FORMAX®

Cut-True 31H

Hydraulic Guillotine Paper Cutter

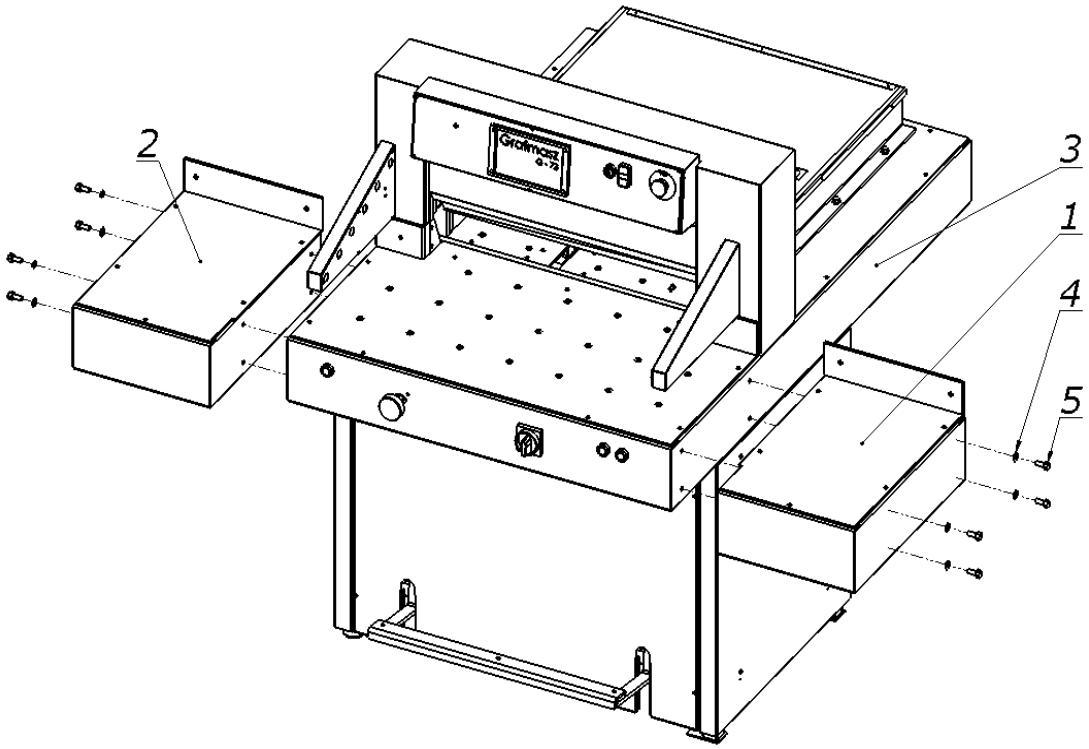
9/2017

OPERATOR MANUAL

1. TRANSPORTATION AND STORAGE

1.1.State of delivery

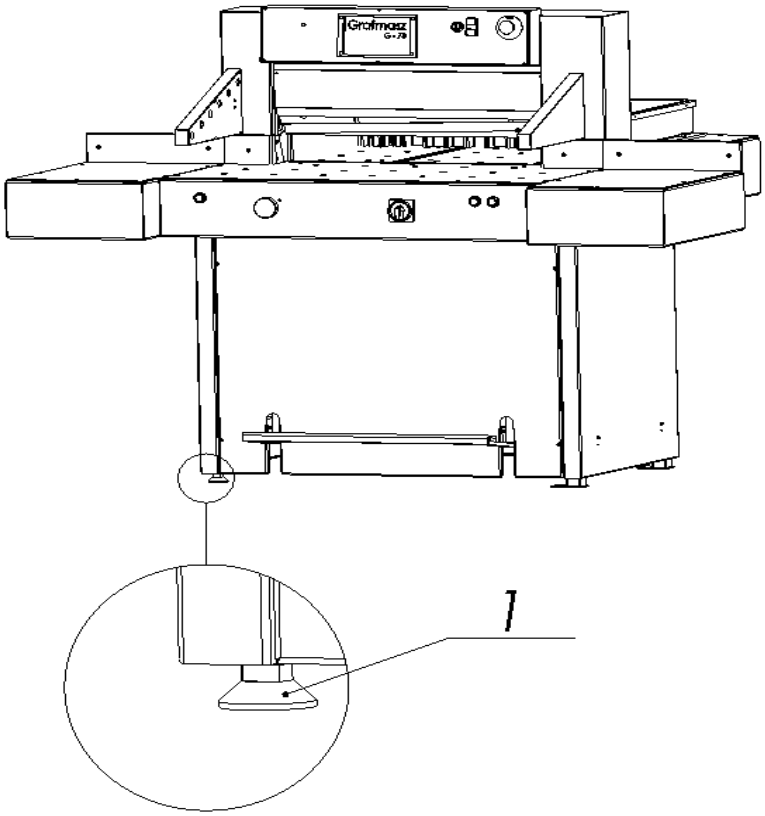
The Cut-True 31H cutter is dispatched by the manufacturer in the complete assembled state and ready to operat. The machine is equipped with side-tables which will be delivered unmounted and have to be installed refer to drawing 1.



Drawing 1. Side tables installation

1. Right side table
2. Left side table
3. Cutter body
4. Rings (8 pieces.)
5. Fixing screws(8 pieces.)

1.2. Cutter levering



Drawing 2. Adjustment of cutter positioning

The cutter does not need to be fixed to the ground. A correct and stable positioning of the machine is done by adjusting the foot rotation, shown in Drawing 2. It is responsibility of the user to create such working conditions for the cutter to be set properly to eliminate possibility of the operator injury.

2. MACHINE TECHNICAL INFORMATION

2.1. Destination

The cutter is designed for cutting: a pile of paper, cardboard and other materials, such as: plastics, etc. It is used in printing houses, bookbinders, work-shops and offices.

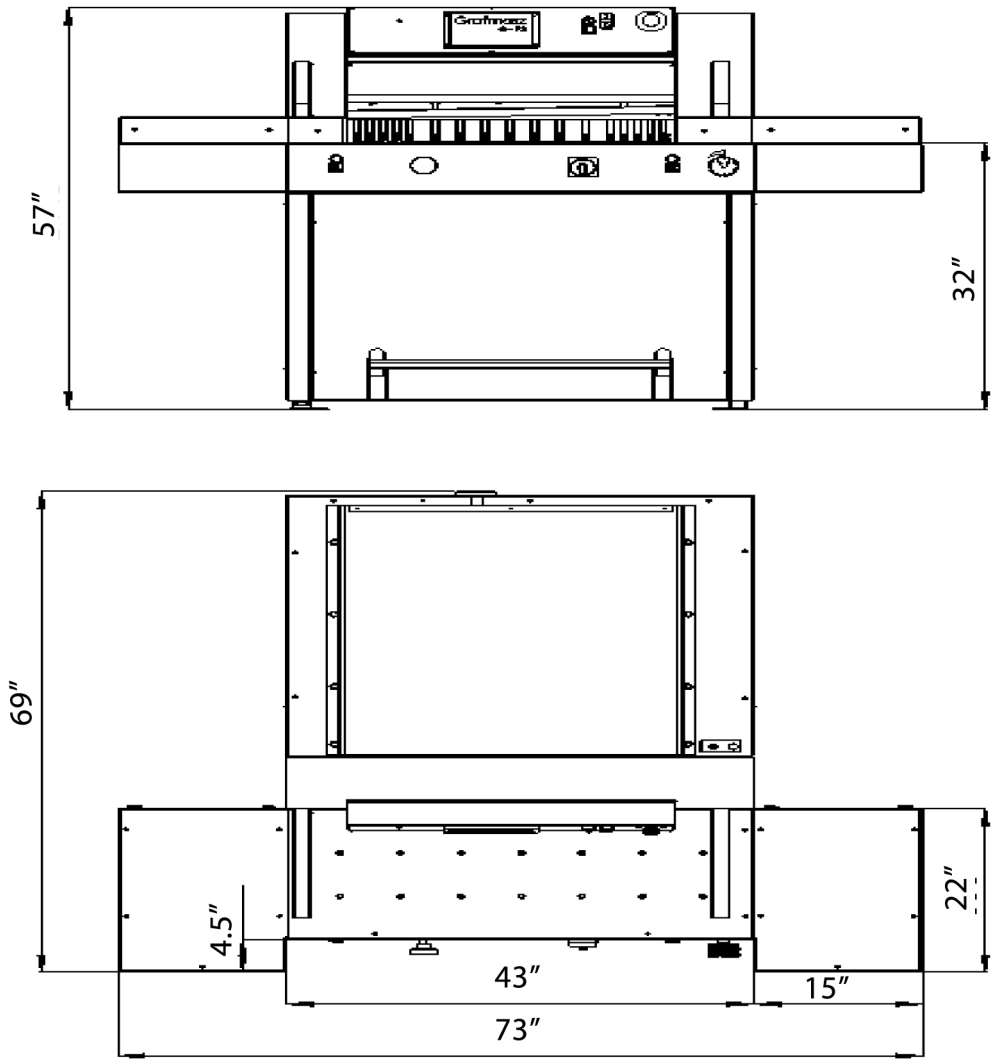
2.2.Main parameters

2.2.1. Technical data

Table 1.

Maximum paper width	**28.7" (730 mm)**
Maximum paper height	**3.94" (100mm)**
Back table length	**28.7" (730mm)**
Narrow cut with false calmp (mm)	**1.18" (30mm)**
Narrow cut without false calmp (mm)	**2.36"(60mm)**
Hydraulic engine drive motor (kW)	**2,2**
Backgauge motor (kW)	**0,18**
Blower motor (kW)	**0,4**
Clamp pressure (daN)	**300-2000**
Weight (kg)	**1,323 lbs (610kg)**
Power	**208V, 30Amp Single Phase NEMA 6-30P**

2.2.2 Machine dimensions

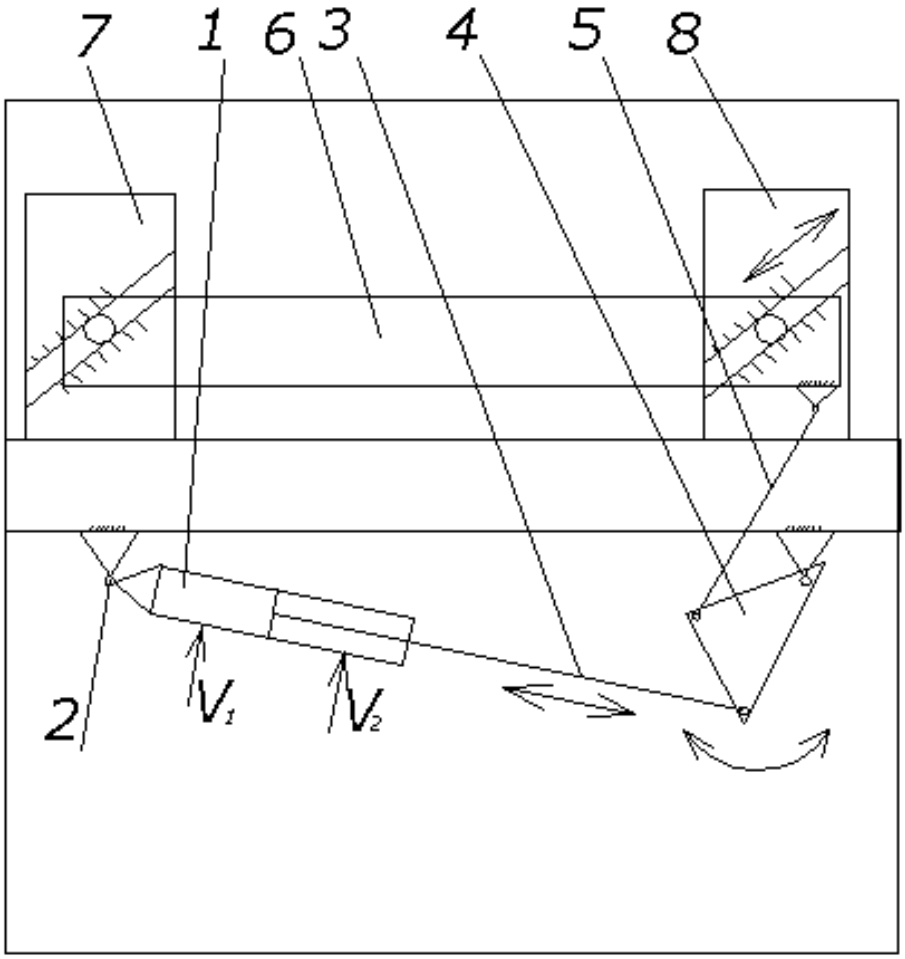


Drawing 3. External dimensions

2.3. Construction of the machine

The cutter consists of three main mechanisms: knife, clamp and backgauge drives and other additional devices.

2.3.1. Knife driving mechanism



Drawing 4. Kinematic diagram of the knife driving mechanism

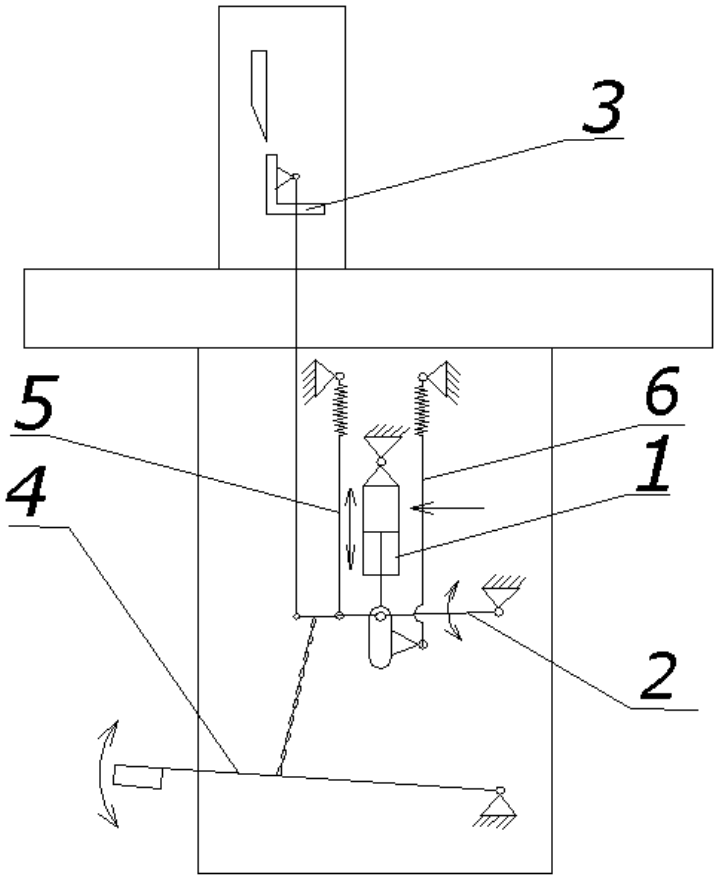
The driving mechanism for the knife is shown on Drawing 4. Hydraulic double – acting cylinder (actuator) 1 is fixed on the knuckle 2. Piston rod 3 is connected with the levers 4, which are connected with connecting rod 5, which pull knife beam 6 together with the knife.

The knife bar 6 moves between the slide ways 7 and 8, in perpendicular plane to the

work tables plane. Inclination of the slide ways at different angles allows inclination of the knife bottom edge at the same angle, when the knife moves down. It decreases a force required for cutting, and the cutting accuracy is increased.

The knife is so guided that in its bottom position the blade is parallel to the under knife cutting stick, and penetrates it up to 0,5 mm depth. Admission of the cylinder with the entry V1 causes, the piston rod 3 moves through the lever 4 knife beam and goes down. After cutting down material, admission of the cylinder with the entry V2 causes piston rod 3 to go back and the knife beam goes up and stops in the top position.

2.3.2 Clamp bar mechanism

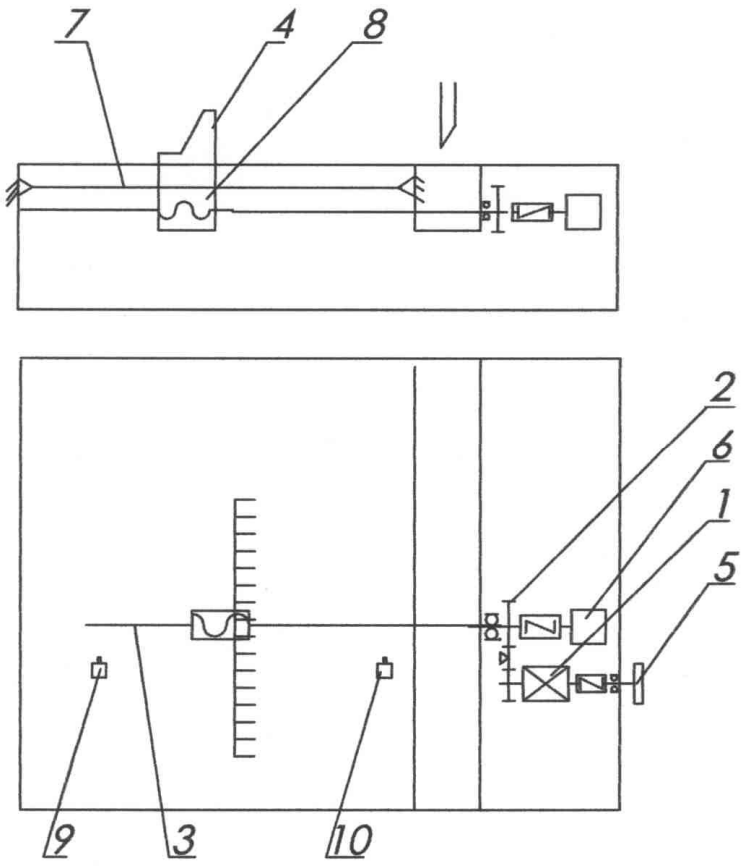


Drawing 5. Kinematic diagram for the clamping bar drive mechanism

The driving mechanism for the clamping bar is shown on Drawing 5. Hydraulic double

– acting cylinder (actuator) 1 through the levers 2, pulls clamping beam 3 down. Clamping beam 3 is shifted in the slideways (not stated on the drawing) , that guarantees its parallelism to the cutting line.
Lowering down the clamp bar 3 is possible also by pressing foot pedal 4. Pushing the pedal 4 moves the bar 5 into the lower position. Return of the clamping bar 3 is permitted by the spring 5. Spring 6 causes the return of cylinder 1 into its start position.

2.3.3 Back gauge mechanism

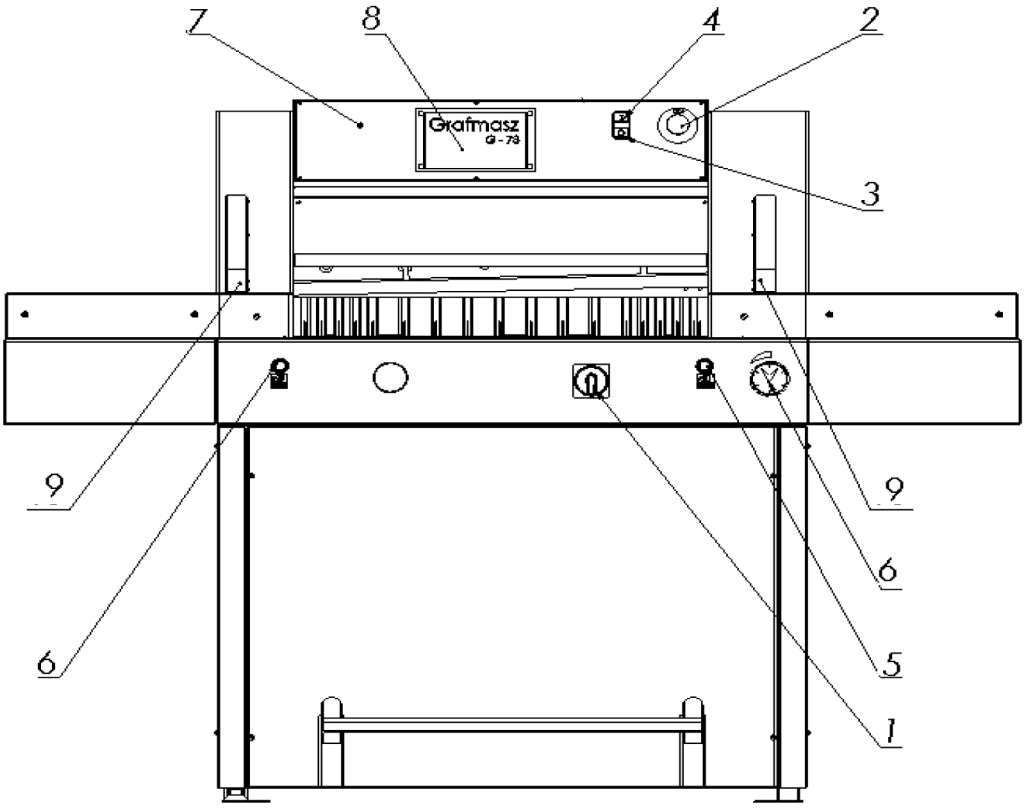


Drawing 6. Kinematic diagram for backgauge mechanism.

Electric motor 1 drives the feed screw through the belt transmission 2, through the nut forcing the movement of the base motion 8 .
The base 8, bolted together with the backgauge bar 4, is guided on the guiding shaft 7. The limit switches 9, 10 cause the backgauge bar 4 to stop in its extreme positions.
An accurate setting of the backgauge bar enables knob 5. The pulse- rotary converter

6 is connected with the feed screw 3, that allows measuring and displaying positions of pushing bar 4.

2.3.4 Control system



Drawing 7. Operation and signalization.

1. Main on-off switch, connecting and disconnecting circuit from the power supply
2. Push button, red color, (emergency switch), used for stopping the control system and prevents the cutter start up
3. Push button, red color, used for locking the cutter system which prevents the cutter start.
4. Push button. green colour, starts the cutter system.

5. Cutting buttons for two-hand activation of cut cycle

6. Knob for the clamp pressure adjustment:

- in order to reduce the pressure turn the knob left

- in order to increase the pressure turn the knob right

7. Diode.

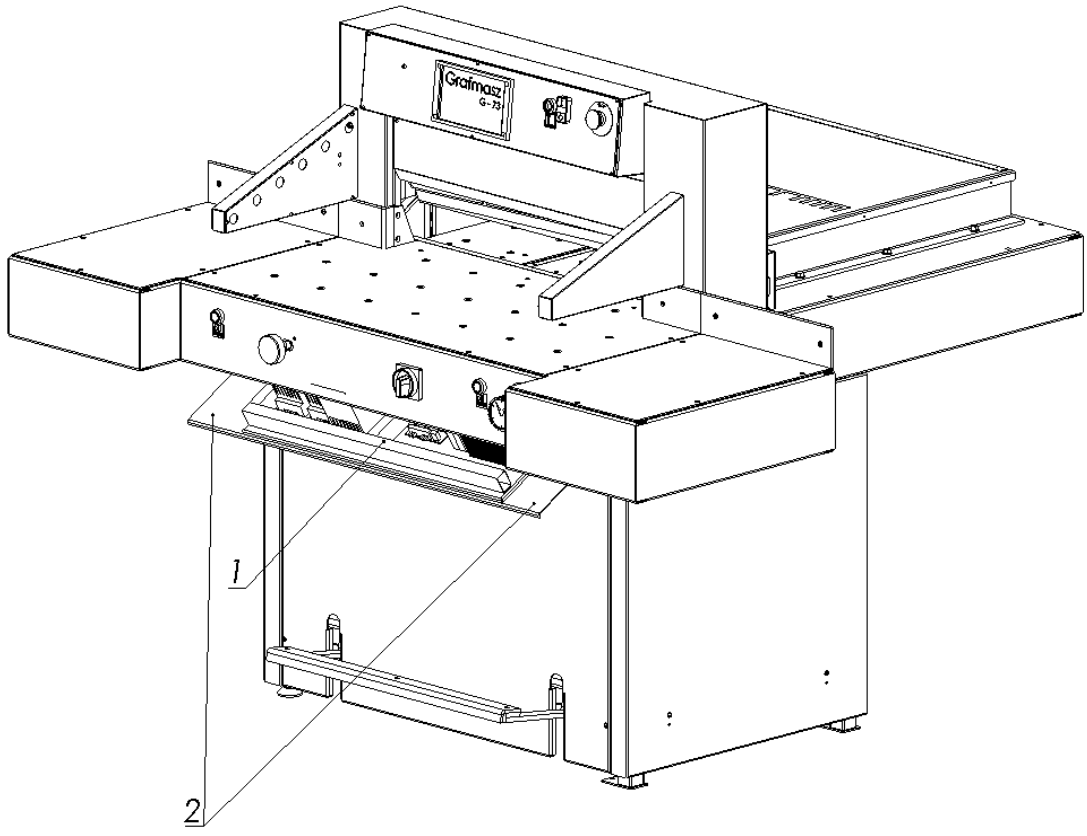
-red, system switched off

-green, system switched on

8. Color Touch Screen Operator Panel

9. Light barrier (photocells)

Control equipment is mounted on the hinged cover 1 - as shown on Drawing 8.The cover 1 is fixed by the 3 nuts in the closing position.



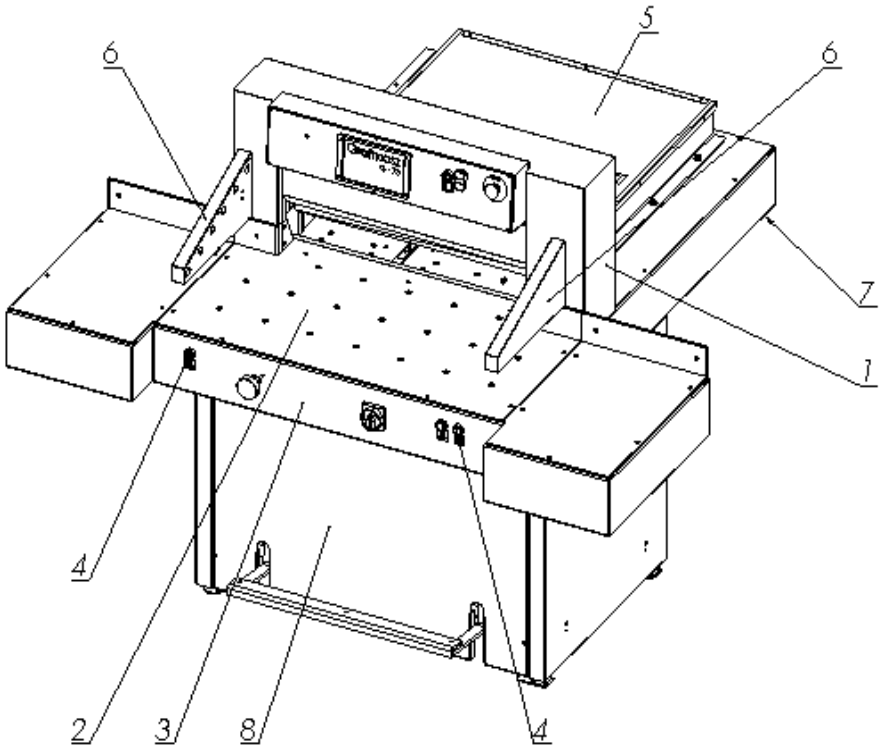
Drawing 8. Control equipment location

3. PROTECTION AGAINST HAZARDS

3.1. Hazards to be expected

The potential hazards resulting with the cutter construction and operation, and safety means to eliminate such hazards are presented in table; layout of the safety items is shown schematically on drawing 9.

The cutter is the type of the machine, where repetitious access to the dangerous clamping and cutting zone for the operator is needed. In order to ensure operator's safety machine is equipped with two-hands safety devices and additionally with light barrier. In addition the correction of the upper stop position of the knife is controlled by cam device.



Drawing 9.

Chart 2.

	Factors and / or danger places	Identification	Item	Drawing
I	**MECHANICAL**			
1.	Levers for the clamping bar drive mechanism	- permanent shield	1,3,8	03.00.00 01.00.00 10.00.00
2.	Motor, belt transmission for the clamping bar drive mechanism	- permanent shield	8	10.00.00
3.	Motor, belt transmission for the pushing bar drive mechanism	- permanent shield - front table	3 2	01.00.00 08.00.01
4.	Motor and levers for the knife driver mechanism	- permanent shield - front table	3 1 8 2	01.01.00 03.00.00 10.00.00 08.00.00
5.	Movement of the clamping bar	- permanent shield - light barrier	1 6	03.00.00 14.00.00
6.	Movement of the pushing bar	- permanent shield	5	00.00.30
7.	Cutting zone	- double-hand protective device - light barrier - cam device supervising the knife stopping In upper dead centre	4 6 9	00.00.14 00.00.40
8.	Handling of the knife during change	- transport clamps - special protective package		

9.	Sharp edges and corners of the cutter elements	- breakdowns, dulls, roundings		
10.	Uneven or rough surfaces	- precise machining of piece - varnish coatings		
II	**ELECTRICAL**			
1.	Direct contact of the active elements	- basic protection, electrical gear in the closed recess	8	12.00.00
2.	Intermediate contact	- additional protection, continuity of protective conduit		

3.2. Rules of safe working

Guidelines for Safe Operation:

a) training of the operator, who should be fully aware of all potential hazards as could arise at the cutter operation;

b) Do not use the cutter, if:

- the machine is used out of specifications
- the cutter is non-operational in a visible manner
- any shield has been removed from moving parts of the cutter
- the working conditions of the protective devices have not been checked.

c) precise definition of tasks, that depend on the Works' requirements, belong or not to the operator's duties and are reserved to the authorized persons, especially as to the faults elimination and repairs – including the wiring system.

d) imperative: the power is turned off for maintenance and repair duties.

.

e) requirements stipulated in points b)-d) should be a subject of the training, and a contents of the work-standard instructions.

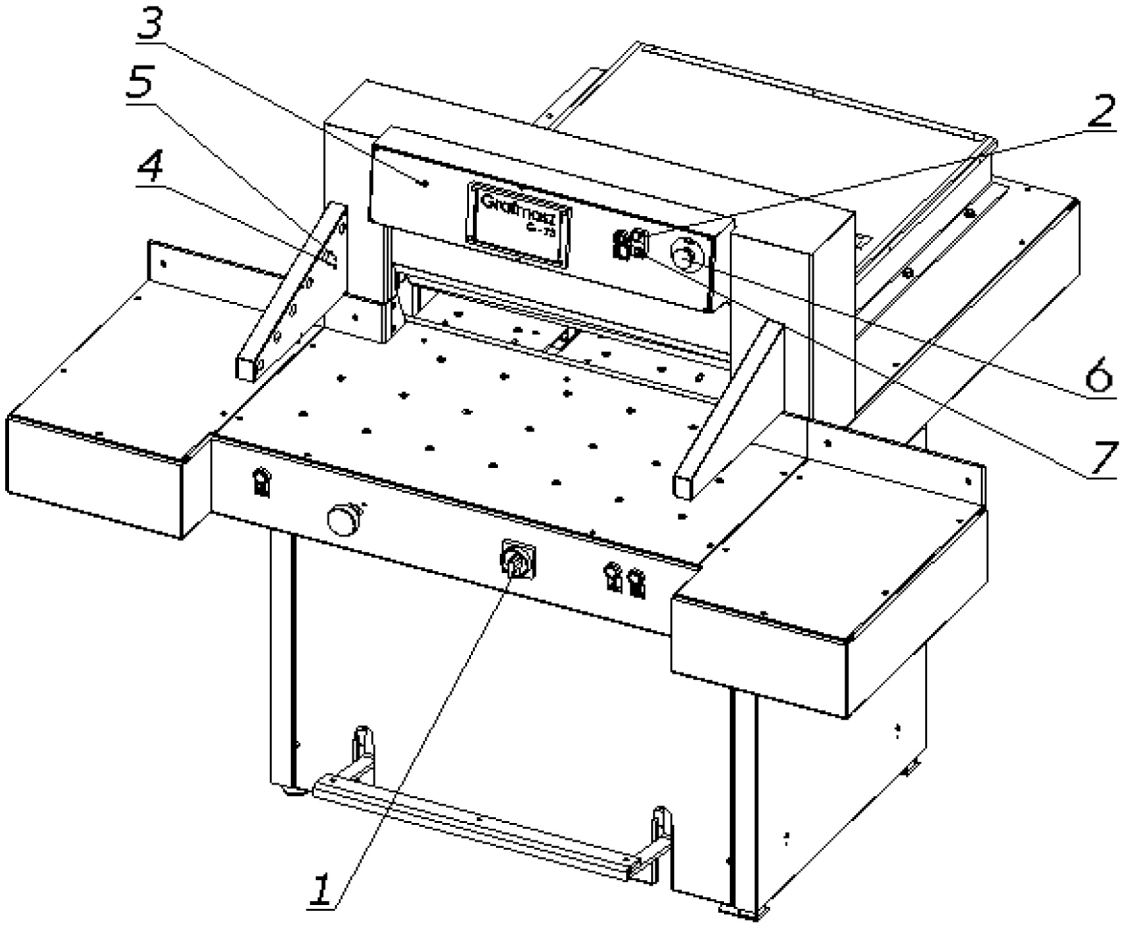
4. INSTALLATION OF PAPER CUTTER

The users obligation is to prepare a good condition for the machine installation which will prevent any stumbling and slippage of the operator due to bad floor condition, incorrect wire location or poor access to the machine.

The paper cutter is delivered with 5 wire, copper cable with diameter 2,5 mm2. The machine has to be installed to electric system having 30A protection. The copper wire 2,5 mm2 must be used. The power supply fluctuation of voltage should be in range 90-110%, with frequency 60 Hz ± 2%.

The cutter can be connected to 5-wires L1, L2, L3, N, PE power supply.
Please mind the correct power supply during the first machine start up.

5. USING THE PAPER CUTTER



Drawing 10. Elements used when turning the cutter on

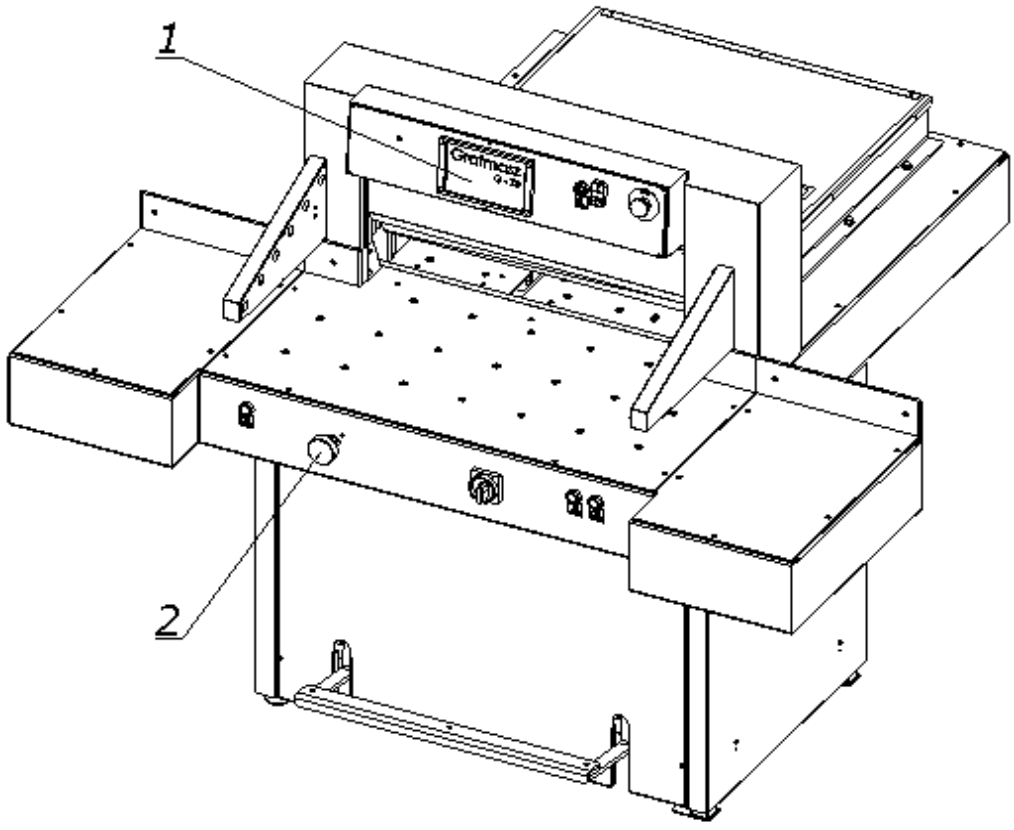
Put the main switch 1 into the “on” position to power the machine. Press the green button 2 “I” starting the cutter system (green diode 3 lights). If there is no obstacle in the light barrier zone the green diode 4 lights, If there is any obstacle red diode 5 lights.

In case of an emergency, stop of the cutter by red button 6 (pressed) to go back to the work unlock button 6 (rotate it) and press button 2 “I” . If the control system is switched off by button 7 “O” press the button 2”I” to activate it.

5.1. Backgauge position set

Setting the position of backgauge is done by program module 1 or the fine tuning manual crank 2 - drawing 11.The program positioning and operation of backgauge is described in the **program module manual.**

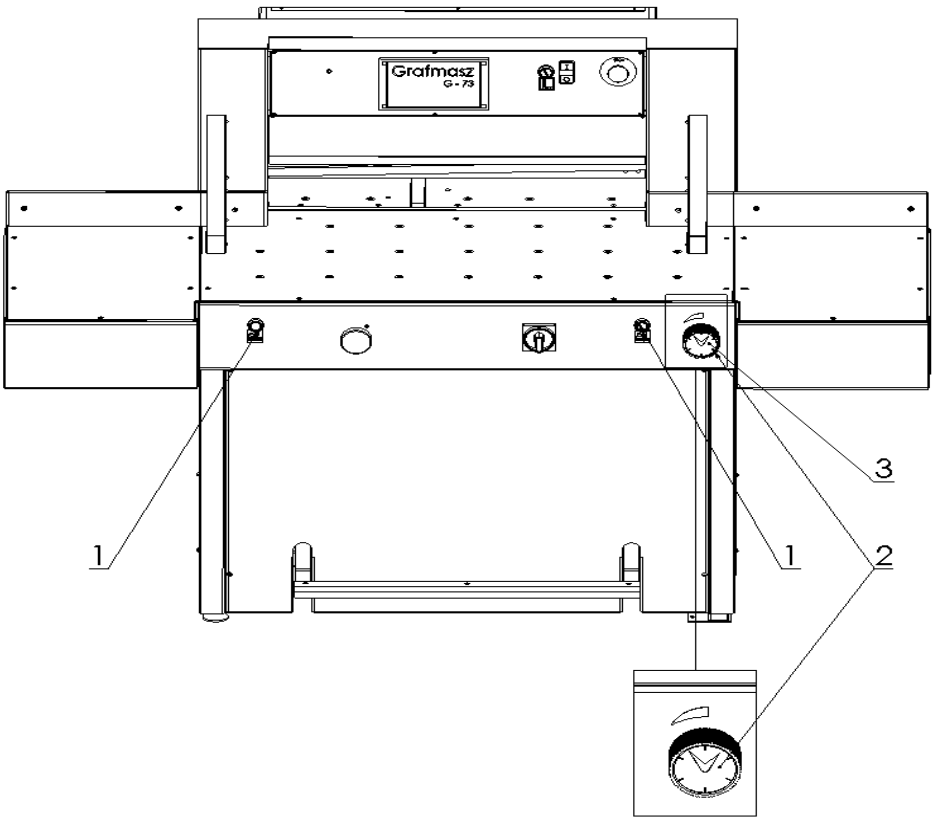
For manual movement of the backgauge press crank 2 in and rotate it forwards or backwards. Current dimension is shown on the display. This is intended for fine tuning.



Drawing 11. Backgauge positioning elements

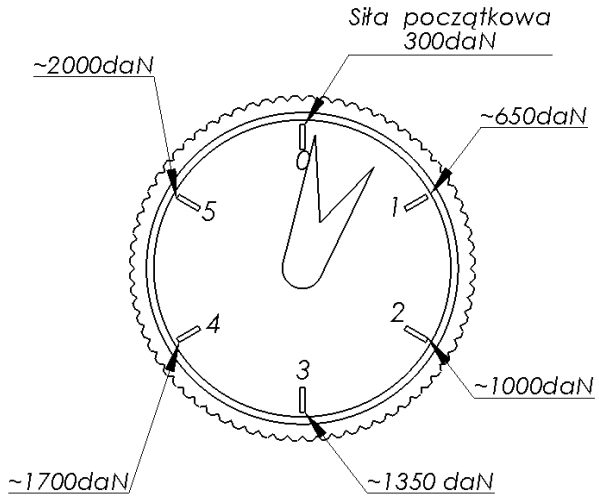
5.2 Clamping Bar

The cut material is clamped automatically after pressing both cut cycle buttons 1(drawing 12) . To press the material without cut, press the foot pedal. The material is pressed until the pedal is released by operator. The clamp force is adjusted by knob 2 of force regulator 3 (drawing 12) Rotating the knob moves the indicator 3 in the box up when increased and down when decreased.



Drawing 12. Clamp force knob location

The clamping force should be selected experimentally by operator according to paper type, size and pile height.



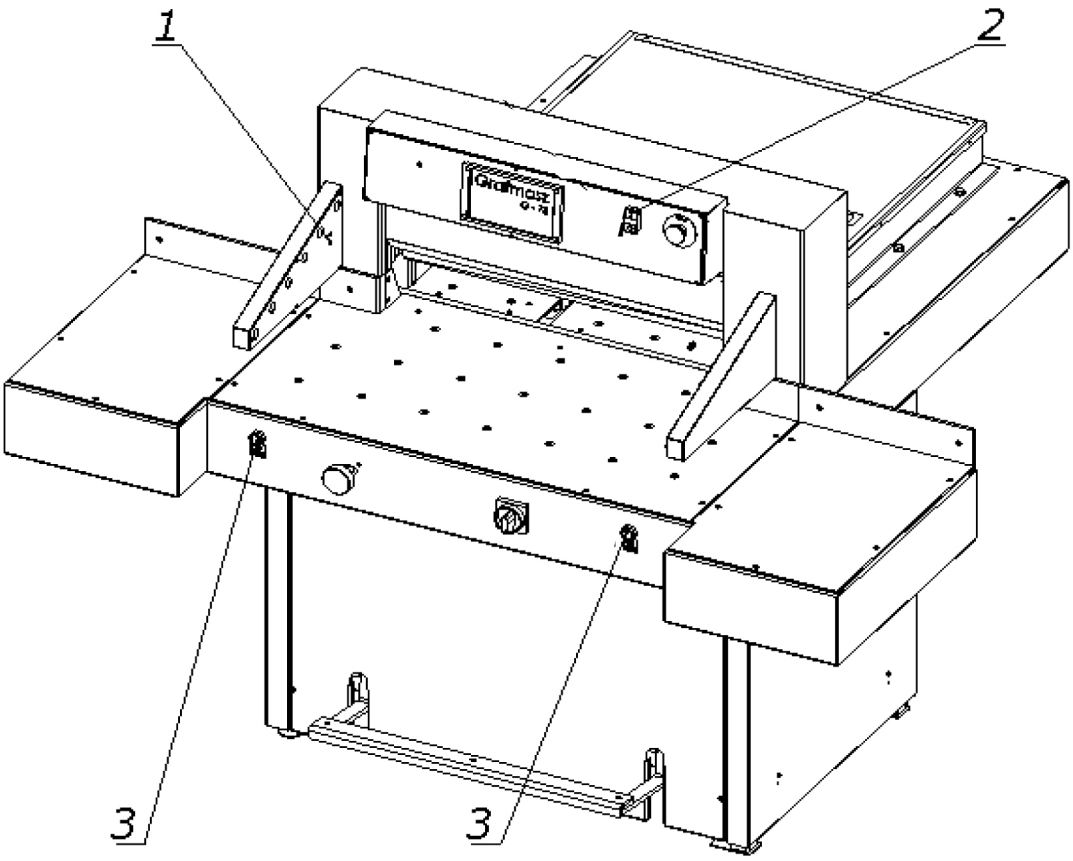
Drawing 12a.

Please mind the following rules:

- The higher the pile the bigger force
- The bigger the pile size the bigger force
- The harder the paper pile the bigger force

5.3 Cutting

Elements of operating and signalization used during cutting shown on drawing 13.



Drawing 13. Operation and signalization during cutting

Before cutting, check to make sure there are no objects in the working area and if the in addition make sure the green button 2 is pressed.
Push-buttons 3 simultaneously to engage the cutting cycle starts.
The clamp bar will and compressing the material, followed the cutting action.
Both push-buttons 3 must be kept pressed down as long as the material is cut down.
Return of the knife to its stop position, and movement of the clamp bar upward are done automatically.
Note: If the push-buttons 4 are released during the downward movement of the clamp bar and knife, then the movement will be stopped.

The Introduction of any object /ex. hand/ into the protected area by the no-contact protective device /light barrier/ 3 cause stopping of the clamp bar and knife down movement.

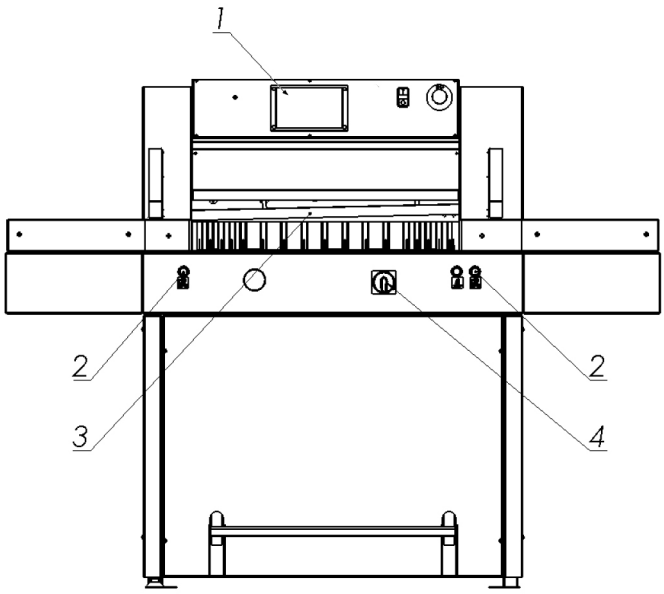
To continue the cutting cycle, the object should be removed from this protected area and again switching-on both push-buttons 4.

6. KNIFE CHANGE, CUTTING STICK CHANGE, BACKGAUGE ADJUSTMENT

6.1 Knife change

It is recommended, basing on experience, to change the knife, after approximatley 8 hours of effective working.

6.1.1 Removing the knife

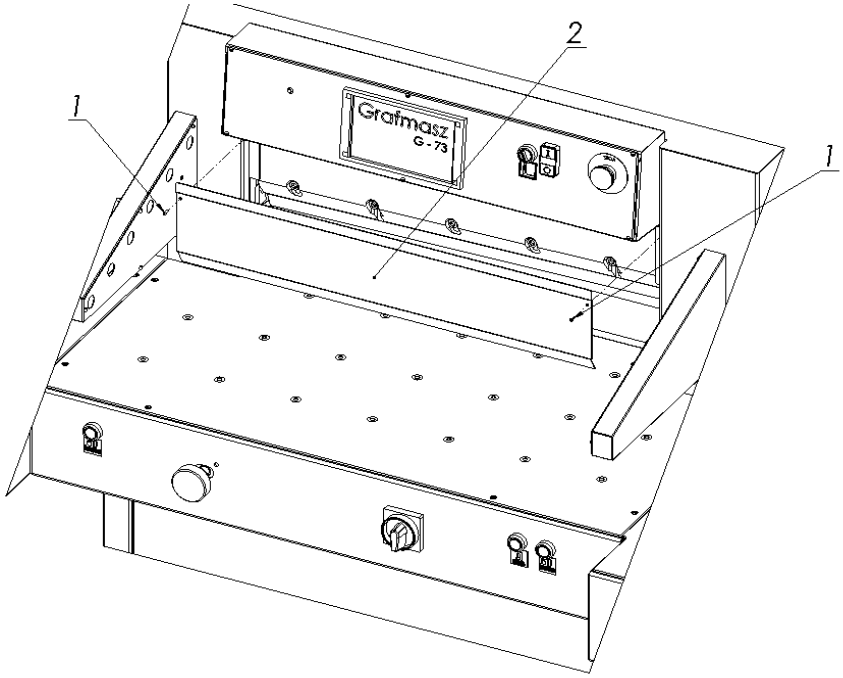


Drawing 14.

6.1.1.1 Press the "Options" button to the control panel and then select "Knife Change". Select yees to turn the change knife mod on.

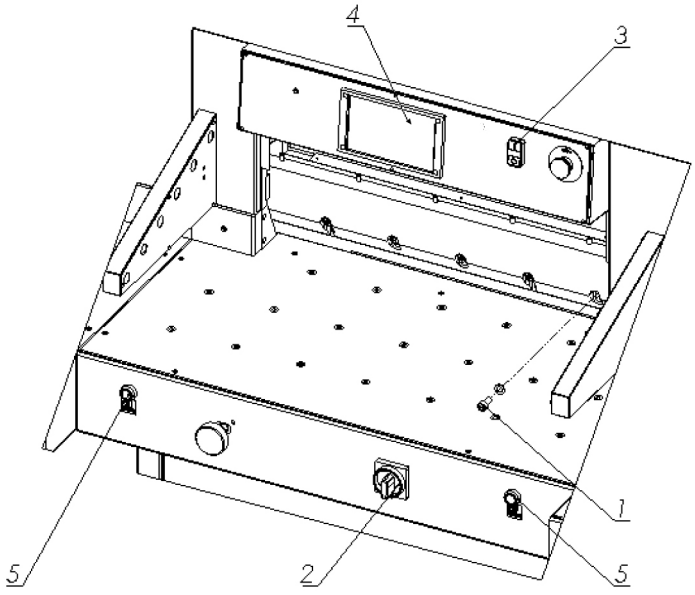
6.1.1.2 Press simultaneously both push-buttons 2 (drawing 14), starting the cutting cycle. The knife stops in the lower position.

6.1.1.3 Switch-off the electric supply by rotating the main switch 4 (drawing 14) to “O” position.



Drawing.15

6.1.1.4 Unscrew screws 1(drawing 15) mounting the cover 2 and remove the cover 2.



Drawing.16

6.1.1.5 Unscrew and remove the screw 1, the first one to right side of the knife bar.

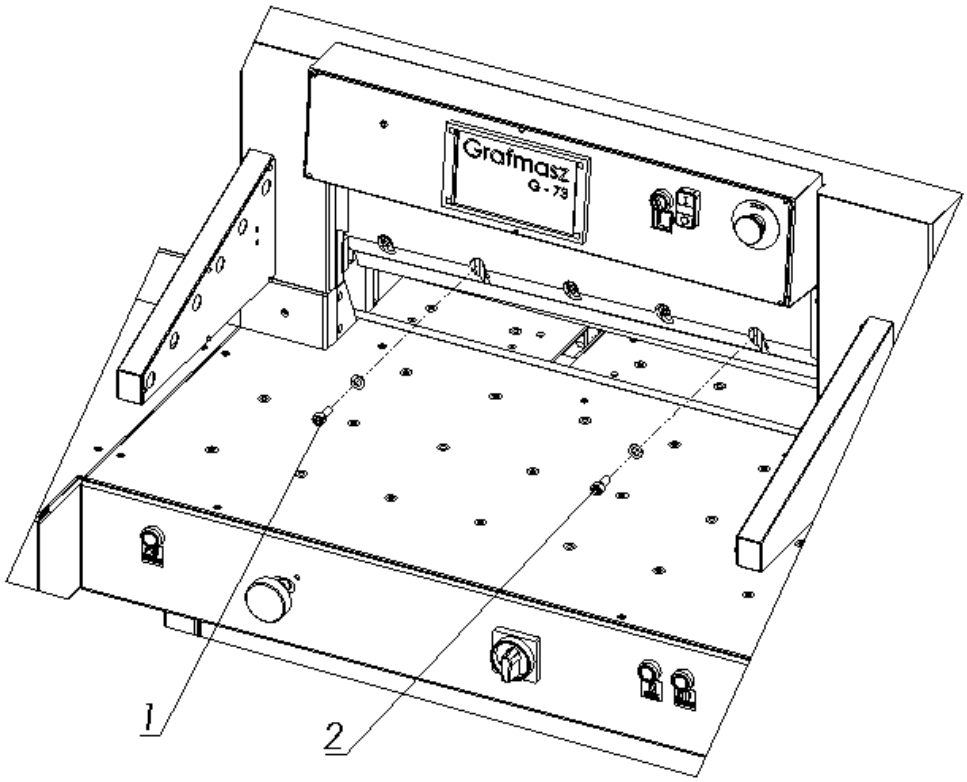
6.1.1.6 Turn on electric system by rotating the main switch 2 (drawing 16) into

position „I”.

6.1.1.7 Turn on cutter system by pressing the green button 3.

6.1.1.8 Turn the Knife change mode off 4, following 6.1.1.1 directions.

Press simultaneously buttons 5. Knife moves to its upper position (drawing 16).



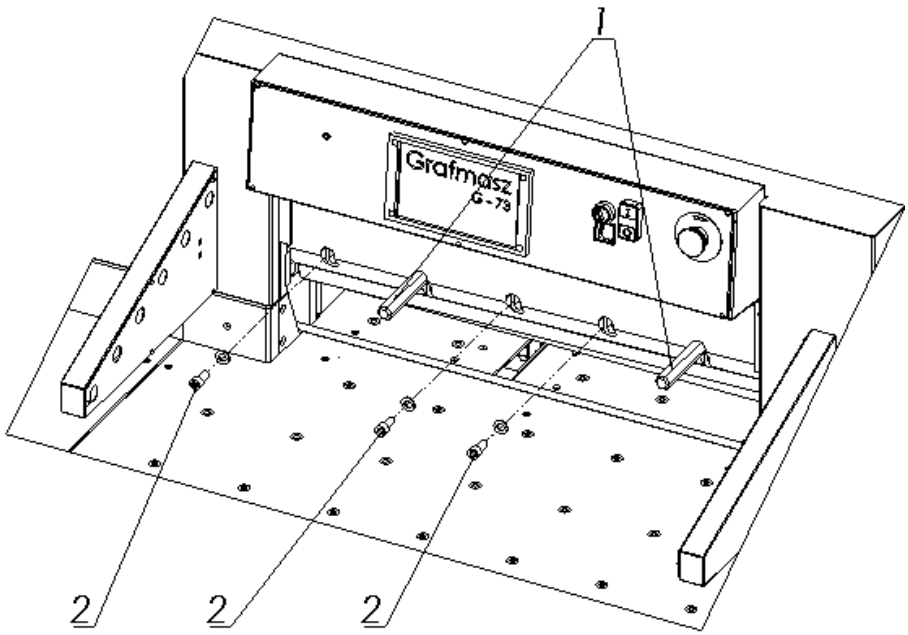
.

Drawing 17.

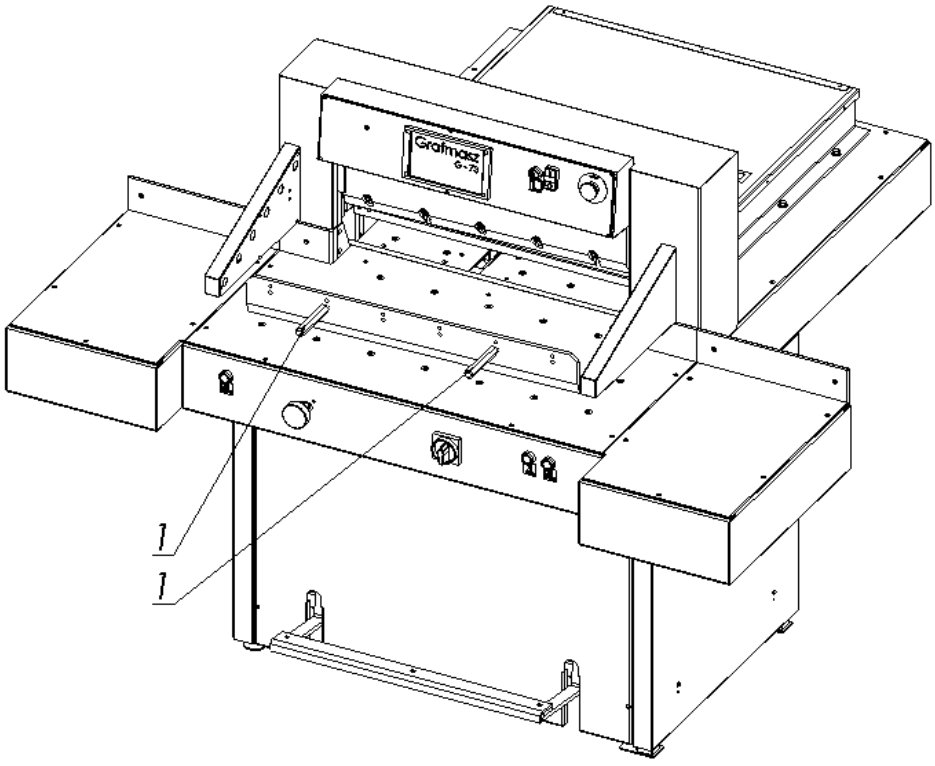
6.1.1.9 Unscrew and remove screws 1,2 (drawing.17).

6.1.1.10 After removing screws, 1 and 2), screw the blade change safety tool (drawing 18) so as to fix the change tool and knoife to the knife bar.

6.1.1.11 Unscrew and remove the remaining clamping screws 2 from the knife bar



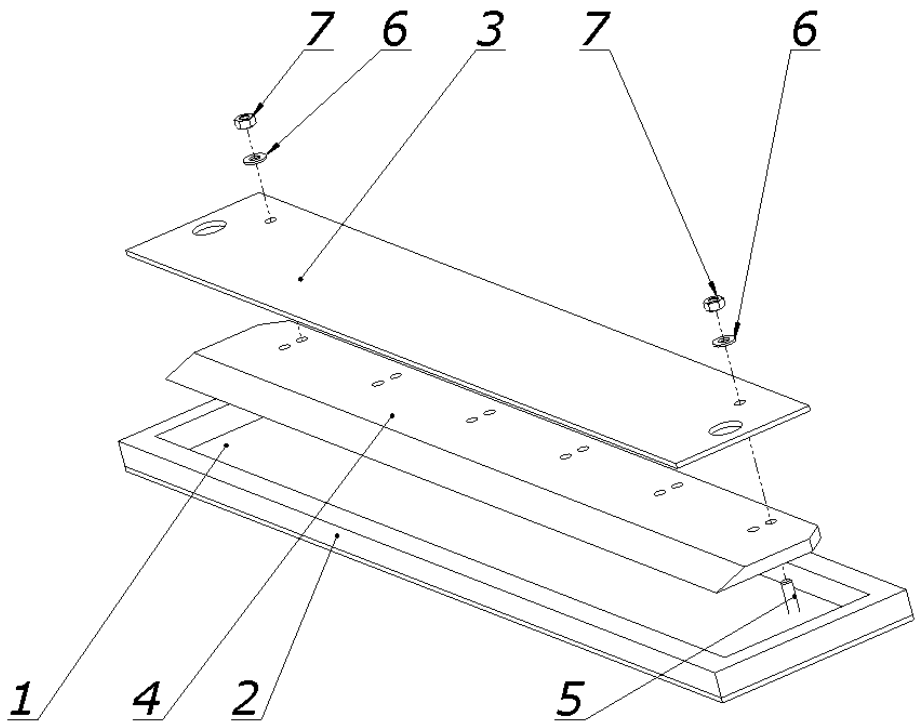
Drawing 18.



Drawing 19.

6.1.1.12 Holding the blade change tool 1, release from the bar by rotating the handles by ½ turn to left simultaneously, and carefully guide the knife downward and out (drawing 19). Place the removed knife into the special protective package (drawing 20), with a

cutting edge to the inside, fix with two bolts, and unscrew the tblade change tool 1.



Drawing 20. Knife package

1 - Board
2 - Frame
3 - cover
4 - knife
5 - screws
6 – washer
7 - nut

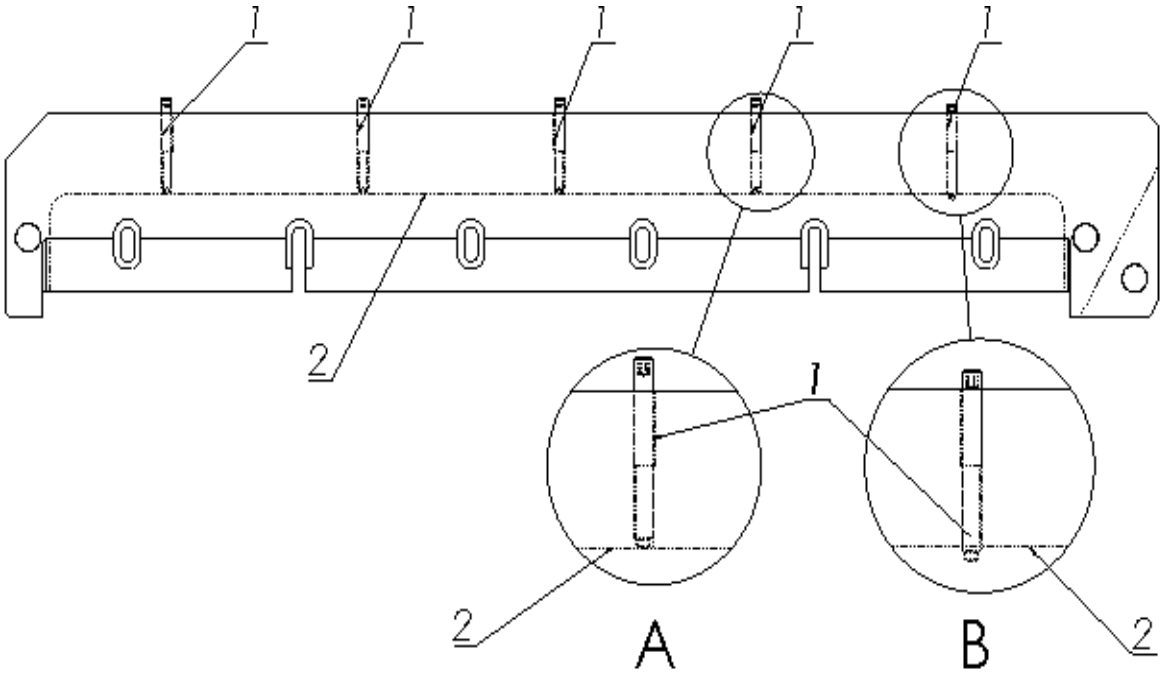
6.1.2. Knife installation

6.1.2.1.Unscrew all adjusting screws 1 /Drawing 21/, so that their faces are hidden into the knife bar body.

Drawing 21A – adjusting screw 1 is Lower then knife bar lobe 2 – **correct position**

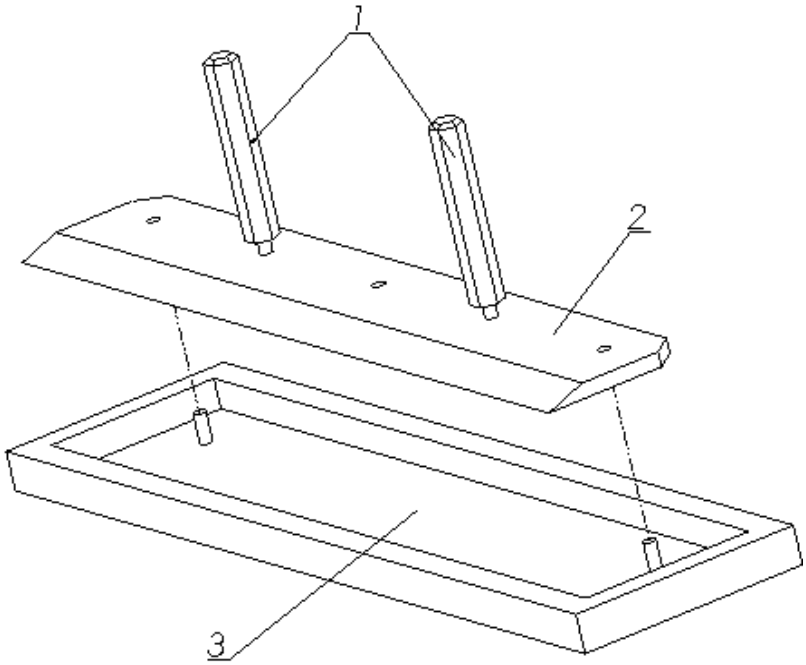
Drawing 21B- adjusting screw 1 is higher then knife bar lobe 2 – **incorrect position, screw must be unscrewed.**

WARNING: The new knife must be supported by its up edge on the knife bar. Not obeying this rule may cause machine overload and possible damage if the new knife is higher then the old one.



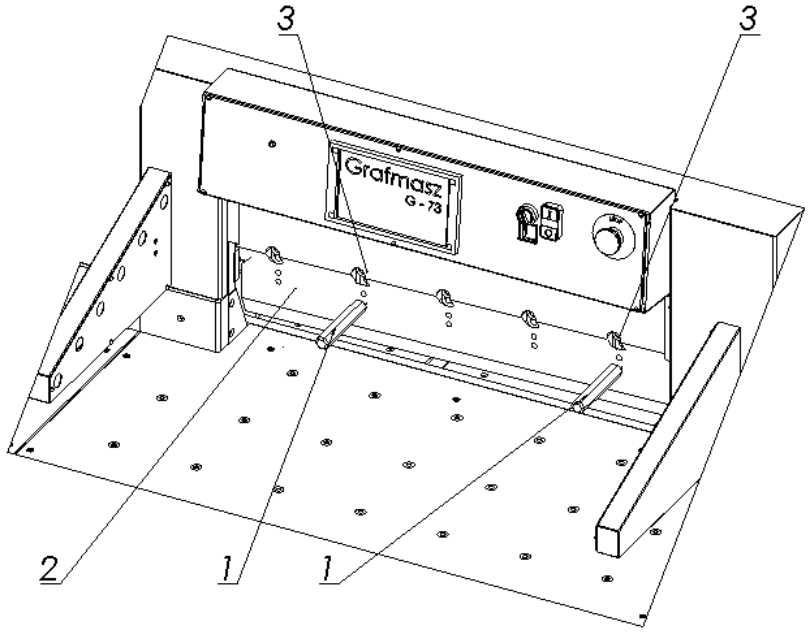
Drawing 21.Adjusting screws position.

6.1.2.2. Screw the screws 1 into holes of knife 2, second from left and second from right side. Take the knife from the package 3 (drawing 22).



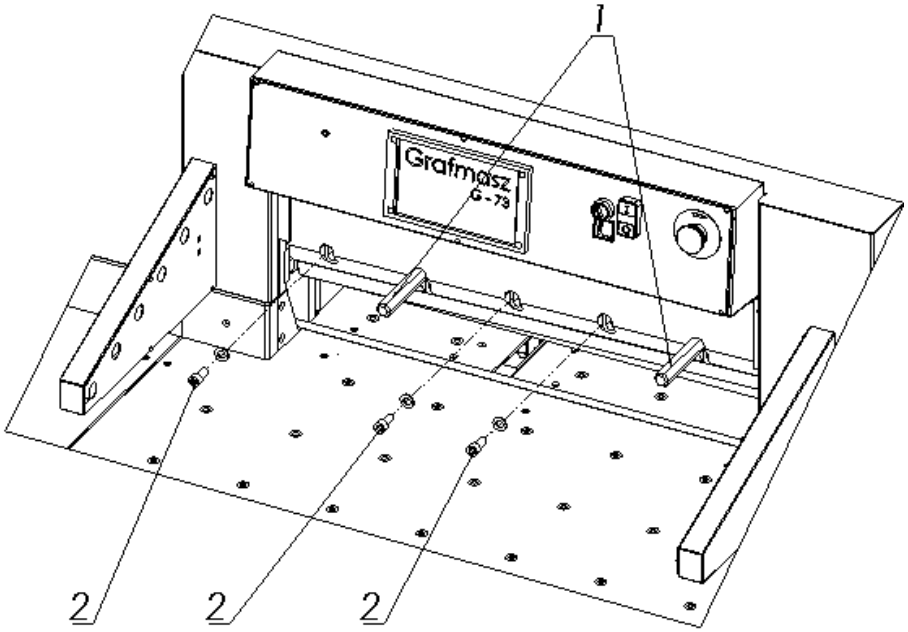
Drawing 22.

6.1.2.3. Holding the screws 1 put the knife 2 into the cutter, and match the blade change tool screws into the knife bar gaps 3. (drawing 23)



Drawing 23.

Put the knife to upper position until its up edge touches the bar lobe 2 (drawing 21).

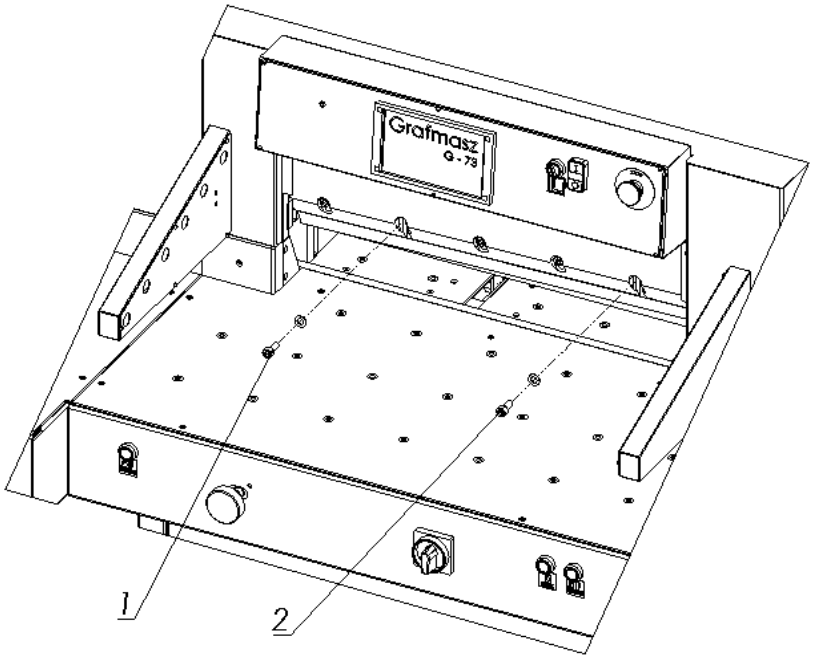


Drawing 24

6.1.2.4 Mount the knife by rotating right with force both screws 1 (drawing 24)

6.1.2.5 Input the mounting screws 2 (drawing 24)

6.1.2.6 Unscrew both screws 1 (drawing 24) and put into its position mounting screws 1,2 (drawing 25)



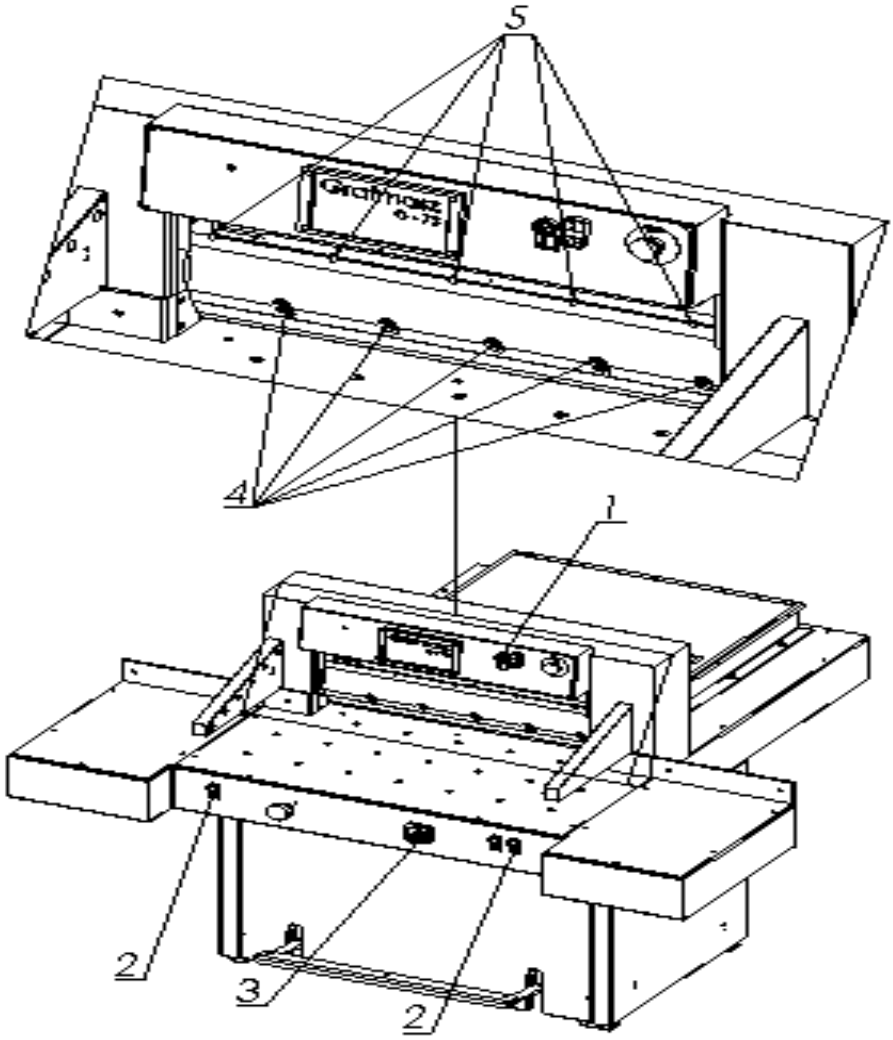
Drawing 25.

6.1.2.7 Unscrew gently first screw from left 2 (drawing 24) paying attention the head of screw does not stick out the knife bar slide.

6.1.2.8 Activate the "Knife Change" mode from the control panel..

6.1.2.9 Press simultaneously cutting buttons 2 (drawing 26) to start cut. Knife stops in lower position.

6.1.2.10. Turn off the power supply by rotating the main switch 3 (drawing 26) to „O" position.



Drawing 26.

6.1.2.11. Loosen screws 4 (drawing 26) so the knife drops down with its weight into the full length of the cutting stick.

6.1.2.12. Mount the screws 5 (drawing 26) to maximum, until the knife blade cuts the stick by 0,3 mm.

6.1.2.13. Fasten the screws 4 (drawing 26)

6.1.2.14. Turn on power supply by rotating button 3 into position "I"

6.1.2.15. Turn the "Knife Change" mode off from the control panel.

6.1.2.16. Press simultaneously buttons 2. Knife moves into its upper position.

6.1.2.17. Turn off the Power supply by rotating button 5 into ”O”

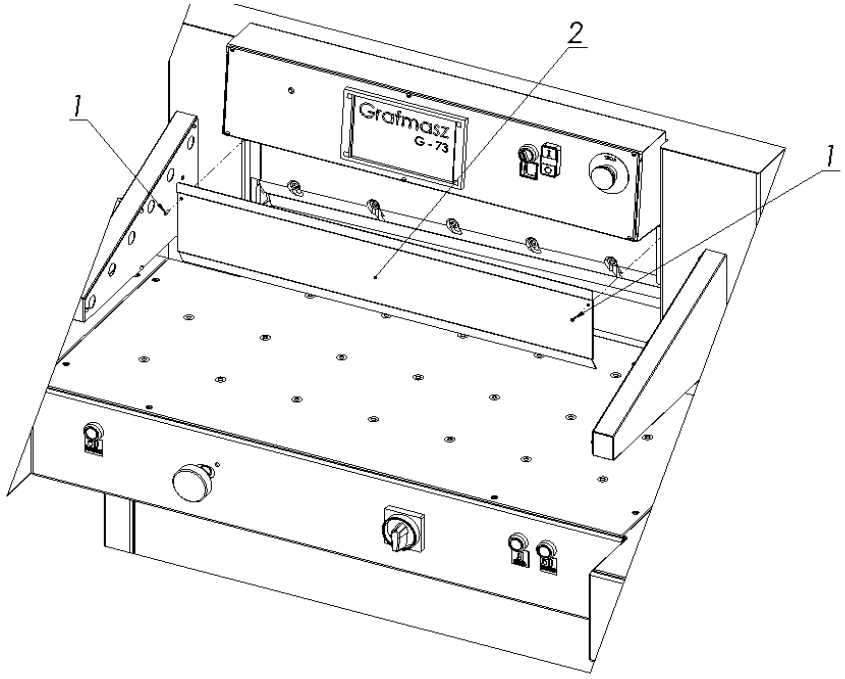
6.1.2.18. Strongly fasten the first screw from the left side 2 (drawing 24)

6.1.2.19. Turn on Power supply by rotating button 3 into position „I”

6.1.2.20 Turn on electric system by pressing Green button 3 (drawing 16)

6.1.2.21 Make trial cut. If knife does not correctly cut the last page of paper pile repeat point 6.1.2.7.

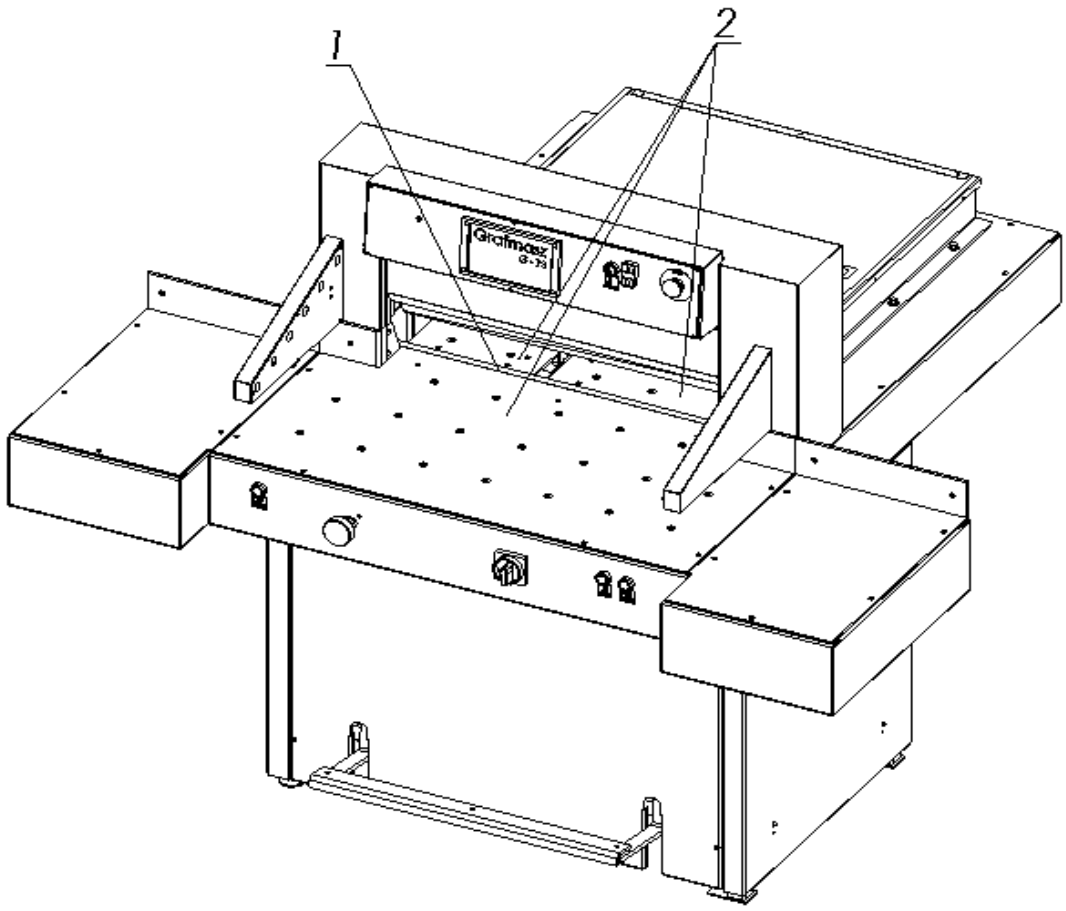
6.1.2.22 Mount cover 2, screws 1 (drawing. 27)



Drawing 27

6.2 Cutting stick change

The cutting quality of the stack bottom sheets and rate of the knife efffectivness, depends largely the quality of the cutting stick. Changing or rotating the stick is recommended after each knife change, or when the bottom sheets are found to be ripped /not completely cut/.

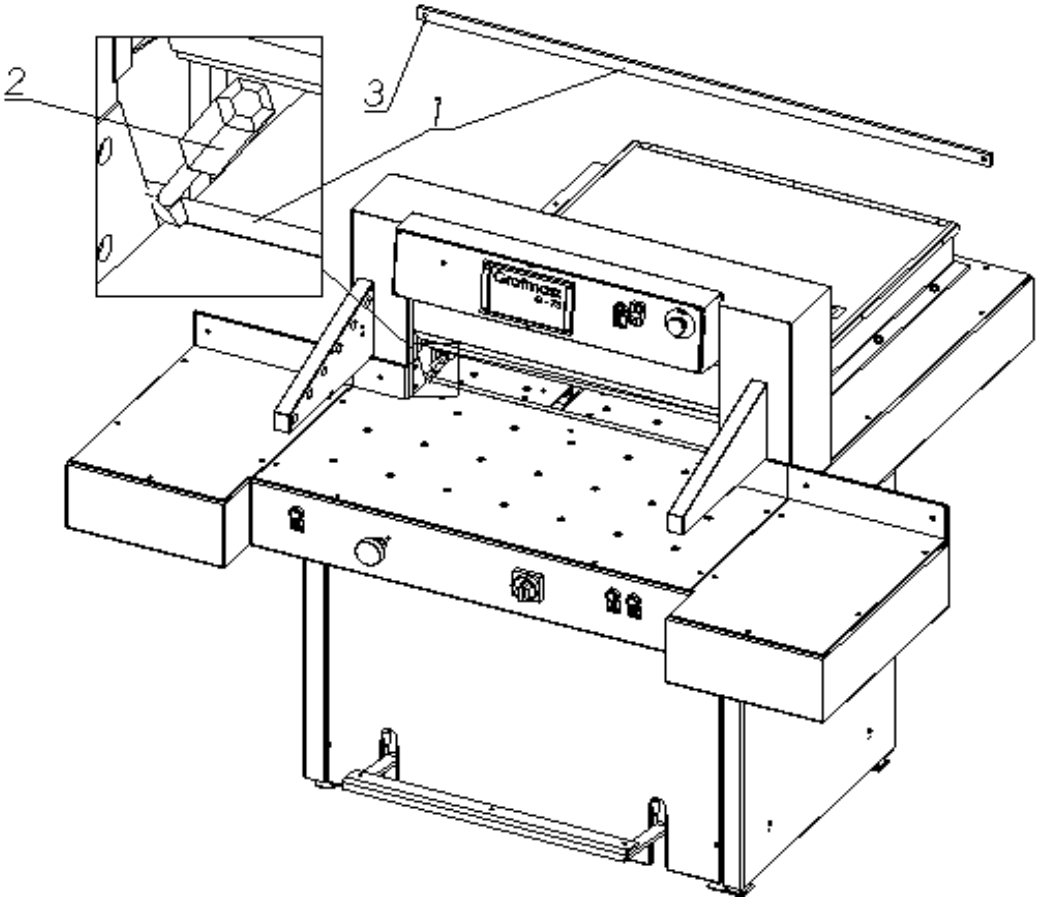


Drawing 28. Cutting stick change

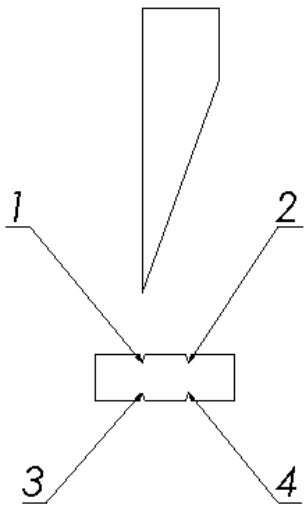
Cutting stick 1 is introduced to a rectangular channel between the cutter tables 2 (drawing 28) and locked in position by a pin.

To make the stick 1 change easier use screwdriver 2 (drawing 29)

The stick 1 should be place with its hole 3 on the pin in the underknife bar to prevent sliding.



Drawing 29. Cutting stick removal



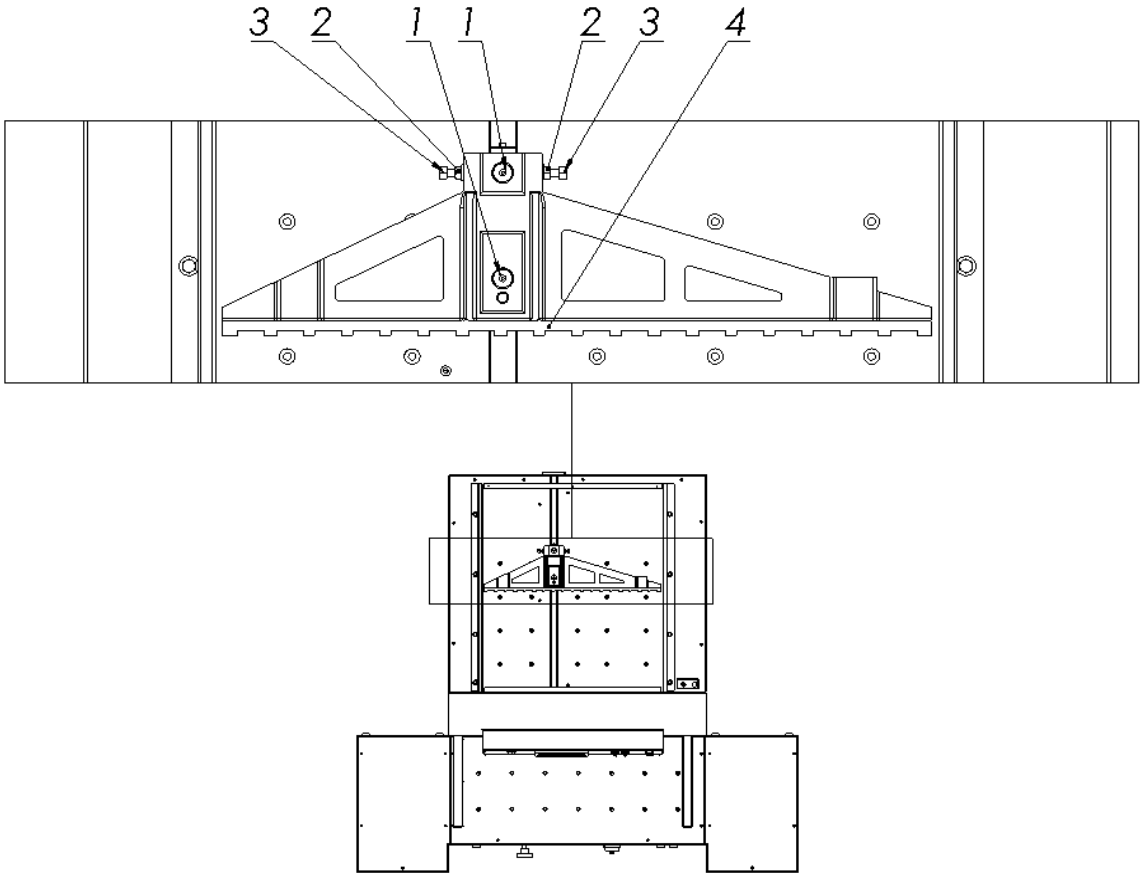
Drawing 30. Stick usage

The stick can be turned in both directions and can be used in four positions as shown on drawing 30.

IMPORTANT: The chanel between the tables where the stick is assemblied has to be j dos clean.

6.3 Parallelism of the backgauge

Depending on the required deviation of the pushing bar 1, it is necessary to perform adjustments shown on drawing 31.



Drawing 31 Backgauge parallelism adjustment

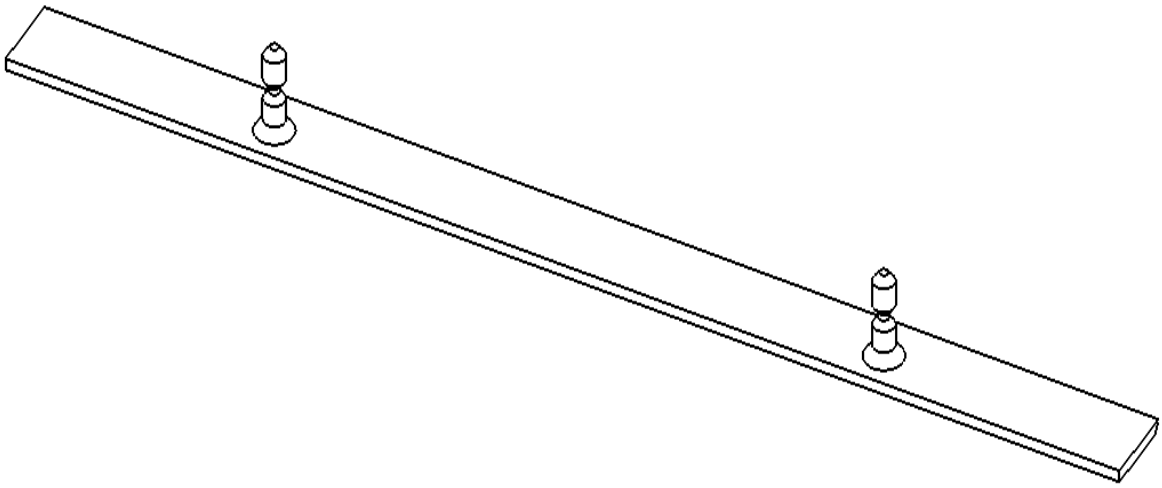
To adjust the pushing bar, it is necessary to:
- loose both screws 1, fastening the pushing bar 4 to a slide;
- loose nuts 2
- turning with adjusting screws 3, set the pushing bar at the appropriate angle;

- lock the adjusting screws 3 with nuts 2;
- tight with force screws 1.

After a trial cutting, repeat adjusting, if it is necessary, until the cutting parallelism is obtained.

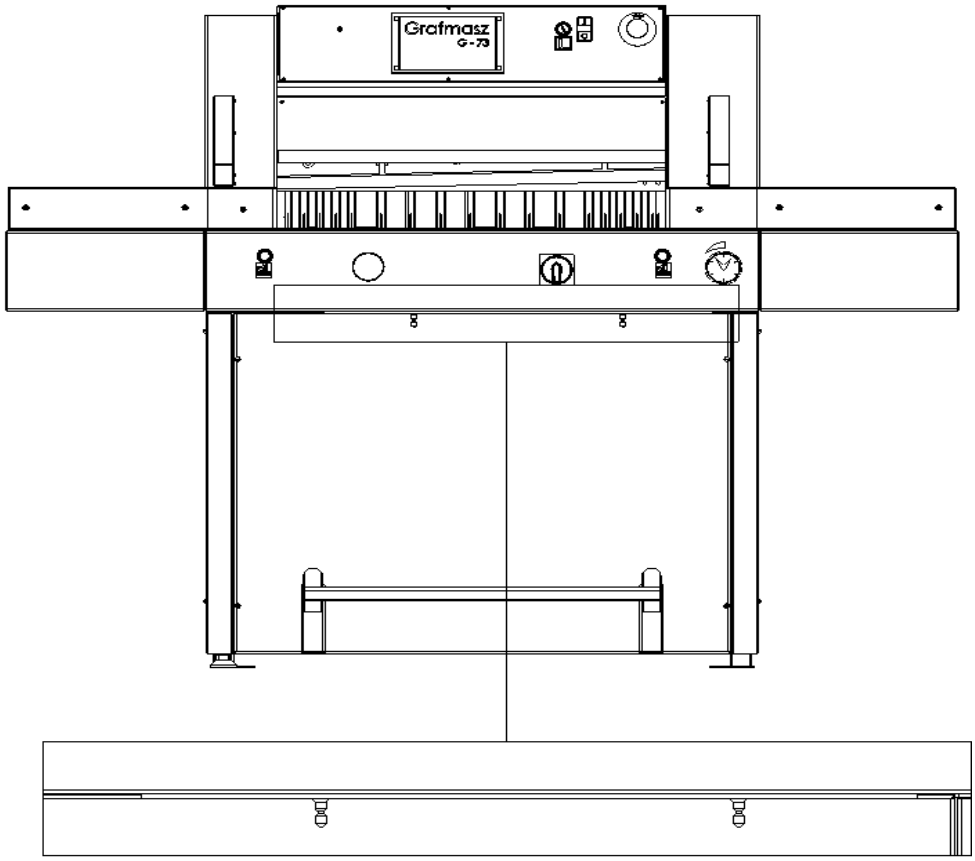
6.4 False clamp

The false clamp prevents against arising imprints from the down part of the clamp on the cut material



Drawing 32. False clamp

The false clamp is inserted under the front table as shown on the drawing 33.



Drawing 33. False clamp location (before fixing on the clamping beam)

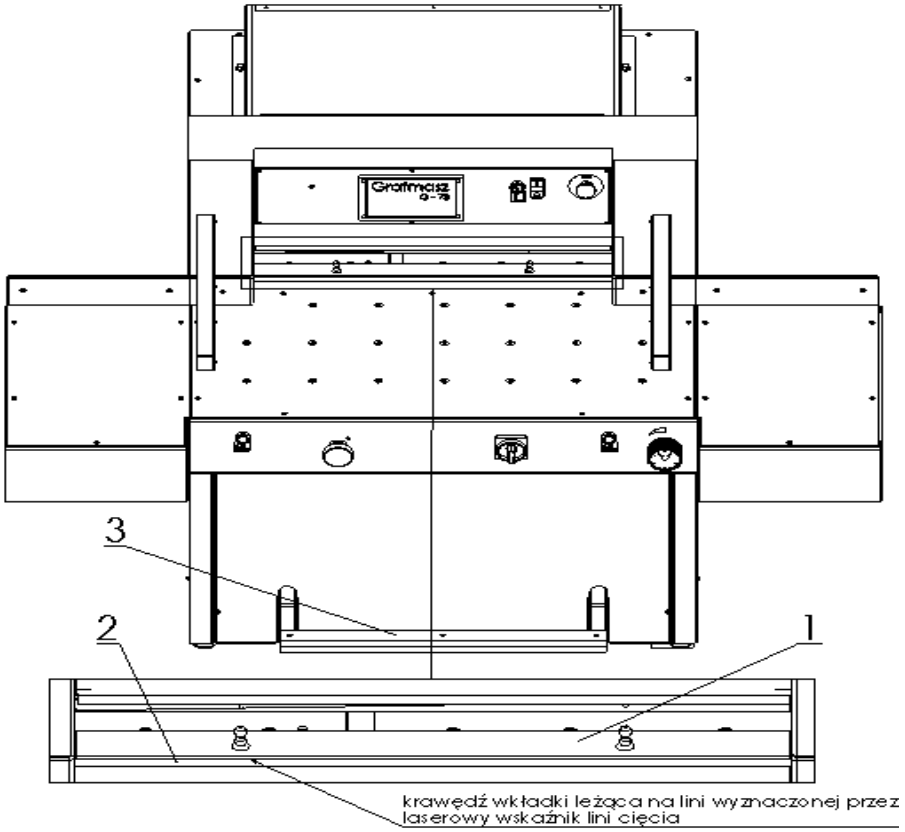
In order to fix the false clamp on the clamping beam:

- lay the false clamp 1 on the cutting stick 2 - radius defining the line should cover the front false clamp surface (drawing 34)
- softly press the clamping pedal 3 (drawing 34) to push the clamping a little bit down (false clamp rods should come into the holes on the clamping beam, whole false clamp should adhere to the clamping beam)
- Use the allen key with 3 mm setting and strongly screw the screws 1 (clamping pedal should be still pressed, drawing 35) into holes on the clamping beam to lock the false calmp on the beam.

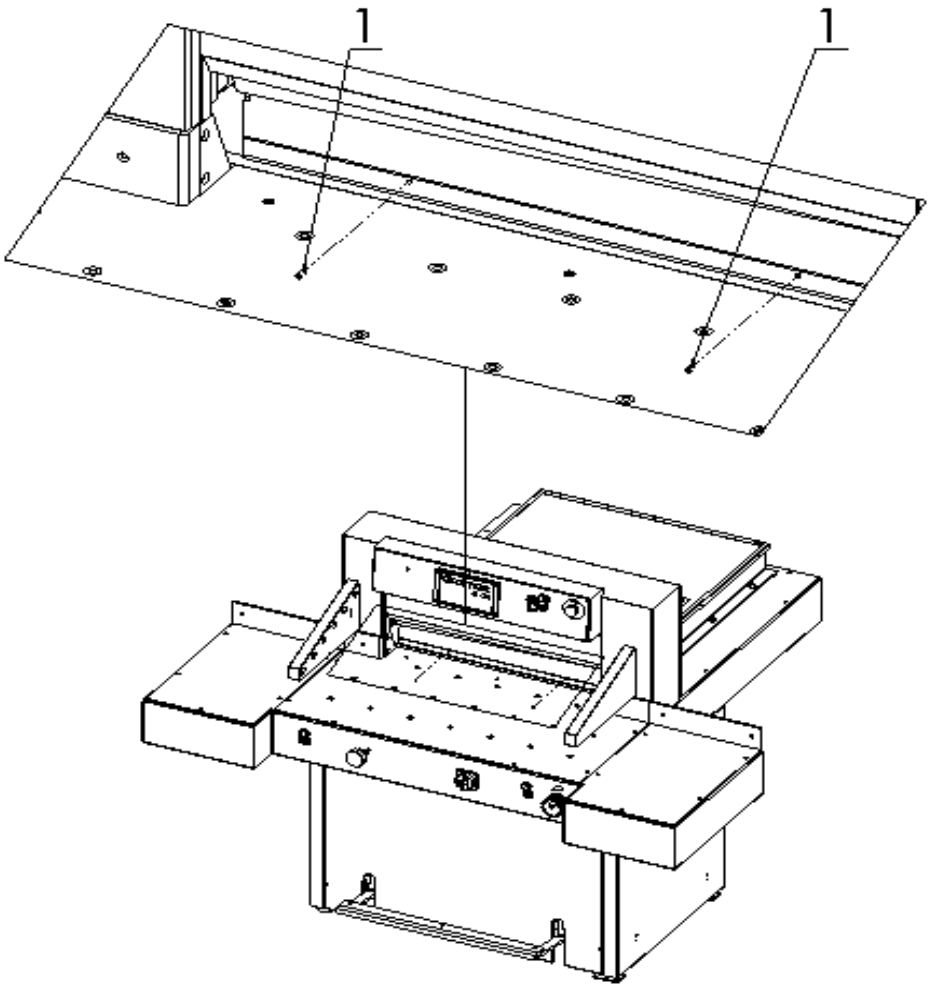
- release the clamping pedal

When the false clamp is installed, the minimum cut will be bigger, than without the clamp.

2.36" (60 mm) with the clamp installed and 1.18"(30 mm) without the clamp.
Maximum pile height during the cut with false clamp will be 96 mm (100 mm without the false clamp).
When the false clamp is not fixed on the clamping beam it should be inserted under the front working table (as shown on drawing 33). NOTE: If the false clamp is not inserted under the table the control panel will work as if the false clamp was fixed to the clamping bar.



Drawing 34. False clamp adjustment before fixing it on the clamping beam



Drawing 35. Location of the screws, which block the false clamp

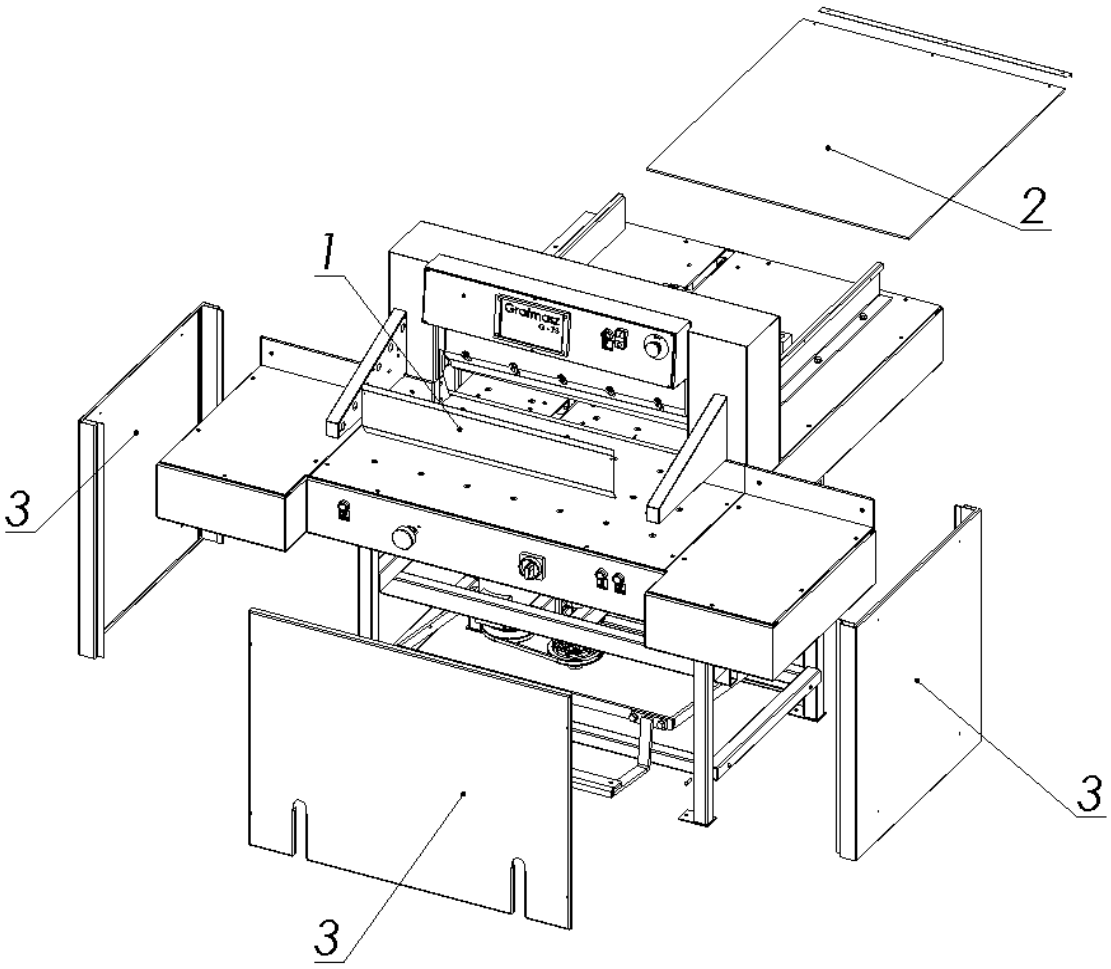
7. MAINTANCE

7.1 Lubrication

Lubrication can be done only if the machine is switched off.

Location of lubrication points to be greased , **every week** is shown on drawings 32,33,34. Access to the stated lubrication points is possible after dissembling the shield shown on the drawing 32

1. Knife cover
2. Backgauge cover
3. Stand cover



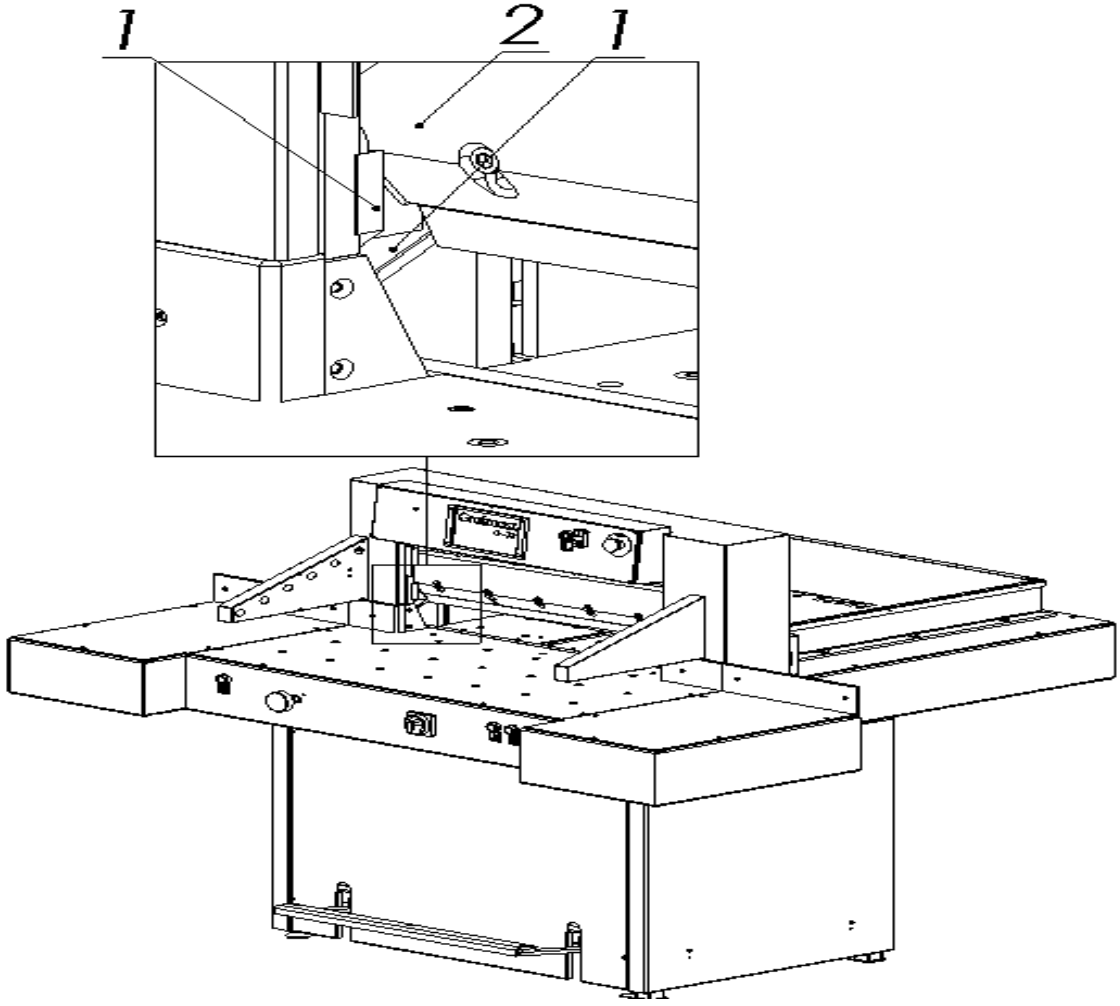
Drawing 36 Covers arrangements

7.1.1 Knife unit lubrication

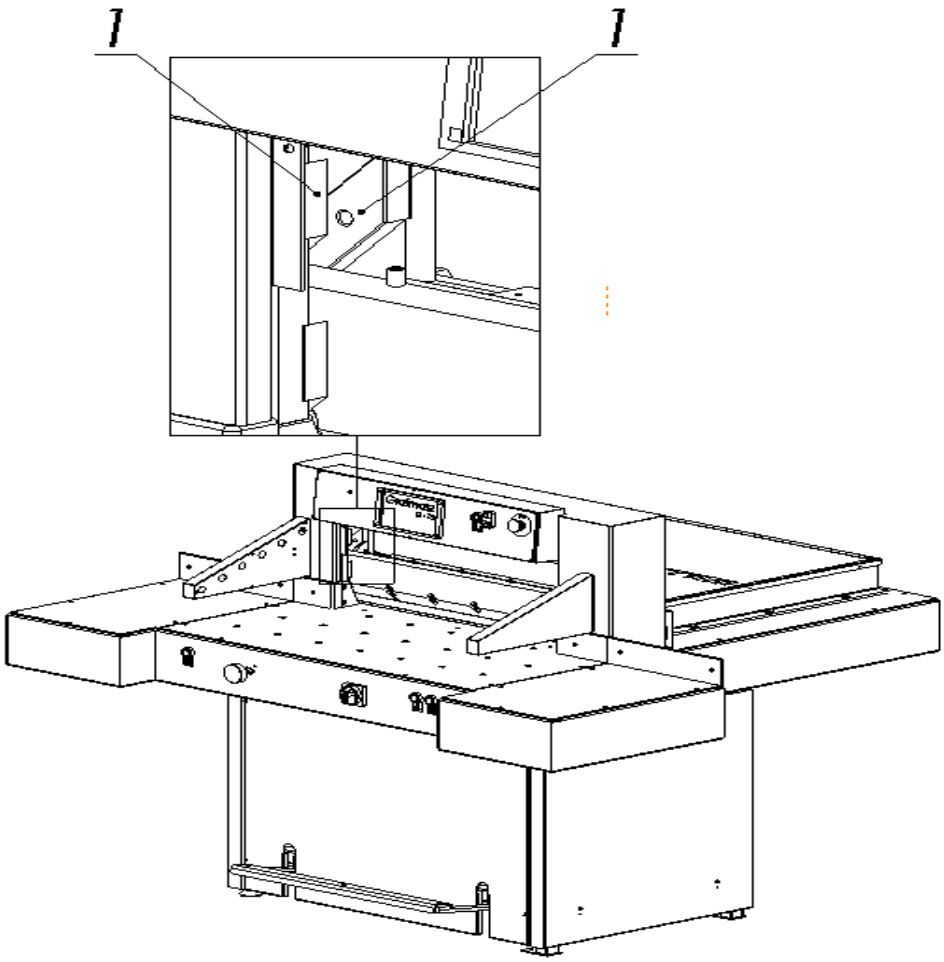
For the knife unit lubrication non-liquid grease must to be used. Access to the knife unit elements is possible after removal of the cover 1 (drawing 36). Lubrication of the side guides and knife body contacted with the guides should be carried out in upper (drawing 37) and lower knife body position (drawing 38). Follow the same procedure as the knife change (points 6.1.1.1; 6.1.1.2; 6.1.1.3) to put the knife into the lower position

The following parts should be lubricated on the both parts of the cutter:

1. – Side surfaces of the guides (contacted with the knife body)
2. – Side surfaces of the knife body



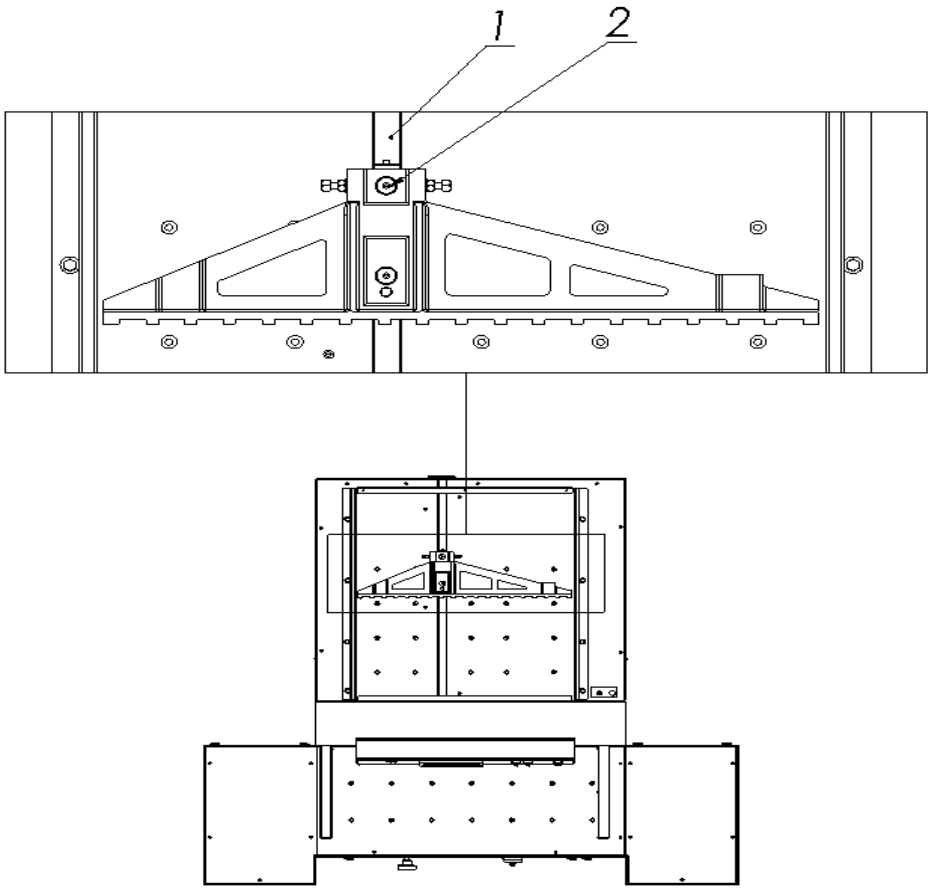
Drawing 37 Locations of the knife lubrication locations (knife in Upper position)



Drawing 38 . Locations of the knife lubrication locations (knife in lower position)

7.1.2 Backgauge lubrication

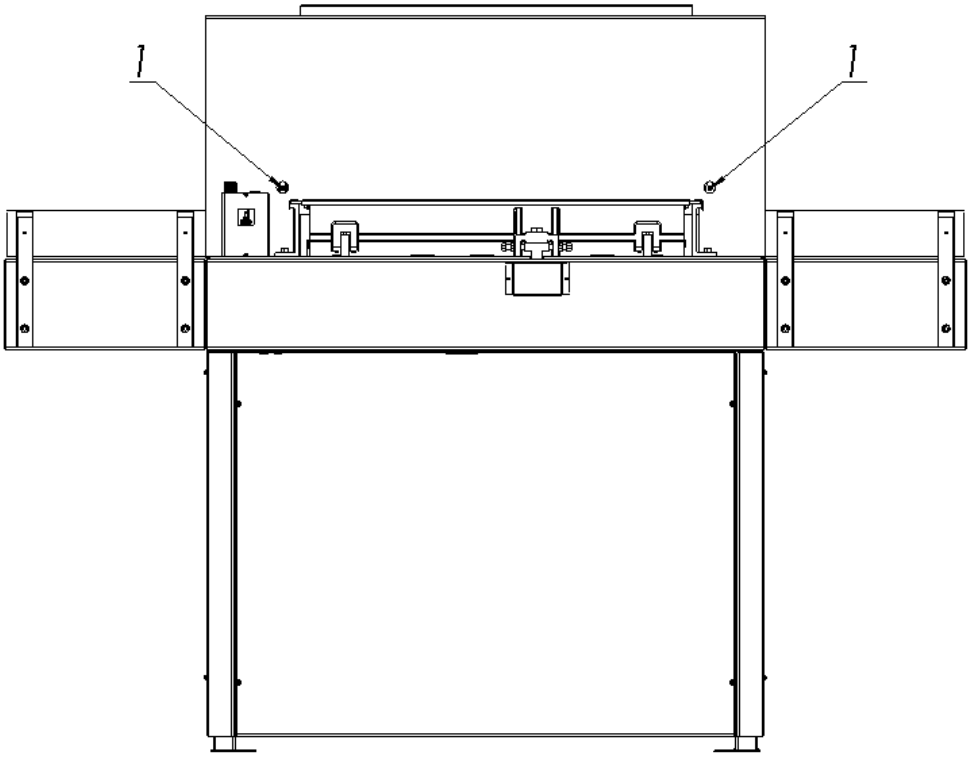
In backgauge mechanism the following parts have to be lubricated: guiding roller (drawing 39) and located under the roller screw (not marked on the drawing). The screw should be lubricated with a non-liquid grease, a thin coat of the grease should be applied to the guiding guiding roller . Poor a small amount of grease into the sleeves guiding the base of the backgauge through the hole in the screw 2.



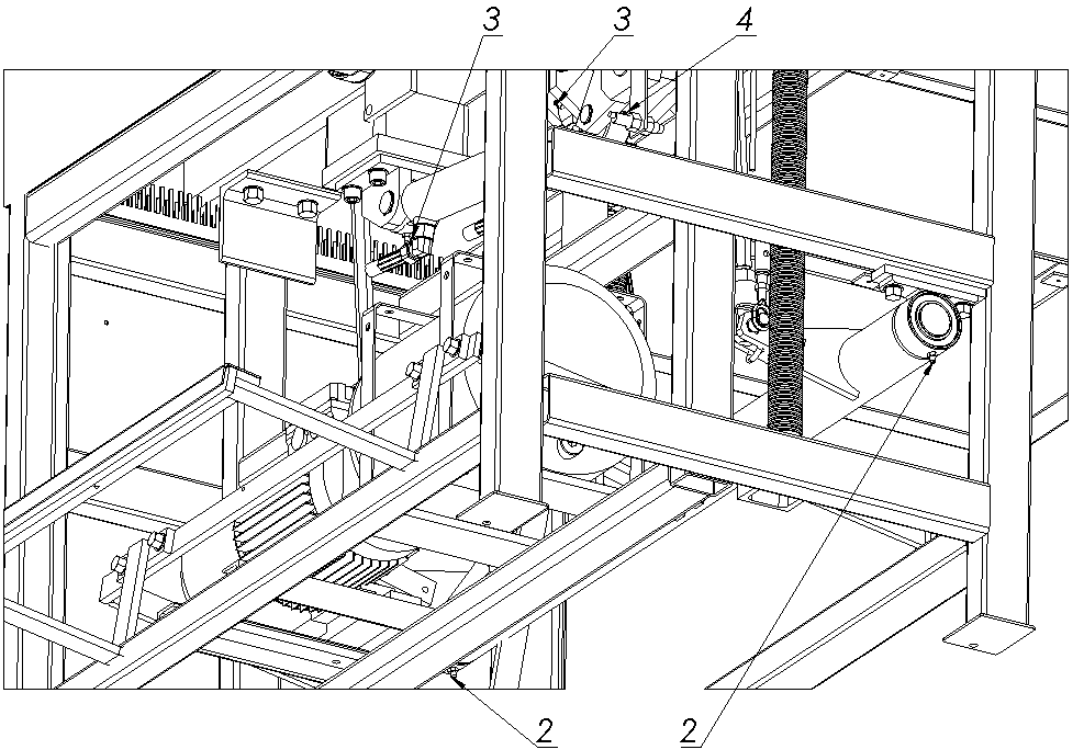
Drawing 39 Backauge lubrication points location

7.1.3 Clamp mechanism lubrication

The parts of the clamping mechanism have to be lubricated with non-liquid grease. In the clamping mechanism the following parts should be lubricated: clamp bar runners 1 (drawing 36), roller bearing 2, running sleeves clamp mechanism 3, screw 4 (drawing 37) . In the cutter with hydraulic clamp beam drive positions 3 and 4 does not exist.



Drawing 40 Clamp bar lubrication points location



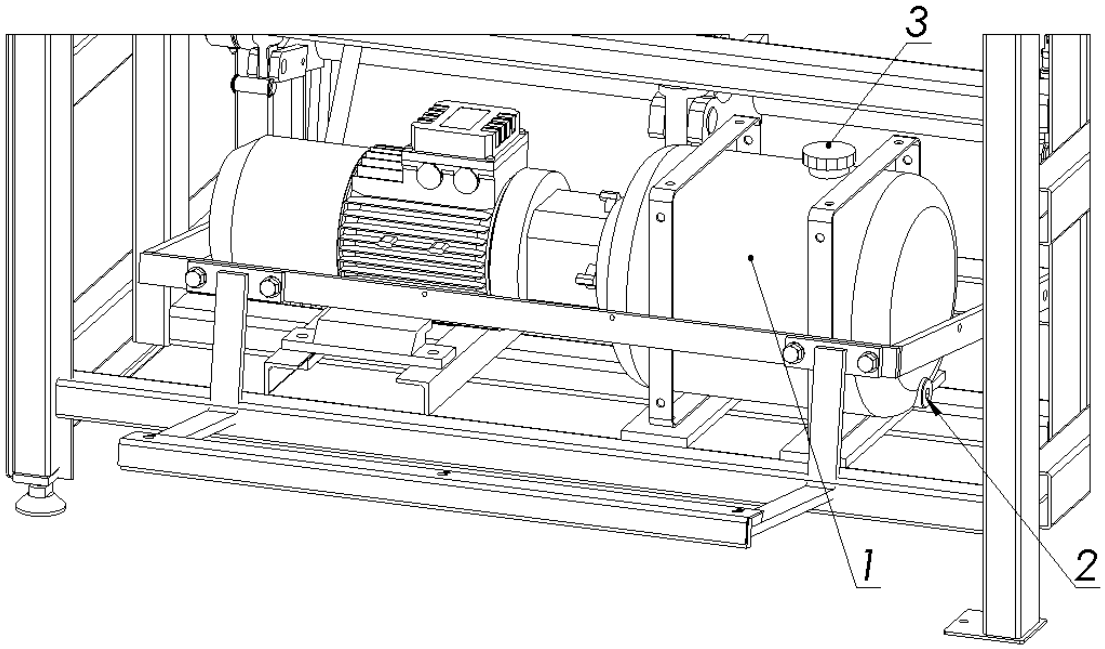
Drawing 41.Roller bearing 2, hydraulic actuators fixing 3, knife band head 4.

7.1.4 Hydraulic system

The overflow valve is set in the factory to a value of 170 bar and sealed. The value can be controlled by manometer (included into unit) by connecting it to manometer slot. This should only be changed by an approved service technician or it may result in a lose of warranty.

7.1.4.1 Working conditions

- temperature in the room 41°F- 86°F,
- hydraulic oil HL 46,
- Dust-free air
- air circulation for cooling
- temperature of hydraulic oil should not exceed values given by supplier
- the unit is designed to work In closed room, protected from any environmental conditions like ex. direct sun, rain etc.
- unit is designed to work in horizontal position
- it should be used according to health and safety rules
- unit should be maintained by qualified staff



Drawing 38. Oil change in the hydraulic unit

The hydraulic unit producer recommends to change the oil after one year of intensive work. In order to change the oil drain plug 2 located on the bottom of the tank 1. Oil should be let out when it is still warm. New oil should be filled after screwing the drain plug 2 through the hole in the filter 3.

7.2. Inspections

7.2.1. General recommendation

- Clean the cutter carefully after each work-shift /paper dust/.
- Pay attention to cleanness of the control element contacts /contactors, switches/.
- **Check correctness of the cutter screw connections, and tight them, if necessary.**
- Check sealing of the hydraulic apparatuses connections. In case of seepage correct connection.

7.2.2 Hydraulic unit maintenance

7.2.2.1 Every-day inspection

- oil level (measuring scale on the tank),
- pipes and wires tightness
- noise level
- oil temperature
- vibrations of pipe connections

7.2.2.2 Monthly inspections

- pressure control
- valves connection
- clearing of motor fan

7.2.2.3 Yearly inspections

- oil change
- tank and filter cleaning

7.3. Regeneration of knife

Quality and accuracy of the cutting depends totally on the knife sharpness and the correct choice of the cutting edge angle.

7.3.1. The features of the blunt knife:

- rough and uneven plane of stack to be cut;
- edges seizing of material to be cut;
- inaccurate cutting;
- increased accumulation of the paper dust;

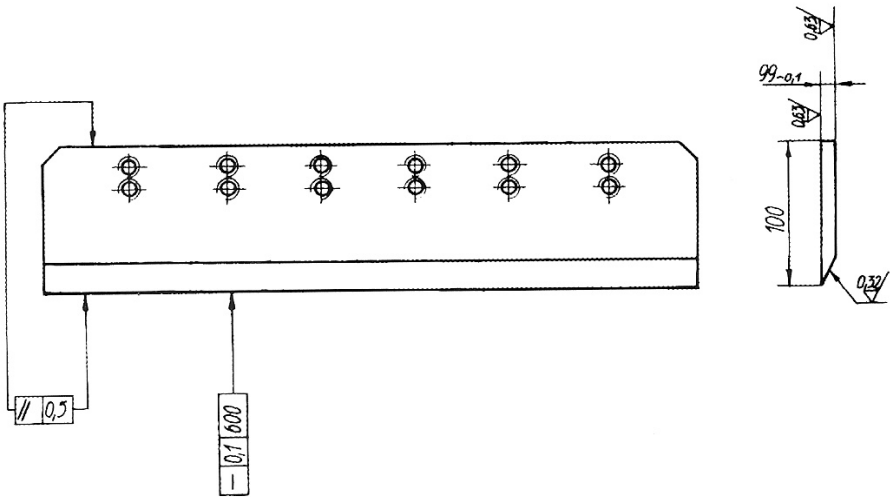
7.3.2. Grinding conditions of the cutter knife:

- grinding machine of correct operation;
- appropriate chosen grinding wheel
- clean and sharp grinding wheel /"sparked out"/
- appropriate coolant
- correct chosen grinding parameters
- even fixing of the knife

The manufacturer of knives used in the cutter recommend the cup-type grinding wheel or grinding segments, "J" hardness, 60-80 grain size, with keeping:

- 500 m/min grinding peripheral speed;
- 8-10 m/min traveling speed;
- max. Grinding Wheel stroke per 1 feed: 0,005 mm;
- cooling with water-oil emulsion, 60 l/min., at least;

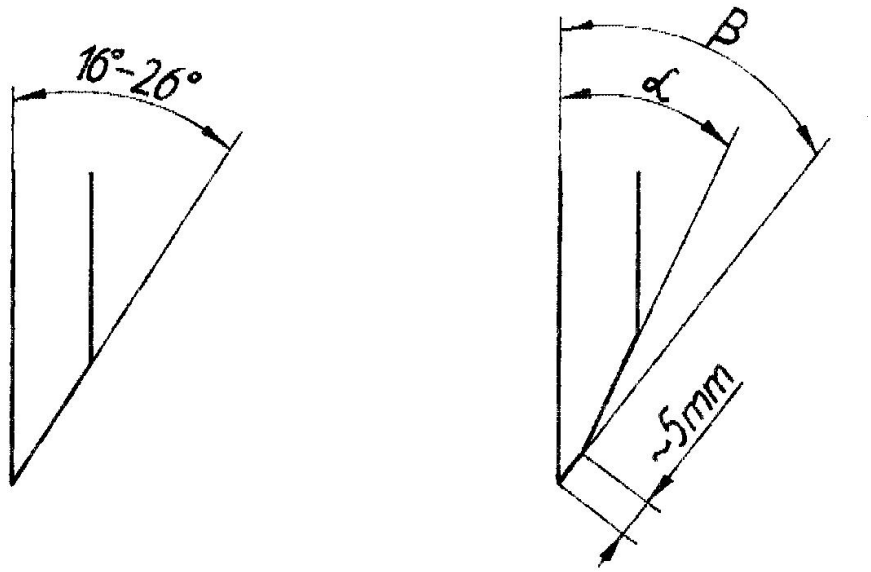
The correct sharpen knife is shown on drawing 39.



Drawing 39.Deviations and roughness of the knife.

7.3.3. Selection of the grinding angle

Depending on the cut down material, a ground off angles are between 16° and 26°.
Soft material needs a smaller grinding angle, whereas a hard material, a larger grinding angle.
If the cut materials are of different hardness, then a larger grinding angle is favourable



Drawing 41. The cutting edge angles

The double-chamfered cutting angle /Drawing 41 right side/, for example 20/24°,in an auxiliary mean and advantages the better material discharge after cutting.

8.ELECTRIC DOCUMENTATION

8.1 Electrical equipment

8.1.1 Electric board

Nr	Symbol	Quantity	Name	Type	Manufacturer
01	K7 K8 K9	3	Contactor	S-N12CX AC24V	MITSUBISHI
02	T1	1	Transformer	TMM 100VA 220/24V	BREVE – TUFVASSONS
03	F1 F3 F9	3	Melting fuse	2A 3,15A 1A	PL
04	F2 F7 F8	3	Over current release	S301 4A S301 6A S301 4A	Schneider / Legrand
05	F5	1	Motor circuit breaker	M250 In 6,3A	Legrand
06	ZF-13z	1	Photocell power supply	ZF-13z	KRONOS PL
07	CKF (K8AB)	1	Phase asymmetry and sequence sensor	CKF – 316 (K8AB)	F&F Filipowski (OMRON)
08	FX	1	Controller	FX3G-40MR/ES	MITSUBISHI
09	INV	1	Inverter	FR-D720S-025-EC	MITSUBISHI
10	K1 K2 K10 K11 K12 K13	6	Current relay	24VAC R4 55.34.8.024.0040	Finder
		6	Current relay base	94.84.3SPA	

8.1.2 Cutter

Nr	Symbol	Quantity	Name	Type	Manufacturer
01	Q1	1	Cam switch 25A	4G25-10-US25	Apator
02	S1F S2F	1	Button START-STOP	L61QA21 Adapter Z33E 33E01 33E10	BACO
03	S3B S4B	2	Button connector	L21AA03 Adapter 33E01 33E10 – 2szt.	BACO
04	S7M	1	Rotary switch	LZ1KA03 Adapter 333E 33E10 – 1pc	BACO
05	SP	1	Limit switch	XCKP2102G11	Schneider
06	S16N S18N	2	Limit switch	MAC6C	Hartmann
07	CZ1 CZ2 CZ4 CZ5 CZ6 CZ7	6	Inductive sensor	PCID – 4ZP	SELS
08	M2	1	Electric motor 2,2kW/1400 rev/min		SIEMENS
09	M3	1	Electric motor 0,18kW/1400 rev/min	Sg63 – 4B	Tamel
10	SG1F SG2F	1	Emergency STOP	LWE16-300 Adapter Z33E Zestyk zw. 33E01 -2szt	BACO
11	ENCODER	1	Impulse – rotary convertor	HTR-W-360-23-PP-SA20	HONTKO CO.
12	H1	1	LED diode red		PL
13	H3	1	LED diode green		PL
14	LS	1	Laser line	LLM635003- D11L32AM20	PL
15	GOT 1000	1	Panel	GT 1265 -VNBA	MITSUBISHI
16	A0 A1 A2 A3 A5	5	Electro valve coil	24VDC	HANSA FLEX
17	A4	1	Electromagnet	ESB 8.6 PMG 24V DC 26W	FANINA SA
18	PA5	1	Pressure relay	TS3-18-0-K1	ARGO-HYTOS
19	M4	1	Air blow	UNI JET 75	ESAM S.p.A. Parma -ITALY
20	DRP240- 24 (S8VK)	1	Power supply	DRP240-24 (S8VK-24024)	.MEAN WELL (OMRON)