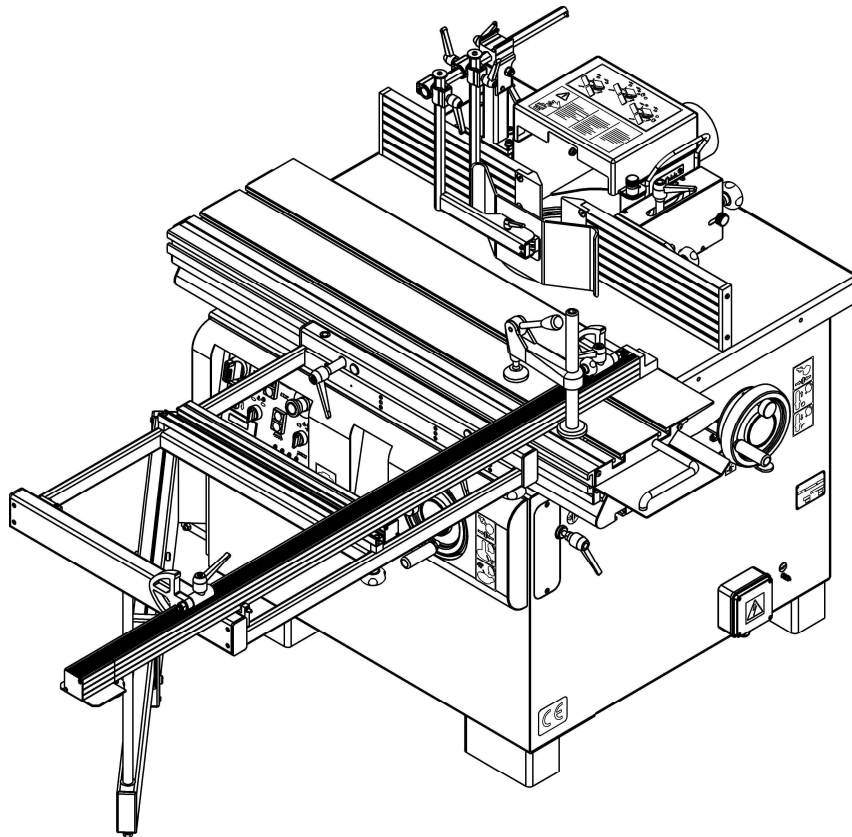


SINGLE-SPINDLE MILLING MACHINE
WITH A TILTING SPINDLE AND SLIDING TABLE
FSN 550A



Service instructions handbook

original translation

updated 3 / 2017

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Foreword

These instructions have been created by the device manufacturer and are an integral part of the machine delivery. They contain basic information for qualified operating staff and describe the environment and manners of the machine use for which it has been designed, and also contain any information necessary for the correct and safe operation.

The machine is equipped with various safety devices protecting both the operator and the machine for its common technological use. Nevertheless these measures cannot cover all safety aspects and therefore it is necessary that the operator should read and understand these instructions before starting to use the machine. Errors made in the course of installation as well as during operation itself will thus be avoided.

Do not try therefore to put the machine into operation before you have read all instructions for use supplied together with the machine and before you have understood all its functions and working procedures.

Certain information or drawings may not be intended directly for the machine purchased by you as these instructions contain any information for various variants of this type made by our company. By comparing the respective part of the instructions with a particular machine you will find out whether or not they correspond to each other.

The manufacturer reserves the right to make partial alterations within continuous technical machine development.

For emphasis of important passages in the basic text the bold characters and marking with a certain of the following symbols have been used:



The appeal recommending to use the procedure according to the following regulation exclusively. A failure to observe this regulation may result in death or serious injuries of the operating staff.



A warning against improper working procedures or use of the machine that may cause a danger to human health, machine functioning, the environment or economic losses.



Caution is an appeal to take due care while the following activities are being performed. Any failure to comply with this appeal may cause small injuries or damage to the machine.

Follow the instructions shown on the plates with which the machine is equipped. Do not remove or damage such plates. In the case of any damage caused to the plate contact the manufacture and renew the plate.

Note

The text and picture part of the instructions is an intellectual property of the ROJEK Co. and will remain in the company's ownership. No part of the instructions may be copied or reproduced without a prior consent nor any third persons are allowed to become acquainted with these instructions or with any part thereof.

1. Use of the machine

1.1 Purpose of the machine

The machine enables semifinished products made of wood or materials based on wood to be milled with a vertical spindle.

The machine is designed for operation performed by one worker only.

The machine may not be handled by children and youngsters in any manner.

1.2 Workers' qualifications


Only and expert skilled in the field of wood-machining or a worker instructed and trained by such expert may operate the machine, regardless of the sex. While working on the machine the operator must get familiar with these instructions and comply with any safety rules, regulations and provisions in force in the respective country.

1.3 Working environment

The machine must be operated in a workshop environment the temperature of which does not exceed +40° and does not drop below +5°. The relative humidity of air from 30% to 95% - non-condensing. The height above the sea level up to 1000 m. The environment classification – danger of inflammable dust fire (BE2N2).

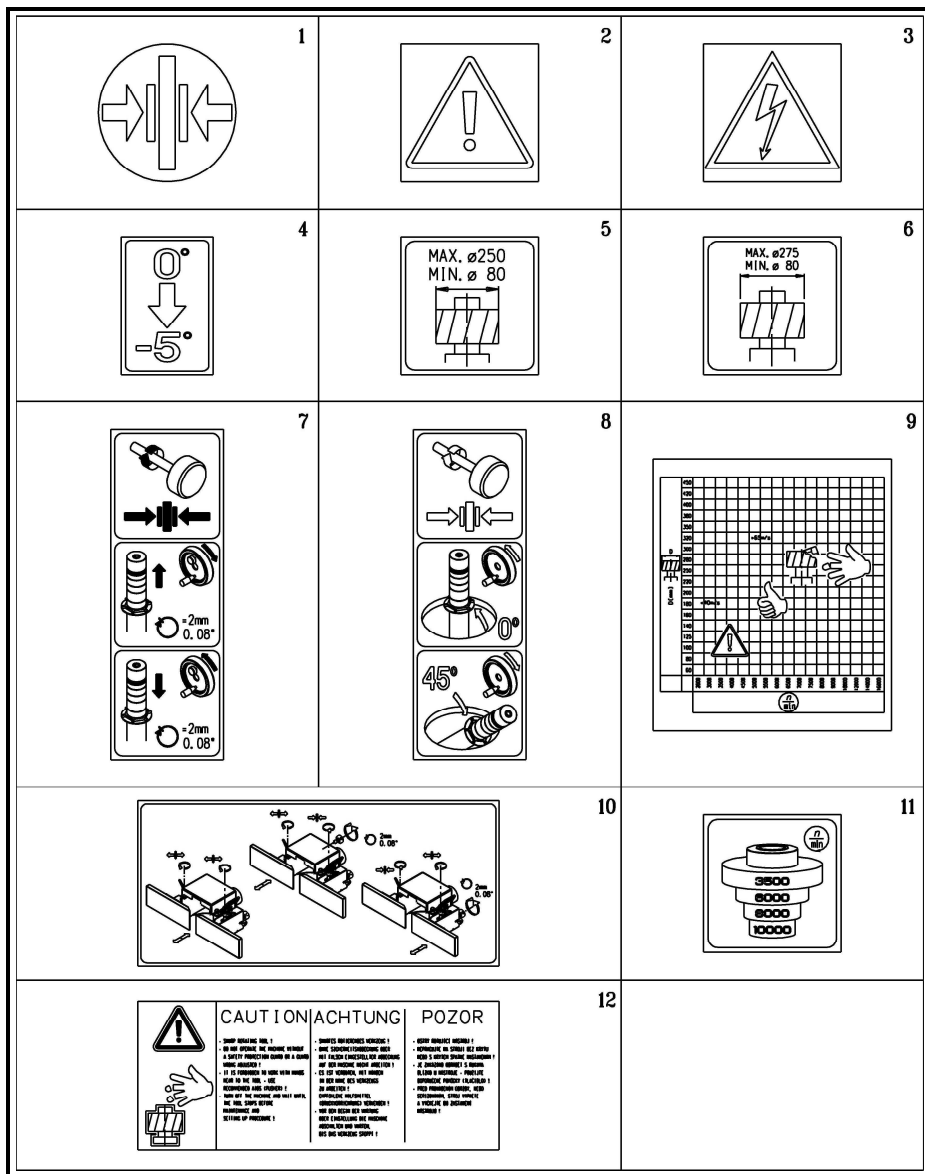
2. Machine marking

The type of the machine may be identified according to the manufacturing plate fixed to the machine stand.

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KMITOČET FREQUENCY FREQUENZ	<input type="text"/>	PROUD CURRENT STROM	<input type="text"/>	

FSN 550A vertical spindle milling machine with tilting spindle and sliding table CV

Information plates as well as plates warning about a danger are placed on the machine.



- | | |
|--|--------------------------------------|
| 1. Tightening | 2. attention ! warning ! |
| 3. attention - electric component | 4. Stop of spindle vertical position |
| 5. proper profiling cutters | 6. proper cutters for tenon jointing |
| 7. vertical adjusting of spindle | 8. spindle tilting |
| 9. range of optimal spindle rotation speed | 10. board rules setup |
| 11. setting of spindle rotation speed | 12. caution ! alert ! |

3. Technical specifications

FS 550A milling machine		
motor power	kW	4; 5,5
motoru rotation speed	/min	2 900 (3 480 at 60 Hz)
spindle diameter	mm	30 (35_40_50)
spindle rotation speed	/min	3 500_6 000_8 000_10 000 (3 500_6 000_8 000_12 500)
spindle lift	mm	142
- above table	mm	1
- under table	mm	141
clamping spindle part length	mm	140 for Ø 30 140 for Ø 35 180 for Ø 40 220 for Ø 50
spindle tilt		-5° ÷ +45°
max. table bore Ø diameter	mm	260
table dimensions	mm	1 000 x 520
table height	mm	897
table dimensions		
length (at CV 360 - 1 200 mm)	mm	1 360
length (at CV 360 - 2 000 mm)	mm	2 160
width	mm	1 050
width with supporting frame of CV 360	mm	2 220
max. machine height	mm	1 320
lower exhausting nozzle diameter Ø	mm	80
Profiling		
Max./ min. tool diameter Ø	mm	250 / 80
guide board rules length in front of/ beyond tool	mm	460
guide board rules height	mm	151
exhausting nozzle diameter Ø of profiling guard	mm	120
Tenoning		
Max./ min. tool diameter Ø	mm	275 / 80
Max. tool diameter Ø under table	mm	250
exhausting nozzle diameter Ø of tenoning guard	mm	120
sliding table CV 360		
table dimensions	mm	360 x 1 200 (2 000)
travel length	mm	1 500 (2 300)
supporting frame dimensions	mm	870 x 630
other parameters		
voltage/ frequency		3x400 V (3x230V) / 50(60) Hz
safeguarding	A	25
weight brutto	kg	410
weight netto	kg	405

* el. motor with power output equal to 3.7 kW only for voltage 3 x 400 V / 50 (60) Hz

3.1 Possible machine variants

Milling machine

motoru power	- 4 kW - 5,5 kW
operation voltage	- 3 x 400V±10%; 50/60 Hz; (UL) - 3 x 230V±10%; 50/60 Hz; (UL)
spindle diameter	- 30 mm (with clamping length 140 mm) - 40 mm (with clamping length 180 mm) - 50 mm (with clamping length 220 mm)
spindle rotating speed	- 3 500, 6 000, 8 000, 10 000 /min - 3 500, 6 000, 8 000, 12 500 /min. by belt position change on multiplied belt pulleys
front / rear table length extension	- YES - NO
supporting frame roll	- ANO - NO
spindle height change-over Indication of spindle height change-over	- by hand wheel - wheel with indicator - displaying unit
spindle rotation reversal	- YES - NO
control panel location	- lower

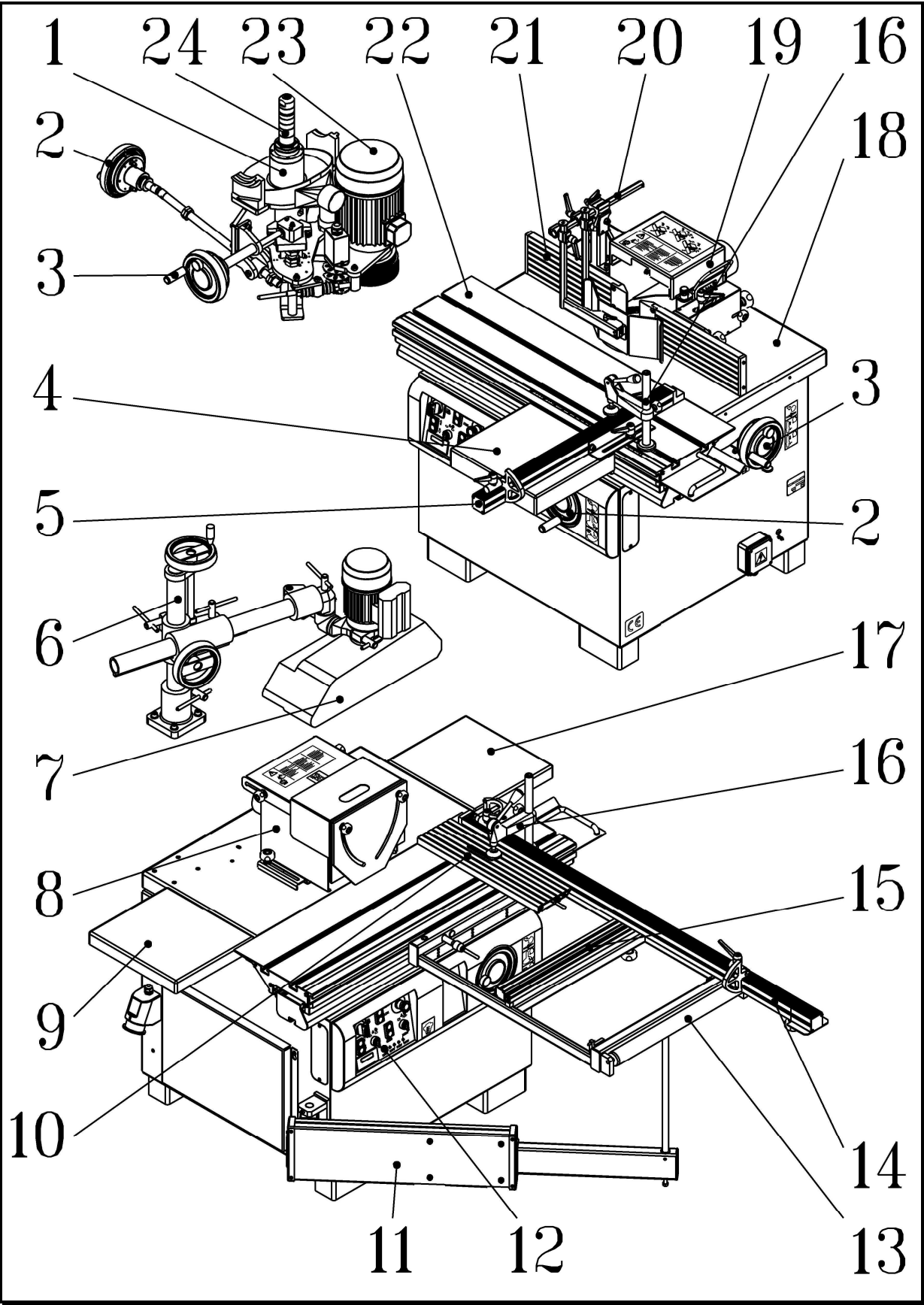
Profiling

guide boards	- YES - NO - wood - Al alloy
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Tenoning

sliding table CV360	- YES - NO - L = 1 200 mm - L = 2 000 mm
supporting frame of CV360	- YES - NO
eccentric fixture	- YES
undercarriage	- YES - NO

3.2 Machine description



- 1 – Head stock
- 2 – spindle tilt hand wheel
- 3 – spindle height hand wheel
- 4 – supporting table
- 5 – angular rule
- 6 – lifter pole
- 7 – lifter
- 8 – tenoning guard
- 9 – rear table length extention
- 10 – instrument for short pieces tenoning
- 11 – supporting frame
- 12 – lower controlling panel
- 13 – supporting frame roll
- 14 – cross rule
- 15 – supporting frame
- 16 – eccentric fixture
- 17 – frontal table length extention
- 18 – milling table
- 19 – profiling guard
- 20 – down pressing instruments for profiling
- 21 – guide rules of profiling guard
- 22 – tenoning sliding table
- 23 – spindle drive motor
- 24 – spindle with spacer rings and clamping nut.

3.3 Values of chips removed, feed and power output

power [kW]	feeding speed [m/min]	machined width [mm]	chip removal [mm]	crossection removed [mm ²]
3	5	130	7	910
4	5	130	8	1 040
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). The values in the table may roughly be used for both planing and thicknessing as well as for milling with a vertical spindle. 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 with a low thickness is being machined, a worse quality of machining must be taken into account due to the part springing.

3.4 Specifications concerning noise of the device (EN 1870-18 / 2013)

		FSN 550A
Level of noise A in the place of operation (L_pA_{eq})	without technology	$L_pA_{eq} = 70.4 \text{ dB(A)}$
	with technology	$L_pA_{eq} = 83.0 \text{ dB(A)}$
Level of acoustic output A (L_{WA}) EN ISO 3746:1995 K = 4 dB	without technology	$L_{WA} = 78.6 \text{ dB(A)}$
	with technology	$L_{WA} = 88.5 \text{ dB(A)}$

The values given are those of emissions and do not necessarily mean any safe working values. Although there is a correlation between the value of emissions and the levels of exposure, these values cannot be used for reliable determination whether or not additional measures are necessary. The factors influencing actual levels of workers' exposure include the properties of the working area, other sources of noise etc., e.g. the number of machines and the other neighbouring procedures. Also the highest permissible levels of exposure may vary in different countries. This information should help the machine user to evaluate the risk and the risk rate in a better manner.

3.4 List of used source documents

Directive **2006/42/EU** stating technical demand on machinery.

Directive **2014/30/EU** about assessing products conformity from view point of electromagnetic compatibility when delivered on market

Directive **2014/35/EU** about assessing conformity of electric devices intended for use under specific limit voltages when delivered on market

EN ISO 12100 : 2011 (EN ISO 12100 : 2010)

Machinery safety - General fundamentals for designing - Risk assessing and reducing

EN ISO 13857 : 2008 (EN ISO 13857 : 2008)

Machinery safety - Safe distances to avoid dangerous places reaching by hands/arms ~ feet/legs

EN 349+A1 : 2008 (EN 349 : 1993 + A1 : 2008)

Machinery safety - the smallest gaps to avoid human parts being pressed

EN ISO 13850 : 2016 (EN ISO 13850 : 2015)

Machinery safety - Emergency stopping - Fundamentals for designing

EN ISO 14120 : 2016 (ISO 14120 : 2015) Machinery safety - Guards - General fundamentals for designing and production of fixed and movable guards

EN ISO 13849-1: 2016 (EN ISO 13849-1 : 2015)

Machinery safety - Safety parts of controlling systems - Part 1: General fundamentals for designing

EN 848-1+A2 : 2013 (EN 848-1 : 2007 + A2 : 2012) Woodworking machinery safety - One-sided shapers with rotating tool - Part 1: One-spindle vertical shapers

EN 1037+A1 : 2008 (EN 1037 : 1995 + A1 : 2008) Machinery safety - avoiding an unwished start

EN ISO 14119 : 2014 (EN ISO 14119 : 2013)

Machinery safety. Blocking devices connected with guards. Fundamentals for designing +choice.

EN 55011 ed.3 : 2010 (EN 55011:2009) Industrial, scientific and medical equipments - Characteristics of high frequency interference - Measuring limits and methods

EN 60204-1 ed. 2 : 2007 (EN 60204-1 : 2006)

Machinery safety - Electric equipment of machines - Part 1: General fundametals

EN 60073 ed.2 : 2003 (EN 60073 : 2002)

Basic and safety fundamentals for interface man-machine, for marking and identification - informers and controlers coding fundamentals

EN 80416-1 ed.2 : 2009 (EN 80416-1 : 2009)

Basic rules for signs for using on objects - Part 1: Making of graphical signs for registration

EN 80416-2 : 2002 (EN 80416-2 : 2001)

Basic rules for graphical signs to be used on objects - Part 2: Arrows form and using.

4. Safety instructions

4.1 General

This machine is equipped with various safety devices protecting both the operator and the machine. Nevertheless, this cannot cover all safety aspects and therefore the operator, before putting the machine into operation, must read this chapter and understand it fully. Furthermore the operator must also take into account other aspects of danger relating to the surrounding conditions and material.



This handbook comprises 3 safety instructions categories. The appeal recommending to use the procedure according to the following regulation exclusively. A failure to observe this regulation may result in a death or serious injuries of the operating staff.



A warning against improper working procedures or use of the machine that may cause a danger to human health, machine functioning, the environment or economic losses.



Caution is an appeal to take due care while the following activities are being performed. Any failure to comply with this warning may cause small injuries or damage to the machine.

Follow the instructions on plates with which the machine is equipped. Do not remove or damage such plates. In the case of any damage caused to a plate contact the manufacturer and renew the plate.

4.2 Basic safety requirements



Do not touch, under any circumstances, the low-voltage devices on the electric control panel, transformers, motors and terminal blocks which are equipped with a plate.

- Before connecting the machine to the mains make sure that all safety items are in their active positions and check their functioning. If it is necessary to remove the doors or protective covers, switch off the main switch and lock it or disconnect the machine by pulling the plug out.



Do not connect the machine to the mains while the door or protective cover is removed.

In order to avoid improper operation get acquainted with location of switches before switching the machine on.

Remember the position (location) of the emergency stop

switch so that you can use it promptly at any time.

- Be careful and do not touch any switches incidentally while the machine is being operated.
- Do not touch any rotating tool with naked hands or with any other object under any circumstances.
- In the case that you are not going to work on the machine, turn off the machine by the switch on the control panel and disconnect the power supply from the machine.
- Before cleaning the machine, switch off and lock the main switch or disconnect the machine by pulling the plug out.
- Before doing any maintenance work inside the machine switch off and lock the main switch or disconnect the machine by pulling the plug out.
- If the machine is used by more workers, do not proceed to other work without informing the other worker about what procedure you want to use.

- Do not alter the machine in any manner which might cause any risk to its safe operation.
- If you have any doubts on correctness of your procedure, contact a responsible person.



- Do not neglect performance of regular inspections in accordance with the instructions for use.
- Check and make sure that no disturbances occur on the machine caused by the user.
- After the work is finished, adjust the machine so that it is ready for another series of operations.
- Should a failure in power supply occur, switch off the main switch immediately or disconnect the machine by pulling the plug out.
- Do not paint, make dirty, cause any damage to, alter or remove safety plates. If they become illegible or lost, contact the manufacturing plant and renew the plates.

4.3 Clothes and personal safety



- Experience shows that injuries are caused by various personal articles, e.g. rings, watches, bracelets etc. Therefore take them off before starting the work, button the sleeves, take off a tie, which may be caught with various parts of the working machine. Pin your hair together so that it does not flutter freely and wear suitable shoes recommended or prescribed by labour-safety regulations of all countries.
- Wear safety outfit (goggles, apron, safety shoes etc.).
- In the case of any obstacles above your head – in the working area - wear a helmet.
- Always wear a protective mask while machining any material that produces dust while being machined.
- Never wear any loose working clothes.
- Do not work on the machine under influence of drugs or alcohol.
- If suffering from dizziness, weakness or faintness, do not work on the machine.

4.4 Safety regulations for machine operator



- Do not put the machine into operation before you get acquainted with the contents of the instructions for use.
- Make sure that electric cables are not damaged so that injuries caused by electric current leaking (electric shocks) are avoided.
- Check regularly that safety covers are mounted properly and that they are not damaged. Repair damaged covers immediately or replace with other ones.
- Do not put the machine with the cover removed into operation.
- Never use any tools that are distorted or broken.
- Always use the tool suitable the work given, which corresponds to the machine specifications.
- Replace blunt tools as soon as possible as blunt tools are often a cause of injuries or damage.
- Never use the tools at speeds higher than those recommended by the respective manufacturer.
- Do not remove or interfere otherwise in safety devices such as covers, end switches, and do not block them mutually.
- While handling parts above your possibilities, ask for assistance.
- It is recommended not to work on the machine during a storm.

4.5 Safety regulations for maintenance

Do not do any maintenance work before you get acquainted with the instructions for maintenance thoroughly.



- Before you start to perform any maintenance work, always turn off the main switch and lock it, or disconnect the machine by pulling the plug out. A possibility of accidental putting the machine into operation by another person is thus avoided.



- Any maintenance work on electric parts of the equipment may be done by a qualified person only.
- Even if the machine is stopped, the power supply is not disconnected. Always switch off the main switch and lock it or disconnect the machine by pulling its plug out.
- Do not clean the machine or its peripheral devices even if the machine is completely out of operation, unless the main switch is switched off and locked or the plug is pulled out from the mains socket.
- Keep your fingers in a distance from belts and belt pulleys.
- While replacing electrical parts of the equipment, switch off the main switch, lock it or disconnect the machine by pulling the plug out. Faulty parts should be replaced only with products having the same specifications as the original ones.
- Do not remove or alter blocking of limit switches or any other safety devices.
- Do not switch the machine on before all covers removed for the purposes of maintenance are put in their places again.
- Always keep the maintenance area including the working place clean.



- Any maintenance work must be done by a qualified staff in accordance with the instructions issued by the machine manufacturer.
- Read the instruction manual for maintenance men carefully and completely.
- For replacement of parts and necessary things, get in advance those being identical with the original type and complying with standards.
- Use only specified kinds or lubricating oils and grease or those equivalent to them.
- Do not use compressed air to clean the machine or to remove chips.
- Always check the results while a responsible person is present.

4.6 Safety regulations for working place



- Always ensure a sufficient working area and free access to the machine and peripheral devices.
- Put tools and any other obstacles in the place designed for this purpose, in a distance from the machine.
- Ensure sufficient lighting in the working area which will not create shadows or cause the stroboscopic effect. For safe and quality work the hygienic standards specify the minimum intensity 500 lx.
- Never put any tools or any other objects on working tables or covers.

5. Transport and storage

5.1 Transport and storage

While transporting or handling the machine, be most careful and let this activity be done by qualified personnel especially trained for this kind of activity.



While a machine is being loaded or unloaded, make sure that no person or subject gets pressed by the machine ! Do not enter the area under the machine lifted by a crane or a high-lift truck !

During transport or storage the machine must be protected against excessive impacts and humidity.

It should be stored in a shelter at temperatures ranging from -25°C to 55°C.

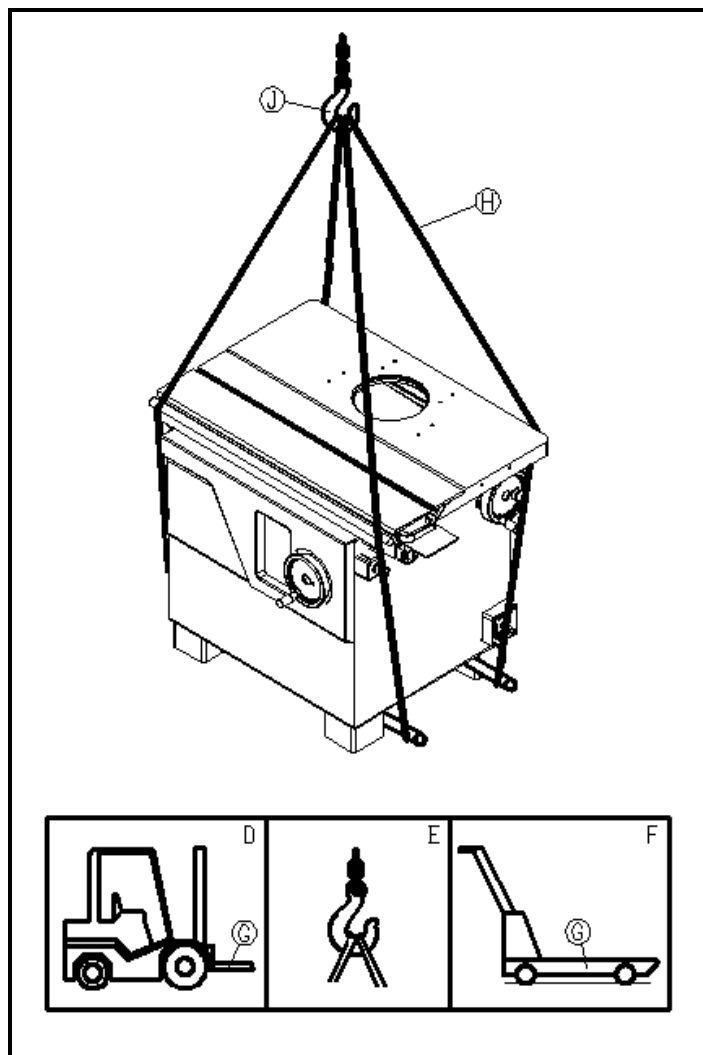
As standard, the machine is wrapped up in a foil and is transported this way. Upon request the machine may also be packed in a wooden box.

5.2 Machine lifting



The machine or its individual parts may only be lifted by means of an approved lifting device with verified lifting capacity. It is recommended to use: D - high-lift truck E - crane or any other lifting device F - manual lifting carriage

Use a high lift with forks of a sufficient length !



Prepare a high-lift truck (D) or a manual lifting trolley (F) with sufficient lifting capacity

- put the forks (G) below the machine.

Should you use a crane (E) or a similar hoisting equipment, proceed as follows:

- prepare four lifting ropes (H) of sufficient lifting capacity or steel ropes joint circles at least 4 m long
- fix the ropes to the hook of the crane with the required capacity
- place the other end of the ropes on the lifting rods according to figure (rods are not part of delivery)
- use rope underlays and spreaders not to damage the machine
- after lifting the machine slightly check the stability of the machine hanging on the ropes, eventually change underlays and spreaders placing under ropes
- lift the machine carefully and slowly and then move it without rapid moving to chosen place.

The weight of FSN 550 A is 410 kg.

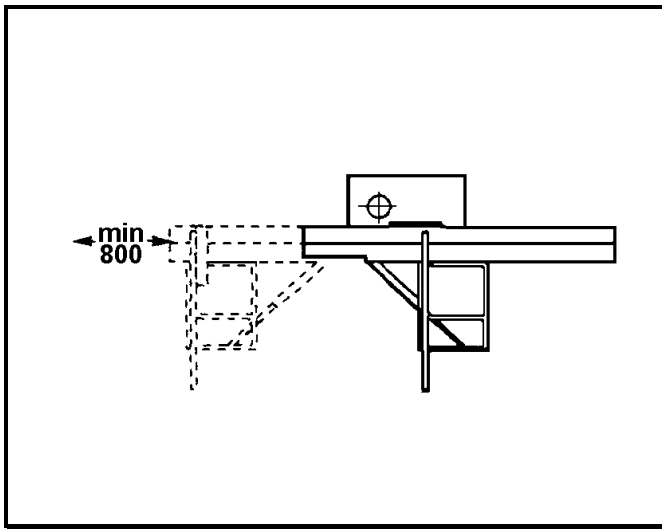
6. Positioning the machine

Remove the protective coating from the working tables and other parts of the machine either with paraffin oil or any similar solvent, do not use petrol or similar solvents for this activity – they might cause reduced corrosion resistance of certain parts of the machine.

The working area size depends on the type of the machine, assumed working operations and size of material machined.

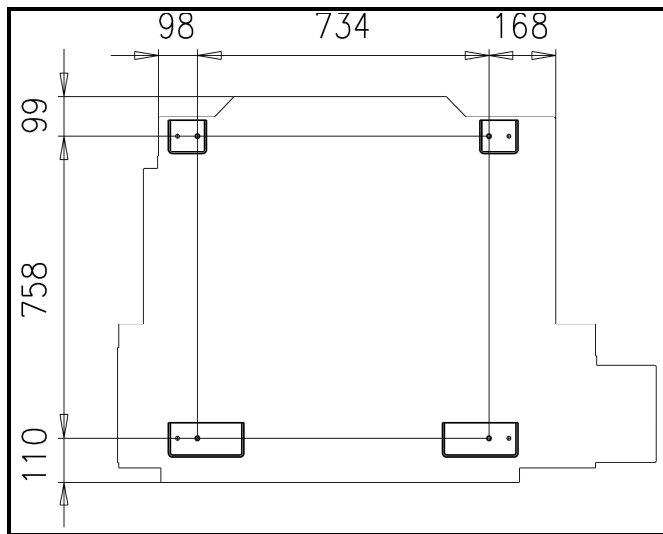
Do not forget about the space for location of a sufficiently effective exhausting system or connecting hoses for the central exhaustion.

6.1 Working area



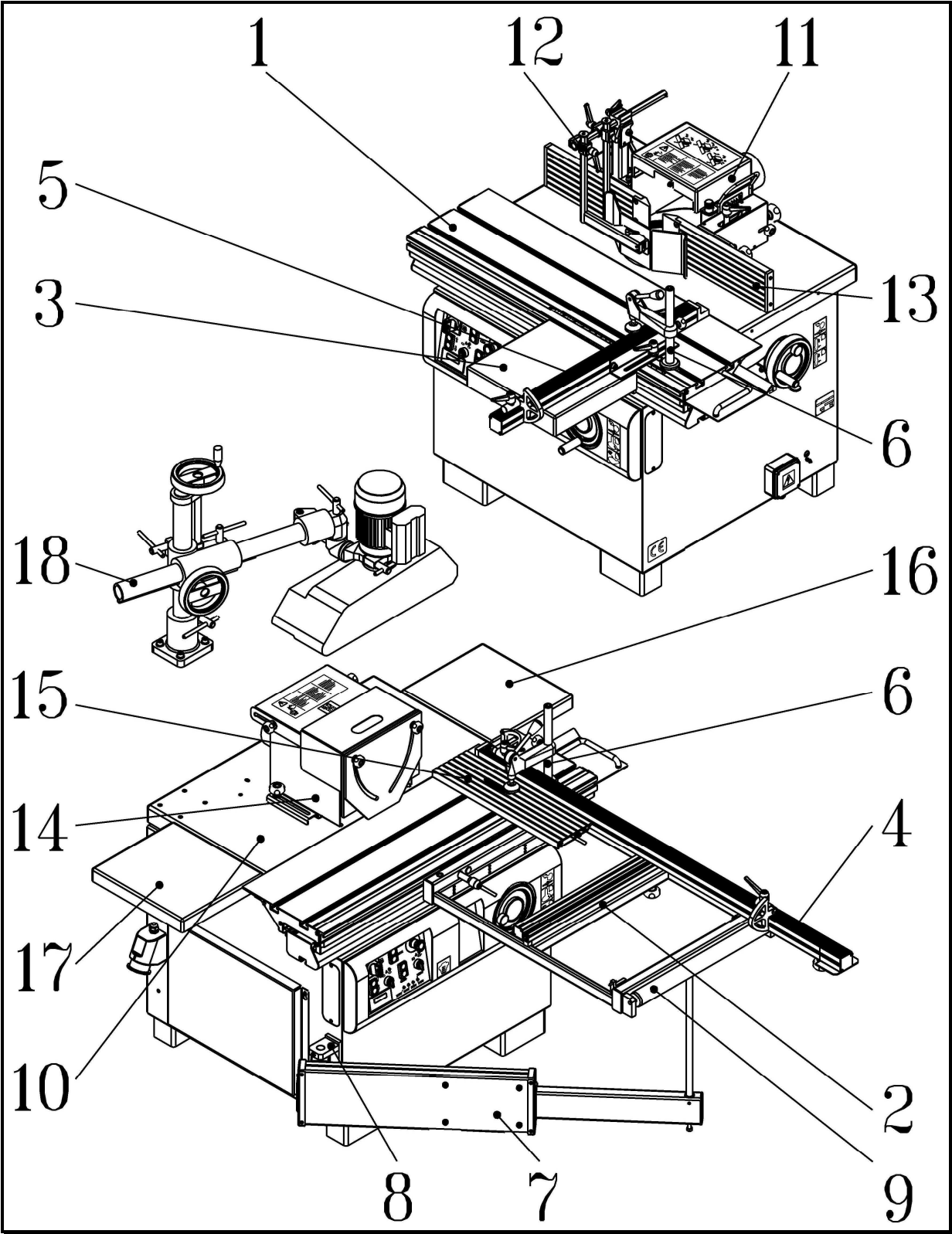
It is important to maintain free area of 0.8 m around the machine, which is required for the working place. If any long material is machined, it is necessary to have a sufficient room in front of the machine as well behind it in the places of material input and output.

6.2 Levelling and fixing the machine



In the lower part of the stand the machine is equipped with legs with levelling bolts and holes for anchoring bolts. Use steel washers under the levelling bolts (included in the delivery) and level the machine horizontally with tolerance of 1mm/1000 mm and screw into the floor (anchor). The attached drawing shows the location of the anchoring holes on the machine.

6.3 Instalation of demountable parts



- Mount the supporting frame (2) into the side slot of sliding table (1) and fix the frame with arresting screws against shifting; the frame must be shored up with supporting arm (7), fastened on holder (8).
- Mount the sliding crossruler (4) onto the frame (2); mount the fixture (6) into upper slot (1) of sliding table
- alternatively you can place the supporting table (3) with angular ruler (5) and fixture (6) into the side slot of sliding table (1)
- It is possible to fix the frame roll (9) onto the supporting frame (9) end.
- Mount the profiling case (11) with rulers (13) and profiling down pressers (12) onto the moulder table (10); Profiling down pressers are fixed by a pole with screws.
- The tenoning case (14) is fixed to table by hand screws. The tenoning case is used for tenoning (machining across the wood fibres).
- It is possible to fix an aid (15) (for tenoning short pieces) into the upper slot (1) of sliding table.
- Shifting device (18) is fixed to moulder table (10) by screws.
- The frontal (16) and rear (17) table prolongation is fixed by screws to moulder table. Forcing-off screws with arresting nuts, are placed close to fixing screws for an easier prolongation leveling with table plain.
- All machine parts must be mounted, set up and leveled very accurately. The machining quality and precision are decisively influenced herewith. We recommend to order it at a specialized company.

7. Connecting of exhaustion system

An exhaustion equipment of sufficient capacity for the proper machine functioning- see table.



**Machine only with the exhaustion system running !
Start machining~exhausting always at the same time !**

Minimum exhaustion capacity :

	exhaustion socket diameter Ø [mm]	dry particles $v_{min.} = 20m/s$ [m ³ /hod]	wet particles $v_{min.} = 28m/s$ [m ³ /hod]
lower exhaustion	80	545	760
upper exhaustion			
- profiling case	120	815	1 140
- tenoning case	120	815	1 140
in all			
- lower + profiling	80 + 120	1 360	1 900
- lower+tenoning	80 + 120	1 360	1 900

Use a flexible exhausting hose of adequate diameter. The lower exhaustion is lead out in the rear machine section.

Wood waste should be liquidated in an environment-friendly manner so that the environment does not become deteriorated.

8. Connecting to the mains



The first connection of the machine to the mains may only be realized by an electrotechnically qualified person, knowing standard norms.

8.1 Connecting to the mains

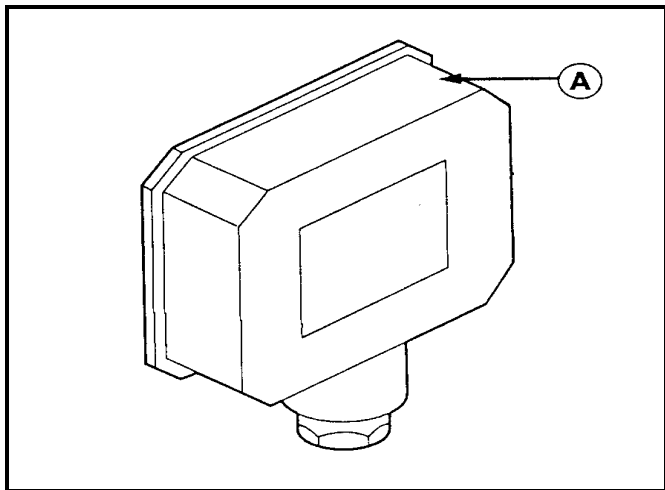
8.1.1 Connecting the machine - up to 3 kW

(installed power output up to 3 kW inclusive)

For the power supply a four-wire cable with plug CEE 16 amperes and socket CEE 16 amperes is used. The socket from which the machine is supplied with power must be grounded (or connected to the neutral wire) in compliance with regulations, protected by at least 16 A cut-out fuse or circuit breaker L.

8.1.2 Connecting the machine - above 3 kW

(installed power output above 3 kW)



Before you start to connect the machine, make sure that the lead is not under voltage. Unscrew the cover of terminal board (A), push the connecting cable through to the box with the terminal board and connect individual phase conductors with the corresponding terminals. Connect the protective conductor (yellow-green) to PE terminal and connect the central conductor (light blue) to terminal A, if it is required. Cross-sections of the phase conductors and of the protective wire must be in compliance with the standards prescribed. Check that the connection is correct and screw the terminal board cover back.

8.2 Safety of operation



Damaged power supply cables must be replaced by the competent specialist immediately. Operation with damaged cables is dangerous to life and therefore forbidden !

Before putting the machine into operation make sure that the voltage and frequency specified on the machine type plate comply with the values of the mains to which it is connected.



Before adjustment and replacement of tools and before any adjustment work, alterations and maintenance work, always turn off the main switch and lock it or disconnect the machine by pulling the plug out. Putting the machine into operation by another person accidentally will thus be avoided.

8.3 Direction of rotation



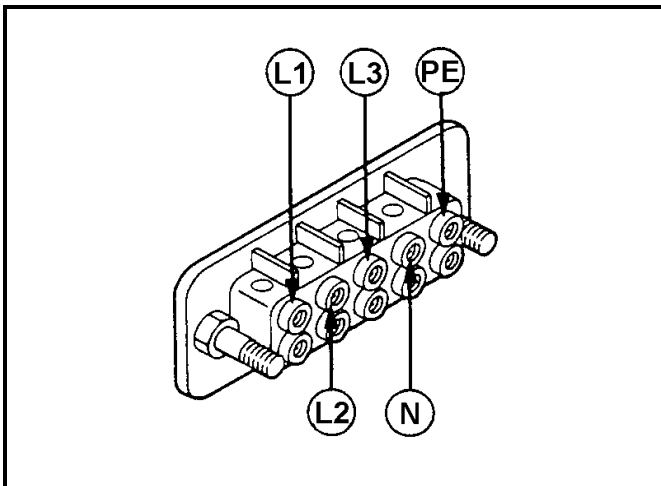
When the spindles are rotating in the incorrect direction, the danger of injury is imminent.

The vertical spindle of the milling machine must turn anticlockwise – i.e. to the left, against the material – the manner of machining in the opposite direction.

Manner of machining in the same direction is forbidden.

In order to find out the direction of rotation switch on the machine for a moment.

8.4 Change in the direction of rotation



In the case of three-phase motors the direction of rotation may be changed by exchanging (reconnecting) two conductors mutually (two black ones or a black one and a brown one) in the power-input plug or in the terminal board. Be careful so that the yellow-green conductor with a phase conductor are not mistaken!

Any alteration of the electrical wiring may only be performed by a specialist with the appropriate electrical engineering qualifications !

8.5 Protection of electrical devices

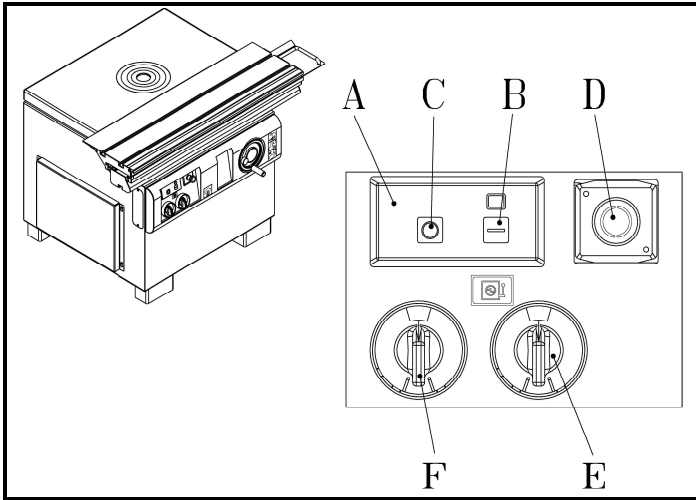
Electric motor of the vertical milling machine is equipped with an electric brake which is capable of stopping the machine in the required time - up to 10 s.

Should the electric brake fail to work properly (the spindle run-out time is longer than 10 s), it is not allowed to work on the machine !

Protection against dangerous contact with unlive wires is made by automatic disconnection from the power supply source in compliance with art. 6.3.1 of EN 60 204-1 and IEC 60 346-4-41.

8.6 Controlling the machine

8.6.1 Lower machine controlling 4 kW



Connection of the machine to or disconnection from the mains is performed by pushing the plug in a socket or pulling it out or by switching on and off by means of a lockable main switch (E). As long as the machine is not connected to the mains, it cannot be turned on by the operating switch (A).

The main switch can be secured with a padlock against ineligible machine starting.

The machine gets started by pressing the green button (B) on the operating switch (A). The machine gets switched off by pressing the red button (C) on the operating switch (A). After termination

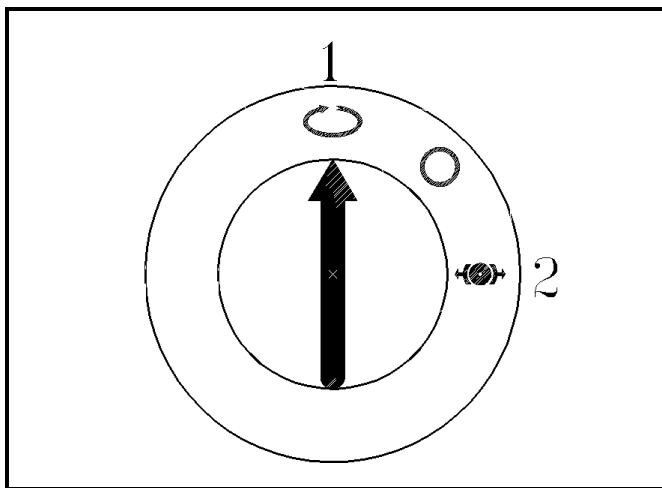
of work switch off the machine on the main switch (E).

In the event of a power supply failure the switch will automatically turn off the machine by means of the protection controller, i.e. when the power supply is restored, the machine must be switched on again. If the motor is overloaded, the built-in circuit breaker for the motor will switch off the machine. If the motor circuit breaker controller switches the machine repeatedly in short intervals (twice or three times), check the machine (motor functioning, blunt tools etc.).

The **emergency stop controller** (D) will remain secured in the switch-off position after use and must be released before a new start of the machine by turning the mushroom-like head slightly. Without such releasing the machine cannot be started!

Spindle brake releasing

For an easier manipulation with tool when changing the milling cutter, in case of a motor with an electric brake, the machine can be equipped with a **motor brake releasing switch** (F).



position 1 - normal operation

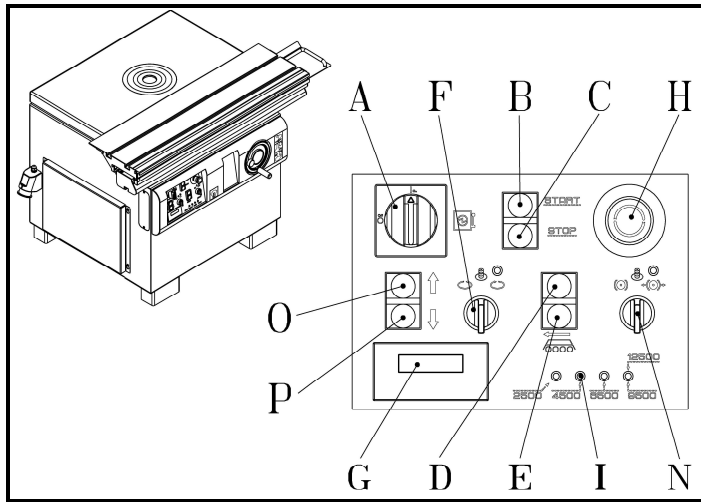
position 0 - OFF

position 2 - brake released

After switching over to this position 2 and pressing the green button (B) on the operation switch (A), the spindle brake will be released.

If the switch is turned over through position 0, the machine must always be turned on by pushing the green button (B) on the operation switch (A).

8.6.2 Lower machine controlling 5,5kW



Connection of the machine to or disconnection from the mains is performed by pushing the plug in a socket or pulling it out or by switching on and off by means of a lockable main switch (A). As long as the machine is not connected to the mains, it cannot be turned on by the operating switch (A). The main switch can be secured with a padlock against ineligible machine starting.

Connecting of spindle motor and feeder drawer

The spindle motor gets started by pushing the knob (B) on lower control panel starter. ATTENTION ! If the machine is equipped with the reversal overswitch (F), it can be started only after a safety time period 20 s ran out. Then start the machine by the main switch (A). The spindle motor gets stopped by pushing knob (C), disconnecting the feeder drawer, too. Feederdrawer connects by pushing the green button (D), disconnects by the red button (E). Between these buttons a control light indicates connecting of feeder drawer. Not until the spindle motor running, feeder drawer is disconnected - it starts only at spindle motor running. In the event of a power supply failure the switch will automatically turn off the machine by the protection controller, i.e. when the power supply is restored, the machine must be switched on again. If the motor is overloaded, the built-in circuit breaker for the motor will switch off the machine. If the motor circuit breaker controller switches the machine repeatedly in short intervals (twice or three times), check the machine (motor functioning, blunt tools etc.).

Rotating sense reversal

The moulder vertical spindle must rotate anticlockwise - to the left, against input workpiece - upfeed method. So far as technological technique requires it, it is possible to start spindle rotating in reverse motion - to the right. It is chosen by turning and holding the switch (F) in(to) due position parallelly with pushing (B). After 20 s (safety period) release the switch (F) - the spindle is rotating clockwise - to the right. Indicating control light is shining. When overswitching (by switch F) spindle rotating into reverse motion during machine run, first the supply to motor interrupts, spindle stops and only after 20 s (safety period) it is possible to start reverse rotation by pushing button (B).

Spindle motor brake release

For an easier manipulation with stopped tool, it is possible to release motor brake by turning the switch (N) to position : released. The key must be put in the switch. After safety period (20 s) ran out, the spindle motor brake gets released which is indicated by lighting up of the control light. The spindle gets rebraked by turning the switch (N) to position : braked (normal stage).

When overswitching the brake release switch (N) during machine run, first the supply to motor interrupts, the spindle stops and only after 20 s (safety period) the spindle gets released. ATTENTION - it is necessary to return the rebrake switch (N) to position : braked. Otherwise the spindle could not restart by green button (B).

Emergency stop controller

The emergency stop controller (H) will remain secured in the switch-off position after use and must be released before a new start of the machine by turning the mushroom-like head slightly. Without such releasing the machine cannot be started !

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.

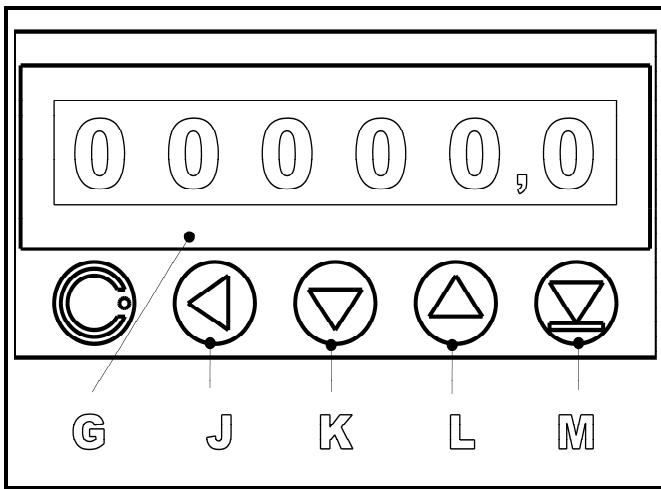
Set-up of vertical spindle height

The position of set-up height of vertical spindle is shown at the position counter display **G**. Its position can be changed in two ways :

a) by help of pushers

The height gets changing upward by pushing of pusher **L**(or **O**) with an arrow aimed upward. The height gets changing downward by pushing of pusher **K** (or **P**) with an arrow downward. The height position of vertical spindle in both directions is being displaced during holding pushed the relevant pusher **K**; **L**. A slow move starts by pushing it going to be overswitched onto a faster move after 3 s. Both limit values of setting are secured by limit switches.

b) by reaching a set up value



Pushing the knob **J** (arrowed to the left) displays the last value of tilted position; it is changed by pushers **L** (arr. upward) and **K** (arr. d-rd.); the pusher **J** (arr. to the left) enables to change the place of decimal point (to change decimal order from tenths to ones, tens, ...).

The pusher, with an **arrow upward**, shifts the decimal point **to the left**;
the pusher, with an **arrow downward**, shifts the decimal point **to the right**.

an example of a setting up :

needed value 22,5°

last set up value 30°

← (1x) 30 displays and zero (blinks);

↑ (5x) 35 gets displayed;

← (1x) 3 blinks;

↓ (1x) 25 gets displayed;

← (1x) 025 displays and zero blinks;

↑ (2x) 225 displays;

← (4x) 000225 displays and decimal point blinks;

↑ (1x) decimal point is shifting to the left and needed 000**22,5** displays.

- By pushing the pusher **M** (arrow underlined) the drive of tilting starts a move to a newly input position, that is reached always from one side (from below).

- The blade-tilting-drive can be stopped (during setting the blades' position) by pusher **M** (underlined arrow).

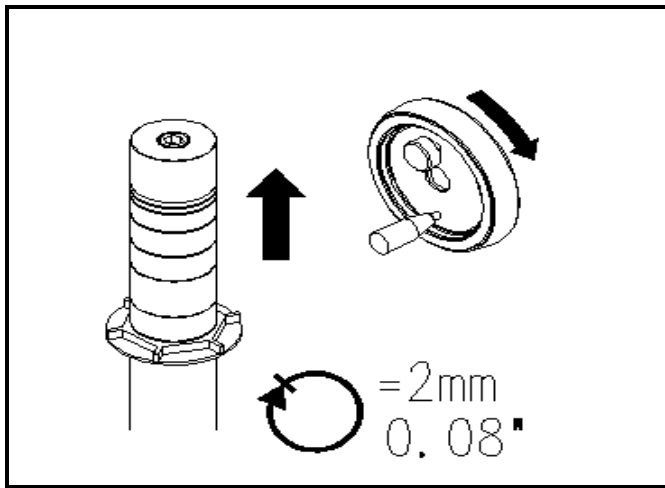
- A coeval pushing the pusher **M** (underlined arrow) and **L** (arrow upward) zeroizes the position scaler, eventually.

- In case of inputting a value besides tilting range (0°- 45°) - the drive stops at one of limit positions by help of limit switches. It is necessary to stop a searching for this wrong input value by a pusher with underlined arrow.

- After inputting a correct value and after pushing the pusher of drive (underlined arrow) - you reach this needed value.

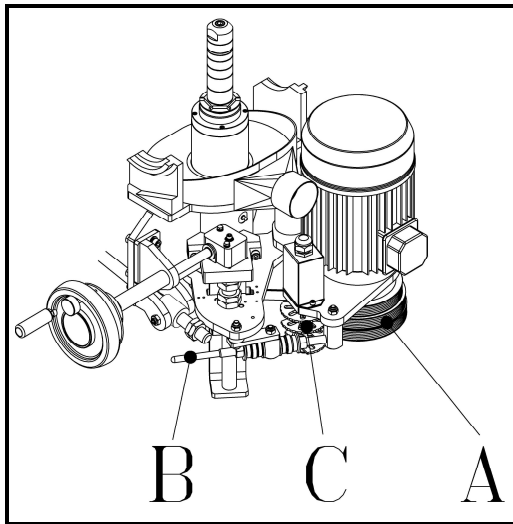
Notice : Do not manipulate with uninscribed pushers nor with a mutual combination of them.

9. Operating and adjusting the machine 9.1 Height setting



Set the required height of the milling spindle by means of a hand wheel located on the right front side of the stand and secure it with the arresting screw. Choose a suitable table filler according to the tool used.

9.2 Spindle rotation speed change and indication



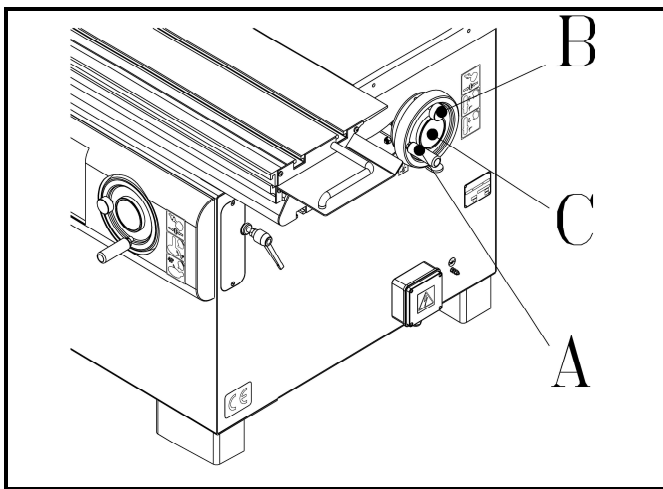
Machine is equipped with stepped pulley of spindle. (A). After releasing by lever (B), remove the belt to related stage groove.



ATTENTION

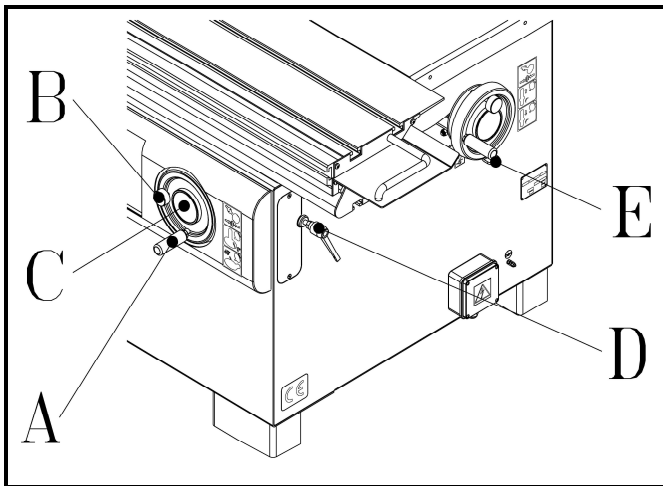
After belt setting up to required RPM pulley groove it is **necessary** to turn the RPM indicating drum (C) into position relevant to position of belt. Due control light turns on at control panel in a correct drum position (chapter 8.6.2).

9.3 Spindle height setting



The vertical spindle height gets adjusted by a hand wheel (A) with setup indicator (C). The wheel is at the side of machine stand. After the height setting up, the wheel can be fixed by an arresting screw (B). Setting-up by electric motor - see chapter 8.6.2.

9.4 Tilting



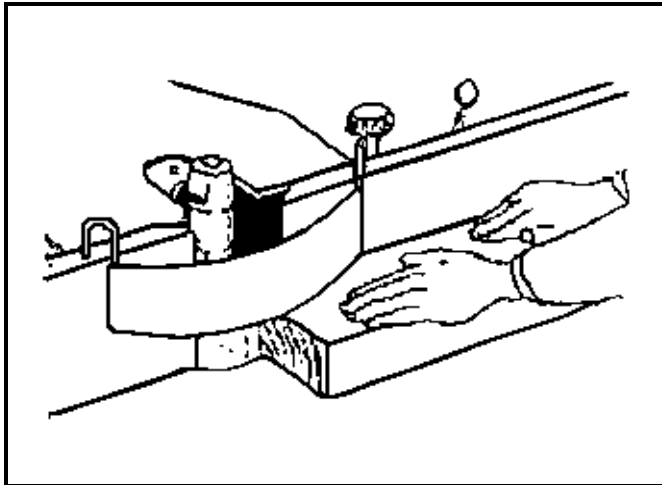
The milling machine spindle may be tilted in the range from minus 45° to plus 5°.

- 45° tilting from the vertical position towards behind the guide ruler, i.e. in the direction from the operator
+ 5° tilting from the vertical position towards in front of the guide ruler, i.e. in the direction to the operator

After releasing the fixing lever (D) and arresting screw (B), the milling spindle can be tilted by hand wheel (A with setting indicator C) from the front side of machine stand.

Push and hold the backstop (E) to tilt the spindle onto +5°. Tighten fixing lever, screw again.

9.5 Longitudinal milling

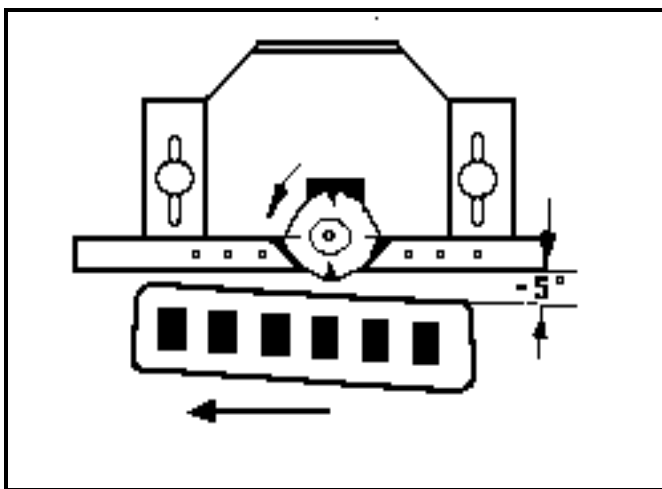


Tool: Use suitable tools with defined chip thickness for manual feeding.

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.

Never adjust guide rulers while the machine being operated ! 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.

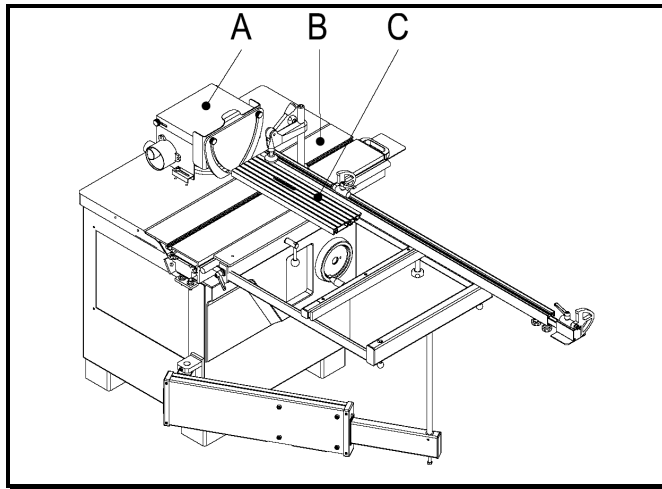
9.6 Milling with mechanical feed



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.

9.7 Milling of narrow workpieces - tenon jointing

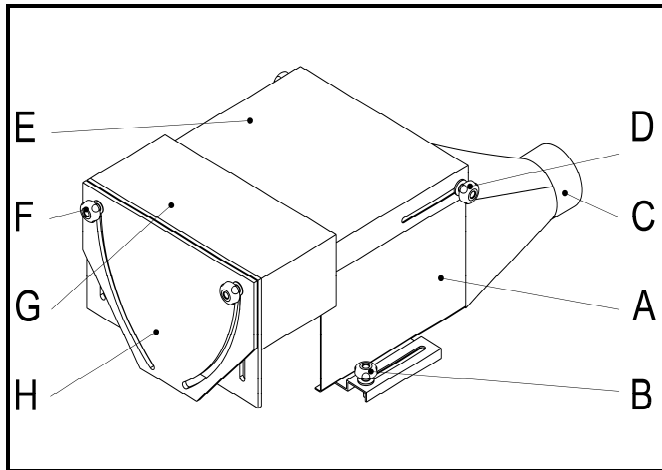


Tool: Choose a tool suitable for manual feeding.

Working cycle: It is necessary to use feeding table (C) so that the workpiece can move safely while passing along the tool during tenon jointing. Fasten the workpiece by clamping to the sliding table. Use tool cover (A) designed for this operation. While making joints for short pieces, use aid (B).

Tenoning case

for tool of diameter max. 275 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.

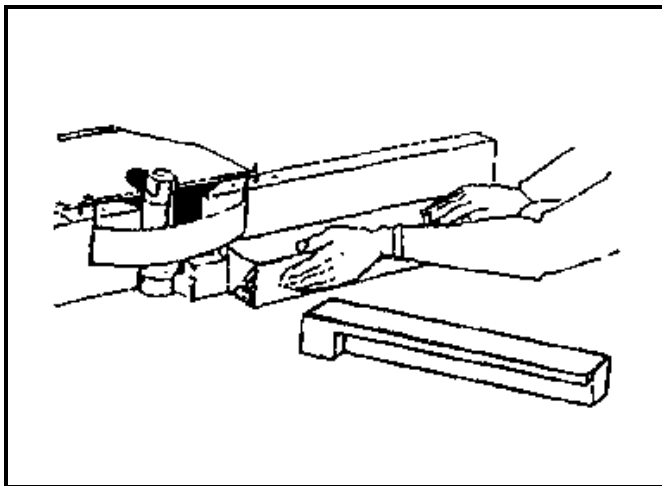
The case is, by help of slots, adjustable according to small diameter of used tool.

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 used tool height.

H - swinging shut of tenoning case swings freely by way through of worked piece by help of cyclic slots.

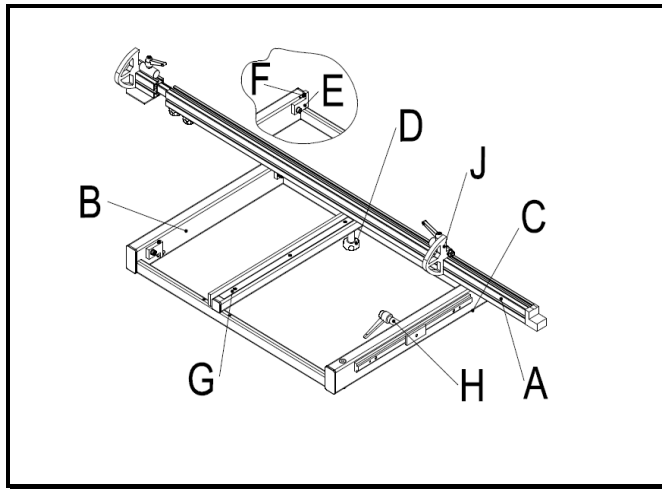
9.8 Milling of workpieces with small cross-section



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.

9.9 Setting the cross guide rule with tiltable backstops



Setting the perpendicular position: Cross guide ruler (A) is placed on supporting frame (B) and its perpendicular position to the cross move axis of sliding table gets adjusted, after releasing arresting stars (C and D) and arresting screw + locknut (F), on tiltable backstop (E). Do not forget to retighten the lock nut + all arresting parts after the rule position has been adjusted.

Setting the cutting angle: After releasing the arresting stars (C and D) and tilting the backstop (E) to the lower position, the cross guide ruler (A) may be set in an angle from 0° to 45° according

to scale measure (G). Do not forget to retighten the arresting parts after the ruler position has been adjusted.

Setting the stops: Stops of the milling width (J) may be arrested, after the arresting handle has been released, by shifting of the profile of cross guide ruler (A) in the groove with reading the value on the scale. Do not forget to tighten the arresting items after the position has been adjusted.

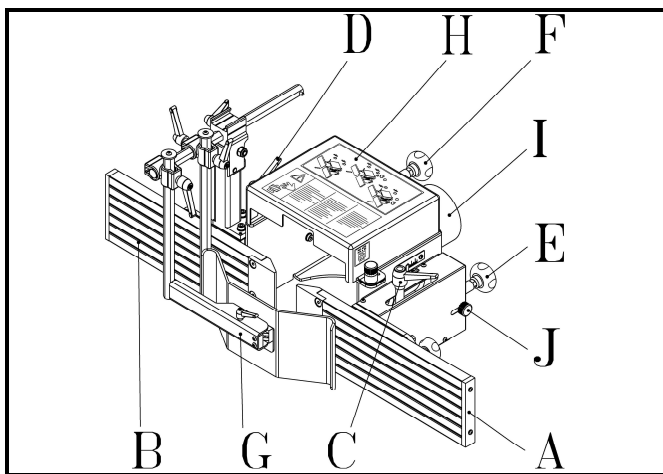
Position of supporting frame:

Supporting frame (B) with cross guide ruler (A) can be shifted in fixing groove of the machine sliding table, after releasing arresting handle (H). The position of cross guide ruler (A) can also be changed by placing it to the other side of supporting frame (B).

At a position change of cross guide ruler it is necessary to check up, eventually set up the measuring scale on supporting frame.

9.10 Profiling case

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-holder

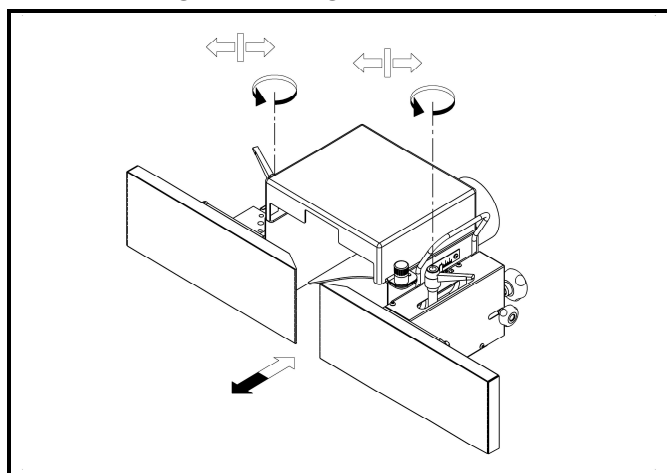
in-presser – for pressing of a part to rulers and to the table, after release of blocking pin – the pressers can be lifted off

H - hinged cover – gets lifted off at a changing of tool

I - exhaustion socket – for connecting of exhausting hose of diameter 120 mm

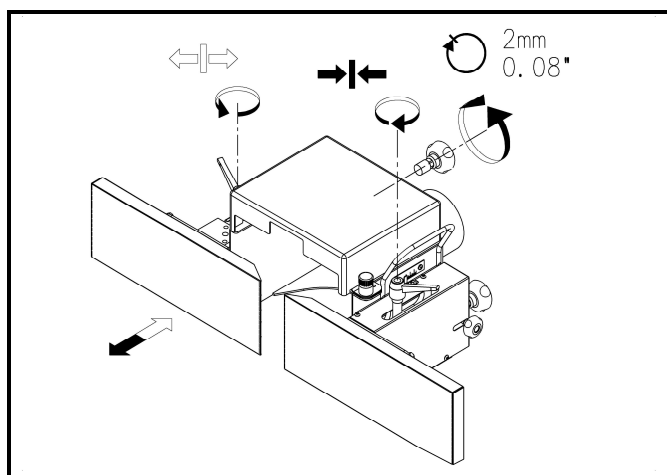
J - arresting rose - for fixing the setup position.

Ruler setting according to tool diameter



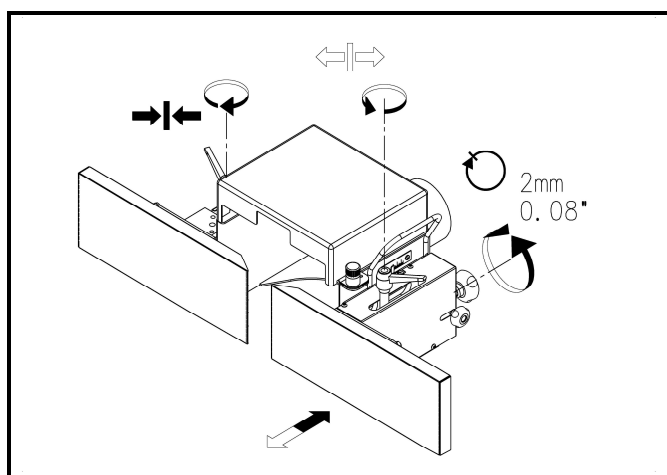
After release of the right and also left arrest, the whole profiling covering gets shifted in the cross direction toward tool. After setting the left ruler to the plane of tool (furthest of the minimum tool diameter) it is necessary to fix this position by drawing up of the left arrest. The left ruler set up value can be read at the measure scale at the left side of profiling case.

Accurate left ruler setting according to tool diameter



After release the left and fastening the right arrest, the left ruler can be set more accurately to the tool plain field. When the left ruler is set up into the tool plain field (furthest of the minimum tool diameter), it is necessary to lock its position by tightening up the left arrest.

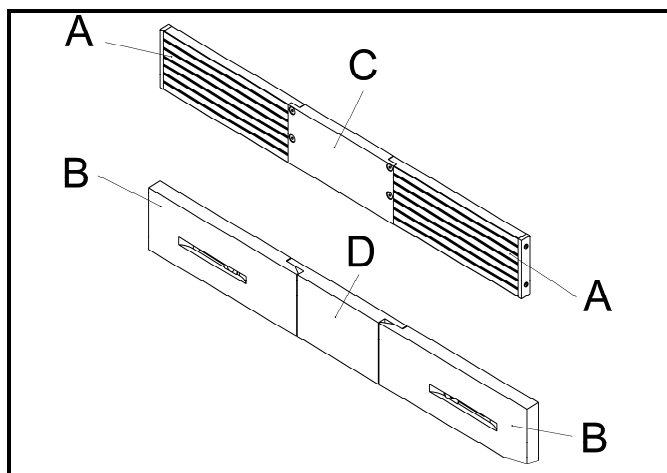
Chip removal setting



After release of the right arrest, the right ruler slides in cross direction toward tool by turning with 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 left ruler set up value can be read at the measure scale at the left side of profiling case.

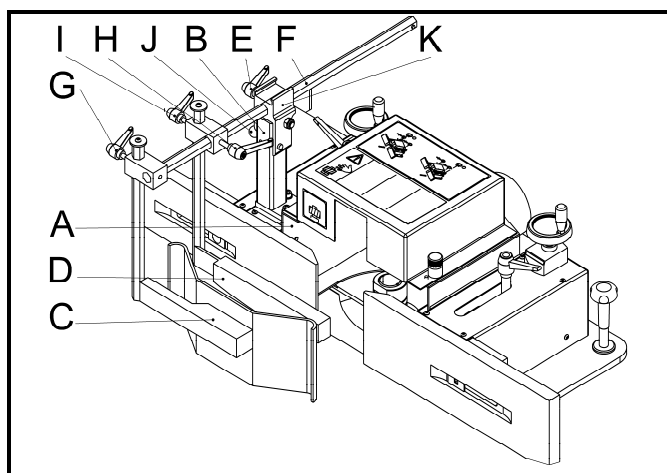
ATTENTION! Always do the setting of a tool diameter, and also of the worth of removed chip thickness, in one direction, in reference to delimiting of mechanism's gives.

Continual insert



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

Wood pressers



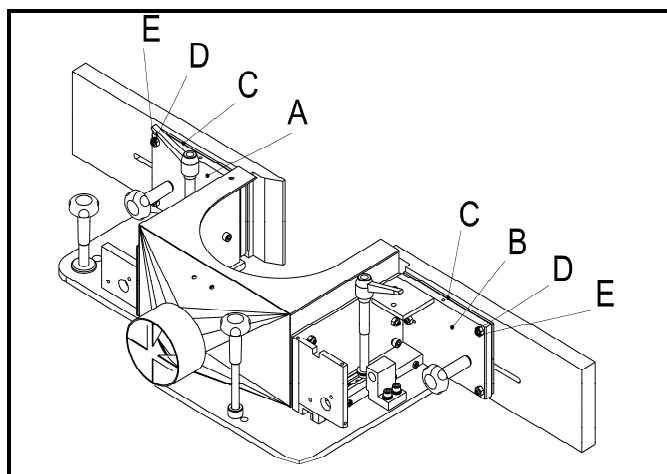
The wood pressers are fastened to a profiling case (A) by means of a pole (B), that holds the bar (F) of wood pressers.

A worked blank is pressed to rulers with a horizontal presser (C) and to the table with a vertical presser (D). After a release of a lever (E) - the horizontal presser can be slid laterally according to the width of workpiece and – after a release of lever (G) - the presser can be slid vertically according to workpiece thickness. After a release of a lever (H) - the vertical presser can be displaced laterally and, after release of a lever (I),

also vertically, according to the workpiece thickness.

After pulling up the fixing plug (J) - the pressers [with a collar (K)] can be tilted-off to position 45° or 90°, and the pressers can be fixed.

Adjusting of parallelity and plumb of rulers



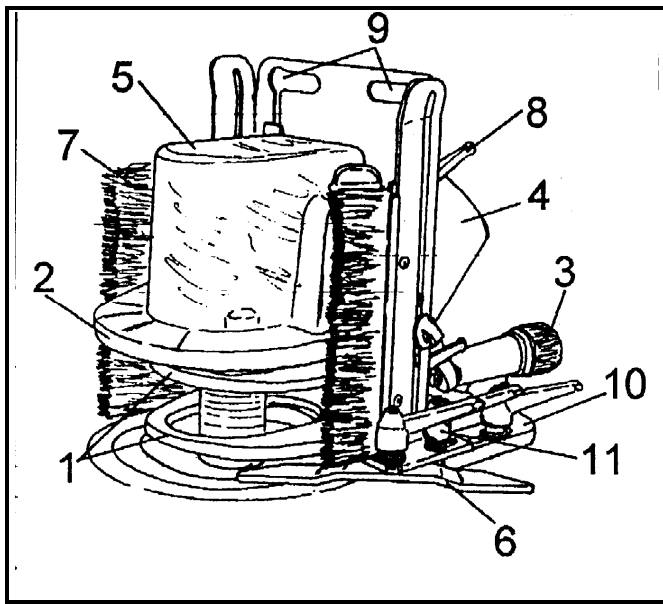
A metal intent-plate C is inlaid between holders A and B. The plate serves for a fine setting of parallelity and plumb of rulers. The plate is movable vertically+horizontally by 3 screws D with safety nuts E.

A moving with 2 screws, located out-side of ruler caps, is equal to an adjusting of a ruler in **one** direction.

9.11 Tool cover for bends milling technical specifications

the smallest radius of the milled bend allowed	mm	190
the largest diameter of the tool allowed	mm	160
spindle diameters allowed	mm	30; 35; 40; 45
exhaustion socket diameter	mm	120
height lift of the cover	mm	130
horizontal shift of the cover (largest milling depth)	mm	60*
largest milling height	mm	140
weight	kg	5.5
spindle rotation direction	± clockwise as well as anticlockwise.	
* 30 mm by the controller (3) + 30 mm by bar (10).		

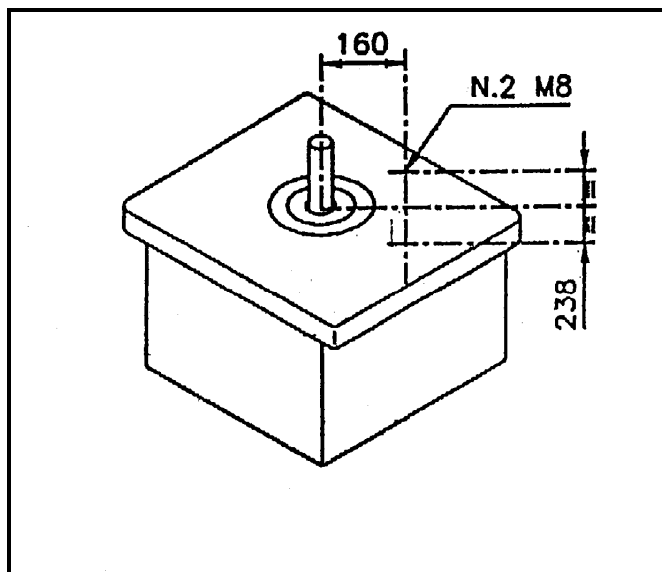
device description



- 1 guide ring
- 2 pressing part of the cover
- 3 controller of adjustment of the max. possible chip removed and milling depth
- 4 exhaustion socket
- 5 cover
- 6 guide bar
- 7 chip removed barrier brushes
- 8 handles securing the cover lift
- 9 groove cuttings
- 10 clamping bar
- 11 fixing lever.

Cover is designed to shape formed, rounded and circular profiles of workpieces with use of the form plate led along the guide ring. Standard design contains the only ring suitable for the tool in the scope of 120 to 150mm.

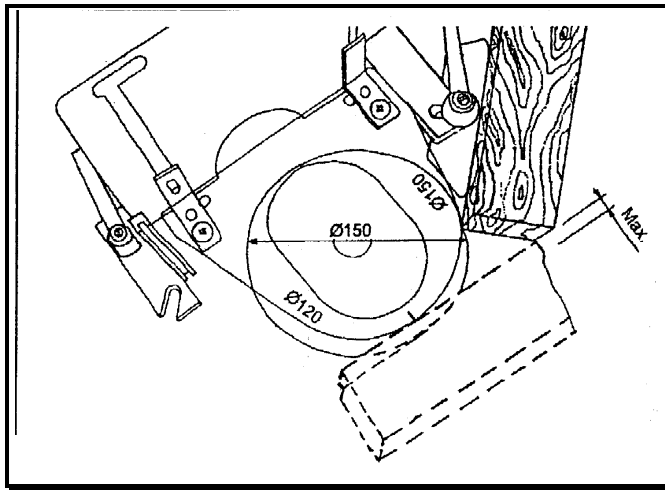
device mounting



The cover must be fixed to the working table by means of two fixing levers with bolt M8. The threaded holes in the milling machine table have been made by the machine manufacturer or it is necessary to make them according to the form plate delivered together with the cover. **No other manner of mounting is allowed.** Mount and fix the circular ring fillers of the table, the milling machine tool and sliding ring of the guiding so that the milled workpiece lies on the working board of the milling machine table in the manner as stable as possible. Adjust the flat lower part of cover (2) so that it mildly presses on the workpiece. Check all fastenings, connect the exhaustion system and turn the tool before you switch on the spindle drive so that a possible contact with a fixed part of the device is avoided.

before you switch on the spindle drive so that a possible contact with a fixed part of the device is avoided.

9.9.4 Work on the machine with the cover



The height of the aluminium guide ring is adjusted above or below the tool and is secured in the groove of the vertical supporting plate. The machine may be moved in parallel with the milling machine table by means of the controller of adjustment of the maximum possible chip removed

and of the milling depth(3) and so

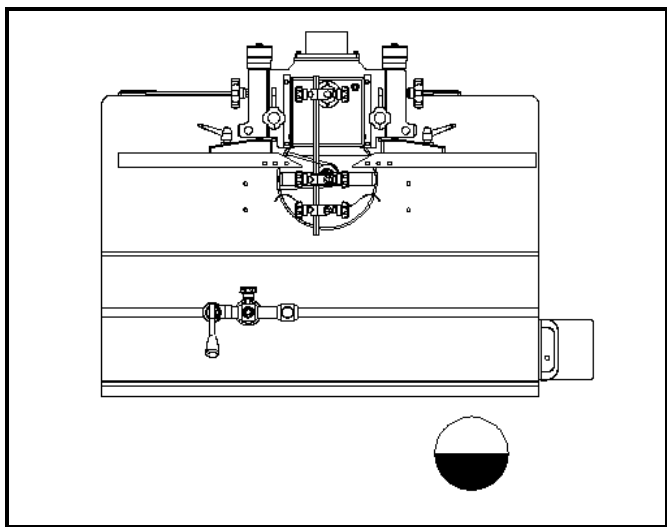
the milling depth may be adjusted, which is given by the setting of guide ring (1)

in relation to the tool. The position will be secured by fixing levers (11). Maximum and minimum diameters of the tool that may be used for the given ring are designated on the top side of the ring in its right and left part. This enables work with tools of various diameters in the scope of the ring (e.g. 120 - 130 - 140 - 150 mm). Before the tool for milling of bends is installed, it is necessary to make sure that the side from which the workpiece approaches the tool is the side on which the diameter on the guide ring nearer to the diameter of the used tool is given. E.g. for the tool with $\varnothing 130$ mm it is the side of the ring designated with $\varnothing 120$, not the other side designated with $\varnothing 150$. If necessary, the ring may be turned so that its right part will be on the left and vice versa. For this case release transparent cover (5) by means of handles (8) and move it upwards in grooves (9) of the supporting plate. Release ring (1) by means of four fixing screws, turn it, install cover (5) and fasten all fixing items. The values of both diameters that may be used are designated on both sides of the ring. Transparent cover (5) must be adjusted so that it presses the workpiece to the working table of the milling machine lightly with its lower widened surface (2) and covers the tool at the same time.

The mark on the guide ring shows the place of the maximum material removal - maximum milling depth. Guide bar (6) should be used whenever possible. It may be mounted on both sides of the cover according to the character of work, and serves to adjust the angle under which the workpiece approaches the ring and to adjust the milling depth more easily.

It is recommended that guide ring (1) should be below the tool, if possible.

9.12 Working place location of the working place



9.13 Protective aids

For machining, a short strengthened apron and eye protection is prescribed. It is advisable to use appropriate ear protection and recommended working shoes. NOT overall coats.

9.14 Forbidden handling



On the machine, it is forbidden:

perform any alteration of the machine safety items without manufacturer's permission
perform any manipulation inconsistent with safety instructions (this 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. Tools

10.1 Recommended tools

Milling tools must be designated with the manufacturer's name or logo and with the maximum spindle rotation speed permitted, and must be produced according to EN 847-1: 2014. The tool diameter must not exceed 250 mm for profiling, and 275 mm for tenoning.

10.2 Replacement of milling tools

Use only milling tools that are designed for manual feeding and can be clamped safely.



Before mounting a tool make sure that spacing rings are clean and not damaged.

Pay attention to due fastening of bolt (nut), which tightens, through closing ring, spacing rings and tool on the milling spindle ! (see chpt. 9.1)

Adjust the hole in the table according to diameter of milling tool (A) by removing rings (B).



Before machine start at released motor brake, the spindle must be freely rotatable, any objects (table inserts, rulers even at max. set chip removed) must not interfere turning.

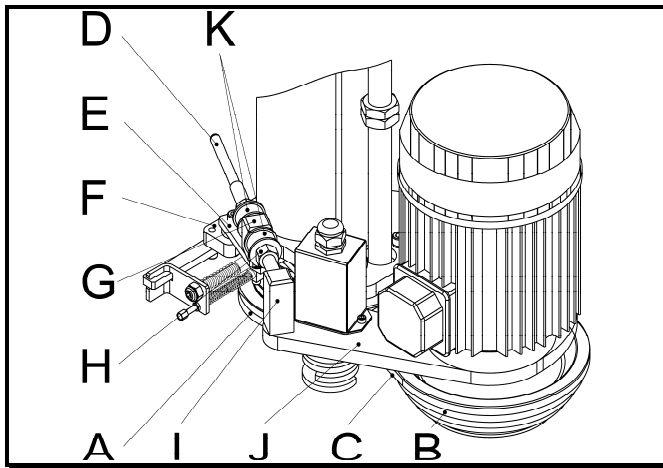
Choose relevant spindle rotation speed as per tool diameter and set up the r.p.m. indication !

11. Maintenance



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

11.1 Machine drive belt tightening



Belt tightening mechanism is accessible after opening the rear machine door.

Belt (C) is stretched between the spindle and motor pulleys. Belt releasing / tightening (e.g. at transition ratio change - chpt. 9.2) is realized by lever (D) position changing. The lever is turnably foot-held at stretcher arm (E). The arm is turnably foot-held to headstock (F) and to motor holder (J) (with right arm end by turnable cube).

So far as belt gets not enough stretched by pushing off lever (D) to working position (from operator position, the (G-I) between cubes distance must be distended by setting nuts (H) so as rubber blocks (K) stay slightly pressed.

If you press the correctly tightened belt by hand force of 30 N (3 kp≈3 kg), it should become sagged by about 5 mm in middle between pulleys. Close the cover of the gears again.

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 oil. The interval for such activities will depend on the manner of work but it should be performed at least once a month.

The bearings of the electric motors and 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.

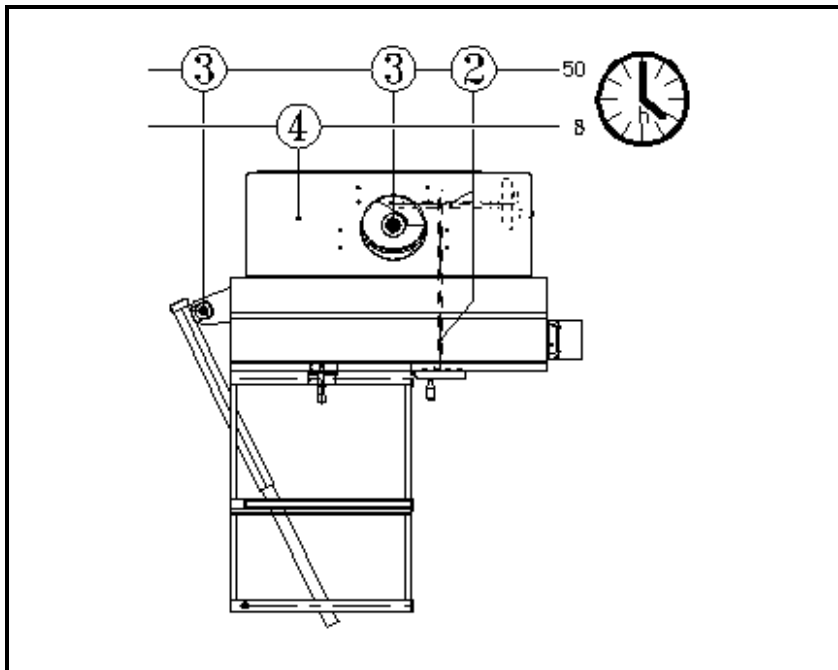
Avoid contamination of belts with oil or grease. If this occurs, clean the belt with paper only or dry it.

Removing the dust is best to be done with a vacuum cleaner. Perform this activity regularly, at least once a week. Do not forget to clean up the inner part of machine stand.

List of greasing points - table of greasing periods

	Spindle bearings	moving bolts	cylinder seating of spindle, tilting pins etc.	Table plates	Spindles, flanges (distance rings)
Greasing point nr.	1	2	3	4	5
Necessary action	after 1 h	(after 2 h)	(after 3 hours)	(after 4 hours)	(after 5 hours)
Permanent grease filling	when changed				
Grease ~spreading		50			
Lubricate with oil can			50	8	without tools/ machine still stand
Plastic grease/ oil	LV-2-3	LV-2-3	OL-B5	OL-B5	OL-B5
Equivalent	ISO-L-XCBEA 3		ISO - LAN 68		

Chart accompanying the greasing table



11.3 Troubleshooting

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, turned 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 the tools used.

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.

The chip with too large thickness is chosen – the width and hardness of the wood should be taken into account.

The V-belt is not tightened enough.

The motor does not work with the full power output - an expert should be called.

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. Scope of delivery

Complete machine,
accessories according to the list of parts,
instructions handbook for use,
special accessories (if ordered).

12.1 Accessories

Name		pieces	note
Spanner 13 x 16		1	
Spanner 14		1	for spindle \varnothing 50 mm
Spanner 41		1	
Spanner 4		1	
Spanner 10		1	
Balancing shim		4	for levelling of the machine
Cardboard box	200x400x160 mm	1	for additional parts
Plastic bag on zip	250 x 350 mm	2	for manual + added packing.

13. Special accessories

	pcs.	Note
Tenoning cover	1	
device for short pieces tenoning	1	
feeding equipment	1	
undercarriage PV 315 U	1	
table extension	1	both sides in workpiece feeding direction
eccentric fixture	1	
frame with supporting telescopic arm and ruler (on CV)	1	
roll of frame	1	
cover of tool for milling of bends	1	

14. 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. Guarantee

Work and activities not specified herein require a consent in writing granted by the ROJEK Co., Masarykova 16, ČR, 517 50 Častolovice. 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 claim, do contact the machine seller.

After the warranty period has expired, you can have the machine repaired by any specialized firm.

16. Dealing with packing, machine service life expiry

16.1 Dealing with packing

Our products are transported in packing from 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 waste 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:

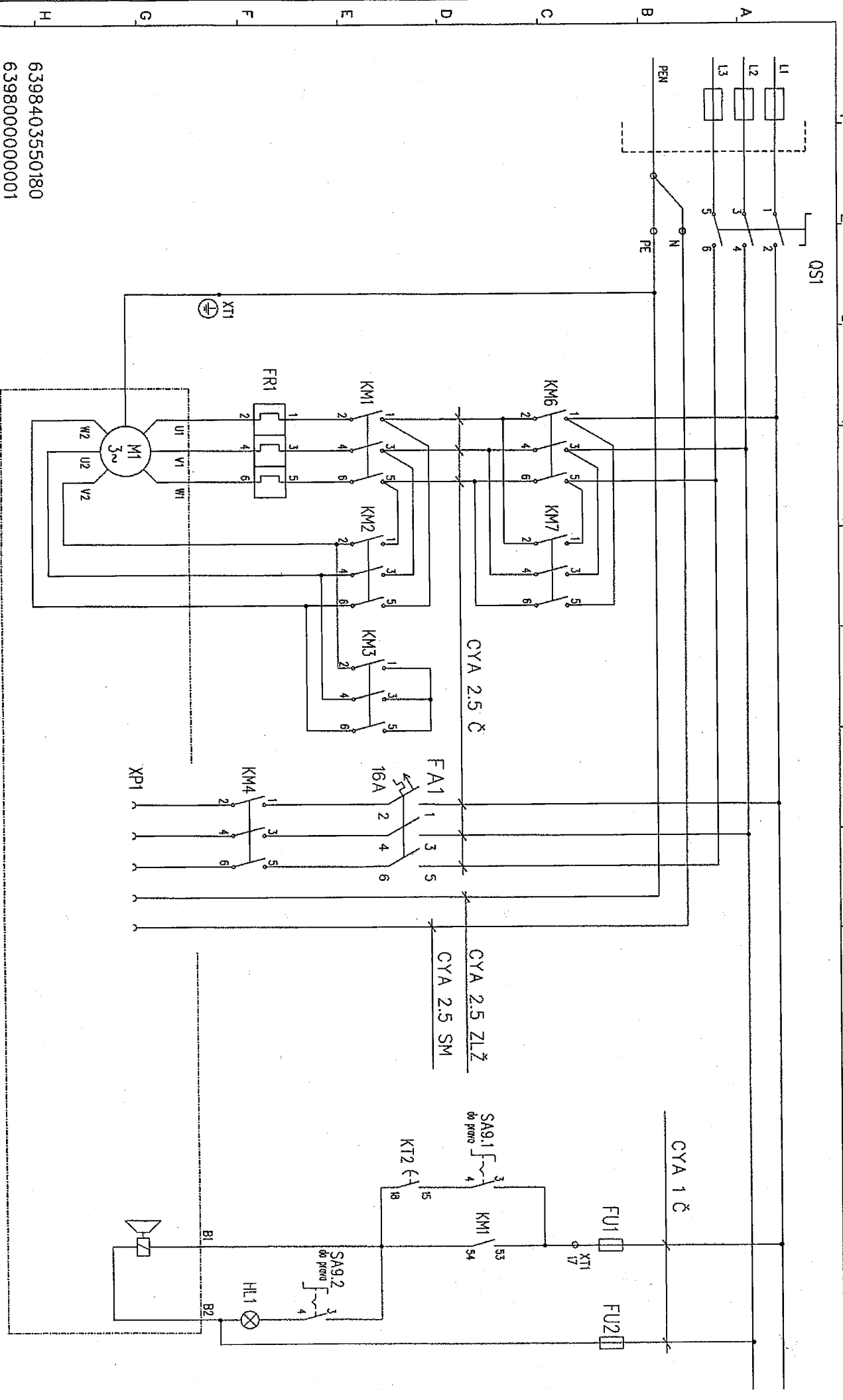
- 1) Remove all plastic parts and put them in the respective waste containers.
- 2) Divide the remaining metals parts into two groups with ferrous and non-ferrous metals and have them liquidated by a respective specialized firm.

ENCLOSURE B - FSN 550A LIST OF ELECTRIC PARTS

FSN 550A electrical components

Name	function	type, tech. data	pcs.(5,5kW motor)	supplier	substitute	note
M1	machine drive motor	CEG M112MB-2/FPC 5,5 kW 3x400/690V 12,2/7,1A 50/60 Hz 2900 /min IM B14	1	CEG Italy		for voltage 3x400 V
		CEG M112MB-2/FPC 5,5 kW 3x230/400V 21,2/12,3A 50/60 Hz 2900 /min IM B14	1			for voltage 3x230 V
	distributor	as per machine variant	1	BaK Systems		
W1-10	control circ	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	protecting circuits	H05V-K1G1,5			CYA 2,5 mm ²	
XT1	terminal	cableBranchJoinBox	1	GEWISS		
name	function	type, techn. data	pcs.(4 kW motor)	supplier	substitute	note
M1	machine drive motor	CEG M100-2/FPC 4,0 kW 3x400/230V 9,1/15,7 50/60 Hz 2900/min IM B14	1	CEG Itálie		
SWITCHES						
SA1	operation switch	LE – 1 M35N716 Uc=400V/50,60 Hz Ie=16A Ue=400V IP54	1	TELE- ME- CANIQU E France		
SA3	brake release switch	VS 16 VZ1C PG21 Ie=16A Ue=400V IP 54	0(1)	VD OBZOR Zlín		variant brake release or reversion
SB1	door end switch	XCK – A 102 I“a“+I“b“ Ue=400V Ie=16A IP 54	1	TELE- ME- CANIQU E France		
SB2	emergency stop pusher	XAL K 178 I“a“+I“b“ Ue=400V Ie=16A IP 54	1	TELE- ME- CANIQU E France		
QS	main switch	VS 16 1104 A8 VSC VZ1C PG21 Ie=16A Ue=400V IP 54	1	VD OBZOR Zlín		
CONDUCTORS						
W1-10	control circ.	H05VV-K1X1	as per machine var.		CYSY 2A x 1mm ²	
W11-20 W31-40	power circuits	H05VV-K3G2,5	as per mach.variant		CYSY 3Bx2,5mm ²	
		H05VV-K4G2,5	as per mach.variant		CYSY 4Bx2,5mm ²	
		H05VV-K4G1,5	as per mach.variant		CYSY 4Bx1,5mm ²	
		H05VV-K5G1,5	as per mach.variant		CYSY 4Bx1,5mm ²	
		H05VV-K7G1,5	as per mach.variant		CYSY 5Bx1,5mm ²	
W 21-30	protection c.	H05V-K1G1,5	as per mach.variant		CYA 1,5 mm ²	
XT1	terminal	cable branch joint box	1	GEWISS		

Note : The manufacturer reserves the right to change part(s) as well as supplier(s).



6398403550180
 6398000000001
 6398000000002



Nakreslil	DV oldknovč
Datum	27.9.2013
Prekonal	mgr. V. P. Hroda
Datum	27.9.2013

Typ

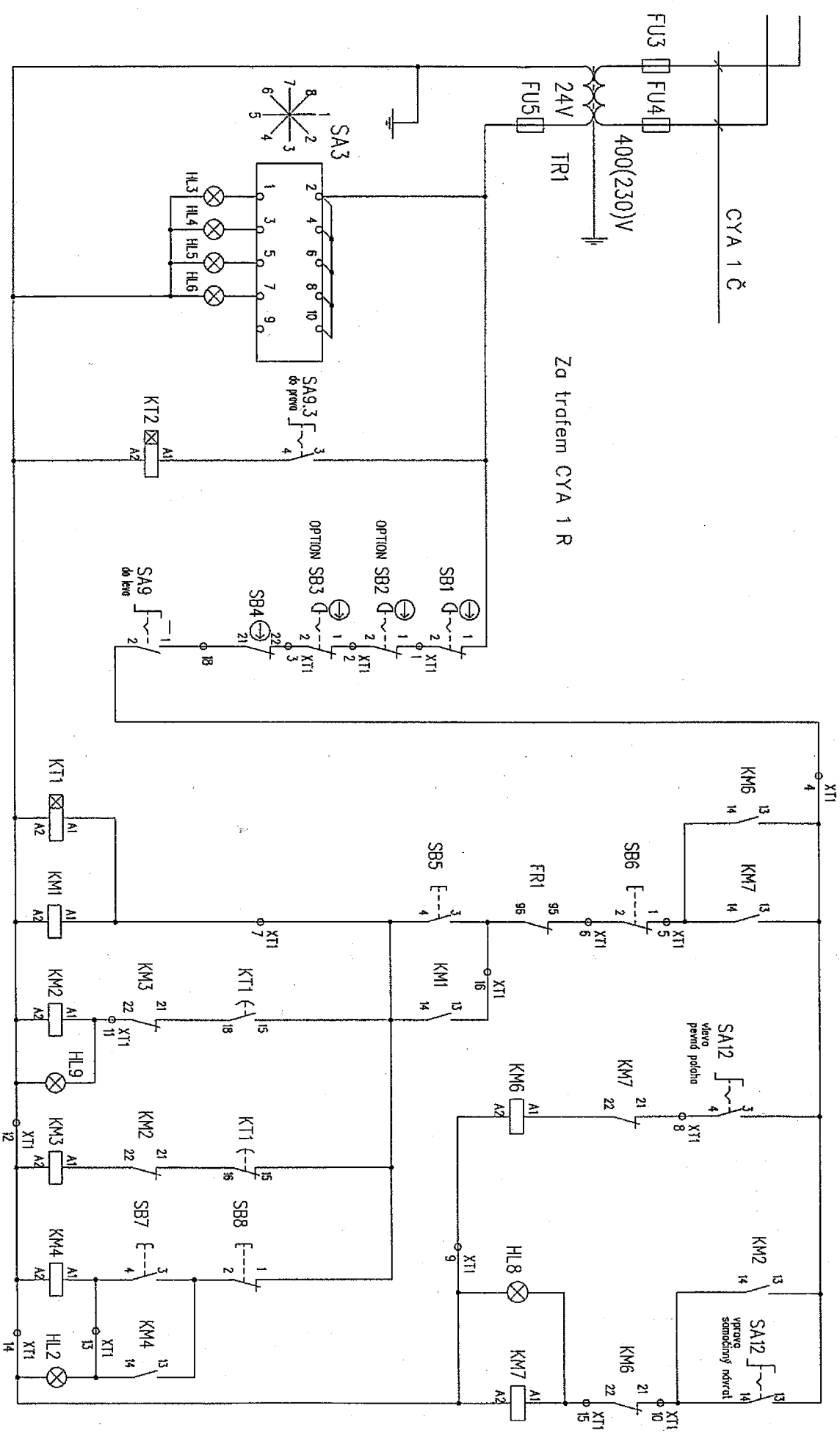
FSN 550A

**SCHEMA
 SLOVĚ**

SC 2173-0

Reverzace + indikace otáček

Lišt	1
Lištd	2



Za trafem CYA 1 R

CYA 1 Č



Nakresil	Miroslav Toč
Datum	27.9.13
Projekoval	Ing. P. P. P. P.
Datum	27.9.13

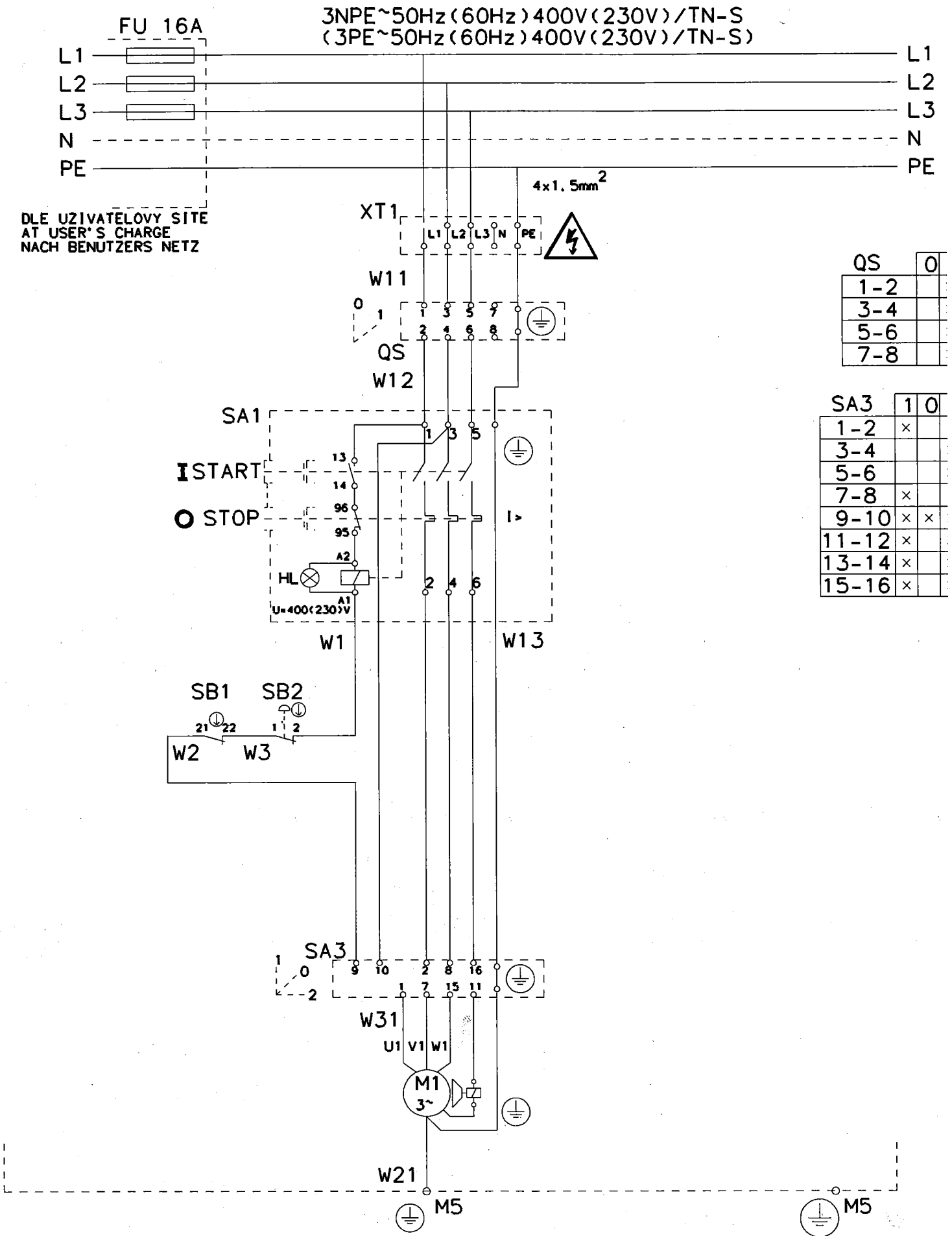
Typ

FSN 550A

SCHEMA
OVLADANI

SC 2173-0

List	2
Listu	2



Nastavení nadprúdové ochrany (|>) dle jmenovité hodnoty proudu motoru.
 Setting of overcurrent protection (|>) according to nominal current of motor.
 Einstellung vom Überstromschutz (|>) nach dem motor-nominalstrom.



ES Prohlášení o shodě

Výrobce : **Rojek dřevobráběcí stroje a.s.** IČO 25266411

Adresa : **Masarykova 16, 517 50 Častolovice, ČESKÁ REPUBLIKA**

Označení výrobku: **Jednovřetenová svislá stolní frézka**

Typ výrobku: **FSN 300 A, FSN 550A, FS 550**

Určení výrobku : **Dřevobráběcí frézovací stroj se svislým vřetenem pro obrábění polotovarů ze dřeva a na bázi dřeva.**

Z titulu naší výlučné zodpovědnosti prohlašujeme, že uvedený výrobek je vyroben ve shodě s následujícími předpisy a normami :

Zákon č.22/1997Sb. v platném znění o technických požadavcích na výrobky

Nařízení vlády č.176/2008Sb. (Směrnice 2006/42/ES) v platném znění, kterým se stanoví technické požadavky na strojní zařízení.

Nařízení vlády č. 118/2016 Sb. (Směrnice 2014/35/EU) v platném znění, kterým se stanoví technické požadavky na elektrická zařízení nízkého napětí

Nařízení vlády č. 117/2016 Sb. (Směrnice 2014/30/EU) v platném znění, kterým se stanoví technické požadavky na elektromagnetickou kompatibilitu

Aplikované normy:

ČSN EN ISO 12100 : 2011 (EN ISO 12100 : 2010), ČSN EN ISO 13857 : 2008 (EN ISO 13857 : 2008)

ČSN EN 349+A1 : 2008 (EN 349 : 1993 + A1: 2008), ČSN EN ISO 13850 : 2017 (EN ISO 13850 : 2015)

ČSN ISO 447 : 1992 (ISO 447 : 1984), ČSN EN ISO 14120 : 2017 (ISO 14120 : 2015)

ČSN EN ISO 13849-1: 2017(EN ISO 13849-1: 2015), ČSN EN 1037+A1 :2008(EN 1037 : 1995+A1: 2008),

ČSN EN ISO 14119 : 2014 (EN ISO 14119 : 2013), ČSN EN 60073 ed. 2 : 2003 (EN 60073 : 2002)

ČSN EN 80416-1 ed. 2 : 2009 (EN 80416-1 : 2009), ČSN EN 80416-2 : 2002 (EN 80416-2 : 2001)

ČSN 33 2000-1 ed.2 : 2009 (epv HD 60364-1 : 2008), ČSN 33 2000-4-482 : 2000 (epv HD384.4.482 S1 : 1997)

ČSN 33 2000-5-51 ed.3 : 2010 (epv HD 60364-5-51 : 2009), ČSN EN 55011 ed.3 : 2010 (EN 55011:2009)

ČSN EN 60204-1 ed. 2 : 2007 (EN 60204-1 : 2006), ČSN EN 60073 ed.2 : 2003 (EN 60073 : 2002)

ČSN EN 848-1+A2 : 2013 (EN 848-1 : 2007 + A2 : 2012),

Posouzení shody bylo provedeno ve spolupráci s: SZÚ Brno, NB 1015.

ES certifikát typu: E-30-20062-18, E-30-20063-18, E-30-00119-18

Poslední dvojčíslí roku, v němž bylo elektrické zařízení opatřeno označením CE: 02

Častolovice
28.3.2018

Evžen Rojek
člen představenstva

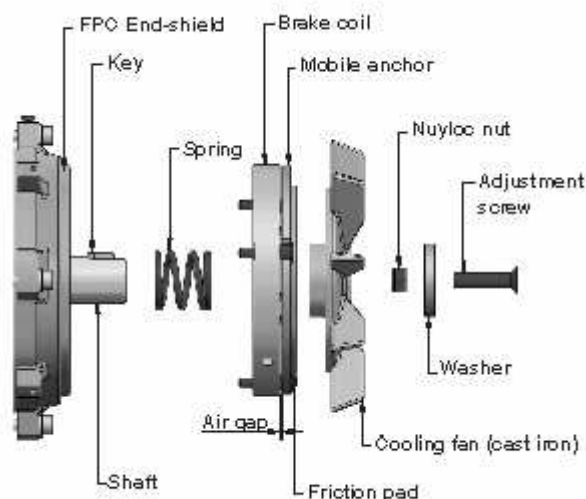

podpis

GRADUAL DC BRAKES MAINTENANCE ADJUSTING, INSTRUCTIONS

General information

This brake type is designed for machinery where a gradual but not necessarily precise braking is required. Thank to the single friction surface, the FCP brake provides noisless controlled stopping with low a brake torque to prevent any damage to machinery and operator alike. The brake friction is applied by the action of a set of springs that push the armature plate against the internal surface of the cast iron cooling fan. When the coil is energized through an AC/DC rectifier, the brake is released.

The brakes are shipped adjusted to the the nominal values air gap and must be reset when a wear occurs. The extent of a brake wear depends on the machine service conditions.



Maintenance and readjusting

All parts of the brake must be checked frequently as the friction work depends on a number of factors, mainly on the inertia moment, the motor speed and the frequency of motor starts. A common criteria to establish what will be the brake life in each particular application is by periodical checking the air gap between coil surface and mobile anchor.

Due to a braking surface wear, the air gap increases. As soon as the air gap achieves 0.5 mm, a restoring is required (see following instructions : air gap setting-up, fitted with each motor). The armature plate must be replaced as soon as the wear of the friction material gets 1.5 mm. This means to replace the brake after every 4 up to 5 restoring operations.

After checking the brake make sure that the air gap is correctly regulated.

Carry out the brake servicing and repairing when the brake is disconnected having checked the earthing in beforehand, following the instructions.

A good functioning of the brake can only be guaranteed if the original components are used. If a restoring is required after a short time, the motor works under non-standard conditions and following needs to be revised : a too big motor inertia moment; or too many motor starts per hour. Both of them can overload the motor brake.

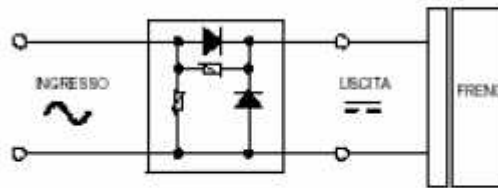
the air gap adjustment instructions

So as to re-adjust the air gap, it is necessary to tighten up the adjustment screw up to the rated values, scheduled below.

brake dimension	brake torque Nm	input power W	turn-on time ms	release time ms	air gap mm
M 63	2,5	15	20	40	0,2
M 71	4	15	15	100	0,2
M 80	9	20	15	120	0,2
M 90	9,5	20	15	120	0,25
M 100	12	30	10	200	0,25
M 112	12,5	30	10	200	0,25
M 132	23	30	10	200	0,3
M 160	23	60	13	215	0,3

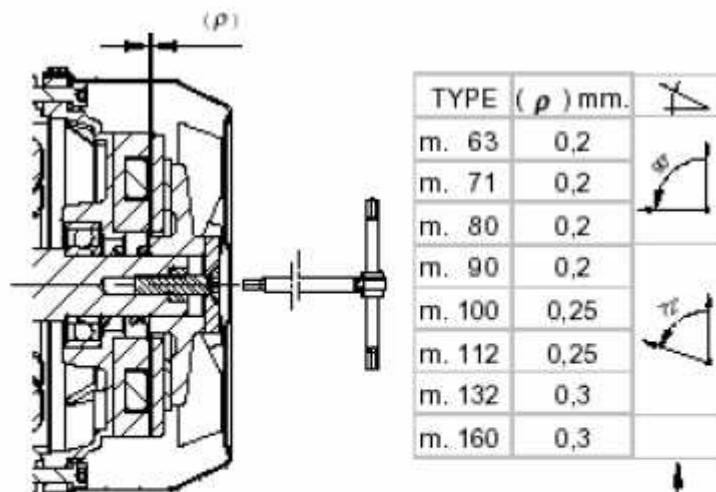
The adjusting screw is accessible without removing the air fan metal sheet - the picture below.

CONNECTION DIAGRAM FOR FPC BRAKE



BRAKE ADJUSTEMENT (or braking gap adjustment – ρ –)

Adjust the screw till you achieve braking gap value listed on the table below



NOTE : for a quicker but more approximate adjustment, first tighten the adjustment screw dock-wise till the bottom; then loosen it, turning it anticlockwise (see values listed on the table above)



VERTICAL SHAPER EXCHANGEABLE SPINDLES

FSN 550A

addition to translation of original
Service instructions handbook

up dated 10/ 2018

ROJEK WOODWORKING MACHINES, Masarykova 16, 517 50 Častolovice
Czech Republic +420 494 339140, -41, fax -341
www.rojek.cz export@rojek.cz

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1. Safety instructions

2. Description of exchangeable spindle

2.1 Description

2.2 Making

3. Assembly and dismantling of exchangeable spindle

3.1 Assembly

3.2 Dismantling

4. Maintenance

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Introduction

This manual is issued as an addition to the use instructions manual of machines with vertical milling spindle. Standard making of vertical milling machines is equipped with a one-piece-spindle. When using the exchangeable spindle, it is segmented of 2 components. One is inbuilt closed in the milling head, the other one is intended for clamping of tools. This construction enables usage of various endings of spindle clamping part on one machine.

Notice

The text and picture part of this manual is a know how of the ROJEK Co. and continue to be the company's property. No part of the manual is allowed to be copied nor to let third persons learn the manual or its parts.

The producer reserves himself the right to particular changes within a continuous technical development of the machine.

1. Safety instructions



Caution recommending to proceed entirely according to following regulation. Non-performance of this regulation can cause a despatch or heavy injury of the machine operator.

Proceed according to this manual during assembly and dismantling of the exchangeable spindle.

Tighten the fixing screws and nuts by rated torsional moment without using of levers or beating onto the spanner.

Make sure that fitting plates are clean, unbroken and perfectly flat on both sides before clamping of tool and distance rings onto the spindle.

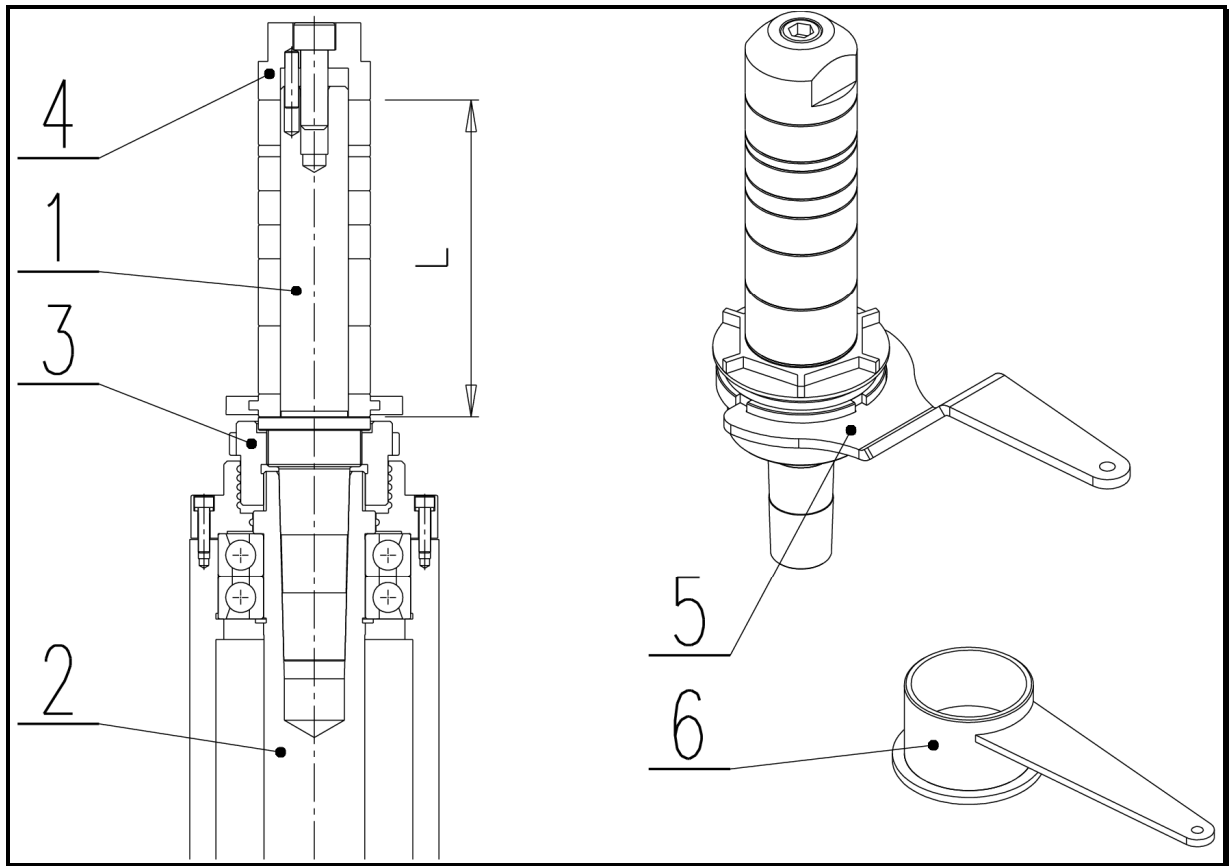
Never use deformed or cracked tools.

Never use tools at a higher rotating speed than recommended by competent tool producer.

Make sure, that all rotating tools are perfectly ballanced , properly sharpened, adapted and fixed.

2. Description of an exchangeable spindle

2.1 Description



- 1 - exchangeable spindle
- 2 - steady spindle
- 3 - union nut
- 4 - clamping nut
- 5 - open wrench
- 6 - socket wrench

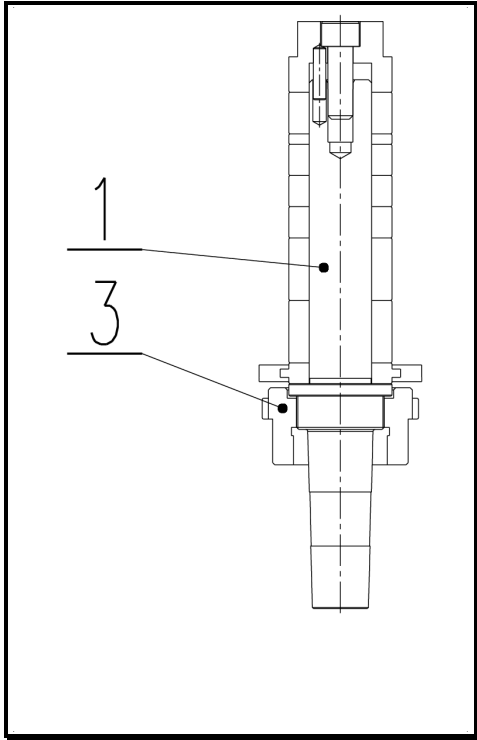
By help of a taper, a replaceable part of the spindle (1) of various diameter and clamping length L, can be fixed onto the steady spindle part (2). On its upper side, the exchangeable spindle can be equipped with a clamping chuck (6) for shank-type cutters (shank mills).

2.2 Making

exchangeable spindle diameter \varnothing (h7)	clamping spindle part length L (mm)	spindle ending part with clamping chuck	note
30 mm	140		
30 mm	80	\varnothing 8 12 (12,7)	possible \varnothing 10 14
32 mm	140		
40 mm	160		

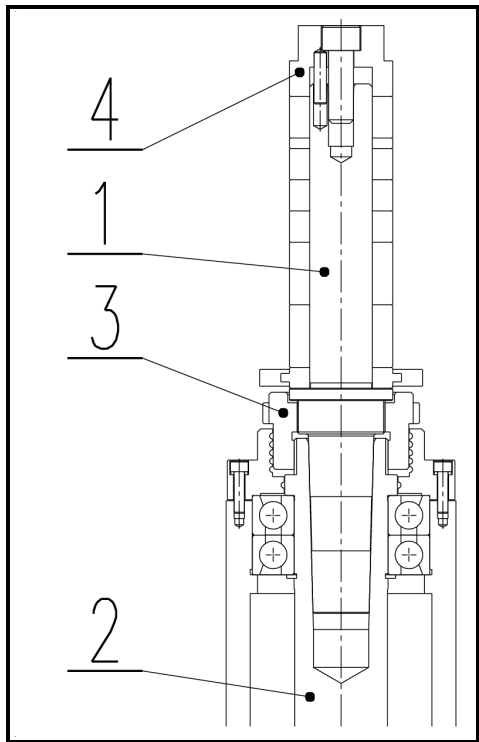
3. Exchangeable spindle assembly and dismantling

3.1 Assembly of an exchangeable spindle



By hand screwing to the left do screw the union nut (3) to the thread end in an exchangeable spindle (1).

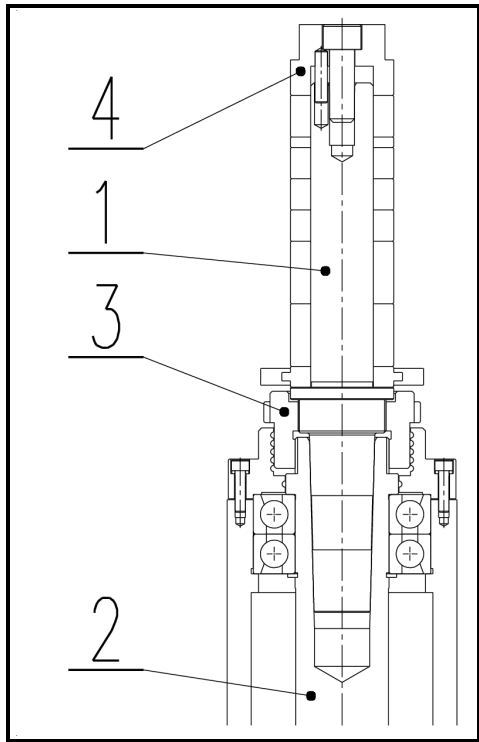
The union nut (3) has 2 threads of different lead.



- Put the exchangeable spindle (1) into the taper of solid spindle.
- By help of wrench (5 or 6) do turn the union nut (3) to the right as far as conic surfaces touch down one to other
- After lumping of both conical faces one on another tighten the union nut (3) slightly by twisting moment of about 10 Nm. The spindle (1) can be held not rotating by the fastening nut (4).

Attention ! The difference of the thread lead on the union nut (3) is 0,5 mm, herewith a big draft intensity comes up.

3.2 Exchangeable spindle dismantling



By help of wrench(size M 5 or 6) turning to the left, do release the union nut (3). Due to different nut threads lead the exchangeable spindle (1) will be pulled out of steady spindle cone (2). The spindle (1) can be held not rotating by the fastening nut (4).

Both spindle parts will get apart by screwing out the union nut (3) from the steady spindle (2).

4. Maintenance

It is necessary to keep all parts of spindle clean and entire. As far as the spindle or its parts are not mounted, attend it with engine oil.

5. Delivery extent

exchangeable spindle diameter Ø	30	30	32	40
clamping head	1	1	1	1
exchangeable spindle	1	1	1	1
union nut	1	1	1	1
distance ring 5	1	1	1	3
distance ring 10	-	-	-	-
distance ring 15	1	1	1	1
distance ring 20	3	1	3	3
distance ring 30	2	1	2	3
open wrench	1	1	1	1
socket wrench	1	1	1	1
clamping chuck:				
nut		1		
insert Ø 8 mm	-	1	-	-
clamping chuck Ø 12 (12,7) mm		1		
wrench 10	1	-	1	1
wrench 12	-	1	-	-
wrench 41	1	1	1	1

