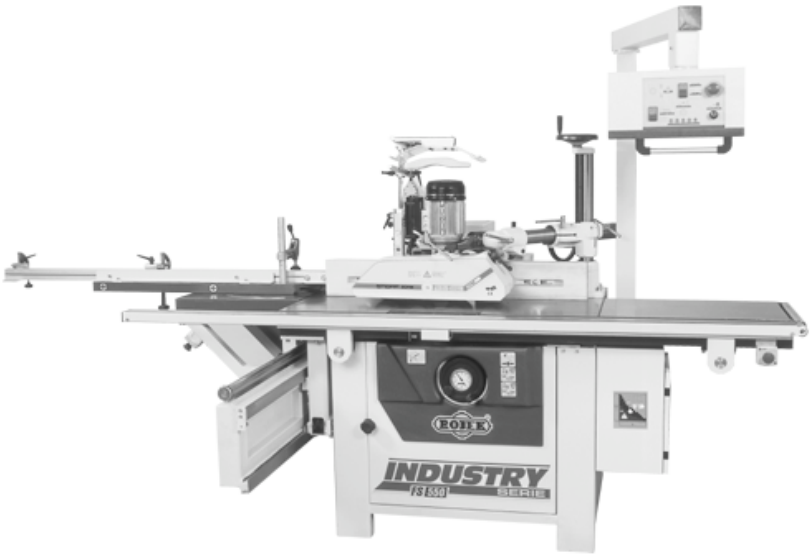
ROJEK®
1921

SINGLE SPINDLE VERTICAL

MOULDING MACHINE
FS 550



Service instructions

updated 2 / 2003

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Contents

Introduction

This manual was conceived at the manufacturer and is an indivisible part of the delivery enclosed with the machine. It contains basic information for qualified operating staff and describes the surroundings and using ways of the machine for those it is intented. It contains also all necessary information for a correct and safe operating.
The machine is equipped with various safety equipment protecting operator and machine as well at usual technological using. These regulations, however, cannot sheet all other safety aspects. That is why operator must peruse and make sense of this manual before starting of machine use. Installation and operation mistakes will be foreclosed herewith.

Do not try to start the machine before having read all instructions manual delivered with the machine and understood every function and technique.

Some information or drawings need not be intended especially for by yours bought type, for this manual contains all information of other this type variants we produce. By comparing of competent manual part with your machine – you will learn whether they correspond.

The producer reserves himself the right for particular variants in frames of a fluent technical development of the machine.

To better stress the importance of some basic passages, they are printed in heavy letters and marked by some preceding symbols - Appeal recommending to follow entirely following regulation :

Appeal recommending to act entirely according to following safety regulation. Disobservance of this regulation can be very **dangerous** and cause a killing or grave health exposure of operating personnel.

Warning from improper techniques or way of machine use that can endanger human health, machine functions, enviromnent or cause economic loss. Breach of these regulation may cause a killing or a grave health exposure of the operator

Caution is an appeal to a due care for practising following operations. Non-performing of this caution may cause a human injury or damage at the machine.

Regard the instructions explicit on shields herewith the machine is equipped. In case of its damage contact the producer and renew the shield in any way.

Caution

1.0 Machine use

This machine is designed as a dimension circular saw with hand shifting of workpiece.
The sliding table fays to the saw blade with a scorer. The saw blade is adjustable in height and with tilting. The machine is intended above all to larger cabinet making workshops for accurate sawing of wood and laminboards from wood and those on wood based ones with a maximal sawing width of 800 (1 320) mm.
The machine is intended to be operated only by one single person.
Any manipulating with the machine by children or youth is forbidden !

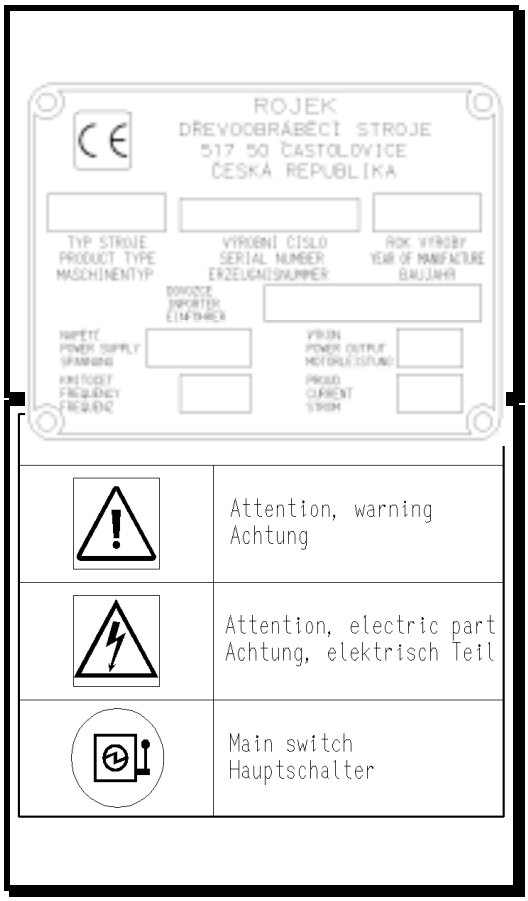
1.1 Qualification of workers

Only a man or woman trained in woodworking branche or instructed and schooled by such a specialist can operate the machine. Machine operator is obliged to learn this manual and abide with all safety regulations, rules and appointments, valid in a country in question.

1.2 Working surroundings

The machine must operate in workshop surroundings of temperature range + 5°C - +40°C, relative air humidity 30% - 95% non condensing and altitude 1000 m above the sea in surrounding classified : fire danger of combustive dusts (BE2N2).

2.0 Machine signification



Machine type can be identified at the production shield on machine frame.
FS 550 single spindle vertical moulding machine

Informative shields and shields warning against dangers are placed at the machine frame.

3.0 Technical data

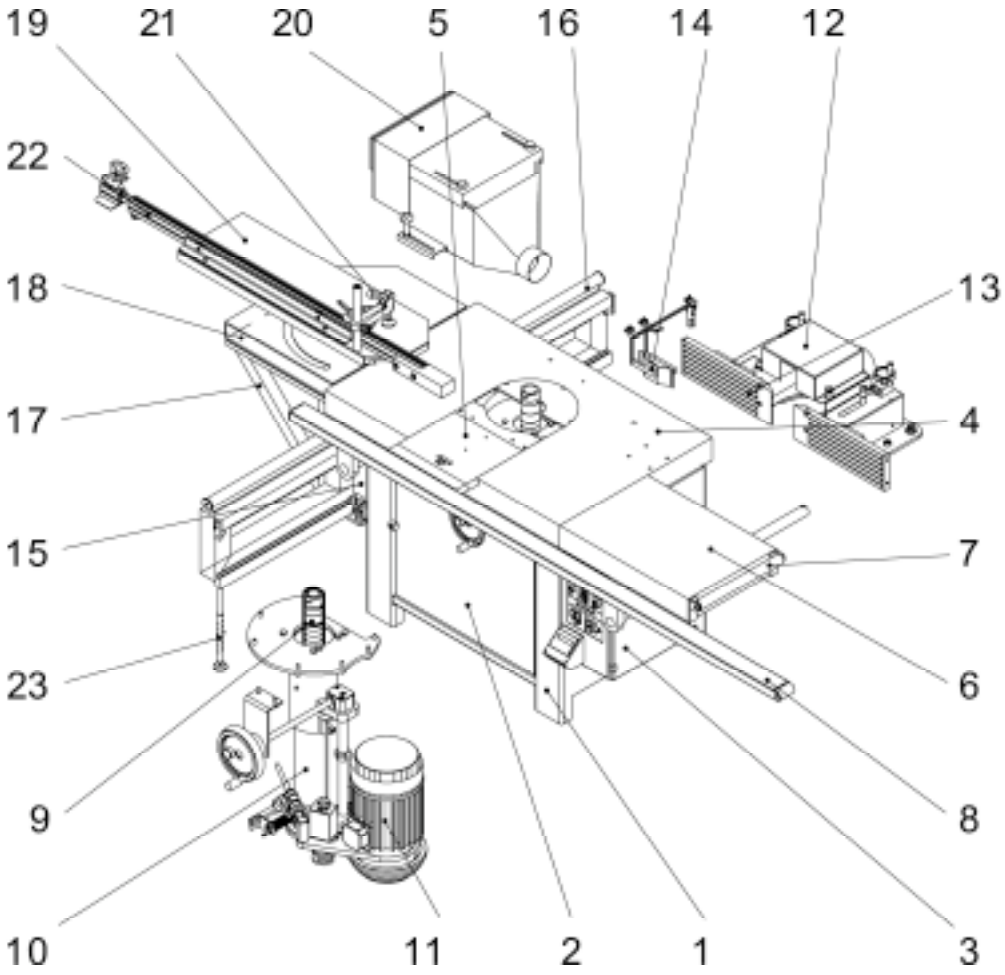
Moulding machine		
Motor output	kW	5,5
Motor rotating speed	/min	2 900 (3 480 at 60 Hz)
Spindle diameter	mm inch	40 (30; 50) -
Spindle rotating speed	/min	3 000; 4 500; 6 000; 8 000; 10 000
Spindle lift - above table - under table	mm	200 62 138
Length of spindle fixing part	mm	175
Max. diameter of opening in the table	mm	320
Table diametres	mm	1 200 x 780
Table height	mm	900
Diameter of front table extension	mm	658 x 450
Lentg of table back extension - only when using tenoning table	mm	560
Machine diametres - without profiling&tenoning case len. x w. x h. - with profiling case length x width x height - with tenoning table a tenon.case l. x w. x h.	mm mm mm	 2 510 x 1 020 x 980 2 510 x 1 020 x 1 315 3 270 x 2 035 x 1 230
Lower exhausting diameter	mm	120
Profiling		
Max./min. tool diameter	mm	250 / 80
Leading rules´length in front of & behind tool	mm	460
Leading rules height	mm	151
Exhaustion diameter of profiling case	mm	120
Tenoning		
Max./min. tool diameter	mm	350 / 80
Diameters of tenoning table	mm	1 050 x 330
Height of tenoning table	mm	947
Winding of tenoning table	°	+ 60; -90
Tenoning table travel length	mm	1 470
Exhausting diameter of tenoning case	mm	120
Other parameters		
Voltage and frequency		3f + N + PE; 400(230) V / 50 (60) Hz
Safeguarding	A	25
Machine weight – without tenoning device	kg	
Machine weight – with tenoning device	kg	930

3.1 Possible machine variants

Moulding machine

motor power	- 5,5 kW
operation voltage	- 3 x 400V ± 10%; 50/60 Hz (UL)
	- 3 x 230V ± 10%; 50/60 Hz (UL)
tool diameter	- 40; 30; 50 mm
spindle rotation speed	- 3 000, 4 500, 6 000, 8 000, 10 000 /min.
	by change of belt position at multiple pulleys
front table extension	- YES
	- NONE -neither witout sliding support of table extesion
roller of front table extesion	- YES
	- NONE
sliding support of table extension	- YES - only with the front table extension
	- NONE
Changining of spindle height	- by hand wheel
Indicating of spindle height change	- wheel with an indicator
Reversation of spindle rotating	- YES
	- NOT
place of control panel	- upper
	- lower
Profiling	**- YES**
	- NOT
leading rules	- wood
	- Al alloy
Indication of rulers´setting	- mechanical digital indicators
Tenoning	**- YES**
	- NOT
tenoning table CV 6	- YES
	- NONE
tenoning table beam	- L = 2 000 mm
beam supporting leg	- YES
	- NONE
rule of tenoning table	- small profile (R)
Eccentric fixture	- YES
	- NONE.

3.2 Machine desription



1 – Frame
2 – Front door
3 – Distributor with control pannel
4 – Moulder table
5 – Sliding table insert
6 – Front table extension
7 – Roller of front table extension
8 – Sliding support of table extension
9 – Moulder spindle
10 – Milling-spindle head with machanics
11 – Drive electric motor
12 – Profiling case
13 – Rulers of profiling cases
14 – Material hold in presser
15 – Beam brace
16 – Beam
17 – Glider
18 – Lower table
19 – Tenoning table
20 – Tenoning case
21 – Eccentric fixture
22 – Tenoning table ruler
23 – Beam supporting leg

3.3 Values of chip removed, feed and power output

power [kW]	feed [m/min]	machined width [mm]	chip removal [mm]	removed section [mm^2]
5,5	5	160	10	1 600
5,5	8	160	6,25	1 000

The value given above apply for spruce wood of a common quality with humidity equal to about 12 to 15%, with sharp tools These values may be thought initial while the machine is being put into operation. The inverse proportion applies between the machined surface (machined width x chips removed) and the feed (the larger the surface the smaller the feed) and the direct proportion applies between the machined surface and the power output (the larger the surface the higher power output). After a long use of the machine these values may become changed a little. E.g. when hard wood is machined and the tool is a bit blunt, an appropriate decrease of the values above should be taken into account.
The size of chips removed depending on the machined width and hardness of the workpiece may be chosen only up to such values with which the driving electric motor does not become overloaded. Otherwise the electric motor thermal protection will be engaged and the machine will stop.
While any material of a small section is being machined, a worse quality of machining must be taken into account due to the workpiece springing.

3.4 Data of machine nois (ISO 7960:1995)

		FS 550
Level of nois A in operator´s place (L_pA_{eq})	without tool	L_pA_{eq} = 80,7 dB(A)
	with tool	L_pA_{eq} = 85,4 dB(A)
Level of acoustic output A (L_{WA}) EN ISO 3746:1995 K = 4 dB	without tool	L_{WA} = 96,7 dB(A)
	with tool	L_{WA} = 101,4 dB(A)

Above stated values are those of emissions and need not represent the safe working values. Although there exists a correlation between emissions values and levels of exposition, these values cannot be used for a reliable statement whether other precautions are necessary or not. Agents, influencing a real exposure of workers, include other working space attributes, other sources of nois, etc., e.g. the number of machines and other from neighbourhood influencing processes. The most permissible exposition levels can differ according to country in question, too. This information will serve for machine user to a better astimation of risks.

3.5 List of used source documents

Government's regulation No. 170/1997 of Coll., (Decree 98/37/EC)
which provides technical requirements for machine equipment

Machine part

EN 292-1 : 1994 (EN 292-1 : 1991)
Safety of machine equipment. Basic terms, general principles for project work, part 1 : Basic terminology, methodology.

EN 292-2/A1 : 1997 (EN 292-2/A1 : 1995)
Safety of machine equipment. Basic terms, general principles for project work, part 2 : Technical principles and specifications.

EN 848-1 : 1999 (EN 848-1 : 1998)
Safety of wood-machining machines. One-side moulding machines with a rotating tool. Part 1: Single-spindle moulding machines.

EN 294 : 1994 (EN 294 : 1992)
Safety of machine equipment. Safe distances preventing dangerous places to be reached by arms.

EN 953 : 1998 (EN 953 : 1997)
Safety of machine equipment. Protective covers. General requirements for construction and manufacture of fixed and movable protective covers.
EN 1088 : 1997 (EN 1088 : 1995)
Safety of machine equipment. Blocking devices connected with protective covers. Principles for design and choice.

EN 954-1 : 1998 (EN 954-1 : 1996
Safety of machine equipment. Safety parts of control systems. Part 1: General principles for designing.

EN 1050 : 1998 (EN 1050 : 1996)
Safety of machine equipment. Principles for the risk rate determination.

EN 563 : 1996 (EN 563 : 1994)
Safety of machine equipment. Temperatures of surfaces that may be touched. Ergonometrical data for determination of limit temperature values of hot surfaces.

EN 349 : 1994 (EN 349)
Safety of machine equipment. The smallest gaps to prevent parts of a human body from being pressed.

EN ISO 7000 : 1994 (ISO 7000 : 1989)
Graphic signs replacing notices on the equipment.

Electrical devices

Government's regulation No. 169/1997 of Coll., (Decree 89/336 EWG)
which lays down technical requirements for products from the viewpoint of the electromagnetic compatibility.

Government's regulation No. 168/1997 of Coll., (Decree 73/23 EWG)
which lays down technical requirements for low-voltage electrical devices.

EN 60204 - 1 : 2000 (EN 60204-1 : 1998)
Safety of machine equipment. Electrical devices of machines. Part 1: General requirements.

EN 1037:1997

Safety of machine equipment - Prevention to an unfought starting

EN ISO 3864:1995

Safety colours and safety symbols

EN 614-1:1997

Safety of machine equipment. Ergonomical principles for projecting. Part 1:Terminology and general principles.

EN 418 : 1994 (EN 418 : 1992)
Safety of machine equipment. Emergency stop devices. Viewpoints of functioning. Design principles.

IEC 38 : 1993 (IEC 38 : 1983)
Electrotechnological regulations. Standardised voltages IEC.

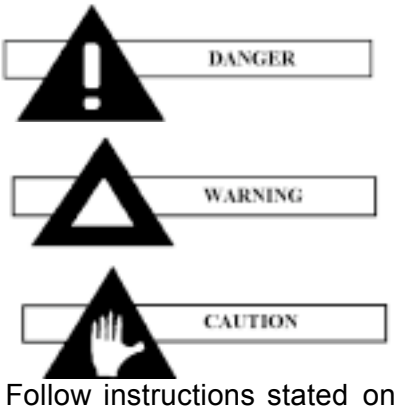
EN 60073 : 1997 (EN 60073 : 1996)
Electrotechnological regulations. Coding of communicators and controllers by means of colours and complementary means.

EN 55011 : 1999 (EN 55011 : 1998)
Limits and methods of measuring the characteristics of electromagnetic interference from industrial, scientific and medical (ISM) equipment.

4.0 Safety instructions

4.1 General

This machine is provided with various safety equipment protecting the operator and the machine as well. This, however, cannot involve all safety aspects. Therefore the operator must read through and understand this chapter. He must moreover respect also other aspects of danger, refering to surroundings conditions and processed materials.
This manual takes in 3 categories of instructive safety symbols :



Appeal recommending to proceed entirely according to following instruction(s). A dispatch or operator´s heavy injury impends in case of non-performing this regulation.

Warning against improper techniques or machine using ways, those can endanger human health, machine function-ing, environment or cause economic worses.

Caution is an appeal to appropriate care during practising of following activities. Non-performance of this caution can cause a small sized injury or machine damage.

Follow instructions stated on shields, fixed on the machine. Do not remove nor damage the shields. In any case of a shield damaging - always contact the producer !

4.2 Basic safety requirements

Never touch the low voltage system on the electric control pannel, transformers, motors and terminal boards. Every of mentioned unit is indicated with a shield.

- Before connecting machine to mains: Make sure that all safety parts are in active position and check up their functioning. In case of necessary removing doors or protecting coverings - switch off main switch and lock it or disconnect by towing plug from mains socket.
- Catchers of eventual back throw must be freely movable and its functioning controled regularly several times a day.
- When door or protecting covering are apart - do not connect the machine to the mains.

To avoid incorrect operating – learn positions of switches before machine starting.

Remember position (location) of emergency switch to be able to use it at once any time.
- Avoid touching some switch(es) by chance on running machine.
- Never touch rotating tool by hands or somewhat else.
- When you will not work on at the machine – switch it off by control pannel switch and disconnect it from the mains.
- Before cleaning : Switch off the machine and lock the main switch or tow plug off socket.
- Before doing maintenance inside machine : Always switch it off and lock main switch or disconnect plug from mains socket.
- When more workers operate the machine – do not begin another work not having informed other worker about your intention how you will run on.
- Do not do up the machine in any way able to endanger its safe operating.
- In doubts about correctness of technique – contact a responsible person.

Do not neglect practising of regular inspections in tune with service manual instructions.
Check up and make sure that nothing troublesome ocurs on the machine.
- After finishing of work adjust the machine so as to be ready for following operations.
- In case of mains outage – switch off immediately main switch or tow plug out from socket.
- Do not overpaint, mear, damage, do up nor get off safety shields. If they get unreadable or lost – contact production plant and renew them.

4.3 Working dress and personal safety

Experience shows that various personally worn objects e.g. finger rings, watches, wristbands and the like used to cause injuries. Hence put them away before beginning of work, fasten sleeves, remove tie – those could be caught by various parts of working machines. Brace your hair so as not to fly free and wear suitable shoes recommended or rated by working safety rules of a country in question.
- Wear safety outfit (glasses, apron, safety footwear and the like).
- In case of obstacles above your head in working space – wear a helmet.
- Wear always a protecting mask during planing material – source of dust (when planed).
- Never wear free working dress.
- Never work on the machine under influence of drugs or spirit drinks.
- If you suffer from stuggers, fade or swoon – do not work on the machine.

4.4 Safety regulations for machine operator

Do not start up the machine before having got up the content of this manual.

- Check up whether electric cabels are not damaged so as an electric current fading would not cause an injury (electric shock).
- Check up regularly whether safety coverings are properly mounted and if they are undamaged. Damaged coverings repair immediately or replace with other ones.
- Do not start the machine with removed protecting covering.
- Never use deformed or cracked tools.
- Replace blunt tools as soon as possible, for blunt tools often cause injuries or damages .
- Never use tools at higher speed than recommended by its producer.
- Stop all machine functions before replacing of tools.
- Do not remove nor in any else interfer to safety elements like coverings, limit switches, nor practise its mutual blockage.
- Require an assistance for manipulation with parts exceeding your abilities.
- At a storm we recommend : Do **NOT** operate at the machine !

4.5 Safety regulations for maintenance

Get up manual instruction for machine maintenance men in all points before starting any maintenance work.

- Before beginning with maintenance works: Switch off always the main switch and lock it or disconnect the machine by towing off the plug from socket. Hererwith you avoid an occassional starting of machine by chance by another else person.

- A qualified person must practise maintenance works on electric parts.
- The machine is not disconnected from voltage when it gets stopped. Switch off always the main switch and lock it or disconnect the machine by towing off the plug from socket.
- Do not clean the machine or its peripheral system if machine is completely out of run as long as the main switch is not switched off or the plug towed out from the mains socket.
- Keep your fingers distant from belts and belts pulleys and from chains and chain wheels. Before exchange of machine electric parts – switch off the main switch, lock it or disconnect the machine by towing off the plug from the socket. For replacing of defected pro ducts use those consistent with specification of originals.
- Do not remove or do up blocking of limit switches or other safety components.
- Keep always tidy the space for maintenance including your working place.

- Maintenance works must be practised by qualified personnel in tune with producer´s instructions.
- Read through all the instructions manual for maintenance men patiently.

- For an exchange of parts and needy subjects – ensure in advance equal ones with the original type or corresponding with the norms.
- Use only specified brands of lubricant (oil or grease) or with these equal ones.
- Do not use compressed air for machine cleaning or removing of wood chips.
- Control results of maintenance in presence of a responsible person.

4.6 Safety regulations for working place

- Ensure always sufficient working space and free access to the machine and its peripheral device.
- Place the tools and other obstacles at a place for this intended and remote from the machine.
- Ensure sufficient lighting in working space that will not throw shadows or cause a stroboscopic effect. Hygienic norms indicate 500 lx for minimal lighting for safe and quality work.
- Never lay tools or other subjects onto working tables or coverings.

5.0 Transport and storage

5.1 Transport and storage

Be especially careful during transport and manipulation and commit it to qualified personnel especially trained for this kind of action.

You must secure that no person nor subject could be folded by the machine during loading and unloading it !

Never enter the space under the machine lifted up by a crane or a high-lift !

The machine must be protected against excessive vibrations and moisture during transport. It must be stored indoor in temperature range (minus) – 25°C to + 55°C.
The machine is modularly wrapped in shrinkable folio when transported.

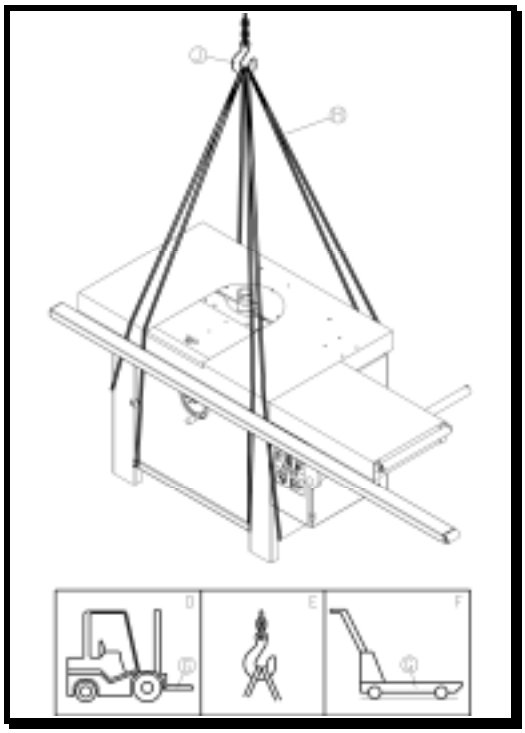
On customer´s wish the machine can be packed in a resistant wooden box.

5.2 Machine lifting

The machine or its separate parts can be lifted only with an approved lifting appliance of certified carrying capacity. We recommend you to use :

D – high-lift
E – crane or other lifting appliance
F – manual lifting carriage

Use a high-lift of sufficient forks length !



Prepare a high-lift (D) or a manual lifting carriage of sufficient forks carrying capacity
- shift forks (G) under the machine, acc. to picture.
When using a crane (E) or a similar lifting mechanism, proceed following-ly : - prepare 4 lifting ropes (H) of sufficient lifting capacity or endlesly connected steal ropes of minimal length 4 m,
- bend belts onto crane(of needy lift-ing capacity) hook(J) and under machine stand,
- use fillers and rope braces so that ropes would not damage the machine or its parts
- check up the stability of machine hang at a moderate lifting up eventually change the placing of fillers and of rope braces,
- lift the machine carefully and slowly and then relocate it without sudden moving changings to chosen place.

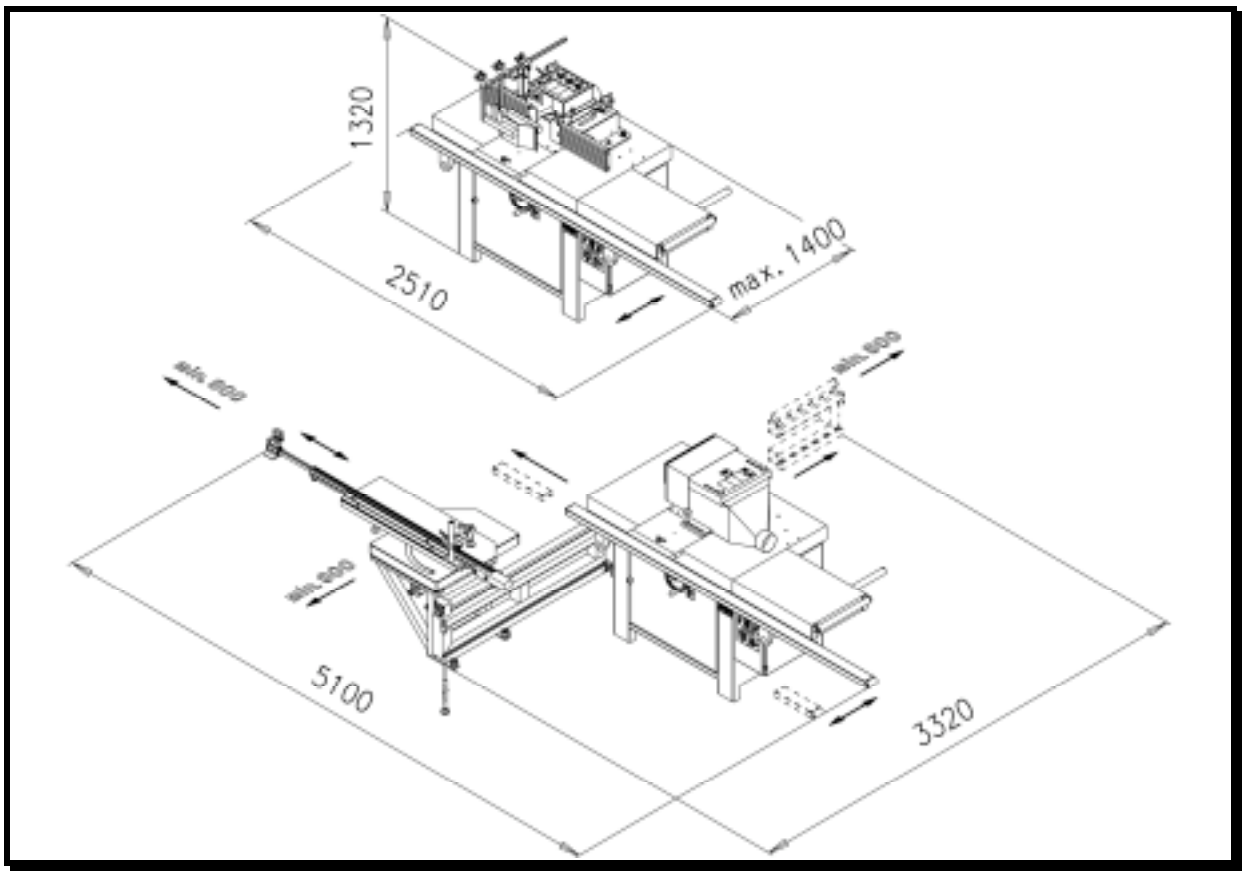
Weight of the machine FS 550 is….. 930 kg

6.0 Positioning the machine

Remove protecting coat from table and other machine parts with a solvent. Do not use petrol or kindred solvents for this action. They can cut down resistance against corrosion of some machine parts.

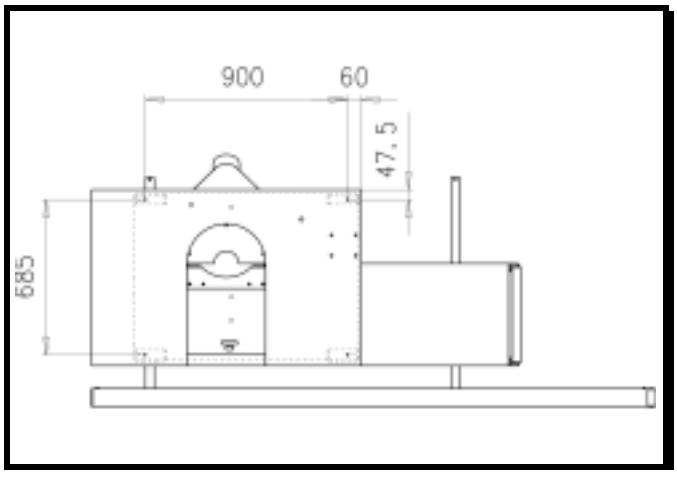
The working space extent depends on machine dimensions, intended working operations and dimensions of processed material.
Do not forget to let free a big enough space for installment of a sufficiently effective exhausting unit or hoses connecting with the central exhausting system.

6.1 Working area



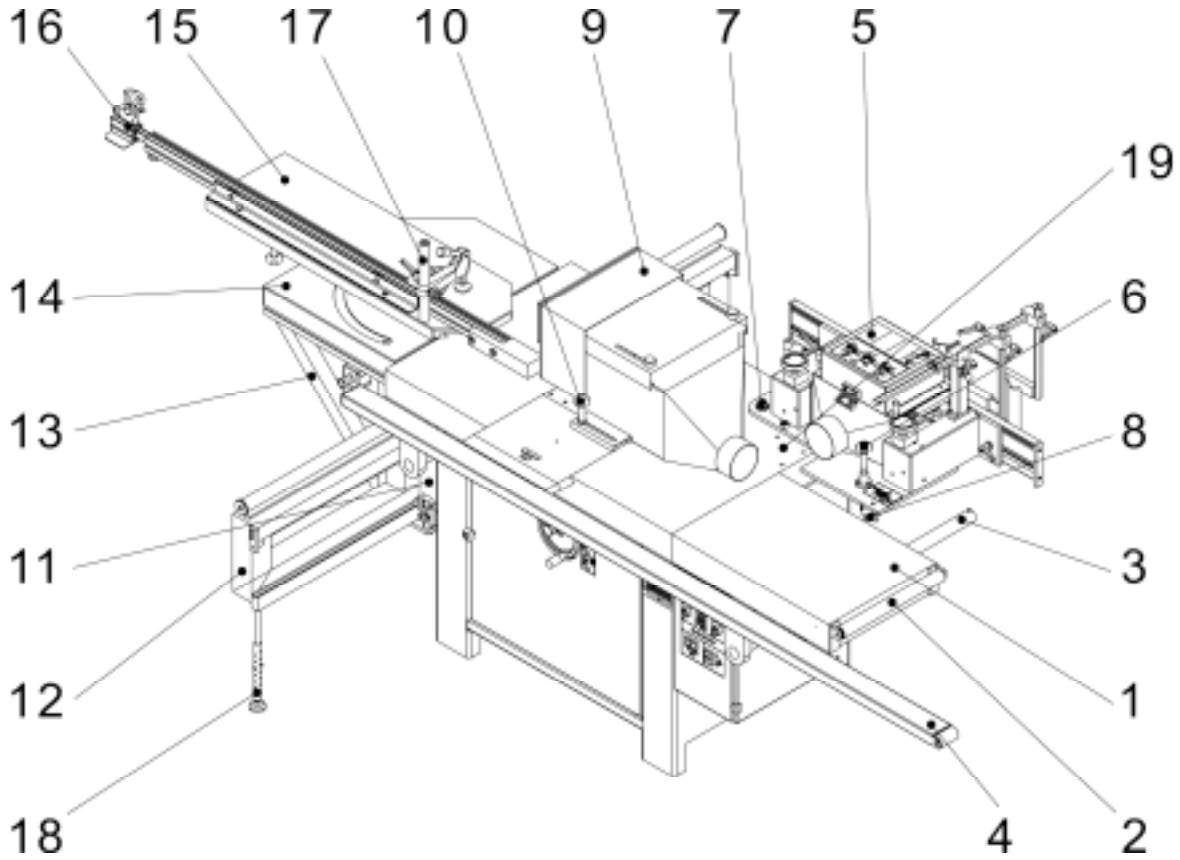
It is important to keep a free space of at least 0,8 m, requested as working space surrounding the machine.
If a long peace is planed, it is necessary to have a sufficient space in front of and behind the machine in places of material in - and output.

6.2 Levelling and fixing the machine



If you are sure that placing of the machine is good, level the machine by help of forcing-off screws in machine feet. Use steel washers (part of delivery) under levelling screws and balance the machine in plane with the clearance limit 1 mm/1metre and screw down machine feet into the bottom (anchor the machine).
Attached drawing shows a lay-out of anchoring openings on the machine.

6.3 Instalment of demountable parts



1. **Front table prolongation** – is fixed with screws to the moulder table. The force-off screws with arresting nuts are placed close to the fixing screws for an easier levelling into the plane of the moulder table.
2. **Roll of front table prolongation** – is fixed to the front table prolongation.
3. **Carrying bars of sliding support of the table widening** – the right bar comes through the beddings, fixed under the front table prolongation; the left bar comes through beddings, fixed under the table of the moulder. The bars are (at its ends) equipped with back stop screws. It is needy to mount the beddings so as the support (4) could be easily moved in the cross (to the machine table length) direction.
4. **Sliding support of the table widening** – is fixed to the bars (3) with screws; it is movable in the cross - to machine length - direction (moulder table widening) and in the lengthwise - with the machine - direction (prolongation of supporting of the part in the place of the lower tenoning table (14).
5. **Profiling case** – is fixed at a turnable pivot (7) onto the moulder table. It gets to be fixed with the screw (6) after turn to working position (machining in the lengthwise machine direction). The screw (8) serves as an adjustable backstop of the casing in the working position.
9. **Tenoning case** – is fixed onto the table by help of hand screws (10). It is used for tenoning (machining in direction cross the grains of wood).
11. **Brace of the beam** – is fixed from the from the down side of the machine table and at the left side of the machine frame. Here the brace is equipped with pressing-off screws for setting the position upright to the lengthwise machine axis namely in the horizontal and also vertical plain field.

12. **Beam of tenonig table** – is mounted at the brace along that it can move. It is possible to fix it by help of the arresting lever in whatever position between the terminal side backstops.
13. **Glider** – slides easily along the carrying bar of the beam (12) on the ball casings and in the lower part on the ball bearings, those are bedded at eccentric pivots for an easier levelling and limitation of gives.
14. **Lower table** – is fixed to the glider(13) with screws and by help of pressing-off screws it is possible to level it into the plain field upright to the axis of moulding spindle.
15. **Tenoning table** – moves in the dovetail leading along the interboard. Its moving can be arrested by help of two hand screws. It can be coiled and also this moving can be arrested with the hand screw.
16. **Tenonig table ruler** – is fixed to the tenoning table by help of the angle bar and is lengthwise adjustable in the slot.
17. **Eccentric fixture** – the post of the fixture is screwed into the tenoning table. The fixture body can be turned and also shifted vertically along the post. The body position on the post ist fixed with a hand screw.
18. **Beam supporting foot** – is screwed up from the beam low side. The foot length is adjustable by help of an openings system and a screw pin. The foot base can be protruded by turning with the screw of the foot base.
19. **place at the moulder table for fixing of the feeder.**

All machine parts must be mounted,set and adjusted with a keen care. It has a decisive influence on quality and machining precision. We recommend to let it out a specialized firm.

7.0 Connecting of exhaustion system

An exhausting unit of sufficient exhausting capacity (see table) is necessary for a proper functioning of the machine. **Always operate machine only with running exhausting !**

Start the machine and the exhausting unit all at once !

Minimal exhausting capacity of exhaustion device

	diameter of exhausting nozzle [mm]	dry particles $v_{min.}$= 20m/s [m^3/hod]	wet particles $v_{min.}$= 28m/s [m^3/hod]
lower exhausting	120	815	1 140
Upper exhausting - profiling casing - tenoning casing	 120 120	 815 815	 1 140 1 140
in all -lower + profil. -lower + _epov.	 120 + 120 120 + 120	 **1 630** **1 630**	 **2 280** **2 280**

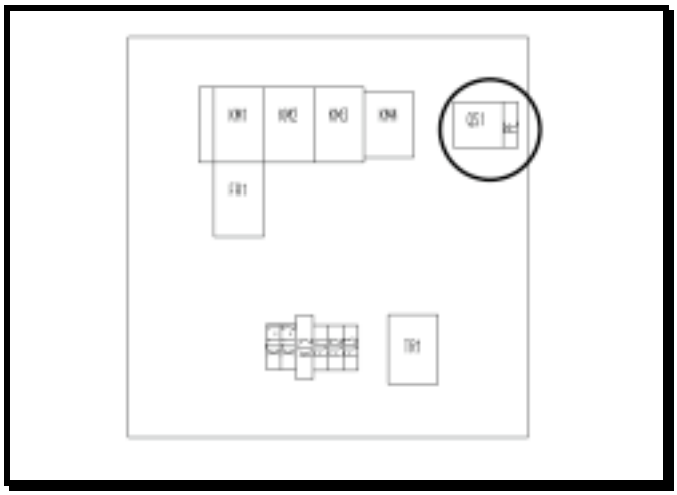
For connecting use a flexible exhausting hose of adequate diameter.
The lower exhaustion is lead out in the back machine part.

Wooden waste must be liquidated eco-friendly - not to worsen the environment !

8.0 Connecting to the mains

Only a qualified person is allowed to realize the first connection of the machine to the mains.

8.1 Connecting to the mains



Make sure that no voltage is at supply lead before connecting. Open the door of distributor. Pass the supplying cable through the cable terminal inward the distributor and connect the individual phase conductors with corresponding clamps of the main switch QS1. Connect the protective conductor (yellow-green) to the clamp PE and the central conductor (pale blue) to the clamp N, if required. Crossections of phase conductors and protective conductor must be conformable with legal standard norms. Check up the rightness of connecting and draw up the cable terminal well.

8.2 Operation safety

Damaged supplying lead must be replaced immediately by a competent specialist. Machine run on damaged supply cables is dangerous to life and therefore forbidden !

Before establishing the machine to the run make sure that the voltage and frequency stated on the machine rating plate answer to those of supplying network.

Always switch off the main switch and lock it or discon-nect the machine by towing the plug from the socket before tools adjusting, replacement and all adjusting, treatment and maintenance works. Herewith you avoid eventual machine starting by chance by an else person.

8.3 Rotating direction

An injury danger menaces at improper rotating direction of saw blade !

The spindle of vertical moulder must rotate in the anticlockweis sense – means to the left, against the input material – up-feed method.
The down-feed method (climb technique) **is forbidden !**
Start the machine without tools for a flash so as to learn its rotating direction.

8.4 Rotating direction change

It is possible to change a rotating direction of 3-phases motors by exchanging (switch-over) of conductors one instead of another (between 2 black ones or a brown and a black one) on clamps of main switch QS1. Attention ! Avoid of mistaken changing of the yellow-green conducter instead of the phase one !

Entirely a specialist qualified in electrotechnics is allowed to make this change and to realize the connecting !

Start the machine without tools for a flash so as to learn its rotating direction.

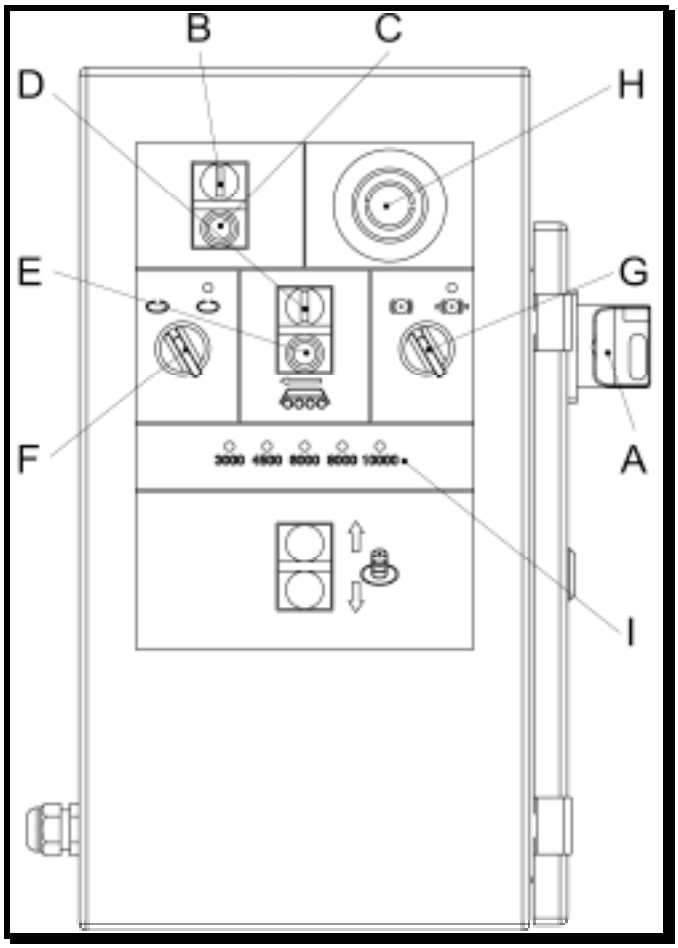
8.5 Protection of electric parts

The electric motor of the saw is equipped with an electric brake, able to stop the spindle in a required time (within 10 s).

If the electric brake does not work well (the spindle run out is more than 10 s) it is forbidden to work on the machine !

The protection against a dangerous contact of inanimate parts is assured with a self acting disconnecting from the mains according to the norm EN 60 204-1 and IEC 60 364-4-41.

8.6 Machine control



8.6.1 Machine connecting

The machine gets connected or disconnected from the mains by switching on/off the lockable main switch (A). The machine cannot be started before being connected. The main switch can be
locked with a pad lock against an ineligible starting of the machine.

8.6.2 Connecting of spindle motor and feeder drawer

The spindle motor gets started by pushing the green knob (B) at the trigger switch of the main control pannel.
ATTENTION ! – so far as equipped with reversible overswitch (F) – the machine cannot be started until the safety time (20 s) after connecting to the mains with the main switch (A) runs out.

The spindle motor will be switched off by pushing the red controller (C), herewith the feeder socket outlet gets together disconnected.
The feeder socket outlet gets connected (switched on) by pushing the green controller (D) and switched off by pushing the red controller (E). Connecting of the outlet is indicated by lighting up of the control light, placed between these two controlers. Until the spindle motor is not started, the socket outlet to connect the feeder is without power – the feeder can be thus started only when the spindle motor is switched on.
In case of a mains failure the machine is switched off by a tapped coil, means that after the voltage restoring the machine must be switched on again.
The inbuilt breaker will switch off the machine in case of motor overloading. Check up the machine (motor function, blunt tools and the like) if the breaker switches it off several times in a sequence.

8.6.3 Rotation reversation

The spindle of vertical moulder must turn anticlockwise – i. e. to the left, against input material - – up-feed method of moulding.
If required by technological process – the spindle can be strated in the rotating sense - i. e. to the right. The choice of required rotation sense is done by turning with the overswitch (F) to the relevant position and after running out of safety time period it is possible to start the spindle motor by pushing the green controler (B). After turning the overswitch (F) into position of reversal rotating sense – to the right – it is necessary to intromit the key into it and this position is indicated by lighting up of the control light.
So far as the rotation sense is reversibly overswitched with the controller (F) during machine running, the motor supply gets interrupted and only after running out of the safety time the spindle can be started with the green controller (B) in the reverse rotating sense.

8.6.4 Spindle break release

For an easier manipulating with the tool, the spindle (after its stand) can be released by turning with the knob (G) into position released. A key must be intromitted into the knob. After running out of the safety period the spindle motor gets rebreaked and this stage is indicated by lighting up of the control light. An again blocking of the spindle comes round after turning of controller (G) into position blocked (normal stage).
So far as the controler (G) of release gets overswitched during machine running – at first the electric connection of the spindle motor gets interrupted. The spindle will stop its turning and only after the running out of the safety time period the spindle will get released.
ATTENTION – it is always necessary to return the controler of release (G) into the position "blocked". In any else way the spindle cannot be started with the green knob (B) again.

8.6.5 Controller of emergency stopping

The emergency switch (H) will stay secured in the position OFF after being used and it is necessary to release it by turning of the "mushroom" head.Without this release the machine cannot be started again !

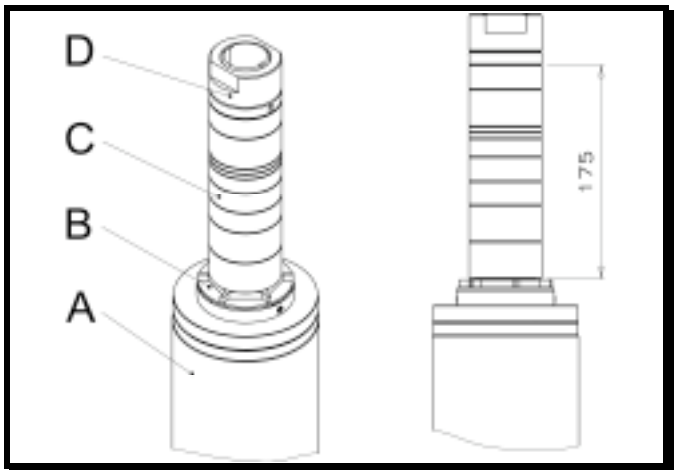
8.6.6 Indication of operation rotating speed

Lighting up of a respective LED diode (I) with stated number of RPM indicates the set up operation rotating speed of the spindle.

9.0 Operation and adjusting of machine

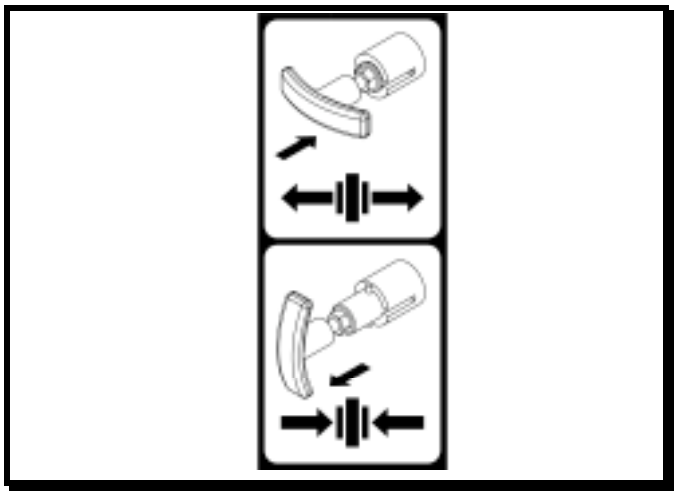
9.1 Exchange and fixing of tool

9.1.1 Tool fixing



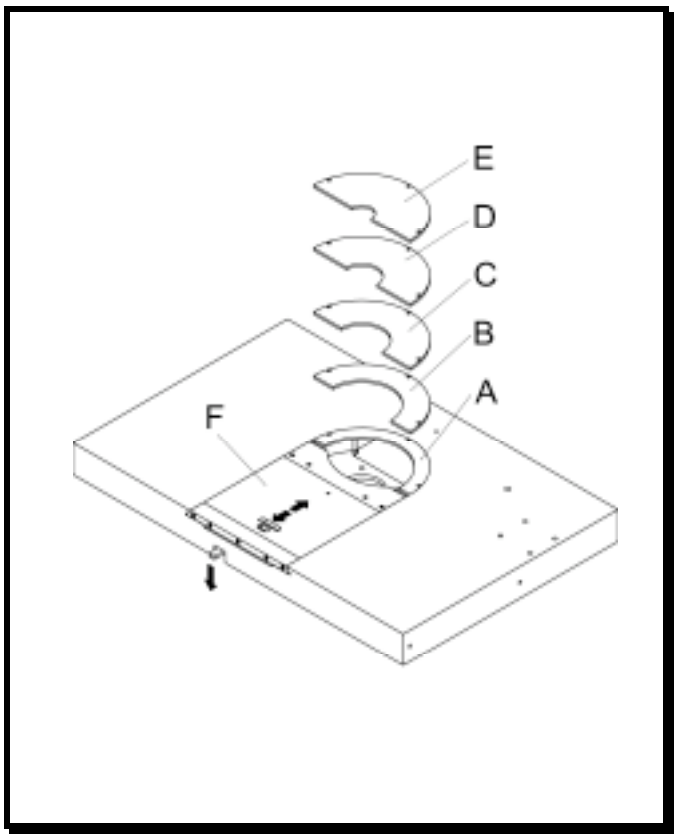
The tool gets fixed onto the spindle (apart of the milling spindle head (A)) by means of distance rings (C) and a fixing nut(D). The nut(D) must be fitted with a freely rotating ring. It is proper to mount a ring(B) with winglets, that inhibits from lodgings of swarf in the spindle head body during working in the body low position (the winglet-ring is not delivered for the spindle of diameter 50 mm).

9.1.2 Spindle arresting during tool fixing



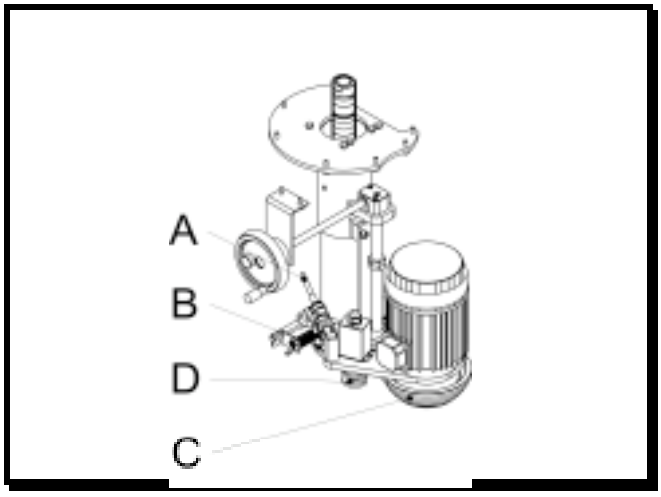
It is necessary to fix the spindle with released breakes (acc. to chp. 8.6.4) against turning during unloosing or drawing up of the fixing nut. The fixing is done by protruding and indexing of the „T“ handle, that is under the machine front door. The door is electrically blocked when the „T“ handle is protruded – the door cannot be shut and so the fixed spindle cannot be started.

9.2 Table inserts and sliding table insert



The table of the moulder, in surroundings of the spindle, is equipped with a set of half-round inserts (A,B,C,D,E) and with a sliding table insert (F).
The shape of the half-round insert and the position of sliding table insert is chosen according to diameter of tool, interfering under the table surface plane. The sliding table insert can be moved, after pushing of the lever, as indicated at the picture.

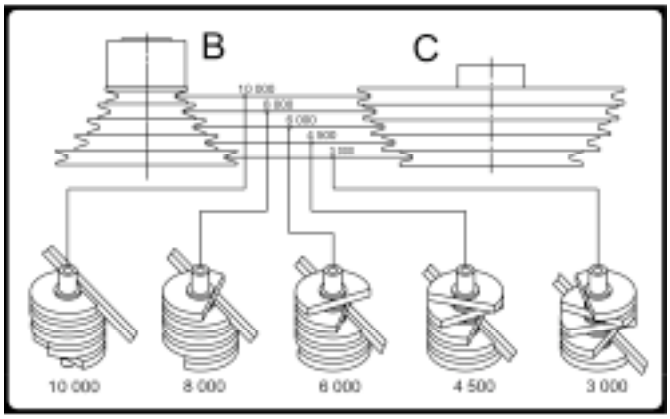
9.3 Spindle rotation change and its indicating



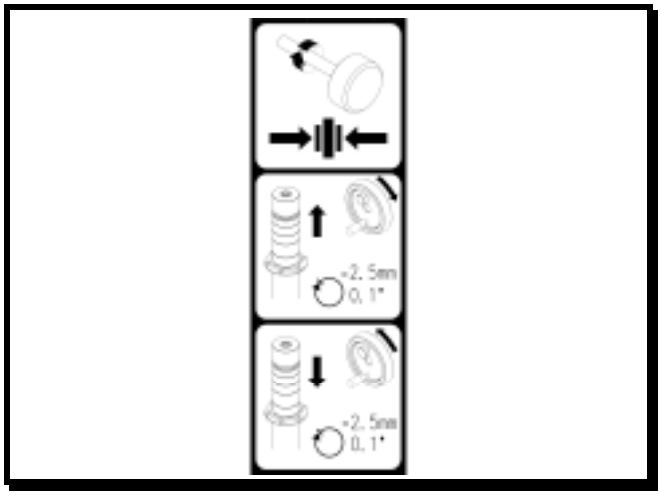
The machine is equipped with a five point belt pulley of the spindle (B) and of the motor (C). After releasing of V-belt with the lever(A) it is possible to remove the V-belt into gorges of pulleys (according to following picture) those agree with required spindle rotating speed.

ATTENTION – after setting of the V-belt onto the required R.P.M. it is NECESSARY to turn the R.P.M. indicator (D) to the position answering to that of the V-belt.

So far as the indicator is turned into the right position – the incident control light (chp. 8.6.6) gets lighted up.



9.4 Adjustment of height

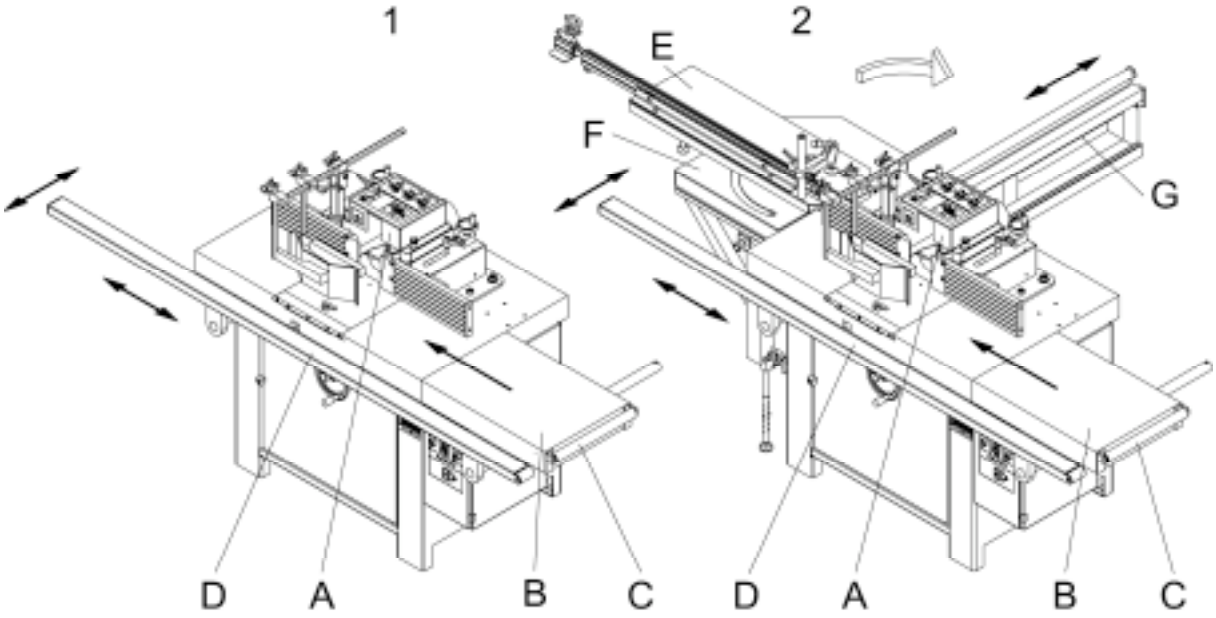


The height adjusting of the vertical spindle is done with the hand wheel with the indicator of setting, that is located at the front side of the machine frame. The wheel can be fixed with the arresting screw after setting the required worth.

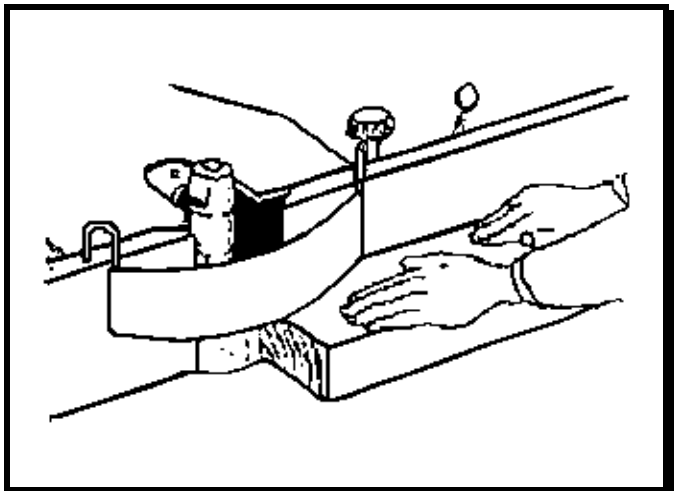
9.5 Profiling

Working intermediates from wood or on its base with a shaped or straight tool in the length-wise direction of wooden grains.

At picture 1 the machine is without tenoning unit and at picture 2 with tenoning unit - ready for profiling or planing.

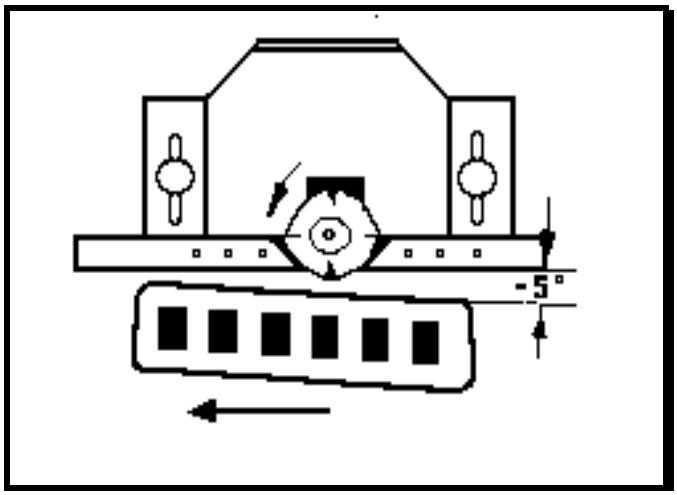


A – Profiling case
B – Front prolongation of machine table
C – Roll of the front prolongation of machine table
D – sliding support od table enlargement – can be displaced in lengthwise and cross direc tion, every changed position can be fixed in both directions.
E – Tenoning table – can be turned within 90° in direction of arrow and herewith to free the place for the second operator, who takes away the ready worked pieces
F – The lower table of tenoning unit can be used as a prolongation of machine table when profiling
G – The beam of tenoning unit can be overslid to the back position so as it does not reduce the operator´s place in the front machine part.



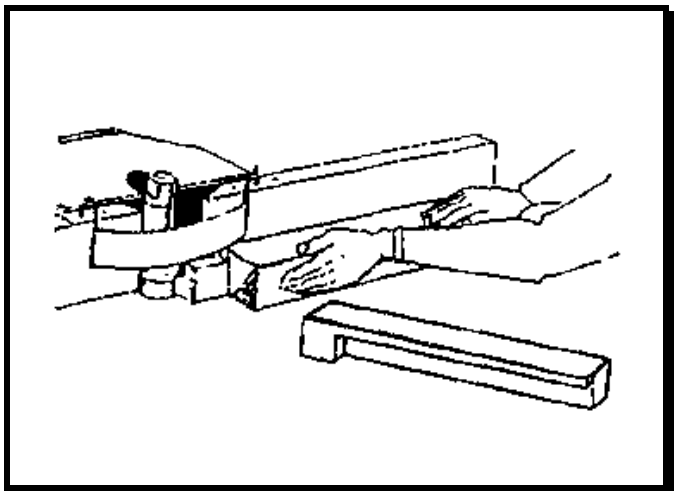
9.5.1 Moulding

Tool: Use suitable tools with defined chip thickness for manual feeding.
Working cycle: During any test milling, start work with a sufficiently long, wide and high workpiece. It is necessary to avoid the machine getting blocked or to use protection against kickback adapted to the workpiece dimensions. While working, feed the workpiece firmly and evenly along the guide ruler. If possible, the position of your hands must prevent the workpiece from being held along its whole perimeter.



9.5.2 Moulding with mechanical feeding

Tool: Use suitable tools for manual or partially mechanical feed for this purpose.
Working cycle: Adjust the milling ruler and fasten it duly. Set the feeding device in a slight angle against the feeding direction so that the workpiece is led safely along the guide ruler. Mount the feeding device always with its front cover close to the guide ruler even in the case of wide workpieces. Use the feeding device also for testing pieces.



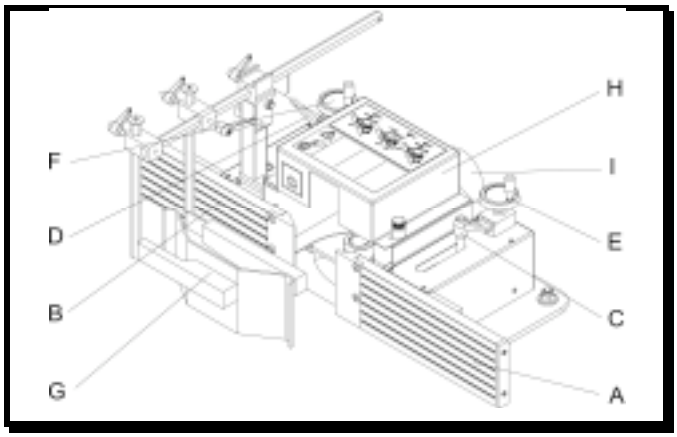
9.5.3 Moulding workpieces of small cross-section

Tool: Choose the tool suitable for manual feeding.
Working cycle: Adjust the milling machine and put both halves of the ruler close to the tool. Machine the material only by means of a pressing piece! Choose the size of the pressing piece so that the hand may be put on it comfortably. According to the workpiece cross-section, create recessing for the workpiece clamping so that the workpiece is firmly pressed against the ruler and

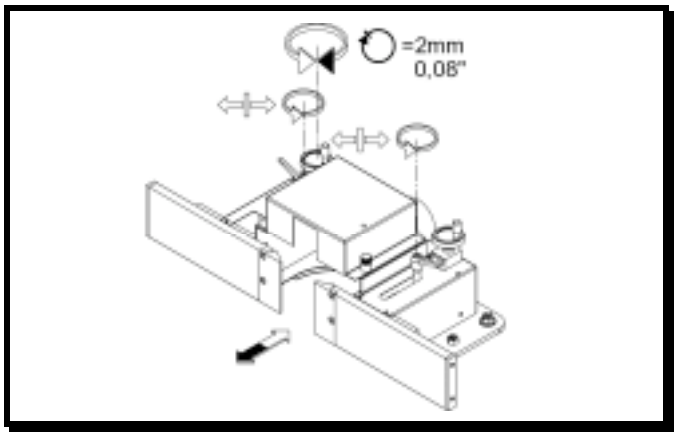
against the table of the machine.

9.5.4 Profiling covering

For tool of max. diameter 250 mm and min. diameter 80 mm

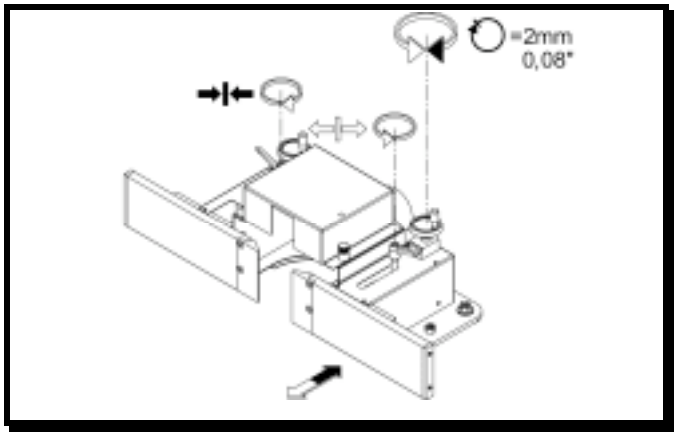


A – right ruler – after release of fixing lever can be displaced in lengthwise direction accord. to used tool diameter.
B – left ruler – after release of fixing lever can be displaced in lengthwise direction accord. to used tool diameter.
The rulers can be made from wood or from the alloy of aluminium.
C – right arrest
D – left arrest
E – right displacement – for setting of removed chip thickness
F – left displacement – for setting of the left ruler according to tool diameter
G – horizontal and vertical material-hold in-presser – for pressing of a part to rulers and to the table, after release of blocking pin – the pressers can be lifted off
H – Hinged cover – gets lifted off at a changing of tool
I – Exhaustion socket – for connecting of exhausting hose of diameter 120 mm.



9.5.4.1 Setting of the left ruler according to tool diameter

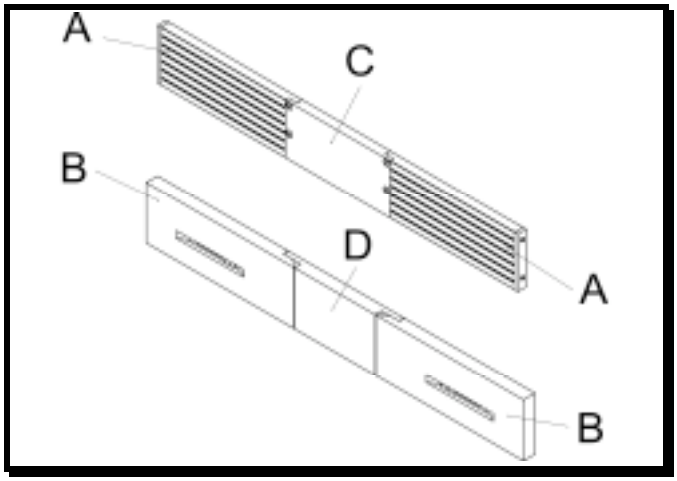
After relaese of the right and also left arrest the whole profiling covering gets shifted in the cross direction toward tool by turning of the left adjusting unit.
After setting the left ruler to the plane of tool (furthest of the minimum tool diameter) it is necessary to fix this position by drawing up of the left arrest.
The worth of tool diameter is shown at the mechanical digital pointer of the left displacing.



9.5.4.2 Chip removal setting

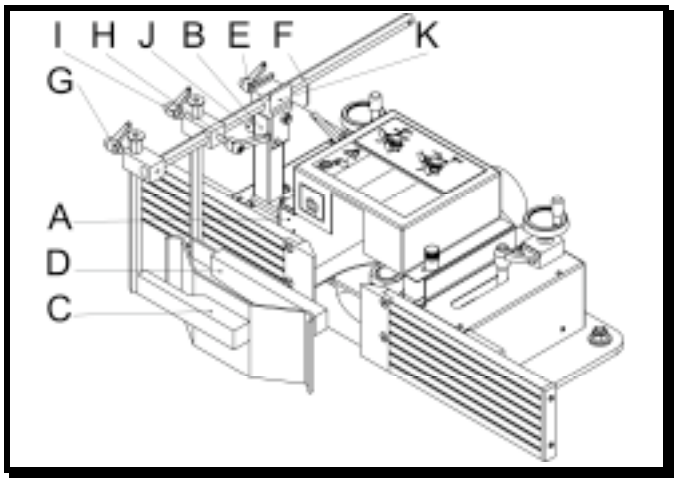
After release of the right arrest – the right ruler slides in the cross direction toward tool by means of turning of the right displacing. After setting of required chip thickness worth (removal) it is necessary to fix this position by drawing up the right arrest.
The worth of set chip removal is shown on the mechanical digital pointer of the right displacing.

ATTENTION – Always do the setting of tool diameter and also of the worth of removed chip thickness in one direction in reference to delimiting of mechanism´s gives.



9.5.4.3 Continual insert

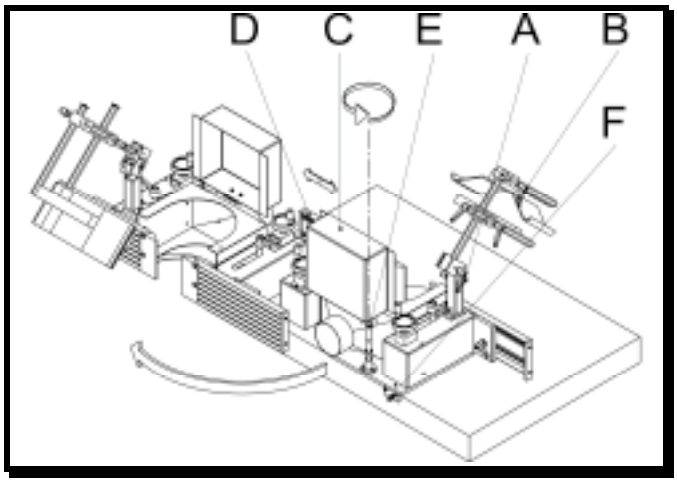
Rulers from aluminium alloy (A) and also from wood (B) can be emended with the insert of continuity (C,D) for working of profiles without any chip removal.



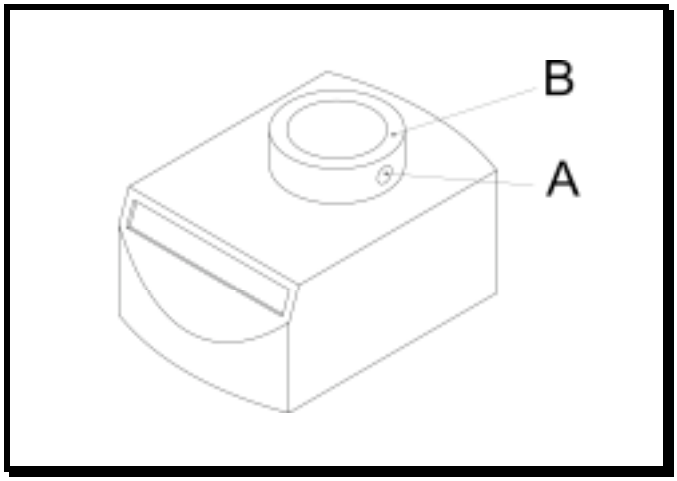
9.5.4.4 Material press-in holders

The pressers are fastened to profiling covering (A) by means of the pole (B), that holds the bar (F) of pressers.
Worked blank is pressed to rulers with horizontal presser (C) and to the table with vertical presser (D). After release of lever (E) – the horizontal presser can be slid laterally according to the width of workpiece and - after release of lever (G) - the presser can be slid vertically according to workpiece thickness. After release of lever (H) the vertical presser can be displaced laterally and after release of lever (I) also vertically according to workpiece thickness.
After pulling up of fixing plug (J) the pressers with collar (K) can be lifted off to position 45° or 90° and fixed.

9.5.4.5 Turn of profiling case

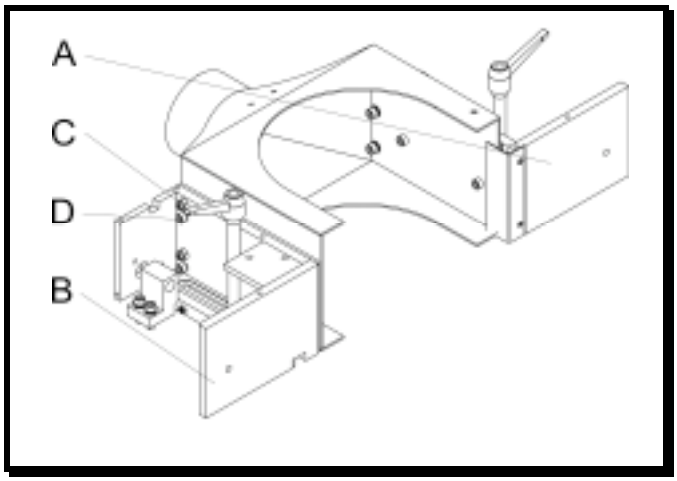


Turning of profiling case away from working position is used for installation of tenonning case.
Action :
- the pressers (B) will lift off by release of arrest (A)
- the whole case must be set in the position of the smallest tool.
- after release the ruler (D) will be shifted off to position of the max. tool dia-meter and will be locked again
- the lid (C) must be lifted off
- the case can be turned after release of the arresting screw (E)
- The back stop screw (F) serves for getting back to the work position.



9.5.4.6 Adjusting of digital mechanic indicators

After release of screw (A) the ring (B) can be turned and herewith the worth, shown by the indicator, can be changed.



9.5.4.7 Adjusting of rulers parallelity

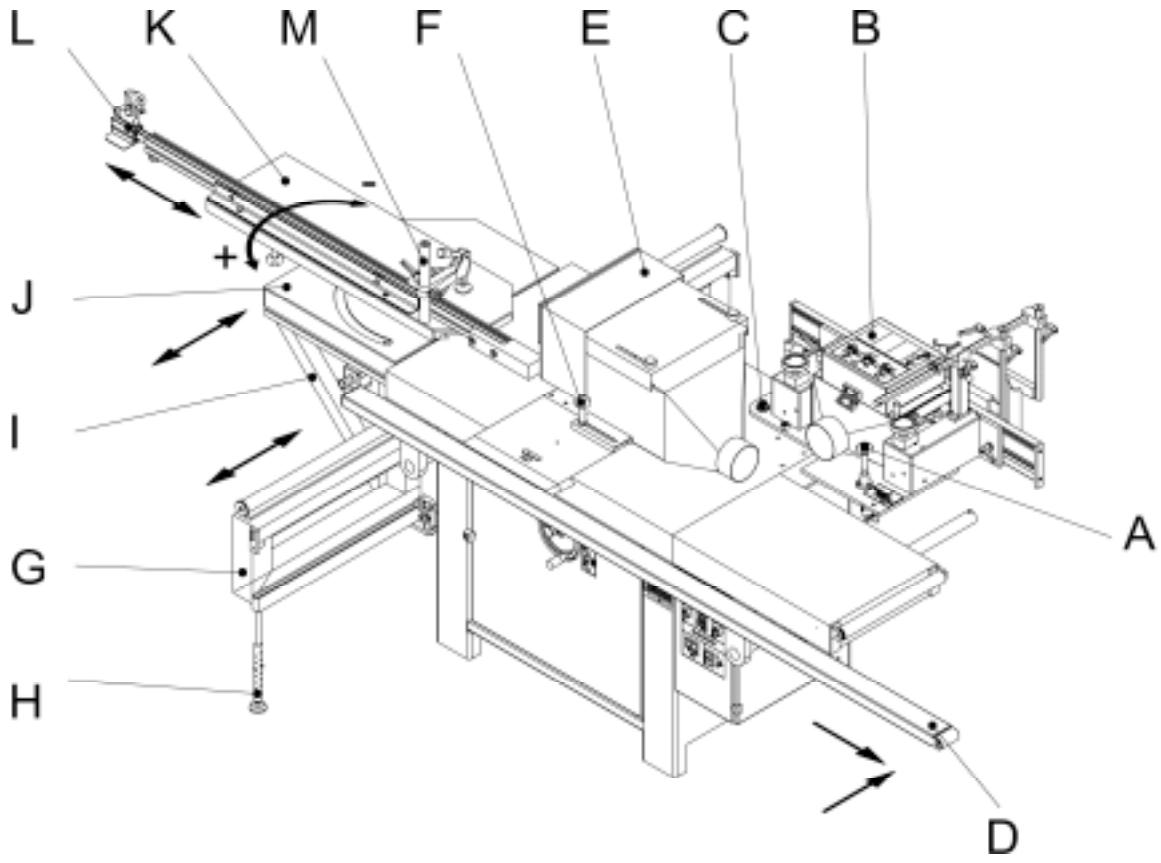
The rulers´parallelity is given by parallelity of its holders (A and B). The right holder (A) is slidingly fastened to the exhausting nozzle, the left holder (B) is
fast connected with the nozzle by help of screws (D). After release of screws it is possible to change the parallelity of both holders by help of pressing-off screws (C) with safety nuts.

The parallelity of rulers is adjusted from the production factory.

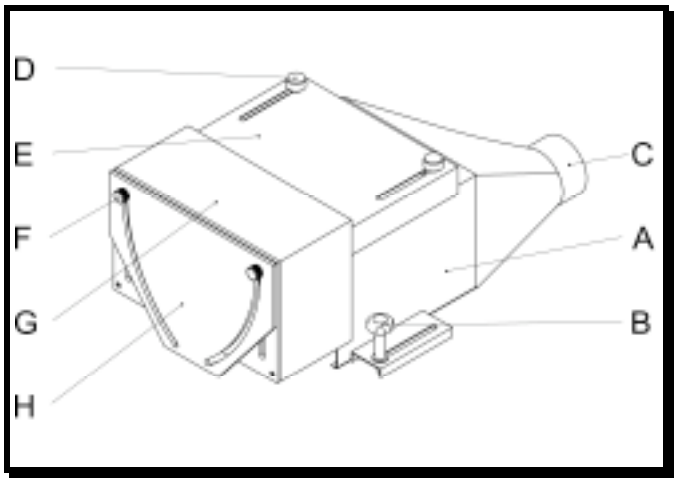
9.6 Tenoning

Working of wooden intermediates (or those based on wood) in the cross-direction of fibres.

The machine at the picture is ready for tenoning.



A – After release of arresting screw (A) - the profiling case (B) turns around the axis (C) (up to 180°).
D – Sliding support of the table enlargement will intromit close to the table and will relocate into the front position, so as to free the space for travel of tenoning unit.
E – The tenoning case will be fixed onto the table by help of hand screws (F).
G – The beam of tenoning unit can be relocated into position answering to the extent of worked pieces.
H – Supporting foot can be used for improving of machine stability.
I – The glider moves along the carrying bar and bears the lower table (J).
J – The lower table is fastened to the glider (I) and bears the tenoning table (K).
K – The tenoning table bears the ruler (L), table can be displaced in lengthwise direction and skewed (+60°,- 90°). The intermediates get fastened onto table by means of fixture (M).
L – The ruler of tenoning table is displacable at the holder in lengthwise direction, has extensible back end and bears the hinged backstops.

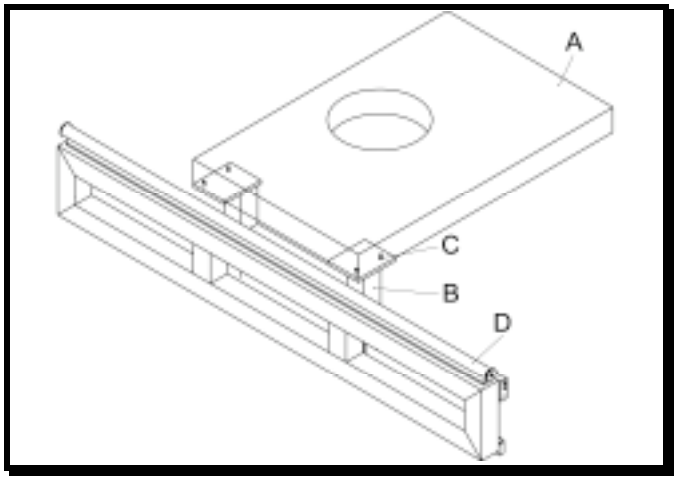


9.6.1 Tenoning case

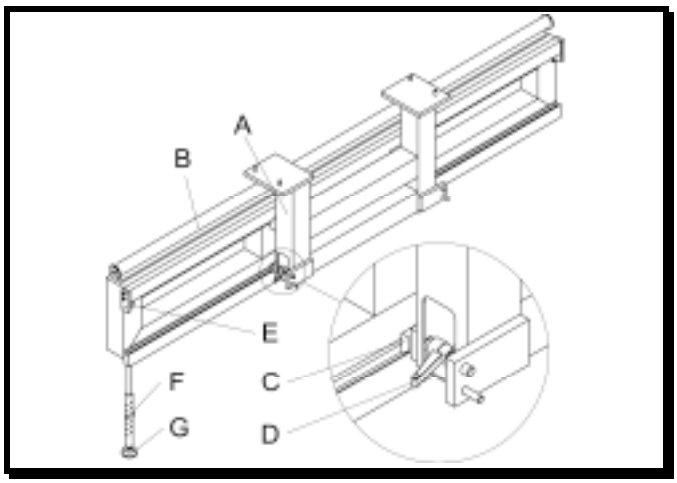
for tool of diameter max. 350 mm, and min. 80 mm

A – basic part of tenoning case is equipped with an exhausting air intake (C) for a hose of diameter 120 mm
B – Hand screws for fastening of tenoning case to the moulder table. The case is, by help of slots, adjustable according to small diameter of used tool.
E – The shut of tenoning case, after release of screws (D), is adjustable according to big diameter of used tool.
G – The front cover of tenoning case, after release of screws (F), is adjustable vertically according to height of used tool.
H – swinging shut of tenoning case swings freely by way through of worked piece by help of cyclic slots.

9.6.2 Parallelity adjusting of tenoning table travel with the moulder table



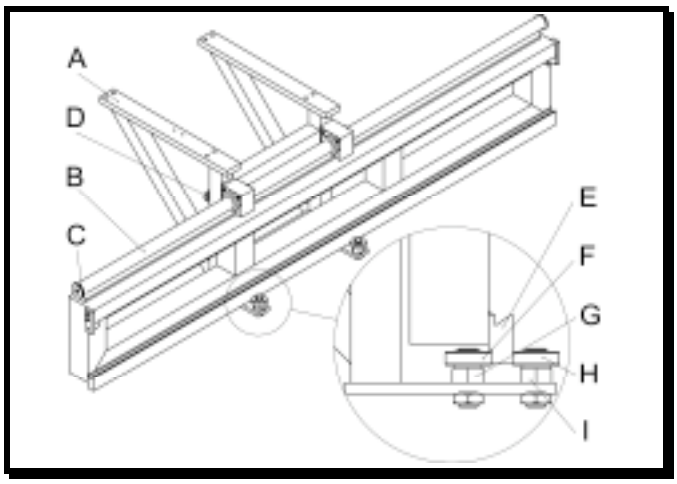
The brace(B) bears the beam with the travel rod(D). The brace is fastened at the moulder table(A) with screws(C). The rod(D) position related to moulder table(A) is changed by underlaying of fixing bases of the brace(B).



9.6.3 Adjusting of tenoning device beam

The brace(A) bears the beam(B) of tenoning device. The beam can move (in dovetail slide with backplates(C)) according to extent of worked piece.
The backplates(C) have an adjustable give by help of screws with self-locking nut. Locking lever(D) is used instead of one screw. The beam(B) can be arrested in set position with the lever.
Outer positions of the beam(B) are fitted with rubber backstops(E).
A suspensory foot(F) with a seating shoe(G) is screwed on the front part of the beam(B) for improving of stability.

9.6.4 Adjusting of tenoning device glider



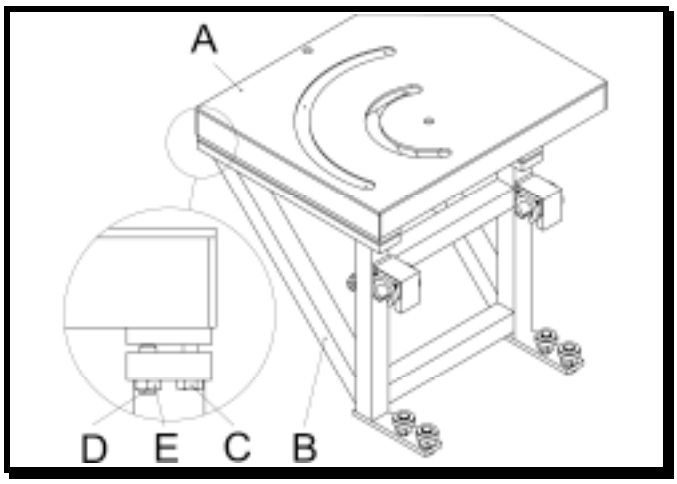
9.6.4.1 Arresting of glider
The glider(A) moves along the bar(B) of beam on ball bushings and in low part on ball bearings(F,H). The end-positions are fitted with rubber backstops(C). Moving of glider can be arrested with the hand screw(D).

9.6.4.2 Lengthwise parallelity adjusting of tenoning table with machine table

Radial bearings(F) of glider are fixed on eccentric journals(G) of bearings. After release of eccenter nuts, the journals can turn and herewith change the position of tenoning table in lengthwise direction.

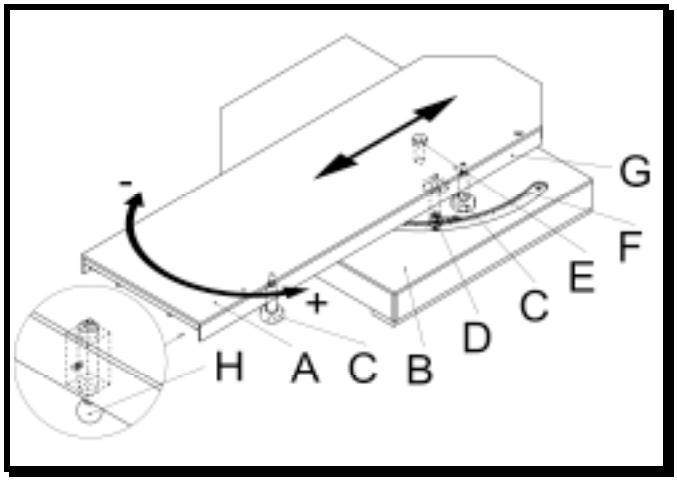
9.6.4.3 Give adjusting of lower leading
The give of the lower leading is adjustable by help of eccentric journals(I) with bearings(H).

9.6.5 Adjusting of lower table of tenoning device
Cross-parallelity adjusting of tenoning table with machine table



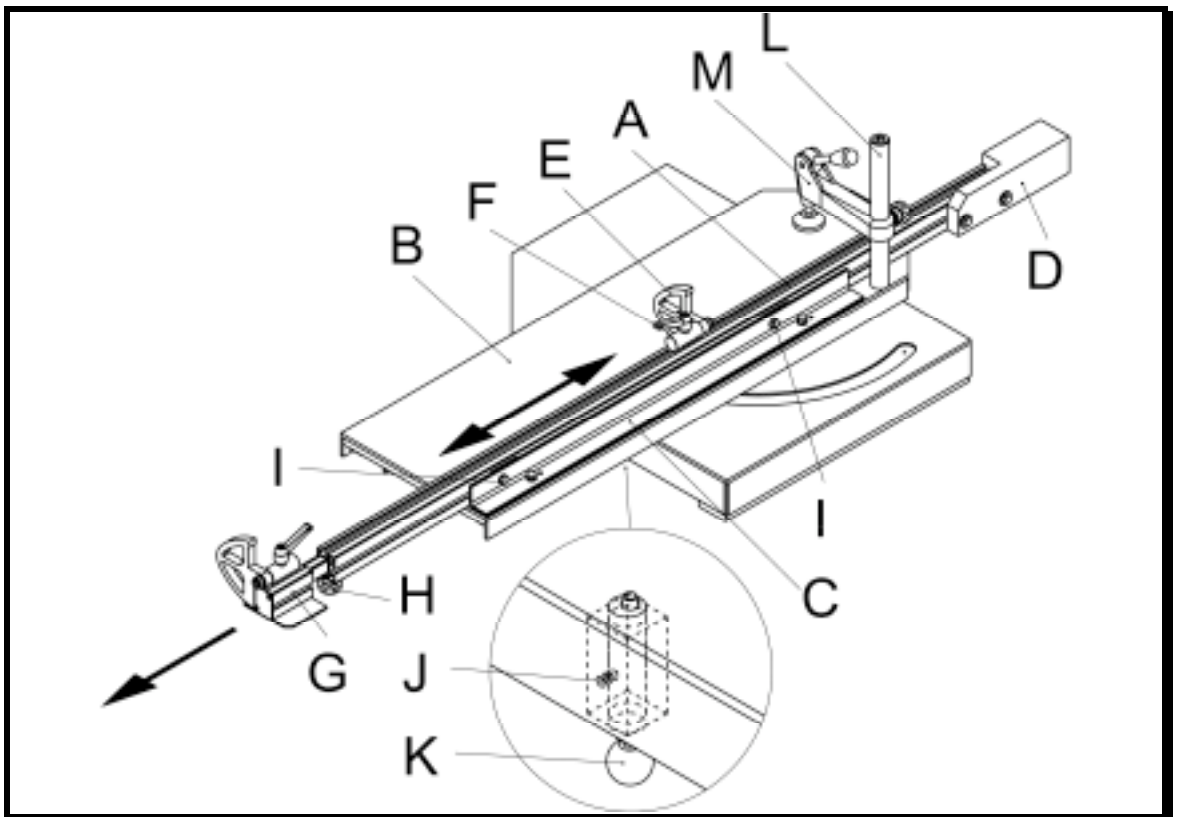
Lower table(A) is fixed to glider(B) with screws(C).The cross-parallelity of tenoning table with moulder table is adjustable by help of pressing-off screws(D) with fixing nuts(E).

9.6.6 Adjusting of tenoning table



The tenoning table(A) is connected with the lower table(B) by means of reversible interboard. The tenoning table moves across the the inter-board in a dove tail slide. After release of hand screws(C), the tenoning table can be moved how it is indicated by the both direction arrow. After release of arresting lever(D) and release of zero position backstop by protrusion and indexing of hinge(H), the tenoning table ca be turned in range +60° to -90°. Position of indexing is deducted at a measure(F) according to the edge(G). The measure(F) is fixed in the slot of lower table(B) by help of screws. The measure can be adjusted in range of fixing slots.

9.6.7 Ruler adjusting of tenoning table



9.6.7.1 Tenoning ruler

Tenoning ruler (A) – is fastened to tenoning table(B) by help of holder(C). The holder is fixed to the table with two screws and its position is fixed with round pins. A wooden foot(D) is in the front part(A) of the ruler. The foot serves as a work rest again picking up the material from processed workpiece. Two tiltable backstops(E) are placed at the ruler. The back-stops can slide along the ruler after release of arresting lever(F).The ruler is fitted with an elongation(G) in its back part. The elongation can push pout after release of hand screw(H). All the ruler can slide in lengthwise slot after release of screws(I).

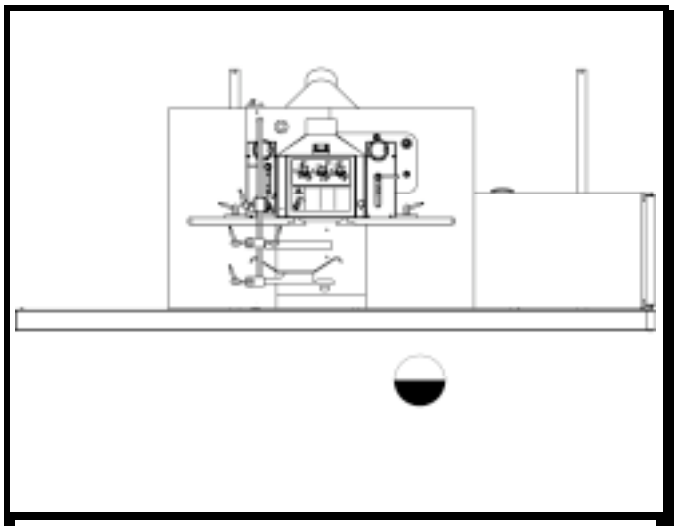
9.6.7.2 Plumb adjusting of tenoning ruler

The plumb of tenoning ruler(A) to axis of tenoning table(B) cross-move influences the steadiness of tenon depth along all processed width of workpiece. The plumb can be adjusted by backstop position change of tenoning table(B) zero position. After release of screw(J), the eccentric bushing of fixing hinge(K) can turn and herewith it is possible to change the position of tenoning table(B). After this manipulation it is always necessary to check adjusting of the measure of tenoning table swinging.

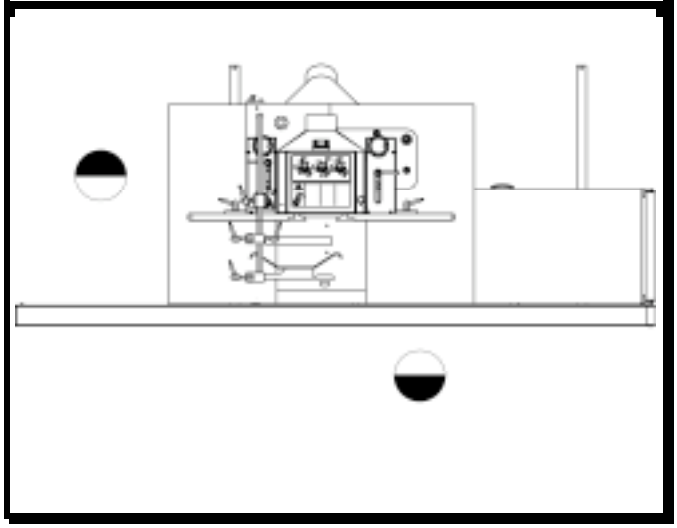
9.6.8 Eccentric fixture

The eccentric fixture(M) is placed at the pole (L). After release of hand screw, it can be vertically displaced according to thickness of processed workpiece, eventually the fixture can be turned and the pressing foot can be placed at the most suitable place according to the width of workpiece.

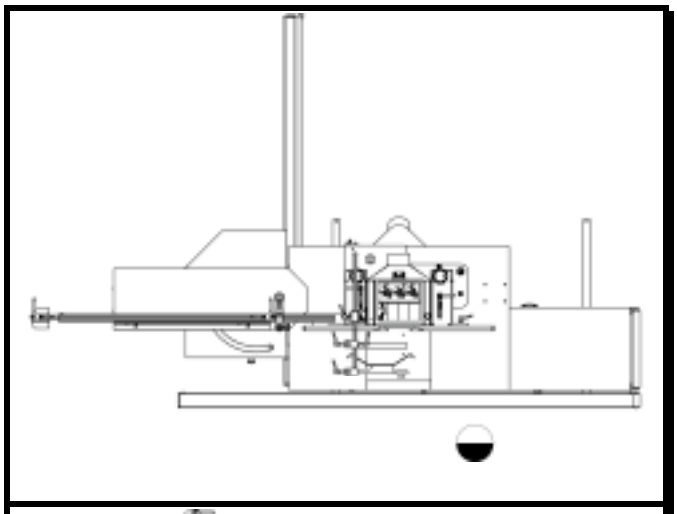
9.7 Working place



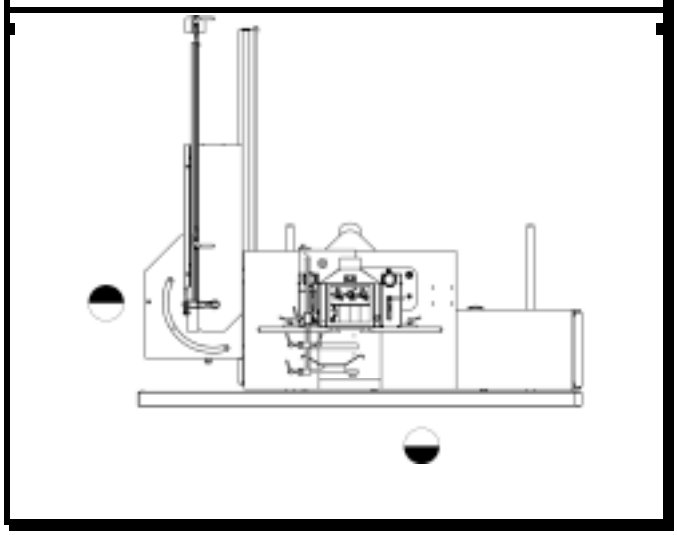
9.7.1 Profiling – machine without tenoning device



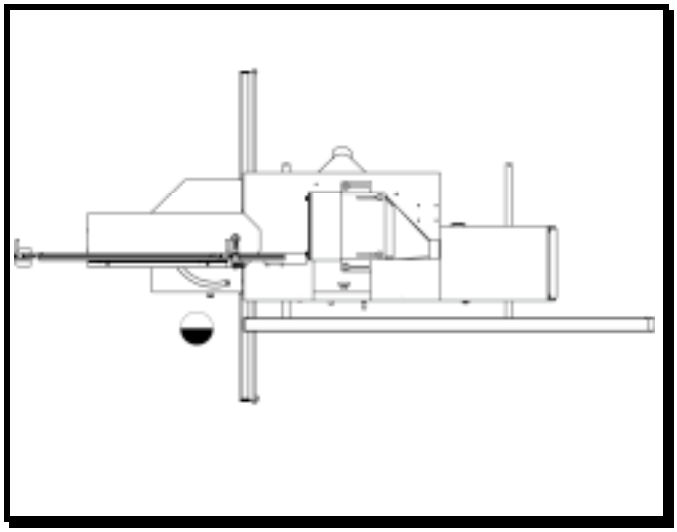
9.7.2 Profiling with assistent taking away operator – machine with teno-ning device



9.7.3 at profiling – machine with tenoning device



**9.7.4 at profiling with assistent tak-
ing away operator – machine with tenoning device**



9.7.5 at tenoning

9.8 Protecting aids

When working on the machine you are obliged to wear short strengthened aipron and safety goggles protecting eyes. It is advisable to use an adequate protection of hearing and recommended working footware. It is forbiden to use working mantles.

9.9 Forbidden manipulations

On the machine, it is forbidden :

- **perform any alteration of the machine safety items without the manufacturer‘s permission**
- **perform any manipulation inconsistent with safety instructions in this hand-book (chap. 3.0)**
- touch the tool or its close surrounding places and other moving parts
- machine any materials other than wood or those based on wood
- machine on the vertical milling machine in a simultaneous manner
- overload the machine while machining large semi-finished products
- remove chips from the place near the tools by hand or with any object while the machine is being operated
- use other tools than those delivered or recommended by the machine manufacturer.
-

10.0 Tools

10.1 Recommended tools

Moulding tools must be designated with name or logo of producer and maximal allowed rotating speed.
The tool must not be of diameter bigger than 250 mm for profiling and bigger than 350 mm for tenoning !

10.2 Exchange of moulding tools

Use only moulding tools, intended for hand feeding, safely clampable. Before clamping a tool check up whether spacing collars are clean and entire ! Attend to proper tightening of the nut, that draws together (over closing ring) spacing collars and tool on the moulding spindle(chp.9.1, 9.2)!

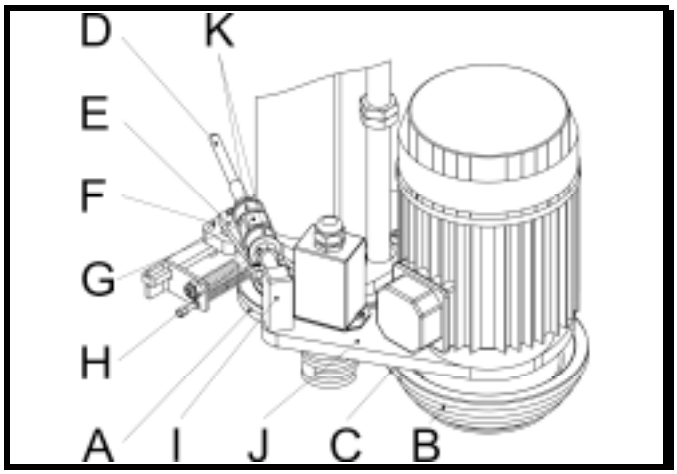
According to moulding tool – do up surroundings of tool
- table insert
- cross and lateral side adjusting of rulers

Before starting of machine with released brakes(chp.8.6.4)
- the tool must rotate freely. No obstacles can be in its way (table inserts, sliding table insert, rulers not even at maximum set chip removal and the like).
Choose and set appropriate tool rotating speed and set its indication (chp. 9.3) !

11.0 Maintenance

Before starting maintenance or repair work always disconnect the machine from the mains ! Switch off and lock the main switch.

11.1 Tightening of moulder V-belt



Mechanism of V-belt tightening is accessible after opening of moulder front door. V-belt(C) is stretched between the spindle(A) and motor belt pulley(B). Its release and retightening (e.g. when changing the transmission ratio – chp. 9.3) is done by changing of lever(D) position. The lever is turningly an-chored in its middle on the arm(E) of belt tensioner. The arm is turnably anchored to the milling spindle head(F). The arm is also anchored with its right end to motor holder(J) by help of turnable cube(I).
As far as during tightening of belt by pressing off the stretching lever(D) to working position (from position of operator from himself) the belt does not get enough tightened, it is necessary to increase the distance between cubes(G) and (I) by help of adjusting nuts(H), so as the rubber blocks(K) remain slightly pressed.

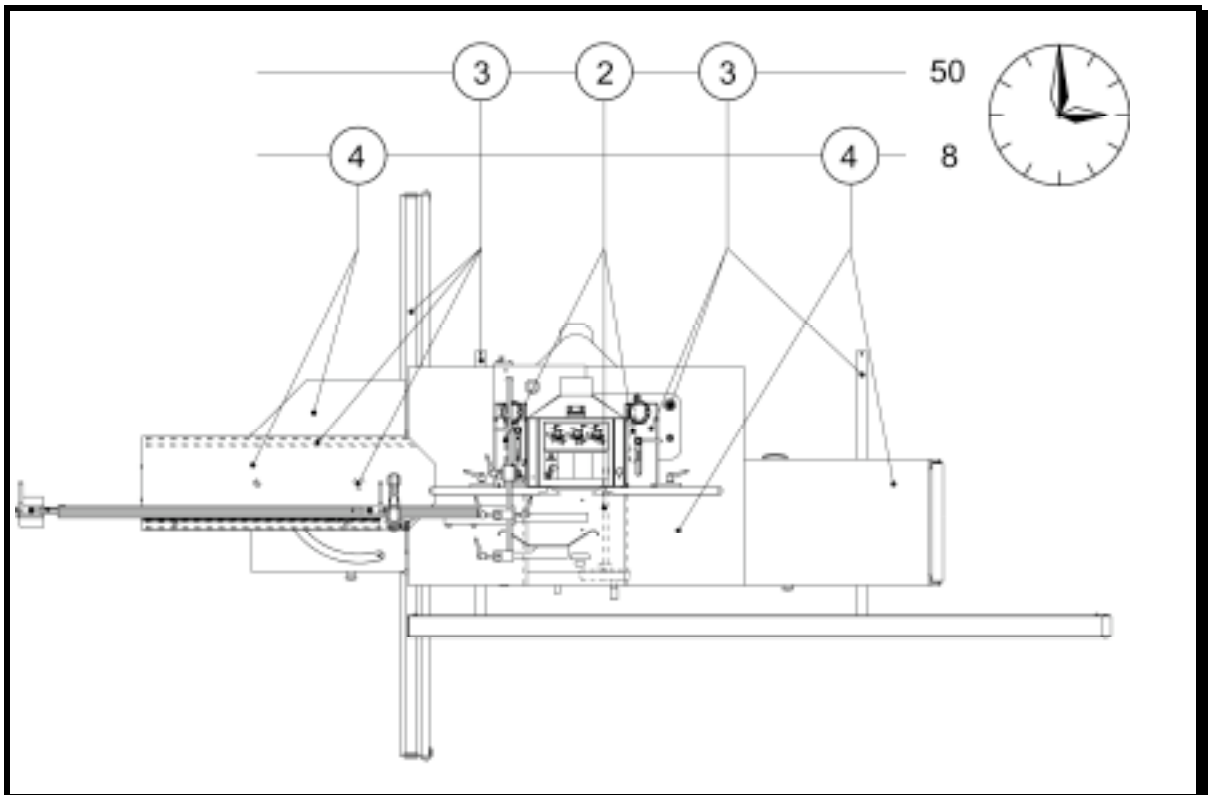
In regard of power transmitted by the V-belt we recommend so as at a proper strain the belt sags c. 5mm when pressed by force 30 N (c.3 kp) in the middle between belt pulleys.

11.2 Cleaning and lubricating

The machine should be cleaned and the rods, pins, threads and other parts liable to corrosion should be lubricated with a suitable lubricant. The interval for such activities will depend on the manner of work and processed material.
The bearings of the electric motors and of milling spindle have permanent grease filling, are closed on both sides and do not require any lubrication.
Clean the tables from resin with a suitable solvent.
Avoid contamination of belts with oil or grease. If this occurs, clean the belt with paper only or dry it.
Removing the dust is best to be done with a vacuum cleaner. Perform this activity regularly, at least once a week. Do not forget the inside of machine frame !

Lubricated points/ periods survey

	Spindles and roll bearings of front table lengthening	Travers screws	Roll bedding of spindle,pilots of tilting and turning,dovetail slides,other movable bearings	Table plates	Spindles and flanges (distance rings)
Lubricating point Necessary act	1 (hour)	2 (hours)	3 (h.)	4 (h.)	5 (h.)
Permanent grease filling	at a change				
to spread		50			
lubricate by oil can			50	8	without tools/ out of machine run
Plastic lubricant or oil	LV-2-3	LV-2-3	OL-B5	OL-B5	OL-B5
equivalent	ISO-L-XCBEA 3		ISO – LAN 68		



11.3 Faults remedy

No faults should occur while the machine is used correctly and maintained duly. If any saw dust becomes stuck on the milling tools, or if the exhausting hose is blocked with saw dust, the machine should be switched off before remedy, otherwise it might become damaged !
If a workpiece becomes jammed, turn off the machine immediately !
A blunt milling tool often causes that the electric motor becomes heated excessively and its power output decreases.
If the machine vibrates excessively, check its setting and anchoring, possibly also clamping and balancing of used tools.

The machine does not work:

It will be necessary to check the electrical wiring and connection

of the machine to the mains.

The machine output is low:

Tools are not sharp.

Too big chip removal – the width and hardness of workpiece should be regarded.

The V-belt is not tightened enough.

The motor does not work on full power output – an expert should help.

The machine vibrates:

Tools not sharpened or adjusted properly.

The tool is not balanced.

The machine is not standing on a flat ground, is not anchored properly.

Recess on the rear part of the machined workpiece:

Uneven lower guiding surface of the part being milled.

Incorrectly adjusted guide rulers in relation to the tool.

Incorrectly pressed or guided material during the milling operation.

12.0 Delivery extent

complete machine
accessories listed (below)
service instructions manual
special accessories (if ordered).

12.1 Accessories

name		ks	note
wrench 13x16		1	
wrench 18x24		1	
wrench 50 (41; 60)		1	acc.to spindle diam.40 (30;50)
wrench 3			
wrench wrench wrench 4		1	
wrench 5		1	
wrench 6		1	
wrench 10		1	
Balancing washer		4	for balancing the machine
Cartoon box	200 x 400 x 160	1	for added packing
Bag on zip	250 x 350 mm	2	

13.0 Special accessories

- case for moulding of bends Koala 2000
- pusher.

14.0 Spare parts

While ordering spare parts, always specify the serial number of the machine (from the manufacturing plate), machine type and year of manufacture. If these instructions include an appendix with the given spare parts, it is advisable to specify numbers and names of the required spare parts according to this appendix.

15.0 Guarantee

Work and activities not specified herein require a consent in writing granted by the ROJEK Co., Masarykova 16, _R, 517 50 _astolovice. The warranty certificate is attached to each machine and its accessories. The warranty certificate should be filled in upon purchasing the machine so that you may lodge warranty claims, and also in the interest of the product safety. Should the machine fail to be installed safely or should any manipulation not allowed be performed with it, damage or injury may occur for which we do not assume any liability in such case. Should you lodge any guarantee complaint, contact the manufacturer directly.
After the warranty period has expired, you are allowed to have the machine repaired by any specialized firm.

16.0 Dealing with packing and service life expiry

16.1 Dealing with packing

Our products are transported in packing fron cartoon or PE folio. Producers of these packings issued a legal declaration about their product. They concluded a contract about filling duties of taking back and usage of the vaste from packings with an authorized company. One of duties of these companies is also to inform the clients how taking it back is assured.

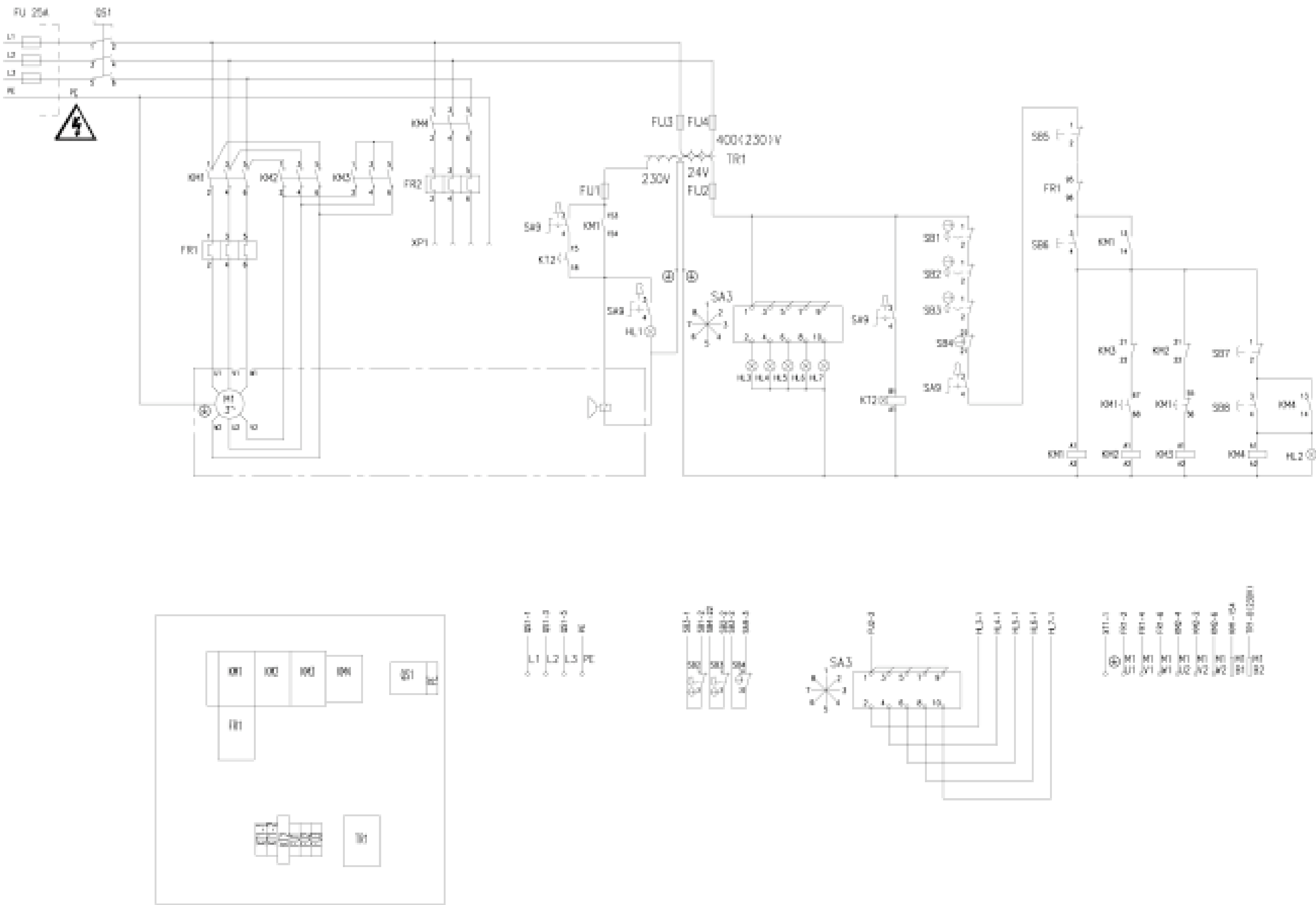
16.2 Dealing with machine

The service life of the machine essentially depends on the manner of using and on the intensity of working performance. The frequency and kind of maintenance performed also has a role that cannot be neglected. 10 years is the period for which, in accordance with the law, the machine manufacturer is responsible for any damage, caused to the customer, in a demonstrable manner by the machine.

After the service life of the machine has expired, the owner‘s duty is to ensure that the machine is liquidated in an environment-friendly manner so that the Act on Waste Materials is complied with and the environment is not endangered.

While the machine is being liquidated, the following procedure should be used:

1) Remove all plastic parts and put them in the respective waste containers.
2) Divide the remaining metals parts into two groups with ferrous and non-ferrous metals and have them liquidated by a respective specialized firm.



FU 25A
QS1
L1
L2
L3
PE
KM1
KM2
KM3
KM4
FR1
FR2
XP1
M1
3~
FU3
FU4
400/230V
TR1
230V
24V
FU1
FU2
SA9
KT2
HL1
SA3
HL3
HL4
HL5
HL6
HL7
SB1
SB2
SB3
SB4
SB5
SB6
SB7
SB8
HL2
QS1
TR1

List of electrotechnical parts

marking	function	type, technical data	5,5 kW pcs.		supplier	substitute	note
M1	saw drive	CEG M112MB-2/FPC 5,5kW 3x400/690V 12,2/7,1A 50,60Hz 2900 /min IM B14	1		CEG Italy		for voltage 3 x 400 V
		CEG M112MB-2/FPC 5,5kW 3x230/400V 21,2/12,3A 50,60Hz 2900 /min IM B14	1				for voltage 3 x 230 V
	distributor	accord. to machine variant	1		BaK Systémy		
W1-10	control circuits	H05VV-K1X1				CYSY 2A x 1mm^2	
W11-20 W31-40	power circuits	H05VV-K3G2,5				CYSY 3Bx2,5mm^2	
		H05VV-K4G2,5				CYSY 4Bx2,5mm^2	
		H05VV-K4G1,5				CYSY 4Bx1,5mm^2	
		H05VV-K5G1,5				CYSY 4Bx1,5mm^2	
		H05VV-K7G1,5				CYSY 5Bx1,5mm^2	
W21-30	protection circuits	H05V-K1G1,5				CYA 2,5 mm^2	
XT1	terminal	terminal box	1	1	GEWISS		

No

Note : The producer reserves himself the right for changing of parts(s) as well as of supplier(s).