

PILOUS ®

INSTRUCTION MANUAL

ARG 260 S.A.F. • ARG 260 plus S.A.F.

ARG 300 S.A.F. • ARG 300 plus S.A.F.



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Dear customer,

thank you for purchasing our product. We wish you a lot of success with it in your business. Please pay close attention to the following instructions in order to ensure faultless operation of the machine.

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0. General

This instruction manual provides the user with assistance and information about the PILOUS metal-cutting band saw and the possibilities of use corresponding to its purpose. The instruction manual contains important instructions on a safe, adequate and economically efficient operation. Observing the operating instructions will prevent risks; the repair and outage time costs will be reduced and the machine reliability and life increased. The instruction manual contains instructions based on the valid national safety regulations and environmental standards. The instruction manual must be always 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 binding safety regulations in force in the user's country and at the service site, it is also necessary to observe the approved rules for safe and professional work.

Letter of Guarantee - Service

The Letter of Guarantee is a separate annex to the instruction manual.

Guarantee Period - see Letter of Guarantee Conditions for Maintenance of Claims under Guarantee

- Transport and storage of the machine in accordance with the instruction manual.
- Use and operation of the machine in accordance with the instruction manual.
- Connection of the machine to the power supply in accordance with the instruction manual.

The guarantee does not apply to:

- Violent and mechanical damage of the machine caused by interference of the user or other persons.
- Inevitable events (natural disaster).
- Damage to the machine during transport.
- Storage or installation of the machine in humid, chemical or any other inappropriate environment.
- Wear parts (see the Letter of Guarantee).

Potential claims concerning guarantee and after-guarantee repairs should be made by phone, post or e-mail to the address: see the Letter of Guarantee.

Note for the User:

The Seller is obliged to hand over to the User the Letter of Guarantee immediately with the purchase of the product. The Letter of Guarantee must be properly and legibly filled out and confirmed by the Seller's stamp, signature and date of purchase. The Seller is obliged to inform the Buyer about the use and handling of the product.

Data Necessary for Claiming Guarantee (After-Guarantee) Repair:

- Machine type
- Letter of Guarantee Number (identical with the serial number of the machine)
- Date of issue of the Letter of Guarantee

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 absolutely 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 lead to serious health and property damage! The safety instructions in this instruction manual are marked with safety symbols / danger spot signs.



**Warning: Dangerous spot -
Use the highest caution!**



Caution: Dangerous voltage!



Use protective goggles!



Health hazard by flying particles!



Use hearing protection!



Danger of injury by compression!



**Use boots or work shoes with a steel toe.
And with anti-slide soles.**



Danger of injury by cutting!



Use protective gloves!



Before using the bandsaw, read this instruction manual carefully and make sure you understand its content!

0.2. Scope of Use / Use According to Designation

The machine is intended solely for cutting (primarily metal) workpieces. Any other use is considered as inadequate to the purpose. The manufacturer is not responsible for damages arising from such use, the risk is borne by the user alone. The use complying with the purpose includes also observing the operating instructions and the check and maintenance conditions.

Examples of materials that can be cut: structural steel cementing steel nitriding steel free-cutting steel heat-treated steel roller bearing steel spring steel tool steel high-speed steel cast steel cast iron copper brass aluminium plastics.

Consider the recommendations for use as prescriptive values. In case of special cases, consult the manufacturer.

0.3. Requirements on operators

The machine may only be operated by persons that have been appropriately trained and instructed in safety at work!

The machine may only be operated if it is in perfect condition with respect to technical safety. The user is obliged to check the machine for visually detectable damages and faults at least once per shift. Immediately report to your manager any damages and faults on protective devices and changes in the operation of the machine that threaten safety. No safety devices may be removed, moved, put out of operation or changed during the machine operation. Otherwise any warranty claims shall be null and void! If any safety device has to be removed during operation or maintenance, secure the main switch in the „OFF" position by a padlock or disconnect the machine from the mains and secure it against restart.

- Remove loose parts of clothes, cover long hair.
- Make sure that all other persons stand or move at least 2 meters from the saw blade, protect them from flying chips and prevent harm to them in case the saw blade breaks.
All persons helping you at the site must be made familiar with all the safety rules.
- The safety rules must be provided on a visible place at the site.
- Keep hands at a safe distance from the saw blade; never adjust the device when the motor is running. Switch off the motor and secure it against restart before you start handling the saw blade.



Only persons with adequate electrician qualifications are allowed to open protective covers of the electrical equipment and to work on it.

0.4. Machine requirements - Safety devices

Danger of Injury!



**No cover on the saw blade in the cutting area! High risk of injury in the operating area of the arm! Before you open protective devices, wait until the saw blade and the grinding wheel stop.
Never use the sharpener when you are tired, exhausted, under the influence of medicaments, drugs or alcohol!**

Horizontal metal band saw is a cutting machine equipped for saw blade cutting. In order to complete the manufacturing process, the grinding wheel must reach the saw blade in the machining area. You can install the protective covers against contact with the saw blade only outside the machining area.

0.5. Protective covers

The saw blade and its wheels are protected against contact outside the machining area. You can remove protective covers only if the MAIN SWITCH is turned off and secured against restart or if the machine is disconnected from the mains and the saw blade is still. Before leaving the band saw, all covers must be closed. The protective cover of the arm and the wheels with the saw blade are secured by an end switch. If the covers is not completely closed, none of the machine's drives will start.

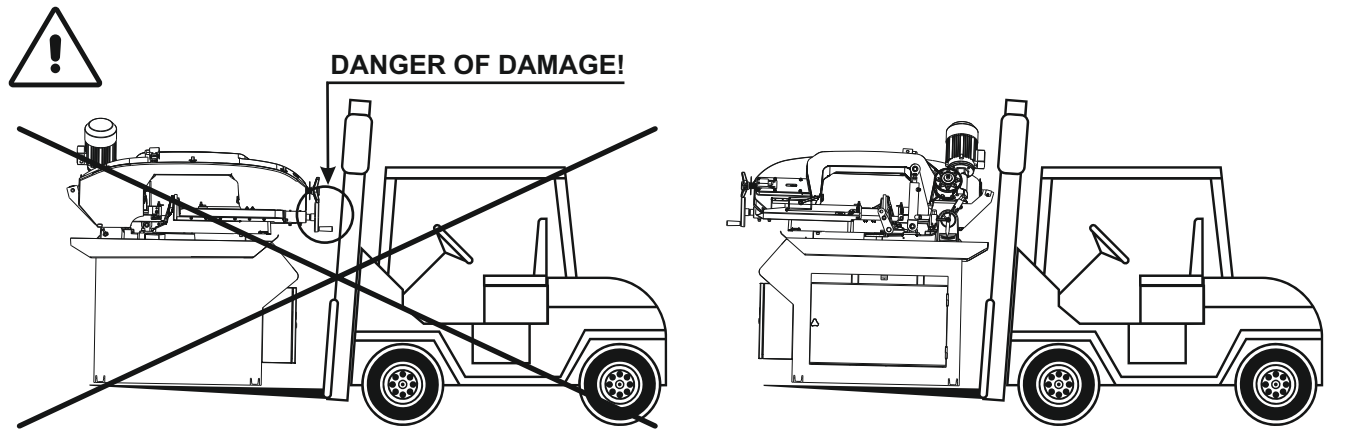
To stop the machine in case of emergency, press TOTAL STOP button. You can put the machine back to operation only after you manually unlock the switch by turning it clockwise. Fixed and movable bars of guide heads are fitted with solid protective covers that protect the area outside the machining area.



Manual cleaning and removal of waste when the machine is working or running down is prohibited. A first-aid kit must be available at the workplace. You have to wear suitable work clothes, shoes and adequate protective equipment (eye protection, hearing protection, gloves, steel-toed work shoes) at work. Observe valid health rules concerning the air quality at the workplace.

1. Transport and Storage

You can transport and lift the machine only with a forklift. Slide the forks under the machine base from the back to prevent damage; see the picture. When handling the machine with a forklift, always make sure that the machine is balanced on the forks.



You can transport and lift the machine only with a forklift. THE USE OF A CRANE PROHIBITED!

1.1. Surface Protection

Machine parts are protected against corrosion by powder coating or a primer and two-component polyurethane varnish. Sliding surfaces are coated with anti-corrosive oil. Surfaces of other parts and components of the machine are treated by galvanization or blackening.

1.2. Packing

The machine is supported on wooden beams, which provide a space of approximately 100 mm from the ground for the purpose of the transport and loading with a forklift. The machine is packed in a stretching foil that protects it against weather influence during transport.

Standard accessories:

- 1 pc. metal saw blade, bimetal M42 (mounted),
- 1 pc. band saw instruction manual,
- 1 length stop.

1.3. Disassembly/Repacking

Disconnect the machine from the mains empty and clean the metal chip tank and the coolant tank clean the machine apply anticorrosive oil on the sliding surfaces before the transport, unscrew the filling cap from the hydraulic unit and replace it with a transport cap, see section 7.5.2. raise the machine and support it by wooden beams observe the distance of approximately 100 mm from the ground for the transport with the forklift make sure that all protective covers of the machine are in place and fastened add the machine accessories.



Caution: used coolants belong to the category of special waste!

Only a person with adequate electrician qualifications can disconnect the machine from the mains!

1.4. 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 that you contact a specialist waste disposal service.


















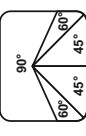






2. Technical Data

Machine noise - measured in conformity with ČSN EN ISO 3746:2011

The acoustic pressure level at the workplace: 76 dB (A), acoustic power level: 91 dB (A).

The measured values exceed the value specified in the Government Regulation No. 176/2008, section 1.7.4.2, article u) and therefore ear protectors must be used during the machine operation. The measurement was carried out while the machine was in a steady state and the saw blade speed was 80m/min. During the operational state with a technical load, the most frequently used technological process was measured. Noise levels measured on the machines may vary depending on the type of cut material, saw blade speed and other factors.



PILVOUS 		ARG 260 S.A.F.	ARG 260 plus S.A.F.	ARG 300 S.A.F.	ARG 300 plus S.A.F.
MAIN MOTOR		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 MOTOR		400 V, 50 Hz 0,05 kW	400 V, 50 Hz 0,05 kW	400 V, 50 Hz 0,05 kW	400 V, 50 Hz 0,05 kW
HYDRAULIC UNIT MOTOR		400 V, 50 Hz 550 W	400 V, 50 Hz 550 W	400 V, 50 Hz 550 W	400 V, 50 Hz 550 W
SAW BLADE SPEED		15-90 m/min	15-90 m/min	15-90 m/min	15-90 m/min
CUTTING ANGLE RANGES	[mm]	 90°  45°  60°	 90°  45°  60°	 90°  45°  60°	 90°  45°  60°
	∅	260	260	300	300
	a	185	185	255	290
a x b	125 x 200	125 x 200	125 x 200	150 x 240	150 x 240
ARM SWING		300x200 185x200 125x120	300x200 190x100 185x200 125x120	375x190 240x160 150x150	375x190 240x160 240x160 150x150
SAW BLADE SIZE		2880x27x0,9	2880x27x0,9	3150x27x0,9	3150x27x0,9
SAW BLADE RUNNER WHEELS DIAMETER		310 mm	310 mm	355 mm	355 mm
VICE OPERATING HEIGHT		910 mm	910 mm	910 mm	910 mm
OIL IN THE HYDRAULICS		Hydraulic oil Olea OPTIMA HV 46	Hydraulic oil Olea OPTIMA HV 46	Hydraulic oil Olea OPTIMA HV 46	Hydraulic oil Olea OPTIMA HV 46
COOLANT TANK		approximately 15 litres	approximately 15 litres	approximately 15 litres	approximately 15 litres
MACHINE WEIGHT		480 kg	580 kg	550 kg	690 kg

3. Installation

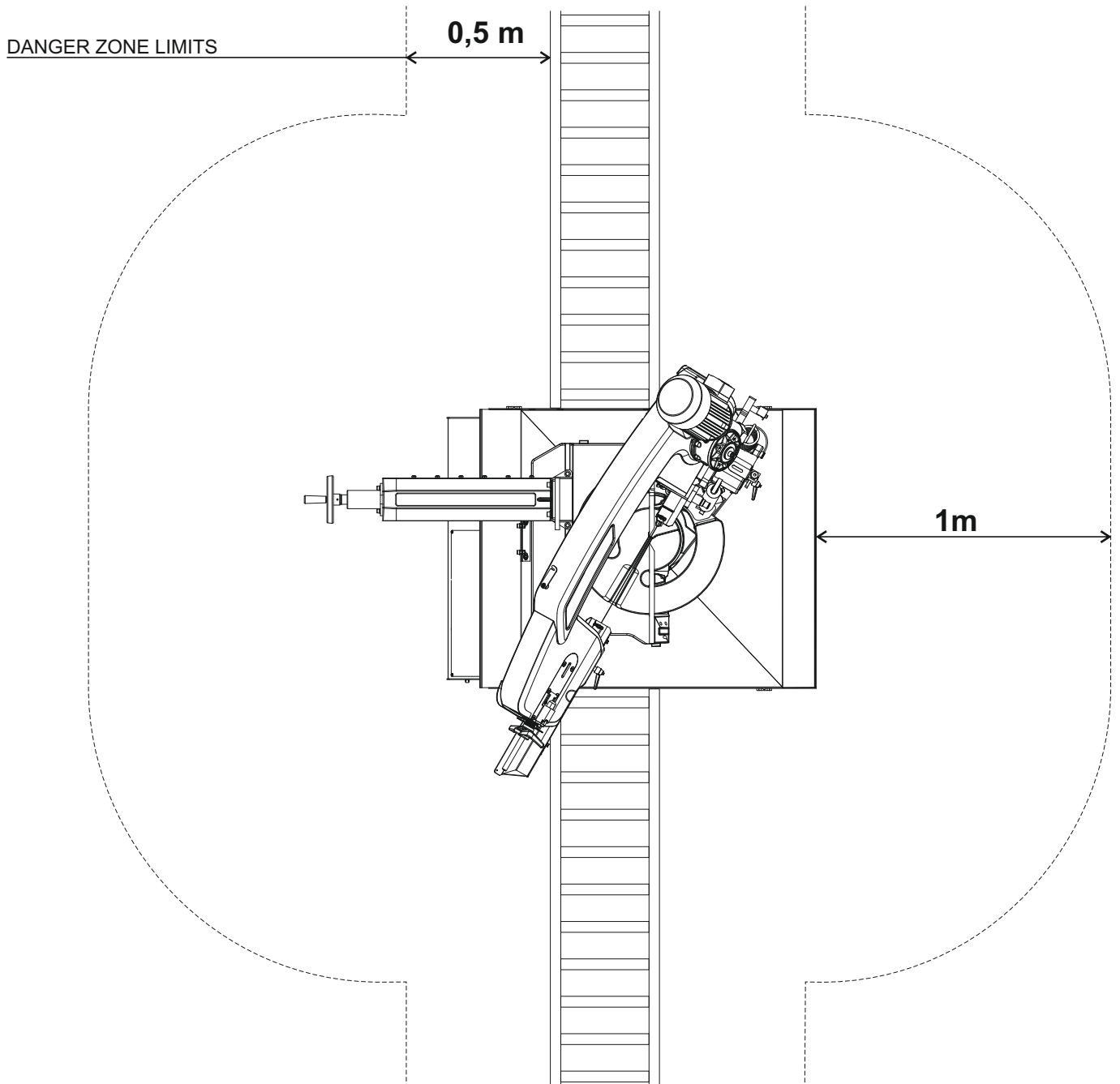
3.1. Space Requirements

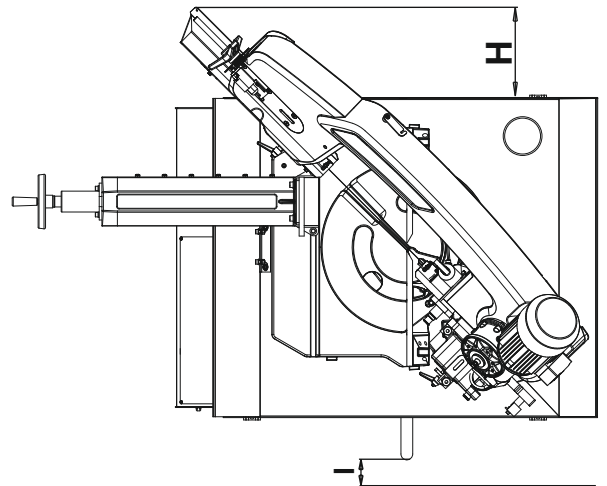
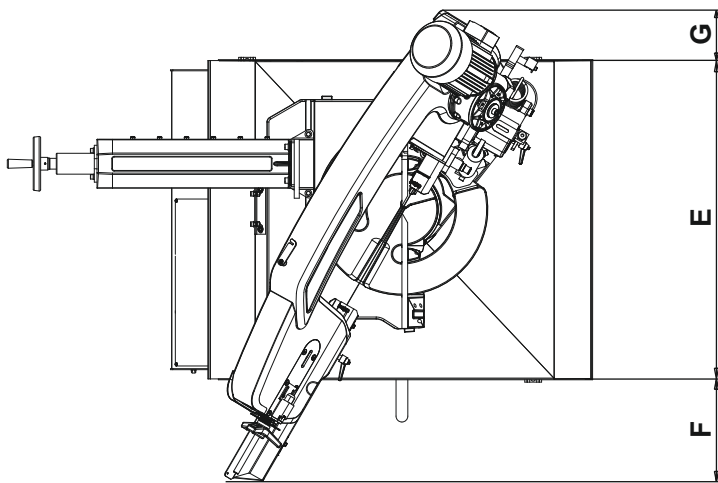
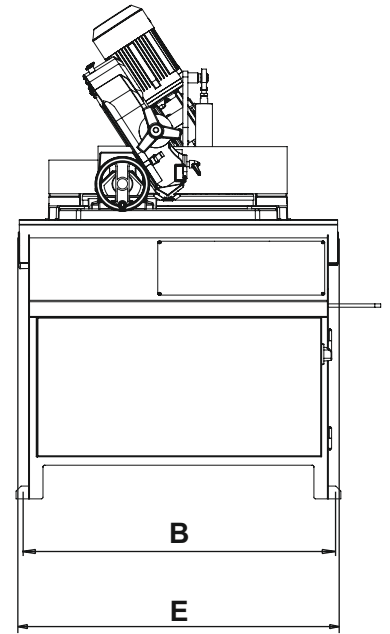
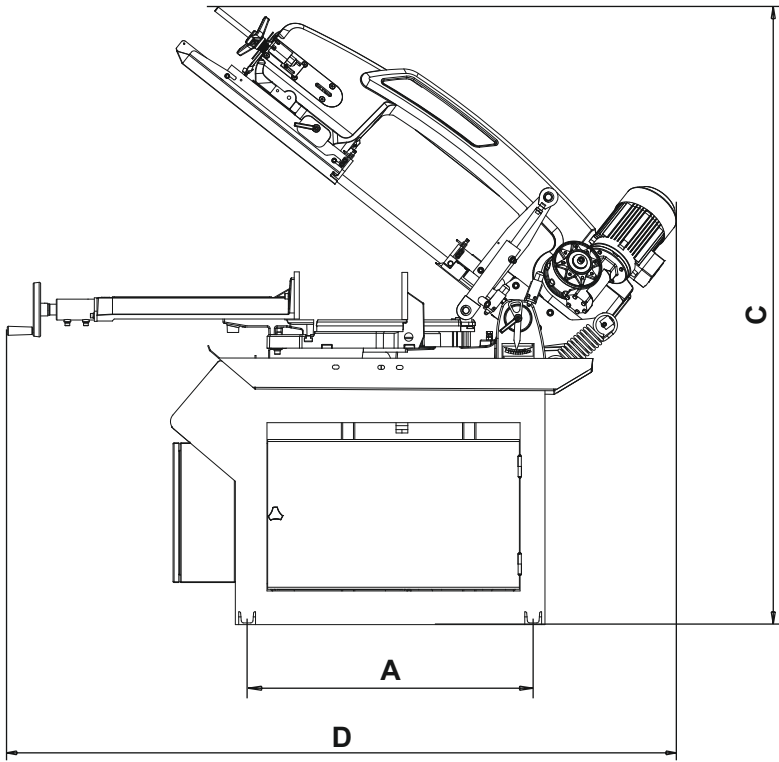
You can install the machine on any suitable and even floor (concrete) in a factory hall. Observe the allowed floor load. The machine should be aligned using the underlay sheets under the base anchors (not included in the shipment).

While preparing the cutting, the operating staff is allowed to move around the machine only when the machine is not running. When the machine is running, the operator has to stay only at the control panel so that he/she is able to switch off the machine any time. The operator must also ensure that no other persons are present in or near the working area of the machine. No unauthorised personnel may enter the dangerous zone. To prevent injury, the danger zone must also be level and free from any foreign objects and obstacles.

Recommendations/requirements:

- Allow for sufficient space for the feeding and removal of the workpiece and the machine maintenance - the operator's working area should be delineated at 1 m minimum around the machine and 0.5 m around the roller conveyors.
- In order to ensure safe handling of workpieces and protection of the space behind the cut from falling cut-off pieces, one or more roller conveyors must be installed, possibly a container for falling cut workpieces.
- Install a lift mechanism for heavy workpieces.
- Ensure proper lighting at the workplace.





	ARG 260 S.A.F.	ARG 260 plus S.A.F.	ARG 300 S.A.F.	ARG 300 plus S.A.F.
A	850	850	850	850
B	945	945	945	945
C min	1470	1470	1550	1550
C max	1840	1840	1980	1980
D min	1520	1520	1870	1880
D max	1970	1990	2250	2260
E	951	951	950	950
F	300	300	425	425
G	150	150	310	310
H	x	270	x	340
I	x	x	x	130

C min - the arm is lowered
 C max - the arm is raised

D min - the arm is lowered, the vice is closed
 D max - the arm is raised, the vice is opened

3.2. Removal of Temporary Transport Beams and Fixation of the Machine

Use a pallet truck to lift the machine and place it directly on the desired location in the workplace. Unscrew the bolts that hold the machine in place and remove the transport beams. Lift the machine, remove the beams and lower the machine onto the floor. Level the machine by laying metal sheets under its legs, possibly anchor to the floor. Remove the anticorrosion film and dust from sliding surfaces and apply oil. Ensure connection to the mains (see section 3.4.). Pour the coolant (maximum 15 litres) into the tank; the fluid will gradually flow into the container in the base. The hydraulic unit is fitted with two filling holes that are covered by red transport caps during the transport (see section 7.5.2.). The cap that is more accessible to the operator has to be removed and replaced by a filling cap, otherwise a risk of making the entire system inoperable arises, along with the risk of pump damage.



When handling coolants, risks linked to hazardous substances cannot be avoided. Observe the national norms and recommendations and manufacturer's or your company's operating instructions related to safe handling of coolants.

3.3. 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 air temperature must not exceed + 35°C within 24 hours.

+ 35°C. In temperatures below + 5°C the conventional coolants should be replaced by coolants designed for respective temperatures. In addition to that, replace the oil in the hydraulic unit for a less viscous one.

3.4. Connection to the mains






Such operations must be carried out only by persons with electrician qualifications!

Make sure that the grid voltage, the voltage protection and the connection voltage comply with the power requirements specified in the point 2. Technical parameters. Only current protection of S characteristics can be installed (for a frequency converter). When connecting the machine to the mains (3 NPe 50 Hz, 400 V, TN-S), **mind the colour coding of wires carefully: L1 brown, L2 black, L3 grey, N blue, PE yellow-brown. Improper connection of the neutral or PE wires may lead to damage of the electrical equipment or to an electric shock!** Connect the power cable to a protected **16 A** socket, in case of direct connection to the mains it is necessary to fit the supply with a lockable MAIN SWITCH. If the motor rotates in an incorrect direction, swap the conductors **L1** brown and **L2** black on the junction box.



Failure to observe the aforementioned may lead to incorrect rotation of the bandsaw and the coolant pump. Danger: Damage to the machine!

3.5. Nameplate

	PILOUS 		
MANUFACTURER	Producer Pilous-pásové pily, spol. s r.o.		EAC CE
MANUFACTURER'S ADDRESS	Address Železná 9, 619 00 Brno, CZ		
MACHINE MODEL	Model ARG 260 plus S.A.F.	Year 2019	YEAR OF MANUFACTURE
SERIAL NUMBER	Serial No. 17/19/0067	kg 580kg	MACHINE WEIGHT
TOTAL WATTAGE	P 2.7kW	I 6.2A	RATED CURRENT
OPERATING VOLTAGE	U 3x400V/50Hz	 400/24	CONTROL VOLTAGE
SAW BLADE SIZE	Blade 2880x27x0,9		
VOLUMETRIC FLOW	 Q 4,7 dm³/min	p_{max} 6 MPa	MAXIMUM SYSTEM PRESSURE

The data are only illustrative

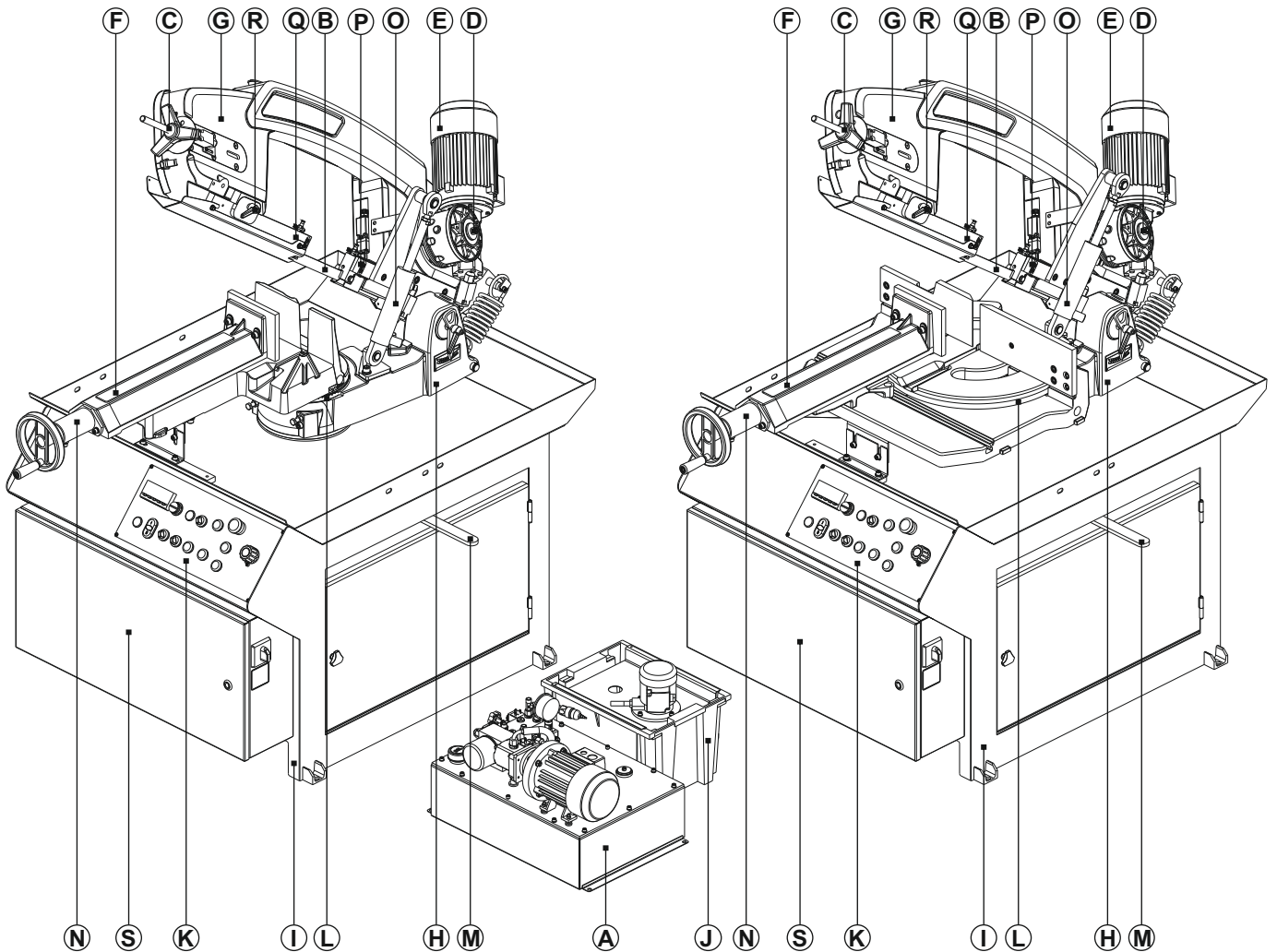
4. Machine description

Horizontal metal-cutting band saws allow for cutting of a wide range of different materials. Pressing a single switch will execute the complete cutting cycle – workpiece clamping, saw blade start, cutting, saw blade stop, arm uplift to the upper (adjustable) position and vice unclamping. In connection with the hydraulic feed of the saw blade into the cut, these measures significantly increase cutting productivity, particularly as regards solid materials. All functions can be controlled separately. The feed of the workpiece is manual. The vice pressure control is included in the basic version of the machine. As the cutting tool, a welded saw blade is used, which is tensioned mechanically via a blade wheel. The saw blade is driven by the blade wheel, which is driven by a single-speed motor via a worm-gear unit. In the machining zone, the saw blade is guided through the saw blade guide heads. Outside the machining zone the saw blade is protected by moving and fixed guards. The standard equipment of these machines includes a frequency converter, which enables a continuous saw blade speed control within the range of 15-90 m/min. The optimum setting of the saw blade speed substantially increases the productivity of the machine, cutting accuracy and the saw blade service life.

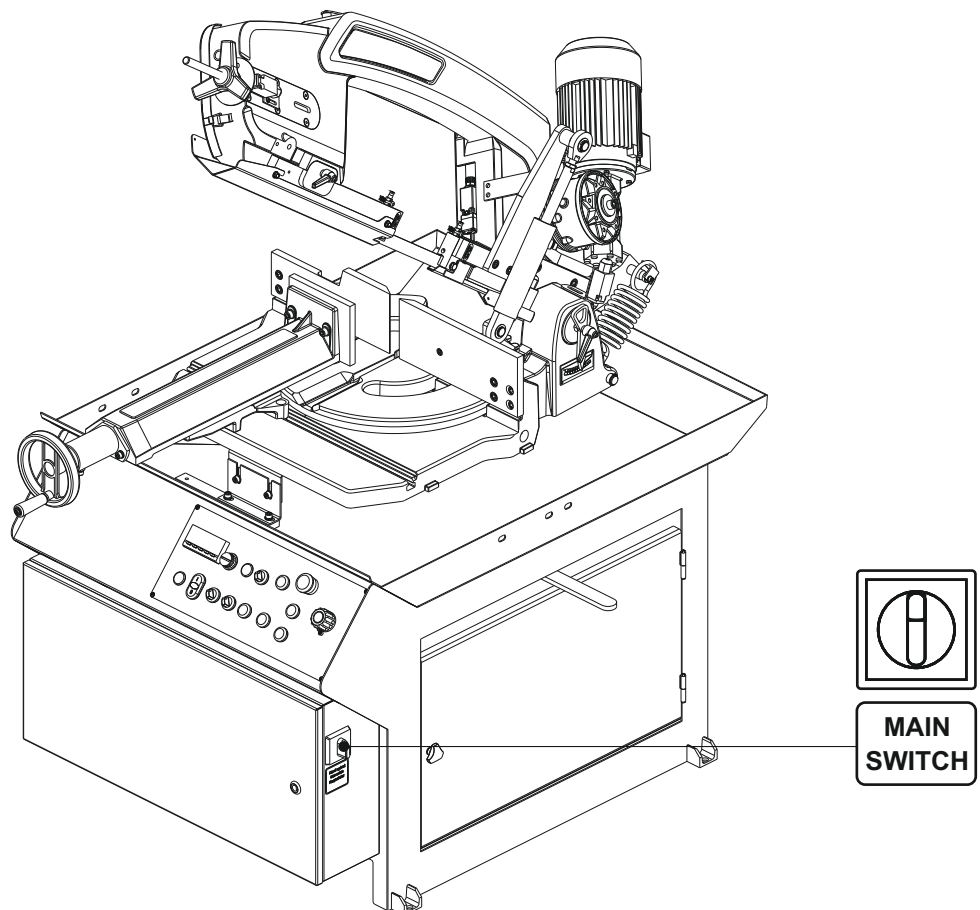
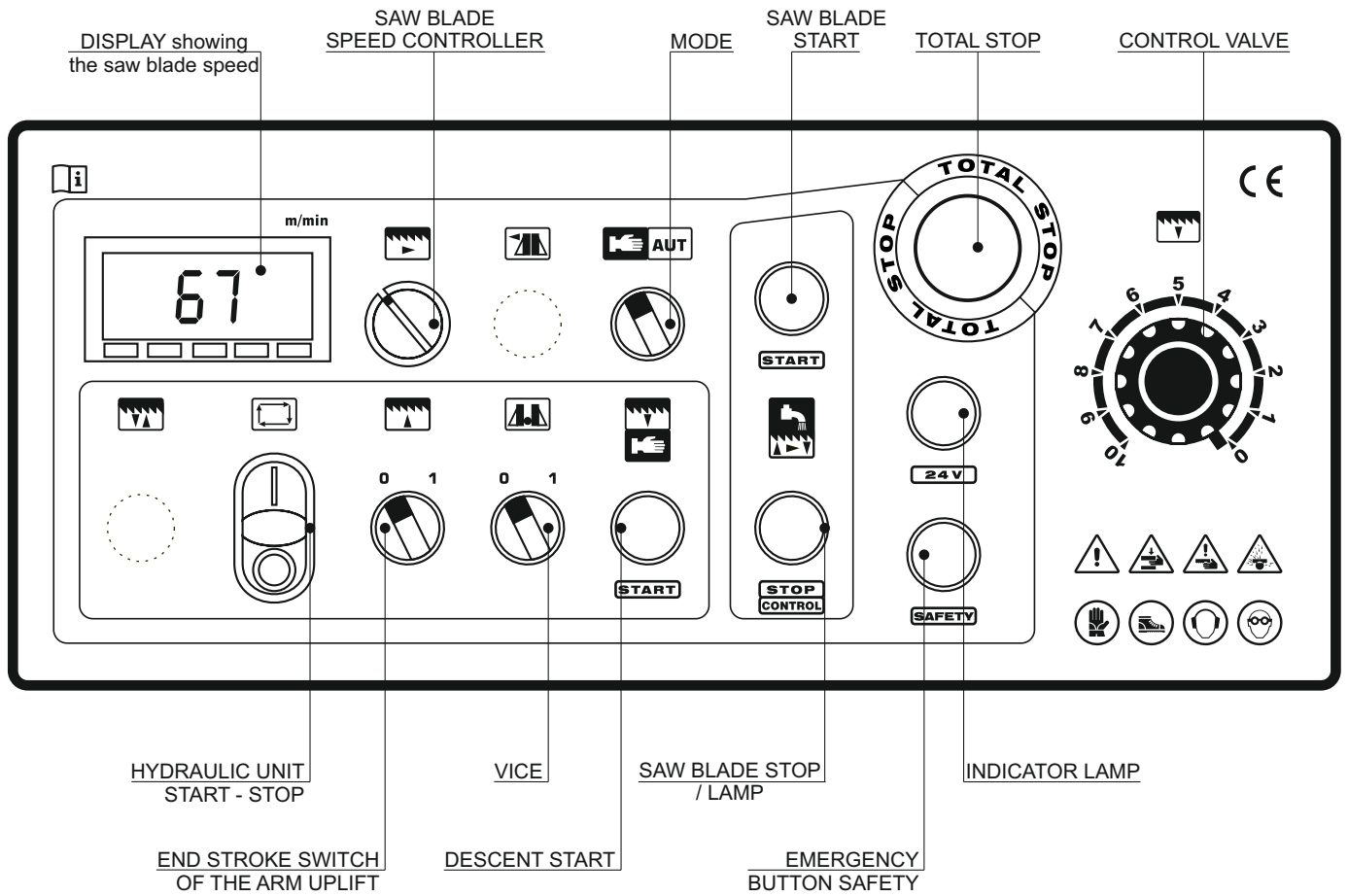
A hydraulic unit	H turntable	N hydraulic vice cylinder
B saw blade	I base	O hydraulic cylinder of the uplift
C saw blade tensioning	J coolant tank with a pump	P fixed bar
D gearbox	K control panel	Q movable bar
E motor	L angle scale	R clamping lever movable
F vice	M arm swing locking lever	S bars switchboard
G arm		

ARG 260 S.A.F., ARG 300 S.A.F.

ARG 260 plus S.A.F., ARG 300 plus S.A.F.



4.1. Control panel



Basic functions

MAIN SWITCH



ON

On

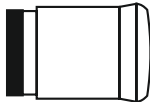
OFF

Off



Before you start the saw blade motor, always make sure that the saw blade is not in contact with the workpiece at the point of cutting.

TOTAL STOP



Use for emergency stop of the saw blade motor, coolant pump and hydraulic unit motor (i.e. the whole machine). You can put the machine back to operation only after you manually unlock the switch by pulling or twisting!

MODE

This switch enables switching between modes:



AUT

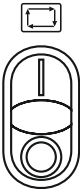
AUTOMAT - closed automatic cutting cycle



M

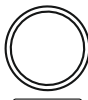
MANUAL - allows for independent control of all functions

HYDRAULIC UNIT START - STOP



When the MAIN SWITCH is on, the HYDRAULIC UNIT - START button serves for activating the electrical system of the machine and at the same time for starting the hydraulic unit. The white indicator lamp between the buttons indicates that the device is on.

SAW BLADE START/STOP



START

Green START button

Press the button in **AUT** mode to start the operating cycle (clamping the material, start of the saw blade engine and the coolant pump, hydraulic arm feed towards the cut, lifting the arm into the specified position, switching off the saw blade engine and the coolant pump, vice release). When starting the saw blade motor, the arm has to be raised above the switching track of the limit switch that ends the cut. Otherwise the motor will not start.



STOP
CONTROL

In **MANUAL** mode, the saw blade and the cooling emulsion pump will start. When starting the saw blade motor, the arm has to be raised above the switching track of the limit switch that ends the cut. Otherwise the motor will not start. The vice must be clamped.

Red button STOP - stops the saw blade motor and the coolant pump.
The button is red-lit - fault in the saw blade drive (see section 9)

END STROKE SWITCH



0 1

The switch in position **1** automatically ascends the arm to the upper position after the cut.

The switch in position **0** leaves the arm after the cut in the lower end position. This enables to set the height of the band saw arm (see section 4.9.).

If the arm is in the lower position, or if the arm is between cuts, turn the switch into position **1** in order to ascend the arm to the upper position.

VICE (only in manual mode)



This switch opens or closes the jaws of the vice.

DESCENT START (only in manual mode)



Press the button to start arm descent. The vice must be closed (switch position 1).



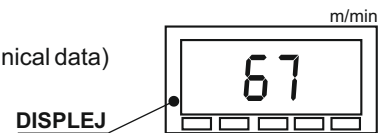
SAW BLADE SPEED CONTROLLER



You can change the cutting speed using a saw blade speed controller (using a frequency converter) on the control panel.



The display continuously shows the selected value (see section 2. Technical data)



EMERGENCY BUTTON SAFETY



If any of the safety features becomes activated during the operation - saw blade cover switch, or the TOTAL STOP button, the yellow-backlit SAFETY button will light up and the control and power circuits of the machine will disconnect. Upon the machine restart, it is necessary to eliminate the cause of disconnection (close the cover, unblock the TOTAL STOP button) and press the SAFETY button.

Each time you start the saw, turn on the MAIN SWITCH and the TOTAL STOP button, the indicator lamp SAFETY must be active. Then press the lamp in order to turn it off, which will allow you to start the hydraulic unit and use the saw. Non-active indicator lamp indicates a fault (see section 9.).

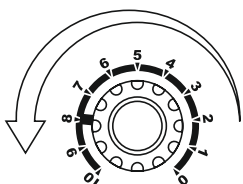
INDICATOR LAMP



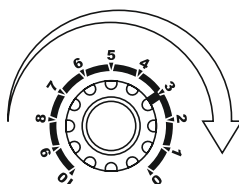
Indicator lamp indicates that the CONTROL PANEL is under power supply of 24 V.

4.2. Control Valve - Saw Blade Feed to the Cut

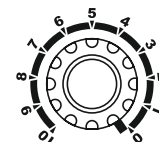
The control valve allows for a continuous setting of the velocity of saw blade feed towards the cut or stabilizing the saw arm in any position by mechanical closing. The optimum value of descent can be determined very easily by ear. The saw blade movement must be noiseless, free from vibrations. Such a state can be achieved by reducing or increasing the pressure force (by the velocity of saw arm descent). The prerequisite of setting the optimum pressure is selecting the correct saw blade velocity and the optimum size of the saw blade teeth.



ACCELERATION
SAW ARM DESCENT



DECELERATION
SAW ARM DESCENT



STOP
SAW ARM DESCENT

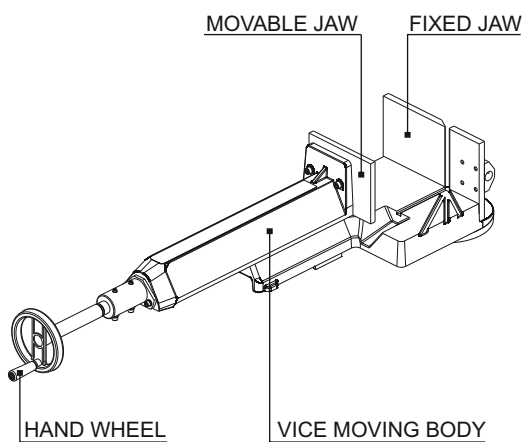
4.3.Vice

The hydraulic cylinder between the fixed clamping jaw and the jaw on the moving part of the vice facilitate workpiece clamping. Do not use the hydraulic cylinder to align long workpieces in the vice! Such operation has to be carried out only manually or by other means. You can set the clamping force depending on the type of material to be cut on the hydraulic unit using the VICE PRESSURE CONTROLLER (see section 4.8.1.).

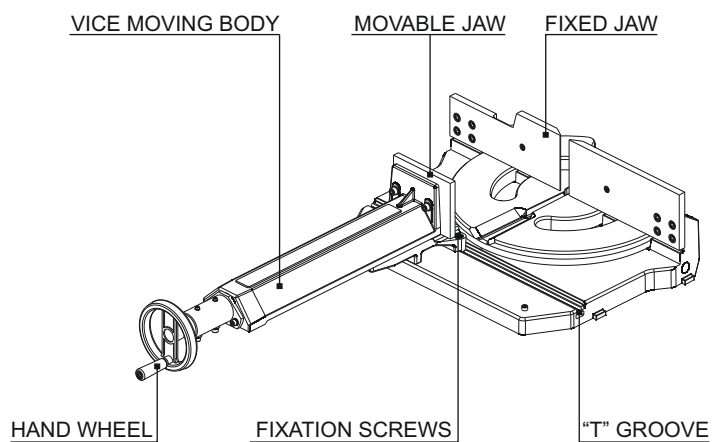
Workpiece clamping procedure:

Raise the arm above the presumed cross-section of the workpiece to be cut. Insert the material between the clamping jaws and align it parallel to the fixed clamping jaw and set the desired cut length. Slide the clamping jaw of the movable vice to approximately 10 mm off of the material. The clamping stroke of the hydraulic cylinder is 15 mm. Depending on the mode of the saw - AUTOMAT, or MANUAL, clamp the material. **Check whether the workpiece is properly clamped, otherwise you risk its ejection during cutting.**

ARG 260, 300 S.A.F.



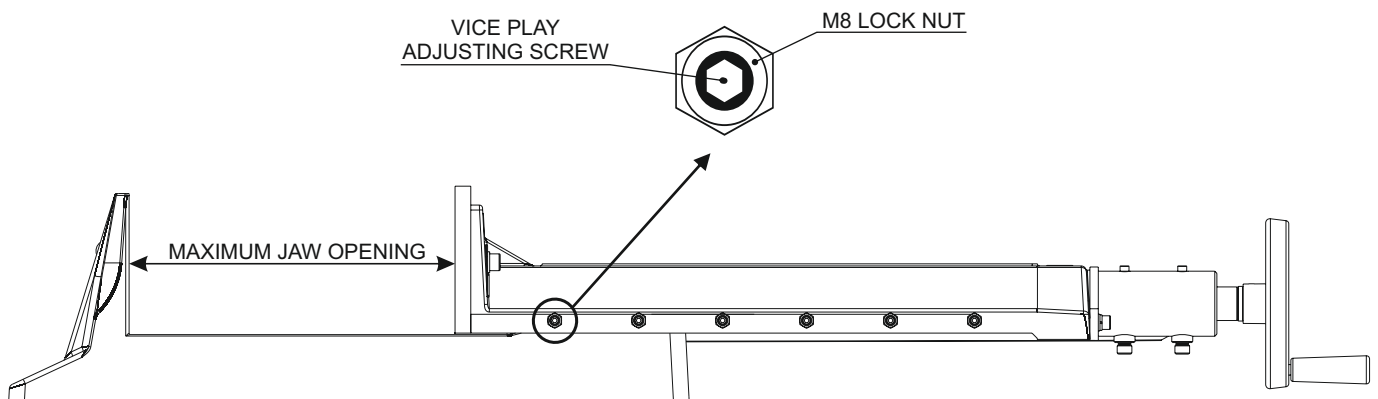
ARG 260, 300 plus S.A.F.



4.3.1. Adjustment Procedure - Lateral Play of the Vice

Adjust the lateral play of the vice in the following way:

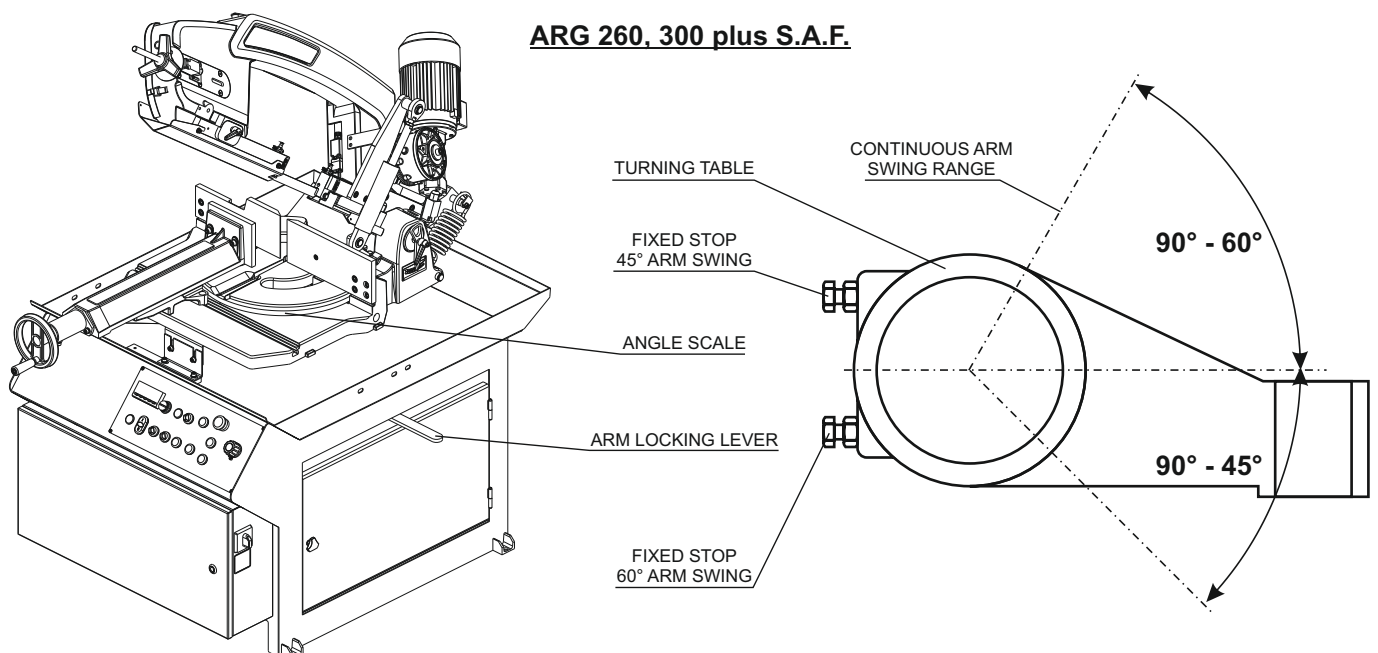
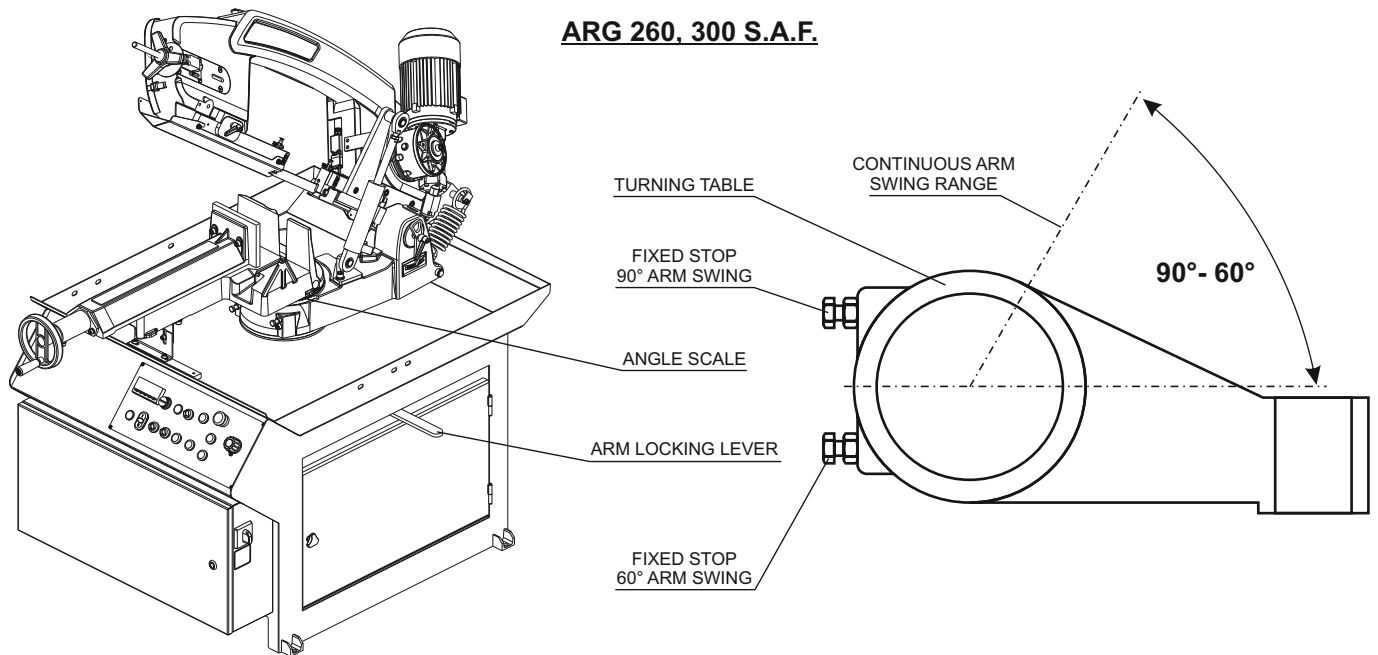
- ① Open the movable vice jaw to maximum extent.
- ② Loosen the M8 LOCK NUTS and loosen the M8 VICE PLAY SETTING SCREWS.
- ③ Carefully tighten the first VICE PLAY SETTING SCREW (right at the movable clamping jaw) up to a point, where you feel that the screw (through a supporting ball) rested on the bar that pushes to the dovetail.
- ④ In this position, tighten the screw with an M8 LOCK NUT against loosening.
- ⑤ Use the handwheel to move the VICE MOVING BODY, so that the next VICE PLAY SETTING SCREW is in the same position as the previous screw.
- ⑥ Repeat points, ③, ④, and ⑤ until the vice is completely closed and therefore adjusted. You can watch the video with instructions on www.pilous.cz.



4.3.2. Cutting Angle Settings

ARG band saws allow for both perpendicular cuts and cuts up to 60° . The band saws ARG 260, 300 S.A.F. allow for single-sided continuous cutting angle settings within 60° on the right. Band saws ARG 260, 300 PLUS S.A.F. allow for double-sided continuous cutting angle settings within 60° to the right and 45° to the left. The stop bolts facilitate a stable limit angle setting. Before you swing the arm, unlock the arm with the locking lever and after setting the desired angle, lock the arm again. The desired arm swing angle will subtract from the angle scale. By the band saws of the PLUS line, before you swing the arm, mind the correct vice positioning in relation to the desired swing angle in order to prevent a collision of the arm/blade with the vice. If there is a danger of collision, loosen the adjusting screws of the vice and move the vice in the T groove to the other side while the arm is raised, and lock the vice again. When swinging the arm of the ARG 260, 300 S.A.F., raise the arm to about 30 mm above the loading surface of the vice in order to prevent the collision of the saw blade with the vice loading surface. If using the band saw only for perpendicular cuts for a longer time, we recommend that you carry out a precautionary step and swing the band saw into the angle and back at least once a week, because the coolant acts aggressively, which can result in jamming of the arm in one position.

WARNING! When using the vertical vice while cutting the workpieces in HVP bundles, you can cut only at 90° .



4.4. Arm - Saw Blade Guidance

The saw arm is made of sturdy cast of grey cast iron, which guarantees outstanding stiffness during band tensioning. The saw blade is guided by two guide heads both behind and in front of the cut. The heads are fitted with eccentrically placed bearings and hardened steel blade guides that allow easier rewinding of the saw blade as opposed to wheel guidance. The fixed guide block is placed on a fixed guide bar and the movable guide block is placed on the movable bar. The moving guide block moves towards the cut material by 30-50 mm manually.



Danger of injury - no cover in the machining area!

4.5. Removal of Protective Housing

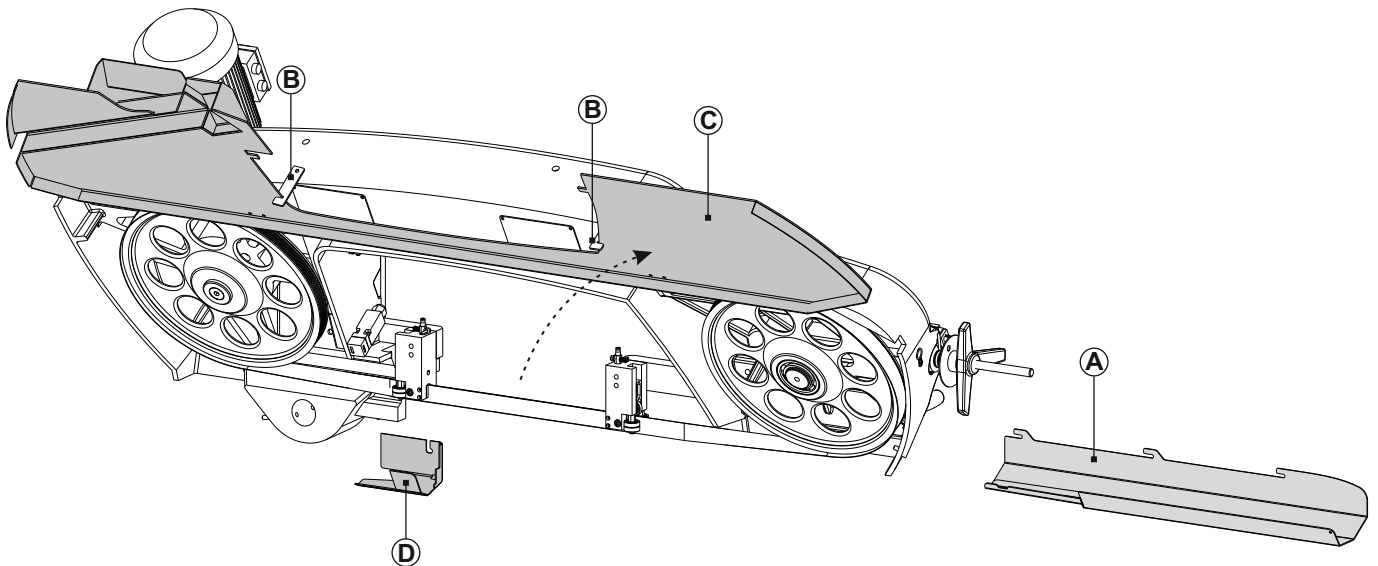


Caution! You can remove the protective covers only if the MAIN SWITCH is turned off and secured against restart or if the machine is disconnected from the mains.

Caution: Danger of injury by the sharp teeth of the saw blade. Use protective gloves. Do not reach between the wheels and the saw blade.

The MAIN SWITCH is turned on, the TOTAL STOP button is unblocked, the SAFETY button is not active. The cutting mode is set to MANUAL. If the arm is lower than approximately 20 mm above the fixed vice jaw, set the height of the arm uplift to its maximum (see section 4.9.) and switch the ARM UPLIFT SWITCH to position 0. Press the HYDRAULIC UNIT - START button. Switch the ARM UPLIFT SWITCH to position 1 and thus raise the arm to its upper position (see section 4.1.). Shut off the control valve of the damper cylinder (see section 4.2.). Start the arm descent by pressing the button START DESCENT. Lower the saw arm approx. 30 mm above the fixed vice jaw and using the CONTROL VALVE, secure it against descending. Switch off the POWER SWITCH and secure it against restart.

Unscrew the blade cover (D) and place it aside. Unscrew and slide out the cover of the front rod (A), place it aside and unlock the angled latch. Open the back cover (C) upwards and secure with latches (B). Use a reverse procedure to mount back the protective covers. Switch on the POWER SWITCH, or connect the machine to the mains. Then press the SAFETY and HYDRAULIC UNIT START button. The arm is now in an interposition between the limit switches, therefore it is necessary to switch the arm uplift switch into position 1 in order to unblock the interposition and allow the arm to ascend.



4.6. Replacement, Tensioning and Adjustment of the Saw Blade

A timely replacement of the saw blade is needed to achieve good cutting performance, surface finish quality and compliance with workpiece dimensions. Blunt saw blades cause high consumption of electrical power, scarf cuts and rough cutting surfaces. One of the decisive factors affecting the quality of the cut and the life of the cutting tool is the correct and sufficient saw blade tension.

Follow the instructions in section 4.5. in order to remove the protective covers. The machine is switched off and secured against restart, the arm is locked approximately 30 mm above the fixed vice jaw.

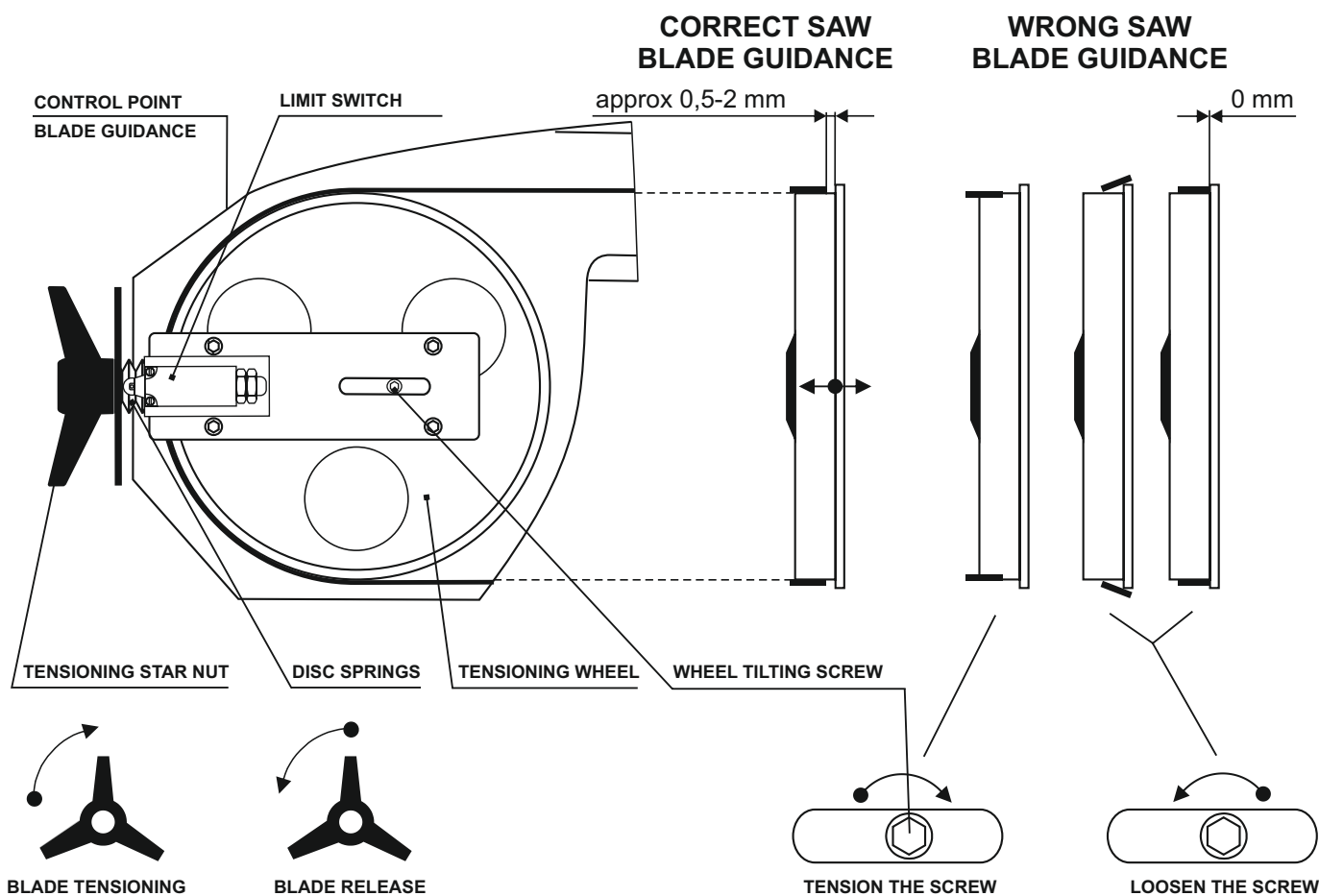


Caution! You can remove the protective covers only if the MAIN SWITCH is turned off and secured against restart or if the machine is disconnected from the mains.

Caution: Danger of injury by the sharp teeth of the saw blade. Use protective gloves. Do not reach between the wheels and the saw blade.

Use the tensioning star nut to release the wheel and the blade. Take the saw blade off of the moving wheels and push it off the guide heads. Insert the new saw blade in the guide heads. Place it on the blade wheels (you can control the position of the tensioning wheel by the tensioning star nut). Tighten the saw blade. **Tension the star nut, so that the disc springs are fully compressed (no light coming through)! In this way, you can achieve correct tensioning of the saw blade.** Install and close the protective covers of the saw blade. Turn on the MAIN SWITCH, press the SAFETY button and turn on the hydraulic unit. Switch to the MANUAL MODE and set the minimum saw blade speed by a SAW BLADE SPEED CONTROLLER. Press the START button of the saw blade to start the saw blade so that it turns approximately once of the full length. Switch off the MAIN SWITCH and secure it against restart. As described in section 4.5, remove the protective covers of the saw blade and check if the saw blade is correctly fitted on the guide heads and correctly installed on the blade wheels (see figure). The machine is also fitted with a control hole that allows you to check the condition of the saw blade on the wheels. The hole is covered by a cap.

If the saw blade is not properly set on the wheels, loosen the saw blade a little bit and use the wheel tilting screw to adjust the wheel tilt. **Tension the star nut, so that the disc springs are fully compressed (no light coming through)! Put back the protective covers of the saw blade, turn on the MAIN SWITCH, press the SAFETY BUTTON and the hydraulic unit. Carry out a saw blade trial run. Switch off the MAIN SWITCH and secure it against restart, remove the protective covers of the saw blade and once again check the placement of the saw blade on the wheels. Repeat the procedure, if required. Put back the protective covers of the saw blade, turn on the MAIN SWITCH, press the SAFETY BUTTON and the hydraulic unit. Carry out the cutting.**



4.7. Guide Heads Adjustment

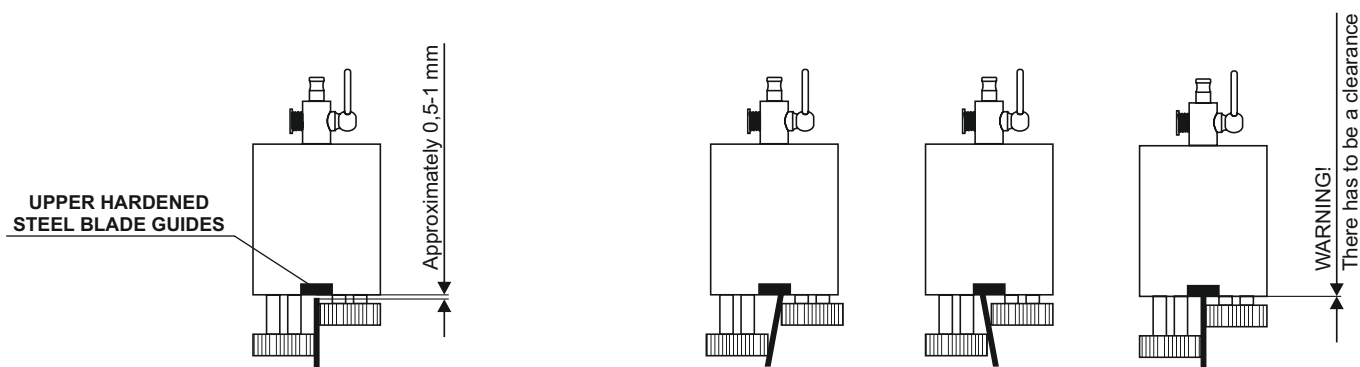
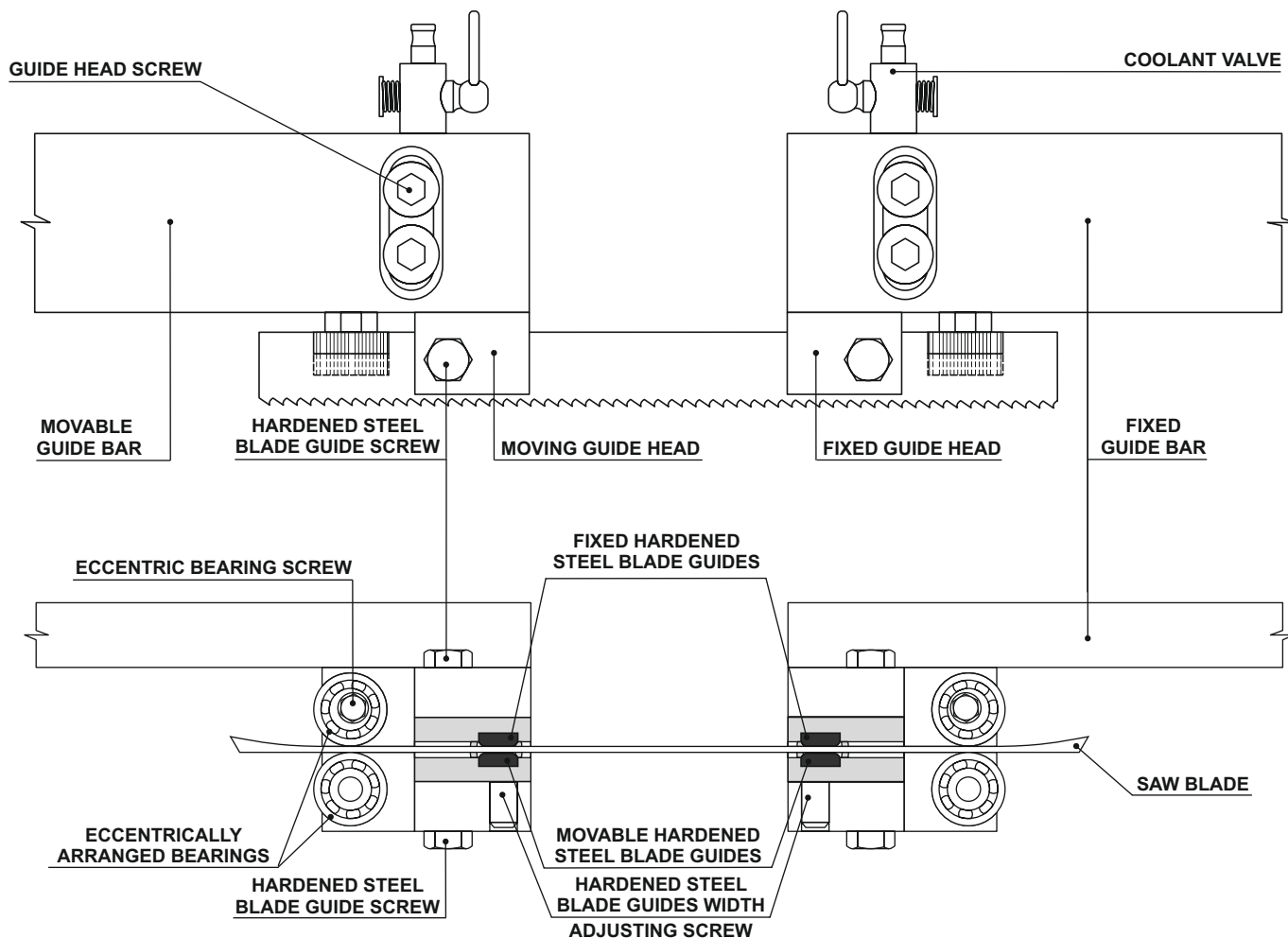
The correct setting of the bearings and the hardened steel blade guides in the guide heads substantially influences the saw blade life and the quality of the cut. The eccentrically arranged guide head bearings must be set in such a manner that the saw blade surface is parallel to the surface of hardened steel blade guides with a minimum play (clearance) between the plates and the blade.

Guide Head Setting Procedure

Follow the instructions in section 4.5. in order to remove the protective covers. The machine is switched off and secured against restart, the arm is locked approximately 30 mm above the fixed vice jaw. Set the movable guide head, so that the distance between the guide heads is approximately 20 cm. Disconnect the inlet hoses from the coolant valve. Loosen the tensioning star, take the saw blade off the wheels and push it off the guide heads. Unscrew the guide heads gradually from the fixed and movable bars, turn them by 180 ° (with bearings and hardened steel blade guides facing upwards) and screw back to the bars. Make sure that the guide heads are perpendicular to the guide bars and that the height of the guide heads is identical. If you find special washers between the guide head and the bar, make sure you place them back afterwards. Check the tightening of the fixed hardened steel blade guides. Insert approximately 30 cm of an old saw blade in the guide heads between the hardened steel blade guides and the bearings. Set the hardened steel blade guides using the width adjusting screw, so that the saw blade does not move between the guides without any play and jamming. When the saw blade has been adjusted, set the eccentrically mounted bearings in such a manner that the bearings do

not "cut" the saw blade, but at the same time you have to prevent too much space for the saw blade between the bearings. When the saw blade moves, the bearings are carried along by the saw blade. Check the tightness of all bolted joints. Unscrew the guide heads from the bars. Fit the saw blade on the wheels, check its correct alignment on the wheels and tension the saw blade. Install both guide heads on the saw blade in the space between the bars and adjust them in the correct position on the bars. You can achieve the correct guide head height in relation to the saw blade by lifting the guide heads, so that the upper hardened steel guide in the guide head is about 0.5-1 mm away from the upper edge of the saw blade. See the picture. In this way, the correct guide head height towards the guide bars is achieved.

Set the guide heads perpendicular to the bars and tighten them. If you fail to achieve perpendicularity, the saw blade will either keep sliding off or running into the wheels. Put back the protective covers of the saw blade, turn on the MAIN SWITCH, press the SAFETY BUTTON and the hydraulic unit. Carry out a saw blade trial run. Switch off the MAIN SWITCH and secure it against restart, remove the protective covers of the saw blade and once again check the placement of the saw blade on the wheels. Make a correction, if necessary - see section 4.6. Put back the protective covers of the saw blade, turn on the MAIN SWITCH, press the SAFETY BUTTON and the hydraulic unit. Carry out the cutting. You can watch the video with instructions on www.pilous.cz.

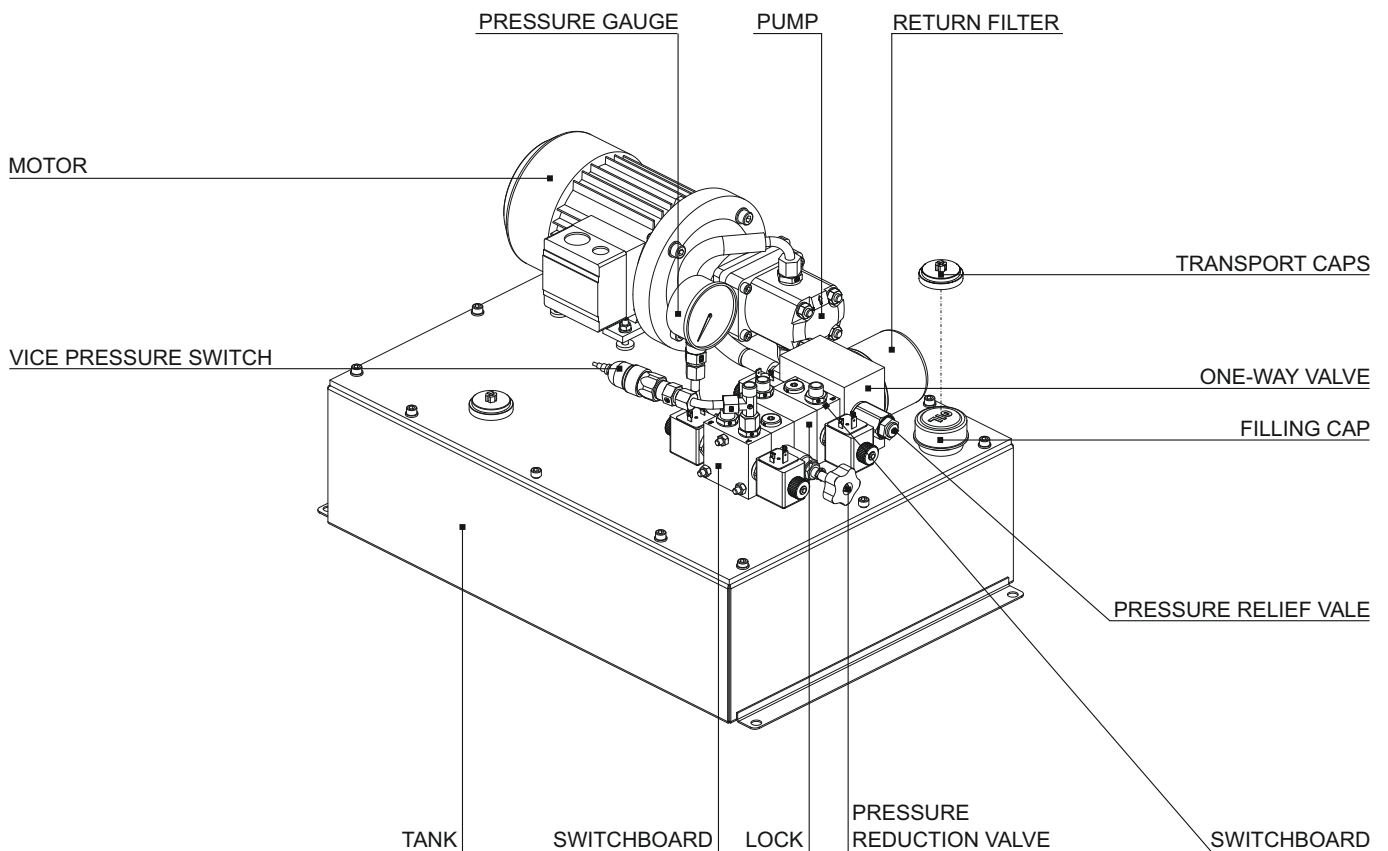


Correct saw blade guidance
to center between guide bearings

Incorrect saw blade guidance

4.8. Hydraulic Unit

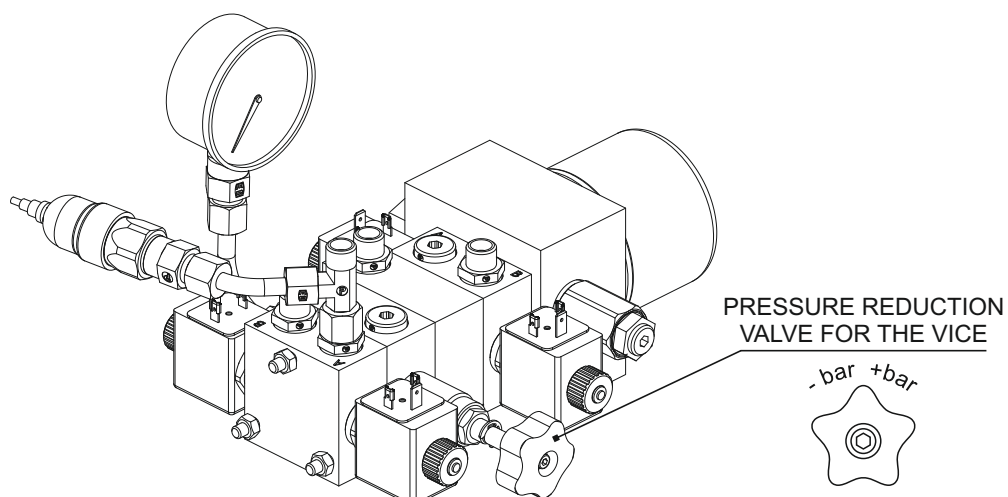
The hydraulic unit is installed in the machine base. It lifts the band saw arm, feeds the saw blade to the cut, and clamps and unclamps the vice. When the MAIN SWITCH is on, the HYDRAULIC UNIT - START button serves for activating the electrical system of the machine and at the same time for starting the hydraulic unit.



4.8.1. Vice Clamping Force Setting

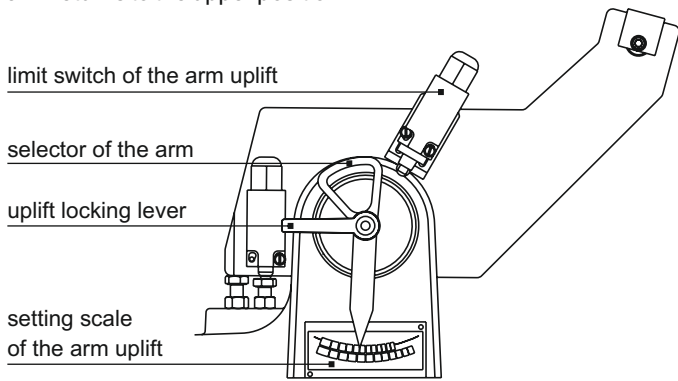
The hydraulic unit is fitted with a PRESSURE REDUCTION VALVE. It enables setting the required vice clamping force between 13 and 35 bar depending on the kind of the workpiece. Turning the PRESSURE REDUCTION VALVE to the left reduces the pressure, while turning it to the right increases the pressure (see picture). The specified pressure is shown on the pressure gauge.

If the pressure is set below the clamping force smaller than 13 bar, the safety PRESSURE CONTROLLER OF THE VICE does not switch on and the saw blade does not start.



4.9. Setting Band Saw Arm Ascent Height

This system enables the setting of the height of the saw arm ascent just above the workpiece. It is particularly important when the workpiece is being cut in series where it substantially reduces the cutting cycle time in comparison with the situation where the saw arm returns to the upper position.



Settings procedure:

The arm is located in the lower end position. Loosen the locking lever of the arm uplift selector and set the required uplift on the setting scale (approximately 5-10 mm above the section of the cut material) and tighten the locking lever again.

The arm is lifted above the lower end position. Switch the machine to MANUAL mode. Switch the saw arm end stroke switch to position 0. Press the button START DESCENT. This opens the valve and the arm will descend to the lower end position. Loosen the locking lever of the arm uplift selector and set the required uplift on the setting scale (approximately 5-10 mm above the section of the cut material) and tighten the locking lever again.

4.10. Cooling System

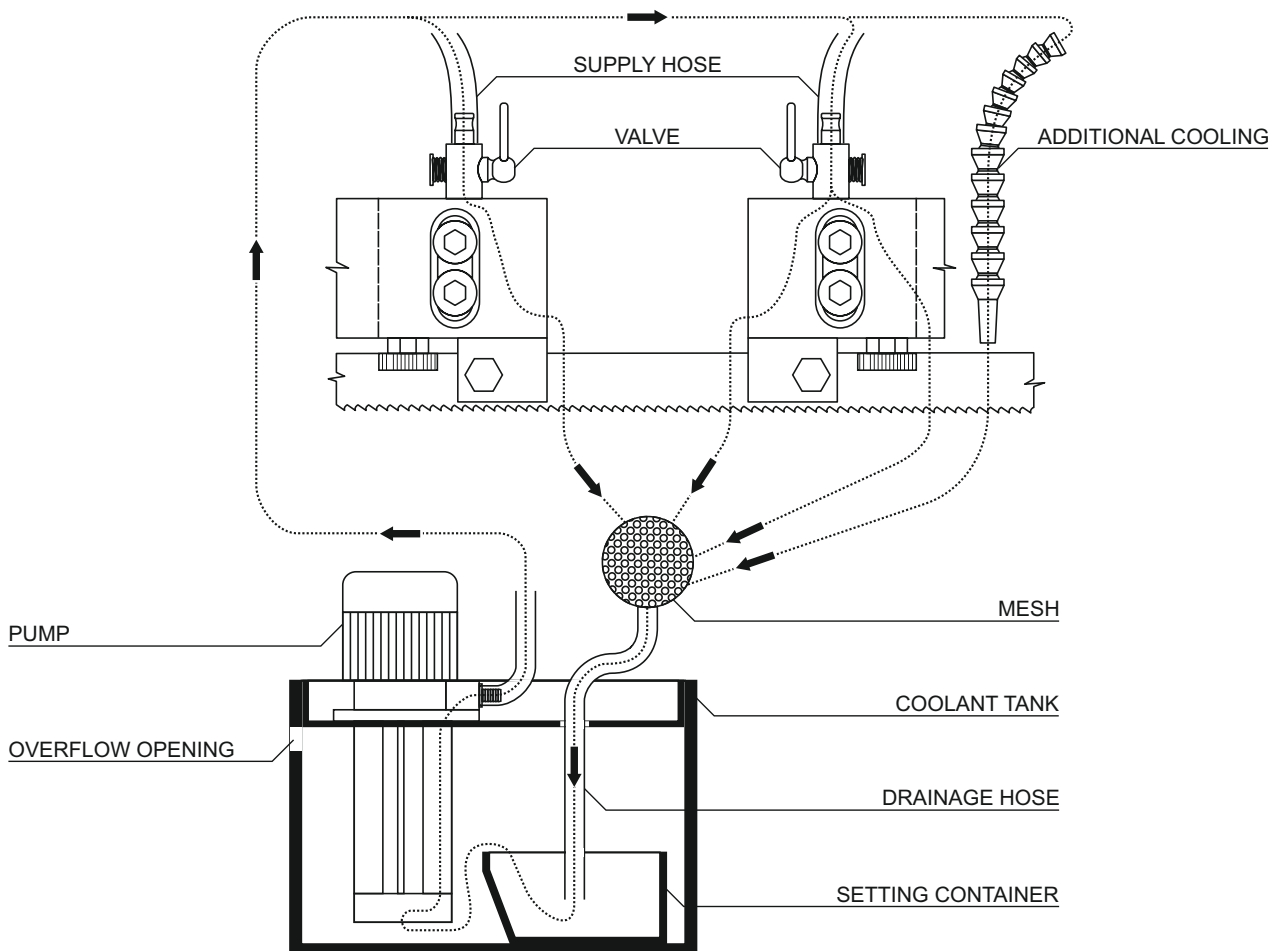
The pump and the coolant tank, which are mounted in the machine base, are the basic elements of the cooling system. You can remove the coolant tank without the pump. The coolant pump conveys the coolant via hoses, valves and guide heads to the saw blade. The volume of the coolant is regulated by the valves on the guide heads. The coolant cools down and lubricates the saw blade and flushes away metal chips. The pump switches on and off when the saw blade drive is started or shut down. There is a setting container in the coolant tank, which needs to be cleaned during regular checks depending on the material to be cut. It is important that the pump is always immersed in the coolant that facilitates its cooling. **If the level of the coolant gets too low during cutting, the pump will be irreparably damaged.**



There is an overflow opening in the coolant tank, ensuring the right volume of the coolant in order to prevent flooding of the pump (danger of burning the pump). **If you fill in too much coolant, it may leak under the saw.**



When handling coolants, risks linked to hazardous substances cannot be avoided. Observe the manufacturer's and/or your company's instructions and recommendations referring to safe coolant handling.



5. Commissioning

5.1. Security Check

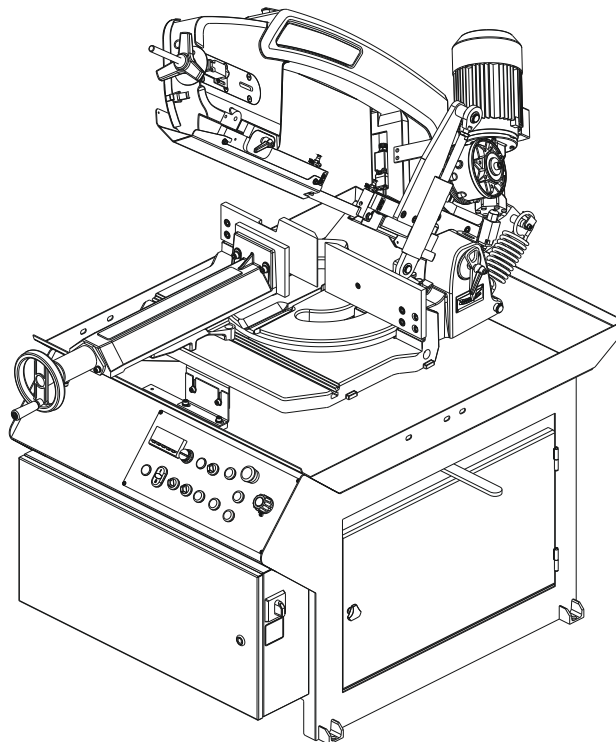


Is everything in perfect condition with regard to safety and technical condition?
Are all protective devices mounted properly?

5.2. Cutting Procedure






Danger of injury!
No cover on the saw blade in the cutting area!
High risk of injury in the operating area of the blade!




- 1) Make sure that the TOTAL STOP button is released, the blade covers are closed, and the blade is properly tensioned and adjusted.
 - 2) Turn on the POWER SWITCH; a yellow-backlit SAFETY button will light up.
 - 3) Turn on the hydraulic unit by pressing the button START HYDRAULIC UNIT.
 - 4) Set the required cutting angle (see section 4.3.2).
 - 5) Preset the required band saw arm stroke height in accordance with the material section (see section 4.9.)
 - 6) Insert the workpiece into the vice and set the desired cut length.
 - 7) Set the movable guide head to 30-50 mm from the cut material (see section 4.4.).
 - 8) Shut off the CONTROL VALVE completely (see section 4.2.)
 - 9) Select the saw blade speed (see section 6.6.)
- On the control panel, select the manual or automatic mode (see section 4.1).

MANUAL MODE

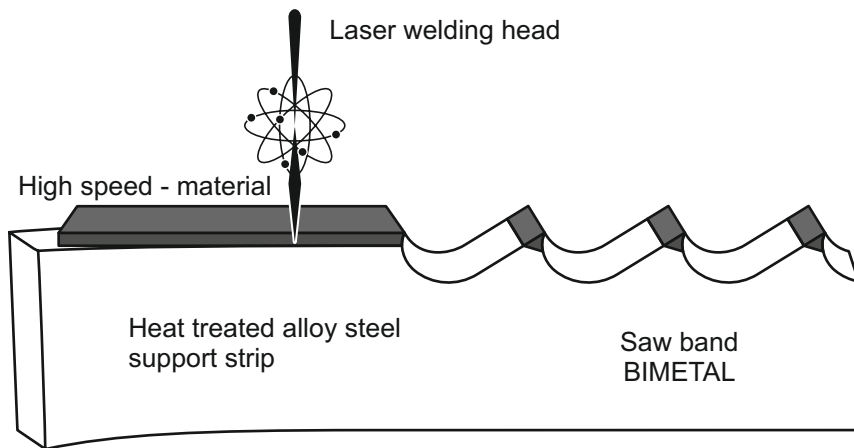
- 10) Switch the MODE switch to the MANUAL mode .
- 11) Use the VICE switch  to clamp the material.
- 12) Press the green button SAW BLADE START  to start the saw blade.
- 13) Use the green-lit START DESCENT button to activate the descent of the arm.
- 14) Set the optimum arm descent to the cut speed by gradual loosening of the CONTROL VALVE (see section 6.6.) and carry out the cutting.
- 15) After the cut, the saw arm will automatically ascend to the preset upper end position (if the arm uplift switch is in the position 1), or the saw arm will remain in the lower position (if the switch is in position 0).

AUTOMATIC MODE

- 10) Switch the MODE switch to the AUTOMATIC mode .
- 11) Use the green START button to activate the cutting cycle (clamping of the material, start of saw blade drive, activation of the arm descent).
- 12) Set the optimum arm descent to the cut speed by gradual loosening of the CONTROL VALVE (see section 6.6.) and carry out the cutting.
- 13) After the cut, the saw arm will automatically ascend to the preset upper end position (if the arm uplift switch is in the position 1), or the saw arm will remain in the lower position (if the switch is in position 0).

6. Saw Blades

6.1. Saw Blade Design



The prerequisite of the correct cutting power of the machine is the use of high-quality saw blades. In order to achieve a high cutting power, it is recommended to use bimetallic saw blades. The main saw blade component is a high-quality heat treated steel with a high elasticity limit. The tooth edges are high-speed steel of the following quality: M 42, M 51.

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

M 51 - with reference to the M 42 saw blade, the M51 is designed first of all for cutting steel up to 50 HRC, steel of higher strength classes, acid-resistant and stainless steels. Furthermore, for cutting nickel, titan alloys and special grade of bronze.

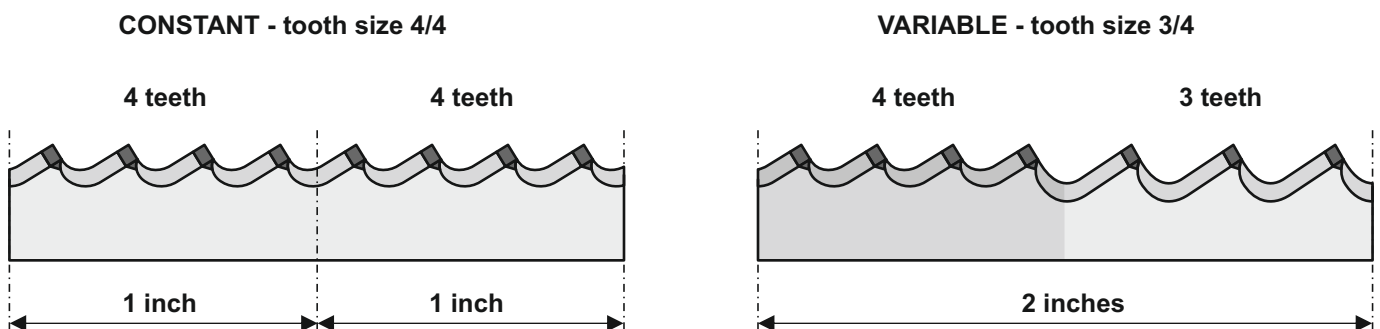
Carbide - high cutting power as compared to bimetallic saw blades. Suitable for cutting of steel, non-ferrous metals, material with high content of chrome, nickel, titan, stainless steel and face-hardened materials up to 62 HRC. The saw blades can be used for all materials including stainless steel, tool steel, non-ferrous metals, cast iron, plastics and fibreboards. Characteristics of these saw blades include a high thermal conductivity, high wear and tear resistance and thus longer life, higher cutting speed, less frequent saw blade replacements and better productivity as compared with carbon steel saw blades.

Design: M 42 - composition: W 2%, Mo 10%, V 1%, CO 8%, tooth hardness: 68 HRC. For cutting of materials up to 45 HRC
 Design: M 51 - composition: W 10%, Mo 4%, V 3%, Co 10%, tooth hardness: 69 HRC. For cutting of materials up to 50 HRC
 Design: Carbide - tooth hardness 1600 HV. For cutting of materials up to 62 HRC.

In addition to standard shapes and sizes of teeth, the saw blades are also manufactured with special features, such as saw setting, tooth angle and tooth face shape, which are used particularly for cutting of specific materials. Please contact your saw blade supplier to get more information about these features.

Saw Blade Tooth Arrangement

- a) **Constant** - tooth edge spacing always equal
- b) **Variable** - the tooth edge space is different, repeating periodically. This modern saw blade design enables a bigger cutting range in one saw blade type. It is able to eliminate vibrations caused by the tooth edge touching the material and thus to achieve a clean smooth cut and longer service life.



6.2. Selection of Tooth Size

The selection of the tooth size is of crucial importance for the saw blade service life.

Tooth sizes recommended for cutting full materials

Material cross-section	Number of teeth per inch	Tooth quality M42/67-69 Hrc	Tooth quality M51/69 Hrc	Carbide 1600 Hr
0-10	14z	●		
0-25	10/14	●		
20-40	8/12	●		
20-40	8/11	●		
30-60	6/10	●		
40-70	5/8	●		
40-70	5/7	●	●	
60-110	4/6	●	●	
80-120	4z	●		●
90-140	3/4	●	●	●
120-200	3z	●		●
120-350	2/3z	●	●	●
200-400	2z	●		

The following table refers to piece-by-piece cutting of sectional materials. If the material is cut in bundles, the forces of the walls of individual tubes must be added with regard to their diameters.

Tooth sizes recommended for cutting sections

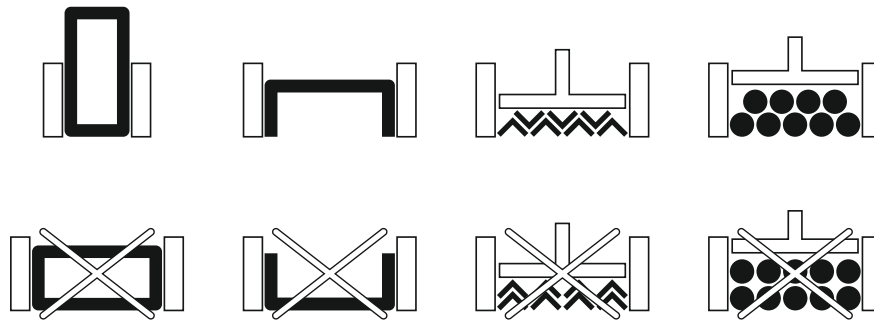
Wall width mm	External tube diameter D (mm)												
	20	40	60	80	100	120	150	200	300	400	500	600	700
2	14	14	14	14	14	14	10/14	10/14	8/11,8/12	8/11,8/12	6/10	6/10	5/7,5/8
3	14	14	14	10/14	10/14	10/14	8/11,8/12	8/11,8/12	6/10	6/10	5/7,5/8	5/7,5/8	5/7,5/8
4	14	14	10/14	10/14	8/11,8/12	8/11,8/12	6/10	6/10	5/7,5/8	5/7,5/8	5/7,5/8	4/6	4/6
5	14	10/14	10/14	8/11,8/12	8/11,8/12	6/10	6/10	5/7,5/8	5/7,5/8	4/6	4/6	4/6	4/6
6	14	10/14	8/11,8/12	8/11,8/12	6/10	6/10	5/7,5/8	5/7,5/8	4/6	4/6	4/6	4/6	3/4
8	14	8/11,8/12	6/10	6/10	5/7,5/8	5/7,5/8	5/7,5/8	4/6	4/6	4/6	4/6	3/4	3/4
10		6/10	6/10	5/7,5/8	5/7,5/8	5/7,5/8	4/6	4/6	4/6	3/4	3/4	3/4	2/3
12		6/10	5/7,5/8	5/7,5/8	4/6	4/6	4/6	4/6	3/4	3/4	3/4	2/3	2/3
15				4/6	4/6	4/6	4/6	4/6	3/4	3/4	2/3	2/3	2/3
20				4/6	4/6	4/6	4/6	3/4	3/4	2/3	2/3	2/3	2/3
30				4/6	4/6	4/6	3/4	3/4	2/3	2/3	2/3	2/3	2/3
50						3/4	3/4	2/3	2/3	2/3	2/3	1,4/2	1,4/2
75								2/3	2/3	2/3	1,4/2	1,4/2	1,4/2
100									2/3	2/3	1,4/2	1,4/2	1,4/2
150									1,4/2	1,4/2	0,75/1,25	0,75/1,25	0,75/1,25
200											0,75/1,25	0,75/1,25	0,75/1,25
250											0,75/1,25	0,75/1,25	0,75/1,25
300												0,75/1,25	0,75/1,25

Caution: The aforementioned values do not apply to cutting of different sectional materials. Such a requirement must be treated with respect to the shape of the sectional material, the number of pieces in the bundle and the dimensions. When the saw blade is used for cutting sectional materials, its service life will decrease by up to one third due to interrupted cutting.

Rule: At least four, but not more than thirty teeth must cut in while a workpiece is being cut.

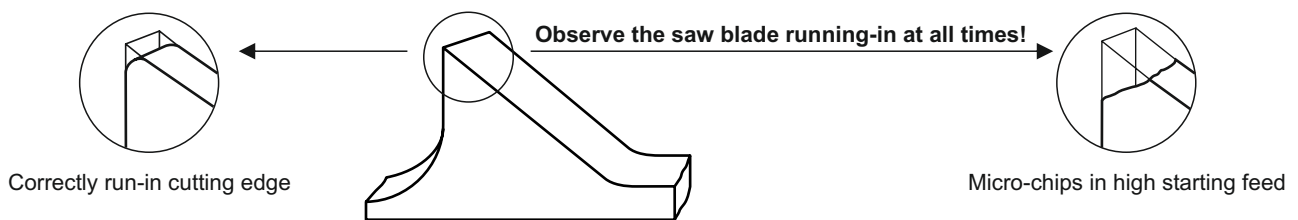
6.3. Optimum workpiece clamping

Correct workpiece clamping can significantly influence the service life of the saw blade and the cutting accuracy. Moreover, it allows for correct selection of tooth size. To cut material in bundles, we recommend to use upper (vertical) pressure device. In order to achieve the optimum cut (service life and cutting performance), observe these ways of clamping.



6.4. Running-in New Saw Blades

The running-in applies to new saw blades. The sharp cutting edges with extremely small edge radii enable high cutting power. In order to achieve maximum tool service life, you have to run in (optimum) the new saw blade. Given the correct cutting speed, the workpiece feed and the quality of its material, the saw blade must be run in only with 50% of currently used feed. Such measure will help you prevent breaking extremely sharp edges particularly in big workpiece sections. These micro-fragments cause destruction of other teeth. Should vibrations or noise due to oscillations manifest themselves when a new saw blade has been fitted, reduce the cutting speed slightly. In small workpiece sections it is recommended to run in the saw blade 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 Saw Blade Service Life

Inappropriate saw blade tooth size • inappropriate saw blade speed and saw blade descent speed to the cutting position • the saw blade (the whole band saw arm) leans against the workpiece when the band saw is not in the cutting position • the workpiece is not clamped as recommended • saw blade tension is not correct (mostly too little tension) • the saw blade is not correctly fitted on the guide wheels (the saw blade touches the wheel shoulder) • the saw blade guide heads are not correctly adjusted • the distance between the saw blade guide heads and the workpiece is too big • the oil content of the coolant is too low • the saw blade is not correctly run in • saw blade maintenance is insufficient, metal chips have not been removed from the band saw.

The above mentioned faults lead to inaccurate cut, reduction of the saw blade service life and/or its destruction.

6.6. Values Recommended for Cutting

The selection of values depends on the material class and the material section. The data in the table are only illustrative; they have to be adjusted to the material for certain ranges. The numbers of the CSN-Standards serve for information only. They define only the guide for the material properties for which the respective saw blade type is designed.

Material		Recommended blade speed (m/min)		Arm descent speed into the cut (mm/min)		Cooling oil volume (%)
ČSN	In general	∅ 0-100 mm	∅ 100-330 mm	∅ 0-100 mm	∅ 100-330 mm	
11 107 - 11 110	Free-cutting steel	70-90	70-90	190-60	55-20	10-15
11 301 - 11 420 / 12 010 - 12 020	Structure/construction steel	60-90	60-80	190-60	55-30	10-15
11 500 - 11 600 / 12 020 - 12 060	Cementing 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 steel	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 steel	40-50	30-40	75-15	12-4	10-15
17 115	Valve steel	40-60	30-50	90-23	21-10	3
17 253 - 17 255	Heat-resistant steel	30-40	30	40-7	6-1	15
19 063 - 19 083 / 15 142 / 16 142	Refining steel	60-90	40-70	125-35	30-25	5-10
19 150 / 19 192 - 19 312	Non-alloy tool steel	50-70	30-60	120-25	20-8	5-10
19 422 / 19 452 / 19 721 / 19 740	Alloy steel	40-50	30-50	100-20	18-2	5-10
19 436	Hammer steel	30-40	30-40	62-15	14-5	do not
19 662	Nitriding steel	40-50	30-40	76-25	23-12	5
19 721	Tool steel for hot processing	30-40	30	70-1	16-6	5
19 802 - 19 860	High speed steel	40-60	30-50	90-23	21-10	3
INCONEL, HASELLOY, NIMONIC, INCOLOY		30	30	25-5	4-2	15-20
Heat-treated steel		30	30	25-5	4-2	15-20
Cast steel		30-70	30-60	190-60	55-25	40
Grey cast iron		40-80	30-70	190-60	55-30	do not
Copper, 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
Aluminium alloy castings		80-90	80-90	450-150	140-55	25
Al 99%, thermoplastics, plastics		50-90	50-80	450-150	140-55	do not

7. Machine Maintenance



Danger of injury!

Carry out the maintenance work only if the MAIN SWITCH is off or if the machine is disconnected from the mains.

Care and maintenance is absolutely necessary to maintain the functionality of the machine and its components. This includes: check and adjustment of band saw guide heads • cleaning • metal chips removal • removing metal chips from the internal part of the band saw arm • coolant replacement • lubrication of sliding surfaces and bearings • checking of supply lines for damage • vice checks • screw connection checks • limit switch checks



Check protective devices

Check the protection devices for possible damages and faults prior to the start of everyday work.



Check power cable

Check in regular intervals, at least once a week: integrity of electric installation • integrity of connections and relief from pulling

7.1. Cleaning

Clean the machine in regular intervals (always at the end of the shift, or if required, during the shift). To clean the machine, use appropriate detergents. Do not use solvents (e.g. nitro diluent). Do not use compressed air! Compressed air would blow delicate chips and dirt particles under sliding elements or endanger the health of personnel by flying particles.

7.2. Removal/disposal of chips



Observe the instructions and recommendations concerning safe disposal of waste produced during operation.

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

7.3. Coolant system cleaning



When handling coolants, risks linked to hazardous substances cannot be avoided. Observe the regulations and recommendations (operating instructions by professional associations or your company) related to safe handling of coolants.

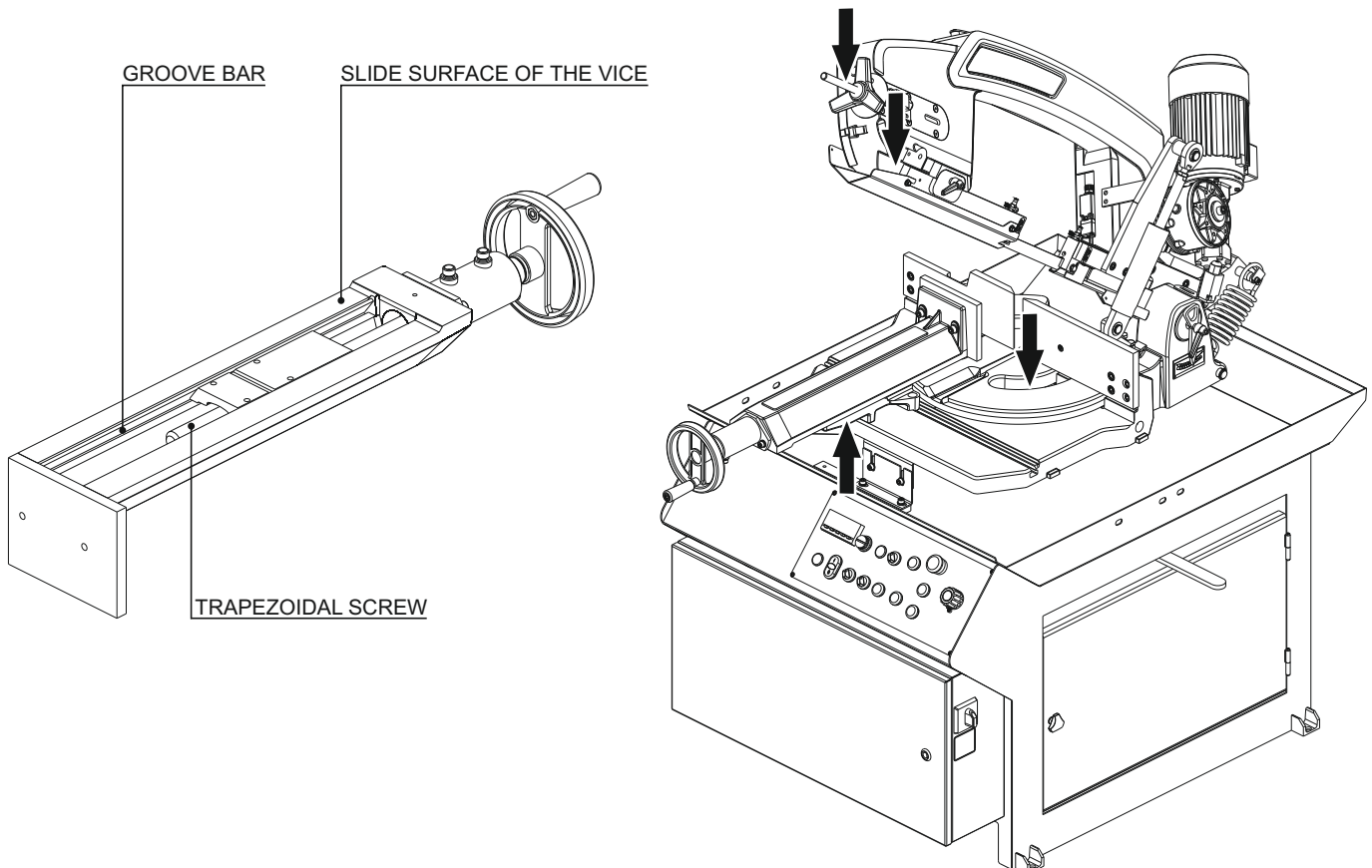
The coolant tank cannot be removed from the machine base during the maintenance and cleaning. Access to it is facilitated through the lid in the base.

Caution: Used coolant belongs to special waste category!

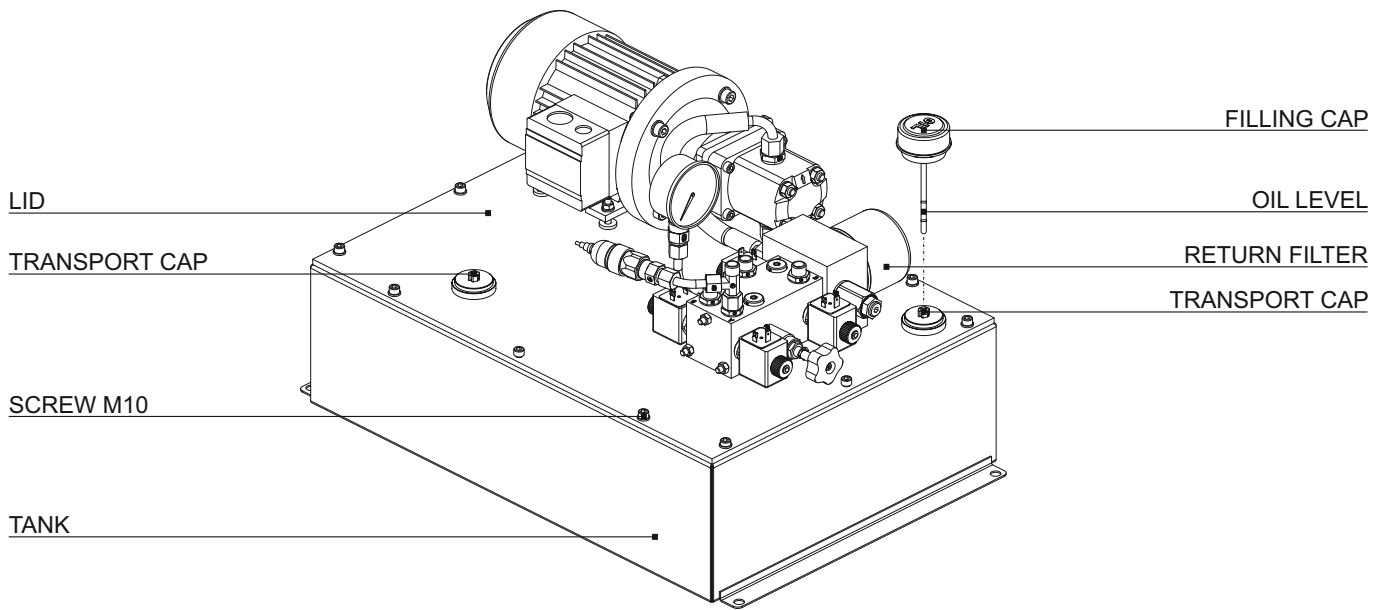
Our recommendations: Regular cleaning and maintenance of the coolant increases the service life and functionality of the coolant pump. If possible, use the coolants miscible with water, non-irritant to skin and with high protection against aging and corrosion. Min. Check the volume of oil in the coolant at least once a week. Optimum lubrication increases cutting productivity. There is a barrier in the coolant tank that separates the space for filtering impurities. This space should be cleaned during routine checks depending on the kind of material to be cut.

7.4. Lubrication

Regular lubrication and cleaning extend the life and functionality of the machine. During a regular check, make sure that there is enough grease on the friction surfaces of the vice, movable bars, and the tensioning helix. Do not forget to grease the trapezoidal screw of the vice regularly. Observe lubrication of greasing points according to the lubrication plan (see figure below) for individual machines, approximately once in a month. The first lubrication with lithium soap-based grease class NGLI-2 is applied during the assembly.



7.5. Principles of Hydraulic Unit Maintenance



The following principles must be adhered to during the assembly of hydraulic circuit elements and piping. The basic rule in cleaning and maintenance is cleanliness and orderliness! The hydraulic circuit consists of very precise elements and it is very difficult, complicated and costly to remove any contamination and its consequences. Remove the protective cap just before putting the device into operation. Consistently check the oil level on the gauge located on the filling cap on the hydraulic unit.

7.5.1. Work safety

The hydraulic circuits are reliable and safe even when under high pressure, if all the elements are appropriately sized. 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 visible defects:

- **dripping oil;**
- **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 leakage to the environment, it can cause extensive pollution of large quantities of water. The destruction of pressure-loaded circuit parts does not lead to any explosion. If the crack is small, oil disperses to the environment in the form of mist, if the crack is large, mostly the whole tank will discharge. The destruction of pressure hoses will manifest itself by oil leaking, but very frequently also by bursting of hose socket. In such case, the hose can spring up and cause a serious injury. Both failures cause pollution of the environment and even a small spark can lead to a huge fire.

It follows that the following principles must be taken into account for installation and operation of hydraulic circuits:

- Keep the machine clean, sprinkle the leaked oil with wood chips or VAPEX absorbate, sweep the floor, clean it with an appropriate solvent and dry.
- When dismantling, prevent oil spilling by installing suitable containers.
- The 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;
- if the anti-flaming agent is in eyes, seek medical help immediately.
- do not smoke or use open fire in the storage facility and near the units and hydromotors;
- shut down the hydrogenerator drive whenever you make any changes or repairs;
- electrical equipment must comply with ESC regulations;
- containers with industrial petrol may only be used in specifically designed 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 overload, as well as hydromotors, which could become overloaded after hydraulic locking;
- The person responsible for maintenance and setting of the hydraulic unit must be appointed.

The above-mentioned principles of safety at work are not exhaustive.

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

7.5.2. Commissioning

The hydraulic unit is fitted with two filling holes that are covered by red transport caps during the transport. The cap that is more accessible to the operator has to be removed and replaced by a filling cap with a gauge, otherwise a risk of making the entire system inoperable arises, along with the risk of pump damage. When transporting the hydraulic unit, always replace the filling cap with a gauge with a transport cap, see figure. Start the hydraulic unit within short intervals. Check the piping for noise and leakage. Vent the hydraulic circuit. Venting is performed usually by raising and descending the arm, clamping and unclamping the vice. Repeat several times, until the system is ventilated (usually 5-10 times).

7.5.3. Hydraulic Liquids

The correct function, service 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 fulfil various tasks in the hydraulic equipment. The most important of them are the following:**

- hydraulic energy transfer from the hydrogenerator to the 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 specified by the following parameters:

Kinematic viscosity is defined as a measure of internal friction of the fluid. Higher viscosity means a thicker liquid. The viscosity unit is $m^2 \cdot s^{-1}$ ($mm^2 \cdot s^{-1}$ 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).

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 suction).

Requirements for Liquid Properties

The main requirements can be put as follows:

- small dependence of viscosity on temperature change
- corresponding viscosity ensuring good efficiency of the 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

HM and HV oil performance classes are particularly suitable for the use 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 formation of permanent emulsion and have excellent viscosity temperature dependence. They are intended for similar purposes as HM class oils, but with increased requirement for a very low dependence of oil viscosity on temperature, particularly for HP mechanisms of mobile machines operated within a wide range of ambient temperatures.

Biologically Degradable Liquids

Lubrication properties of environment-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. Usage of the liquid must be tested. Nevertheless, practical experience shows clearly that carefully adjusted systems operated with environment-friendly liquids run smoothly.

Do not use any vegetable oils in the hydraulic unit. Risk of contamination of the whole system and irreversible damage to the unit!

Oil type	Kinematic viscosity in $mm^2 \cdot s^{-1}$ at the temperature					Freezing point in $^{\circ}C$
	0 $^{\circ}C$	20 $^{\circ}C$	40 $^{\circ}C$	60 $^{\circ}C$	80 $^{\circ}C$	
MOGUL HM 32	220	100	32	15	8,5	-40
MOGUL HM 46	400	170	46	18	11	-30
MOGUL HV 32	180	67	32	17	11	-40
MOGUL HV 46	350	110	46	25	14	-36

7.5.4. Hydraulic Mineral Oils

HM performance class according to CETOP RP 91H European specification in viscosity classes ISO VG 32 and 46. Oils marked as HM 32 are recommended for use in environment with ambient temperatures reaching 0 °C and below 0 °C. HM 46 oil types are recommended for use in environment with ambient temperatures within the range +5 °C and +40 °C.

CETOP RP 91 H Specifications	HM 32	HM 46
AGIP	OSO 32	OSO 46
ARAL	VITAM GM 32	VITAM GF 46
BP	ENERGOL HLP 32	ENERGOL HLP 46
CASTROL	HYSPI AXS 32	HYSPI AWS 46
ESSO	NUTO H 32	NUTO H 46
MOBIL	MOBIL DTE 24	MOBIL DTE 25
MOGUL	MOGUL HM 32	MOGUL HM 46
OLEA	OPTIMA HM 32	OPTIMA HM 46
ÖMV	HLP 32	HLP 46
PARAMO	PARAMOL HM 32	PARAMOL HM 46
SHELL	TELLUS OIL 32	TELLUS OIL 46
VALVOLINE	ULTRAMAX AW 32	ULTRAMAX AW 46

7.5.5. Service intervals

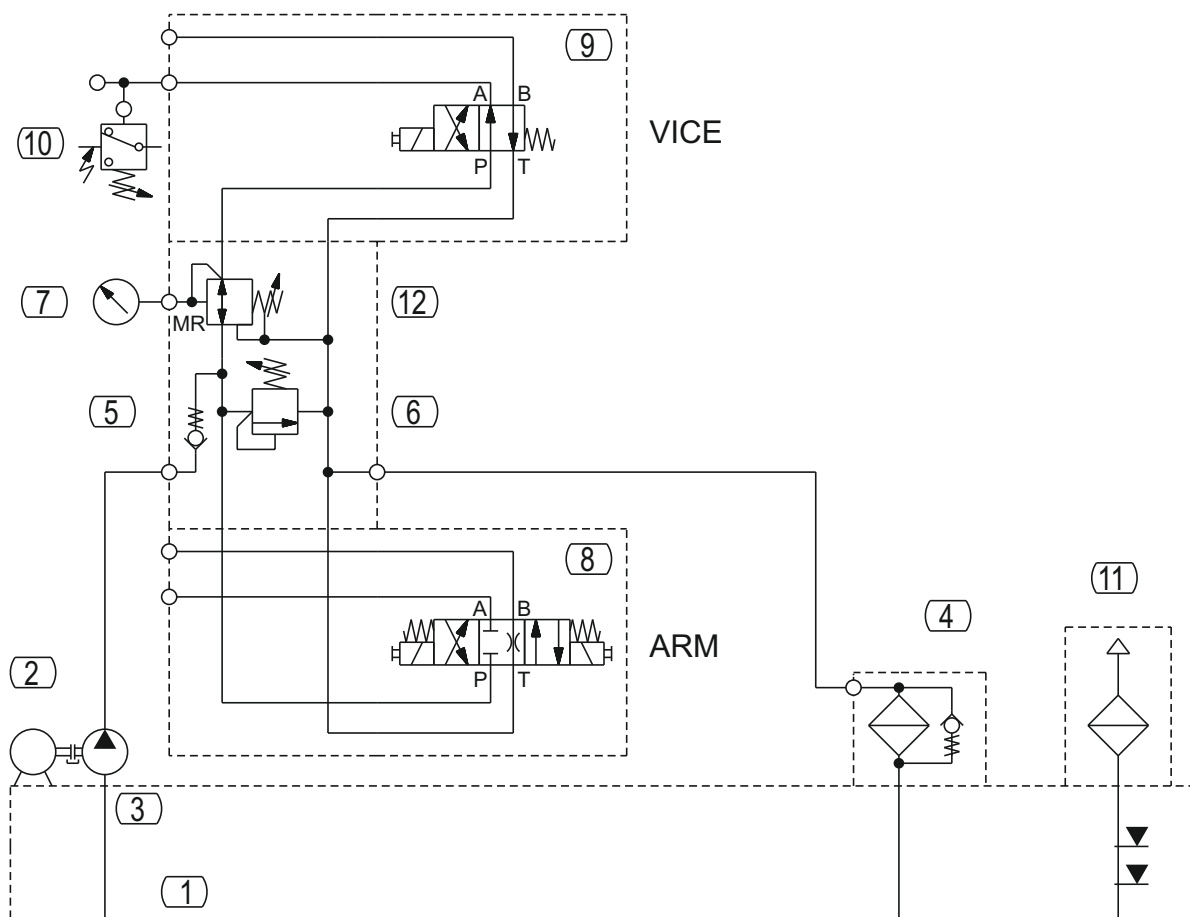
The hydraulic unit is filled with OPTIMA HV46 hydraulic oil, for which it is recommended to replace the oil within a time interval shorter than 4,500 operating hours, along with the return filter, or once in a year depending on what occurs first. Replace the return filter each 1500 operating hours (MANN FILTER W 79 supplied by the manufacturer). Consistently check the oil level on the gauge located on the filling cap on the hydraulic unit in the machine base. The oil level must be maintained between the two oil marks.

7.5.6. Oil Refill and Filter Replacement

- Unscrew the return oil filter.
- Remove the lid of the hydraulic unit by unscrewing the twelve M10 bolts.
- Very carefully raise the lid and make sure the sealing does not stick to the lid or the tank, leading to its damage.
- If the sealing is damaged, replace it for a new one. Never use a damaged sealing, otherwise you risk contamination of the hydraulic system by the remnants of cork sealing.
- When replacing the oil, pour out the old oil and clean the tank. A cloth is a sufficient tool for cleaning, but it must be non-linting. You can use a solution that does not disturb the tank coating and does not leave residues in the tank. After the cleaning, check the inside 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 the deteriorated coating, which contaminates the entire hydraulic system, will be prevented.
- Once the tank is clean and free from deposits, place the lid and the sealing back on the tank using a reverse procedure and cross-tighten the screws.
- Pour in new oil. Only oil recommended by the equipment manufacturer can be filled in. Never refill directly from barrels. Always use a filter unit with filters with a mesh density lower than 25 µm. Using filters with contamination indication improves the quality and convenience of the work. Consistently check the oil level on the gauge located on the filling cap. **The oil level must be maintained between the two oil marks.**
- Unscrew the new return oil filter.
- Check the piping for noise and leakage.
- Start the hydraulic unit within short intervals.
- Vent the hydraulic circuit. Venting is performed usually by raising and descending the arm, clamping and unclamping the vice. Repeat several times, until the system is ventilated (usually 5-10 times).

Caution: Oil and the filter are classified as special waste!

8. Hydraulic Unit Wiring Diagram



Q = 4,7 l/min
 p_{max} = 60 bar
 P = 0,55 kW

BASIC PARAMETERS

HYDRAULIC UNIT TYPE NUMBER: S_001_037

Pos.	Name	Designation
1	Tank	TM20; 20 liters
2	Electrical motor	EM 71 0,37kW/3 1500 RPM B35-L
3	Pump	10A3,65X053G
4	Return filter	W79
5	One-way valve	CVG 14
6	Relief valve	MO-020/10; 40 bar
7	Pressure gauge	dia. 68 with glyc. Rad.; 0-100 bar
8	Switchboard	DVE03-S51-B5-C24/20/T1-M1
9	Switchboard	DVE03-S12-B2-C24/20/T1-M1
10	Pressure switch	0166 411 031 043 + cover; adj.13 bar+-2
11	Pressure reduction valve	RV03-P-55_R_M; 0-40 bar
12	Filling cap	CPT-MD-FA/1"

9. Faults and Remedies


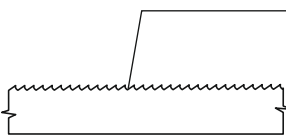
9.1. Repairs

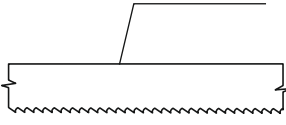


Caution: Danger of injury!

Carry out repairs only when the **MAIN SWITCH** is off or secured against switching on or when the machine is isolated from the power supply and secured against restarting. We recommend that you contact an authorised service centre for repairs.

9.2. Failures - Potential Causes and Remedies

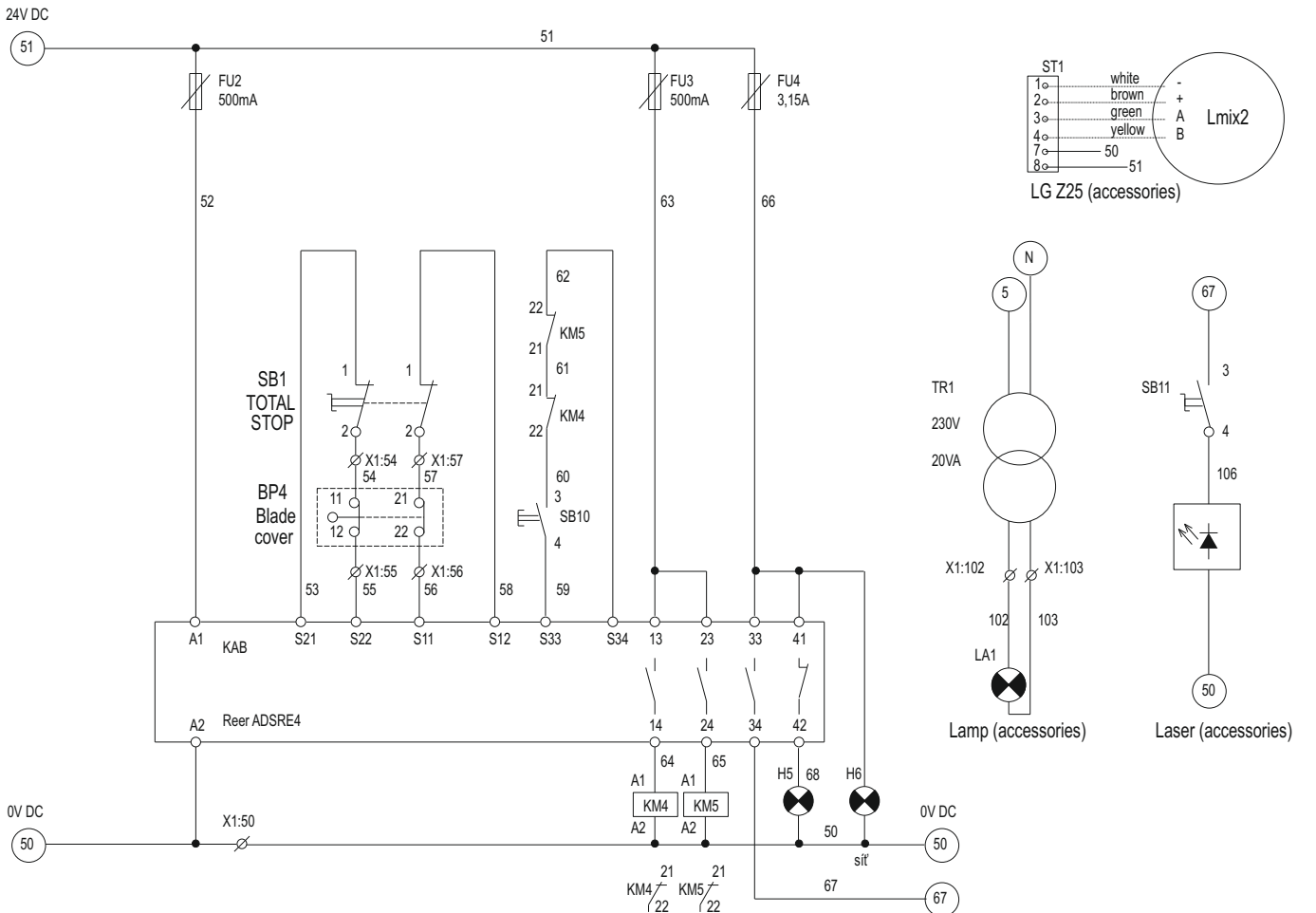
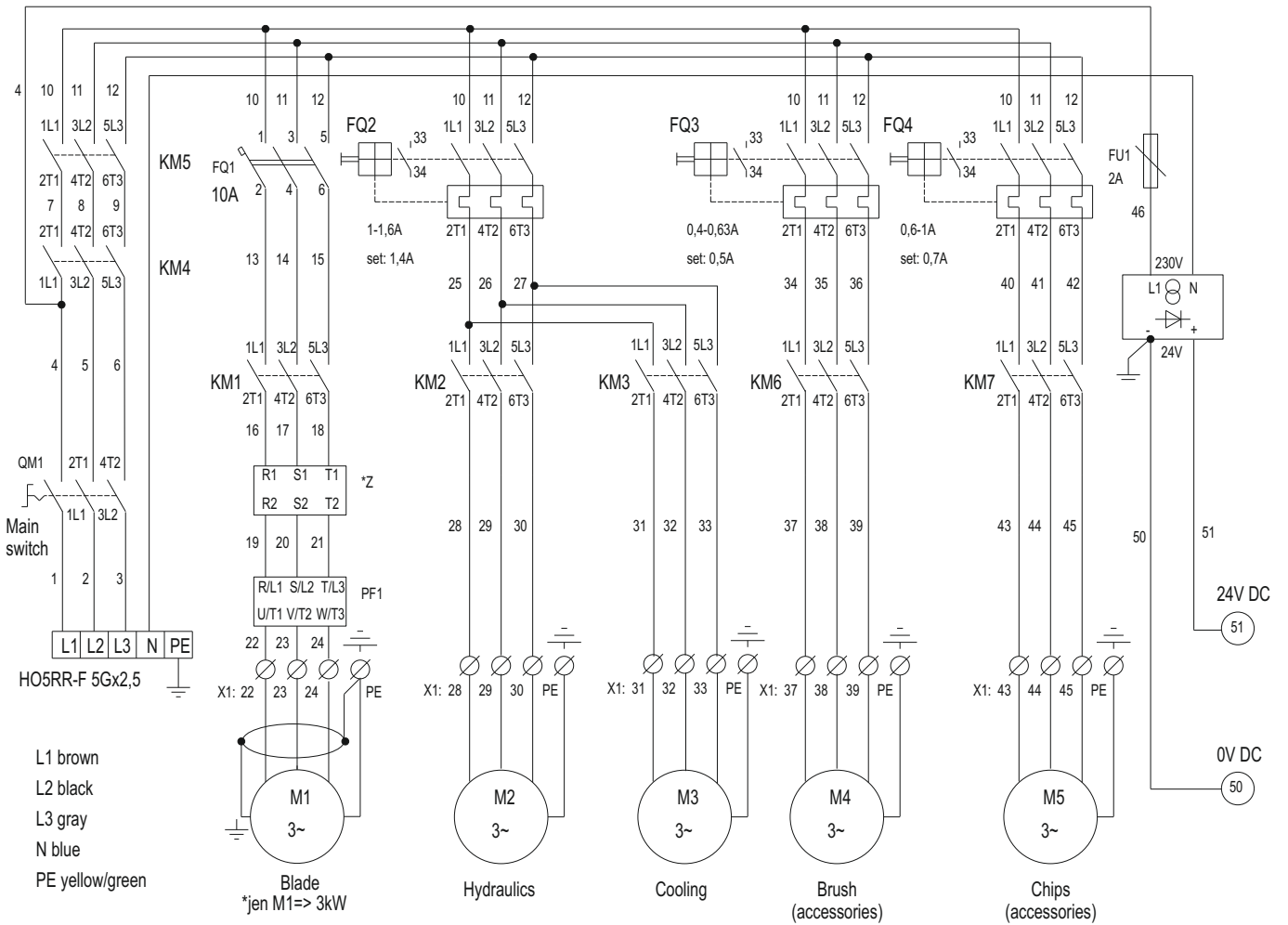
Failure	Possible cause	Remedy
Saw blade feed cannot start	<ul style="list-style-type: none"> The MAIN SWITCH is off SAFETY indicator lamp is on The TOTAL STOP button is locked. The protective overcurrent relay is off The limit switch of the arm cover not actuated The control board fuse is burnt The saw arm is in the lowest position, the limit switch is pressed 	<ul style="list-style-type: none"> Turn on the MAIN SWITCH Press the SAFETY button Unlock the TOTAL STOP button Check motor protective switch Check the arm cover Replace the fuse The saw arm must be raised when the saw blade starts
The yellow SAFETY indicator lamp is on	<ul style="list-style-type: none"> The saw is actively secured by the safety relay 	<ul style="list-style-type: none"> Press the SAFETY button and continue operating the saw Unblock a TOTAL STOP button, close the rear cover and press the SAFETY button in order to continue operating the saw
The motor is on, but the saw blade is not moving	<ul style="list-style-type: none"> The saw blade slips on the blade wheel Broken blade Other fault in the gearbox 	<ul style="list-style-type: none"> Tension the blade properly (see section 4.6.) Replace it (see section 4.6.) Call the service technician
Red light on the control panel Only personnel with electrician qualifications are allowed to carry out such tasks!	<ul style="list-style-type: none"> The protective function for frequency converter overload has responded. 	<ul style="list-style-type: none"> Press STOP/RESET button on the frequency converter. 
Irregular cooling	<ul style="list-style-type: none"> Coolant used up The coolant tank and/or supply pipes or the ball valves are dirty Broken pump 	<ul style="list-style-type: none"> Check the coolant Clean the coolant tank and supply pipes Replace the pump
Vibration during cutting	<ul style="list-style-type: none"> The feed to the cut occurs within a non-desirable range Wrong selection of saw blade tooth size Incorrectly adjusted guide heads, hardened steel blade guides, bearings Incorrectly clamped material 	<ul style="list-style-type: none"> Set 5% less/more feed to the cut Check the tooth size (see section 6.2.) Adjust it (see section 4.7.) Check workpiece clamping
Broken teeth stuck in the cutting channel in the workpiece		<ul style="list-style-type: none"> Do not cut into an old cutting channel with a new blade! Otherwise you damage the new blade with the first cut!
The cut is not rectangular	<ul style="list-style-type: none"> Incorrectly set cutting angle 	<ul style="list-style-type: none"> See section 4.3.2.
The blade cuts under	<ul style="list-style-type: none"> Blunt saw blade Wrong selection of saw blade tooth size Feed to the cut is too quick The blade slid under guide bearings Clearance between hardened steel blade guides The workpiece is not placed parallel with the vice loading surface 	<ul style="list-style-type: none"> Replace the saw blade (see section 4.6.) Check the tooth size (see section 6.2.) Adjust the feed Insert the blade properly (see section 4.6.) Adjust it (see section 4.7.) Align the roller conveyor, check workpiece clamping
Saw blade cracking between teeth 	<ul style="list-style-type: none"> Wrong selection of saw blade tooth size Feed to the cut is too quick Incorrectly adjusted or damaged guidance through heads (hardened steel blade guides, bearings) The moving guide head is too far from the workpiece Insufficient cooling Incorrectly clamped workpiece while cutting a bundle 	<ul style="list-style-type: none"> Check the tooth size (see section 6.2.) Adjust the feed Adjust (see section 4.7.) or replace them Move it closer (see section 4.4.) Increase the coolant supply Clamp the workpiece properly

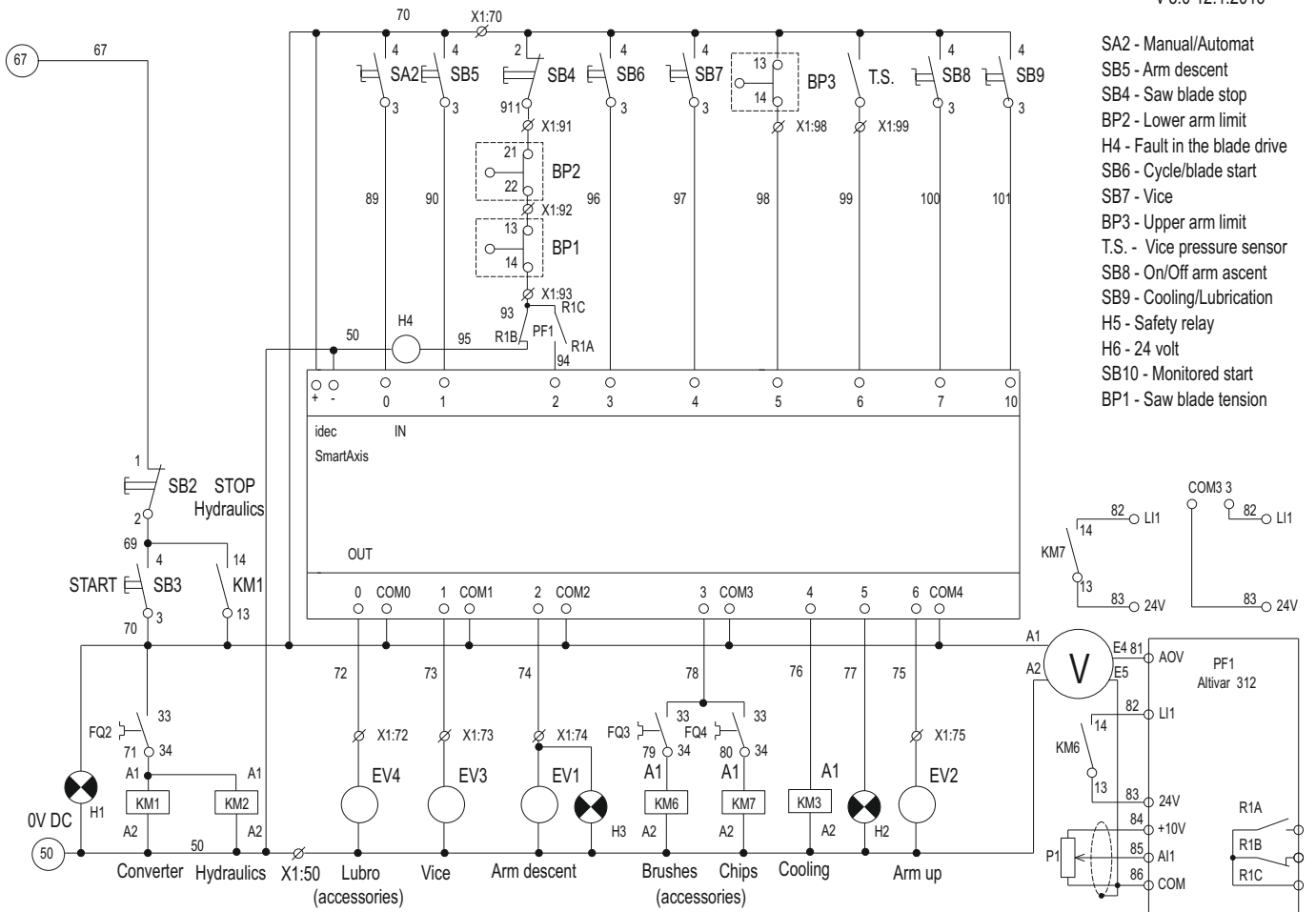
Failure	Possible cause	Remedy
<p>Saw blade cracking on the face</p> 	<ul style="list-style-type: none"> • Saw blade incorrectly placed on wheels (runs into the fitting) • Wrong selection of saw blade tooth size • Feed to the cut is too quick • Incorrectly adjusted or damaged guidance through heads (hardened steel blade guides, bearings) • The moving guide head is too far from the workpiece 	<ul style="list-style-type: none"> • Check (see section 4.6.) • Check the tooth size (see section 6.2.) • Adjust the feed • Adjust (see section 4.7.) or replace them • Move it closer (see section 4.4.)
<p>The feed to the cut is not constant, sinks</p>	<ul style="list-style-type: none"> • Not enough oil in hydraulics 	<ul style="list-style-type: none"> • Call the authorised service centre
<p>The arm descends even when the relief valve is closed</p>	<ul style="list-style-type: none"> • Loosened M4 screw on control valve's wheel - turns loosely • Valve seat is worn out • Cylinder sealing is worn out • Valve failure (impurities) 	<ul style="list-style-type: none"> • Tighten it • Tighten M4 lock screw, turn wheel approx. 10° to the left and tighten • Call the authorised service centre • Call the authorised service centre
<p>The arm does not ascend</p>	<ul style="list-style-type: none"> • The arm uplift switch is set to 0 • The MAIN SWITCH is off • The TOTAL STOP button is locked. 	<ul style="list-style-type: none"> • Switch it to 1 • Turn on the power switch • Unlock the TOTAL STOP button

The adjustment of guide heads is a matter of regular maintenance and that is why such fault is not covered by the guarantee.

10. Electrical Wiring Diagram

v 5.0 12.1.2016



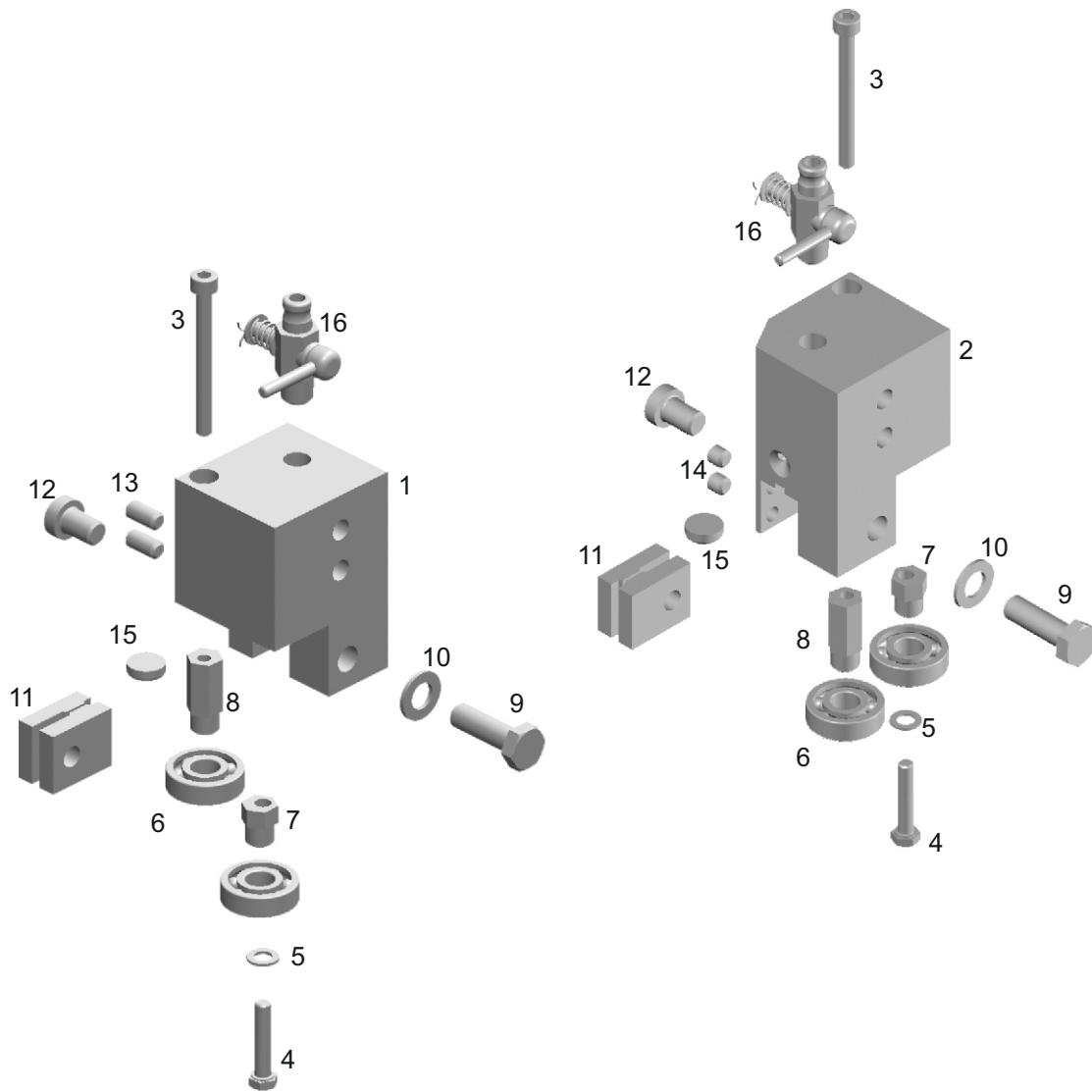


- SA2 - Manual/Automat
- SB5 - Arm descent
- SB4 - Saw blade stop
- BP2 - Lower arm limit
- H4 - Fault in the blade drive
- SB6 - Cycle/blade start
- SB7 - Vice
- BP3 - Upper arm limit
- T.S. - Vice pressure sensor
- SB8 - On/Off arm ascent
- SB9 - Cooling/Lubrication
- H5 - Safety relay
- H6 - 24 volt
- SB10 - Monitored start
- BP1 - Saw blade tension

Diagram:	Name:	Type:	Order No:
BP1	Blade tensioning limit switch	FR 615	002491
BP2	Lower position limit switch	FR 6A1	002490
BP3	Upper position limit switch	FR 615	002491
BP4	Limit switch Blade cover	FR 993	016830
KM1	Contactor	DILEM - 10 (24V DC)	012488
KM2	Contactor	DILEM - 10 (24V DC)	012488
KM3	Contactor	DILEM - 10 (24V DC)	012488
KM4	Contactor	DILEM - 01(24V DC)	016828
KM5	Contactor	DILEM - 01(24V DC)	016828
KM6	Contactor	DILEM - 10 (24V DC)	012488
KM7	Contactor	DILEM - 10 (24V DC)	012488
FQ1	Circuit breaker	PL6-C10/3	017351
FQ2	Motor actuator	MS 325 + HKF11 1,6-2,5A	001786
FQ3	Motor actuator	MS 325 + HKF11 0,4-0,63A	002702
FQ4	Motor actuator	MS 325 + HKF11 1,0-1,6A	001921
FU1	The fuse holder	Fuse terminal 5x20 tiltable	001779
	Fuse glass	2A	001597
FU2	The fuse holder	Fuse terminal 5x20 tiltable	001779
	fuse glass	500mA	004197
FU3	The fuse holder	Fuse terminal 5x20 tiltable	001779
	fuse glass	500mA	004197
FU4	The fuse holder	Fuse terminal 5x20 tiltable	001779
	fuse glass	3.15A	001793
FU5	The fuse holder	Fuse terminal 5x20 tiltable	001779
	Fuse glass	1A	006674
zdroj	Actuated power unit	24V	020201
Idec	SmartAxis	FT1A-H24RA	022699
KAB	safety relay	Reer AD SRE4	018630
PF1	2.2kW frequency converter	ATV312	022400
V	Panel measuring device	K3MA-J-A2 24VAC	006719
P1	Potentiometer	TP195 4K7/N	002780
	Machine button	Diameter 34,8 mm	002781
SA2	MO rotary head, black 0-1	M22-WKV	006102
	MO head connection	M22-A	006103
	MO switch, unit 1on	M22-K10	006090
SB1	MO head lock Red	M22-PV/K01	006104
SB2	Mo switch double 1/0	M22-DDL-GR-X1/X0	006100
	MO head connection	M22-A	006103
	Mo switch, unit 1off	M22-K01	006091
SB3	MO switch, unit 1on	M22-K10	006090
H1	MO led socket white	M22-LED-W	006092
SB4	Mo head grip.red-lit	M22-DL-R	017172
	MO head connection	M22-A	006103
	Mo switch, unit 1off	M22-K01	006091
H4	MO led socket red	M22-LED-R	006093
SB5	MO head grip.green-lit	M22-DL-G	006098
	MO head connection	M22-A	006103
	MO switch, unit 1on	M22-K10	006090
H3	MO led socket green	M22-LED-G	006094
SB6	MO head grip.green-lit	M22-DL-G	006098
	MO head connection	M22-A	006103
	MO switch, unit 1on	M22-K10	006090
H2	MO led socket green	M22-LED-G	006094
SB7	MO rotary head, black 0-1	M22-WKV	006102
	MO head connection	M22-A	006103
	MO switch, unit 1on	M22-K10	006090
SB8	MO rotary head, black 0-1	M22-WKV	006102
	MO head connection	M22-A	006103
	MO switch, unit 1on	M22-K10	006090
SB10	MO head grip.yellow-lit	M22-DL-Y	016736
	MO head connection	M22-A	006103
	MO switch, unit 1on	M22-K10	006090
H5	MO led socket white	M22-LED-W	006092
H6	MO head sig. white	M22-L-W	006095
	MO head connection	M22-A	006103
	MO led socket white	M22-LED-W	006092
QM1	Switch	OT 16 ET3	002861
	OT switch - accessories	OTS 32 T 3	002863
	OT switch - accessories	OHB2PJ	003523
EV1	Electromagnet connector	is part of the hydraulic unit	005433
EV2	Electromagnet connector	is part of the hydraulic unit	005433
EV3	Electromagnet connector	is part of the hydraulic unit	005433
T.S.	Pressure switch	is part of the hydraulic unit	009150

11. Assemblies

11.1. Guide Head Assembly

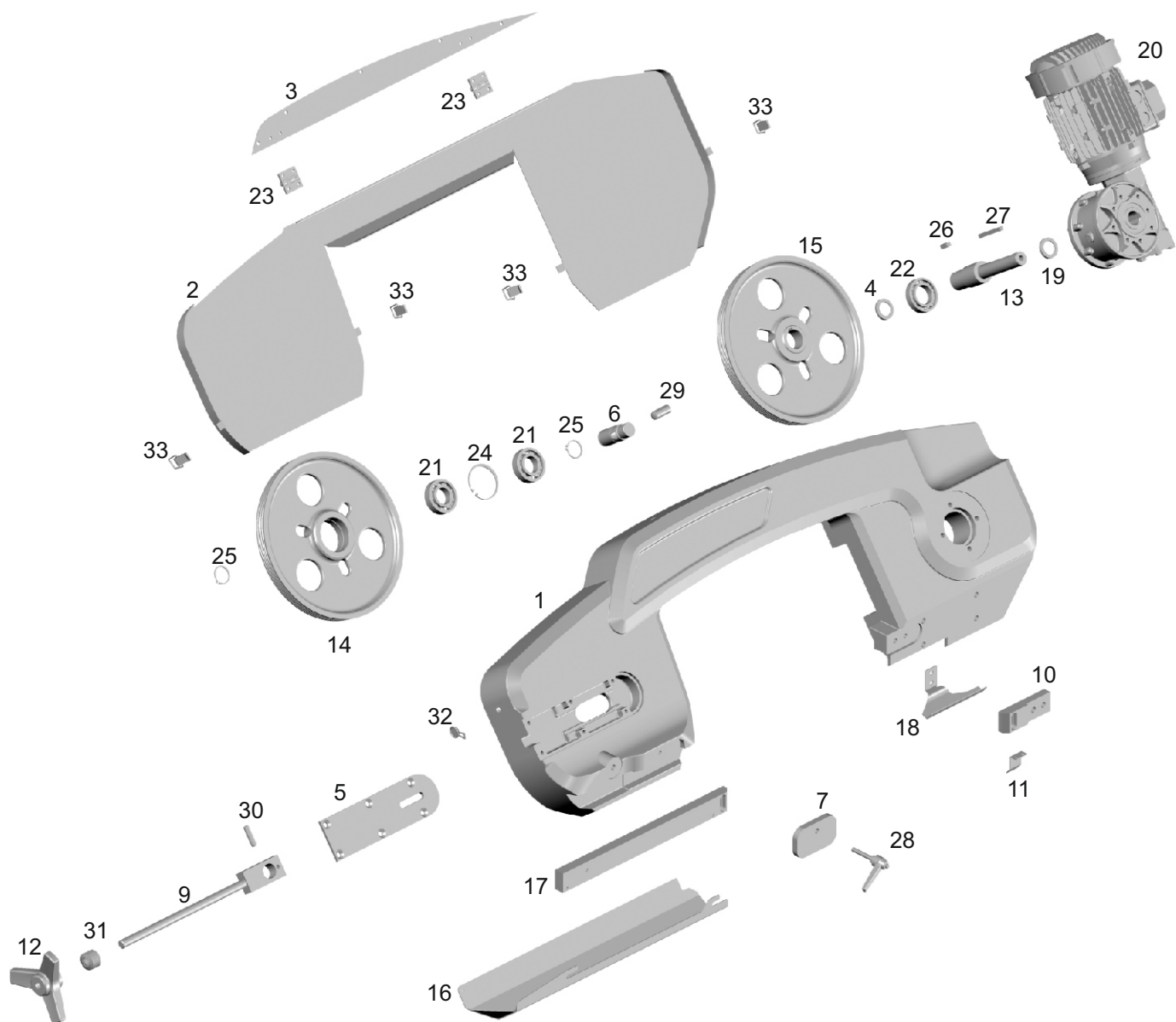


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Pos.	Order number	Name	Type ARG	Pcs
1	014056	Guide head moving	260	1
	013848	Guide head moving	300	1
2	014055	Guide head fixed	260	1
	013850	Guide head fixed	300	1
3	002207	Allen screw M5x50	260,300	2
4	001452	SW M5x25 screw	260,300	2
5	001473	Washer 6	260,300	2
6	001405	697 2Z bearing	260,300	4
7	013821	Exc. bearing, guide head, small	260,300	2
8	013822	Exc. bearing, guide head, big	260,300	2
9	001454	M8x25 SW screw	260	2
	001717	M8x30 SW screw	300	2
10	001474	Washer 8	260,300	2
11	001349	Hardened steel plate	260,300	4
12	001673	Allen screw M8x12	260,300	2
13	001457	M6x12 setting screw	260,300	2
14	001924	M6x6 setting screw	260,300	2
15	001351	Hardened steel blade guide KR 12x4	260,300	2
16	001402	Drain valve	260,300	2

11.2. Arm Assembly

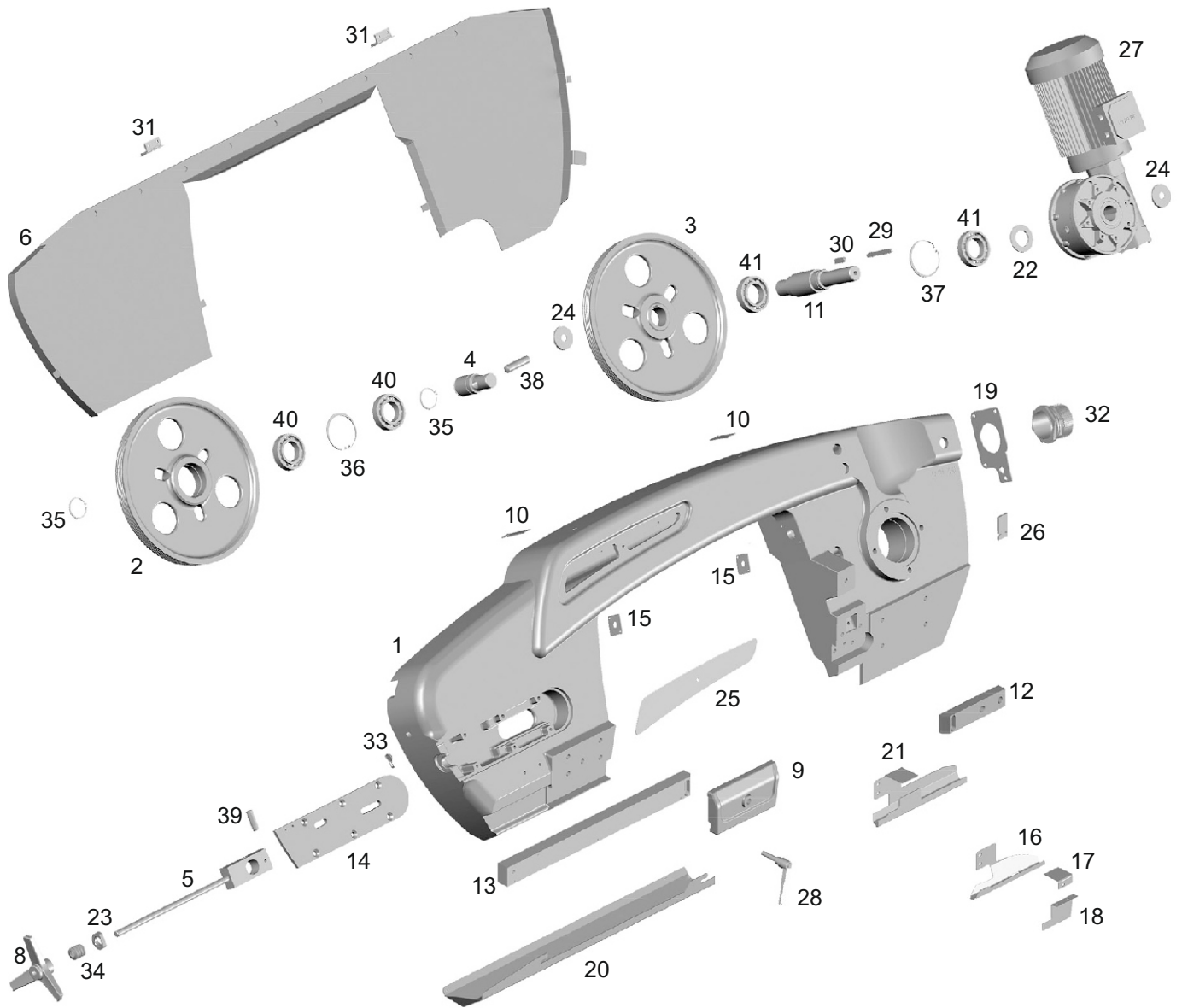
11.2.1. Arm Assembly ARG 260



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Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	025548	Arm 260	260	1	18	025555	Blade cover, fixed guide head	260	1
2	025549	Back cover, arm	260	1	20	021915	Drive MRT70, i=30	260	1
3	025550	Upper cover	260	1		021916	Drive MRT60, i=25	260 F	1
4	025553	Distance ring	260	1	21	001626	Bearing 6206-2Z	260	2
5	024922	Tensioning system cover	260	1	22	001627	Bearing 6207-2RS1	260	1
6	025554	Tensioning bolt	260	1	23	024793	Hinge	260	2
7	024924	Clamp	260	1	24	001437	Retaining ring, inner \varnothing 62	260	1
9	024926	Tensioning plate	260	1	25	001432	Retaining ring, outer \varnothing 30	260	2
10	002183	Fixed rod	260	1	26	001488	Tight spring 10e7x8x25	260	1
11	015880	Bearing cover	260	1	27	006699	Tight spring 8e7x7x70	260	1
12	001340	Triangle	260	1	28	026106	Adjustable lever, M8x25	260	1
13	025552	Shaft drive	260	1	29	001485	Hardened pin 16x40	260	1
14	025559	Tensioning wheel	260	1	30	001484	Hardened pin 10x40	260	1
15	025558	Blade wheel	260	1	31	001483	TP 31,5x16,3x1,8x2,5	260	10
16	025287	Blade cover	260	1	32	009577	Cap	260	1
17	025286	Movable rod	260	1	33	002108	Angled latch	260	4

11.2.2. Arm Assembly ARG 300

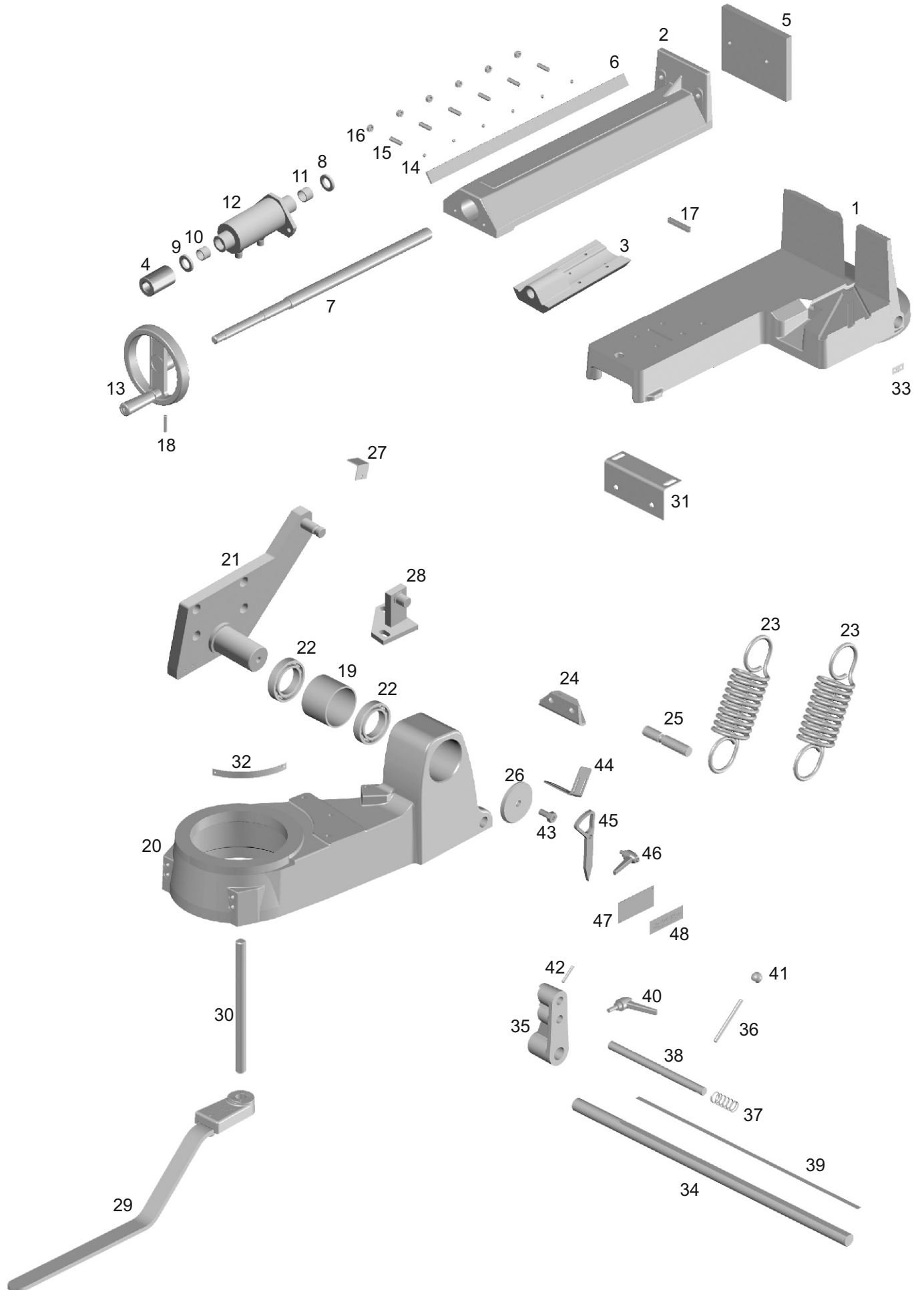


ver. 1.11.2018

Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	023378	Arm	300	1	22	023377	Ring	300	1
2	002161	Tensioning wheel	300	1	23	025248	Tensioning washer	300	1
3	002160	Blade wheel	300	1	24	014108	Washer	300	2
4	023368	Tensioning bolt	300	1	25	023825	Underlying metal sheet	300	1
5	023369	Tensioning plate	300	1	26	018708	Limit switch washer	300	1
6	023429	Back cover, arm	300	1	27	021917	El. drive MRT80-25-FT-RL-90/115	300	1
8	001340	Triangle	300	1	28	011205	Adjustable lever, M12x50	300	1
9	023379	Clamp	300	1	29	011885	Tight spring 10x 8x 80	300	1
10	020473	Cover stop - rear	300	2	30	005423	Tight spring 12x 8x 30	300	1
11	002172	Shaft drive	300	1	31	021170	Hinge	300	2
12	021701	Fixed rod	300+	1	32	014591	Bushing	300	1
	002183	Fixed rod	300	1	33	009577	Cap	300	1
13	013851	Movable rod	300	1	34	001483	TP 31,5x16,3x1,8x2,5	300	10
14	023367	Tensioning system cover	300	1	35	001432	Retaining ring, outer ø 30	300	2
15	020774	Cooling cover	300	2	36	001437	Retaining ring, inner ø 62	300	1
16	015823	Blade cover fixed guide head	300	1	37	001893	Retaining ring, inner ø 90	300	1
17	022208	Top blade cover	300	1	38	001485	Hardened pin 16x40	300	1
18	022212	Side blade cover	300	1	39	002384	Hardened pin 10x45	300	1
19	026079	Arm cover rear	300	1	40	001626	Ball bearing 6206-2Z	300	2
20	024291	Blade cover	300	1	41	002186	Ball bearing 6308-2Z	300	2
21	024251	Blade cover, fixed guide head	300+	1					

11.3. The Table, Turntable, Joint and Vice Assembly

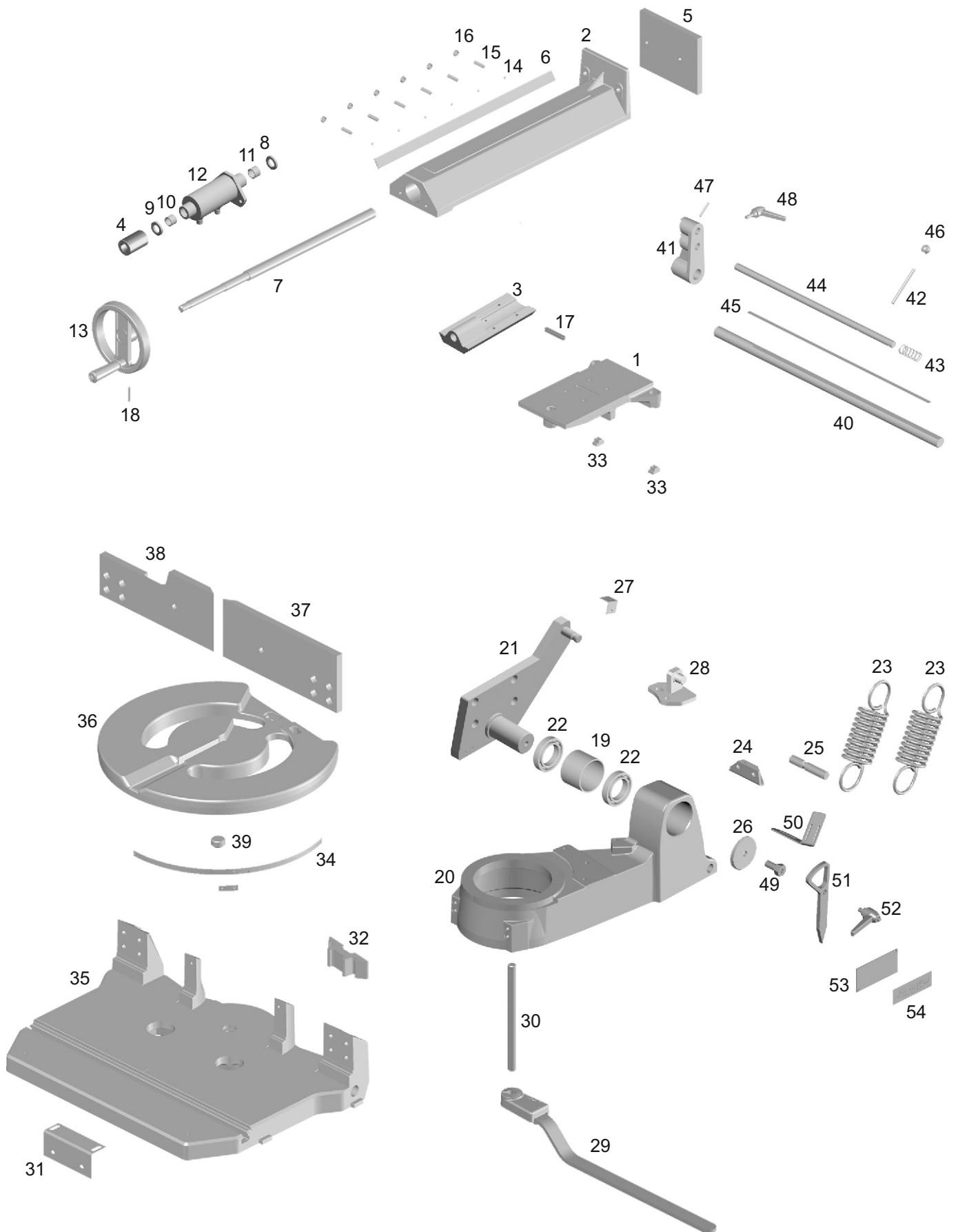
11.3.1. The Table, Joint and Vice Assembly in ARG 260 S.A.F., ARG 300 S.A.F.



Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	002177	Vice body	260	1	26	013855	Joint cap	260	1
2	002178	Movable jaw	260	1	27	002210	Spring angle	260	1
3	008876	Trapezoidal nut	260	1	28	014989	Hydraulics holder, lower	260	1
5	016073	Movable jaw plate	260	1	29	002158	Table lever	260	1
6	002187	Dovetail bar	260	1	30	001360	Screw, table, M20	260	1
7	002176	Trapezoidal screw	260	1	31	006359	Vice console, top	260	1
8	008874	Trapezoidal screw ring 1	260	1	32	008396	Angular plate 60 °	260	1
9	002148	Trapezoidal screw ring 2	260	1	33	001421	Measuring plate	260	1
10	001835	Pin bearing 18x22x17	260	1	34	015415	Stop rod, long	260	1
11	001836	Pin bearing 20x24x17	260	1	35	015416	Adjustable stop body	260	1
12	002090	Hydraulic cylinder PČH-50/32x15	260	1	36	015417	Stop rod lever	260	1
13	002111	Vice handwheel with a crank	260	1	37	015418	Compression spring 2x22x60	260	1
14	001711	Ball, bearing 6	260	6	38	015419	Stop rod, short	260	1
15	001617	Worm screw, punched M8x30	260	6	39	009295	Label, stop gauge, mm	260	1
16	001712	Locking nut M8	260	6	40	011540	Adjustable lever M8x16	260	1
17	004390	Tight spring 10e7x8x60	260	1	41	001552	Ball 20 M8	260	1
18	002642	6x40 flexible pin	260	1	42	002642	6x40 flexible pin	260	1
19	009587	Tube spacer	260	1	43	002112	Uplift measuring screw	260	1
20	023780	Turntable	260	1	44	009429	Limit switch holder	260	1
21	024665	Joint	260	1	45	024565	Arrow	260	1
22	006474	6010-2Z ball bearing	260	2	46	011540	Adjustable lever M8x16	260	1
23	002165	Tension spring	260	1	47	005290	Plate washer	260	1
24	014534	Limit switch stop	260	1	48	005289	Arm uplift plate	260	1
25	001373	Spring pin	260	1					

Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	015391	Vice body	300	1	25	002168	Spring pin	300	1
2	002665	Movable jaw	300	1	26	013855	Joint cap	300	1
3	008717	Trapezoidal nut	300	1	27	002210	Spring angle	300	1
4	014909	Spacer ring	300	1	28	014989	Hydraulics holder, lower	300	1
5	002666	Movable jaw plate	300	1	29	002158	Table lever	300	1
6	002669	Dovetail bar	300	1	30	001360	Screw, table, M20	300	1
7	014908	Trapezoidal screw	300	1	31	006359	Vice console, top	300	1
8	008874	Trapezoidal screw ring 1	300	1	32	008396	Angular plate 60 °	300	1
9	002148	Trapezoidal screw ring 2	300	1	33	001421	Measuring plate	300	1
10	001835	Pin bearing 18x22x17	300	1	34	015415	Stop rod, long	300	1
11	001836	Pin bearing 20x24x17	300	1	35	015416	Adjustable stop body	300	1
12	002090	Hydraulic cylinder PČH-50/32x15	300	1	36	015417	Stop rod lever	300	1
13	002111	Vice handwheel with a crank	300	1	37	015418	Compression spring 2x22x60	300	1
14	001711	Ball, bearing 6	300	7	38	015419	Stop rod, short	300	1
15	001617	Worm screw, punched M8x30	300	7	39	009295	Label, stop gauge, mm	300	1
16	001712	Locking nut M8	300	7	40	011540	Adjustable lever M8x16	300	1
17	004390	Tight spring 10e7x8x60	300	1	41	001552	Ball 20 M8	300	1
18	002642	6x40 flexible pin	300	1	42	002642	6x40 flexible pin	300	1
19	009588	Tube spacer	300	1	43	002112	Uplift measuring screw	300	1
20	023780	Turntable	300	1	44	009429	Limit switch holder	300	1
21	024217	Joint	300	1	45	024565	Arrow	300	1
22	009605	Tapered roller bearing 32010 X	300	2	46	011540	Adjustable lever M8x16	300	1
23	001368	Tension spring	300	2	47	005290	Plate washer	300	1
24	014534	Limit switch stop	300	1	48	005289	Arm uplift plate	300	1

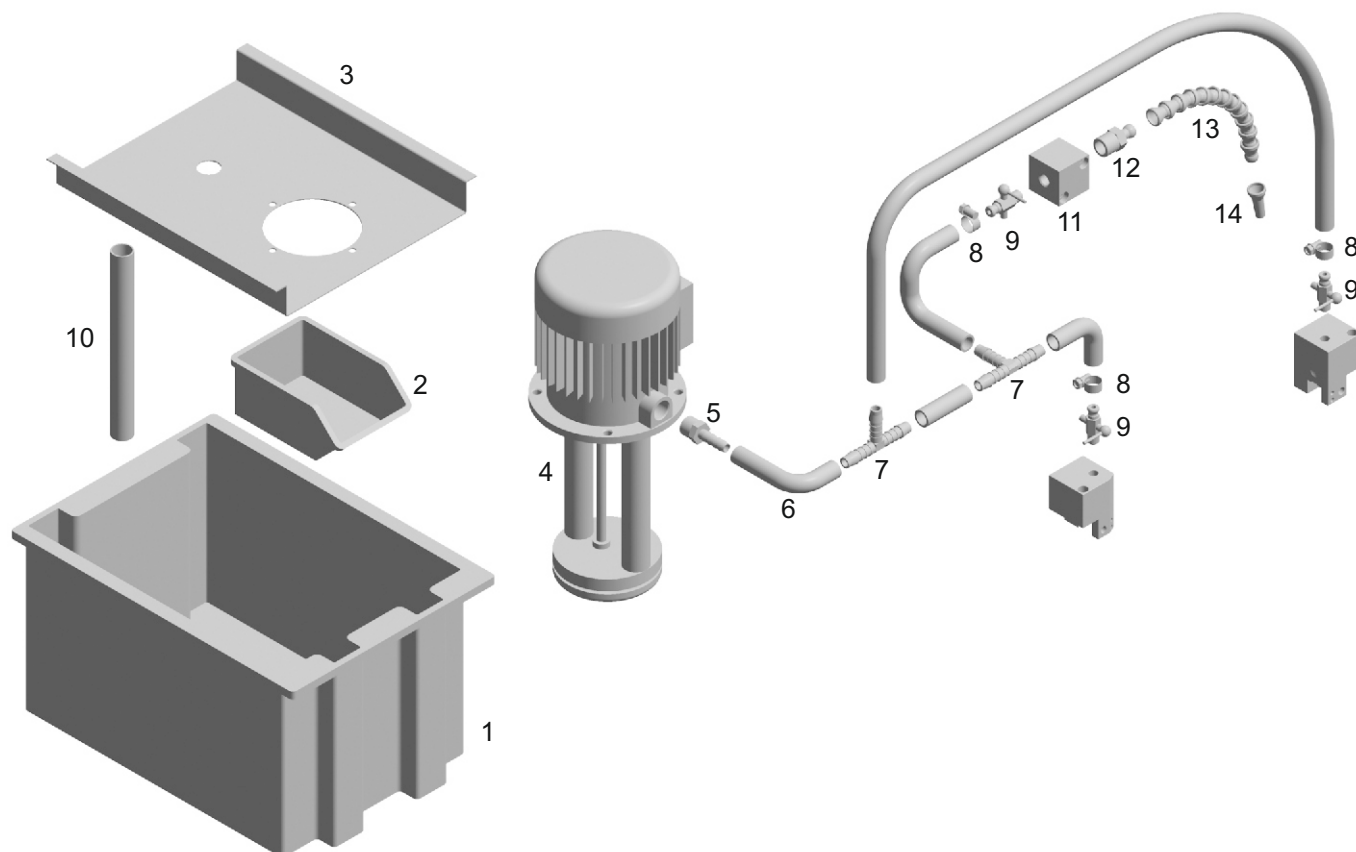
11.3.2.The Table, Joint and Vice Assembly in ARG 260 plus S.A.F., ARG 300 plus S.A.F.



Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	015394	Vice body	260+	1	29	002158	Table lever, mounted	260+	1
2	002178	Movable jaw, shell	260+	1	30	001360	Screw, table, M20	260+	1
3	008876	Trapezoidal nut	260+	1	31	006359	Vice console, top	260+	1
5	016073	Movable jaw plate	260+	1	32	015411	Table head	260+	1
6	002187	Dovetail bar	260+	1	33	001496	T Nut	260+	2
7	002167	Trapezoidal screw	260+	1	34	001498	Angular plate	260+	1
8	008874	Trapezoidal screw ring 1	260+	1	35	015406	Table plate	260+	1
9	002148	Trapezoidal screw ring 2	260+	1	36	015408	Turntable	260+	1
10	001835	Pin bearing 18x22x17	260+	1	37	015409	Right jaw	260+	1
11	001836	Pin bearing 20x24x17	260+	1	38	015410	Left jaw	260+	1
12	002090	Hydraulic cylinder PČH-50/32x15	260+	1	39	009603	Aligning nut	260+	1
13	002111	Vice handwheel with a crank	260+	1	40	015415	Stop rod, long	260+	1
14	001711	Ball, bearing 6	260+	6	41	015416	Adjustable stop body	260+	1
15	001617	Worm screw, punched M8x30	260+	6	42	015417	Stop rod lever	260+	1
16	001712	Locking nut M8	260+	6	43	015418	Compression spring 2x22x60	260+	1
17	004390	Tight spring 10e7x8x60	260+	1	44	015420	Stop rod, short	260+	1
18	002642	6x40 flexible pin	260+	1	45	009295	Label, stop gauge	260+	1
19	009587	Tube spacer	260+	1	46	001552	Ball 20 M8	260+	1
20	023780	Turntable	260+	1	47	002642	6x40 flexible pin	260+	1
21	024665	Joint	260+	1	48	011540	Adjustable lever M8x16	260+	1
22	006474	6010-2Z ball bearing	260+	2	49	002112	Uplift measuring screw	260+	1
23	002165	Tension spring	260+	1	50	009429	Limit switch holder	260+	1
24	014534	Limit switch stop	260+	1	51	024565	Arrow	260+	1
25	001373	Spring pin	260+	1	52	011540	Adjustable lever M8x16	260+	1
26	013855	Joint cap	260+	1	53	005290	Plate washer	260+	1
27	002210	Spring angle	260+	1	54	005289	Arm uplift plate	260+	1
28	014990	Hydraulics holder, lower	260+	1					

Pos.	Order number	Name	Type ARG	Pcs	Pos.	Order number	Name	Type ARG	Pcs
1	015394	Vice body	300+	1	28	014990	Hydraulics holder, lower	300+	1
2	002665	Movable jaw, shell	300+	1	29	002158	Table lever, mounted	300+	1
3	008876	Trapezoidal nut	300+	1	30	001360	Screw, table, M20	300+	1
4	014909	Spacer ring	300+	1	31	006359	Vice console, top	300+	1
5	002666	Movable jaw plate	300+	1	32	015411	Table head	300+	1
6	002669	Dovetail bar	300+	1	33	001496	T Nut	300+	2
7	014908	Trapezoidal screw	300+	1	34	002135	Angular plate	300+	1
8	008874	Trapezoidal screw ring 1	300+	1	35	015397	Table plate	300+	1
9	002148	Trapezoidal screw ring 2	300+	1	36	015398	Turntable	300+	1
10	001835	Pin bearing 18x22x17	300+	1	37	015399	Right jaw	300+	1
11	001836	Pin bearing 20x24x17	300+	1	38	015400	Left jaw	300+	1
12	002090	Hydraulic cylinder PČH-50/32x15	300+	1	39	009603	Aligning nut	300+	1
13	002111	Vice handwheel with a crank	300+	1	40	015415	Stop rod, long	300+	1
14	001711	Ball, bearing 6	300+	7	41	015416	Adjustable stop body	300+	1
15	006429	Worm screw, punched M8x35	300+	7	42	015417	Stop rod lever	300+	1
16	001712	Locking nut M8	300+	7	43	015418	Compression spring 2x22x60	300+	1
17	004390	Tight spring 10e7x8x60	300+	1	44	015422	Stop rod, short	300+	1
18	002642	6x40 flexible pin	300+	1	45	009295	Label, stop gauge	300+	1
19	009588	Tube spacer	300+	1	46	001552	Ball 20 M8	300+	1
20	023780	Turntable	300+	1	47	002642	6x40 flexible pin	300+	1
21	024217	Joint	300+	1	48	011540	Adjustable lever M8x16	300+	1
22	009605	Tapered roller bearing 32010 X	300+	2	49	002112	Uplift measuring screw	300+	1
23	002165	Tension spring	300+	2	50	009429	Limit switch holder	300+	1
24	014534	Limit switch stop	300+	1	51	024565	Arrow	300+	1
25	002168	Spring pin	300+	1	52	011540	Adjustable lever M8x16	300+	1
26	013855	Joint cap	300+	1	53	005290	Plate washer	300+	1
27	002210	Spring angle	300+	1	54	005289	Arm uplift plate	300+	1

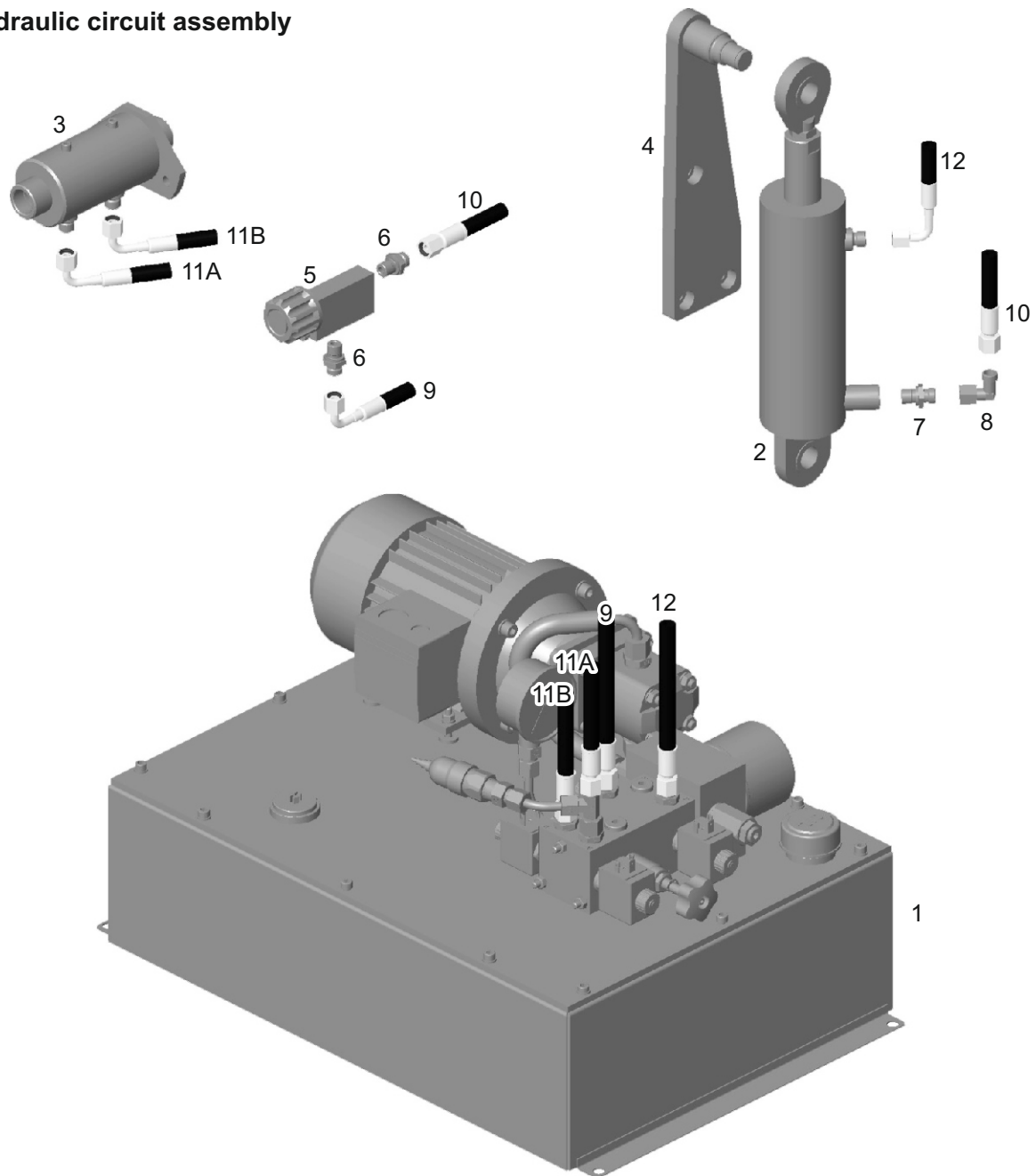
11.4. Cooling Assembly



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Pos.	Order number	Name	Type ARG	Pcs
1	001397	Coolant tank	250,300	1
2	001335	Settling container	250,300	1
3	001387	Coolant tank lid	250,300	1
4	015819	Pump 1COP1-17, 20kPa/16l/min, 3x230V/3x400V, 50Hz	250,300	1
5	002403	Hose connector, tapered, 3/4", 8 mm	250,300	1
6	001399	PVC hose DN 8x2	250,300	5,5 m
7	001401	T-piece TS 10	250,300	2
8	001398	Hose clamp	250,300	3
9	001402	Draincock 050	250,300	3
10	005747	Drain hose MPVC 25x32mm	250,300	0,7 m
11	013849	Additional cooling head	250,300	1
12	002194	Neck 12-3/8"	250,300	1
13	001661	Joint part 12"	250,300	17
14	001662	Cylindrical end piece KR 12	250,300	1

11.5. Hydraulic circuit assembly



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Pos.	Order number	Name	Type ARG	Pcs
1	021187	Hydraulic unit S001_037_5	260-300	1
2	015759	Hydraulic cylinder	260	1
	015756	Hydraulic cylinder	300	1
3	002090	Hydraulic cylinder of the vice	260-300	1
4	025556	Gibbet	260	1
	025557	Gibbet	260+	1
	023432	Gibbet	300	1
	023433	Gibbet	300+	1
5	001929	Butterfly valve	260	1
	002286	Butterfly valve	300	1
6	001986	Straight connector	260-300	2
7	024157	Socket	260-300	1
8	006735	Adjustable connector	260-300	1
9	002444	Hydraulic hose DN6- 1000 Straight/90°	260-300	1
10	014187	Hydraulic hose DN6- 3500 Straight/90°	260	1
	018180	Hydraulic hose DN6- 3500 Straight/Straight	300	1
11	002753	Hydraulic hose DN6- 2000 Straight/90°	260-300	2
12	014187	Hydraulic hose DN6- 3500 Straight/90°	260-300	1
13	003569	Hydraulic oil OPTIMA HV 46	260-300	22 l

12. Accessories

12.1. Laser Guideline Light

Laser guidance is a very practical tool for easy identification of the desired length of the cut material without a horizontal side stop both during perpendicular and angular cutting. The future cutting spot is indicated by a red mark copying the saw blade.



Safety warning

Caution! Includes a 3R-class laser source. Avoid eye contact with both direct and reflected laser beam. Never look into the laser lens when the machine is in operation! Risk of permanent damage to your vision!

Information - What is a Laser of the performance class 3R - classification according to IEC 60825

To this group belong lasers that emit radiation in the continuous mode in the visible part of the spectrum, from 400 to 700 nm, and whose power does not exceed 5mW. Laser of this class cannot cause damage to the human eye in case of a fleeting glance. The eye of a healthy human is protected by the natural blink reflex, supposing the person is not under the influence of narcotic substances. It is assumed that the time that elapses between the contact with the eye and the laser beam, and the closing of the eyelids (or turning the head aside), is less than 0.25 s. That is sufficient for the retina to remain protected from the light energy of over 0.25 millijoule. The amount of 0.25 mJ is the maximum permissible value the human eye can be exposed to in case of a direct eye contact with the laser bundle. Danger arises during an intentional and a long look into the laser beam, or when contemplating the beam with an optical system. **It is not allowed to watch the beam with binoculars.** These lasers would cause permanent eye damage.

12.1.1. Activation and deactivation of the laser beam

After unpacking, the laser guideline light is in a full working condition. After switching on the machine (according to the instruction manual of the machine), the laser beam is activated and starts to radiate. After turning off the machine (according to the instruction manual of the machine), the beam extinguishes.

12.1.2. Laser indication on the machine

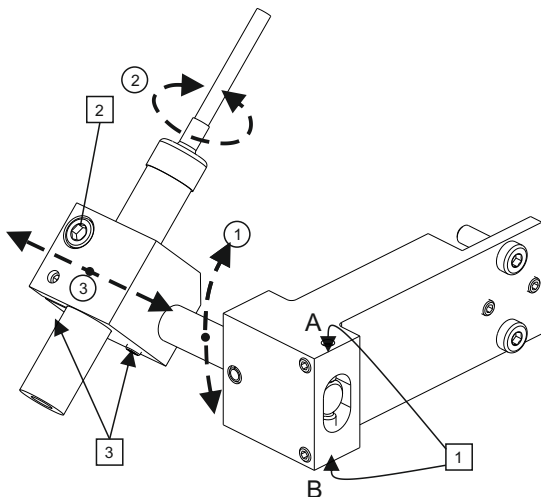
Each machine equipped with the laser guideline light must be indicated with a laser pictogram label.

In the proximity of the machine and the operator, a security warning must be displayed.



12.1.3. Adjustment

If the laser beam does not point exactly at the cut, it needs to be adjusted.



1. Switch on the machine, the laser beam starts to radiate.
2. Set up the beam as close as possible to the desired position.
3. Then, while adjusting, start moving the laser holder console ① upwards or downwards and adjust the laser beam with a descending arm so that it does not veer to one or the other side.
If the beam veers in the direction ahead of the cut, when the shoulder is descending, loosen the setting screw 1A and tighten 1B. Or the other way round.
4. When the beam does not veer anymore and remains directed during both ascending and descending of the arm, readjust the desired direction by ② and ③.

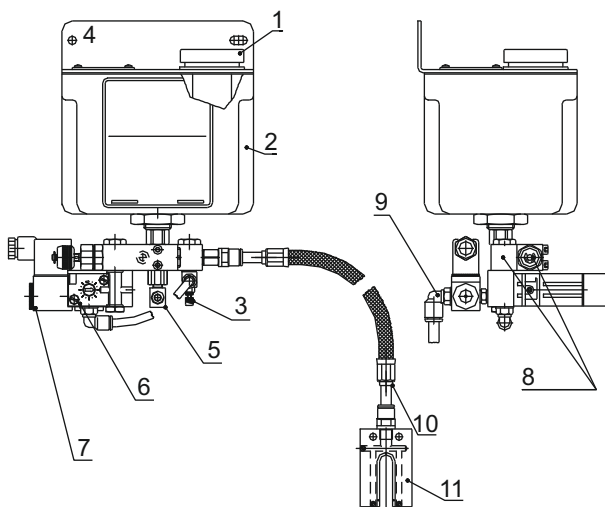
12.2. Oil Mist Lubrication

When using the standard cooling equipment, coolant leakages from the machine often occur, particularly when cutting long sections. Oil mist lubrication is a device that creates oil mist subsequently applied through nozzles directly onto the saw blade that is then cooled and lubricated. The device functions by dosing oil and air mixture. It is also useful in the processing of material that excludes the contact with a regular coolant. This lubrication system is lossy, so it is necessary to refill the coolant regularly.

The injection nozzle holder must be placed near the designated point in order to reach the optimum adjustment of the nozzle with the least possible distance from the lubrication point. The supplied compressed air must be absolutely dry and oil free. Optimum operating pressure is between 4 and 8 bars. Commissioning is carried out during the open subordinate actuating valve by an external signal from the control valve (optional), the connection to mains is facilitated by a supplied screw connector (PG9). Fill the tank with COOLcut Micro liquid and the mist lubrication is ready for operation.

Important:

In the event of use of lubricating media other than the recommended, a risk of decay or deposits arise. That is why the system functionality can only be guaranteed for the use of COOLcut Micro liquid.



1	SCREW-ON LID WITH A FILTER
2	1.2L CONTAINER
3	OIL MIST SETTING
4	FITTING HOLE
5	VENTING
6	PULSE GENERATOR
7	SOLENOID VALVE 24V DC PG 9 SOCKET
8	DOSING PUMP
9	COUPLING 8MM
10	2.5 M COAXIAL POWER CABLE (METAL PROTECTION)
11	NOZZLE HEAD CAT. NO.: 70.107.1

Oil mist venting

Oil mist lubrication system is supplied after testing.

Before commissioning and maintenance on the coaxial cable or nozzle, the system has to be vented. If the volume of oil in the container does not drop under the minimum threshold, other venting is not necessary.

Venting procedure:

1. Fill the tank with a clean lubrication medium.
2. Loosen the drainage and venting screw a little and keep releasing the lubricating medium until there are no air bubbles present in it.
3. Set the pulse generator frequency to the maximum value (approx. 66 pulses per minute).
4. Set the dosing pump piston stroke to the maximum.
5. Connect the compressed air and fill the capillary tube, so that all the tubing along the whole length is bubble-free (filling duration depends on the length of tubing).
6. Connect to coaxial head to the spray head.
7. After venting, set the frequency and piston stroke to operating values again.

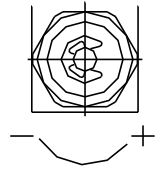
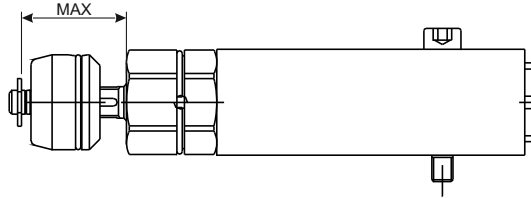
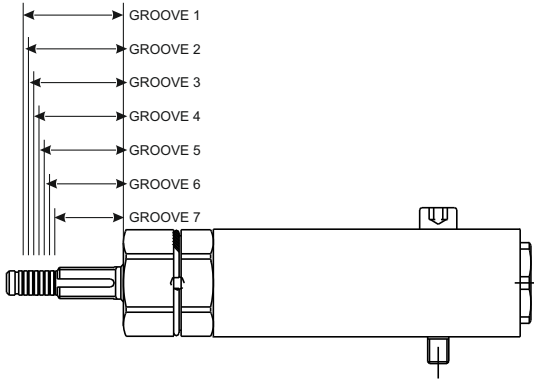
Oil mist setting

1. Pulse generator settings: pneumatic time relay controls the dosing pump. You can set the frequency continuously from 0 to 66 pulses per minute.
2. Dosing pump settings: the piston vacuum pump doses the lubricating medium under high pressure. The quantity of the lubricant can be regulated by turning the manual setting wheel.
3. Oil mist spray setting: By spraying the air the drops form a very fine lubricating film and its setting influences the degree of dispersion, cooling and chips formation. Volume of air in the nozzle can be adjusted by the adjustment screw.

DOSING PUMP SETTINGS

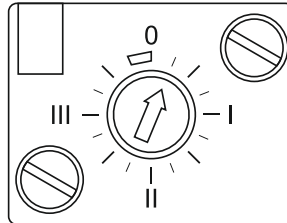
Piston vacuum pump doses the lubricant accurately and under high pressure.

CLICK	GROOVE No.	SUPPLIED VOLUME/STROKE
0	1	41 mm ³
4	2	30 mm ³
8	3	23 mm ³
12	4	16 mm ³
16	5	9 mm ³
18	6	2 mm ³
20	7	0 mm ³



PULSE GENERATOR SETTINGS 6 BAR (90 PSI)

66 PULSES
PER MINUTE



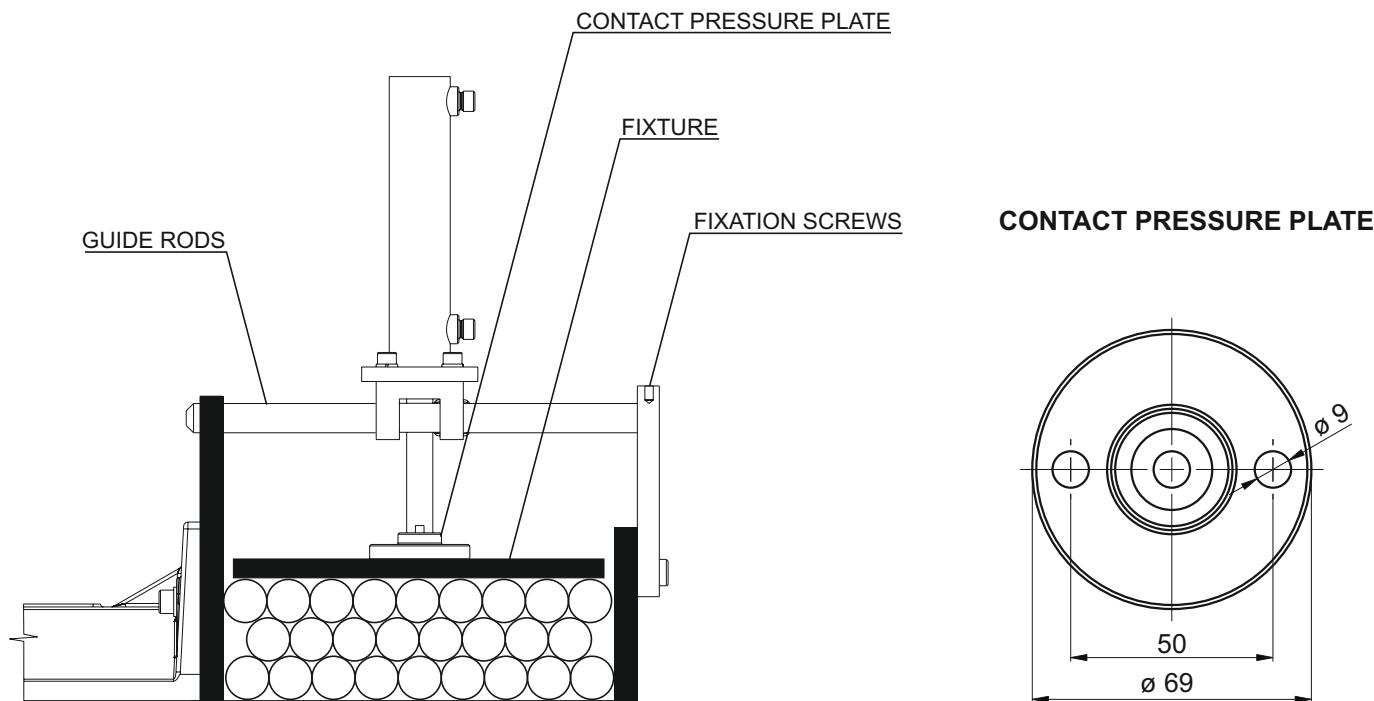
37 pulses per minute	21 pulses per minute	13 pulses per minute	10 pulses per minute	6 pulses per minute	5 pulses per minute

4 pulses per minute	3 pulses per minute	2,5 pulses per minute	2 pulses per minute	1,5 pulses per minute	1 pulses per minute

12.3. Vertical Vice for HVP Bundle Cutting

The HVP vertical vice facilitates are used for cutting of materials in bundles. Proper and sufficient clamping of all workpieces in the bundle significantly influences the service life of the saw blade. The contact pressure plate facilitates vertical clamping of the workpiece. If a larger bearing surface is required, mount your own fixture of corresponding dimensions onto the contact pressure plate. Make sure that the guide rods are locked by fixation screws before you start cutting. **Check whether the workpiece is properly clamped, otherwise you risk its ejection during cutting!**

WARNING! When using the vertical vice while cutting the workpieces in HVP bundles, you can cut only at 90°.

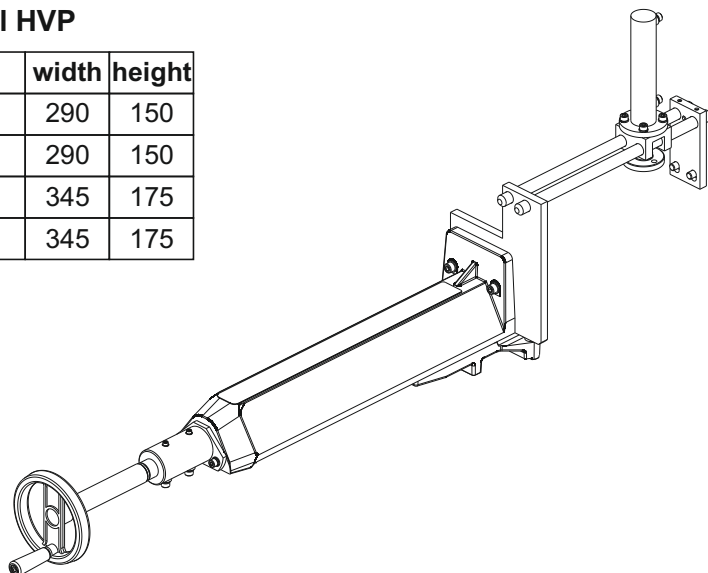


The HVP packet for one-directional swing saw ARG 260, 300 S.A.F. includes a new movable clamping jaw and also a small clamping jaw that has to be connected onto a pre-drilled cast iron fixed clamping jaw in front of the cutting line.

The HVP packet for one-directional swing saw ARG 260, 300 plus S.A.F. includes a new movable clamping jaw and also a small clamping jaw that has to be connected onto a pre-drilled cast iron fixed clamping jaw in front of the cutting line. Longitudinal rods are usually supplied in three pieces, in order to allow for cutting of a whole range of sections. It is necessary to replace the rod before cutting in order to prevent collision with the guide head or clamping jaw.

Maximum material HVP

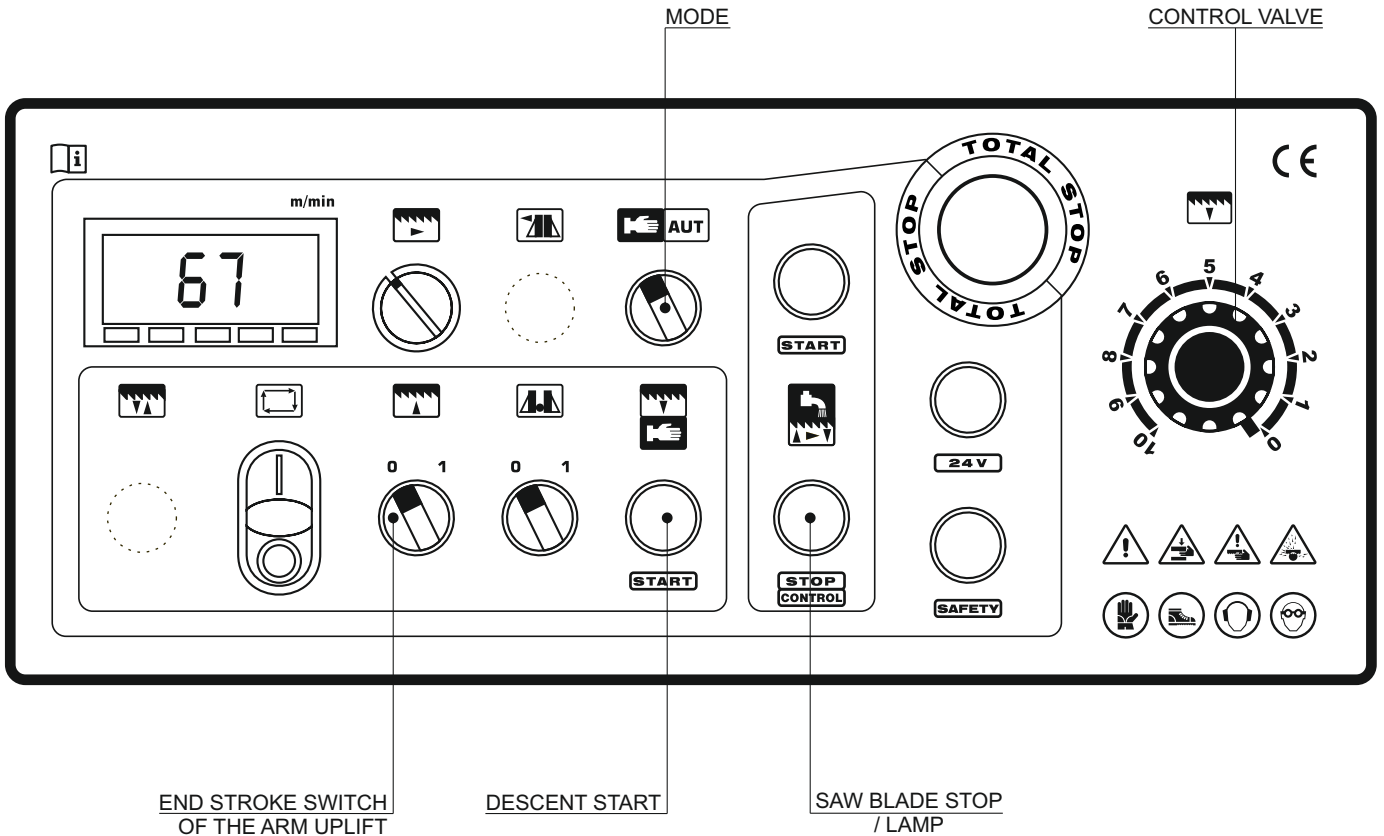
Machine type	width	height
ARG 260 S.A.F.	290	150
ARG 260 plus S.A.F.	290	150
ARG 300 S.A.F.	345	175
ARG 300 plus S.A.F.	345	175



12.4. Electronic arm uplift height setting

On a standard machine, the arm uplift height is adjusted manually on a scale located on the machine's joint. This version is fitted with a sensor on the machine's joint.

Switch the machine into manual mode (see section 4.1.). Set the END STROKE SWITCH OF THE ARM UPLIFT into position 1, arm will travel upwards to the maximal position. Shut off the CONTROL VALVE and set the END STROKE SWITCH OF THE ARM UPLIFT into position 0. Press the DESCENT START and the arm goes down by gradually releasing the CONTROL VALVE. Move the sawblade to the desired height of the arm by closing the CONTROL VALVE. Press the SAW BLADE STOP and switch MODE into position AUT. The set arm uplift height is stored in the machine memory after switching the machine to semi-automatic mode. Set the END STROKE SWITCH OF THE ARM UPLIFT into position 1. After the workpiece is cut, the arm is automatically raised to the set arm uplift height.



EU Declaration of Conformity

in accordance with Directive 2006/42/EC of the European Parliament and of the Council (Government Regulation No. 176/2008 Coll.)
in accordance with Directive 2014/30/EU of the European Parliament and of the Council (Government Regulation No. 117/2016 Coll.)

Manufacturer: Pilous-pásové pily, spol. s r.o., Železná 9, Brno 619 00, CZ, VAT: CZ60727551

Identification data of the machine: Band saw including accessories

Type: ARG

Serial number:

Description and designation of product function: The band saw is intended for cutting primarily metal materials, while the workpiece is clamped in a fixed vice and the cutting is carried out by a saw blade arm.

All applicable provisions the machine is in compliance with:

- Directive 2006/42/EC of the European Parliament and of the Council
- Directive 2014/30/EU of the European Parliament and of the Council

The EU Declaration of Conformity is issued to the sole responsibility of the producer.

Applied harmonized standards:

- ČSN EN ISO 16093:2018
- ČSN EN 50370 - 1:2005
- ČSN EN 50370 - 2:2003
- ČSN EN 614-1+A1:2009

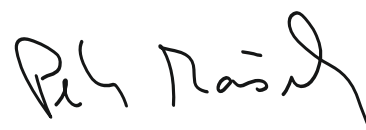
Responsible for drawing up technical documentation:

name, company address: **Pilous-pásové pily, spol. s r.o., Železná 9, Brno 619 00, CZ, VAT: CZ60727551**

This EU Declaration of Conformity is original EU Declaration of Conformity.

The last two digits of the year in which the CE mark was placed on the product: 19

In Brno, on: 1.10. 2019



person authorized to act on our behalf
Ing. Petr Mašek
Managing Director