H.WINTER HOLZTECHNIK

OPERATION MANUAL

FOUR SIDE PLANER

WINTER TIMBERMAX 4-18 S

WARNING!

The operator must thoroughly read this manual before operation.
Keep this manual for future reference.

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TO OUR CUSTOMERS

This manual contains all the instructions required for the faultless operation of the machine and its respective maintenance, as well.

Thus, during the warranty period, you will receive for free all components that have presented eventual defects.

The producer is always at your disposal for resolving of problems that machine operators may encounter during operation, and for delivery of spare parts, too.

CONTENTS

SECTION A: GENERAL DATA

A.1. MANUFACTURER

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A.2. INTRODUCTION

The present manual is designed for those who will operate the machine. You will find in it the necessary data for assembly, commissioning, maintenance and safety operation of the machine. The experience of the company manufacturer and its experts in considered in the preparation of this manual.

We recommend you to consider with responsibility our recommendations concerning the safety of work. The operations requiring disassembly of machine and electrical components should be performed by authorized and qualified personnel only. Repairs and settings not described in the present manual should not be performed. This manual is prepared by the manufacturer and is an integral part of the machine's delivery. The information contained herein is intended for specialists and is compulsory.

The manual defines the machine's field of application and contains all the information necessary for its proper and safety operation.

The permanent and exact observation of the instructions contained in this manual ensure safety of personnel and machine, profitable work as well as long life of the machine itself.

For better clarity this manual is divided in separate parts in which are contained the more important subjects.

The contents will allow you to find fast the specific subjects.

The important text is printed in bold and is marked by the following symbols:

This means that you should proceed very carefully in order to avoid situations that could be dangerous to human life or may cause serious injury to the personnel.

Provides information about situations that may occur during the life of the product, the system or the equipment and that may cause injury to the personnel, damages on the machine, environmental pollution or financial loss.

Means that you should be more cautious in order to avoid material damage.

Very important instructions.

Some figures and information in this manual may not coincide with those of the machine purchased by you.

The producer is constantly working on the improvement and renovation of the product and may introduce modifications without prior notification.

At preparation of this manual are considered all the operations belonging to "normal servicing". Repair works and other operations not mentioned in the manual should not be undertaken.

All operations requiring disassembly of machine parts should be carried out by technically qualified personnel.

The instructions of this manual should be observed for correct usage of the machine.

The manufacturer should not be held responsible for damages caused by the use of spares which are not original.

INFORMATION

The machine can be operated and serviced only by specially trained personnel, well acquainted with this manual.

A.3. CORRESPONDENCE

In case of technical problem please contact the Seller or Service department.

In the correspondence or telephone call with them concerning the purchased machine please supply the following information:

- Machine serial number
- Operating voltage and frequency
- Date of production
- Detailed description of the eventual failure
- Detailed description of the working process
- Total time of operation – working hours;

In case of enquiry concerning the electrical part is necessary to provide the data from the name plate.

A.4. NAME PLATE

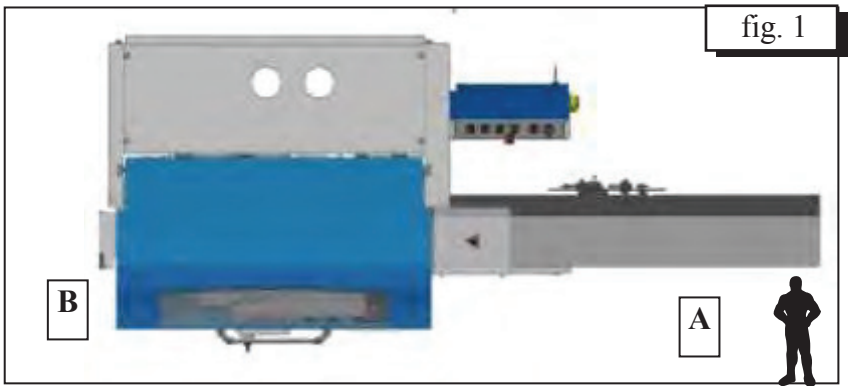
A.5. FIELD OF APPLICATION

The four-sided planner is designed for simultaneous machining on all four sides of the workpiece during the manufacturing of wooden products as well as partially profiling of machined workpiece.

This machine is designed for machining solid wooden material and materials with technological and physical properties similar to these of the wood. The machine user is fully responsible for damages caused by processing inappropriate materials..

A.6. WORKING CONDITIONS AND REQUIREMENTS

fig. 1



Working places

ATTENTION

This machine is designed to be serviced by two workers only.

A – working place for machine control and feeding material.
B – working place for acceptance of the material.

Tools that may be used:
Only tools meeting the EN 847-1/2 standard requirements could be installed and used on this machine.

Working environment

The machine is designed for operation under the following environmental conditions:

Humidity	Max 90%
Temperature	Min +1°C Max +40°C
Altitude	Max 1000 m

The machine should not be open-air operated.
The machine should not be operated in environment presenting danger of explosions.

Defense to operate

- The operation of the machine under conditions differing from those above mentioned is prohibited.
- The operation of the machine without the protection devices provided, as well as the removal of any part of those devices, is prohibited.
- Materials differing from those described above may not be processed on the machine.
- Tools that do not comply with pr. EN847-1 and tools, whose dimensions do not comply with the cutting disk shaft diameter, may not be used.
- Introduction of modifications in the machine is prohibited.

The sole and exclusive liability in case of injury of personnel and damages of the machine as a result of processing of unspecified materials shall be borne by the machine operator.

A.7. TECHNICAL CHARACTERISTICS

	STANDARD VERSION		VS-20N1
1	Finished workpiece max. width	mm	180
2	Finished workpiece min. width	mm	25
3	Finished workpiece max. thickness	mm	105
4	Finished workpiece min. thickness	mm	10
5	Workpiece min. length		
	- single workpiece feeding	mm	350
	- serial feeding	mm	250
6	Maximum allowance for each of the four sides (single-side)	mm	10
7	Number of operating spindles		4
8	Spindle revolutions	min^{-1}	6000
9	Spindle diameters	mm	40
10	Cutting head diameters	mm	120
11	Horizontal spindles operating length	mm	190
12	Vertical spindles operating length	mm	120
13	Feeding speed	m/min	6 ; 12
14	Feeding rollers diameter	mm	120
15	Feeding table length	mm	1700
16	Table height, considered from the floor	mm	920
17	Table and fence adjustment range	mm	10
18	Spindles motor power	kW	4.0
19	Feeding motor power	kW	0.8 / 1.1
20	Total installed power	kW	17.1
21	Working voltage	V	400 +6/-10%
22	Power frequency	Hz	50
23	Suction hole diameters	mm	2x120/150
24	Velocity of the suction air	m/s	min 20
25	Flow rate of the suction air	m^3/h	2900
26	Overall dimensions		
	- length	mm	2730
	- width	mm	1170
	- height	mm	1550
27	Net weight	kg	950

A.8. NOISE CHARACTERISTICS

A continuous noise exposure over above 85 dB (A) may result in health injury. That is why we recommend using in such cases noise protection devices like ear-plugs, earphones, etc.

Statement on the emitted noise:

1. /A/ weighed level of noise pressure at idle

L_{pfA} = 96.7 dB

Indefiniteness K = 3 dB

2. /A/ weighed level of noise power at material processing

- L_{wA} = 100.7 dB

Indefiniteness - K = 3 dB

At 95% probability

SECTION B: SAFETY OF WORK

B.1. SAFETY INSTRUCTIONS

Before commissioning, use, servicing, repair, cleaning or any other operations on the machine read very carefully this manual.

The manufacturer shall not be liable for any damages on the machine or any injury of personnel occurred as a result of failure to observe the operation, maintenance and safety instructions.

- Only people well acquainted with the operation and especially with the risks related to the operation of such types of machines who are in full control of their mental capabilities are allowed to work with this machine.
- Do not operate the machine without following the specified safety instructions and with disabled safety equipment.
- Strictly observe the operating and maintenance manual.
- During all operations for preparation for work, troubleshooting, maintenance, etc., disconnect the machine from the power supply by disconnecting the power plug from the socket.
- Prior to start the machine operation, check the availability and good working condition of the safety equipment.
- Working with gloves is forbidden.
- After work, clean thoroughly the machine from dust and shavings.
- Do not clean the machine with water when connected or disconnected.
- Keep clean the working space around the machine.
- Prior to start the works, remove all adjustment tools from the machine.
- Always bear in mind that the machine must be switched off prior to connection to the electric mains.
- Prior to starting the machine, make sure that the connection to the electrical network is performed correctly.
- Use the machine and tools only for the purpose for which they are designed.
- Do not work with the machine in wet environment and do not leave the machine under the rain or low temperature conditions.
- Never leave the machine working without control when you are away from it.
- Do not work with loose clothes, loose hair or long stoles.
- Remove any bracelets, watches, necklaces or similar items.
- The sleeves of the working clothes must be always well buttoned up.
- Work with the machine using ear protection against the noise if necessary.
- Always use protecting goggles, dust mask and other prescribed safety means.
- Keep children away from the machine and ensure that the machine could not be started by children.
- Young men under 16 years old could work on the machine only under the supervision by experienced adult specialist.
- Prior to start the operation, check the workpieces for defects, such as: loosen knots, cracks, nails, metal objects or other impurities.
- Use only perfectly sharpened tools.
- Do not use cracked, damaged or incorrectly sharpened tools or tools with incorrect forms.
- Always store the tools carefully and do not allow unauthorized people to touch them.
- All machine adjustments must be carried out on a switched-off machine.
- Do not clean the tools using wire brush and do not use water in any case.
- Never open the safety covers or doors during the machine operation.
- Always work with safety equipment, tools, etc., in good working conditions.
- Do not touch the movable parts or materials by bear hands or other limbs.
- Process on the machine only materials it is designed for.
- Ensure appropriate lighting (500 lux) which must not dazzle the eyes and avoid stroboscopic effects.

- ➟ Unauthorized personnel must not perform repair or maintenance works on the machine.
- ➟ Transport, installation and assembly works for the machine must be assigned only to qualified personnel having the required skills and equipment for such purposes.
- ➟ All interventions in the machine electrical equipment can be performed exceptionally and solely by qualified personnel with respective knowledge in such areas.
- ➟ Never perform modifications in the machine electrical installations.
- ➟ Do not start the machine with opened control panel or motor covers.
- ➟ Sufficient space must be available around the machine in order to ensure that the operator is always out of the danger areas.
- ➟ Regularly clean the machine rollers of dust and shavings.
- ➟ While the machine is stopped for adjustments, repair, maintenance, cleaning, and other works, place the main switch in zero position, warn other people by means of warning label and lock the starting device using padlock.
- ➟ The padlock key must be stored by the authorized person operating the machine.

Training of servicing staff

All people operating the machine must be trained for that purpose as well as on how to make the necessary adjustments.
In particular, the training must include the following:

Main principles of the machine drive, correct operation of the machine, correct adjustment as well as the use of accessories for certain types of machining operations.

The operating personnel must be informed about the dangers during the use of the machine as well as about the respective protection measures.
The operating personnel must have the required knowledge and must be trained for regular inspections on the protecting equipment.
The operating personnel must be informed for the use of protecting equipment.

Additional dangers

Despite of observation of all safety and use rules according to this Operation and Maintenance Manual, the following risks could occur:

- Contact with the tools;
- Contact with rotating drive parts, etc.;
- Risk of splitting the workpiece or parts thereof;
- Risk of dust pollution during operation.

However, safety depends mainly on you.

➟ Note that while you operate the machine you always take a risk.

ATTENTION

Failure to observe the safety instructions or improper use of the machine represents a major risk for the operating personnel.

B.2. DESIGN MEASURES FOR ENSURING SAFETY FOR WORK

The four-side planner is equipped with the following safety equipment:

➟ ***Safety cover for the whole working area.***

➟ ***Safety covers for all moving parts (milling tools, belt pulleys, belts, chain pulleys, chains, etc.).***

➟ ***Protecting air suction housings of all spindle units.***

➟ ***Perfectly sharpened tools***

Blunt tools could overload the machine and produce bad surfaces after machining. They could lead to workpiece splitting.

➟ ***The profile of the feeding rollers is made in such a way that it could avoid the so called "kickback".***

➟ ***Tunnel from the machine inlet equipped with size limiter for the fed workpieces in order to avoid placing workpieces of unallowable sizes.***

➟ ***Controls located in suitable points.***

➟ ***Overload and overheating protections for the motors (thermal contacts) are provided.***

➟ ***Minimum voltage protection***

In case of voltage drops the machine stops operation and does not automatically restart after voltage recovery.

In order to restart the machine operation it is necessary to proceed to the same operations as during the initial start of the machine.

➟ ***Machine and motor housing are neutrally earthed in order to avoid electric shocks.***

➟ ***The electrical panel and motor are protected against dust penetration (IP 54).***

➟ ***Emergency stop on main panel.***

SECTION C: ASSEMBLY OF MACHINE

C.1. REQUIREMENTS TO THE WORKING AREA

- Select suitable location of the machine taking into account the moving of the input and output workpieces.
- Observe the instructions described in Section **B**.
- The preselected machine location must ensure suitable connection to the power supply network and dust / shavings suction device.
- Secure suitable lighting (500 Lx), which does not blind eyes and avoids stroboscope effects.
- Check the floor loading capacity taking into account that the machine must be leveled on its three support points together.
- Install the machine at a suitable location taking into consideration its dimensions, the space required for arrangements, taking in and out the machined workpieces and keep sufficient space for the unobstructed moving of the machine operator.

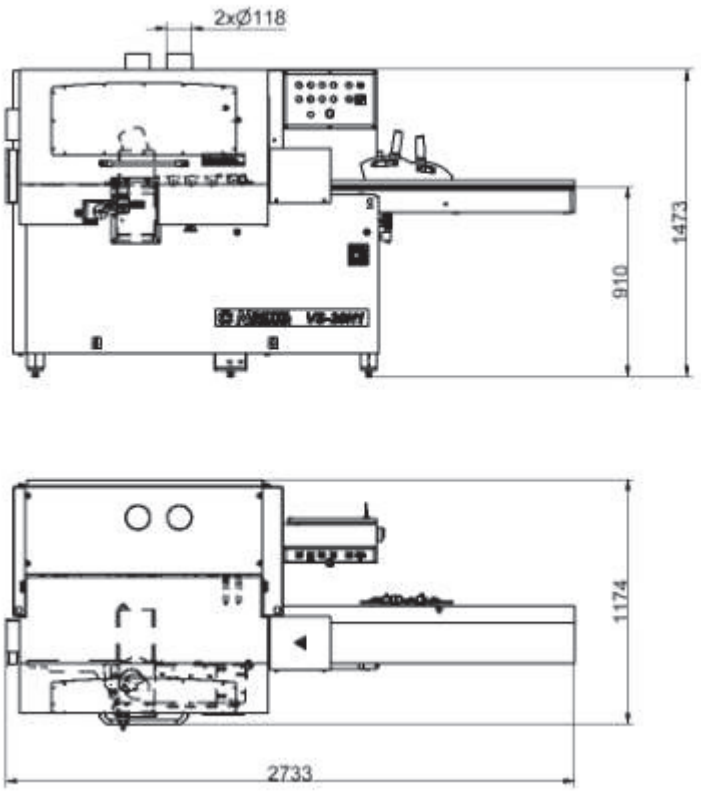


fig. 2

C.2. UNLOADING OF MACHINE

The machine is transported packed in wooden case in compliance with the standard requirements. In order to avoid damages on the protruding parts and to spare place in the case, the machine is delivered partially disassembled.
The fixing points of the ropes during the lifting and handling operations with the machine are marked on the machine package.

The lifting and handling the machine must be performed using appropriate personnel who are specially trained for such types of works and possess the required equipment.

WARNING

During loading and unloading the machine, work very carefully without hits and shocks in order to avoid personal injuries and damages to the goods.

During lifting and handling the machine, no people must present near the hanged loads or within the crane operation range.

The unpacking of the machine must be carried out, as follows:

- Carefully unnail the case.
- Unpack the machine and all its parts and accessories which are nailed to the cradle or packed in a cardboard box.
- Check the availability of the machine according to the packing list. Note to check all accessories and all requested elements. In case of undelivered items inform your seller.

After the machine has been freed from the cradle, you can lift it using whip or other non-metal ropes or belts with the required load capacity and length.

The ropes must be hanged on the crane hook; therefore the load capacity of the crane must comply with the machine weight.

WARNING

Check if the lifting hooks are securely fixed to the machine body.

- Adjust the ropes correctly and if necessary slightly move the crane in order to provide vertical and stable lifting without tilting the machine. The machine must be lifted slowly and with great care in order to avoid pushes or swinging the load.

Once the machine is lifted approximately 1 m from the ground, stop the lifting and unscrew the leveling bolts in order to release the transport plates and retighten the bolts.
Place the machine on the selected location.
Level the machine using the leveling bolts in order to achieve stable position.

During the lifting and handling the machine, no people must be present near the hanged loads or within the crane operating range.

The shifting of the machine and its parts must be carried out only by transportation means that correspond to the weight of the machine, e.g.

- fork-lift truck;
- crane;

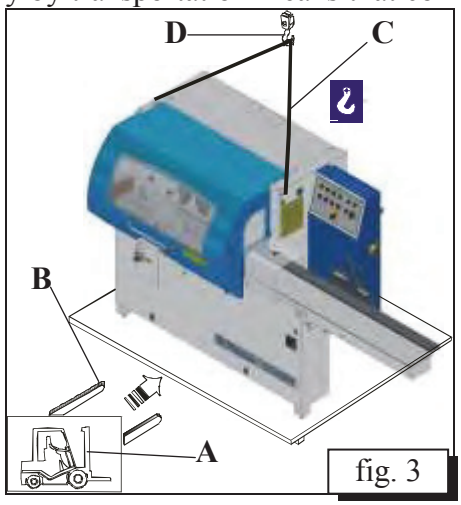


fig. 3

ATTENTION

For hoisting of the machine you will need a fork-lift truck with fork long at least 1400 mm.

- Ensure a fork-lift truck **A** with the required loading capacity corresponding to machine's weight.
- The engine truck forks **B** must be led to the machine as shown on Figure 3 (exactly under the labels "Arrow").

In case you dispose of crane or other similar means, act as follows:
- prepare 2 ropes or belts **C** with the required loading capacity and length.
- The ropes should be hung on the hook of crane **D** with loading capacity corresponding to that of machine's weight.
- Hang the ropes in the points marked with hook labels provided for lifting the machine and lift the load using the crane.

WARNING

Check the secure fixing of the hoisting hooks to machine's body.

- ➟ Adjust the ropes well and, if required, the crane should move slightly apart in order to ensure the stable vertical hoisting without inclination of the machine.
- ➟ The machine must be hoisted slowly and with extreme precaution in order to avoid pushes and swinging of the load.
- ➟ Place the machine on the chosen location by means of the crane.

Level the machine using the leveling supports in order to achieve stable positioning. The permissible diversion during the leveling of the working table in both directions is ± 0.25 mm.

C.3. DESLUSHING OF MACHINE

Remove the anti-corrosion grease from all unpainted machine parts using kerosene, turpentine or ordinary cleaning products commercially available.

Do not use nitro- thinners or similar diluents and by no means use water.

C.4. FOUNDATIONS LAYOUT

The stable construction of the machine, ensuring precise leveling and vibration-free operation does not require any foundations.

C.5. ASSEMBLY OF THE DISASSEMBLED UNITS

For transportation and packing purposes some of the machine parts are delivered in disassembled condition.
This machine is delivered fully completed and no additional installation is required.

C.6. CONNECTION TO THE MAINS

ATTENTION

The connection of the machine to the electric mains, as well as all subsequent checks, must be carried out by electrical technician only.

- Check by suitable apparatus the good condition of the nullifying and earthing device.
- Check if the power voltage and frequency meet the data specified on the machine type plate. Deviations in the power voltage of ± 5 % are permissible (e. g. a machine with 230 V working voltage can work within a voltage range from 210 up to 240 V).
- In order to determine the required power cable cross section use the data specified in the machine type plate as well as the following table.
- We recommend using rubber-lined power cable of **H07RN (WDE0282)** type and taking protection measures against mechanical damages, as well.

Electric current (A)	*Section of the cable*	*Fuse*
Up to 10	2.5 mm^2	12A AM
from 10 to 14	4.0 mm^2	16A AM
from 14 to 18	6.0 mm^2	20A AM
from 18 to 22	6.0 mm^2	25A AM
from 22 to 28	10.0 mm^2	32A AM
from 28 to 36	10.0 mm^2	40A AM
From 36 to 46	16.0 mm^2	50A AM

- There must be a short-circuit fuse available in the power network where the machine is powered.
- In case of CEE socket (230 V, 32 A), the connection to the power network must be carried out through respectively powered CEE plug (L, N, PE).

C.7. CONNECTION TO THE ASPIRATION DEVICE

The chip and dust aspiration device must ensure a minimal rate of air delivery of 1800 m^3/h at a speed of 25-30 m/sec.

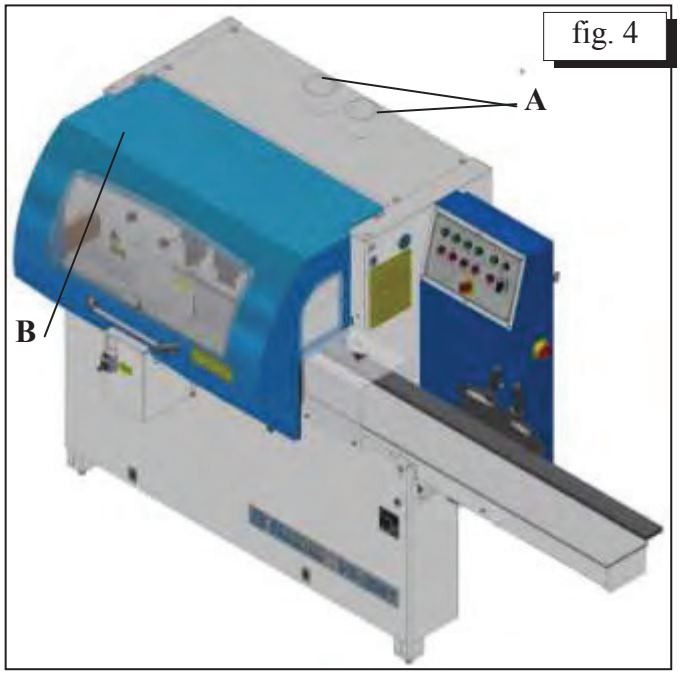


fig. 4

ATTENTION

The dust and chips aspiration device must be switched on simultaneously with the motor of the machine.

The milling heads are the machine points where dust and shavings are released during operation.

All milling heads are equipped with shavings-separators which through flexible suction hoses are connected to air suction plugs **A** (Figure 4) of ø120 mm and **B** of ø150 mm located on the machine enclosure.

SECTION D: FITTING AND OPERATING OF MACHINE

D.1. OPERATING OF MACHINE

Machine layout (fig. 6)

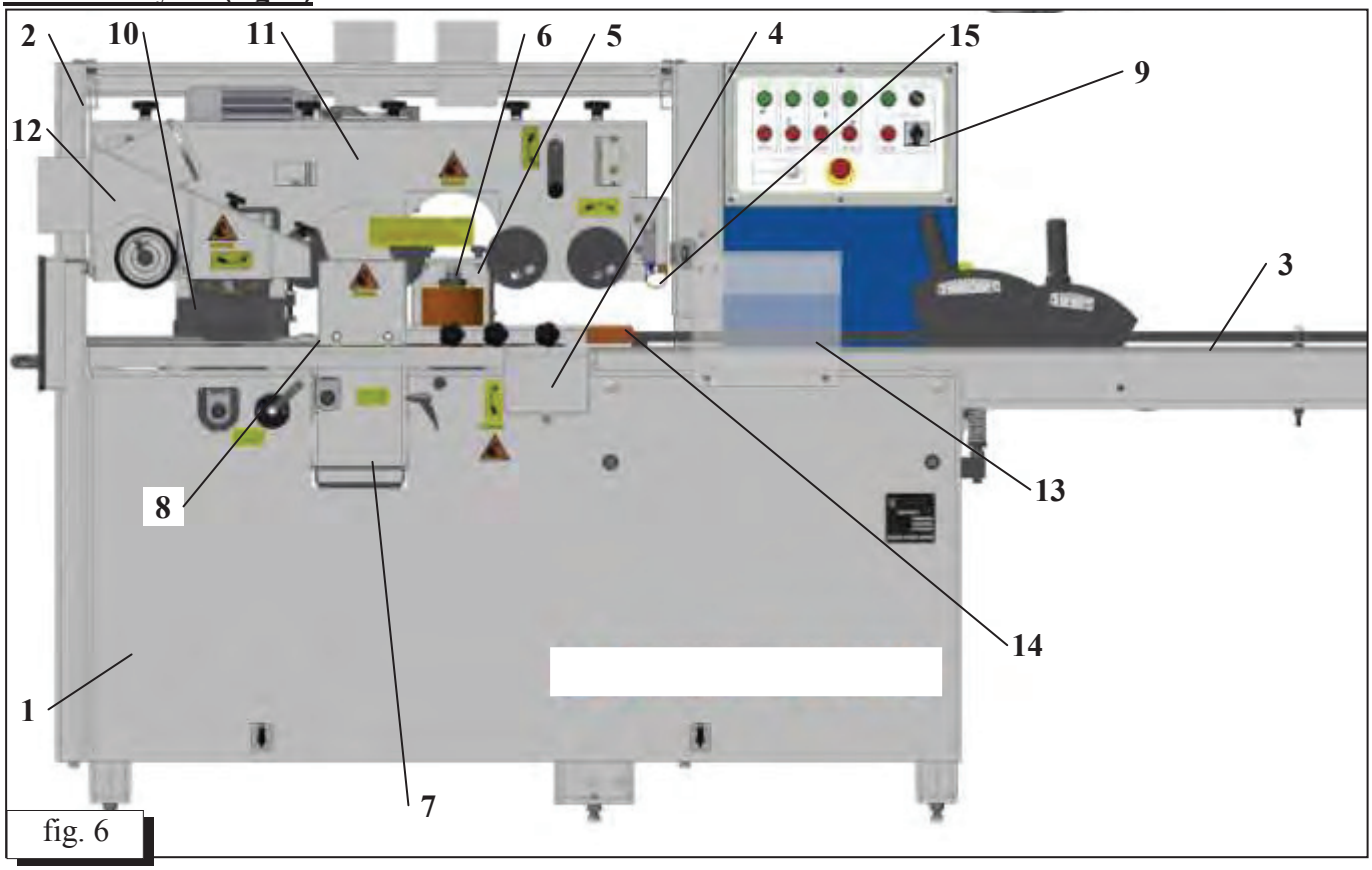


fig. 6

1. Housing
2. Enclosure
3. Adjustable table, complete
4. 1st spindle set
5. Intermediate table
6. 2nd spindle set
7. Movable table
8. 3rd spindle set
9. Electrical panel
10. Lifting device
11. Feeding group
12. Splitter fuse
13. Fuse
14. Maximum width allowance limiter
15. Single side height allowance limiter

D.2. MACHINE CONTROL PANEL

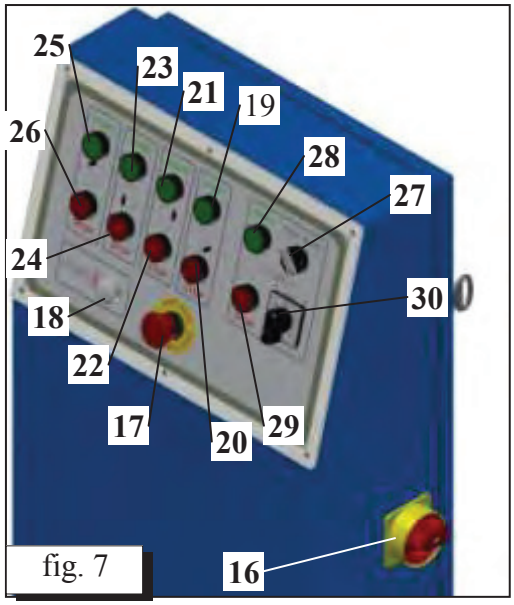


fig. 7

Control (fig. 7)

16. Main switch – It is used to switch on and off the machine power supply. It is possible to be locked in "0" position in order to avoid undesirable machine starts. It is operated by turning. Position "1": on. Position "0": off.
17. Emergency stop button – It is used for emergency stop of the machine. It is operated by pressing and the button locks in pressed position. It must be reset by turning in right hand direction or pulling. When the emergency stop button is not reset the machine cannot be turned on.
18. Signal lamp. It lights in case of machine turned on.
19. 1st spindle start. Operated by pressing.
20. 1st spindle stop. Operated by pressing.
21. 2nd spindle start. Operated by pressing.
22. 2nd spindle stop. Operated by pressing.

23. 3rd spindle start. Operated by pressing.
24. 3rd spindle stop. Operated by pressing.
25. 4th spindle start. Operated by pressing.
26. 4th spindle stop. Operated by pressing.
27. Feeding type switch – pulse (TEST) or normal (AUTO) feeding.
28. Feeding start (works with all spindles on).
29. Feeding stop.
30. Feeding speed switch.

D.2. STARTING THE MACHINE

ATTENTION

Prior to start operation, always check the safety devices. Observe safety operation instructions according to the maintenance manual.

The machine starting is carried out by the following procedure (fig. 7):

1. Turn the main switch **16** in "1" position.
2. Select the feeding speed by the switch **30**.
3. Press subsequently the green buttons – start **19, 21, 23, 25** and **28** to start spindle rotation and feeding.

D.3. STOPPING THE MACHINE

Normal machine stop

The machine stop is carried out by the following procedure (fig. 7):

- Press the red buttons – stop **20, 22, 24, 26** and **29** by which the machine operation stops.
- Turn the switch **16** in "0" position.

Emergency stop

The emergency stop is carried out by pressing the emergency stop button **17**.

ATTENTION

The machine must not be stopped from the main switch 16 except in emergency situations.

D.4. OPERATION

Prior to start machine operation you must:

1. Check if the tools are clamped.
2. Check if the machine protecting devices are in correct positions.
3. Turn the main lockable switch **16** (Figure 7) in "1" position and then the machine becomes live (the control lamp **18** lights).
4. Ensure that the emergency stop button **17** is not pressed.
5. Ensure that the machine safety cover is closed (locking made using end-switch - lock). The machine safety cover cannot be opened with rotating spindles. The opening of the machine safety cover is possible after the spindles are stopped and time set by the time switch (approximately 30 sec.) is expired in order to increase the working safety.
6. Press the "START" buttons (**19, 21, 23, 25**) for rotation of the spindles 1 to 4.
7. Select suitable feeding movement speed by the switch **30**.
8. Using the mode switch "TEST / AUTO" (**27**) select pulse feeding (TEST mode) or continuous feeding (AUTO mode).
9. Press the start button for the feeding movement (**28**). According to the position of the mode switch "TEST / AUTO" (**27**) the movement will be of pulse or continuous type.

10. The maximum allowance on the upper side (approximately 10 mm) of the fed material is limited by end switch **15** (Figure 6) (with its operation the feeding movement stops).
11. The maximum allowance on the left side (approximately 10 mm) of the fed material is limited by mechanical stop **14** (Figure 6).
12. The machine stop is carried out by subsequent pressing of the buttons **20, 22, 24, 26** and **29** (Figure 7).

1. Pressing the emergency stop button **17** stops all movements. Time switch ensures additionally that the opening of the safety cover is possible once the spindles are fully stopped.

ATTENTION

Opening the machine safety cover is possible after switching off and full stop of all the machine spindles (it is necessary to press the stop or emergency stop buttons).

D.6.1. Spindle unit I (lower horizontal spindle)

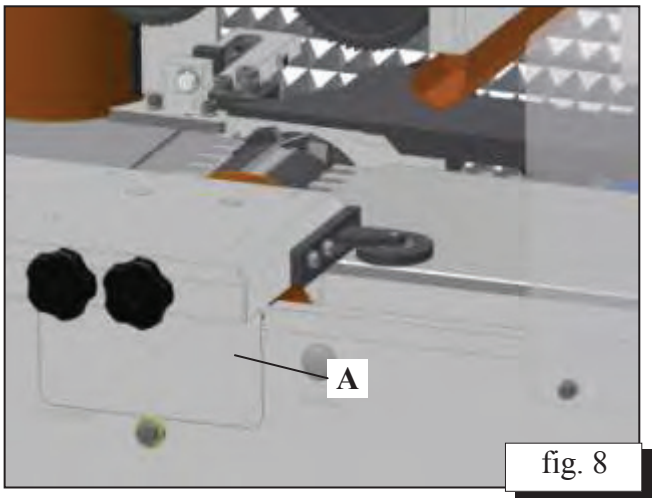


fig. 8

Prior to start the operations ensure that the safety cover **A** (Fig. 8) is installed correctly.
The lower horizontal spindle can be adjusted in vertical direction. For that purpose, first remove the safety cover **A** (Fig. 8), loosen the screw **B** (Fig. 9) and then perform the adjustment procedure using the screw **C**. Replace the safety cover **A** (Fig. 8).
Check the alignment of the milling head cutters against the fixed table. You may use wooden gauge or dial indicator.
In order to perform more precise guiding of the machined workpiece it is possible to install end milling cutter on the lower horizontal spindle axis. It consists of a body and carbide bits. With the help of the end milling cutter make preliminary cleaning of the lower part of the right side of the machined workpiece which leads to straightening of the workpiece right side and precise guiding of it along the fence.
If end milling cutter is used the end stop **D** (Fig. 9) must be adjusted according to the following procedure:

1. Release both crews **E**.
2. Adjust the end stop using the screw **F**.
3. Retighten the screws **E**.

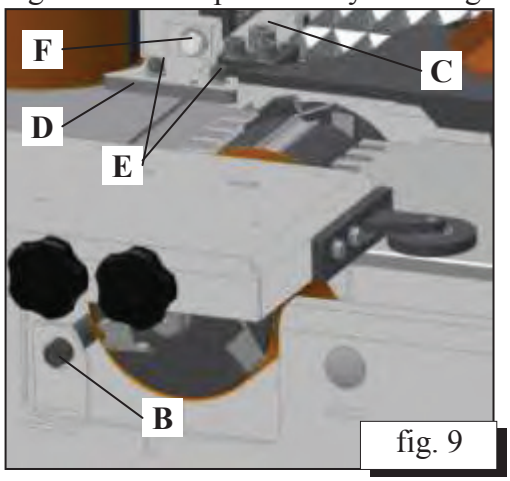


fig. 9

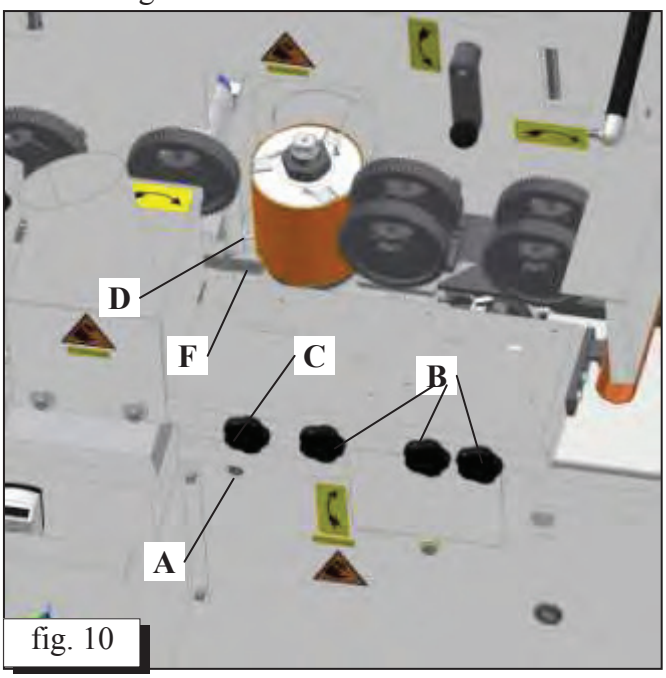


fig. 10

In case of abatements of the milling cutter bits they should be reversed or changed. After each disassembly of the end milling cutter, the end stop **D** should be readjusted according to the procedure described above.

D.6.2. Spindle unit II (right vertical spindle)

The adjustment of the right vertical spindle must be carried out using the differential screw **A** (Fig. 10) however the screw **D** must be unscrew before that.
After adjustment, the alignment of the milling cutters against the fence **F** must be checked.

D.6.3. Spindle unit III (left vertical spindle)

The desired width of the machined workpiece is achieved by side movements of the left vertical spindle. This is achieved by turning the screw **C** (Fig. 11) and before that the handle **A** must be unscrewed. The movement amount is read on the specially designed counter **B**.

In order to perform better guiding of the workpiece during the machining and to avoid the possible vibrations, a number of guiding and pressing elements are provided.

During the feeding movement before the left vertical spindle is reached, the workpiece is pressed to the guide fence by pressing rollers. The pressing force can be adjusted using the three handles **B** (Fig. 10). Using the fourth handle **C** the adjustment of the pressing force of the shavings separator of the left vertical spindle can be carried out.

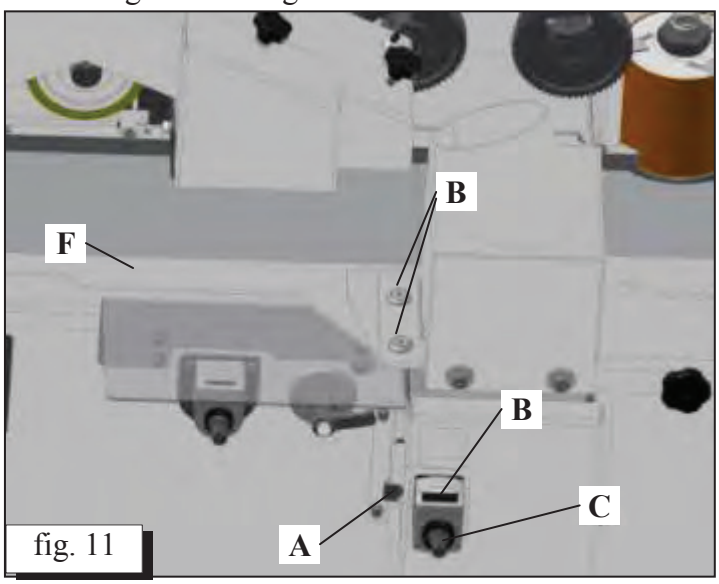


fig. 11

Then, adjust the guide **F** (Fig. 11) located after the left vertical spindle. To do this, the workpiece must be stopped in the moment when it reaches the end of the pressing plate. Unscrew the two screws **B**, touch the pressing plate to the workpiece and retighten the two screws.

D.6.4. Spindle unit IV (upper horizontal spindle)

The upper horizontal spindle is installed on a vertical guide. Horizontal bar is installed on it supporting the feeding groups. Owing to this, the reaching the desired finished product thickness is achieved using one single adjustment by raising or lowering the horizontal bar.

The access to the milling head is performed by removal of the safety cover **A** (Fig. 12).

The height adjustment of the upper horizontal spindle is carried out by turning the screw **C** after the handle **F** is released. The moving amount is read by the specially designed counter **B**.

In order to avoid possible vibrations during the machining process, pressing elements are provided also in this unit. These pressing elements are the following:

1. Pressing plate that presses the workpiece before machining by the upper rizontal spindle. The pressing force can be adjusted by the handle **D**.
2. Pressing plate **E** that presses the finished product after machining by the upper horizontal spindle. The plate position is selected after releasing the two screws. We recommend that the plate plane to be at approximately 0.2 mm under the milling head.

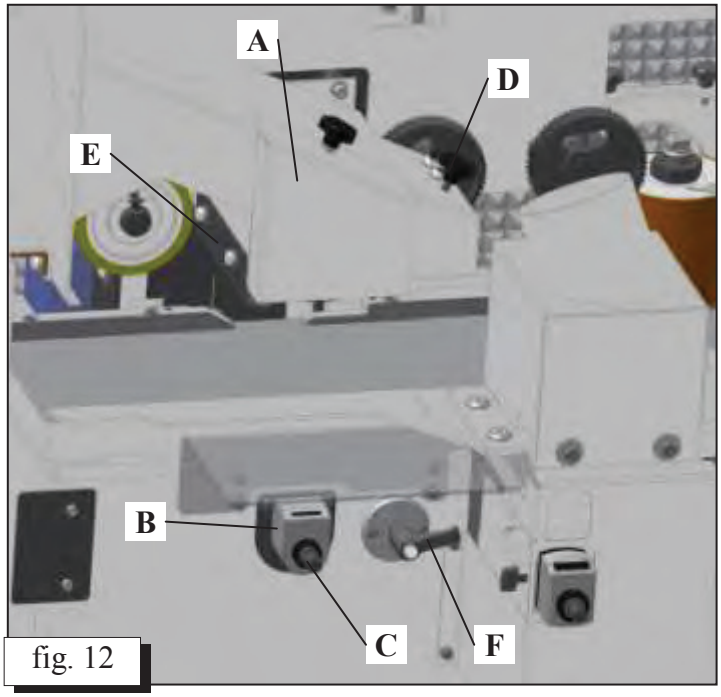


fig. 12

D.6.5. Feeding group

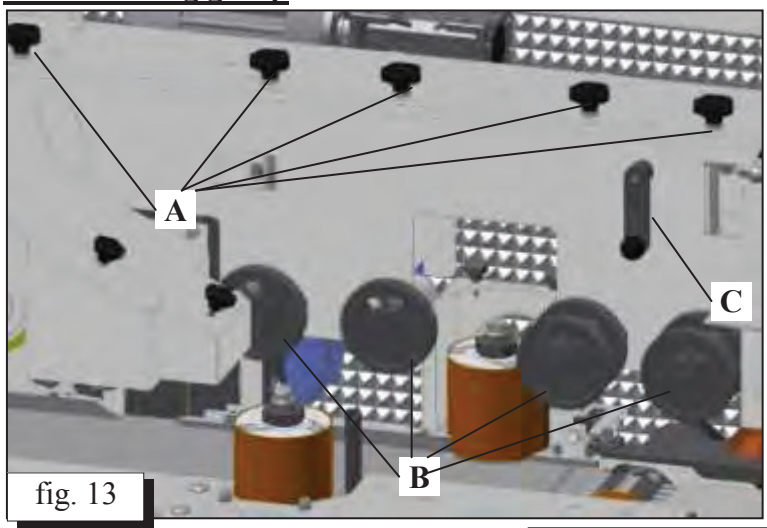


fig. 13

The machine feeding system is used to move the workpiece during the machining. It consists of 5 motor driven shafts, 4 of which are equipped with toothed wheels **A** (Fig. 13). The 5th wheel is rubber-lined in order to avoid damages to the finished product. The pressing force of the feeding wheels can be adjusted individually by 5 handles **B**, one for each wheel. In some cases it is necessary the first toothed wheel located before the lower horizontal spindle not to take part in the workpiece feeding. For that purpose, it can be raised using the handle **C**.

D.6.6. Adjustable table and fence

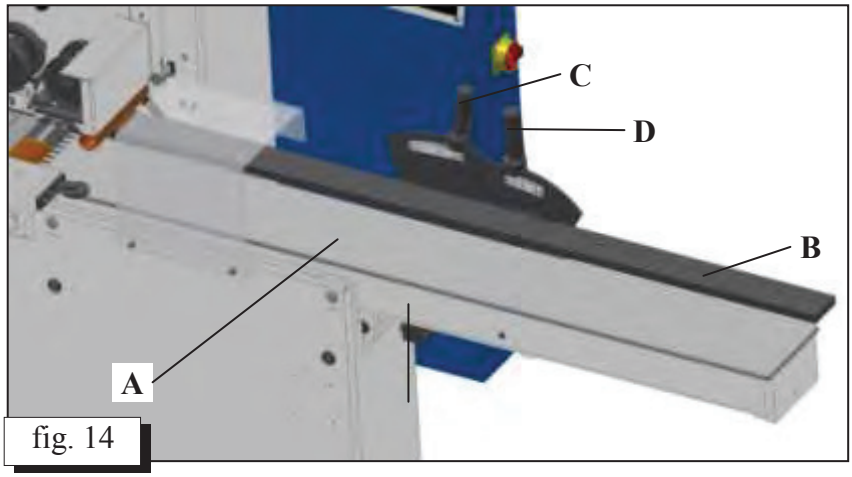


fig. 14

The feeding table **A** (Fig. 14) and side limit fence **B** are equipped with handles for quick and easy adjustment of the thickness of the removed layer of material, on the lower and right sides of the machined workpiece, respectively, within 10 mm. This function of the machine is useful for use when frequent changes of workpieces of various thicknesses of the machining allowances are necessary.

The adjustment of the feeding table is performed by unscrewing the handle **C**, moving to the desired size and subsequent retightening.

In similar way is carried out the adjustment of the fence by the handle **D**.

The amount of the machining allowance is read by the respective measuring scales. The distances between each two graduating marks are equal to approximately 1 mm. The accuracy of the measuring scales is ensured by the precise setting of the parallelogram units used in the design. Additional setting of the parallelogram units is carried out using eccentric sleeves only by competent and authorized persons.

D.6.7. Adjustment and installation of milling heads

WARNING

One of the most important preconditions for normal operation of the machine is to keep the good working conditions of the milling heads. They must be very well balanced. The pairs of cutters located opposite to each other must have equal weights and must be always replaced in pairs. The lowest weight differences cause high vibrations to occur in the machine in case of high rotation speeds of the spindles.

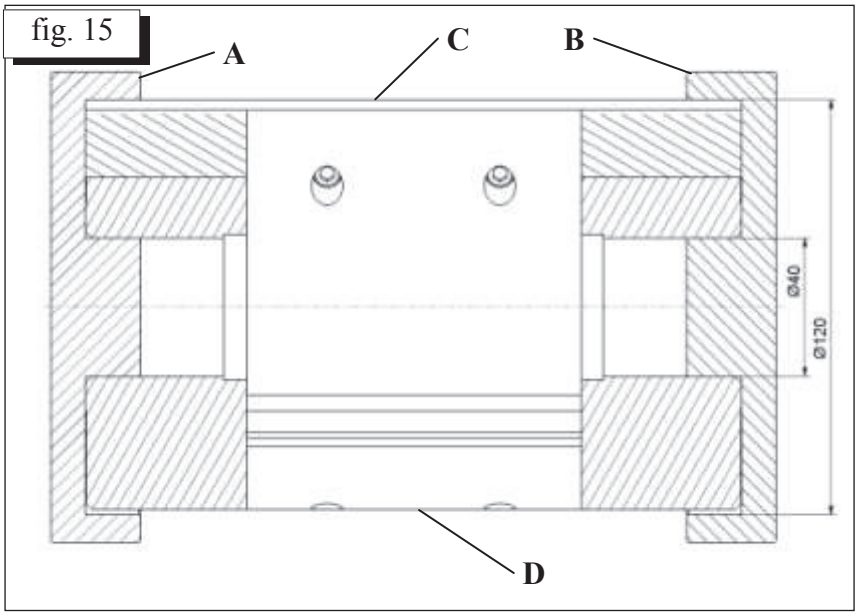
In order to be set, the milling head must be removed from the spindle using two wrenches – one is the special wrench attached to the machine and the other wrench is 17 – 19. Then, it must be disassembled on its components which must be cleaned carefully. The cutters and wedges must be placed on place and you must ensure that they do not protrude laterally from the milling head body. No interchanges between the elements of one milling head and other milling head are permissible during the reassembly works.

Special accessory delivered with the machine must be used to set the milling heads. This accessory consists of 2 identical gauges **A** and **B** for ø120 which must be placed in the hole on both sides of the milling head **D** (Fig. 15).

The adjustment must be carried out in the following order:

1. Press the cutters to get into the milling head body and tighten them by the end screws.
2. Place the gauges **A** and **B** (Fig. 15) in the hole on both sides of the milling head **D**.
3. Release the end screws so they must release the cutter **C** very slightly and its cutter edge must touch the gauges under the springs below the cutter. Thus, it is ensured that the cutter will rotate along diameter equal to the gauge diameters, namely – 120 mm.
4. Tighten lightly all screws diagonally till normal tightness is achieved without the use of wrench extensions.

fig. 15



5. Repeat steps 3 to 4 for other milling head cutters.
6. Once again check the correct tightness of all cutter screws.
7. Take out the gauges from the milling head.

Repeat the above procedure for all milling heads on machine.

ATTENTION

Using end milling cutter, check that the milling head cutters are protruded not higher than 2 mm because in such case they could touch the end milling cutter. Otherwise, readjustment of the respective milling head is required.

Prior to the setting the cutters, ensure cleanness of the contact surfaces of the cutters and milling head.

After the setting of the milling heads, you should install them on the respective machine spindles. Removal or placing the cutters before the milling is removed from the spindle is forbidden.

SECTION E: DESCRIPTION OF MACHINE

E.1. TECHNOLOGICAL PART

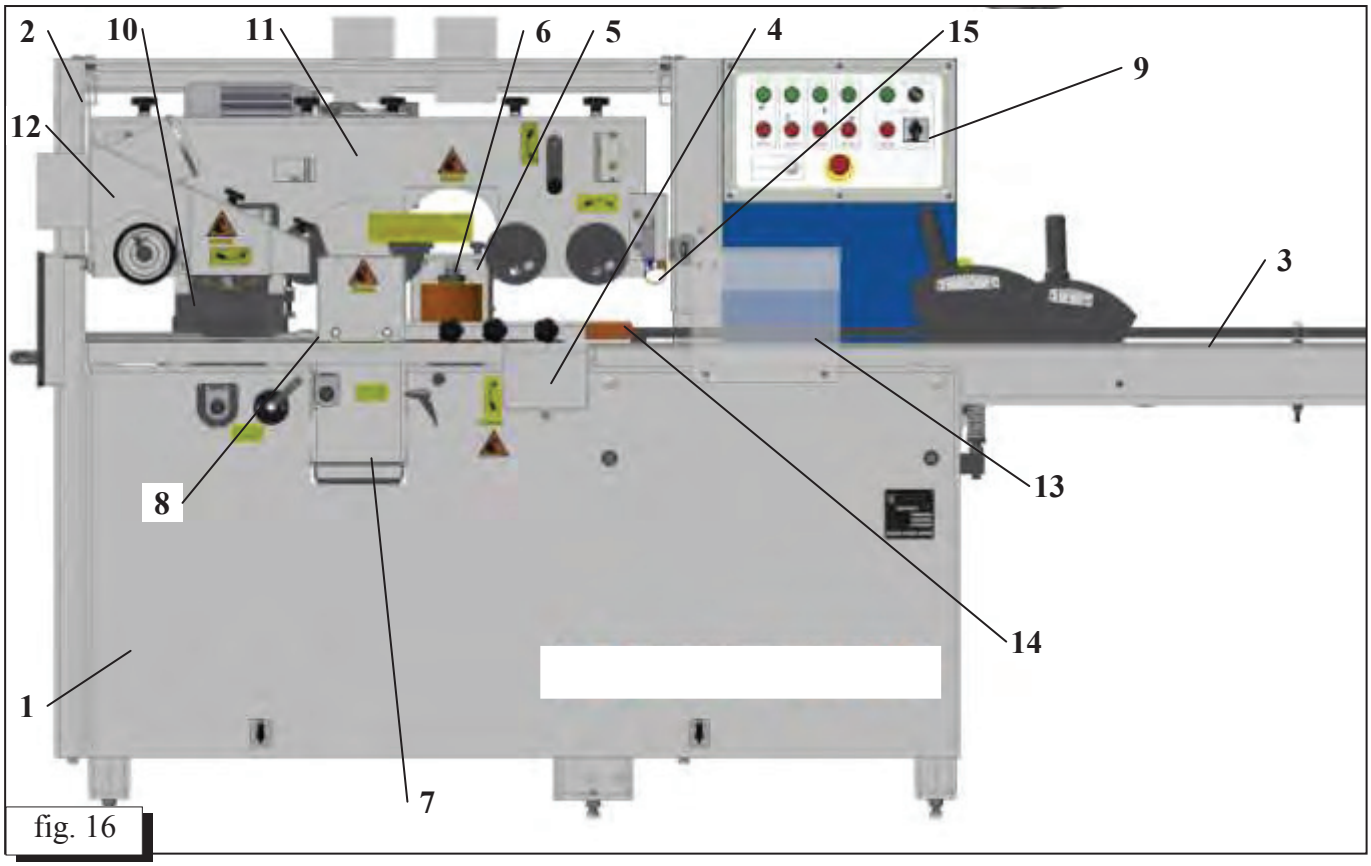


fig. 16

1. Housing
2. Enclosure
3. Adjustable table, complete
4. 1st spindle set
5. Intermediate table
6. 2nd spindle set
7. Movable table
8. 3rd spindle set
9. Electrical panel
10. Lifting device
11. Feeding group
12. Splitter fuse
13. Fuse
14. Maximum width allowance limiter
15. Single side height allowance limiter

The machine general layout is shown on Fig. 16. It consists of the following main parts: housing, adjustable table on which the machined workpiece is fed; spindle units; feeding group; lifting gear and electrical cabinet.
The first milling head must be adjusted in such a way that the cutter cutting edges must be on the same height as the fixed table.
The same is valid also for the adjustment of the second milling head and its cutters must be aligned to the fixed fence.
The positions of the 3rd and 4th milling heads are adjusted according the workpiece size that are required to be achieved.

E.2. ELECTRICAL PART

The machine is equipped with:
- thermal protection for the electric motor;
- lockable circuit-breaker and locking timer for the opening of the safety cover in case of rotating spindles;
- the electric equipment is dust and moisture protected (IP 54);
- emergency stop button on the control panel;
- electrical interlock in case that the maximum machining allowance on the workpiece upper side is exceeded.

SECTION F: MAINTENANCE

F.1. CLEANING OF MACHINE

The general (complete) cleaning will guarantee long life of the machine and is one of safety factors.

WARNING

Prior to any attempt of repair, maintenance, cleaning, etc., operations, you must disconnect the machine power supply, and to lock the main switch by padlock.

This machine needs regular cleaning.
After each working shift:

1. Check the air suction heads of the milling spindles, working tables, recesses around the feeding group, motor compartment and clean them from dust and machined material shavings. If the air suction ducts are obstructed it is necessary to check the efficiency of the air suction system.
2. Clean the working place around the machine.
3. Also the hoses of air suction ducts must be removed regularly and if there are any obstructions or collected dust these obstructions must be eliminated.

F.2. LUBRICATION OF MACHINE

Prior to commissioning the machine, start operation and especially when the machine has not been worked for a long time it should considered the machine lubrication. Inspect carefully all the machine, check and lubricate all points designed for that.
All bearings used in the machine are enclosed and have integrated greases, so they do not need any lubrications during the whole their service life. The screw pairs of the left vertical spindle and upper horizontal spindle as well as the guides of the lifting device of the upper horizontal spindle should be lubricated every week using grease and the feeding group chains – two times a month. We recommend the use of grease of one of the following types: *Shell Alvania 2, Shell Alvania 3, FAG Arcanol L38, -L71, -L78* or equal grade products.
The reduction gear lubricant must be changed at each 1000 working hours. The reduction gears must be lubricated using transmission grade oil *SAE 80, SAE 80 WEP* or similar grade products.
The left vertical spindle guides must be lubricated with oil once in a week. We recommend the use of the above oils.

Regular and careful lubrication of the above machine elements is a precondition for continuous and seamless machine operation.

F.3. CHECKING THE CONDITION OF SOME UNITS AFTER OPERATION

The safety machine operation depends on the safety equipment described in **Section B**.

Before starting any maintenance works on the machine disconnect the electric supply, unplugging it from the mains.

F.3.1. Chain tension

This procedure is recommended to be performed only by experienced and qualified personnel. The following procedure must be followed:

1. Remove the machine rear cover.
2. For tensioning the chain **A** unscrew the screws (1, Fig. 17) and the chain slackens.
3. Perform tensioning the chain using 2 eccentric bolts (2, Fig. 17) delivered with the machine. For that purpose, they must be inserted in their respective holes and turned in the required direction in order to achieve the required tension.

4. Lock the chain puller support using the screws (1, Fig. 17) and take out the eccentric bolts.
5. Repeat the above procedure for the other chain **B**.
6. Replace the feeding device cover and machine rear cover.

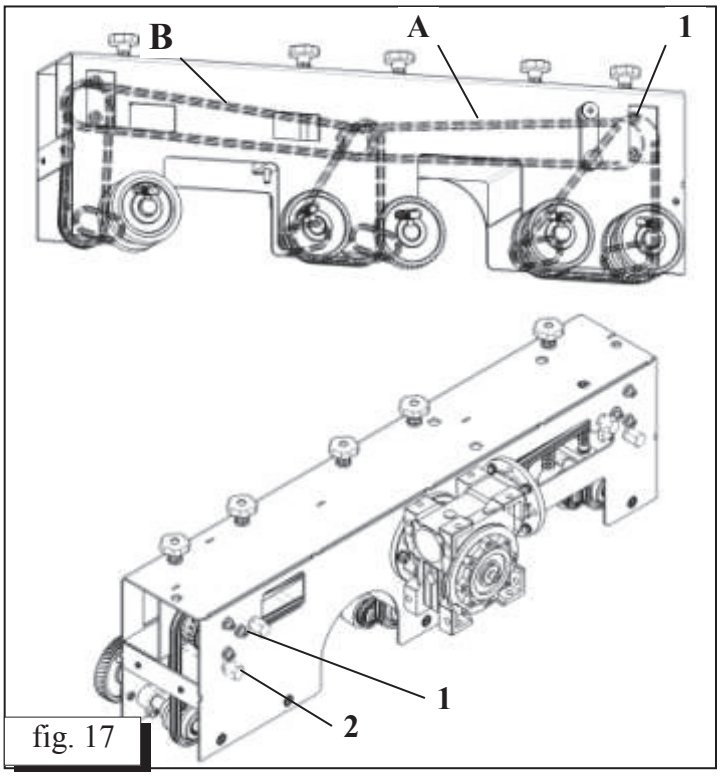


fig. 17

Every week check the emergency stop as follows:
In normal machine operation press the emergency stop button. The motors must stop.

Regularly check the presence of the warning signs on the machine and their good conditions.
The labels must be available and they must be clearly readable.
This is valid especially for the "Safety instructions" label.

Taking the machine out of operation, storage – disassembly (disposing) the machine.
During the taking the machine out of operation, disconnect the electrical equipment.
If the machine is not to be used for a long time after the disconnection of the electrical equipment, clean the machine carefully and treat the guides, rollers and other unpainted parts with anti-corrosion agent.
The machine must not be stored in wet rooms and it must be protected against weather conditions.
The machine is manufactured of non-toxic and non-harmful materials. In case of disposal of the machine, separate the metal parts from the plastics and then reduce them to scrap.

Emergency situations (conditions)

In case of flooding the working place, disconnect the power supply immediately.
Prior to restart the machine operation, the machine must be inspected by trained authorized technician.
In case of fire, disconnect the power supply immediately and use fire-extinguishers.
Direct the spray in the flame base.
Prior to use the machine again, it must be inspected by trained authorized technician.
The working area around the machine must be always free of objects.
The machine must not be used in explosion dangerous areas.

F.4. TROUBLE-SHOOTING

WARNING

Before starting any repair works switch off the electric supply of the machine.

After the assembly in the manufacturer's plant, the machine has been tested, so after installation in the working room observing the instructions in this Manual, it would work perfectly. Reasons for any failures normally could be incorrect operation of the machine, overloading the motors, dirty relay or contactor contacts, incorrect operation of the end stops, disconnections of any wire or short-circuits.

In the text below the most occurring defects, possible reasons for their occurrences and methods of troubleshooting are summarized.

Fault:
The machine does not start

Reason:	**Repair:**
- The emergency stop button is tripped.	Reset the emergency stop button through opening of the safety cap.
- Power failure on one or more phases.	Check if all 3 phases are live.
- The safety cover is open.	Close the safety cover.

Fault:
The machine is stopping during the work

Reason:	**Repair:**
- Power failure on one or more phases.	Check if all 3 phases are live.
- Heavier work compared to the machine capacity (overloading). The motor thermal contact is tripped.	Wait until the motor cools down. Do not overload the machine.

Fault:
Workpiece feeding stops during work

Reason:	**Repair:**
- The workpiece thickness is not permissible.	Stop the machine and take out the workpiece.

Fault:
Workpiece lower side is curved.

Reason:	**Repair:**
- The lower horizontal spindle is lower or higher than the machine fixed table level.	Adjust the lower horizontal spindle till the cutters and fixed table become even. For that purpose, use smooth wooden block placed on the fixed table. Turn the spindle slightly by hand and adjust it until the cutters start to touch the wooden block slightly. (Turn full revolution in order to find the highest cutter).

Fault:
The workpiece right side is curved.

Reason:	**Repair:**
- The limiter (**D**, Fig. 9) is not aligned to the end milling cutter.	Align the limiter to the end milling cutter.
- The right vertical spindle is not aligned to the fixed fence.	Adjust the right vertical spindle until the cutters and fixed fence become aligned. Use wooden block and precede as in case of adjustment the lower horizontal spindle to the fixed table (see above).

Fault:
Curves and defects on the workpiece left side.

Reason:	**Removal:**
- The left pressing elements and rear guide plate (**F**, Fig. 11) are not adjusted.	The pressing elements on the machine left side must be adjusted in order to press the workpiece to the fence securely and the rear guide plate must be set parallel to the workpiece (see Section D.6.3.).

Fault:
Curves and defects on the workpiece upper side.

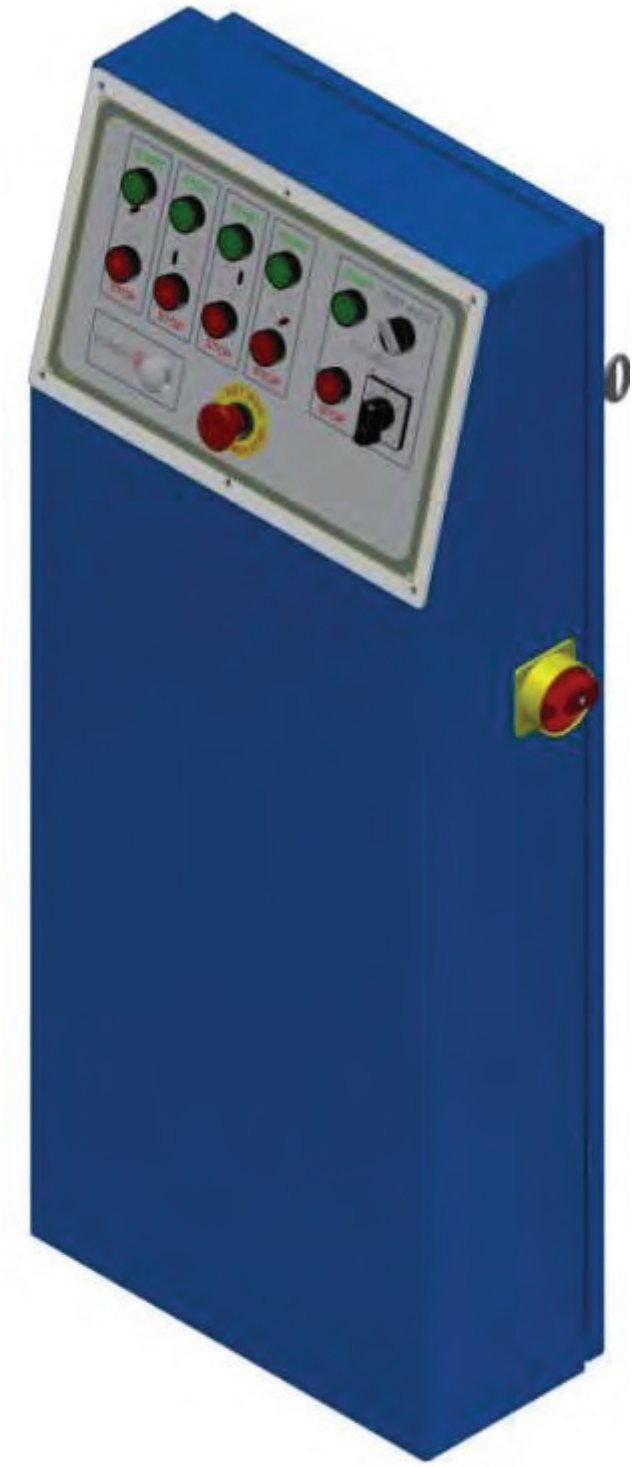
Reason:	**Removal:**
- The front or rear pressing plates of the upper horizontal spindle are not adjusted correctly.	Adjust the front and rear pressing plates of the upper horizontal spindle (see Section D.6.4.).

Ensure that the milling heads are adjusted perfectly using the special accessory. (The optimum position of the cutters is when they protrude approximately 1 mm above the milling head).

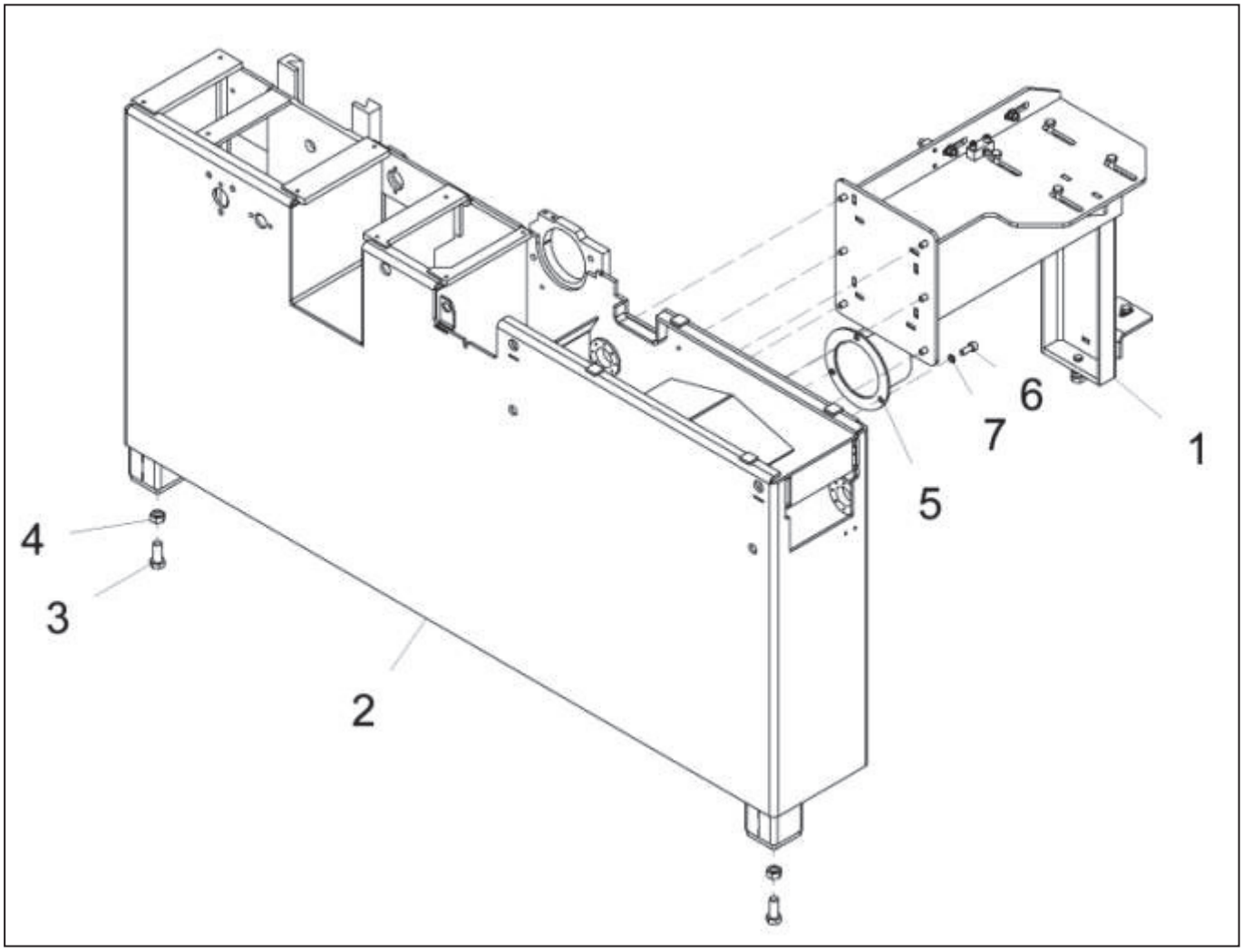
SECTION G: APPENDICES

G.1. WIRING DIAGRAM AND LIST OF THE ELECTRICAL COMPONENTS

G.2. ELECTRIC CABINET – LAYOUT OF COMPONENTS

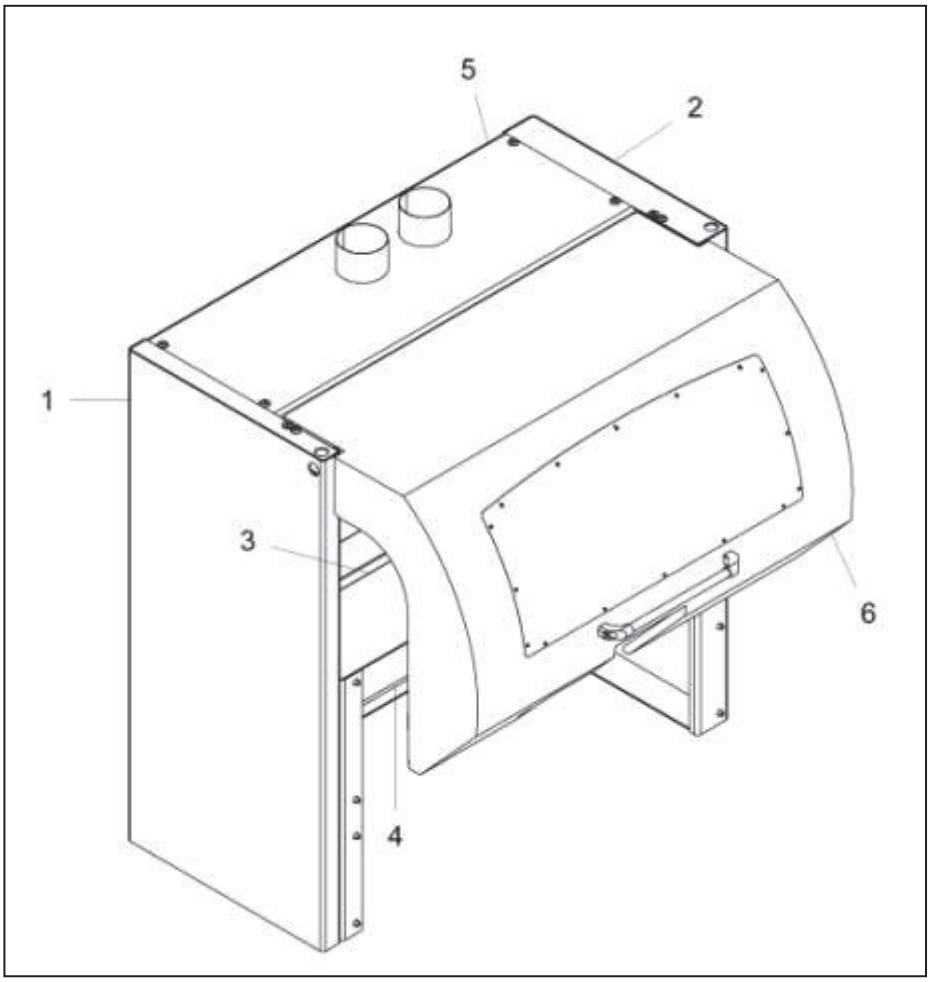


SECTION H: CATALOGUE OF SPARE PARTS



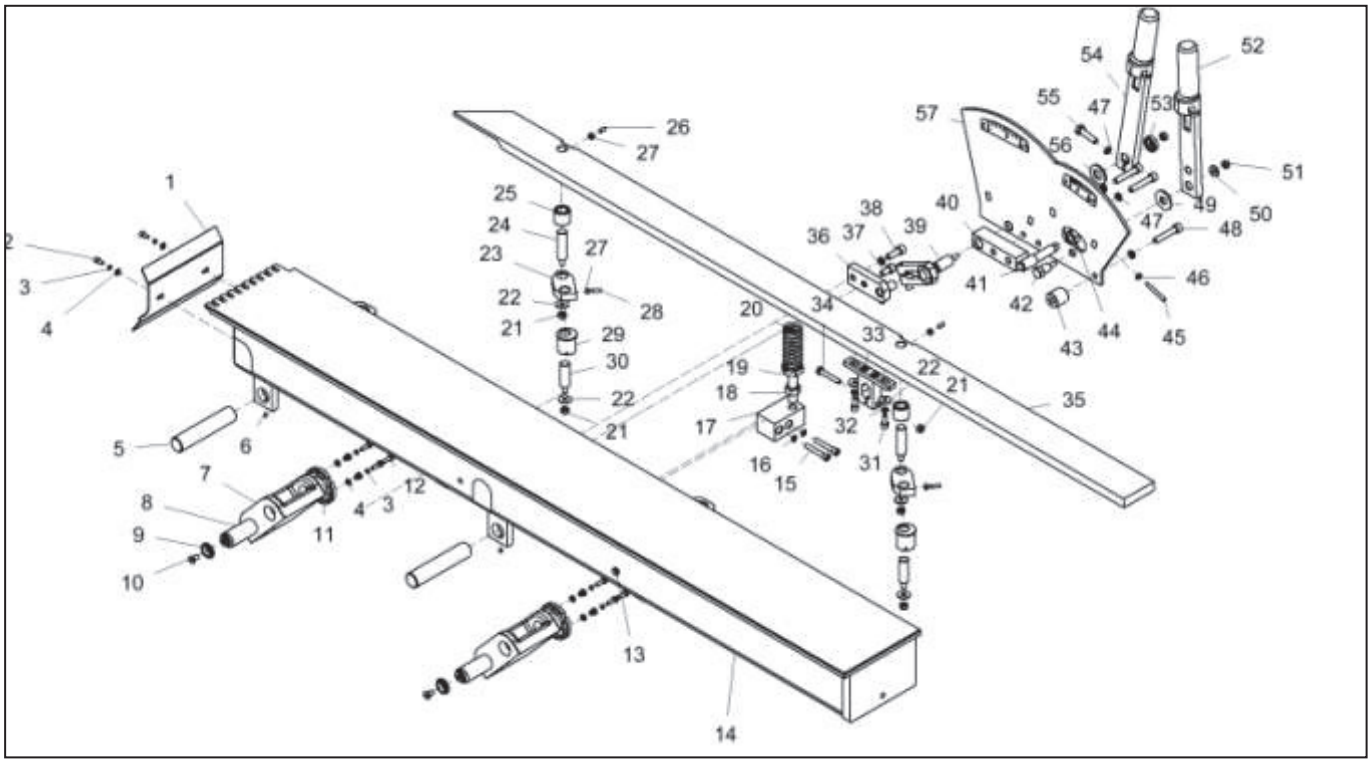
VS20N1.09.00.00.00 MAIN BODY

1	VS20N1.09.01.00.00	ELECTRICAL MOTOR STAND	1
2	VS20N1.09.00.00.00-ZAV	MAIN BODY -4 MOTORS.	1
3	DIN 933	BOLT M16x40	2
4	DIN 934	NUT M16	2
5	FSP.09.00.03S.00	PLUG	1
6	DIN912	SCREW M10x25	3
7	UN 792	WASHER M10	3



FSP.15.00.00.00 ENCLOSURE

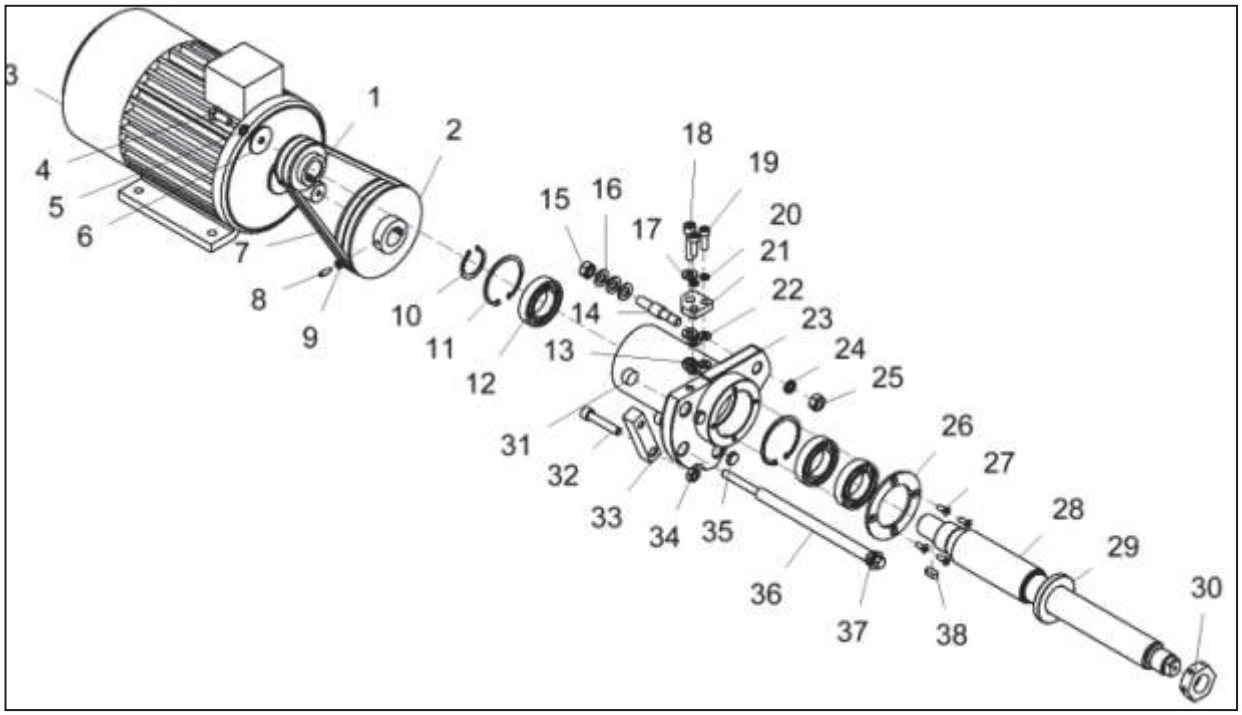
1	FSP.15.03.00.00	LEFT SIDE	1
2	FSP.15.04.00.00	RIGHT SIDE	1
3	FSP.15.05.00.00	REAR COVER	1
4	FSP.15.06.00.00	PROFILE	1
5	FSP.15.10.00.00	UPPER PROFILE	1
6	VS-20.15.10.00.00	MOVABLE COVER	1



VS20N1.01.00.00.00 ADJUSTABLE TABLE COMPLETE

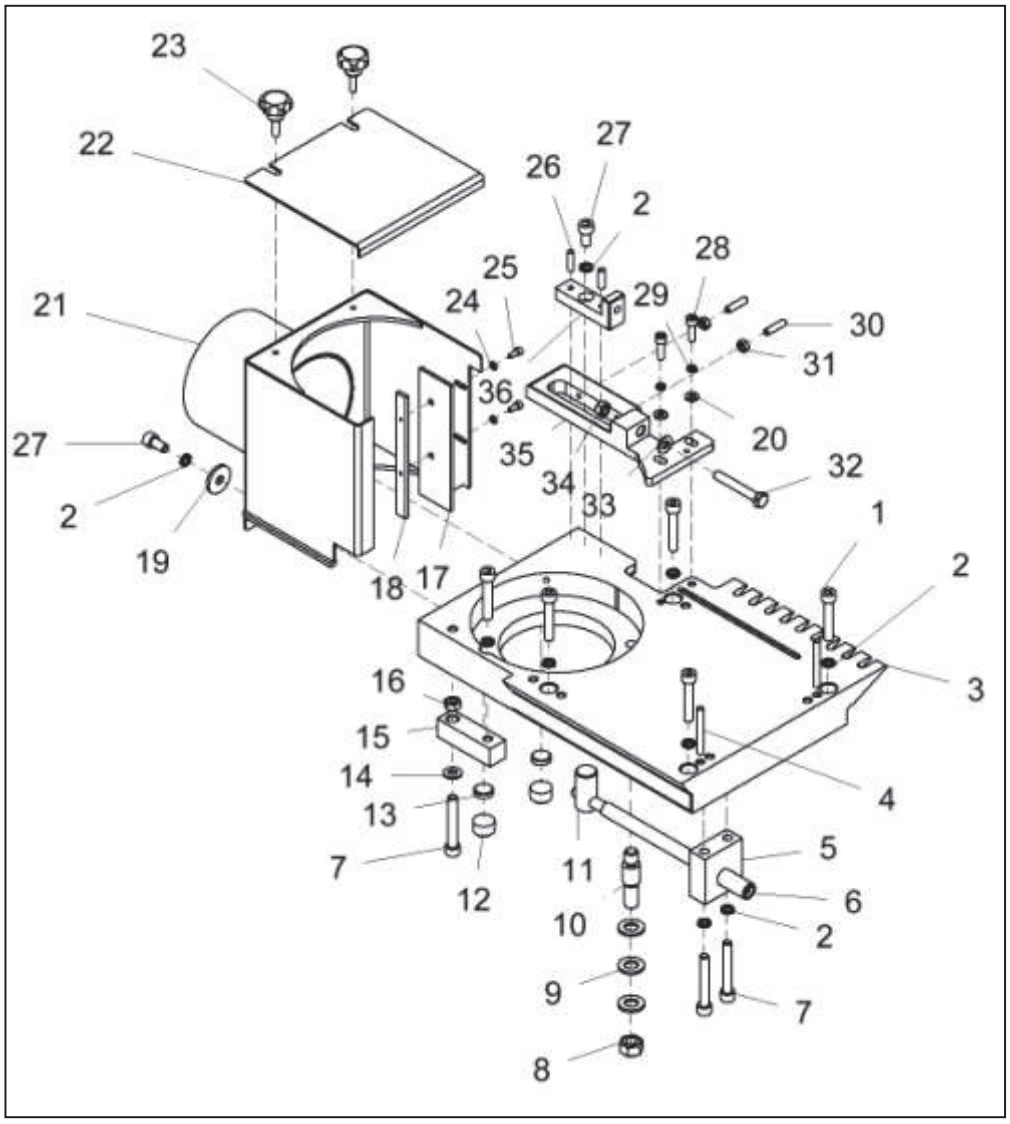
1	FSP.01.00.00.02	PROFILE	1
2	DIN 912	SCREW M 6X12	2
3	DIN 7980	SPRING WASHER 2-6H	10
4	DIN 125A	WASHER AM 6	10
5	FSP.01.00.00.06	AXIS	2
6	DIN 914	FIXING SCREW M 6 x 8	4
7	FSP.01.00.00.05	BODY	2
8	FSP.01.00.00.08	AXIS	2
9	FSP.01.00.00.22	WASHER	2
10	DIN 7991	SCREW M 8X16	2
11	FSP.01.00.00.11	FLANGE	2
12	DIN 933	BOLT M6X20	8
13	085 0140 699 03	LAMINATED PLUG ф14	2
14	VS20N1.01.01.00.00	ADJUSTABLE TABLE	1
15	DIN912	SCREW M8x50	2
16	DIN 7980	SPRING WASHER 2-8H	2
17	VS20N1.01.04.00.02	STOP BLOCK	1
18	DIN 934	NUT M16	1
19	VS20N1.01.04.00.01	TENSOR	1
20	VS20N1.01.04.00.03	SPRING	1
21	DIN 982	NUT M 8	5
22	DIN 9021 A	WASHER M 8	6
23	VS20N1.01.02.00.02	PARALLELOGRAM PLATE	2
24	VS20N1.01.02.00.04S	UPPER AXIS	2
25	VS20N1.01.02.00.05	BUSHING	2
26	DIN 914	FIXING SCREW M 6X16	2
27	DIN 934	NUT M6	6
28	DIN 914	FIXING SCREW M 6X20	4
29	VS20N1.01.02.00.06	ECCENTRIC BUSHING	2
30	VS20N1.01.02.00.03	AXIS	2
31	DIN 912	SCREW M8x20	2
32	DIN 7980	SPRING WASHER 2-8H	2
33	VS20N1.01.02.01.00	CONNECTOR	1
34	DIN 931	BOLT M 8X50	1
35	VS20N1.01.02.00.01S	FENCE - 80X20	1
36	VS20N1.01.03.02.00	STOP - BODY	1
37	DIN 912	SCREW M10X20	1

38	DIN 912	SCREW M10X30	1
39	VS20N1.01.03.01.00-ЧС	ECCENTRIC	1
40	VS20N1.01.03.00.01	CONNECTING RIM	1
41	VS20N1.01.03.00.05	AXIS	1
42	VS20N1.01.03.00.06S	SPECIAL BOLT MP	1
43	VS20N1.01.03.00.04	DISTANCE BUSHING	1
44	DIN 934	NUT M16	1
45	DIN 915	FIXING SCREW M 6X50	4
46	DIN 934	NUT M6	4
47	DIN 7980	SPRING WASHER 2-10H	6
48	DIN 912	SCREW M10X55	3
49	VS20N1.01.03.00.09	WASHER	1
50	DIN 7349	WASHER M8	1
51	DIN 982	NUT M 8	2
52	VS20N1.01.03.04.00-ЧС	LEVER - FENCE	1
53	VS20N1.01.03.00.08	BUSHING	1
54	VS20N1.01.03.03.00-ЧС	LEVER - TABLE	1
55	DIN 933	BOLT M10X40	1
56	VS20N1.01.03.00.07	SPECIAL WASHER	1
57	VS20N1.01.03.05.00	BASE	1



VS20N1.03.00.00.00 SPINDLE I COMPLETE

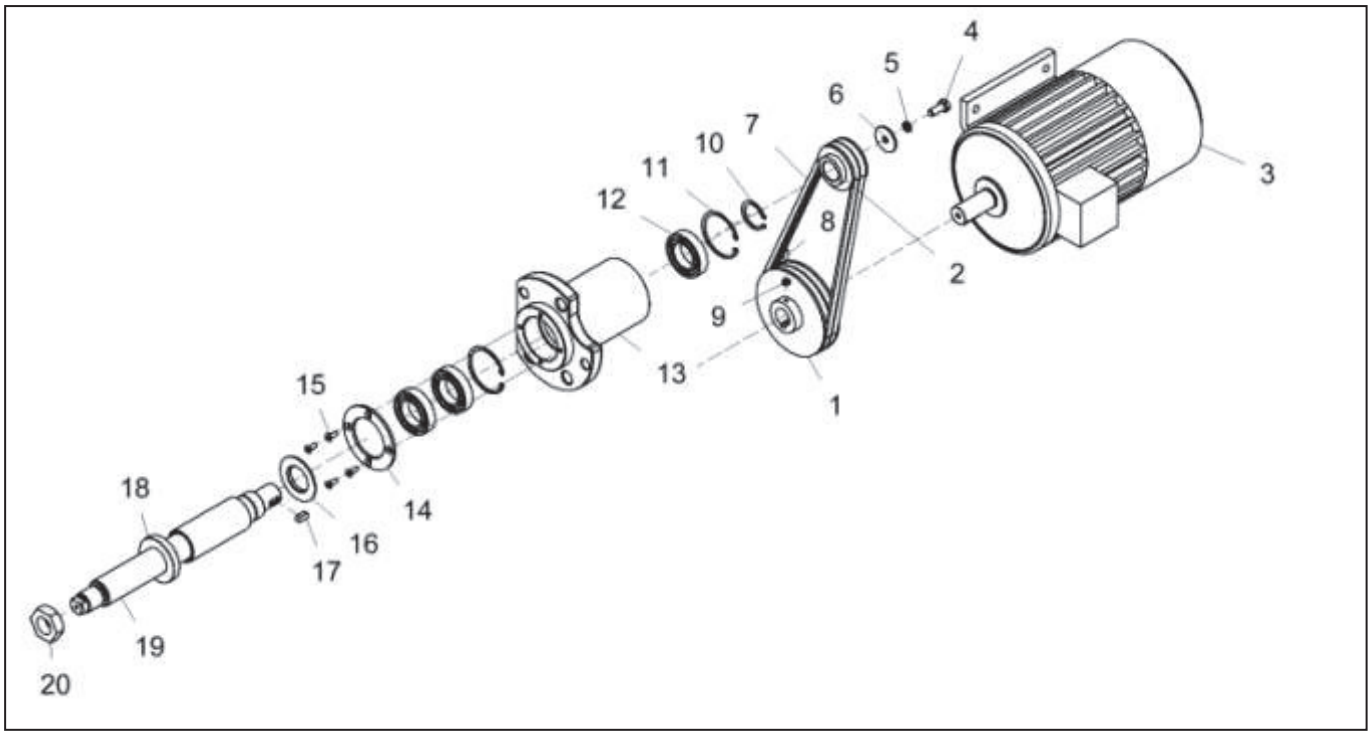
1	VS20N1.05.00.00.06	BELT PULLEY - H	1
2	VS20N1.05.00.00.07	BELT PULLEY - ELECTRIC MOTOR	1
3		ELECTRIC MOTOR	1
4	DIN 933	BOLT M10x25	1
5	DIN 7980	SPRING WASHER 2-10H	1
6	UN 732	WASHER Φ10XΦ40X2,5	1
7		BELT Z(10X6) L=780	2
8	DIN 914	FIXING SCREW M 6X20	1
9	DIN 934	NUT M6	1
10	DIN 471	RING FOR SHAFT ø40	1
11	DIN 472	RING FOR HOLE ø68	2
12		RADIAL BALL BEARING 6008-ZZ	3
13	DIN 985	NUT M10	1
14	FSP.03.00.00.15	AXIS	1
15	DIN 985	NUT M 12	1
16	DIN 125A	WASHER AM12	3
17	DIN 125A	WASHER AM10	2
18	DIN 912	SCREW M10X45	1
19	DIN 912	SCREW M8x25	2
20	DIN 7980	SPRING WASHER 2-8H	2
21	FSP.03.00.00.08S	PLATE	1
22	DIN 125A	WASHER AM 8	4
23	VS20N1.03.01.00.01	BEARING HOUSING I	1
24	DIN 7980	SPRING WASHER 2-12H	1
25	DIN 934	NUT M12	1
26	VS20N1.05.00.00.03	BEARING WASHER	1
27	DIN 7991	SCREW M 6X16	4
28	VS20N1.03.01.00.02	SPINDLE I	1
29	VS20N1.03.01.00.05	STOP WASHER	1
30	VS20N1.03.01.00.03	NUT M30 L	1
31	FSP.03.00.00.19	SCREW	2
32	DIN 912	SCREW M10X55	1
33	FSP.03.00.00.17	PLATE	1
34	DIN 934	NUT M10	1
35	FSP.03.00.00.20	PLUG	2
36	FSP.03.00.00.21	AXIS	1
37	FSP.03.00.00.22	BUSHING	1
38	DIN 6885A	COTTER A8X7X20	1



VS20N1.04.00.00.00 INTERMEDIATE TABLE

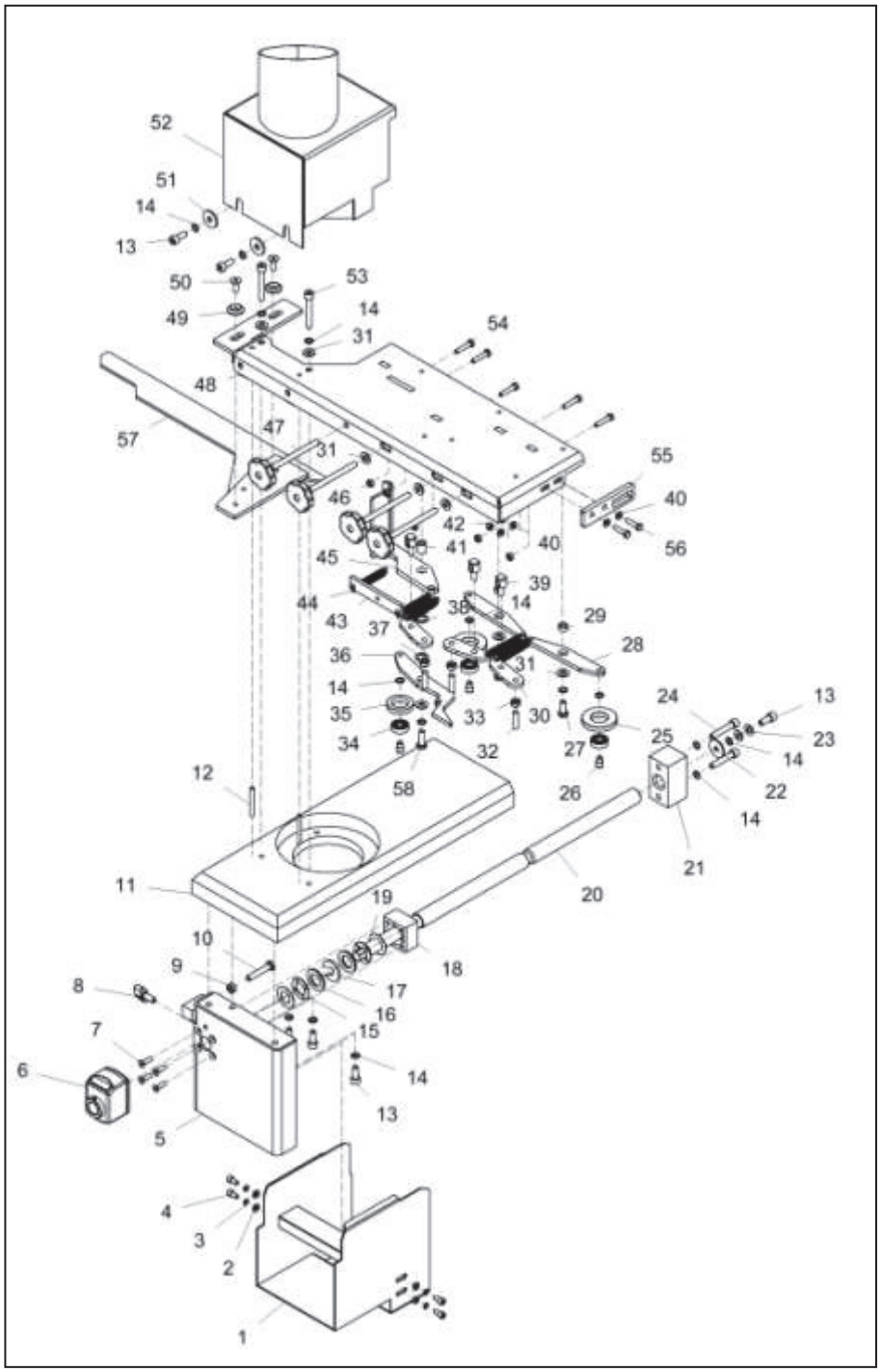
1	DIN 912	SCREW M8X45	5
2	DIN 7980	SPRING WASHER 2-8H	10
3	VS20N1.04.00.00.01	TABLE II	1
4	DIN 1481	SPRING PIN Φ 6X50	2
5	FSP.04.00.00.04	BLOCK	1
6	FSP.04.00.00.05	AXIS	1
7	DIN 912	SCREW M8x55	3
8	DIN 985	NUT M 12	1
9	DIN 125A	WASHER AM12	3
10	FSP.04.00.00.07	AXIS	1
11	FSP.04.00.00.30	SCREW	1
12	FSP.03.00.00.19	SCREW	2
13	FSP.03.00.00.20	PLUG	2
14	DIN 125A	WASHER AM 8	1
15	FSP.04.00.00.28	PLATE	1
16	DIN 934	NUT M8	1
17	FSP.04.00.00.35	RUBBER	1
18	FSP.04.00.00.37	PLATE	1
19	DIN 440 R	WASHER M 8	2
20	DIN 125A	WASHER AM 6	2
21	VS20N1.04.02.00.00	PROTECTOR	1
22	VS20N1.04.00.00.02	COVER	1
23	F178-30 M06-20	HANDLE STAR M6X20	2
24	DIN 125A	WASHER AM 4	2
25	DIN 912	SCREW M 4x10	2

26	DIN 1481	SPRING PIN Φ 6X20	2
27	DIN 912	SCREW M8x16	3
28	DIN 912	SCREW M 6X20	2
29	DIN 7980	SPRING WASHER 2-6H	2



VS20N1.05.00.00.00 SPINDLE II COMPLETE

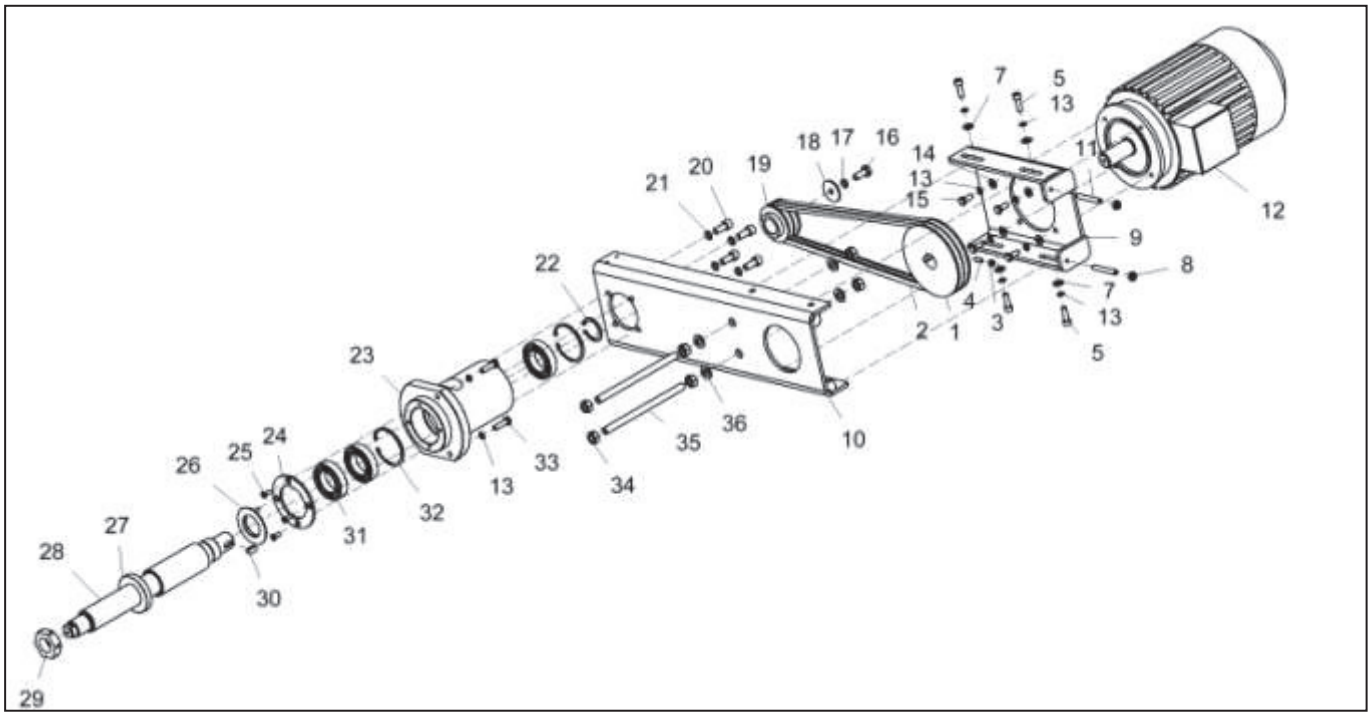
1	VS20N1.05.00.00.07	BELT PULLEY - ELECTRIC MOTOR	1
2	VS20N1.05.00.00.06	BELT PULLEY - H	1
3		ELECTRIC MOTOR	1
4	DIN 933	BOLT M10X25	1
5	DIN 7980	SPRING WASHER 2-10H	1
6	UN 732	WASHER Φ10XΦ40X2,5	1
7		BELT Z(10X6) L=930	2
8	DIN 914	FIXING SCREW M 6X20	1
9	DIN 934	NUT M6	1
10	DIN 471	RING FOR SHAFT 40	1
11	DIN 472	RING FOR HOLE Φ68	2
12		RADIAL BALL BEARING 6008-ZZ	3
13	VS20N1.05.00.00.01	BEARING HOUSING - II	1
14	VS20N1.05.00.00.03	BEARING WASHER	1
15	DIN 7991	SCREW M 6X16	4
16	VS20N1.05.00.00.04	STOP WASHER	1
17	DIN 6885A	COTTER A8X7X20	1
18	VS20N1.05.00.00.05	WASHER	1
19	VS20N1.05.00.00.02	SPINDLE - B. II	1
20	VS20N1.05.00.00.10	NUT M30x2	1



VS20N1.06S.00.00.00 TABLE MOVABLE

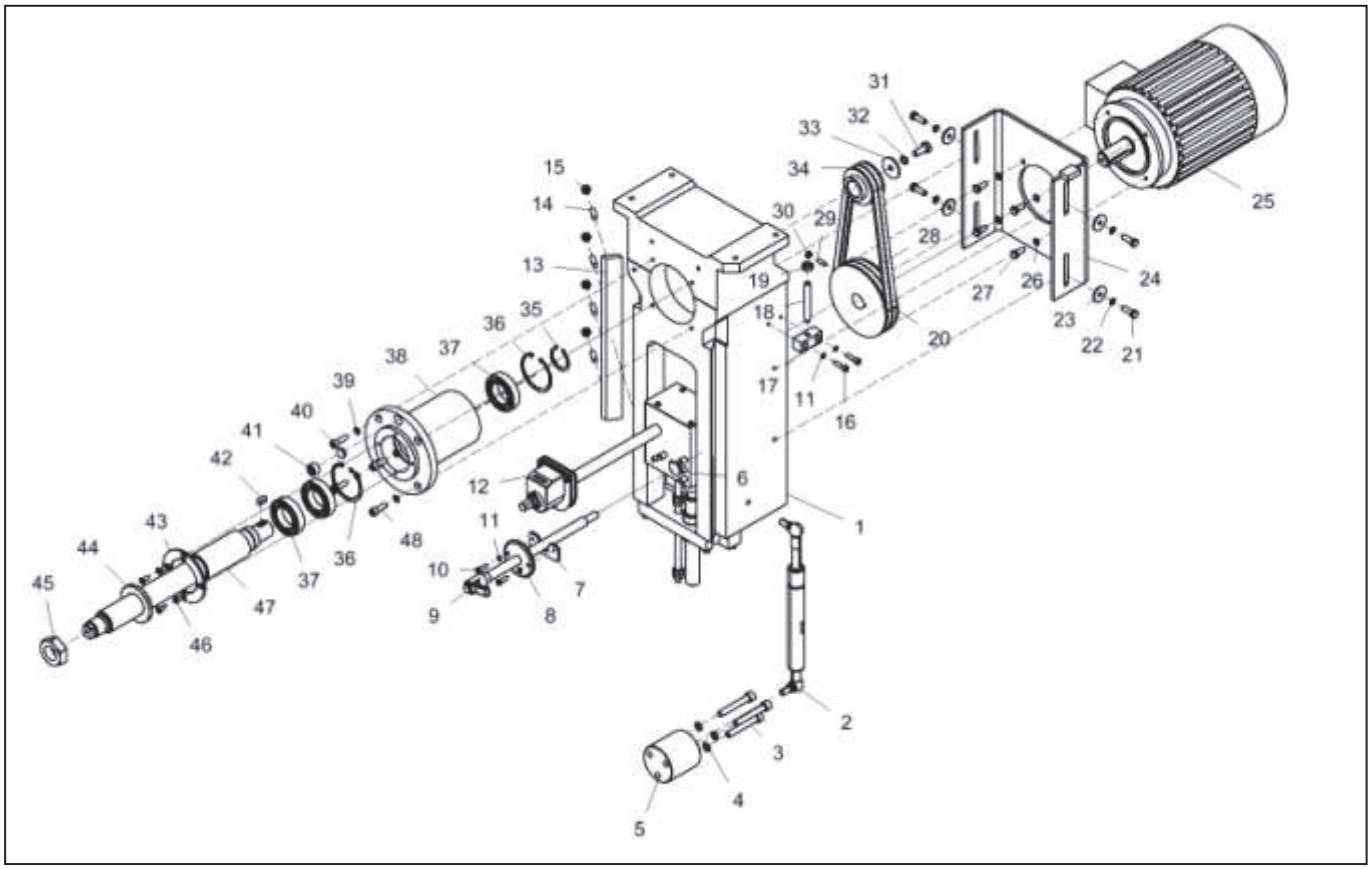
1	VS20N1.06.04.00.00	SAFETY COVER	1
2	DIN 125A	WASHER M6	4
3	UN 792	WASHER M6	4
4	DIN 912	SCREW M 6X12	4
5	FSP.06.00.01.00	COVER	1
6	DA0912-5.0E-20-GC	MOVABLE	1
7	DIN 7991	SCREW M 6X20	4
8	L751-32 M8X20	FLY HANDLE	1
9	DIN 934	NUT M8	1
10	DIN 933	BOLT M8x45	1
11	VS20N1.06.00.00.01	TABLE MOVABLE ON VERTICAL SPINDLE	1
12	DIN 1481	SPRING PIN Φ 6X50	2
13	DIN 912	SCREW M8x20	6
14	UN 792	WASHER M8	16
15	AXK 2035	AXIAL NEEDLE BEARING	2

16	WS81104	AXIAL WASHER 20x35x2.75	2
17	FSP.06.00.00.29S	WASHER	1
18	FSP.06.00.00.26S	BODY	1
19	AS2035	AXIAL WASHER Φ20x35x1	2
20	FSP.06.00.00.08SS	SCREW	1
21	VS20N1.06.00.00.31S	NUT Tr 24x5	1
22	UN 732	WASHER ϕ8xϕ30x2	1
23	DIN 125A	WASHER AM 8	2
24	DIN 912	SCREW M8X45	2
25	VS20N1.06.00.00.74S	WHEEL	2
26	FSP.06.00.00.42	SPECIAL SCREW	3
27	DIN 933	BOLT M8x20	2
28	VS20N1.06.00.00.71S	ARM	2
29	FSP.06.00.00.47	BUSHING	2
30	VS20N1.06.00.00.72S	TENSION LEVER	3
31	DIN 134	WASHER M 8	14
32	DIN 913	FIXING SCREW M 8X30	3
33	DIN 985	NUT M 8	6
34		RADIAL BALL BEARING 6000-ZZ	3
35	FSP.06.00.00.38	WHEEL	1
36	VS20N1.06.00.00.64S	ARM	1
37	DIN988	WASHER Φ14XΦ20X0.5	1
38	DIN988	WASHER Φ14XΦ20X1	1
39	VS20N1.06.00.00.73S	SPECIAL NUT	3
40	DIN 125A	WASHER M6	4
41	FSP.06.00.00.48	BUSHING	1
42	DIN 985	NUT M 6	2
43	FSP.06.00.00.06	RIM	1
44	FSP.06.00.00.19	SPRING	5
45	VS20N1.06.03.00.00	STOP	1
46	DIN 934	NUT M6	5
47	FSP.06.00.08.00	HANDLE	4
48	VS20N1.06.01S.00.00	3-ROLLER COVER	1
49	UN 1277	WASHER M8	2
50	DIN 7991	SCREW M 8x20	2
51	DIN 440 R	WASHER M 8	2
52	VS20N1.06.02.00.00	PROTECTOR	1
53	DIN 912	SCREW M8x55	2
54	DIN 933	BOLT M6X30	5
55	VS20N1.06.00.00.66SS	LIMITER	1
56	DIN 933	BOLT M6X25	2
57	FSP.06.00.02.00	STOP	1
58	DIN 933	BOLT M8x25	1



VS20N1.07.00.00.00 SPINDLE III COMPLETE

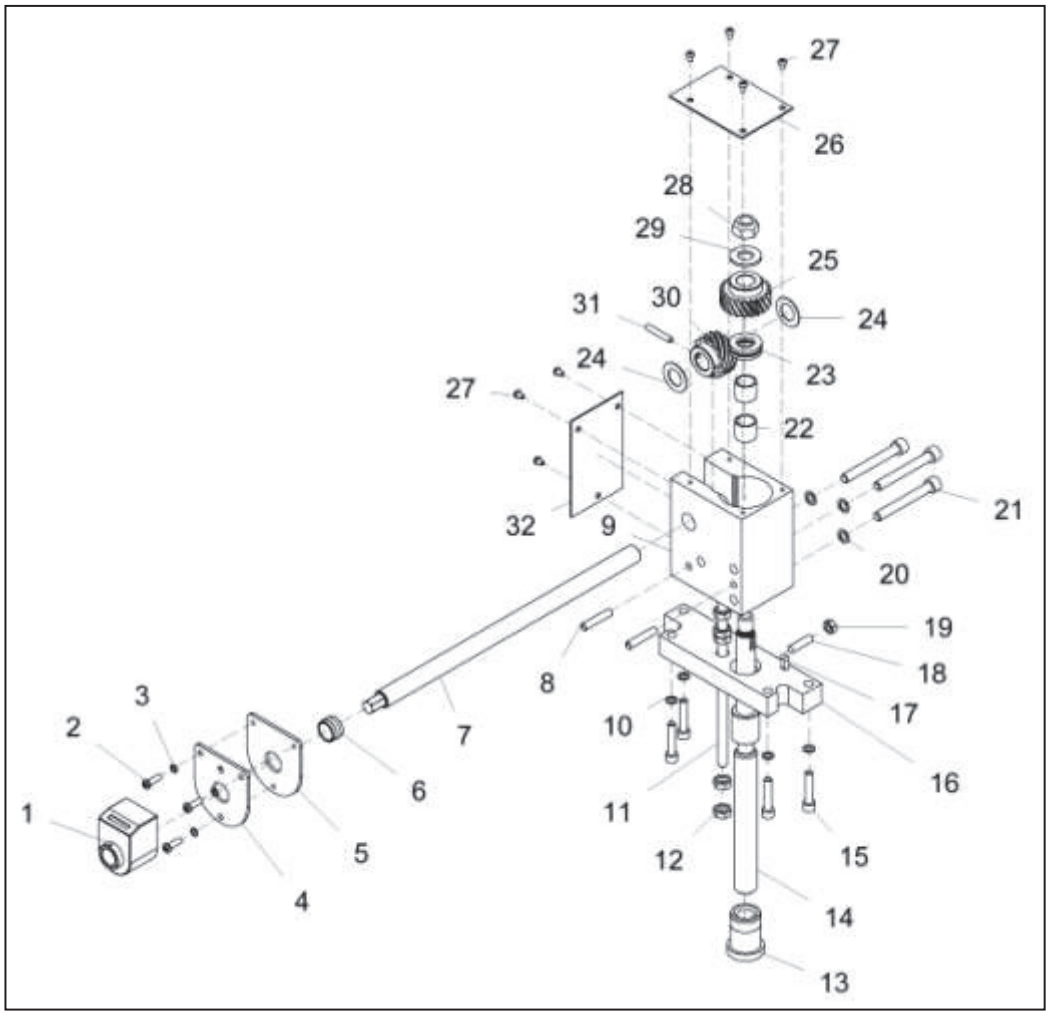
1	VS20N1.05.00.00.07	BELT PULLEY - ELECTRIC MOTOR	1
2		V-BELT Z L=1120	2
3	DIN 934	NUT M6	1
4	DIN 914	FIXING SCREW M 6X20	1
5	DIN 912	SCREW M8x25	4
7	DIN 134	WASHER M 8	4
8	DIN 934	NUT M8	2
9	VS20N1.07.02S.02.00	LOWER SUPPORT	1
10	VS20N1.07.02S.01.00	UPPER SUPPORT III K-T	1
11	DIN915	FIXING SCREW M 8x60	2
12		ELECTRIC MOTOR	1
13	UN 792	WASHER M8	4
13	UN 792	WASHER M8	7
14	DIN 125A	WASHER M8	4
15	DIN 933	BOLT M8x20	4
16	DIN 933	BOLT M10x25	1
17	UN 792	WASHER M10	1
18	UN 732	WASHER Φ10XΦ40X2,5	1
19	VS20N1.05.00.00.06	BELT PULLEY - H	1
20	DIN912	SCREW M10x25	4
21	UN 792	WASHER M10	4
22	DIN 471	RING FOR SHAFT 40	1
23	VS20N1.07.01.00.01	BEARING HOUSING III	1
24	VS20N1.05.00.00.03	BEARING WASHER	1
25	DIN 7991	SCREW M 6X16	4
26	VS20N1.05.00.00.04	STOP WASHER	1
27	VS20N1.05.00.00.05	WASHER	1
28	VS20N1.07.01.00.02	SPINDLE III	1
29	VS20N1.03.01.00.03	NUT M30 L	1
30	DIN 6885A	COTTER A8X7X20	1
31		RADIAL BALL BEARING 6008-ZZ	3
32	DIN 472	RING FOR HOLE Φ68	2
33	DIN 933	BOLT M 8X30	3
34	DIN 934	NUT M12	6
35	VS20N1.07.00.00.01	STUD M12 L=195	2
36	DIN 125A	WASHER M12	4



VS20N1.13S.00.00.00 LEVELLING DEVICE

1	VS20N1.13.00.00.01S	CARRIAGE - H	1
2	2362LI	GAS SPRING	1
3	DIN912	SCREW M10x70	3
4	UN 792	WASHER M10	3
5	VS20N1.13.00.00.60S	SUPPORT	1
6	VS20N1.13.00.00.56S	PLATE	1
7	VS20N1.13.00.00.55S	PLATE	1
8	FS 32N.10.00.05	FLANGE	1
9	VS20N1.13.51S.00.00	CLAMPING LEVER	1
10	ISO 7380	SCREW M6X20	2
11	UN 792	WASHER M6	4
12	VS20N1.13.50S.00.00	REAR LEVELLING	1
13	FSP.13.00.00.02	WEDGE	1
14	DIN 914	FIXING SCREW M 8X30	4
15	DIN 934	NUT M8	4
16	DIN 912	SCREW M 6X25	2
17	VS20N1.13.00.00.02	STOP	1
18	DIN 915	FIXING SCREW M10x80	1
19	DIN 934	NUT M10	1
20		V-BELT Z L=780	2
21	DIN 933	BOLT M8x25	4
22	UN 792	WASHER M8	4
23	UN 732	WASHER ϕ8xϕ30x2	4
24	VS20N1.13.02.01.00	SUPPORT ELECTRIC MOTOR. IV	1
25		ELECTRIC MOTOR	1
26	UN 792	WASHER M8	4
27	DIN 933	BOLT M8x20	4
28	VS20N1.05.00.00.07	BELT PULLEY - ELECTRIC MOTOR	1
29	DIN 914	FIXING SCREW M 6X20	1
30	DIN 934	NUT M6	1
	VS20N1.13.01.00.00	**SPINDLE IV - H**	
31	DIN 933	BOLT M10x25	1
32	UN 792	WASHER M10	1

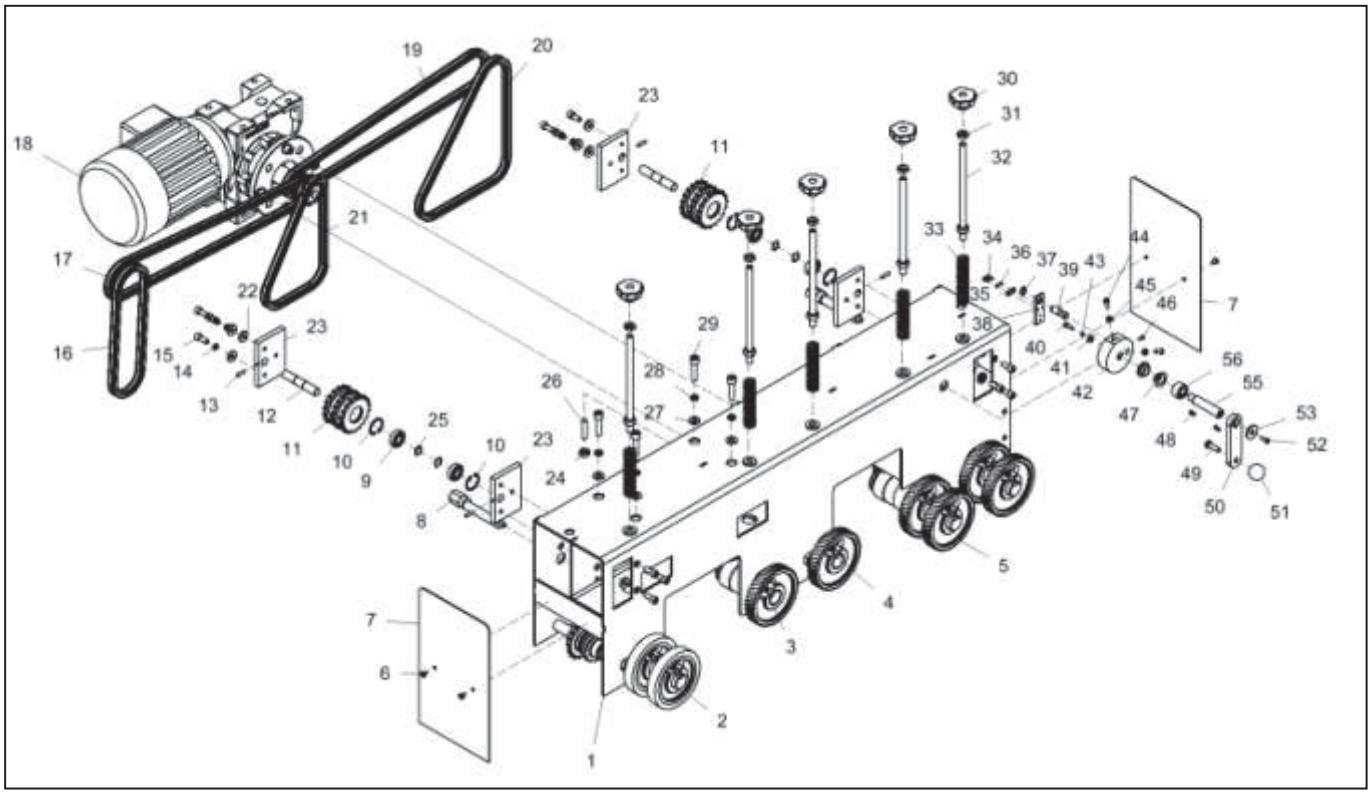
33	UN 732	WASHER Φ10XΦ40X2,5	1
34	VS20N1.05.00.00.06	BELT PULLEY - H	1
35	DIN 471	RING FOR SHAFT 40	1
36	DIN 472	RING FOR HOLE Φ68	2
37		RADIAL BALL BEARING 6008-ZZ	3
38	VS20N1.13.01.00.01	BEARING HOUSING IV	1
39	UN 792	WASHER M8	4
40	FSP.03.00.00.20	PLUG	1
41	FSP.03.00.00.19	SCREW	1
42	DIN 6885A	COTTER A8X7X20	1
43	VS20N1.05.00.00.03	BEARING WASHER	1
44	VS20N1.13.01.00.05S	STOP WASHER	1
45	VS20N1.05.00.00.10	NUT M30x2	1
46	DIN 7991	SCREW M 6X16	4
47	VS20N1.13.01.00.02	SPINDLE IV	1
48	DIN 912	SCREW M8x25	4



VS20N1.13.50S.00.00 LEVELLING

1	DD52-AN-002.5-D-GR	COUNTER	1
2	ISO 7380	SCREW M6X20	3
3	UN 792	WASHER M6	3
4	VS20N1.13.50S.00.19	INDICATOR PLATE	1
5	VS20N1.13.50S.00.18	REAR PLATE	1
6	VS20N1.13.50S.00.15	BEARING SUPPORT	1
7	VS20N1.13.50SS.00.17	SHAFT	1
8	DIN 1481	SPRING PIN ф8x40	2
9	VS20N1.13.50S.00.01	CONSOLE	1
10	UN 792	WASHER M8	4
11	VS20N1.13.50S.00.05	STUD	1

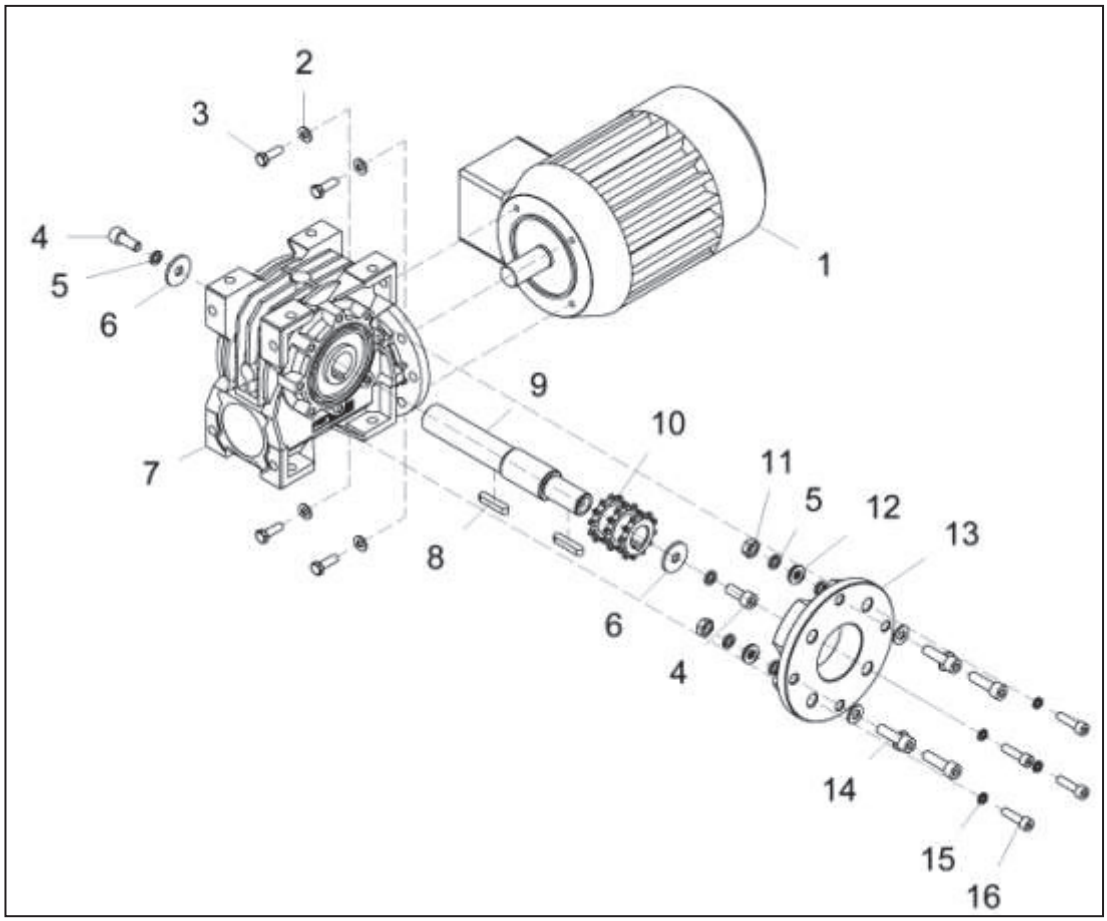
12	DIN 934	NUT M10	5
13	VS20N1.13.50S.00.09	LEVELLING NUT Tp24x5	1
14	VS20N1.13.50S.00.08	SCREW	1
15	DIN 912	SCREW M8x40	4
16	VS20N1.13.50S.00.02	SUPPORT	1
17	DIN 6885A	COTTER 6x6x18	1
18	DIN 914	FIXING SCREW M 8x35	1
19	DIN 934	NUT M8	1
20	UN 792	WASHER M10	3
21	DIN912	SCREW M10x80	3
22	PAP 2020 P10	BUSHING	2
23		AXIAL BALL BEARING 51104/8104	1
24	AS2035	AXIAL WASHER Φ20x35x1	2
25	VS20N1.13.50S.00.22	WHEEL GEAR Z=22	1
26	VS20N1.13.50S.00.26	UPPER COVER	1
27	ISO 7380	SCREW M 5X 8	7
28	DIN 985	NUT M16	1
29	DIN 134	WASHER M16	1
30	ДМ5-401.31.10.08	WHEEL GEAR Z=11	1
31	DIN 1481	SPRING PIN Φ6x36	1
32	VS20N1.13.50S.00.29	SIDE COVER	1



FSP.12.00.00.00 FEEDING GROUP

1	FSP.12.00.02.00	BODY	1
2		RUBBER FEEDING ROLLERS	1
3		FEEDING ROLLER WITH SINGLE ROLLER LEFT	1
4		FEEDING ROLLER WITH SINGLE ROLLER RIGHT	1
5		FEEDING ROLLER WITH TWO ROLLERS	2
6	ISO 7380	SCREW M 6X 8	4
7	FSP.12.00.00.22	COVER	2
8	FSP.12.00.00.90	ECCENTRIC BOLT	4
9		RADIAL BALL BEARING 6002-ZZ	4
10	DIN 472	RING FOR HOLE ø32	4
11	FSP.12.00.00.27	BLOCK – CHAIN WHEEL	2
12	FSP.12.00.00.26	AXIS	2
13	DIN 913	FIXING SCREW M 5x20	4
14	DIN 7980	SPRING WASHER 2-8H	17
15	DIN 912	SCREW M8x20	12
16		CHAIN 08-B n=50	1
17		CHAIN 08-B n=90	1
18	FSP.12.02.00.00	REDUCTION GEAR COMPLETE	1
19		CHAIN 08-B n=88	1
20		CHAIN 08-B n=66	1
21		CHAIN 08-B n=52	1
22	DIN 7349	WASHER M8	12
23	FSP.12.00.00.29	PLATE	4
24	DIN 934	NUT M10	1
25	DIN 471	RING FOR SHAFT Φ15	4
26	DIN 913	FIXING SCREW M10x40	1
27	DIN 125A	WASHER AM10	4
28	DIN 7980	SPRING WASHER 2-10H	4
29	DIN 912	SCREW M10x40	4
30	F175-50-M12	HANDLE STAR Φ50 M12	5
31	DIN 439B	NUT M12	5
32	FSP.12.00.03.00	STUD M12	5
33	FSP.12.00.00.05	SPRING	5
34	DIN 912 (	SCREW M 4X8	2
35	FSP.12.00.00.71	PLATE	1
36	DIN 7980	SPRING WASHER 2-4H	2

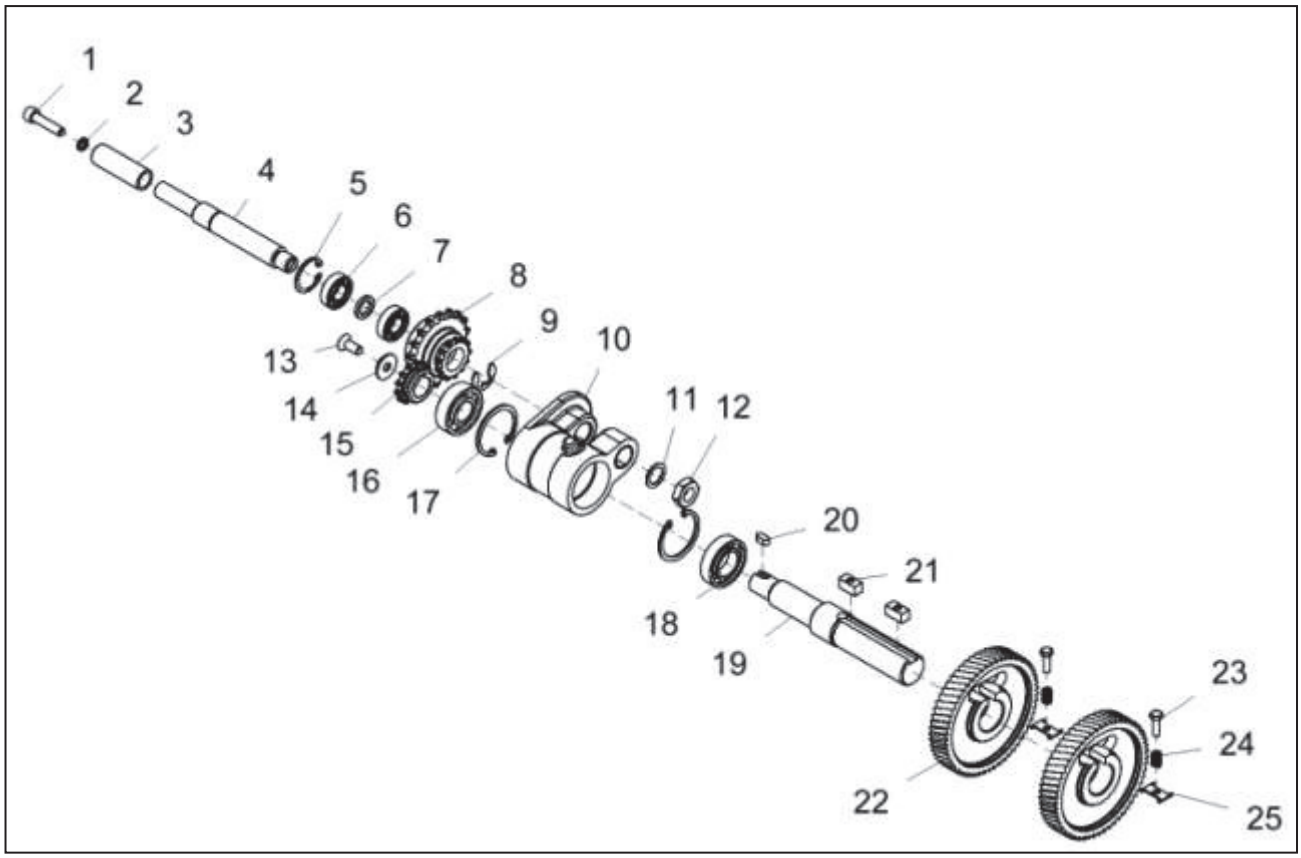
37	DIN 471	RING FOR SHAFT Φ12	1
38	FSP.12.00.00.72	PLATE	1
39	FSP.12.00.00.69	AXIS	1
40	DIN 912	SCREW M 5X16	1
41	DIN 7349	WASHER M 5	1
42	FSP.12.00.00.66	ECCENTRIC	1
43	DIN 7980	SPRING WASHER 2-5H	1
44	ISO 7380	SCREW M6X16	2
45	DIN 934	NUT M6	2
46	DIN 7991	SCREW M 4x10	1
47	FSP.12.00.00.80	BUSHING	2
48	DIN 6885A	COTTER4X4X14	2
49	DIN 933	BOLT M8x25	1
50	FSP.12.00.00.73	HANDLE	1
51	I10330.TM0801	HANDLE BALL Φ30 M8	1
52	DIN 7991	SCREW M 5X16	1
53	FSP.12.00.00.76	WASHER	1
55	FSP.12.00.00.79	AXIS	1
56	FSP.12.00.00.78	DISTANCE BUSHING	1



FSP.12.02.00.00 REDUCTION GEAR COMPLETE

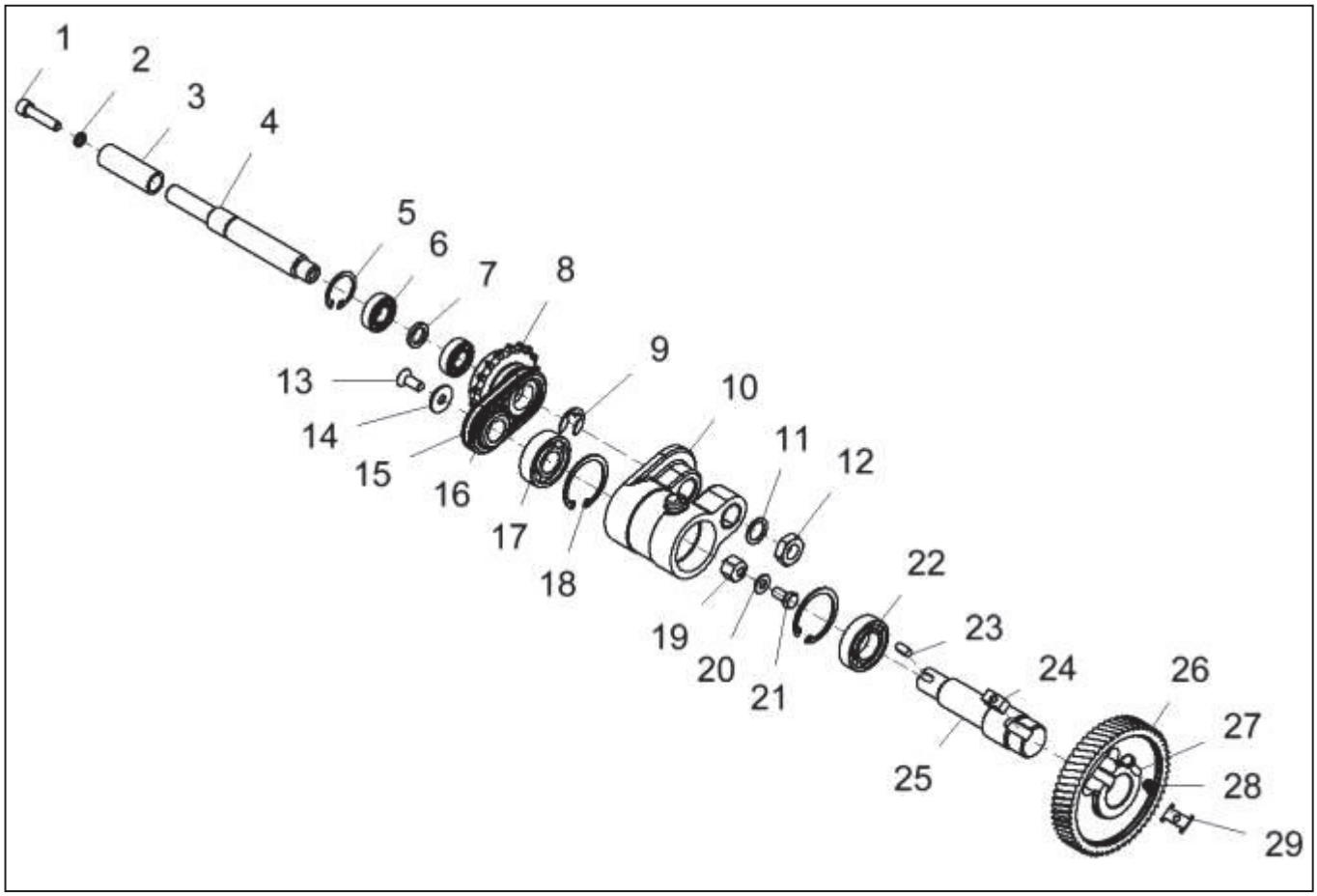
1		ELECTRIC MOTOR	1
2	DIN 125A	WASHER AM 8	4
3	DIN 933	BOLT M8x25	4
4	DIN912	SCREW M10x25	2
5	DIN 7980	SPRING WASHER 2-10H	6
6	DIN 440R-04	WASHER Φ11X34X3	2
7		P REDUCTION GEAR	1
8	DIN 6885A	COTTER 8X7X40	2
9	FSP.12.02.00.01	SHAFT	1
10	FSP.12.00.00.56	BLOCK – CHAIN WHEEL	1
11	DIN 934	NUT M10	4
12	DIN 125A	WASHER AM10	8

13	FSP.12.02.00.09	FLANGE	1
14	DIN912	SCREW M10x35	4
15	DIN 7980	SPRING WASHER 2-8H	4
16	DIN 912	SCREW M8x30	4



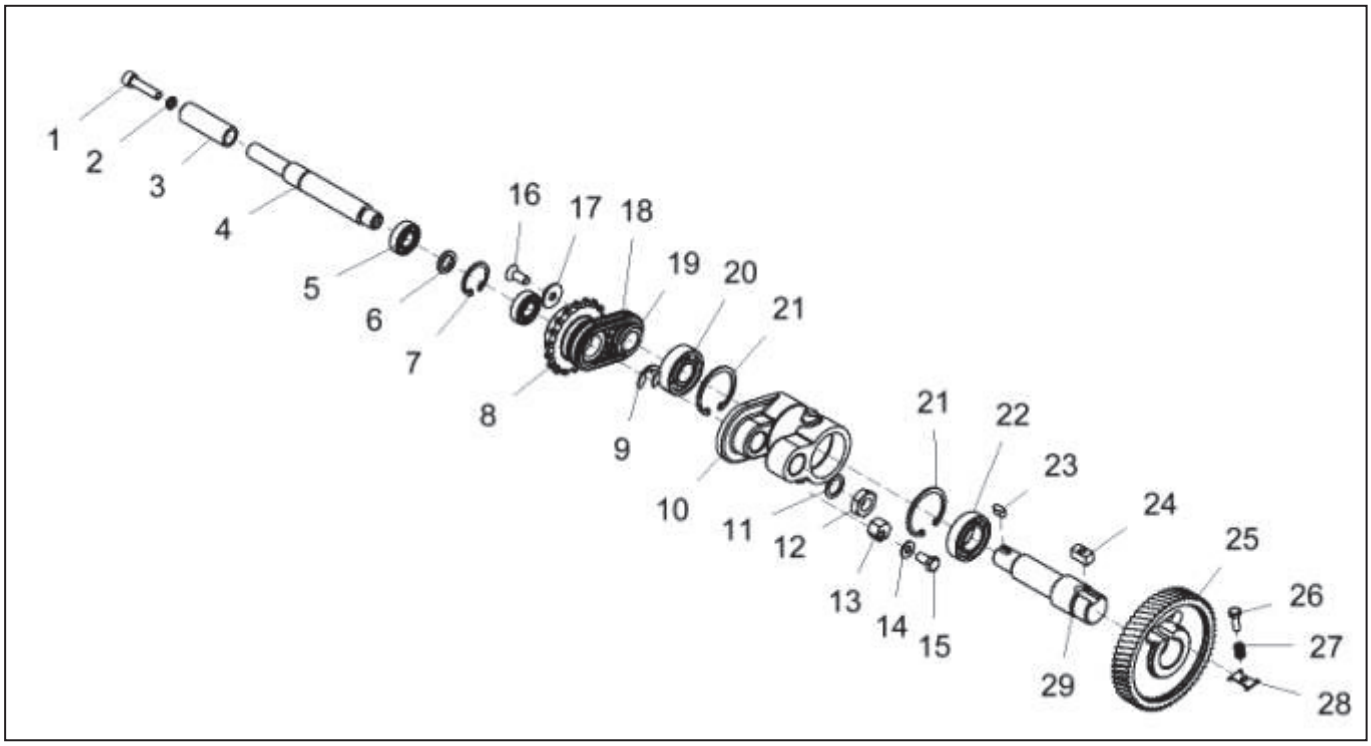
FEEDING ROLLER WITH TWO ROLLERS

1	DIN 912	SCREW M8x35	1
2	DIN 7980	SPRING WASHER 2-8H	1
3	FSP.12.00.00.34	BUSHING	1
4	FSP.12.00.00.03	AXIS	1
5	DIN 472	RING FOR HOLE 32	1
6		RADIAL BALL BEARING 6002-ZZ	2
7	FSP.12.00.00.35	DISTANCE BUSHING	1
8	FSP.12.00.00.30	BLOCK – CHAIN WHEEL	1
9	DIN 6799	RETAINING WASHER E15	1
10	FSP.12.00.01.00	BODY	1
11	DIN 988	WASHER Φ17XΦ24X1	1
12	DIN 439B	NUT M16	1
13	DIN 7991	SCREW M 8x20	1
14	UN 1277	WASHER M8	1
15	FSP.12.00.00.62	CHAIN WHEEL	1
16		RADIAL BALL BEARING 6204-ZZ	1
17	DIN 472	RING FOR HOLE 47	2
18		RADIAL BALL BEARING 6005-ZZ	1
19	FSP.12.00.00.08	SHAFT	1
20	DIN 6885A	COTTER 6X6X14	1
21	FSP.12.00.00.44	COTTER	2
22	FSP.12.00.00.46	FEEDING ROLLER	2
23	DIN 933	BOLT M6X20	2
24	FSP.12.00.00.06	SPRING	2
25	FSP.12.00.00.42	PLATE	2



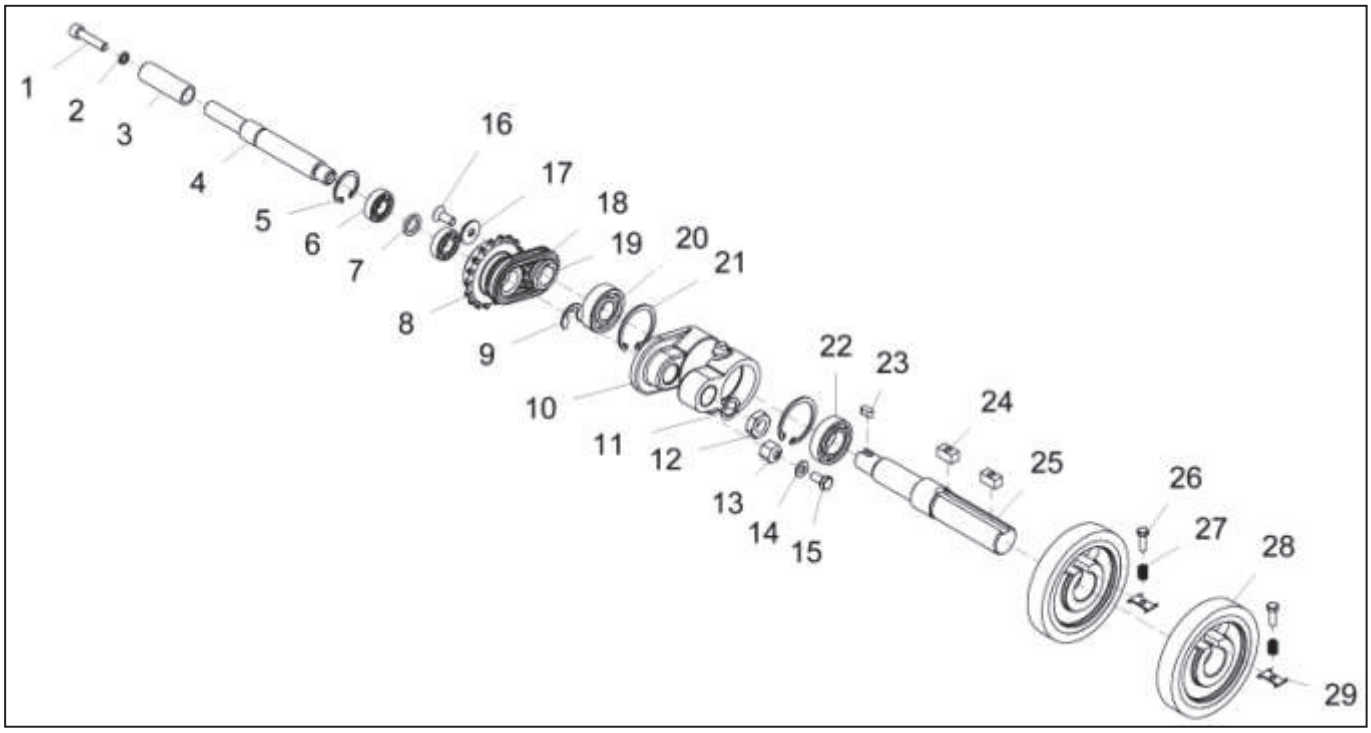
FEEDING ROLLER WITH SINGLE ROLLER LEFT

1	DIN 912	SCREW M8x35	1
2	DIN 7980	SPRING WASHER 2-8H	1
3	FSP.12.00.00.34	BUSHING	1
4	FSP.12.00.00.03	AXIS	1
5	DIN 472	RING FOR HOLE 32	1
6		RADIAL BALL BEARING 6002-ZZ	2
7	FSP.12.00.00.35	DISTANCE BUSHING	1
8	FSP.12.00.00.30	BLOCK – CHAIN WHEEL	1
9	DIN 6799	RETAINING WASHER E15	1
10	FSP.12.00.01.00	BODY	1
11	DIN 988	WASHER Φ17XΦ24X1	1
12	DIN 439B	NUT M16	1
13	DIN 7991	SCREW M 8x20	1
14	UN 1277	WASHER M8	1
15		CHAIN 06-B n=22	1
16	FSP.12.00.00.62	CHAIN WHEEL	1
17		RADIAL BALL BEARING 6204-ZZ	1
18	DIN 472	RING FOR HOLE 47	2
19	FSP.12.00.00.39	ECCENTRIC	1
20	DIN 125A	WASHER AM 8	1
21	DIN 933	BOLT M8x16	1
22		RADIAL BALL BEARING 6005-ZZ	1
23	DIN 6885A	COTTER 6X6X14	1
24	FSP.12.00.00.44	COTTER	1
25	FSP.12.00.00.45	SHAFT	1
26	FSP.12.00.00.46	FEEDING ROLLER	1
27	DIN 933	BOLT M6X20	1
28	FSP.12.00.00.06	SPRING	1
29	FSP.12.00.00.42	PLATE	1



FEEDING ROLLER WITH SINGLE ROLLER RIGHT

1	DIN 912	SCREW M8x35	1
2	DIN 7980	SPRING WASHER 2-8H	1
3	FSP.12.00.00.34	BUSHING	1
4	FSP.12.00.00.03	AXIS	1
5		RADIAL BALL BEARING 6002-ZZ	2
6	FSP.12.00.00.35	DISTANCE BUSHING	1
7	DIN 472	RING FOR HOLE 32	1
8	FSP.12.00.00.30	BLOCK – CHAIN WHEEL	1
9	DIN 6799	RETAINING WASHER E15	1
10	FSP.12.00.01.00	BODY	1
11	DIN988	WASHER Φ17XΦ24X1	1
12	DIN 439B	NUT M16	1
13	FSP.12.00.00.39	ECCENTRIC	1
14	DIN 125A	WASHER AM 8	1
15	DIN 933	BOLT M8x16	1
16	DIN 7991	SCREW M 8x20	1
17	UN 1277	WASHER M8	1
18		CHAIN 06-B n=22	1
19	FSP.12.00.00.62	CHAIN WHEEL	1
20		RADIAL BALL BEARING 6204-ZZ	1
21	DIN 472	RING FOR HOLE 47	2
22		RADIAL BALL BEARING 6005-ZZ	1
23	DIN 6885A	COTTER 6X6X14	1
24	FSP.12.00.00.44	COTTER	1
25	FSP.12.00.00.46	FEEDING ROLLER	1
26	DIN 933	BOLT M6X20	1
27	FSP.12.00.00.06	SPRING	1
28	FSP.12.00.00.42	PLATE	1
29	FSP.12.00.00.45	SHAFT	1



RUBBER FEEDING ROLLERS

1	DIN 912	SCREW M8x35	1
2	DIN 7980	SPRING WASHER 2-8H	1
3	FSP.12.00.00.34	BUSHING	1
4	FSP.12.00.00.03	AXIS	1
5	DIN 472	RING FOR HOLE ø32	1
6		RADIAL BALL BEARING 6002-ZZ	2
7	FSP.12.00.00.35	DISTANCE BUSHING	1
8	FSP.12.00.00.30	BLOCK – CHAIN WHEEL	1
9	DIN 6799	RETAINING WASHER E15	1
10	FSP.12.00.01.00	BODY	1
11	DIN 988	WASHER Φ17XΦ24X1	1
12	DIN 439B	NUT A M16	1
13	FSP.12.00.00.39	ECCENTRIC	1
14	DIN 125A	WASHER AM 8	1
15	DIN 933	BOLT M8x16	1
16	DIN 7991	SCREW M 8x20	1
17	UN 1277	WASHER M8	1
18		CHAIN 06-B n=22	1
19	FSP.12.00.00.62	CHAIN WHEEL	1
20		RADIAL BALL BEARING 6204-ZZ	1
21	DIN 472	RING FOR HOLE ø47	2
22		RADIAL BALL BEARING 6005-ZZ	1
23	DIN 6885A	COTTER 6X6X14	1
24	FSP.12.00.00.44	COTTER	2
25	FSP.12.00.00.08	SHAFT	1
26	DIN 933	BOLT M6X20	2
27	FSP.12.00.00.06	SPRING	2
28	FSP.12.00.04.00	ROLLER	2
29	FSP.12.00.00.42	PLATE	2