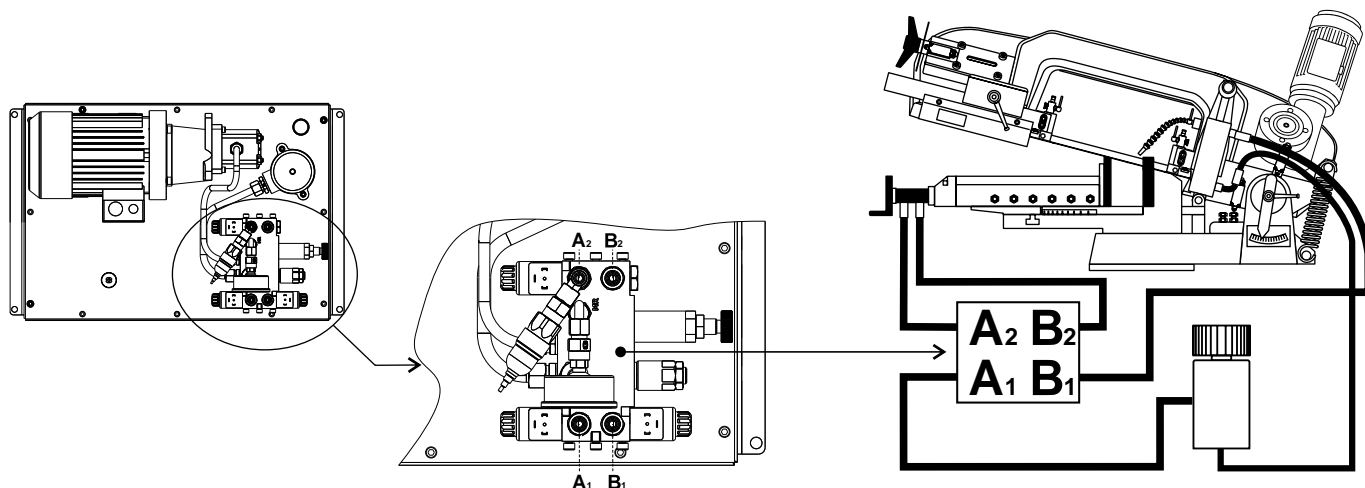
If during the operation there is any activation of a safety element – disconnection of the switch on the belt cover or activation of the TOTAL STOP button, the backlit SAFETY button shines and the control power circuits are disconnected. After restoration of the activity of the machine it is necessary to remove the reason for disconnection (close the cover, unlock TOTAL STOP) and consequently press the SAFETY button.

During each running of the saw, activation of the main switch and the TOTAL STOP button, the SAFETY signal lamp must shine, by consequently pressing the signal lamp is PFF and, consequently, it is possible to set the hydraulic aggregate and to control the saw. A non shining signal lamp means failure (see Chapter 9).

5.6. Hydraulic unit

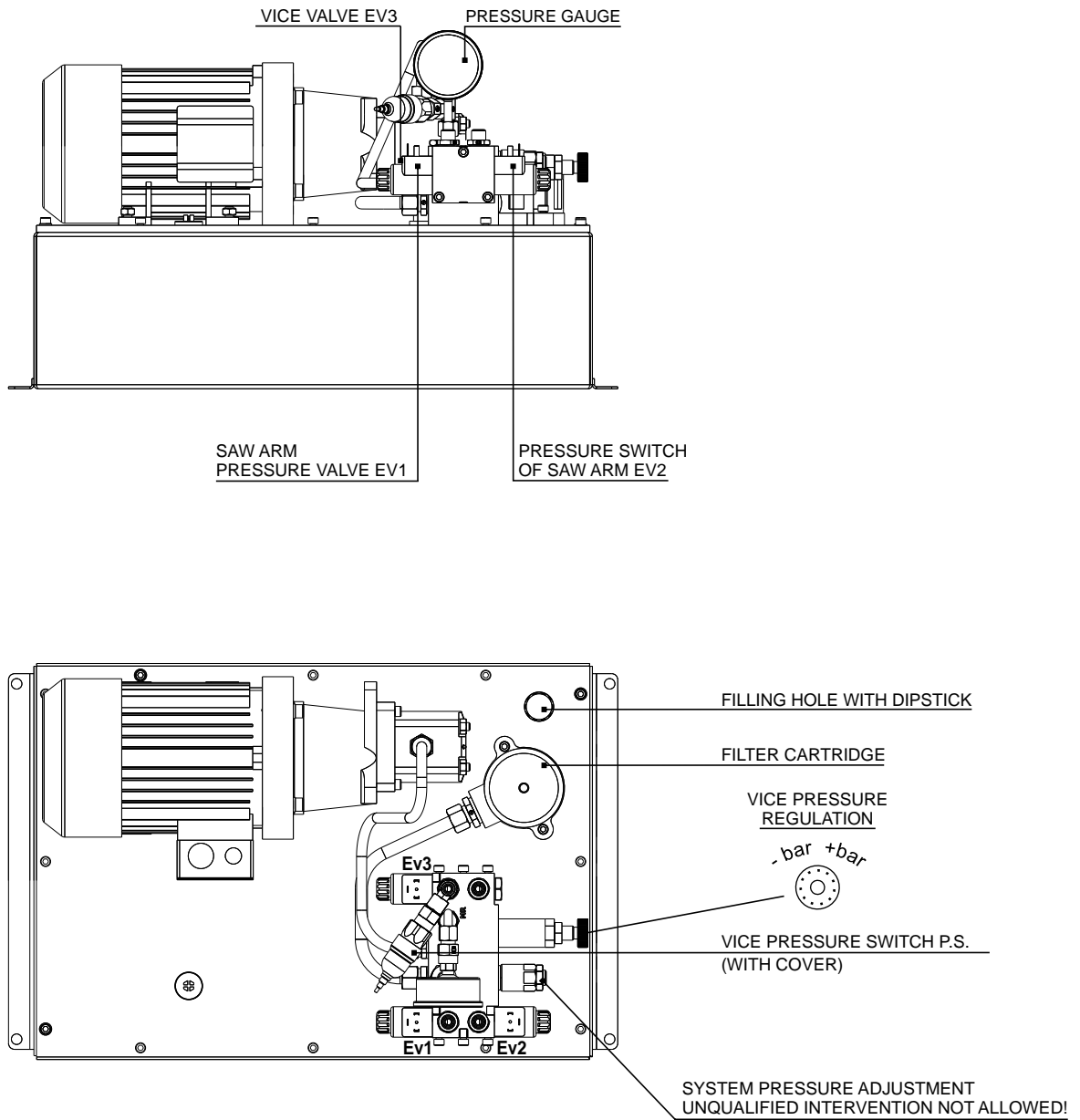


Hydraulic unit is placed inside machine base. Enables arm lift up after cut is finished, arm feed into cut and vice opening and closing. The HYDRAULIC UNIT - START button together with MAIN SWITCH on activates the electrical and hydraulic systems of the machine.



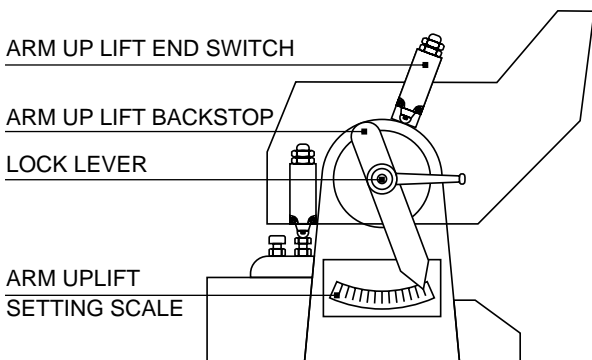
5.7.1. Vice clamping pressure setting

Hydraulic unit is equipped with PRESSURE REGULATION. The PRESSURE REGULATION enables required clamping pressure of the vice according to the workpiece character in the range of 13-35 bars. By turning the PRESSURE REGULATION to the left the pressure decrease, to the right for pressure increase (see picture). The set pressure is showed on the pressure indicator. If less than 13 bar pressure is set, the safety pressure switch P.S. will not switch and the saw band will not start.



5.8. Arm uplift height setting

This system enables arm uplift height setting exactly above the workpiece. This is very useful when cutting in bigger series for saving cutting cycle time.



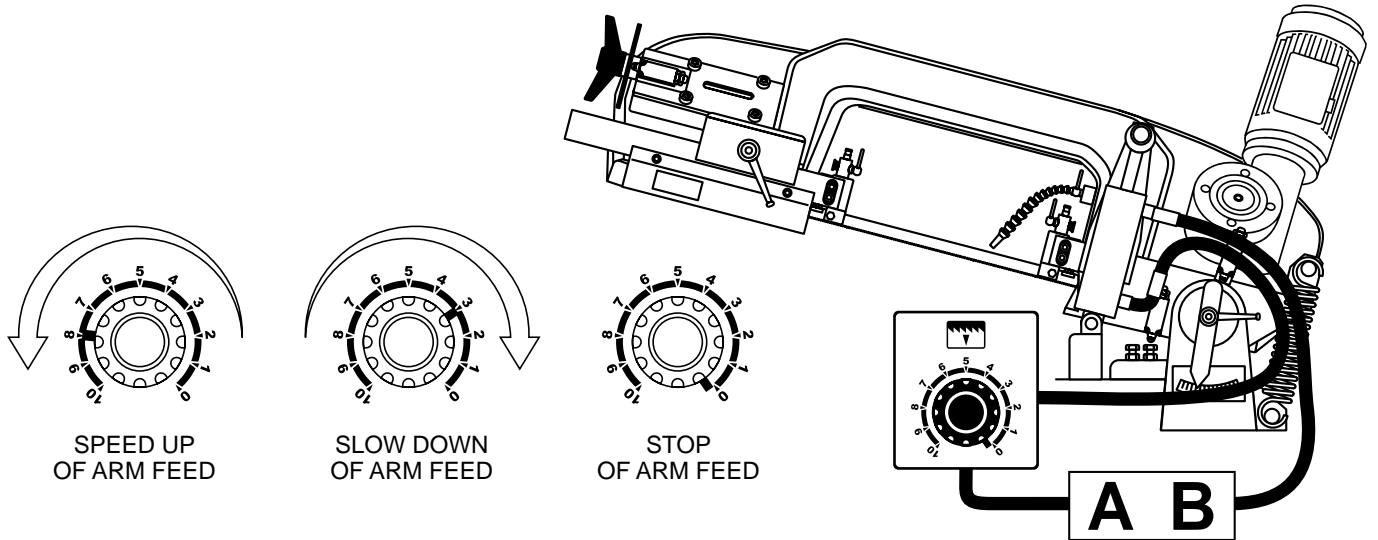
Steps for setting:

Saw arm is in the down end position. Loose arm uplift lever and on the scale set requested uplift (approx. 5 - 10 mm above the workpiece) and tighten the lock lever.

Saw arm is above the down end position. Switch the arm uplift switch to position 0. Press START button. Valve will open and the arm will move to down end position. Loose the arm up lift lever and set on the scale requested uplift (approx. 5 - 10 mm above the workpiece) and tighten the lock lever.

5.9. Regulation valve - saw band feed into cut

Regulation valve enables continuous feed speed into cut or arm stabilization in any position by mechanical turning. Examples of feed speeds are in Chapter 6.6. The optimal value may be easily set by hearing. The saw band movement must be noiseless and without vibrations. This state may be achieved by reducing or increasing the pressure (arm feed speed). Term for right cutting pressure is the correct feed speed and optimal band tooth size.



5.10. Cooling equipment

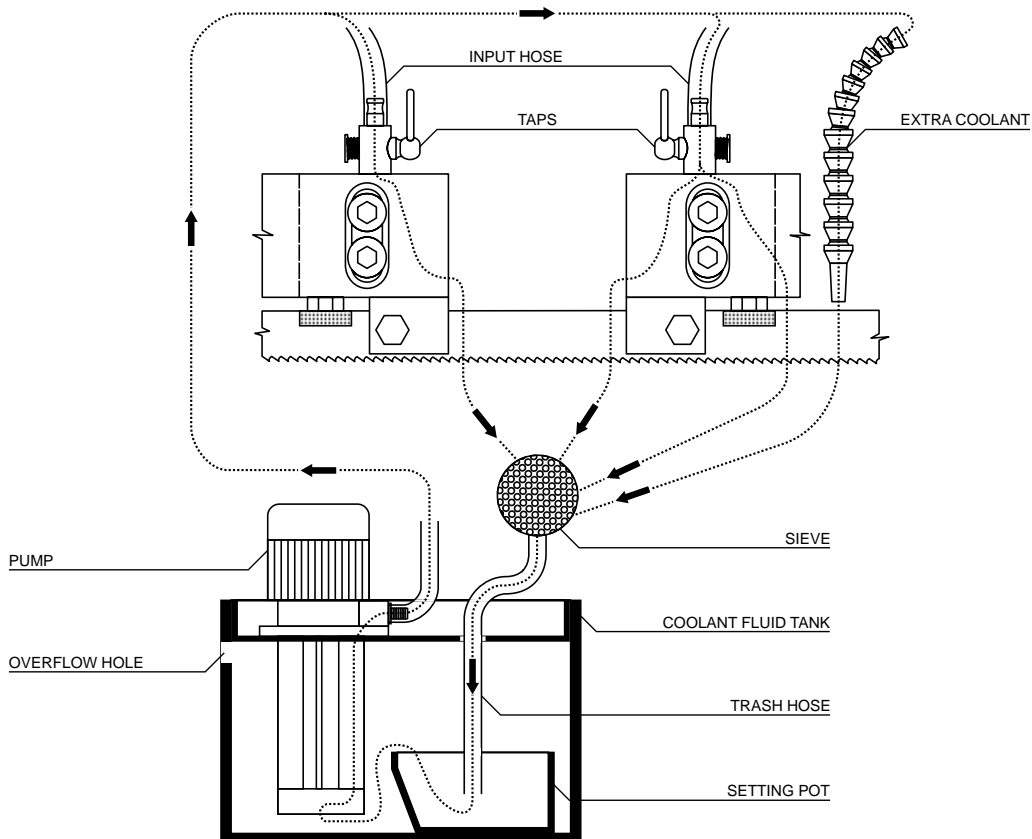
The basis of the cooling equipment is a pump and the coolant tray located in the machine base. The coolant tray can be taken out separately. The coolant pump conveys the coolant through hoses, valves and guide heads to the band. The coolant quantity is controlled by these valves. The coolant provides band cooling and lubrication and chip flushing. The pump switches on and off simultaneously with the band drive start or shutdown.



On the coolant tank is overflow hole which secure the proper quantity of coolant fluid. This is to protect the coolant pump from being overflow and damaged. In case of infusion of bigger volume the coolant fluid may run under the band saw.

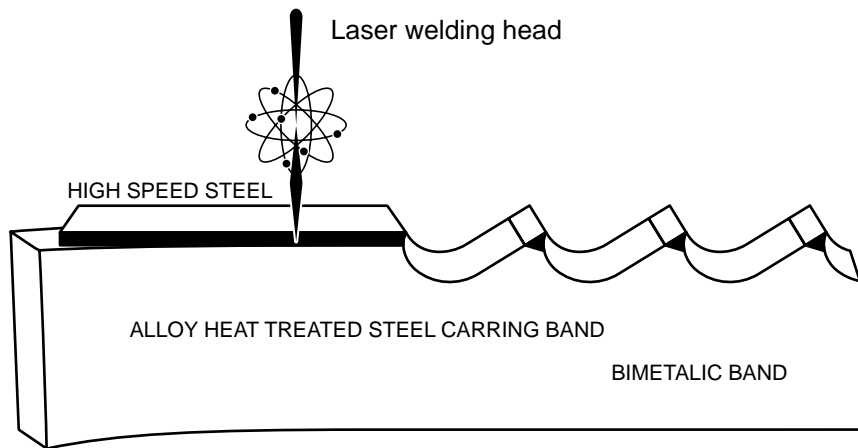


Hazards due to dangerous matters cannot be excluded while handling coolants. Observe the manufacturer's and/or your company's instructions and recommendations concerning handling of coolants.



6. Saw bands

6.1. Saw bands design



The precondition of the machine correct cutting power are high-quality bands. In order to achieve a high cutting power it is recommended to use bimetallic bands. The main band carrier is high-quality heat treated steel with a high limit of elasticity. The tooth edges are high-speed steel in the quality M 42.

M 42 - a band for universal use for cutting metallic and non-ferrous materials within the whole range of quality classes up to the hardness 45 Hrc. This band is suitable for cutting full materials of all sections and diameters, profiles, pipes and bundles.

M 51 - with refer to saw band M 42, the determination of M51 band is for cutting steels with hardness of 50 HRC, steels of higher steadiness classifications, stainless steels and acid proof steels. Also nickel, titan and special bronze alloys.

Hardmetal - High cutting performance against the bimetallic bands. Suitable for cutting steels and materials with high contain of nickel, chrome, wolfram, titan, stainless steels and surface hardened materials till hardness of 62 HRC. Saw bands may be used for all types of materials, including stainless steel, cast iron, plastic materials and materials with wood fibre. High heat conductivity and abrasion resistant of these bands gives them higher lifetime, cutting speed and productivity against bimetal bands.

Design: M 42 - Structure: W 2%, Mo 10%, V 1%, CO 8%, tooth hardness: 68 HRC. For cutting materials till hardness 45 HRC.

Design: M 51 - Structure: W 10%, Mo 4%, V 3%, CO 10%, tooth hardness: 69 HRC. For cutting materials till hardness 50 HRC.

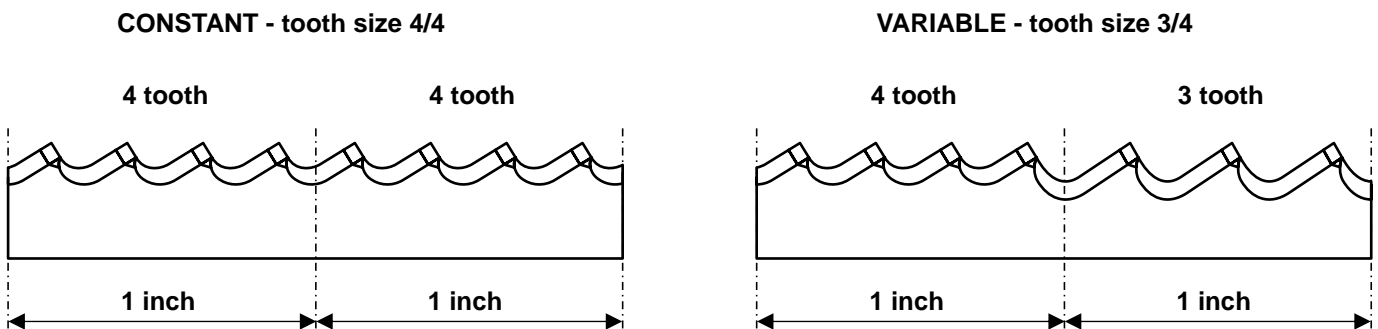
Design: Hardmetal - tooth hardness 1600 HV. For cutting materials till hardness 62 HRC

Except standard tooth shape and size, special corrected bands are manufactured with corrections like tooth distribution, tooth angle and shape of its face. This band may be applied on specific materials. Ask your bands distributor for advise.

Band Tooth Arrangement

a) Constant - tooth edge spacing always equal

b) Variable - tooth edge spacing is different repeating periodically. This modern band design allows for a bigger cutting range when one band type is being used, with the capability to eliminate vibrations due to the tooth edge striking the material and thus to achieve a clean smooth cut and a longer life.



6.2. Band tooth selection

Band tooth size selection has a great influence on the band lifetime.

Recommended tooth sizes for cutting full materials

Material section	Number of tooth / inch	Tooth quality M42/67-69 Hrc	Tooth quality M51/69 Hrc	Tooth quality 1600 Hr
0-10	18			
0-20	14	•		
0-30	10/14	•		
20-50	8/12	•		
30-50	8	•		
25-60	6/10	•		
50-80	6	•		
35-80	5/8	•		•
50-100	4/6	•	•	
80-120	4	•		•
80-150	3/4	•	•	
120-200	3	•		
120-350	2/3	•		
200-400	2	•		

When cutting profile materials the following table is recommended for one piece cutting. While cutting in bundles, it is necessary to count the wall thicknesses of all tubes in bundle and taking in consider their diameter.

Recommended tooth sizes for cutting profile materials

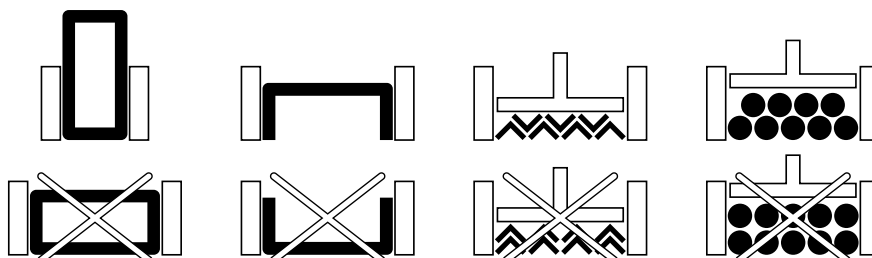
Wall thickness in (mm)	Tube diameter, diameter D (mm)							
	20	40	60	80	100	120	150	200
2	18	18	18	10/14	10/14	10/14	10/14	10/14
3	18	18	10/14	10/14	10/14	10/14	8/12	8/12
4	18	10/14	10/14	10/14	8/12	8/12	6/10	6/10
5	18	10/14	10/14	8/12	6/10	6/10	6/10	5/8
6	10/14	10/14	8/12	8/12	6/10	6/10	5/8	5/8
8	10/14	8/12	6/10	6/10	5/8	5/8	5/8	4/6
10	8/12	6/10	6/10	5/8	5/8	5/8	4/6	4/6
12	8/12	6/10	5/8	5/8	4/6	4/6	4/6	4/6
15	6/10	5/8	5/8	4/6	4/6	4/6	4/6	3/4
20	6/10	5/8	4/6	4/6	4/6	6	6	4
30	6/10	5/8	4/6	4/6	6	6	4	4

Caution : These values do not apply to cutting of other material profiles. This should be decided individually with respect to the profile form, the number of pieces in the bundle and the dimensions. Cutting of profile material will reduce the band life by up to one third due to the interrupted cut.

Rule: Minimally 4 tooth should be inside the workpiece when cutting but no more than 30 tooth

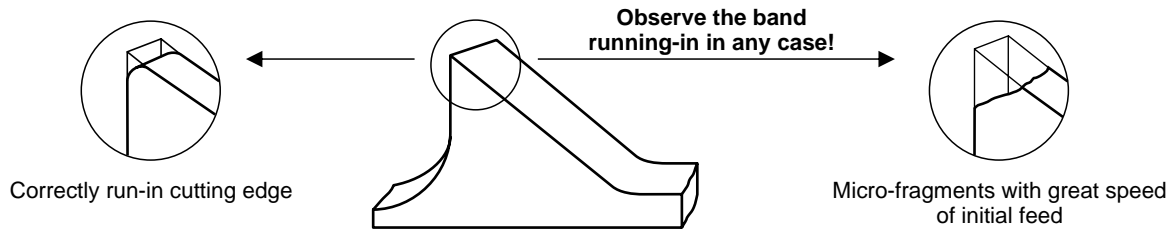
6.3. Workpiece clamping

The correct workpiece clamping can substantially influence the band life, the cut quality and precision allowing for a correct selection of the tooth size. To insure optimal cut, productivity and lifetime apply the following clamping methods :



6.4. Running-in the bands

The running-in applies to new bands. The high cutting power is possible because of the sharp cutting edges with extremely small edge radii. In order to achieve the maximum tool life, it is necessary to run in the band to the optimum. Depending on the correct cutting speed and the workpiece feed and its material quality the band must be run in only within 50 % of currently used feed. In this way the breaking of extremely sharp edges particularly with bigger sections of the work pieces will be avoided. These micro-fragments cause the destruction of further teeth. Should vibrations or sounds due to vibrations manifest itself when a new band has been put on, slightly reduce the cutting speed. In small workpiece sections it is recommended to run in the band with a reduced power for 15 minutes, in big sections for 30 minutes. Then increase the feed slowly to the optimum value.



6.5. Factors influencing band life

The band size / tooth size has not been appropriately selected for the workpiece • The band speed and the arm lowering speed into the cutting position are not appropriately selected • The band (the whole arm) bears against the material when the band is not in cutting position • The clamping of the profile material does not comply with the recommendation • The band is not correctly tensioned • The band is not correctly adjusted to the guide wheels (the band is driving against the wheel shoulders) • The guide head of the band is in a too big distance from the workpiece • Insufficient oil content in coolant • Incorrect running-in of the band • Insufficient maintenance of the bandsaw, insufficient cleaning of the arm from chips

The above-mentioned shortcomings cause inaccuracy of the cut and a substantial reducing of the band life and/or its destruction.

6.6. Recommended values for cutting

The values depend on the material class and its profile. Table of cutting speeds is only informative, in specific ranges it must be adapt to given material. SN numbers are informative and determine the material characteristics for which is the band type given.

Material		Recommended band speed in m/min for		Arm feed speed into cut in mm/min		Coolant oil content %
SN	Generaly	∅ 0-100 mm	∅ 100-300 mm	∅ 0-100 mm	∅ 100-300 mm	
11 107 - 11 110	Free machining steels	70-90	70-90	190-60	55-20	10-15
11 301 - 11 420 / 12 010 - 12 020	Structural steel	60-90	60-80	190-60	55-30	10-15
11 500 - 11 600 / 12 020 - 12 060	Case-hardening steel	60-90	50-70	125-38	35-25	10-15
13 250 / 14 260 / 15 260	Spring steel	50-70	40-60	125-30	28-15	5-10
14 100 / 15 220	Bearing steels	50-70	30-60	125-30	28-15	3
14 220 / 15 124	Alloy steel	50-80	40-70	125-35	30-20	10
17 020 - 17 042	NIRO steels	40-50	30-40	75-15	12-4	10-15
17 115	Ventil steels	40-60	30-50	90-23	21-10	3
17 253 - 17 255	Heat-resistant steels	30-40	30	40-7	6-1	15
19 063 - 19 083 / 15 142 / 16 142	Heat treatment steels	60-90	40-70	125-35	30-25	5-10
19 150 / 19 192 - 19 312	Simple steel	50-70	30-60	120-25	20-8	5-10
19 422 / 19 452 / 19 721 / 19 740	Alloy steels	40-50	30-50	100-20	18-2	5-10
19 436	Hammer materials	30-40	30-40	62-15	14-5	No coolant
19 662	Nitriding steels	40-50	30-40	76-25	23-12	5
19 721	Tool steels for in heat work	30-40	30	70-1	16-6	5
19 802 - 19 860	Rapid steels	40-60	30-50	90-23	21-10	3
INCONEL, HASELLOY, NIMONIC, INCOLOY		30	30	25-5	4-2	15-20
Heat treated steell 1000 - 1500 N/mm		30	30	25-5	4-2	15-20
Cast steel		30-70	30-60	190-60	55-25	40
Gray iron		40-80	30-70	190-60	55-30	No coolant
Cooper, bronze, tin bronze		70-90	60-90	300-90	85-55	3
Red bronze		70-90	60-90	230-75	70-45	10
Aluminium bronze		40-70	30-60	230-75	70-45	10-15
Cast from Al alloys		80-90	80-90	450-150	140-55	25
Al 99 %, thermoplastics, plastic materials		50-90	50-80	450-150	140-55	No coolant

7. Putting into operation

7.1. Safety Control

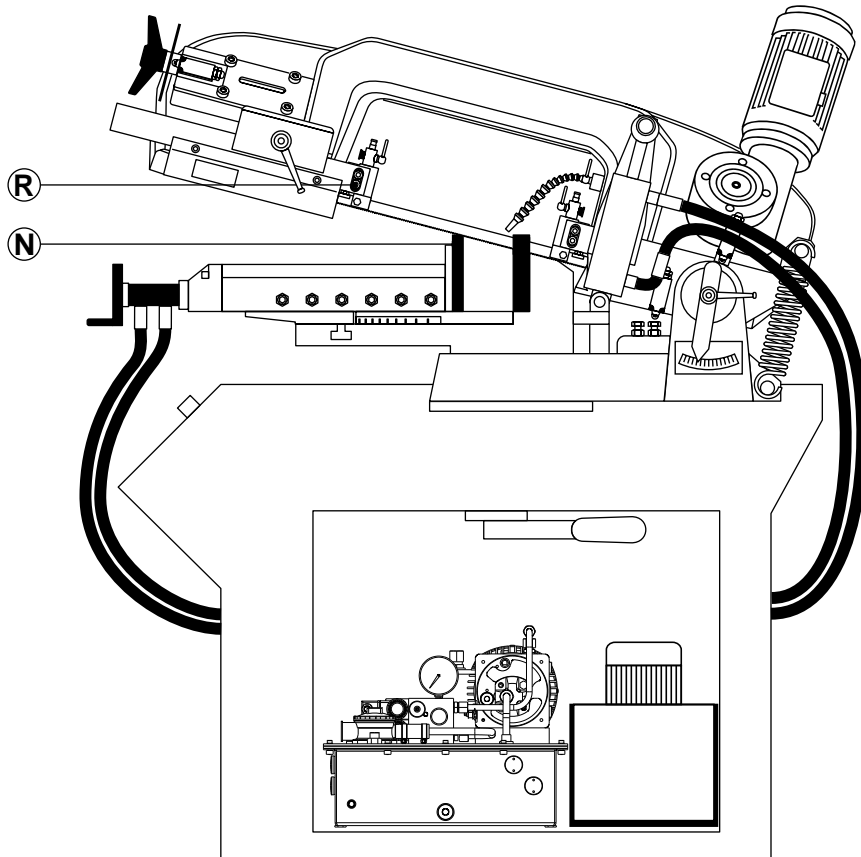


Is everything in perfect condition as far as technical safety is concerned?
Have all covers been properly fitted?

7.2. First cut



Caution! Danger of injury!
The band is not covered in the machining zone.



- 1) TOTAL STOP button must be unblocked. Switch on the main switch and the HYDRAULIC UNIT START button, machine will be activated.
- 2) Set correct cutting angle (see Chapter 5.5.1.)
- 3) Set needed arm up end position according to the workpiece (see Chapter 5.8.)
- 4) Into vice (N) enter the workpiece and set requested length.
- 5) Set the left guiding head (R) 5 - 10 mm far from the maximal workpiece dimension.
- 6) Close completely the regulation valve (see Chapter 5.9.)
- 7) Set the band cutting speed (see Chapter 6.6.)

On the control panel select the MANUAL or AUTOMATIC mode (see Chapter 5.5.)

MANUAL MODE

- 8) Switch the MODE switch to MANUAL.
- 9) By switch VICE, clamp the workpiece.
- 10) Start the saw band by pressing the green button for band start.
- 11) With green exciter START button activate the arm down feed system.
- 12) By gradual slacking of regulation valve set the optimal arm feed speed into cut (see Chapter 5.9.) and by controlling the feed speed with regulation valve finish the cut.
- 13) After cut is finished, the arm will move automatically up to upper set position (or the arm remains in the lower position if the switch is in the position 0).

AUTOMATIC MODE

- 8) Switch the MODE switch to position AUT AUTOMAT mode.
- 9) By green START button, cutting cycle is activated (material is clamped, band drive starts, band feed into cut activated)
- 10) By gradual slacking of regulation valve, the optimal arm feed into cut speed is set (see Chapter 5.9.). Cut will be finished.
- 11) After cut is finished the arm will move automatically to upper set position (or the arm remains in the lower position if the switch is in the position 0).

8. Machine maintenance

8.1. Maintenance and control



Caution! Danger of injury
Carry out maintenance only with the main switch off or with the machine cut off the mains.

For maintaining the efficiency of the machine and its components it is unconditionally necessary to carry out the maintenance of the machine which includes: machine cleaning • metal chips removing • coolant exchange • lubrication of sliding and guiding surfaces • checking of connecting cables for damage • vice control • screw connection checking • limit switch checking.



Checking of Protective Covers

Check the protective covers of the machine for damage and failures in regular intervals (at least once a week).



Checking of Connecting Cables

Check the connecting cables for intactness in regular intervals - at least once a week.



Machine Cleaning

Clean the machine thoroughly in regular intervals (at least once a week). Use appropriate cleaning agents. Do not use solvents (e.g. nitrosolvent) for machine cleaning. Do not use compressed air for machine cleaning! Otherwise the fine chips and impurities will penetrate under the sliding elements.

Chips removal / likvidation.



Observe the instructions and recommendations related to safe disposal of service waste.

Correct cutting angles will be achieved when the bearing surfaces for the workpiece and the jaws are free from metal chips and other impurities.

Coolant unit cleaning



Hazards due to dangerous matters cannot be excluded while handling coolants. Observe in your own interest the manufacturer's and/or your company's instructions and recommendations concerning safe handling of coolants.

The coolant tray may be taken out of the machine base for maintenance and cleaning. The pump is limited by the length of the connecting cable and the coolant piping. **Caution: Used up coolants are special waste!**

Our recommendations: Regular cleaning and maintenance of the coolant aggregate increase the coolant pump life and functionality. Use water-mixable coolants, if possible, not irritating the skin with high anti-ageing and anti-corrosion protection. Check the coolant oil content at least once a week. Optimum cooling sufficiently increases the band life.

Hydraulic unit:

Hydraulic unit is maintenance free. PILOUS bandsaws are filled with PARAMOL HM 46 oil. Oil exchange is recommended in period shorter than 3000 working hours. Check properly the oil in the hydraulic unit! Keep the oil level between the max. and min. pointers on the hydraulic unit placed in the machine base.

Lubrication

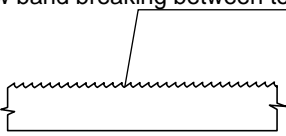
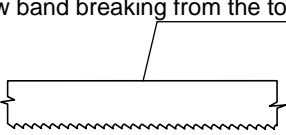

Regular lubrication and cleaning extend the life and the reliability of performance of the machine. While making routine checks, make sure there is sufficient grease on the vice friction surfaces and the trapezoidal screw and on the friction surfaces of the saw blade moving bar. Add grease, if necessary for example MOGUL LV 2 WR (classification in harmony with: ISO 6743 - BCHB 2, DIN 51 502 - KP2K-20).


8.2. Repairs



Caution! Danger of injury!
Repairs may only be carried out when the main switch is off and secured against switching on or when the machine is cut off the mains.

9. Errors - reasons and elimination

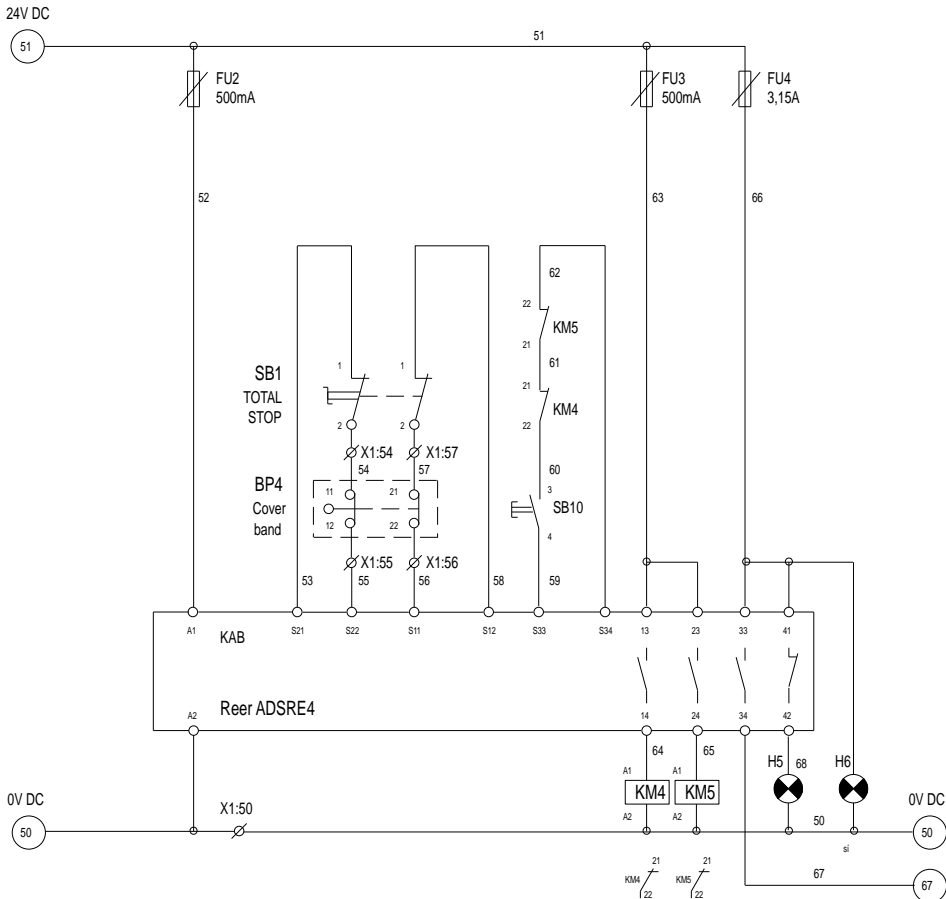
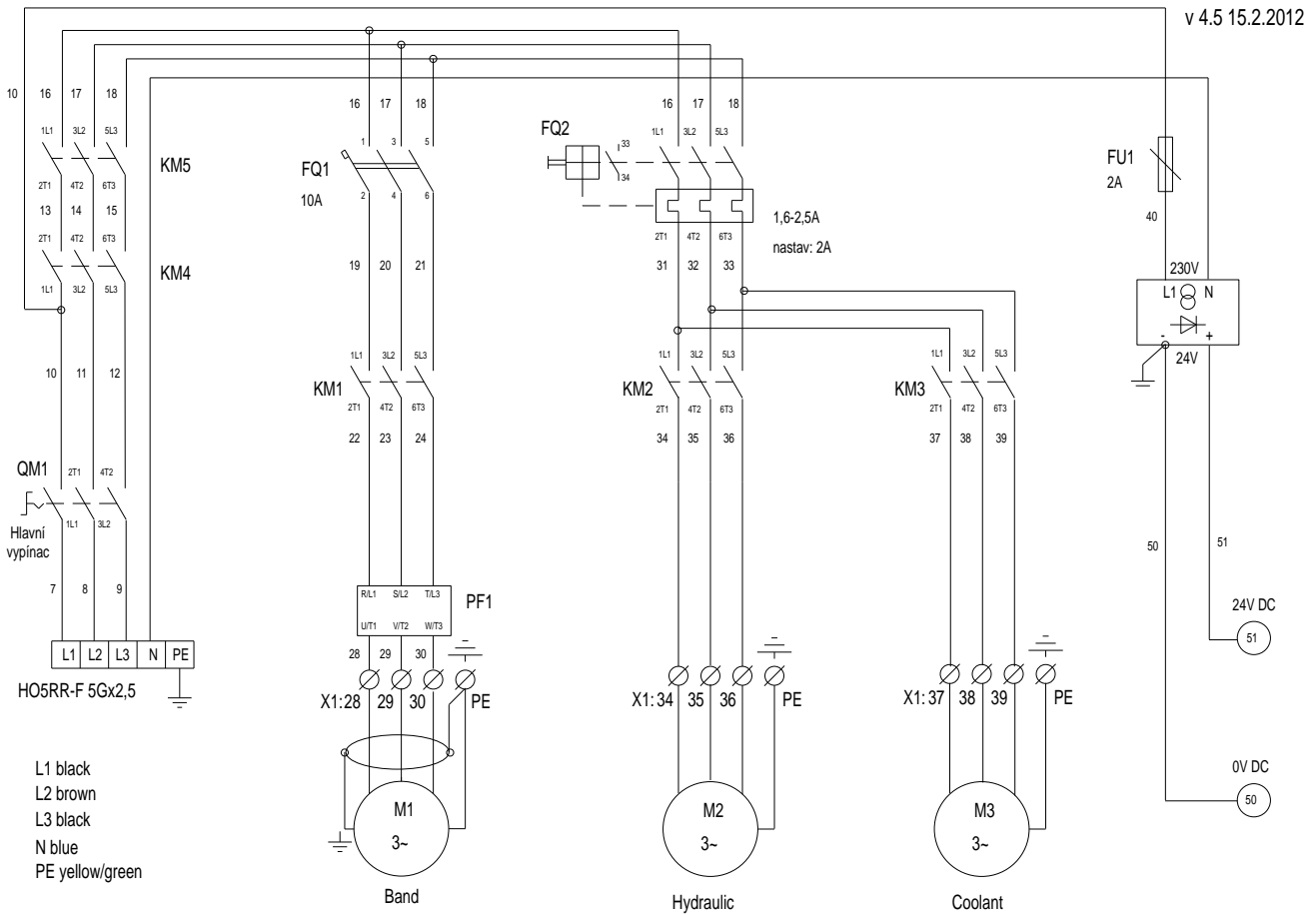
Error	Possible error reason	Error elimination
NOT possible to start band drive	<ul style="list-style-type: none"> • Main switch OFF • TOTAL STOP button is blocked (pressed) • Premium overcurrent relay is off • Band cover safety switch is not switched • Burned fuse inside the control panel • The arm is in down limit position and end switch is switched 	<ul style="list-style-type: none"> • Switch ON main switch • Unblock TOTAL STOP button • Test the overcurrent relay of motor • Control band cover • Change the fuse • When starting saw band drive the arm must be raised
SAFETY signal lamp shines	Activate securing of the saw by the safet relay	Press the SAFETY button and continue wit the control of the saw Unblock the TOTAL STOP button, close the rear cover, press the SAFETY button and continue with the control of the saw
Motor is ON, saw band NOT turning	<ul style="list-style-type: none"> • Band is slipping on driving wheel • Band is broken • Other gearbox error 	<ul style="list-style-type: none"> • Tension the band properly (see chapter 5.2.) • Change the band (see chapter 5.2.) • Call the service technician
Coolant skips	<ul style="list-style-type: none"> • No coolant left inside the cooling system • Coolant tank, connections or taps are dirty • Broken coolant pump 	<ul style="list-style-type: none"> • Control the coolant fluid • Clean coolant tank, connections and taps • Change coolant pump
Vibrations during cutting	<ul style="list-style-type: none"> • Incorrect arm feed speed • Incorrect band teeth pitch • Incorrect setting of band guiding heads, hard metals or bearings • Incorrect material clamping 	<ul style="list-style-type: none"> • Set the arm feed speed 5% less / more • Control the teeth size and pitch • Adjust correctly see chapter 5.3 • Control the material clamping
Broken teeth inside the cutting hollow of the material		<ul style="list-style-type: none"> • Start new cut • Do not use new band in old hollow it will be damaged during the first cut
Cut is NOT rectangular	<ul style="list-style-type: none"> • Incorrect cutting angle setting 	<ul style="list-style-type: none"> • See chapter 5.4.
Saw band cut is not square	<ul style="list-style-type: none"> • Blunt saw band • Incorrect teeth size • High speed of arm feed into cut • Band slipped from guiding bearings • Clearance of hardmetal guidance • Workpiece is not placed horizontally in the vice against the working table 	<ul style="list-style-type: none"> • Put new saw band • Check correct teeth size see chapter. 6.2. • Adjust the correct feed speed • Adjust saw band correctly see chapter. 5.2. • Adjust them see chapter 5.3. • Adjust the roller conveyor
Saw band breaking between tooth 	<ul style="list-style-type: none"> • Incorrect teeth size • High speed of arm feed into cut • Incorrect adjustment of hard metal guidance inside guiding heads • The moving guiding head is too far from the workpiece • Not enough cooling 	<ul style="list-style-type: none"> • Check correct teeth size see chapter. 6.2. • Adjust the correct feed speed • Adjust them see chapter 5.3. • Move it closer, see chapter 5.1. • Increase the coolant fluid inflow
Saw band breaking from the top 	<ul style="list-style-type: none"> • Incorrect band adjustment on the running wheels • Incorrect tooth size • High speed of arm feed into cut • Incorrect adjustment or break of hard metal guidance or bearings inside guiding heads • The moving guiding head is too far from the workpiece 	<ul style="list-style-type: none"> • See chapter 5.2. • See chapter 6.2. • Regulate the feed • See chapter 5.3. • Move it closer 5.1.
Non-uniform motion of arm feeding	<ul style="list-style-type: none"> • Oil deficit 	<ul style="list-style-type: none"> • Call Customer service
Red control light on the control panel is blinking. Only persons with electrical equipment repair qualification may do the repair!	<ul style="list-style-type: none"> • On saws of S.A. Type, band motor starter FQ2 has failed. • On saws of S.A.F., congestion of frequency changer. 	<ul style="list-style-type: none"> • Starter FQ2 set position I • On box of frequency changer press button 

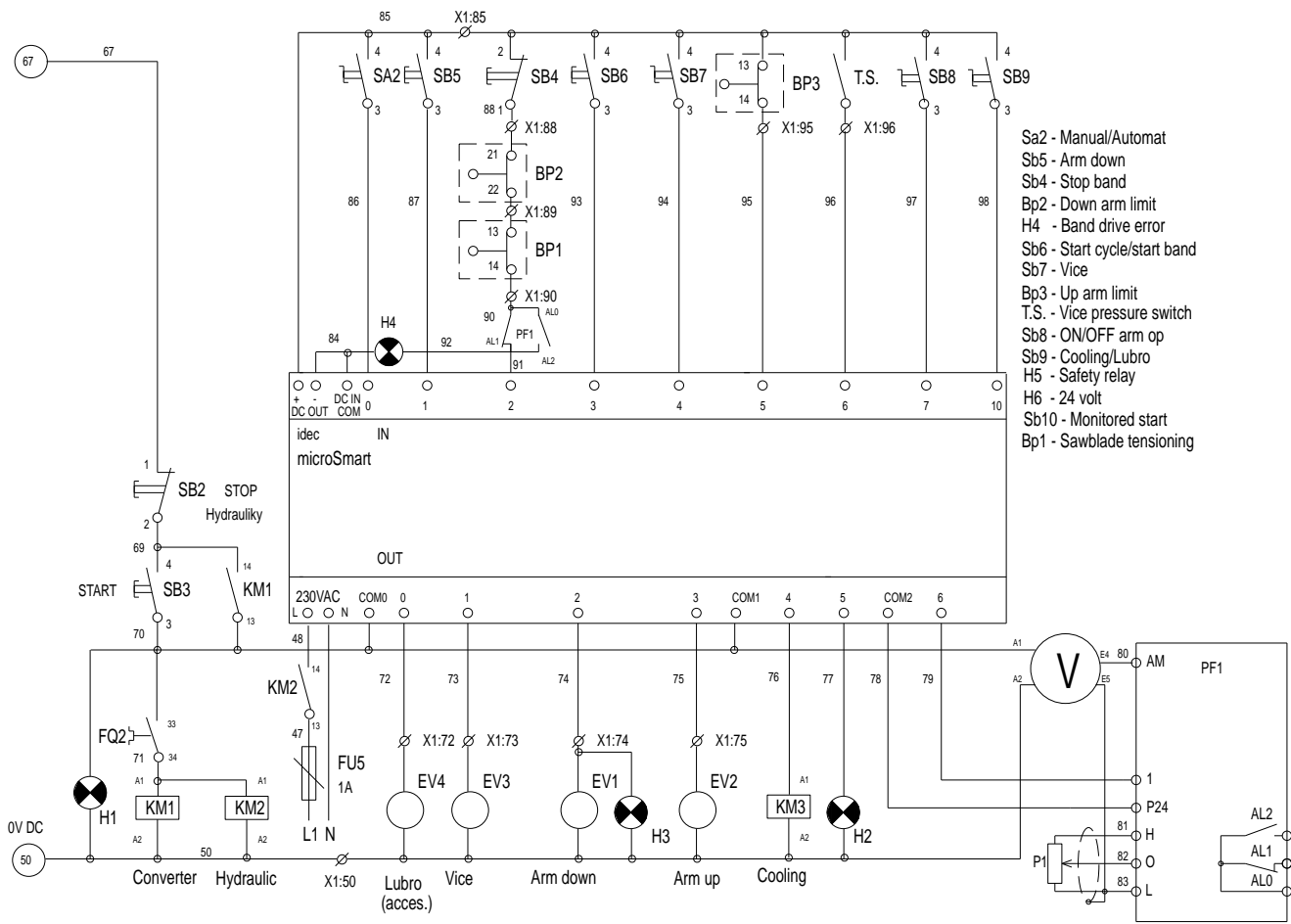
Error	Possible error reason	Error elimination
Red control light on the control panel is blinking. Only persons with electrical equipment repair qualification may do the repair!	<ul style="list-style-type: none"> • Oil deficit • On saws of S.A. Type, band motor starter FQ2 has failed. • On saws of S.A.F., congestion of frequency changer. 	<ul style="list-style-type: none"> • Call Customer service • Starter FQ2 set position I • On box of frequency changer press button 
Arm is feeding even if regulation valve is tighten	<ul style="list-style-type: none"> • M4 lock screw of control valve wheel is loose - turns through • Valve seat is worn out • Cylinder sealing is worn out • Valve failure (impurities) 	<ul style="list-style-type: none"> • Tighten M4 lock screw • Loosen M4 lock screw, turn wheel through approx. 10° to the left and tighten. • Contact service center • Contact service center

The adjustment of guiding head is a matter of permanent maintenance of the machine. This defect is NOT included in the warranty.

10. Electrical scheme

10.1. Electrical scheme ARG 250 S.A.F., ARG 250 plus S.A.F., ARG 300 S.A.F., ARG 300 plus S.A.F.





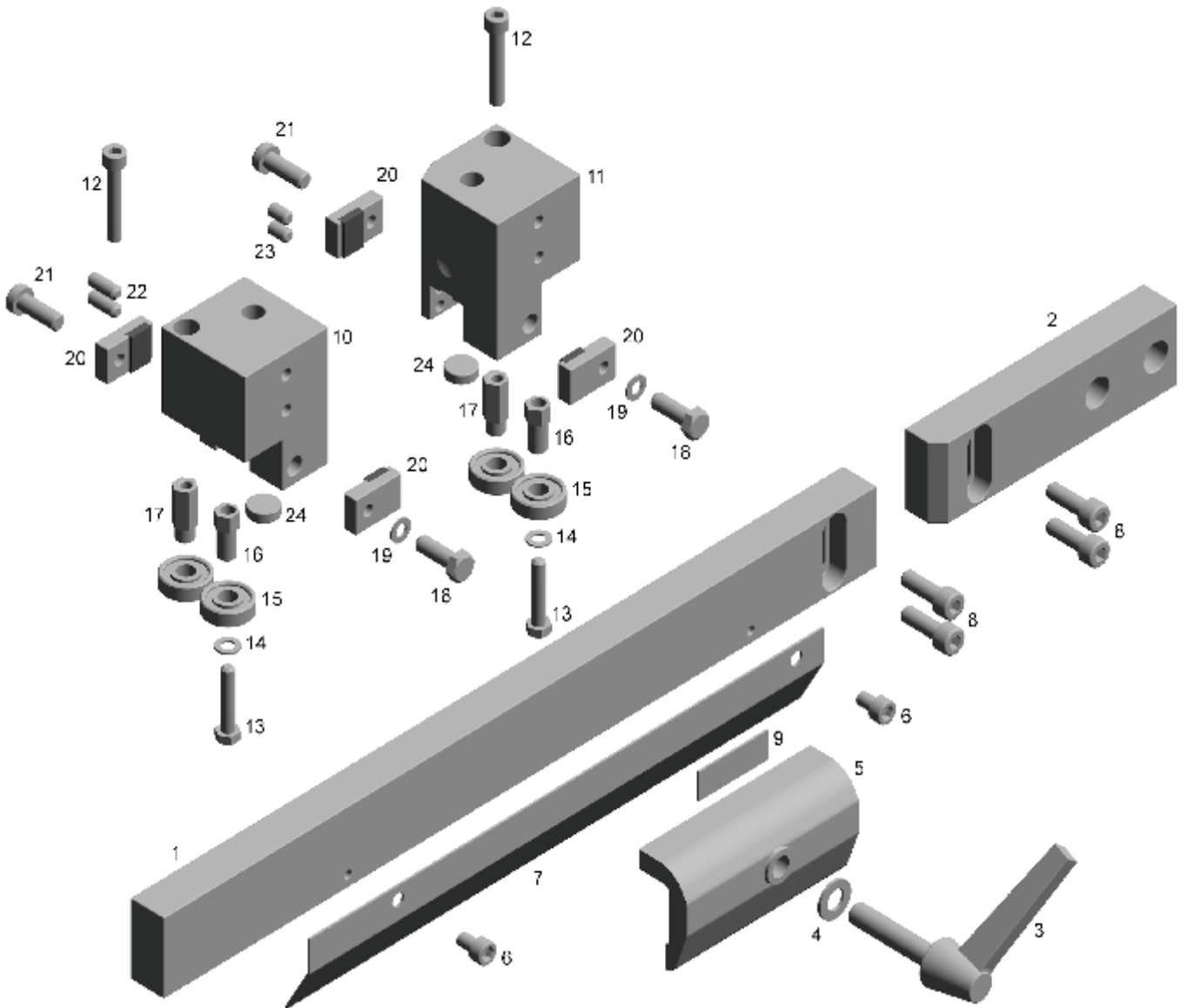
- Sa2 - Manual/Automat
- Sb5 - Arm down
- Sb4 - Stop band
- Bp2 - Down arm limit
- H4 - Band drive error
- Sb6 - Start cycle/start band
- Sb7 - Vice
- Bp3 - Up arm limit
- T.S. - Vice pressure switch
- Sb8 - ON/OFF arm op
- Sb9 - Cooling/Lubro
- H5 - Safety relay
- H6 - 24 volt
- Sb10 - Monitored start
- Bp1 - Sawblade tensioning

Scheme:	Name:	Type:	Order number:
Bp1	Terminal switch for the band cover	FR 615	002491
BP2	Down position end switch	FR 6A1	002490
BP3	Up position end switch	FR 615	002491
BP4	Band cover end switch	FR993	016830
KM1	Contactora	DILEM - 10 (24V DC)	012488
KM2	Contactora	DILEM - 10 (24V DC)	012488
KM3	Contactora	DILEM - 10 (24V DC)	012488
KM4	Contactora	DILEM - 01(24V DC)	016828
KM5	Contactora	DILEM - 01(24V DC)	016828
FQ1	Breaker	PL6-C10/3	017351
FQ2	Motor starter	MS 325 + HKF11 1,6-2,5A	001786
FU1	Fuse carrier	pojistková svorka 5x20 výklopná	001779
	Fuse	2A	001597
FU2	Fuse carrier	pojistková svorka 5x20 výklopná	001779
	Fuse	500mA	004197
FU3	Fuse carrier	pojistková svorka 5x20 výklopná	001779
	Fuse	500mA	004197
FU4	Fuse carrier	pojistková svorka 5x20 výklopná	001779
	Fuse	3,15A	001793
FU5	Fuse carrier	pojistková svorka 5x20 výklopná	001779
	Fuse	1A	006674
generator	Competent unit	PS5R-SF24	012491
Idec	Smart Relay	FC4A-C16R2	011429
KAB	Safety Relay	Reer AD SRE4	018630
PF1	Invertor	JX-A4022-EF	016321
V	Panel scale	K3MA-J-A2 24VAC	006719
P1	Potenciometer	TP195 4K7/N	002780
	Machine button	pr. 34,8mm	002781
SA2	Mo turning head black 0-1	M22-WKV	006102
	Mo connecting part for head	M22-A	006103
	Mo switch unit 1on	M22-K10	006090
SB1	Mo head button aret. red	M22-PV/K01	006104
SB2	mo double button 1/0	M22-DDL-GR-X1/X0	006100
	mo connecting part for head	M22-A	006103
	mo switch unit 1off	M22-K01	006091
SB3	mo switch unit 1on	M22-K10	006090
H1	mo socket led white	M22-LED-W	006092
SB4	mo double button 1/0	M22-DL-R	017172
	mo connect part for head	M22-A	006103
	mo switch unit 1voff	M22-K01	006091
H4	mo head signal red	M22-LED-R	006093
SB5	mo press head button green	M22-DL-G	006098
	mo connecting part for head	M22-A	006103
	mo switch unit 1on	M22-K10	006090
H3	mo socket led green	M22-LED-G	006094
SB6	mo press head button green	M22-DL-G	006098
	mo connecting part for head	M22-A	006103
	mo switch unit 1on	M22-K10	006090
H2	mo socket led green	M22-LED-G	006094
SB7	mo turning head black 0-1	M22-WKV	006102
	mo connecting part for head	M22-A	006103
	mo switch unit 1on	M22-K10	006090
SB8	mo turning head black 0-1	M22-WKV	006102
	mo connecting part for head	M22-A	006103
	mo switch unit 1on	M22-K10	006090
SB10	mo press head button yellow	M22-DL-Y	016736
	mo connecting part for head	M22-A	006103
	mo switch unit 1on	M22-K10	006090
H5	mo socket led white	M22-LED-W	006092
H6	mo head signal white	M22-L-W	006095
	mo connecting part for head	M22-A	006103
	mo socket led white	M22-LED-W	006092

Schéma:	Název:	Typ:	Obj. íslo:
QM1	Switch	OT 16 ET3	002861
	Switch OT - accessory	OTS 32 T 3	002863
	Switch OT - accessory	OHB2PJ	003523
EV1	Electromagnet connector	a part of the hydraulic unit	005433
EV2	Electromagnet connector	a part of the hydraulic unit	005433
EV3	Electromagnet connector	a part of the hydraulic unit	005433
T.S.	Pressure switch	a part of the hydraulic unit	007122

11. Assembly

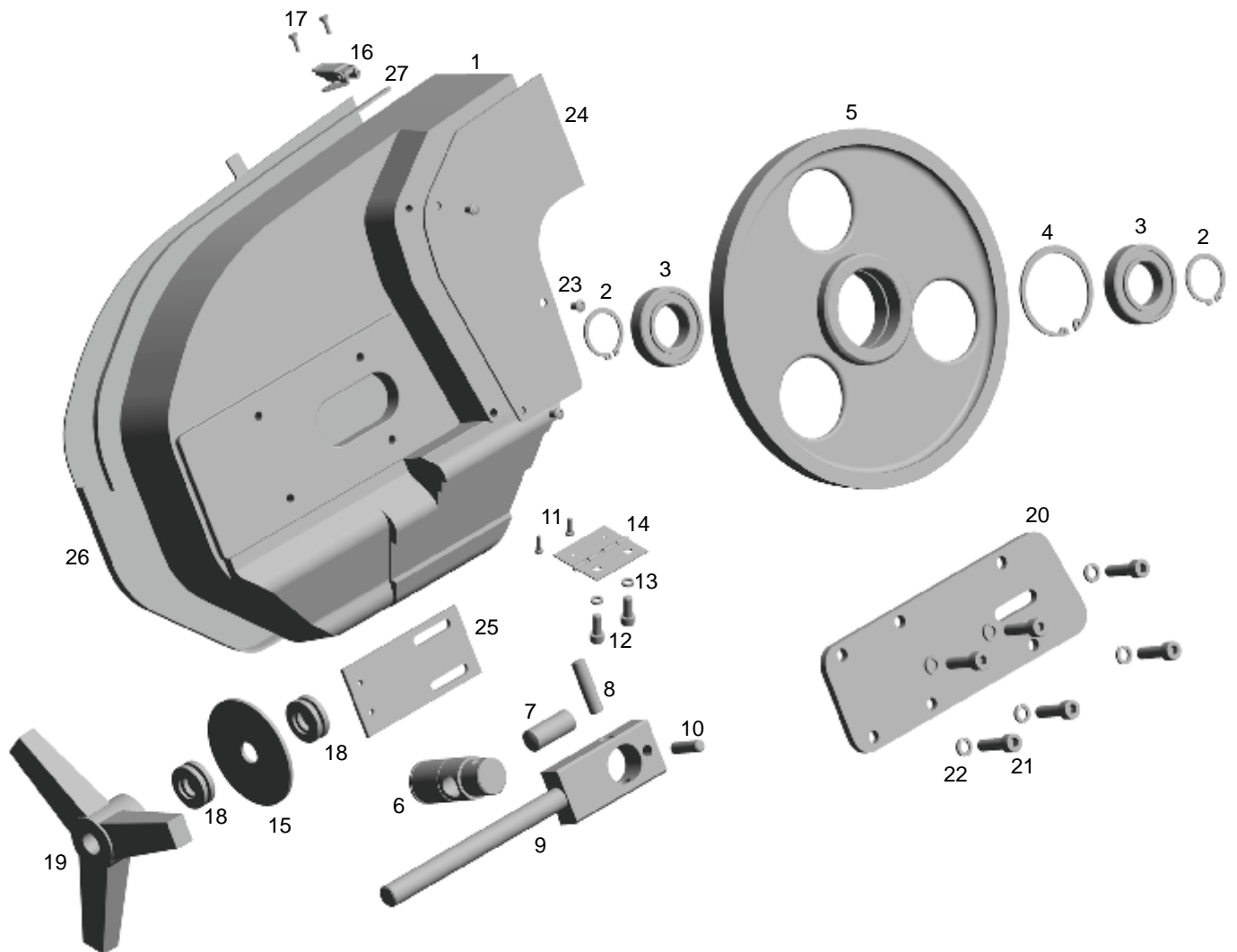
11.1. Guiding heads assembly



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Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	002182	front guiding bar	250	1	12	002709	screw M5x45	300	4
	004055	front guiding bar	300	1		001439	screw M5x40	250	2
2	002183	back guiding bar	250,300	1	13	001452	screw SW M5x25	250,300	2
3	001649	adjustable lever M 12x50	250,300	1	14	001473	washer 6	250	2
4	001475	washer 12	250,300	1	15	001405	bearing 609 2Z	250,300	4
5	001344	clamp - cast	250,300	1	16	001347	small tappet	250,300	2
6	001442	screw M6x12	250,300	2	17	001348	big tappet	250,300	2
7	001505	guiding bar cove	250,300	1	18	001454	screw M8x25 SW	250	2
8	001441	screw M8x20	250,300,	4		001717	screw M8x30 SW	300	2
9	002144	band direction label	250	1	19	001474	washer 8	250,300	4
	002145	band direction label	300	1	20	001349	hard metal plate	250,300	4
10	002162	front guiding head	250	1	21	001673	screw M8x12 NH	250,300	2
	002192	front guiding head	300	1	22	001457	adjustable screw M6x12	250,300	2
11	002163	back guiding head	250	1	23	001924	adjustable screw M6x6	250,300	2
	002193	back guiding head	300	1	24	001351	hard metal KR 12x4	250,300	2

11.2. Idler wheel assembly

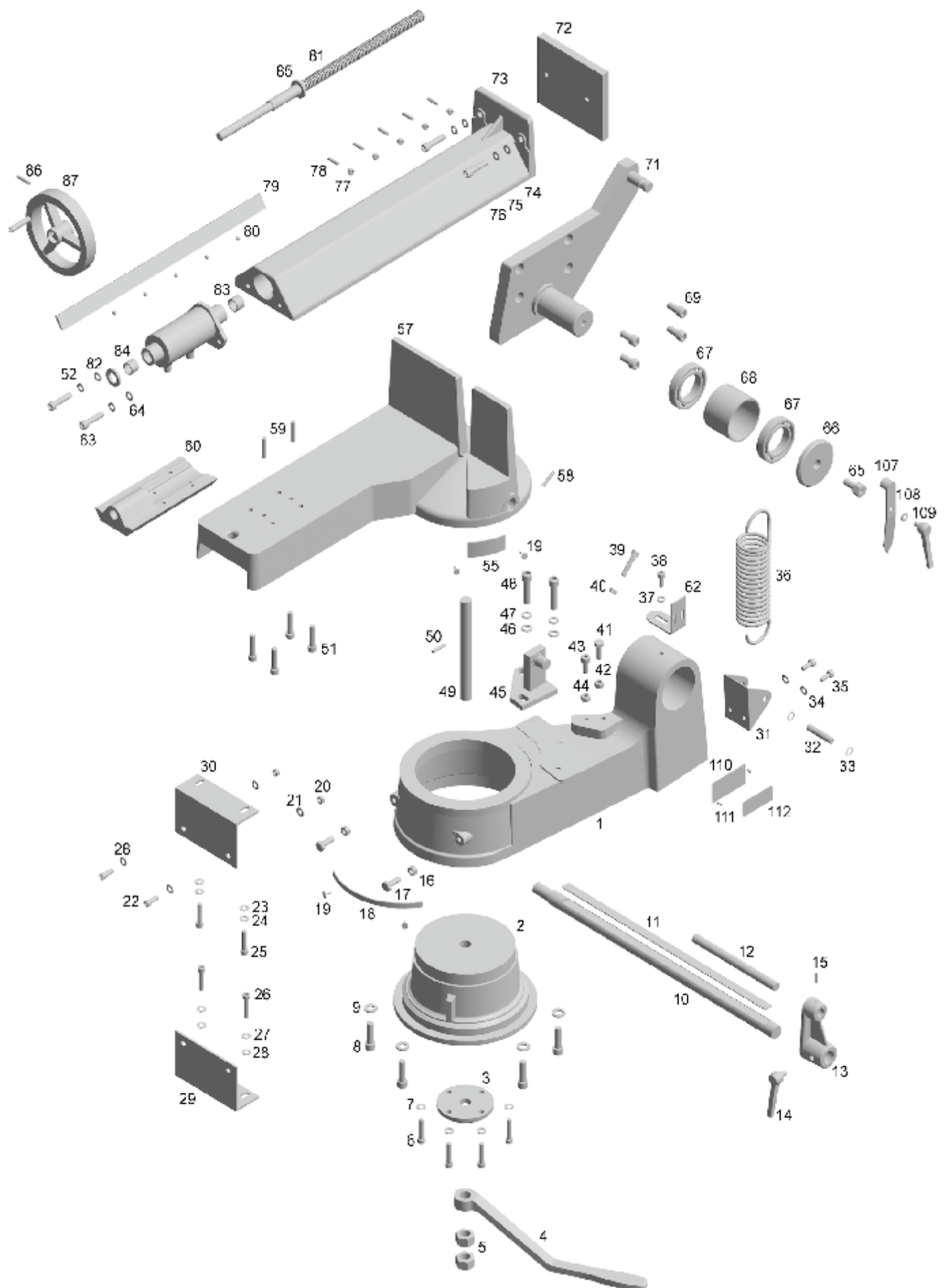


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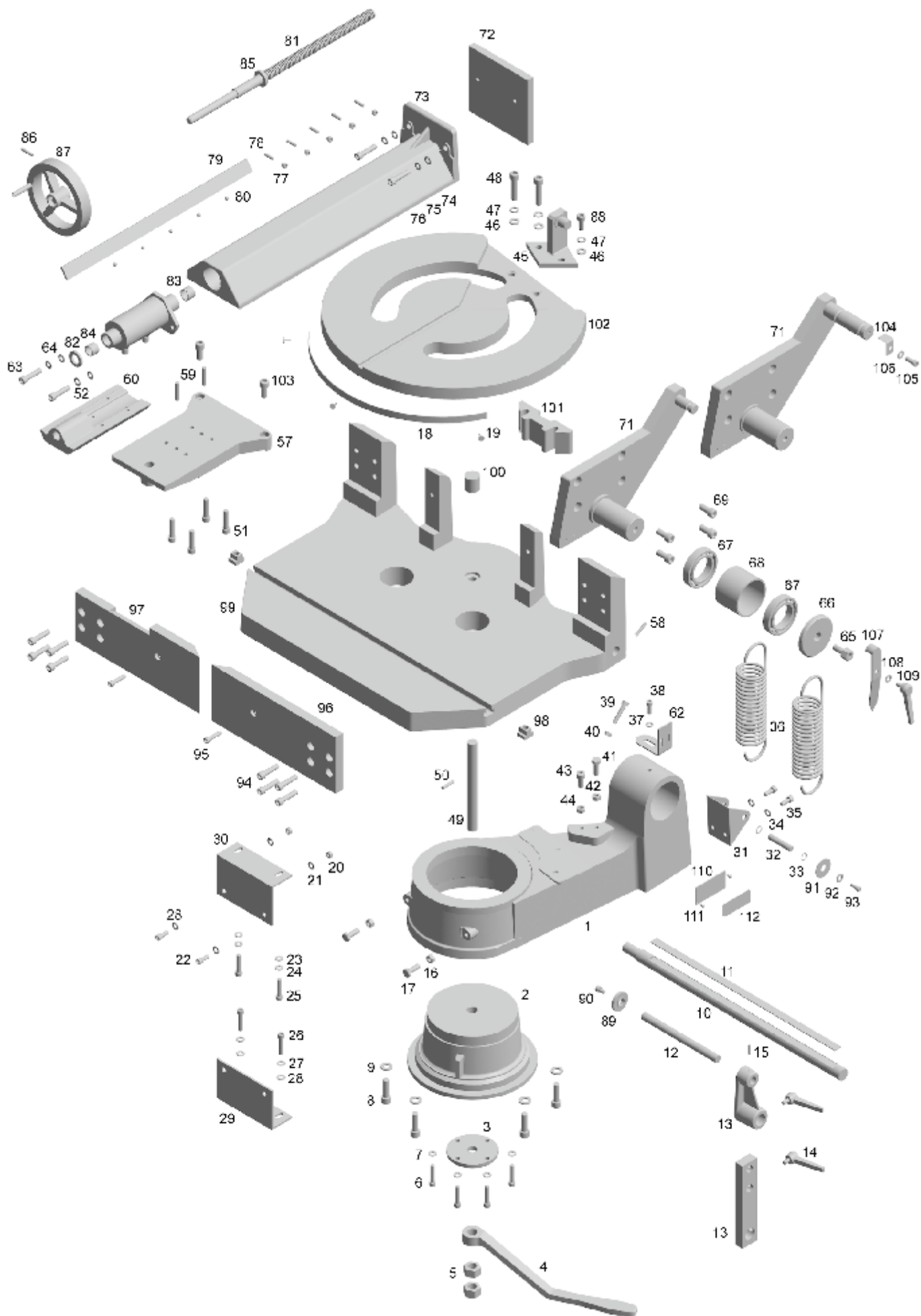
Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	007585	bow (arm) SRS70	250	1	16	002108	toggle latch	250,300	4
	002131	bow (arm) SRS85	300	1	17	001489	parker 3x10	250,300	8
2	001432	snap ring - outer KR 30	250,300	2	18	001483	TP 31,5x16,3x1,8x2,5	250,300	10
3	001626	bearing 6206 2Z	250,300	2	19	005140,001340	Handle star plastic, metallic	250,300	1
4	001437	snap ring - inner KR 62	250,300	1	20	008632	tensioning cover	250	1
5	001670	idler wheel + bearings	250	1		002154	tensioning cover	300	1
	002161	idler wheel + bearings	300	1	21	001678	screw M8x20 NH	250	6
6	001339	tensioning plug	250	1		001976	screw M8x30 NH	300	4
	002181	tensioning plug	300	1	22	001479	washer - flexible 8	300	4
7	001485	cylindrical pivot 16x40	250,300	1		001479	washer - flexible 8	250	6
8	001484	cylindrical pivot 10x40	250,300	1	23	002743	screw fl. M5x10	250,300	7
9	002157	tensioning plate + spiral	250,300	1	24	002175	bow front cover	250	1
10	001459	adjustable screw M10x25	250,300	1		002190	bow front cover	300	1
11	002381	rivet 4x10 Al.	250,300	2	25	001668	ten.lim. switch washer	250,300	1
12	001442	screw M6x12	250,300	2	26	002176	bow back cover	250	1
13	001573	washer - flexible 6	250,300	2		002191	bow back cover	300	1
14	002380	back arm cover hinge	250,300	1	27	007324	protective creeling 12 mm	250	1
15	001667	limit switch dish	250,300	1		007324	protective creeling 12 mm	300	1

11.3. Table, turning table, pivot and vice assembly

11.3.1. Table, pivot and vice assembly ARG 250 S.A.F., ARG 300 S.A.F.

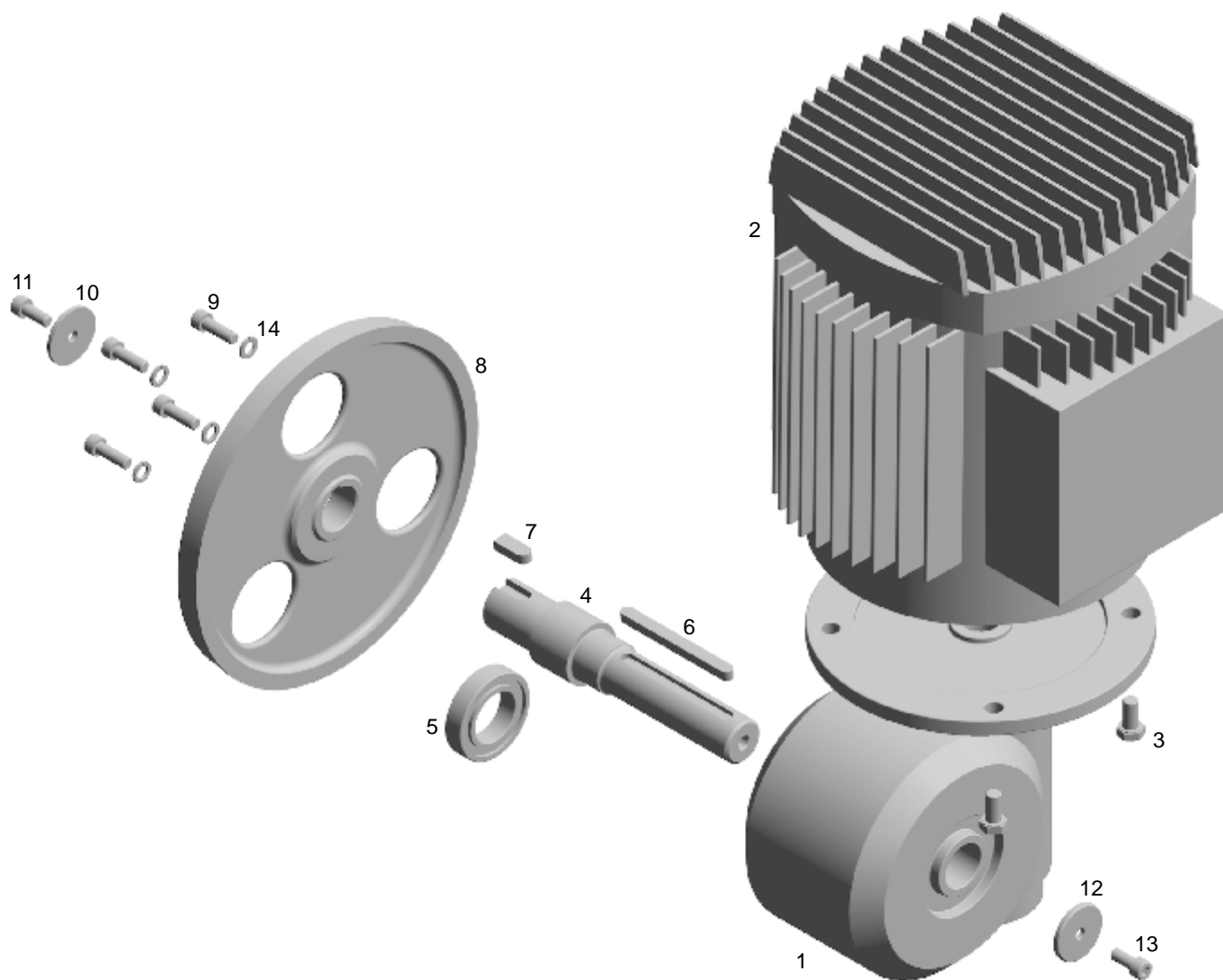


11.3.2. Table, turning table, pivot and vice assembly ARG 250 plus S.A.F., ARG 300 plus S.A.F.



Pos	Order number	Name	Type ARG	Pcs	Pos	Order number	Name	Type ARG	Pcs
1	008599	turning table	250,300	1	62	001845	arm lift holder	250,300	1
2	001501	drum C	250,300	1	63	001443	screw M8x25	250,300	1
3	001370	lever washer	250,300	1	64	001474	washer 8	250,300	1
4	002158	table lever	250,300	1	65	002112	arm lift measure bolt.	250,300	1
5	001471	nut M20	250,300	2	66	001367	pivot cover	250,300	1
6	001443	screw M8x25	250,300	4	67	006474	bearing 6010 2Z	250	2
7	001479	washer - flexible 8	250,300	4		009605	bearing 32010 AX	300	2
8	002280	screw M12x35	250,300	4	68	009587	distance tube	250	1
9	001582	washer - flexible 12	250,300	4		009588	distance tube	300	1
10	001363	backstop long bar	250,300	1	69	001450	screw M12x40	250,300	4
11	009295	backstop scale	250,300	1	71	005013	pivot	250	1
12	001364	backstop short bar	250	1		009371	pivot	300	1
	001988	backstop short bar plus	250+	1	72	001361	moving grip plate	250	1
	002237	adjustable backstop bar	300	1		002666	moving grip plate	300	1
13	001362	backstop body	250	1	73	002178	moving grip	250	1
	002246	backstop guidance	300	1		002665	moving grip	300	1
14	001418	lever M8x15	250	1	74	001476	washer 10	250,300	2
	001418	lever M8x15	300	2	75	001581	washer - flexible 10	250,300	2
15	001457	screw - adjustable M6x12	250,300	1	76	001447	screw M10x30	250,300	2
16	001469	nut M10	250,300	2	77	001712	safety nut M8	250	6
17	001455	screw SW M10x60	250,300	2		001712	safety nut M8	300	7
18	001422	angle scale	250	1	78	001617	screw - adjustable M8x30	250	6
	001498	angle scale	250+	1		006429	screw - adjustable M8x35	300	7
	002135	angle scale	300+	1	79	002187	ribbon	250	1
19	001489	parker 3x10	250,300	5		002669	ribbon	300	1
20	001468	nut M8	250,300	2	80	001711	ball 6	250	6
21	001479	washer - flexible 8	250,300	2		001711	ball 6	300	7
22	001441	screw M8x20	250,300	2	81	006958	trapez. Bolt	250	1
23	001476	washer 10	250,300	2		004769	trapez. bolt	300	1
24	001581	washer - flexible 10	250,300	2	82	001408	trapez. bolt ring 2	250,300	1
25	001445	screw M10x20	250,300	2	83	008715	bearing 20x24x17	250,300	1
26	001441	screw M8x20	250,300	2	84	008716	bearing 18x22x17	250,300	1
27	001479	washer - flexible 8	250,300	2	85	009589	trapez. bolt ring 1	250,300	1
28	001474	washer 8	250,300	4	86	009597	flexible plug 8x40	250,300	1
29	006451	vice down console	250,300	1	87	002111	vice handle with knot	250,300	1
30	006359	vice upper console	250,300	1	88	001441	screw M12x20	250+,300+	1
31	001372	U100	250,300	1	89	002248	backstop surface	300+	1
32	001373	spring plug	250	1	90	001939	screw M8x12	300+	1
	002168	spring plug	300	1	91	001571	wide washer 6	300+	1
33	001431	snap ring outer KR 20	250,300	2	92	001573	washer - flexible 6	300+	1
34	001479	washer - flexible 8	250,300	2	93	001442	screw M6x12	300+	1
35	001989	screw M8x25 NH	250,300	2	94	002039	screw M12x20	250+,300+	8
36	001368	spring 7,1x64x221x17	300	1	95	001441	screw M8x20	250+,300+	2
	002165	spring 8x72x220x14	250,300	1	96	006031	right grip plate	250+	1
37	001476	washer 10	250,300	1		006729	right grip plate	300+	1
38	001446	screw M10x25	250,300	1	97	006030	left grip plate	250+	1
39	001623	screw SW M8x35	250,300	1		006730	left grip plate	300+	1
40	001468	nut M8	250,300	1	98	001496	nut T	250+,300+	2
41	001456	screw SW M10x30	250,300	1	99	009598	table plate	250+	1
42	001469	nut M10	250,300	1		009599	table plate	300+	1
43	001625	screw M10x35	250,300	1	100	009603	plug	250+	1
44	001469	nut M10	250,300	1		009604	plug	300+	1
45	002275	down hydraulic holder	250	1	101	007342	table cube	250+,300+	1
	001503	down hydraulic holder	250+,300+	1	102	009602	turning table	250+	1
46	001475	washer 12	250+,300+	3		009601	turning table	300+	1
47	001582	washer - flexible 12	250+,300+	3	103	001499	screw M12x30 NH	230+,250+,300+	2
48	001564	screw M12x30	250	2	104	002210	spring backstop	300+	1
	001500	screw M12x90	250+,300+	2	105	001442	screw M6x12	300+	1
49	001360	šroub stolu	250,300	1	106	001478	washer 6	300+	1
50	001666	cylind. plug 6x40+thread	250,300	1	107	002026	arm lift arrow	250,300	1
51	001441	screw M8x20	250,300	4	108	001474	washer 8	250,300	1
52	001479	washer - flexible	250,300	2	109	005104	lever M8x15 adjustable	250,300	1
55	001421	measuring scale	250	1	110	002027	washer of lift scale	250	1
57	002177	vice body	250	1		005290	washer of lift scale	300	1
	002267	vice body plus	250+	1	111	001489	parker 3x10	250,300	2
	002668	vice body plus	300+	1	112	002028	arm lift indication sticker	250	1
58	001458	adjustable screw M8x10	250,300	1		005289	arm lift indication sticker	300	1
59	001665	cylind. plug 6x24	250,300	2					
60	008718	trapez. Nut with guidance	250,300	1					

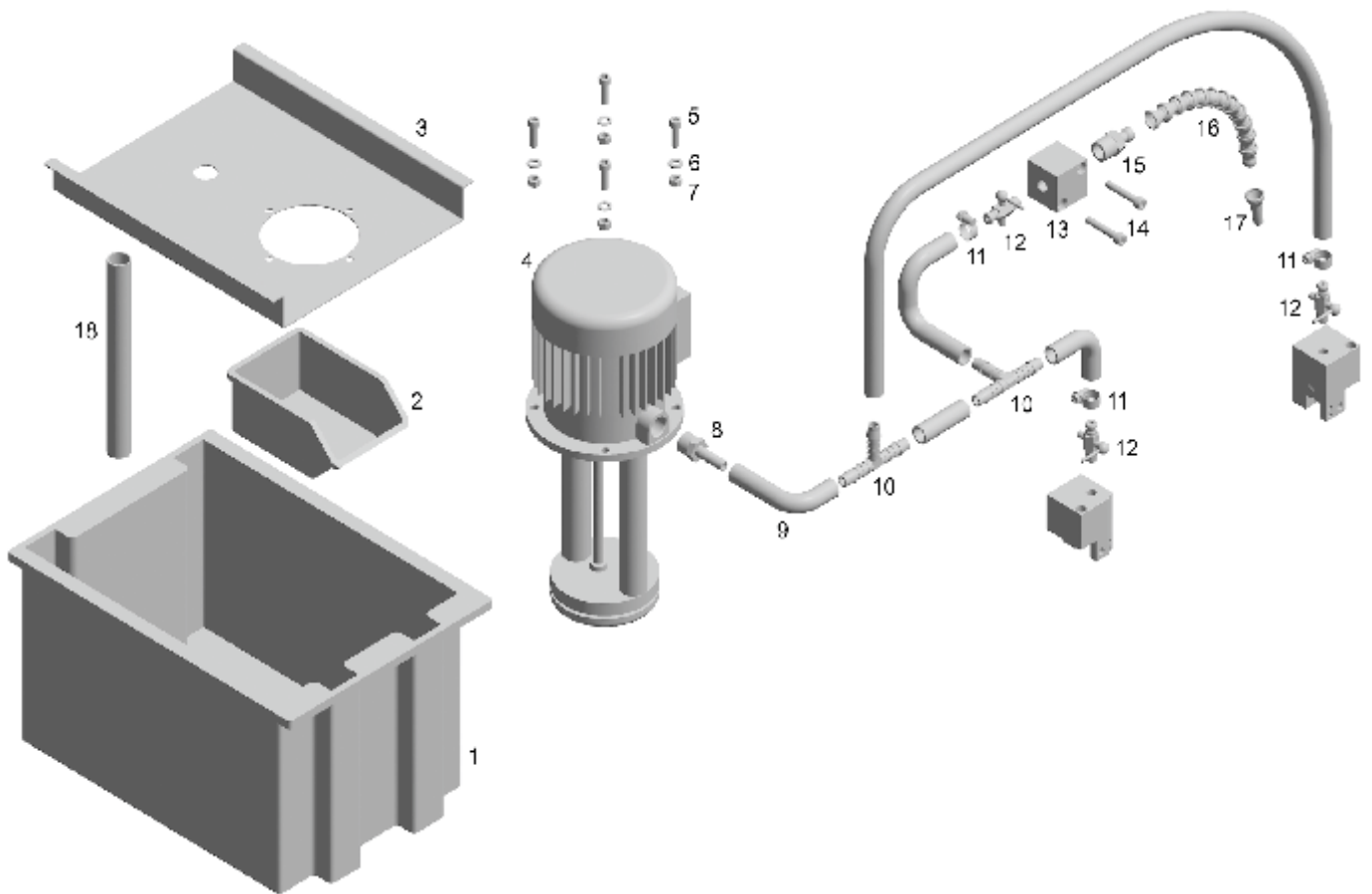
11.4. Drive assembly



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Pos.	Order number	Name	Type ARG	Pcs
1	011957	gearbox MI70 30/1, FP, PAM B14-80 ND	250 S.A.	1
	010438	gearbox MI70, i25, FP, PAM B14-90 ND	250 S.A.F.	1
	011966	gearbox MI80, i25, FP, PAM B14-100 ND	300 S.A., S.A.F.	1
2	010439	motor MS 0,9/1,4kW, 4/2pole, 3 phase, H80L ND	250 S.A.	1
	010436	motor MS 2,2kW, 4pole, 3 phase, H90L ND	250,300 S.A.F.	1
	011967	motor H100/4-8, B14 0,9/1,5kW ND	300 S.A.	1
3	004621	screw SW M6x20	250,300	4
4	006598	driving gear	250	1
	002172	driving gear	300	1
5	001627	bearing 6207 2RS	250	1
	002186	bearing 6308 2Z	300	2
6	004400	feather 8x7x60	250	1
	001878	feather 10x8x110	300	1
7	001488	feather 10x8x25	250	1
	005423	feather 12x8x30	300	1
8	001342	driving wheel	250	1
	002160	driving wheel	300	1
9	001172	screw M8x60	250	4
	002029	screw M10x90	300	4
10	001477	wide washer 14	250,300	1
11	001448	screw M12x20 NH	250,300	1
12	001477	wide washer 14	250,300	1
13	001815	screw M12x60	250,300	1

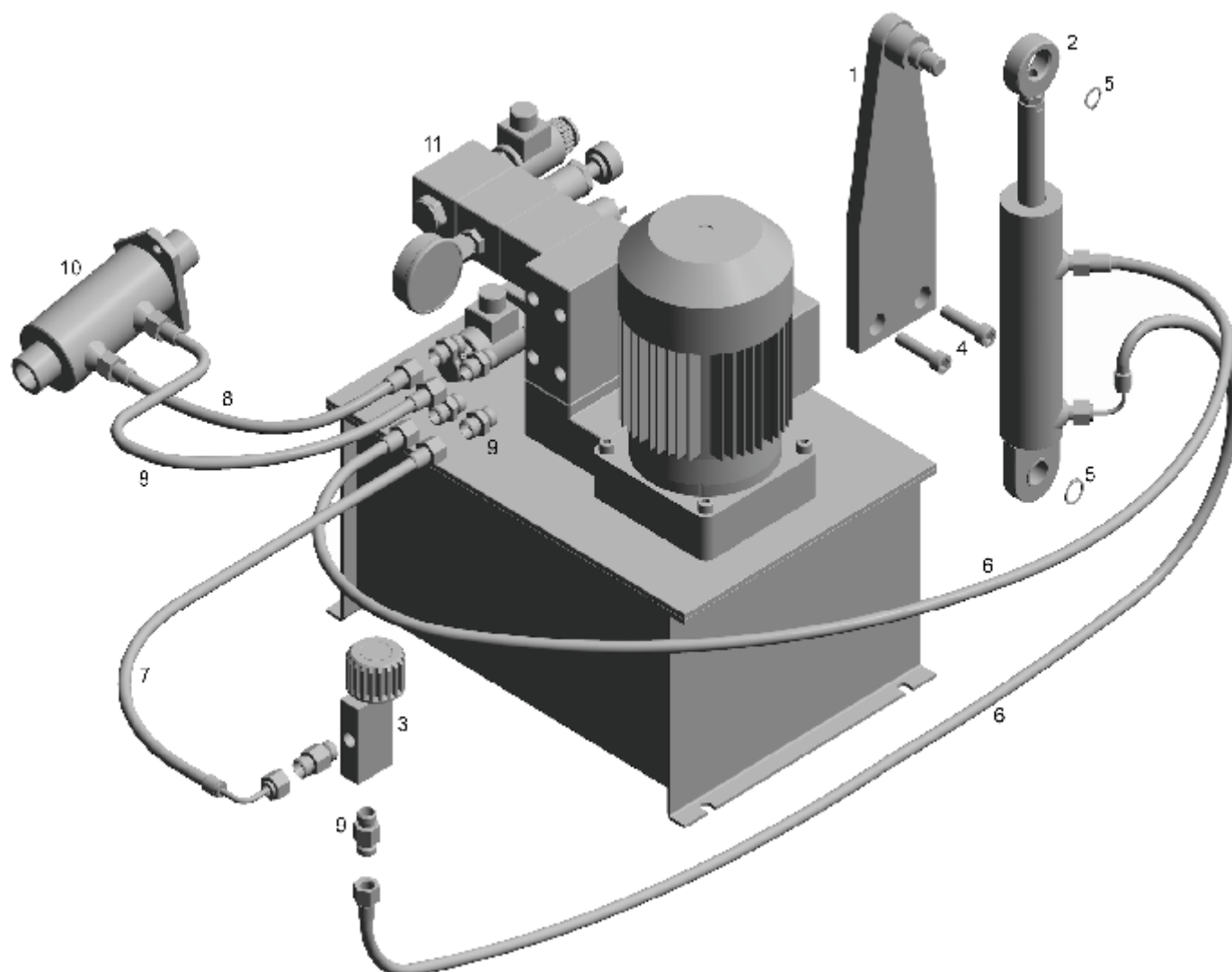
11.5. Coolant assembly



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Pos.	Order number	Name	Type ARG	Pcs
1	001397	coolant fluid tank	250,300	1
2	001335	setting pot ERBA	250,300	1
3	001387	cover of coolant fluid tank	250,300	1
4	010154	pump SAMEC AST 30/180 400 V	250,300	1
5	001440	screw M6x16	250,300	4
6	001573	washer 6	250,300	4
7	001467	nut M6	250,300	4
8	006860	connection 3/8" - 9 mm	250,300	1
9	001399	hose PVC DN 8x2	250,300	5 m
10	001401	T connection TS 10	250,300	2
11	001389	hose clip 7-13	250,300	3
12	001402	tap 050	250,300	3
13	001663	extra coolant cube	250,300	1
14	002770	screw M5x40	250,300	2
15	002194	throat KR 12-3/8"	250,300	1
16	001661	toggle part KR 12	250,300	20
17	001662	cylind. end KR 12	250,300	1
18	001400	trash hose 19x3	250,300	0,7 m

11.6. Hydraulic unit assembly



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Poz.	Objednací číslo	Název	Typ stroje ARG	Ks
1	001918	holder of hydraulic cylinder	250	1
	001846	holder of hydraulic cylinder	250 Plus	1
	002279	holder of hydraulic cylinder	300 Plus	1
2	015759	hydraulic cylinder P H 40/22x115	250	1
	015756	hydraulic cylinder P H 63/32x115	300	1
3	001929/002286	valve	250/300	1
4	001563	screw M10x40	250,300	2
5	001431	snap ring outer KR 20	250,300	2
6	001881	hydraulic hose DN 6x2500 p /90	250	2
	001881	hydraulic hose DN 6x2500 p /90	300	1
	002226	hydraulic hose DN 6x3000 p /90	300	1
7	001882	hydraulic hose DN 6x1500 p /90	250,300	1
8	002753	hydraulic hose DN 6x2000 p /90	250,300	2
9	001986	right connection GES 8L/R	250,300	6
10	002090	hydraulic cylinder P H 50/32x15	250,300	1
11	017077	hydraulic unit 731-0481	250,300	1
	003569	hydraulic oil HM46	250,300	20 l

ATTACHMENT TO OPERATING INSTRUCTIONS FOR HYDRAULIC UNIT

Principles of Hydraulic Unit Assembly and Maintenance

The following principles must be adhered to during assembly of hydraulic circuit sub-assemblies, elements and piping. The basic rule is cleanliness and good order! The hydraulic circuit consists of very precise elements and it is very difficult, tough and costly to remove any contamination and its consequences. Inappropriate storage or failure to renew the rust protection of hydraulic elements causes locking of internal moving parts of the elements. The element must be washed with a suitable degreasing agent (petrol, etc.) and the oil film must be renewed. Read through the manufacturer's documentation containing the instructions concerning the method of assembly, the torque of bolts, etc. All the hydraulic circuit components must be mounted without force. When lifting the hydraulic units and sets, make sure they are protected against mechanical damage by the binding equipment. Hydraulic element guards (transport plates on bearing surfaces, plugs in threaded chambers) should be removed immediately before assembly.

Electrical Installation

Electrical installation, electromagnet and control element leads (electromagnets) must comply with the valid regulations and standards, especially CSN 33 2200 and CSN 34 5611. Check the plate or catalogue operational voltage and frequency values with regard to the network values before making the connection to the electric network. Protection against dangerous touch voltage must comply with CSN 34 1010, according to which the entire equipment must, among others, be properly earthed. The earth connection (interconnection of the equipment with the earthing system or the neutral conductor) is carried out by the earthing screw provided on one leg of the unit tank. The nut welded to the tank is provided with the earthing marking. The regulations stipulated by the CSN 34 3100 must be followed during attendance and repair of the electrical installation.

Filling Tank with Oil

First, check the inside space of the tank thoroughly. Check the condition of the oil-resistant coating. Should any flaking or poor quality manifest themselves, remove the coating with an appropriate solvent, wash, dry and clean with pressure air. In this way, failures caused by poor-quality coating, which contaminates the entire hydraulic system, will be prevented. On principal, only oil recommended by the equipment manufacturer may be filled in. Never make the filling directly from barrels. Always use a filter unit with filters 12 µm and better. The proven method is using two filters with different filtering property. The first coarse filter with a metal sleeve, the other one fine with a paper sleeve. The work will be facilitated and achieve better quality if the filters are provided with signaling of clogging.

What should be done before putting hydraulic unit into operation after repair.

Make sure that

- the tank has been filled with the prescribed pure oil up to the upper limit;
- all pipelines have been thoroughly cleaned, the connections properly tightened and the pipeline assembled without internal strain;
- all pipe unions and elements have been properly mounted and tightened by the specified torque and the assembled connection corresponds to the hydraulic diagram;
- alignment and axial clearance have been adhered to when the couplings between motors and hydrogenerators and/or hydromotors and other equipment have been mounted;
- the electric motor has been correctly connected (Δ or Y), the sense of rotation adhered to and the level, pressure and temperature sensors function properly;
- the filters (sleeves) have the specified filtration values and are mounted in the correct flow direction and filled with oil identical to the tank oil, and the inside space of the piston hydrogenerators is filled with oil.

Putting the Equipment into Operation

- start the hydrogenerator within short intervals,
- check the piping for noise and leakage,
- vent the hydraulic circuit,
- check the circuit functions with minimum load, if possible,
- gradually increase the pressure to the specified operating value; at the same time, adjust the control elements, such as control valves, etc.,
- monitor the gauges and measuring devices, noise, oil level and temperature in the tank,
- follow the instructions of the individual operating manuals.

Putting out of Operation

- tighten all connections.

Restarting

- check oil level,
- test all functions simultaneously; compare the values measured to values specified,
- check the signaling of pressure gradient on filters.

Brief survey of defects, which can occur on a hydraulic device. An open circuit consisting of standard components is considered.

I. The hydrogenerator does not supply oil

- a) reversed sense of rotation of hydrogenerator,
- b) not sufficient oil in tank,
- c) suction piping closed,
- d) suction piping leakage,
- e) zero geometrical volume set with control hydrogenerator,
- f) oil viscosity does not comply with the specified value,
- g) hydrogenerator failure.

II. Oil contains air bubbles (pressure aggregate is noisy - hydraulic device running is unsteady)

- a) the new circuit has not been sufficiently vented,
- d) suction piping leakage,
- c) suction piping is not fully immersed in oil,
- d) circulating oil is not fed under the level and entrains air,
- e) hydrogenerator shaft sealing is damaged,
- f) incorrect design of suction piping big negative pressure in suction part (cavitation),
- g) temperature too low for the specified oil,

III. Increased mechanical noise

- a) drive is not trued up,
- b) drive coupling damaged,
- c) damaged or ruined bearings,
- d) damaged rubber mounting of drive equipment,
- e) air infiltration.

IV. Hydrogenerator supplies oil but pressure does not increase

- a) hydraulic circuit unloaded,
- b) safety valve defect,
- c) pressure manifold connected to drain, probably in distributor,
- d) hydrogenerator functional surfaces are worn,
- e) hydraulic unit leakage portion of oil leaks outside the working space.

V. Increase of hydrogenerator loss flow (refers also to rotating hydromotor)

- a) degree of hydrogenerator functional surface wear and tear is high due to the influence of impurities contained in oil,
- b) low viscosity superheated oil,
- c) mechanical failure of hydrogenerator.

VI. Hydrogenerator has seized

- d) the basic parameters overload have not been adhered to,
- b) damage due to cavitation,
- c) damage by solid particles contained in oil,
- d) the specified oil viscosity has not been adhered to,
- e) inappropriate kind of oil,
- f) hydrogenerator life has been exceeded,
- g) permissible radial and thrust forces at the output shaft have been exceeded.

VII. Overheating of oil in tank

- a) efficiency has decreased due to wear and tear; loss flow of hydrogenerator has sufficiently increased; a portion of energy supplied changes to heat,
- b) some of the elements is leaking, portion of pressure oil flows to drain,
- c) tank capacity is small, the heat exchanging surface is insufficient,
- d) external source of heat,
- e) element base in circuit is inappropriately designed.

VIII. Hydraulic circuit does not comply with designed parameters

- a) hydrogenerator flow does not comply with the original calculation,
- b) two or more functions take place at the same time,
- c) hydraulic device is undersized or oversized,
- d) increased pressure loss of piping,
- b) some of the elements is leaking, portion of pressure oil flows to drain,
- f) gradual fouling of pressure filter.

Safety at Work

If all the elements are appropriately designed, hydraulic circuits are reliable and safe even at great pressures. However, a breakdown due to material defect or fatigue can occur in them, which could endanger the safety of the staff or contaminate the environment with oil. Examples of defects manifesting themselves outwardly:

- **oil dripping,**
- **destruction of pressure-loaded circuit parts.**

Oil dripping from an untight connection or another spot, which collects on the floor, can cause slipping and falling of persons or floor damage and penetrating in the environment, it can cause extensive pollution of large quantities of water. The destruction of pressure-loaded circuit parts does not cause any explosion. If the crack is small, oil is dispersed to the environment in form of mist, if the crack is large, mostly the whole tank will be discharged. The destruction of pressure hoses will manifest itself by oil leaking, but very frequently also by bursting of hose socket. In such an instant, the hose can spring up and cause a serious injury. Both failures cause pollution of the environment and a small spark can be the cause of a huge fire.

It follows that the following principles must be taken into account for designing, installing and operating hydraulic circuits:

- do not use hydraulic elements for pressures lower than the circuit working pressure,
- keep the machine clean, sprinkle the poured out oil with wood chips or VAPEX absorbate, sweep the floor, clean it with an appropriate solvent and dry,
- while dismantling, prevent oil spilling by installing suitable containers,
- units and all hydraulic elements including hoses and pipelines must be protected against external mechanical damage and heat resources,
- if the circuit is under pressure, do not come close to the pipelines and hoses, particularly do not expose your face,
- should oil be spilled into eyes, flush eyes with Ophtal or any other suitable agent immediately,
- should a nonflammable liquid be spilled into the eyes (except for water emulsion), consult an ophthalmologist.
- do not smoke or use open fire in the store and near the units and hydromotors,
- shut down the hydrogenerator drive whenever you make any changes or repairs,
- electrical equipment must comply with the ESC regulations,
- containers with industrial petrol may only be used in reserved spaces and must be covered with a cover or a closure at all times,
- hydromotors, which could start turning automatically in case that the driving hydrogenerator switches off (pressure drop), must be mechanically or hydraulically locked against this possibility,
- all hydraulic systems and circuits must be protected by a pressure valve against overloading, as well as hydromotors, which could become overloaded after hydraulic locking,
- a person responsible for maintenance and setting of the hydraulic unit must be appointed.

The above-mentioned safety at work principles are not complete.

There are different conditions for each hydraulic circuit and different possibilities of endangering the environment. These principles, however, should reduce the accident rate and improve the working conditions of users.

Hydraulic Liquids

The correct function, life, operational reliability and economy of the hydraulic equipment are substantially influenced by the usage of suitable hydraulic liquids. Mineral oils, also called hydraulic oils, are the most frequently used liquids. **Hydraulic liquids fulfill various tasks in the hydraulic equipment. The most important of them are the following:**

- hydraulic energy transfer from hydrogenerator to hydromotor
- lubrication of moving parts of hydraulic elements
- rust protection
- discharge of impurities
- water drain
- air vent, etc.
- removal of loss heat developed by volume losses and friction.

The hydraulic liquid quality is characterized by the following parameters:

Kinematic viscosity is defined as resistance against flowing through lines and clearances. Higher viscosity means a thicker liquid. The viscosity unit is $\text{m}^2 \cdot \text{s}^{-1}$ ($\text{mm}^2 \cdot \text{s}^{-1}$ is used in practice). Viscosity is dependent on temperature. The amount of temperature influence, i.e. the change of viscosity with temperature, is determined by the viscosity index. The bigger the viscosity index, the smaller the dependence of viscosity on temperature (in standard mineral oils between 85 and 90, in better quality oils 100 and higher). Viscosity is also influenced by pressure. Viscosity increases with the pressure increase.

The compressibility affects the rigidity of the system and thus also the precision of motion in high-pressure devices. The compression value is relatively small. The compressibility of liquid increases with the content of air or other gases.

Foaming quality is undesirable with regard to the function of liquid but also with regard to its ageing. Chemical additives reduce the foaming quality. The foaming quality can be very substantially affected by the hydraulic system design (tank design, air infiltration).

Requirements for Liquid Properties

The main requirements can be put as follows:

- small dependence of viscosity on temperature change
- corresponding viscosity guaranteeing good efficiency of system
- good lubricating capacity and high mechanical oil film stability
- chemical stability and neutrality against materials used
- operational stability (liquid resistance against ageing)
- low foaming quality
- availability and reasonable price.

Specification of Hydraulic Liquids According to ISO 6743/4

HM and HV oil performance classes are particularly suitable for using in hydraulic circuits.

HM - high-quality oils containing additives against oxidation, corrosion, foaming, for reducing wear and tear and viscosity modifier improving also low-temperature properties. They are intended for hydrostatical mechanisms with high mechanical heat stress and for machines operated in unprotected environment throughout the year.

HV - are highly refined oils with additives against oxidation, corrosion, foaming, for reducing wear and tear and a viscosity modifier. High-quality oils with outstanding oxidation stability and anti-abrasive properties, low foaming quality and good resistance against creation of permanent emulsion and especially with excellent viscosity temperature dependence. They are intended for similar purposes like HM class oils, but with increased requirement for a very low dependence of oil viscosity on temperature, particularly for h.-p. mechanisms of mobile machines operated within a wide range of ambient temperatures.

Biologically Degradable Liquids

The ecological standpoint must be taken into account especially with hydraulic mechanisms in plants, which come into contact with water outdoors, with equipment and machines in agriculture and forestry, building machine drives and mobile technology on general. Lubrication properties of environmentally-friendly liquids are as a rule identical to those of mineral oils. As regards the resistance against ageing and tolerance of liquids to construction materials, no generally valid knowledge is available at present. The using of the liquid must be tested. Nevertheless, practical experience shows clearly that carefully adjusted systems operated with environmentally-friendly liquids run smoothly.

Kind of oil	Kinematic viscosity in mm ² .s ⁻¹ at the temperature					Setting temperature in °C
	0°C	20°C	40°C	60°C	80°C	
MOGUL HM 32	220	100	32	15	8,5	-40
MOGUL HM 46	400	170	46	18	11	-30
MOGUL HM 68	700	170	68	26	14	-28
MOGUL HV 32	180	67	32	17	11	-40
MOGUL HV 46	350	110	46	25	14	-36

Hydraulic Mineral Oils

HM performance class according to CETOP RP 91H European specification in viscosity classes ISO VG 32 and 46. HM 32 oils are recommended for ambient temperatures around 0°C and below. HM 46 oils are recommended for ambient temperatures between +5 and 40°C.

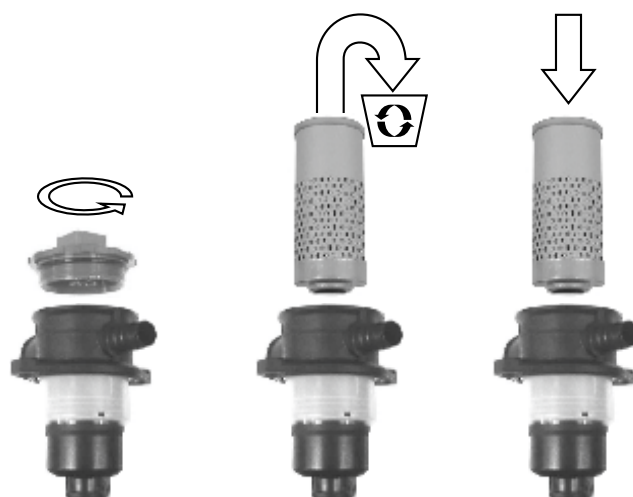
The Pulous bandsawing machines are filled with PARAMOL HM 46 oil. Oil renewal is recommended within a period of less than 3000 operating hours. Check consequently the oil level at the oil level gauge located on the hydraulic unit in the machine base.

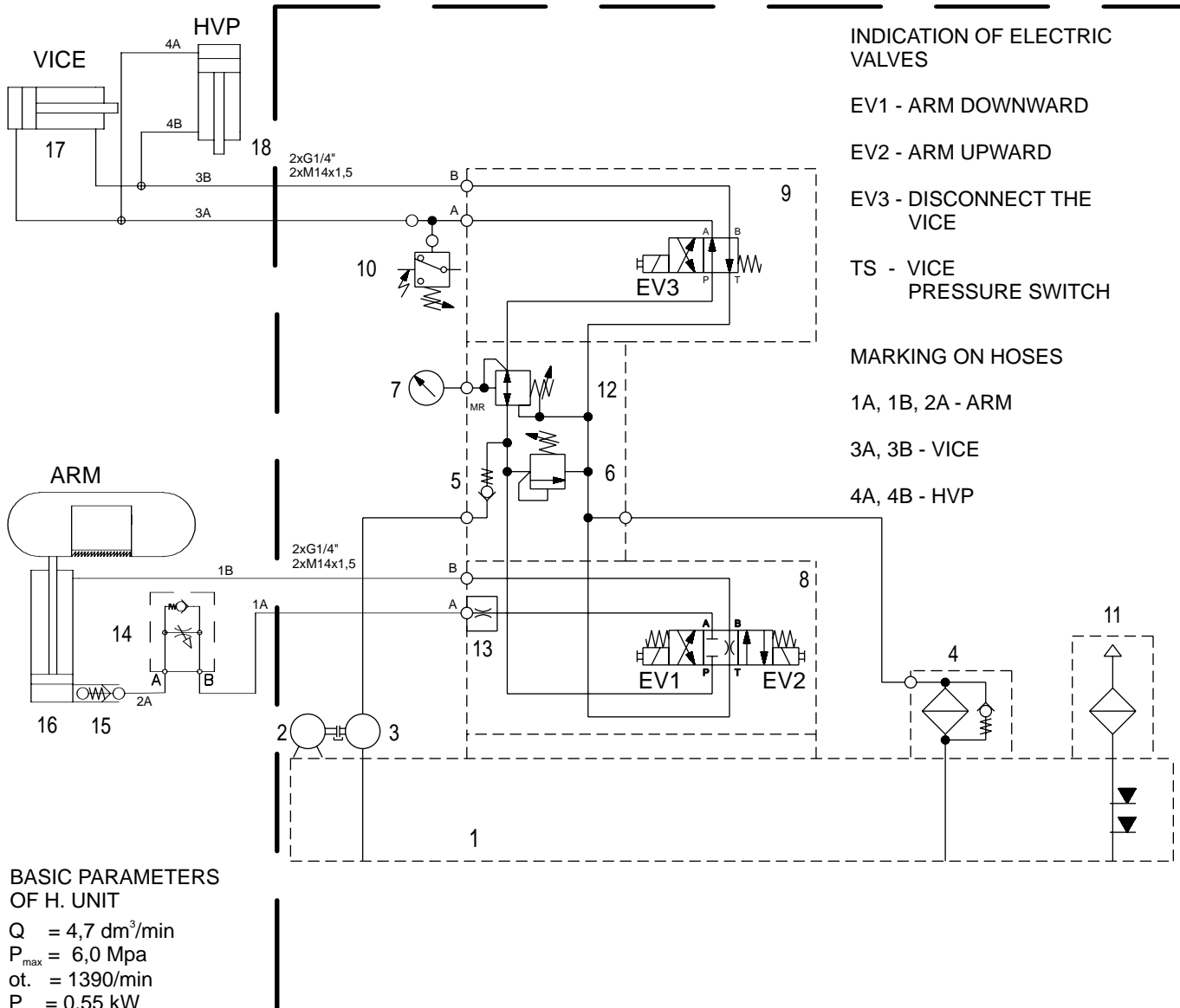
Specification CETOP RP 91 H	HM 32	HM 46
AGIP	OSO 32	OSO 46
ARAL	VITAM GM 32	VITAM GF 46
AVIA	AVILUB RSL 32	AVILUB RSL 46
EPRO	MOGUL HM 32	MOGUL HM 46
BP	ENERGOL HLP 32	ENERGOL HLP 46
BULGARIA	MX-M/32	MX-M/46
CASTROL	HYSPIN AXS 32	HYSPIN AWS 46
DEA	ASTRON HLP 32	ASTRON HLP 46
ELF	ELFOLNA 32	ELFOLNA 46
ESSO	NUTO H 32	NUTO H 46
FAM	FAMHIDO HD 5030	HD 5040
FINA	HYDRAN 32	HYDRAN 46
INA	HIDRAOL 32 HD	HIDRAOL 46 HD
KLÜBER	LAMORA HLP 32	LAMORA HLP 46
HUNGARIA	HIDROKOMOL P 32	HIDROKOMOL P 46
MOBIL	MOBIL DTE 24	MOBIL DTE 25
ÖMV	HLP 32	HLP 46
PARAMO	PARAMOL HM 32	PARAMOL HM 46
POLAND	HYDROL 20	HYDROL 30
ROMANIA	H 32 EP	H 46 EP
RUSSIA	IGP 18	IGP 30
SUN	SUNVIS 832 WR	SUNVIS 846 WR
SHELL	TELLUS OIL 32	TELLUS OIL 46
TEXACO	RANDO HD A 32	RANDO HD B 46
VALVOLINE	ULTRAMAX AW 32	ULTRAMAX AW 46

Oil Renewal and Filter Replacement

- unscrew the red cover
- take out the filter sleeve
- change oil
- insert the new filter sleeve
- fill in fresh oil
- screw in the red cover
- vent the whole system

Caution: The oil and the filter sleeve are special waste.





TYPE NUMBER OF HYDRAULIC UNIT: S001-37
ORDER No: 017077

UNIT
ver. 20.2.2012

Poz.	Objednací číslo	Název	Typ stroje ARG
1	018631	tank TM 20	250, 300
2	018632	electric motor EM 80 0,55 kW/3 B34-L 1,6A	250, 300
3	018633	hydrogenerator 10A3,65x053G	250, 300
4	018634	filter cartridge P10NBP01	250, 300
	018635	filter + cartridge MPFO301AG1	250, 300
5	018636	one-way valve CV08-20-0-N-4	250, 300
6	018637	relief valve MO-020/32	250, 300
7	002858	pressure gauge 68 axiální s glycerínem; 0-100 bar	250, 300
8	018638	distributor + coil 24V DC DVE03-S51-B3-C24/20/T1-M1	250, 300
9	018639	distributor + coil 24V DC DVE03-S12-B2-C24/20/T1-M1	250, 300
10	007122	pressure switch SUCO 0166 411 031 043 13±2bar	250, 300
11	018640	filter cap CPT-MD-FA/1"	250, 300
12	018641	pressure control valve PR08-32B-0-N-6	250, 300
13	017350	nozzle jet 1mm	300
14	001929	throttle valve VS01-04/R2 OS	250
	002286	throttle valve VS01-04/R3,5 OS	300
15	015744	safety valve VP N-H G1/4"	250, 300
16	015759	arm cylinder PILOUS - ZH1-40/22x115	250
	015756	arm cylinder PILOUS - ZH1-63/32x120	300
17	002090	vice cylinder PILOUS - P H 50/32x15	
18	001965	cylinder HVP PILOUS - Zh1 32/18x120	
	005433	connector 24V DC	250, 300
	018642	coil 24V DC	250, 300

NOTES:



NOTES:



EC Declaration of Conformity

In conformity with the Directive 2006/42/EC of the European Parliament and of the Council
in conformity with the Directive 2006/95/EC of the Council
and in conformity with the Directive 2004/108/EC of the Council

Manufacturer: Pilous-pasove pily, spol. s r.o., Zelezna 9, Brno 619 00, VAT: CZ60727551

Identification of the machinery: Band sawing machine with accessory

Type: ARG 250 S.A.F., ARG 250 PLUS S.A.F., ARG 300 S.A.F., ARG 300 PLUS S.A.F.,
ARG 380 PLUS S.A.F., ARG 400 PLUS S.A.F., ARG 500 PLUS S.A.F.

Description and determination of product function:

The band sawing machine is designed for cutting metal material, while the workpiece is clamped in a fixed vice and the cut is being performed by the saw blade.

All appropriate provisions that the machinery complies with:

- Directive 2006/42/EC of the European Parliament and of the Council
- Directive 2006/95/EC of the European Parliament and of the Council
- Directive 2004/108/EC of the European Parliament and of the Council

Reference to the harmonized standards, national standards and technical specifications:

- EN ISO 12100-1:2004
- EN ISO 12100-2:2004
- EN ISO 14121-1:2008
- EN ISO 13857:2008
- EN 953+A1:2009
- EN 60204-1 ed. 2.:2007
- EN 982+A1:2008
- EN 13898+A1:2009
- EN ISO 3746:2010
- EN ISO 11202:2010
- EN 61000-6-1 ed. 2:2007
- EN 61000-6-3 ed. 2:2007

Person authorised to compile the technical file: Ing. Petr Mašek

name, company address: **Pilous-pásové pily, spol. s r.o., Železná 9, Brno 619 00, VAT: CZ 60727551**

Person empowered to draw up the EC Declaration of Conformity: Ing. Petr Mašek

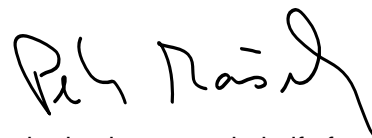
name, company address: **Pilous-pásové pily, spol. s r.o., Železná 9, Brno 619 00, VAT: CZ 60727551**

Manufacturer hereby declare that the machinery fulfils all the relevant provisions of this decree (directive) and simultaneously declare, that the machinery is in harmony with other decrees (directives) and/or relevant provisions with which the machinery complies.

This EC Declaration of Conformity is original EC Declaration of Conformity.

The last two digits of the year in which the CE marking was affixed: 11

Brno, 4.1. 2011



Person authorized to act on behalf of our company
Ing. Petr Mašek
Managing Director

