

USER AND MAINTENANCE MANUAL



Drill-mill

Drill-mill Art T044/230V Art T044/400V



ORIGINAL INSTRUCTIONS

FOREWORD



Read this manual before operation

ORIGINAL INSTRUCTIONS

Reading this instruction manual is required before operating any of the machinery. The guarantee that the machine will function and perform properly is strictly dependent upon the application of all the instructions contained in this manual.



Operator Qualifications

The workers responsible for using this machine must have all necessary information, education and receive adequate training regarding safety, including:

- a) Conditions of use for the equipment;
 - b) Foreseeable, abnormal situations;
- pursuant to art. 73 of Legislative Decree no. 81/08.

We guarantee the Machine's conformity to specifications and technical instructions described in the Manual on the date of issuance and listed herein; On the other hand, the machine may also be subject to important technical changes in the future, without the manual being updated.

Therefore, contact FERVI for information about modifications that could be implemented.



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1. INTRODUCTION

This manual is considered an integral part of the machine to which it is attached at the time of purchase.

The manufacturer reserves the material and intellectual property rights of this publication and prohibits the disclosure and copying of any part herein without prior written consent.

The purpose of this manual is to provide the knowledge required for the use and maintenance of the **square column bench drill-mill (Art. T044/230 and Art. T044/400)** with dovetail guides and create a sense of responsibility and an understanding of the possibilities and limits of the medium given to the operator.

As a processing machine is entrusted to experienced and skilled operators, the following machine must be perfectly known by its operator if it is to be used safely and effectively.

Operators must be properly trained and prepared, so make sure that this manual is read and consulted by the staff responsible for commissioning, operating and maintaining the **Drill Presses**. This is to make all operations the safest and most effective possible for those who carry out these tasks.

Therefore, it is imperative to strictly comply with the requirements in this manual, a necessary condition for safe and satisfactory operation of the machine.

Before starting operation, installation and usage of the machine, authorized personnel must therefore:

- read this technical documentation carefully;
- know which protections and safety devices are available on the machines, their location and how they work.

It is the responsibility of the buyer to ensure that users are properly trained, that they are aware of all the information and instructions in this document and that they are aware of the potential risks that exist while working with Drill Mills.

The manufacturer is not liable for any damage to people and/or things caused by non-observance of the instructions in this manual.

The **Drill Presses** have been designed and built with mechanical guards and safety devices designed to protect the operator/user from possible injury. It is strictly forbidden to modify or remove guards, safety devices and caution labels. If this must be done (for example, for cleaning or repair), make sure that no one can use the machine.

Modifications to the machines carried out by the user must be considered their sole responsibility, therefore the manufacturer declines all responsibility for any damage caused to persons and/or property resulting from maintenance performed by unqualified personnel and in a manner different from the operating procedures shown below.

1.1 Graphic risk alerts and safety and operational warnings

The following images were designed to attract the attention of the reader/user for correct and safe use of the machine:



Pay Attention

This emphasizes behavioral rules to avoid damaging the machine and/or the occurrence of hazardous situations.



Residual risks

This emphasizes the presence of hazards causing residual risks which the operator must watch for to avoid personal injury or material damage.



1.2 Preface

For safe and easy operation of the machine, this manual must be read carefully in order to acquire the necessary knowledge. In other words, the life and performance of the machine are dependent on how it is used.

Even if you're already familiar with the square-column bench drill-mill with dovetail guides, you must follow the instructions herein, as well as general precautions to be observed during operation.

- Acquire full knowledge of the machine.

Read this manual carefully to understand: operation, safety devices and all necessary precautions. All this is to allow safe use of the machine.

- Wear appropriate clothing for the job.

The operator must appropriate clothing. To prevent the occurrence of unpleasant accidents.

- Carefully maintain the machine.



Using the Machine

The machine must only be used by qualified personnel trained to use the machine by authorized personnel.

2.2. GENERAL SAFETY WARNING

2.1 General Safety Rules for the Machine's Equipment



Accident

There is always a risk of injury during drilling or milling operations due to accidental contact of body parts with the moving tool, flying debris from the workpiece, tool breakage or ejection of a badly blocked workpiece.

There is no "intrinsic" means of safety, just as there is no worker who, while careful, can "always" avoid an accident. Therefore, DO NOT underestimate the risks associated with using the machine and concentrate on the work in progress.



Risks Associated with Using the Machine

Although machines like this are not to be considered particularly dangerous, it is important not to underestimate the risks associated with the use of the machine and concentrate on the work that is taking place.



Risks related to Using the Machine

Despite the implementation of all safety devices for safe use of the machine, it is necessary take note of all the requirements for the prevention of the accidents reported in various parts of this manual.



Risks Associated with Using the Machine

Every person who is responsible for the use and maintenance of the machine should have first read the instruction manual, particularly the chapter on safety information. It is recommended that the plant safety manager get written confirmation of the above.



Operator Protection

Before starting any work on the machine, the operator must wear the appropriate personal protective equipment (PPE) such as gloves and eye protection (see section 6.6 of this manual).

Read this manual carefully, and then work safely.

1. Always check the efficiency and integrity of the machine.
2. Before connecting the machine to the mains, make sure that the rotating parts are not damaged or badly worn. Make sure that the switch is in the neutral position.
3. Do not start the machine in an enclosed or poorly ventilated area, or in the presence of a flammable and/or explosive atmosphere. Do not use the machine in damp and/or wet locations, or those exposed to rain.
4. Avoid starting accidentally.
5. Before starting the machine, get used to ensuring that no remaining maintenance and service keys are inserted.



6. Keep the workplace tidy and free from obstruction; disorder causes accidents.
7. Make sure that the work environment is forbidden to children, non-employees and animals.
8. Do not perform tasks on the machine other than those for which it was designed. Only use the machine in the manner in which it was intended, as described in this instruction manual.
9. Work without disturbances.
10. Work areas must be well lit.
11. Always wear eye protection and protective gloves while working. If dust is produced, use the appropriate masks.
12. Wear appropriate clothing. Loose clothing, dangling jewelry, long hair, etc., can get caught in the spindle and moving parts, causing irreparable injury.
13. Firmly secure the workpiece before starting the drill.
14. Always use the tool (tip or tap) in an appropriate manner. Perform only the work for which the tool is made. Do not use the tool for inadequate work.
15. Only use suitable resistance tools in relation to the work that is to be done. This is to avoid risky and unnecessary overloading for the operator, which may be harmful for the life of the tools themselves.
16. Do not pick up moving tools or other moving parts. To stop the spindle on the machine, always only use the stop command device.
17. Do not remove the shavings from the table with hands, even at a standstill. To do this, use tongs or a palette knife.
18. When the cutting tools need to be replaced or the speed needs to be changed, stop the motor and wait for the spindle to stop.
19. Do not leave the machine until the spindle and the tool are completely stopped.
20. After the work is completed, clean the tool and check its efficiency.
21. Replace worn and/or damaged parts, check that the repairs and protection work correctly before operating. Eventually, if necessary, have it checked by Service staff. Use only original spare parts.
22. **Cut the mains voltage supply of the machine when:**
 - not using the machine;
 - the machine is left unattended;
 - performed maintenance or registration does not work properly;
 - the tool is replaced;
 - moved or transported;
 - cleaning.
23. It is recommended that users of this publication, for maintenance and repair, have a basic knowledge of mechanical principles and procedures inherent in repair technique.
24. **Management responsible for safety is to make sure that the staff responsible for using the machine has read and understood this manual in its entirety.**
25. **Management is responsible for safety and verification of the company's risk status according to Legislative Decree 626/94 and subsequent modifications and amendments.**

2.2 2.1 General Electric Power Tool Safety Standards



Risks related to Using the Machine

1. Do not modify the electrical system in any way. Any attempt in this regard may jeopardize the operation of electrical devices, causing malfunction or accident.
2. Work carried out in the electrical system of the machine must, therefore, be carried out only by qualified and authorized personnel.
3. If one hears unusual noises, or feels something strange, immediately stop the machine. Then carry out an inspection and, if necessary, perform any repairs as required.

1. The supply voltage must correspond to that stated on the label and in the technical specifications. Specifically: 400 V AC / 50 Hz.

Never use any other type of power supply !

2. Please use a life saving device on the power supply line. For more detailed information, contact a trusted electrician.
3. The mains power outlet should be grounded. Extension cables must have sections that are the same or greater than the sections of the power cable of the machine. ($\varnothing \geq 1.5 \text{ mm}^2$)
4. The power cord and extension should not come in contact with hot objects, wet or oiled surfaces, and/or sharp edges.
5. The power cord and extension should be checked regularly and before each use to check for signs of damage or wear. If these are not in good condition, do not use the machine, and replace the damaged cable.
6. Do not use the power cord to disconnect the plug.

2.3 Technical Support

For any problems or concerns, please contact, without hesitation, the dealer from whom you purchased the machine, who has competent and specialized staff, specific equipment and spare parts.

2.4 Other Provisions

ALTERING SAFETY DEVICES IS PROHIBITED

The first thing to do when starting work is to check the presence and integrity of the protections and the operation of the safety devices.

If any defect is detected, do not use the drill press.

A fortiori, it is strictly forbidden to modify or remove guards, safety devices, labels and plates indication.



3. TECHNICAL SPECIFICATIONS

Size	Width (mm)	785
	Depth (mm)	1090
	Height (mm)	1120
Weight	Net mass (kg)	300
	Gross mass (kg)	350
Nominal Values	Nominal voltage: V	230 (T044/230V)
		400 (T044/400 V)
	Power (W)	1500
General Characteristics	Spindle travel (mm)	120
	Drill chuck (mm)	Ø 27
	Max distance between table and spindle nose (mm)	460
	Drilling capacity (mm)	Ø 45
	Cross travel (mm)	190
	Milling capacity with insert cutters (mm)	Ø 80
	Longitudinal travel (mm)	560
	Morse taper	CM / MT 4
	Sleeve (mm)	Ø 75
	Head inclination	± 90°
	Housing (mm)	12
	Cross table (mm)	800 x 240
	Sound pressure level (equivalent weighted level A) at the workplace	67,2 dB
	Speed (r/min)	95- 1600

4. INTENDED USE AND DESCRIPTION OF THE MACHINE

The square column bench drill-mill are machine tools designed to perform simple operations, such as:

- drilling (max drilling capacity: 45 mm);
- threading;
- milling;
- boring and sanding.

The machines are made to perform such machining of different materials, changing the tool depending on the operation to be performed and the material of the workpiece.

The machines provide 6 different speeds of spindle rotation. The motor rotates at a constant speed, while a gear system changes spindle speed.

The levers to change speed are on the head, in any case, such adjustments should always be carried out *at standstill*.

The advancement of the tool (drilling) and the movement of the table (milling) are completely manual.



Intended use and materials

- The machine has been designed and manufactured for the use specified. The machine has been designed and manufactured for the use specified. Operating the machine other than as intended and within maximum capacity does not comply with the manufacturer's specifications; the latter cannot accept any responsibility for damage resulting therefrom.

4.1 Usage environment and support surface

The drill-mill is equipped with a supporting base and must be installed on floors or work benches that have adequate mechanical and ergonomic features.

It is very important to remember that the weight of the machine is about 350 kg. It is very important to remember that the weight of the machine is about 350 kg. For this reason, before placing the machine please ensure that the work surface has sufficient hardness and strength, and is therefore able to support its weight.

Drills can operate in closed work environments (production halls, warehouses, etc.), i.e. protected from the weather and where there is no danger of fire or explosion.

Operating temperature is in the range +5 / +50°C.

The working environment must also be sufficiently lit to ensure maximum operational safety (at least 50 lux are recommended).



Risks associated with the work environment

ALWAYS comply with instructions about the machine's work environment, especially about the security and strength features of the surface.



4.2 The main components

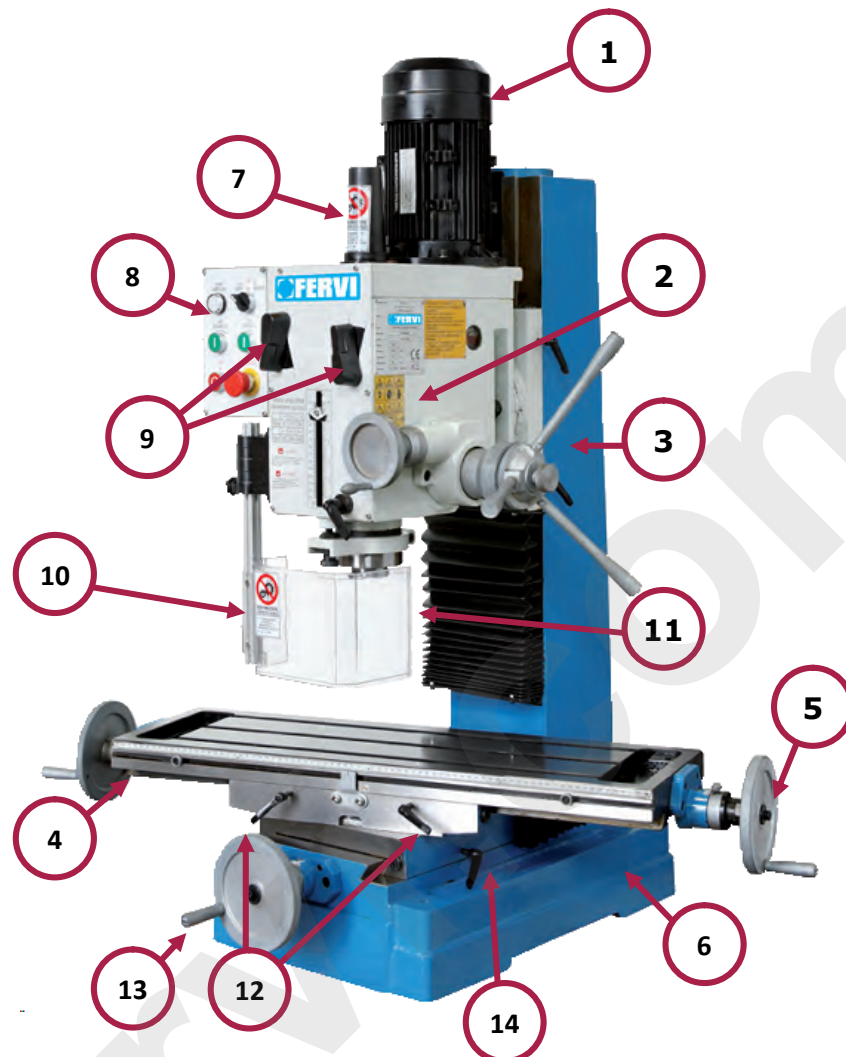


Figure 1 - General view.

- | | | | |
|----------|------------------------------------|-----------|------------------------------|
| 1 | Motor | 8 | Control panel |
| 2 | Micrometric progression hand wheel | 9 | Speed control levers |
| 3 | vertical progression hand wheel | 10 | Spindle guard |
| 4 | Work table | 11 | Spindle |
| 5 | Longitudinal movement hand wheel | 12 | Table locking levers |
| 6 | Base | 13 | Sideways movement hand wheel |
| 7 | Spindle shaft guard | 14 | Table locking levers |

4.3 Identification plate

On drill-mills, the identification plate is on the right side of the head(see [Figure 2](#)).

Fabbricante	Fervi S.r.l. Via del Commercio 81 41058 Vignola MO	
Marca		
Tipo	TRAPANO FRESA DA BANCO	
Modello	T044/230V	
Lotto n°		
Anno	2013	
Potenza	1500	W
Tensione	230	V
Frequenza	50	Hz
Velocità	75 - 1600	giri/min
 		

Fabbricante	Fervi S.r.l. Via del Commercio 81 41058 Vignola MO	
Marca		
Tipo	TRAPANO FRESA DA BANCO	
Modello	T044/400V	
Lotto n°		
Anno	2013	
Potenza	1500	W
Tensione	400	V
Frequenza	50	Hz
Velocità	75 - 1600	giri/min
 		

Figure 2 - Identification Plates



4.4 Plates and pictograms T044/230V



ATTENTION

IT IS PROHIBITED TO WORK ON LIVE ELECTRICAL EQUIPMENT

- ANY EXCEPTIONS MUST BE APPROVED BY THE HEAD MANAGER
- UNDER PARTICULARLY DANGEROUS CONDITIONS, ANOTHER PERSON MUST BE PRESENT WHO IS NOT PERFORMING THE WORK

ONLY BEGIN WORKING WHEN SAFETY MEASURES HAVE BEEN IMPLEMENTED

In accordance with Legislative Decree 81/08 on accident prevention

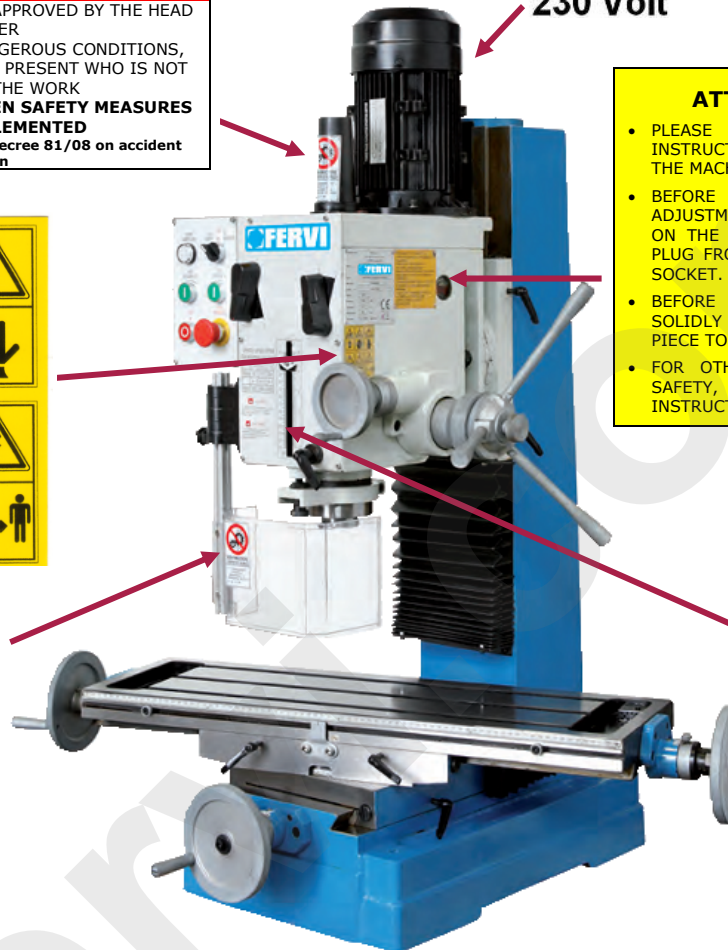


DO NOT REMOVE

I DISPOSITIVI DI SICUREZZA

MALICIOUS OMISSION OR REMOVAL ARE STRICTLY FORBIDDEN

D.Lgs. 81/08



ATTENZIONE!!

- PLEASE READ THE INSTRUCTIONS BEFORE USING THE MACHINE
- BEFORE CARRYING OUT ANY ADJUSTMENT OR MAINTENANCE ON THE MACHINE, DETACH ITS PLUG FROM THE POWER SUPPLY SOCKET.
- BEFORE OPERATING, SECURE SOLIDLY TO THE TABLE THE PIECE TO BE MACHINED.
- FOR OTHER INFORMATION ON SAFETY, PLEASE CONSULT THE INSTRUCTION MANUAL.



CAUTION

LE OPERAZIONI DI MASCHIATURA VANNO ESEGUITE ALLA VELOCITÀ MINIMA

USE LOW SPEED DURING TAPPING OPERATIONS



CAUTION

NON CAMBIARE LA VELOCITÀ MENTRE IL MOTORE GIRA

CHANGE SPEED WITH THE MACHINE OFF

4.5 Plates and pictograms T044/400V

ATTENTION

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ATTENTION!!

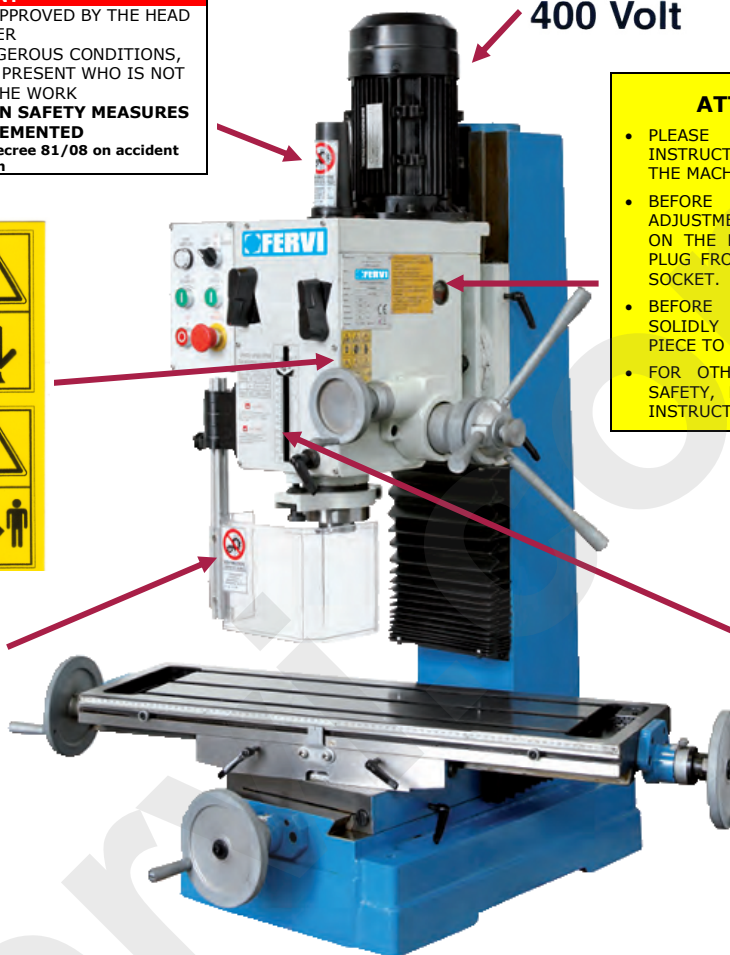
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- BEFORE OPERATING, SECURE SOLIDLY TO THE TABLE THE PIECE TO BE MACHINED.
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DO NOT REMOVE
SAFETY DEVICES

MALICIOUS OMISSION OR REMOVAL ARE STRICTLY FORBIDDEN

D.Lgs. 81/08



CAUTION

LE OPERAZIONI DI MASCHIATURA VANNO ESEGUITE ALLA VELOCITÀ MINIMA

USE LOW SPEED DURING TAPPING OPERATIONS

CAUTION

NON CAMBIARE LA VELOCITÀ MENTRE IL MOTORE GIRA

CHANGE SPEED WITH THE MACHINE OFF



Caption T044/230V and T044/400V

PLATE IN ITALIAN



**MALICIOUS
OMISSION OR
REMOVAL ARE
STRICTLY
FORBIDDEN**
D.Lgs. 81/08

ATTENTION

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CAUTION

LE OPERAZIONI DI MASCHIATURA VANNO ESEGUITE ALLA VELOCITÀ MINIMA
USE LOW SPEED DURING TAPPING OPERATIONS

CAUTION

NON CAMBIARE LA VELOCITÀ MENTRE IL MOTORE GIRA
CHANGE SPEED WHITH THE MACHINE OFF

ATTENTION!!

- PLEASE READ THE INSTRUCTIONS BEFORE USING THE MACHINE
- BEFORE CARRYING OUT ANY ADJUSTMENT OR MAINTENANCE ON THE MACHINE, DETACH ITS PLUG FROM THE POWER SUPPLY SOCKET.
- BEFORE OPERATING, SECURE SOLIDLY TO THE TABLE THE PIECE TO BE MACHINED.
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PLATE IN ENTGLISH



**MALICIOUS
OMISSION OR
REMOVAL ARE
STRICTLY
FORBIDDEN**
D.Lgs. 81/08

ATTENTION

IT IS PROHIBITED TO WORK ON LIVE ELECTRICAL EQUIPMENT

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CAUTION

LE OPERAZIONI DI MASCHIATURA VANNO ESEGUITE ALLA VELOCITÀ MINIMA
USE LOW SPEED DURING TAPPING OPERATIONS

CAUTION

NON CAMBIARE LA VELOCITÀ MENTRE IL MOTORE GIRA
CHANGE SPEED WHITH THE MACHINE OFF

ATTENTION!!

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- FOR OTHER INFORMATION ON SAFETY, PLEASE CONSULT THE INSTRUCTION MANUAL.

Spindle speed plates

The plate indicating of the speed of rotation of the spindle corresponding to different gearbox configurations is on the front part of the head.

SPINDLE SPEED (RPM)			
GIRI MANDRINI (giri/min)			
	L-1	L-2	L-3
50Hz	75	170	280
	H-1	H-2	H-3
50Hz	540	960	1600

Minimum speed:

75 rev / min - lever configuration: L-1.

Maximum speed:

1600 rev / min - lever configuration: H-3.

There is a graduated scale indicating the depth of the hole made in the workpiece on the central part of the drill, above the spindle.



Figure 3 - Graduated scale.



5. DESCRIPTION OF CONTROLS AND ADJUSTMENTS

5.1 Control panel buttons and lights



Figure 4 - Control panel.

- | | |
|----------|--|
| 1 | Power indicator; |
| 2 | Mode switch; |
| 3 | Switch (clockwise rotation); |
| 4 | Emergency push-button |
| 5 | Start button (anticlockwise rotation). |
| 6 | Stop button |
| 7 | Power switch |

1) Power indicator

It lights up when the machine is powered by the switch 7.

2) Mode switch

This rotary switch selects the operating mode of the machine:

- Drilling and milling (DRILL / MILL);
- Tapping (TAP).
 - press the green 3 and 5 buttons in drilling mode depending on the rotation of drilling to make the machine start.
 - In tapping mode, the spindle will automatically rotate in a clockwise direction as soon as the sleeve is lowered slightly. Upon reaching the preset depth the rotation of the tip will stop for a short time thanks to the internal timer and will start to rotate in reverse to extract the tap.

3) Start button I

This button is used to rotate the spindle.

4) Emergency stop button (red mushroom)

The red button mushroom stops the movement of the machine and disconnects the power supply.



In case of emergency

In an emergency, press the red emergency button to stop the machine.



Checking the Emergency Button

Before starting any work on the machine, the operator must ensure that the emergency stop button functions.

5) Start button (clockwise rotation)

By pressing this button the spindle starts, turning it to the left (for tapping operations).



Changing the direction of rotation

Always wait for the spindle to come to a complete stop before starting the rotation in the opposite direction to the one you are using.

6) Stop button

Pressing this button stops the spindle.

7) Power switch

Turning this switch powers the machine. Power light 1 comes on when the switch is rotated.



5.2 Levers and control wheels

To set the speed of rotation of the spindle, turn off the machine and bring the levers (ref. 6 and 7 in 5), to the required position, following the directions given in the speed table and in relation to the machining to be followed.

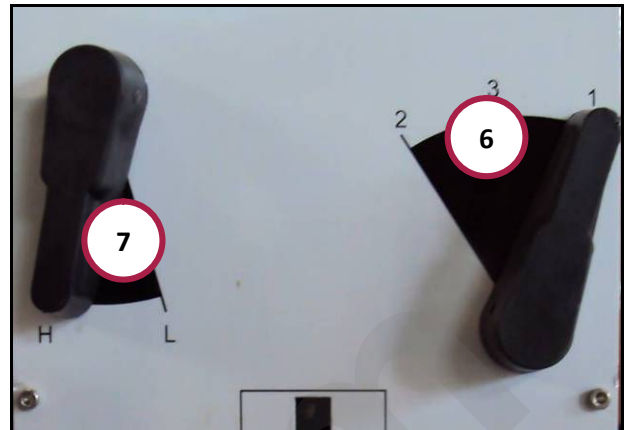


Figure 5 - Speed control levers.

The leaflet ref. 8 in Figure 6 allows the rapid advance of the drilling spindle if rotated counterclockwise. Rotating it in a clockwise direction allows the rapid ascent of the spindle. The knob ref. 9 loosens the body of the cone of the worm screw to adjust the drilling depth.

Rotating hand wheel ref. 10 Figure 6 in a clockwise direction allows the slow forward calibrated depth progression of the spindle.. Rotating it counterclockwise allows its ascent

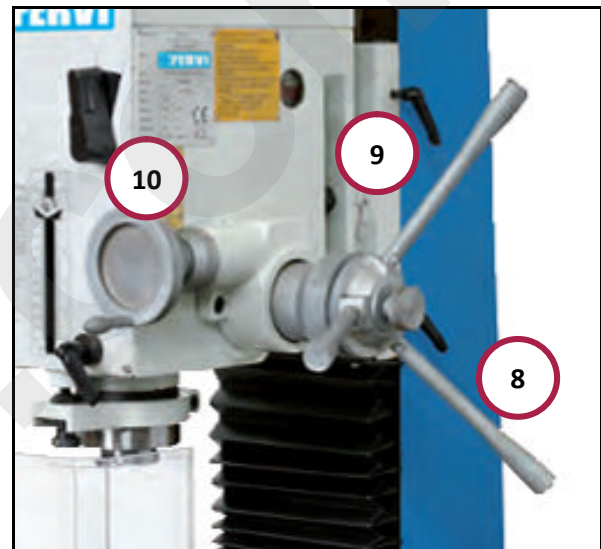


Figure 6 - Flyers spindle.

Flyers ref. 11 (Figure 7) allow the calibrated longitudinal advancement of the work table.

Hand wheel 12 controls the calibrated cross feed of the worktable.

Levers 13 are used to block the longitudinal feed of the table.

Levers 14 are used to block the cross feed of the table.

Nut 15 is used to lock the rotation of the table.

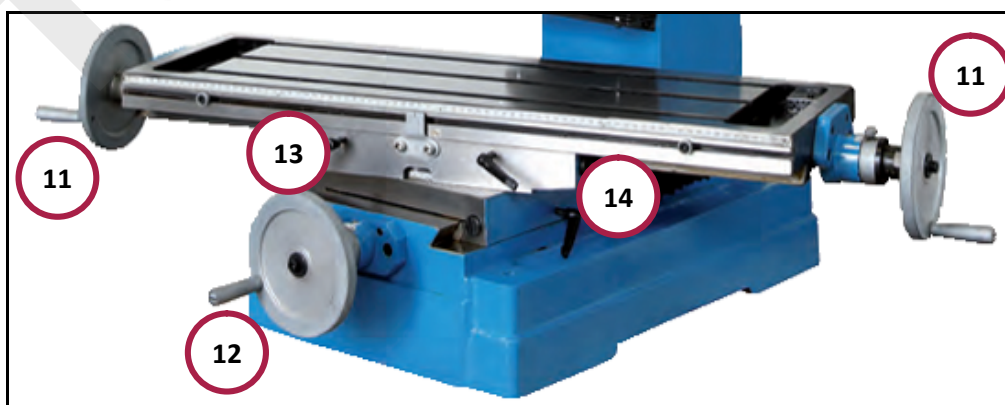
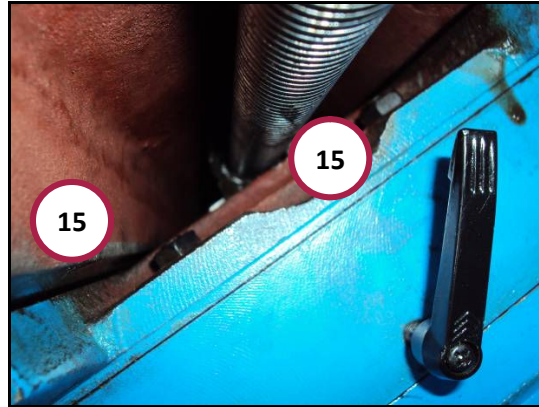


Figure 7 - Flyers and levers of the board.



This handle adjusts the height of the head of the bench drill-mill.



Figure 8 - Vertical adjustment handle.

This lever locks the spindle.

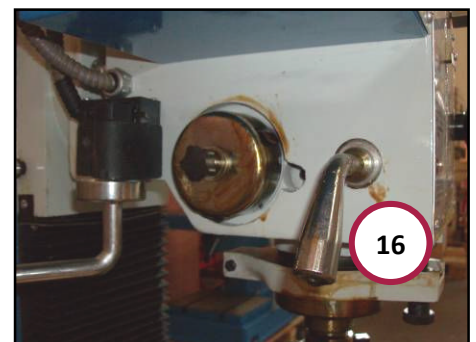


Figure 9 - Spindle safety lock.

This knob adjusts the height (depth) of drilling / tapping. When the spindle reaches zero the rotation stops.

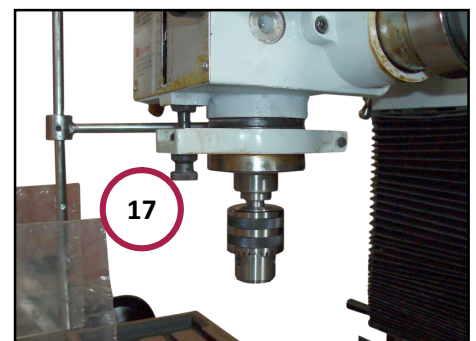


Figure 10 - Adjusting knob height.



6. MACHINE SAFETY DEVICES



Accident

UNDER NO CIRCUMSTANCES SHOULD PROTECTION AND SAFETY DEVICES BE MODIFIED OR REMOVED!

Before using the machine, always check the condition and correct safety device operation provided by the manufacturer.

6.1 Spindle guard

To protect the operator from contact with the rotating tool or from ejected parts during processing, there is a plexiglass guard (Figure 11).

This guard is equipped with a micro-switch, which stops the power supply to the machine when it is not in closed position (protection of the spindle).



Figure 11 – Spindle Guard



Accident

Before using the machine, always check status and proper operation of the safety guard of the spindle.

6.2 Spindle shaft guard

There is a recessed guard in the upper part of the head, to protect the spindle shaft.



Figure 12 - Spindle shaft guard.

6.3 Emergency stop switch

The emergency stop is constituted by a cap red which, if pressed, activates the stop button thus interrupting the power supply of the machine.



Figure 13 – Emergency Button.

Pressing the emergency stop, the spindle continues to rotate for a few seconds before stopping completely. Do not approach the tool until it is completely stopped!



Checking the Emergency Button

Before starting any work on the machine, the operator must ensure that the emergency stop button works.



In case of emergency

In an emergency, press the red emergency button to stop the machine.

6.4 Electrical safety devices

In the event of drill malfunction or failure, the machines are equipped with an electric cable with **conductor grounding** to protect the operator from electrocution (electric shock), providing a path of least resistance for electric current thus reducing the danger of electrocution.



Electric Shock

Improper connection of the machine's grounding conductor can result in the risk of electric shock. Do not make any changes to the electrical system.

The machine must be connected to an electrical system with plant grounding and devices for the automatic interruption of the power supply to ensure an adequate level of protection.

If you are not sure whether the electrical system connected to the network which the machine is equipped with is grounded or if you doubt its effectiveness, perform a check with a qualified electrician.

Repair or replace damaged or worn cables immediately.



6.5 Use of PPE

Even if the **bench drill-mills (Art T044/230V and Art T044/400V)** are equipped with safety devices, there remains a risk of injury related to the execution of the work.

It is therefore imperative that the operator wear the following personal protective equipment before starting work:

- wear goggles or face shield to prevent splinters or other parts from damaging your eyes or face;
- wear gloves to protect your hands from burrs on the piece;
- wear safety shoes to protect your feet from falling objects;
- wear suitable work clothes, close-fitting with dangling parts.



Use of PPE

ALWAYS use appropriate personal protective equipment (PPE), such as (see Figure 14):

- Gloves,
- Goggles or face shields;
- Overalls or aprons;
- Safety shoes.



PROTECTIVE
GLOVES



PROTECT THE
EYES



PROTECTIVE
CLOTHING



PROTECTIVE
FOOTWEAR

Figure 14 - Personal protective equipment.

7. TRANSPORT AND LIFTING

Use suitable lifting equipment to move the drill. Please remember that the machine weighs about 350 kg, so use lifting equipment with a higher maximum load capacity.

Lifting cranes, cranes and hoists with sufficient load capacity may be considered appropriate.



Means of transport

Before starting any work on the machine, the operator must ensure that the emergency stop button works.

8. MACHINE ASSEMBLY

Proceed as follows to assemble the square column bench drill-mill with dovetail guides:



Staff Required

The assembly must be carried out by at least two people.



Clean the Machine

Before starting assembly, clean the protective product from the machine's components.



Risk of Crushing

Assemble the square column bench drill-mill on a solid, resistant support base to avoid breakage.

1. Ensure the head on the column is fixed correctly before moving the tool;
2. Check the stability and safety of the drill cutter;



Installing the Machine

Do not install the unit outdoors, to prevent warping or loss of accuracy.

1. Install the machine on strong benches and / or foundations to avoid vibration during operation;
2. Check that the motor turns clockwise before connecting the power supply;
3. Tighten the 4 bolts at the base of the machine only when you are sure that the floor / workbench is flat.

Drills are supplied completely assembled, with the exception of:

- spindle taper;
- spindle;
- table height adjustment knob;
- spindle activating hand wheels.

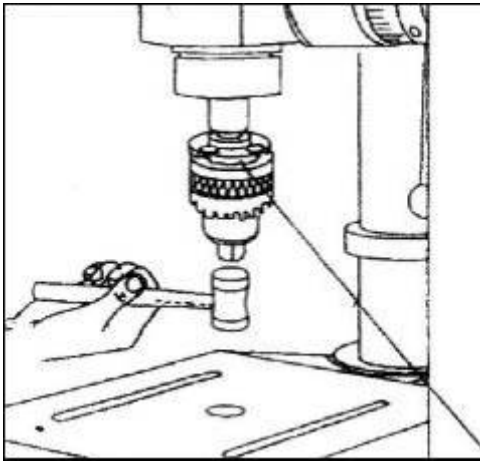
Upon delivery of the machine, check that all parts are present and check them for damage !



8.1 Spindle taper and spindle assembly

Proceed as follows to assemble the spindle cone and the spindle:

1. Clean the inner surface of the cone spindle coupling, using a dry cloth. Clean the spindle and the spindle taper the same way
2. Insert the end with the two flat surfaces of the spindle taper inside the coupling by pressing firmly upwards.
3. Insert the spindle shaft in the bore of the cone spindle, then beat the tip of the spindle with a rubber or wood mallet (as shown in **Figure 15**).



Spindle shaft

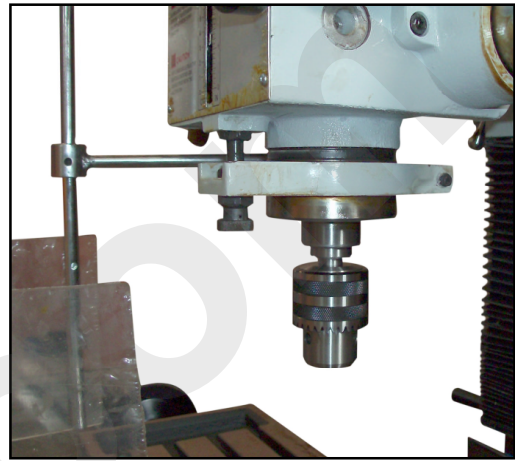


Figure 15 - Chuck (A: tap with a hammer - B: overview).



Hold the spindle

- Hold the spindle with one hand, while tapping the knife with the hammer.
- Do not drop the spindle on the worktable, so as not to damage these parts.

9. OPERATION

The drill press is a very easy machine to use. It functions by making holes in metal parts.



Using the Machine

The Bench Drill-Mill should be used only with tools for precision machining of metals.



Risk of Crushing

Before using the machine, make sure that the base is fixed to the floor to prevent movement or loss of stability.



Using the Machine

Drill-mills should be used only by skilled, trained staff so use the drills only after you have read and understood the manual.



Risk of Injury

The workpiece must be firmly fixed to the table (with the vice) while operating the machine. Never is the workpiece to be held in place with one's hands.

9.1 Preliminary checks

Make sure that the tool holder spindle is securely fastened. Use only appropriate tool holder. Use only appropriate tool holder.

Clean the machine and lubricate where required (see chapter "Maintenance"), to turn the machine starting from the lowest speed up to the maximum, making sure that everything is working properly.



9.2 Drilling

Unscrew the knob to loosen the worm screw cone and the spring base. Then set the stroke of the spindle by setting the positive depth of the blind holes (depth gauge) or through holes. Located at the front of the head.



Figure 16 - Depth adjustment.

1. Choose an appropriate tool for the next process and insert it between the jaws of the spindle.
2. Secure the tool by tightening the spindle with the key provided.



Machine assembly

Make sure that the tool is properly and securely assembled before starting the machine.



Locking the table

Before starting drilling / tapping operations, lock the table using the levers (ref. 13 and 14 [Figure 6](#)) and bolt (ref. 15 in [Figure 6](#)) that hold the table.

3. Set the speed of rotation of the spindle (and tool) depending on the operation to be performed, moving the levers, as reported in paragraph .
4. Secure the workpiece on the work surface by tightening it with the spindle.
5. Adjust the height of the work surface, as well as its rotation.
6. Lock the table using the appropriate levers, as shown in paragraph 5.2.
7. Close the spindle's interlocked guard protection.
8. Turn on the drill and start the rotation setting the switch to the position DRILLING (Ref. 2 in [Figure 4](#)) and the START switch (Ref. 3 in [Figure 4](#)).
9. Lower the spindle using the hand wheel for vertical displacement and drill the hole (see the [Figure 17](#)).



10. When finished, release the wheel.

To perform micrometric displacements, move the tool to the required height, tighten the knob and then drill the hole using the micrometric hand wheel at the front of the head

Figure 17 - Lower the spindle.



Figure 18 - Hand wheel activation.



Drilling depth

Check drilling depth on the graduated scale on the spindle feed hand wheel.

9.3 Tapping

Use a suitable tool for tapping, then:

1. Move the switch (ref. 2 in Figure 4) to position Tapping
2. Start with the normal rotation of the start button .
3. When it reaches the position 0, the machine automatically stops and restarts after a brief moment with the direction of rotation reversed.



Tapping

Tapping operations should only be performed at low rotation speed by setting the levers in position I-L or I-M (max. 170 rpm).

DO NOT reverse the direction of rotation when the spindle is in motion.



9.4 Milling

1. Set the depth gauge to the highest position;
2. Screw the knob to couple the worm screw and the base spring;
3. Turn the micrometric feed hand wheel (ref. 11 in Figure 6) to set the spindle to the required height;
4. Then tighten the locking lever, located on the left side of the cylinder head (Figure 9).



Risk of Injury

The workpiece must be firmly fixed to the table (with the vice) while operating the machine. Never is the workpiece to be held in place with one's hands.

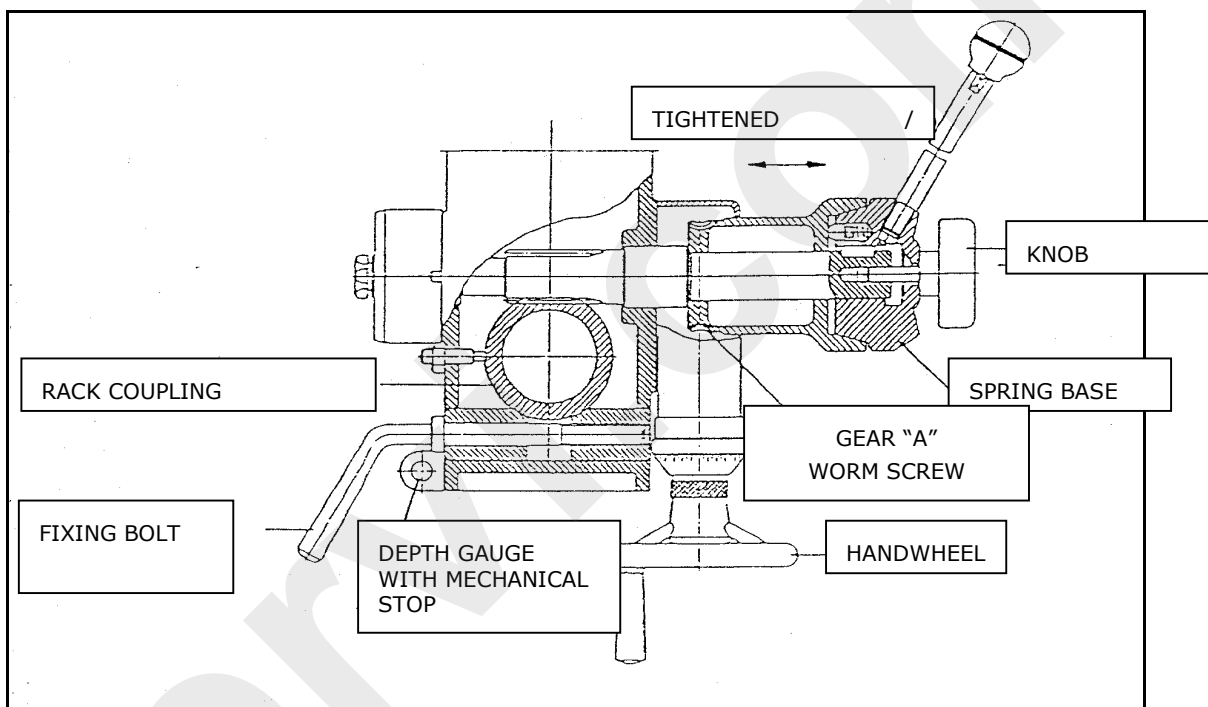


Figure 19 - Key elements for the spindle feed.

5. Start the machine by setting the switch (ref. 2 in Figure 4) to MILLING position.
6. Start spindle rotation by pressing the button START (Ref. 3 in Figure 4).
7. Move the table in longitudinal and/or transverse direction using the appropriate hand wheels (ref. 11 and 12 in Figure 6).



Figure 20 - Moving the table.



Unlocking of the table

Before starting milling operations, remember to release the levers (ref. 13 and 14 in Figure 6) that hold the table.

8. At the end of machining turn off the machine, bringing the switch to a vertical position.



Risk of Injury

After turning off the machine, the spindle continues to turn for a few seconds, do not place hands near the tool and/or workpiece, as long as the rotation has not stopped completely.

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10. MACHINE ADJUSTMENT

10.1 Adjusting the head

Head adjustment is performed as follows:

- Loosen the thumb screws on the head (**Figure 21**)
- Use the handle on the right of the column to raise and lower the head (**Figure 8**);
- Once the required height is attained, tighten the thumb screws to prevent vibration.



Figure 21 - Thumb lock heads.

10.2 Inclination of the head

To adjust the inclination of the head:

- Loosen the hex nut (**Figure 22**);
- Turn the head with both hands up to the required inclination by observing the graduated scale on the side;
- When the required inclination is attained, tighten the hex nut.



Figure 22 - Nut and graduated bay.

10.3 Table adjustment and locking

The Bench Drill-Mill has an adjustable guide to compensate for work table wear and play. Proceed as follows to adjust the play: Proceed as follows to adjust the play:

- Turn the guide adjustment bolt clockwise, with a hex wrench in case of excessive play, counterclockwise otherwise;
- Adjust the guide registration bolt to obtain slight drag in the feed.

The same nut can be used to lock the table in the rotated position, by reference to the graduated scale, located at the front.

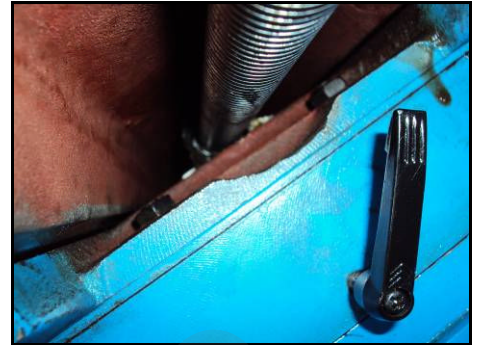


Figure 23 - Adjustment nut.



Figure 24 - Table rotation.



10.4 Locking the table and the base



Risks Associated with Using the Machine

With longitudinal feed milling, it is compulsory to lock the transverse feed stroke of the table to ensure accurate operation. For this purpose, tighten the thumb screws on the right side of the table.



Figure 25 - Cross locking screws.

Conversely, with transverse feed milling, lock the longitudinal movement of the table using the screws at the front.



Figure 26 - Longitudinal locking screws.

Finally, with drilling or tapping operations, lock all movements of the table using the thumb screws and the bolt.

11. MAINTENANCE

11.1 Routine Maintenance

Remove dust accumulated inside the motor and machining residues on the work surface using compressed air.

11.2 Lubrication

Check the lubricating oil level is sufficient through the indicator on the right of the head. Top up the lubricating oil through the hole in the upper part of the head as required.



Figure 27 - Lubricating oil indicator and cap.



Worn Power Cable

Immediately replace the power cable when you notice that it is worn, cut or damaged.

Every 50 hours or every 5 days lubricate the gear mechanism and rotating surfaces of the table and the grooves of the spindle with oil.

Every 120 hours or every month of life of the machine, adjust both cross and longitudinal table play.

Every 300 hours or every 6 months during the life of the machine, a thorough check of operation, and wear and tear on the machine is to be carried out by a qualified technician.

Every 600 hours or every year of life of the machine, adjust the horizontal position of the table to preserve accuracy.



12. TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
Noisy operation.	A) Improper belt drive B) Dry spindle. C) Loose Pulley. D) Loose belt. E) Broken bearing.	A) Adjust the tension. B) Remove the spindle sleeve and lubricate. C) Tighten the pulley. D) Adjust the belt tension. E) Replace the bearing.
Excessive wobbling of the spindle.	A) Loose spindle. B) Worn spindle shaft or bearings. C) Broken spindle.	A) Serrate pushing the spindle downwards towards the table. B) Replace the spindle shaft or bearings. C) Replace the spindle.
The motor will not start.	A) Power supply B) Motor connection. C) Connections of the switches D) Burnt motor windings. E) Broken switch	A) Check the mains power supply B) Check the motor connections C) Check the switch connections D) Replace the motor E) Replace the switch
The tip is jammed in the workpiece.	A) Excessive pressure on the feed handle. B) Loose belt. C) Loose tip D) Speed is too fast	A) Apply less pressure B) Check the belt tension C) Tighten the tip with the key D) Change the speed
The tip is burning or smoking.	A) Incorrect speed. Revolutions per minute. B) Shavings will not discharge C) Tip is worn or does not cut the material well. D) Needs lubrication E) Incorrect feeding pressure	A) See table speed B) Clean the tip C) Check the sharpness and taper D) Lubricate while drilling E) Apply less pressure
The stroke of the table is not balanced	A) The slack in the spindle taper is too large B) The wing bolt is too slow; C) Feed too deep.	A) Adjust the bolt B) Tighten the wing; C) Reducing the depth of advancement.
The tip vibrates, the hole is not round.	A) Knot in the wood, the tip was sharpened off-centre. B) Bent tip.	A) Sharpen the tip correctly. B) Replace the tip.
The temperature of the spindle holder is too high.	A) Insufficient lubrication.	A) Lubricate the spindle holder.

PROBLEM	PROBABLE CAUSE	SOLUTION
Lack of precision.	A) Horizontal table not flat.	A) Perform the control and maintenance of the table to keep it perfectly horizontal.
The spindle will not stick to the sleeve.	A) Dirt, grease or oil in the morse taper. B) Running in an unauthorized mode.	A) Use detergents (alcohol, etc.) to clean the conical part of the drill and the spindle. B) Drilling causes the failure.

13. DISPOSAL OF PARTS AND MATERIALS

If the machine is to be scrapped, its parts must be disposed of separately.

The materials of the machine include:

- Steel, aluminum and other metal components.
- Plastic materials.
- Copper cables, motors and electric components.



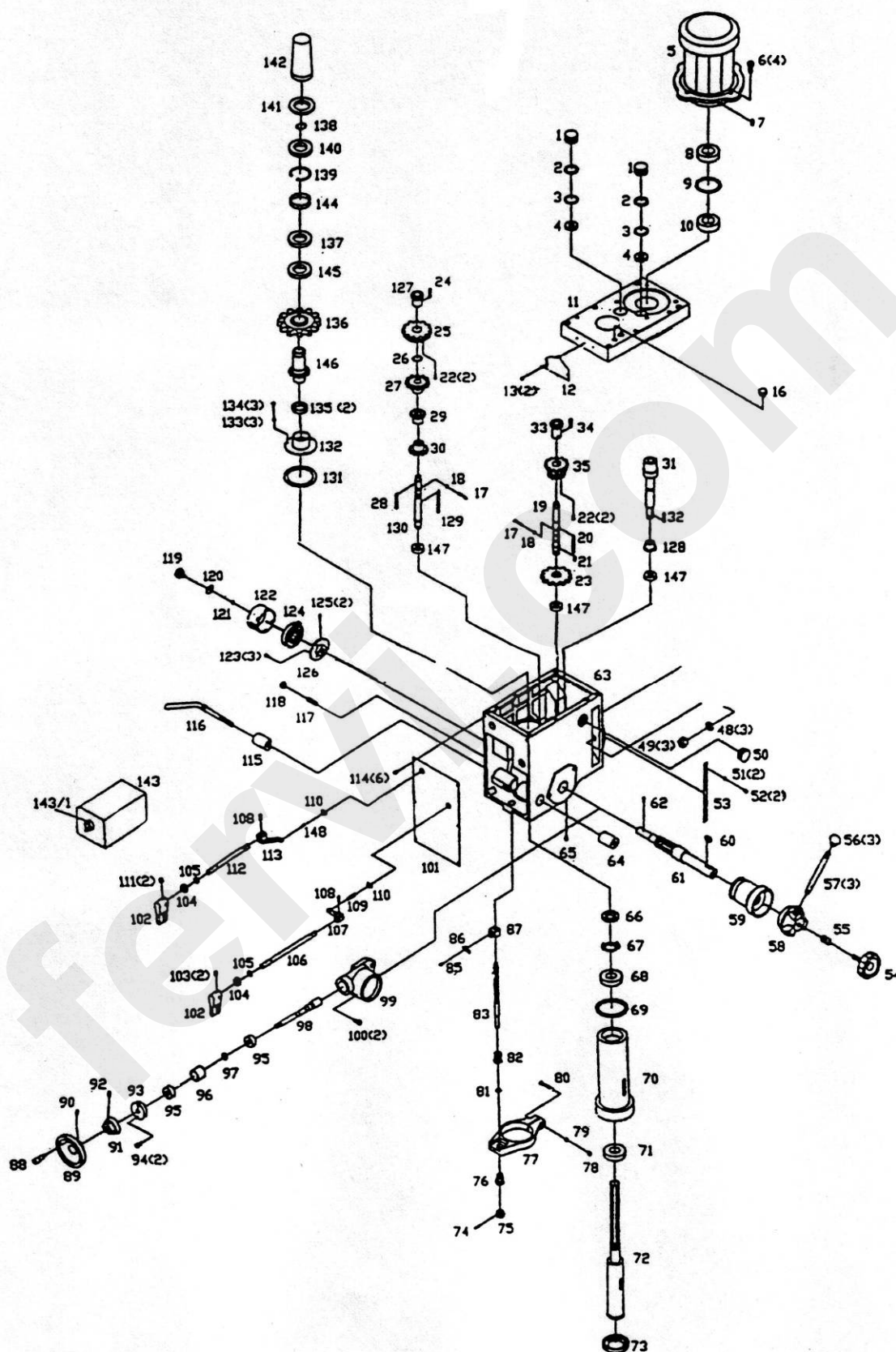
Respect the Environment!

Contact a specialist center for the collection of materials.





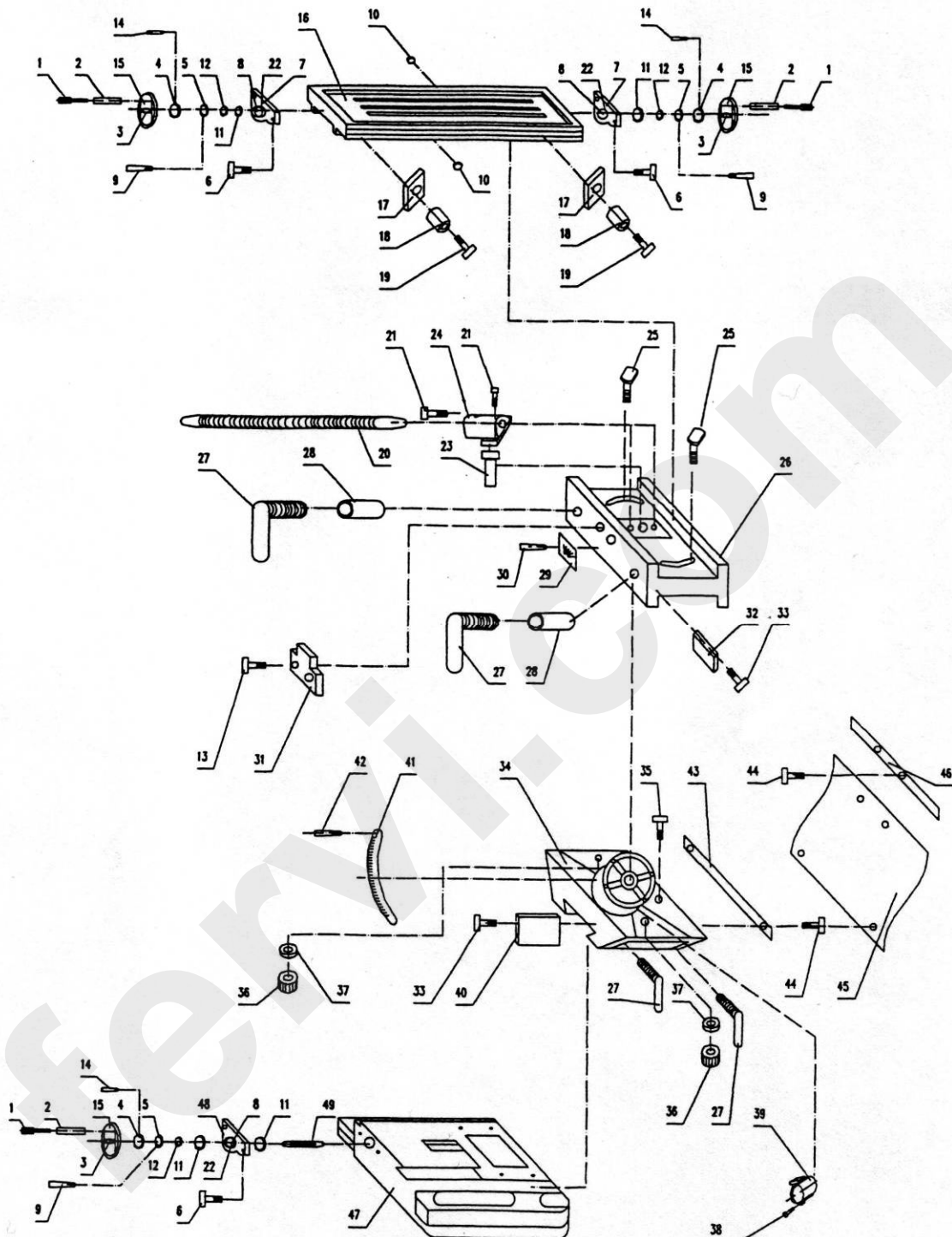
14. SPARE PARTS



Code	Description	Code	Description
T044/01	Cap	T044/43	Shaft
T044/02	Air seal	T044/44	Bolt
T044/03	Retainer ring	T044/45	Body
T044/04	Ball bearing	T044/46	Bolt
T044/230V/05	Motor 230V	T044/47	Reference
T044/400V/05	Motor 400 V	T044/48	Washer
T044/06	Screw	T044/49	Nut
T044/07	Key	T044/50	Oil level
T044/08	Oil seal	T044/51	Washer
T044/09	Retainer ring	T044/52	Screw
T044/10	Ball bearing	T044/53	Scale
T044/11	Head cover	T044/54	Handlebar
T044/12	Nameplate	T044/55	Spring
T044/13	Rivet	T044/56	Rod knob
T044/14	Pipe	T044/57	Rod
T044/15	Vent	T044/58	Shaft body
T044/16	Oil cap	T044/59	Gear
T044/17	Spring	T044/60	Key
T044/18	Steel ball	T044/61	Shaft
T044/19	Shaft	T044/62	Screw
T044/20	Key	T044/63	Head
T044/21	Key	T044/64	Collar
T044/22	Screw	T044/65	Screw
T044/23	Gear	T044/66	Locking Ring
T044/24	Key	T044/67	Washer
T044/25	Gear	T044/68	Ball bearing
T044/26	Key	T044/69	Stop
T044/27	Gear	T044/70	Sleeve
T044/28	Key	T044/71	Ball bearing
T044/29	Gear	T044/72	Fuse
T044/30	Gear	T044/73	Bearing protection
T044/31	Shaft	T044/74	Plug
T044/32	Key	T044/75	Knob
T044/33	Gear	T044/76	Base feed
T044/34	Key	T044/77	Power base
T044/35	Gear	T044/78	Nut
T044/36	Screw	T044/79	Washer
T044/37	Oil cap	T044/80	Screw
T044/38	Support	T044/81	Nut
T044/39	Gear	T044/82	Nut

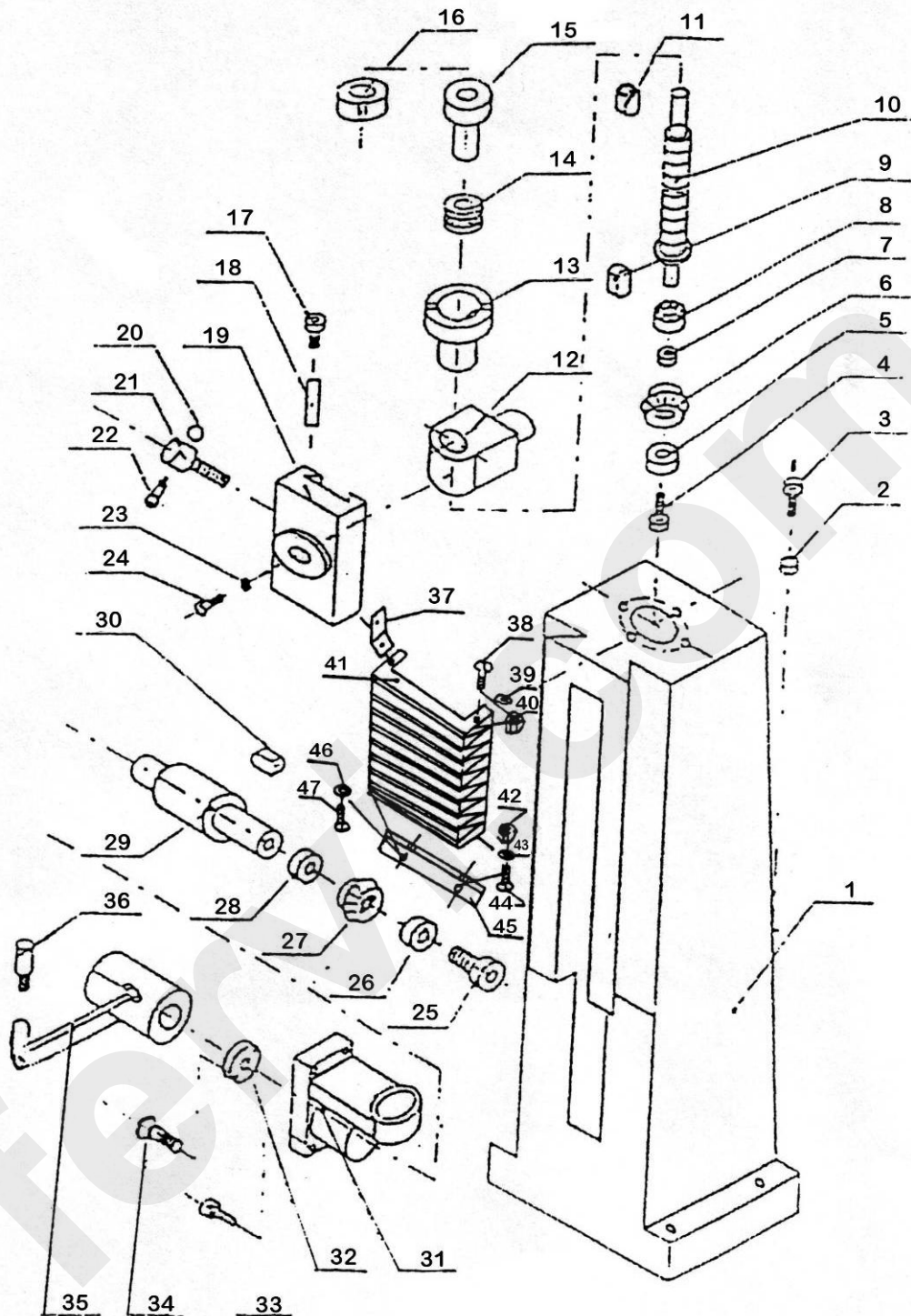


Code	Description	Code	Description
T044/40	Shaft	T044/83	Graduated shaft
T044/41	Shaft	T044/84	Plug
T044/42	Nut	T044/85	Screw
T044/86	Graduated scale	T044/119	Knob
T044/87	Bolt	T044/120	Washer
T044/89	Hand wheel	T044/121	Washer
T044/90	Screw	T044/122	Cover spring
T044/91	Micrometer	T044/123	Screw
T044/92	Screw	T044/124	Spring retainer
T044/93	Casing	T044/125	Plug
T044/94	Screw	T044/126	Base spring
T044/95	Ball bearing	T044/127	Gear
T044/96	Separator ring	T044/128	Gear
T044/97	Stop	T044/129	Key
T044/98	Shaft	T044/130	Shaft
T044/99	Feed casing	T044/131	Ring
T044/100	Screw	T044/132	Base
T044/101	Nameplate	T044/133	Washer
T044/102	Speed lever	T044/134	Screw
T044/103	Screw	T044/135	Oil seal
T044/104	Oil seal	T044/136	Gear
T044/105	Ring	T044/137	Oil seal
T044/107	Flat	T044/139	Ring
T044/108	Right lever	T044/140	Ball bearing
T044/110	Left shaft lever	T044/139	Ring
T044/111	Screw	T044/141	Base
T044/112	Left shaft lever	T044/143	Casing
T044/113	Left lever	T044/230V/145	Switch
T044/114	Screw	T044/400V/145	Switch
T044/115	Collar	T044/146	Ring
T044/116	Bar	T044/147	Ball bearing
T044/117	Screw	T044/148	Plug
T044/118	Nut		





Code	Description	Code	Description
T044/201	Bolt	T044/226	Table support
T044/202	Switch	T044/227	Locking handle
T044/203	Stop	T044/228	Stop
T044/204	Micrometer	T044/229	Reference
T044/205	Graduated scale	T044/230	Rivet
T044/206	Bolt	T044/231	Stop
T044/207	Base of support	T044/232	Guide plate
T044/208	Oiler	T044/233	Bolt
T044/209	Plug	T044/234	Table support
T044/210	Oiler	T044/235	Bolt
T044/211	Bearing	T044/236	Nut
T044/212	Adjustment washer	T044/237	Washer
T044/213	Bolt	T044/238	Screw
T044/214	Plug	T044/239	Casing
T044/215	Hand wheel	T044/240	Guide plate
T044/216	Work Plan	T044/241	Graduated scale
T044/217	Stop	T044/242	Rivet
T044/218	Cylinder	T044/243	Stop
T044/219	Screw	T044/244	Bolt
T044/220	Transverse screw	T044/245	Table guard
T044/221	Hex bolt	T044/246	Stop
T044/222	Reference	T044/247	Base
T044/223	Linchpin	T044/248	Screw support
T044/224	Casing	T044/248	Longitudinal screw
T044/225	Retainer screw		

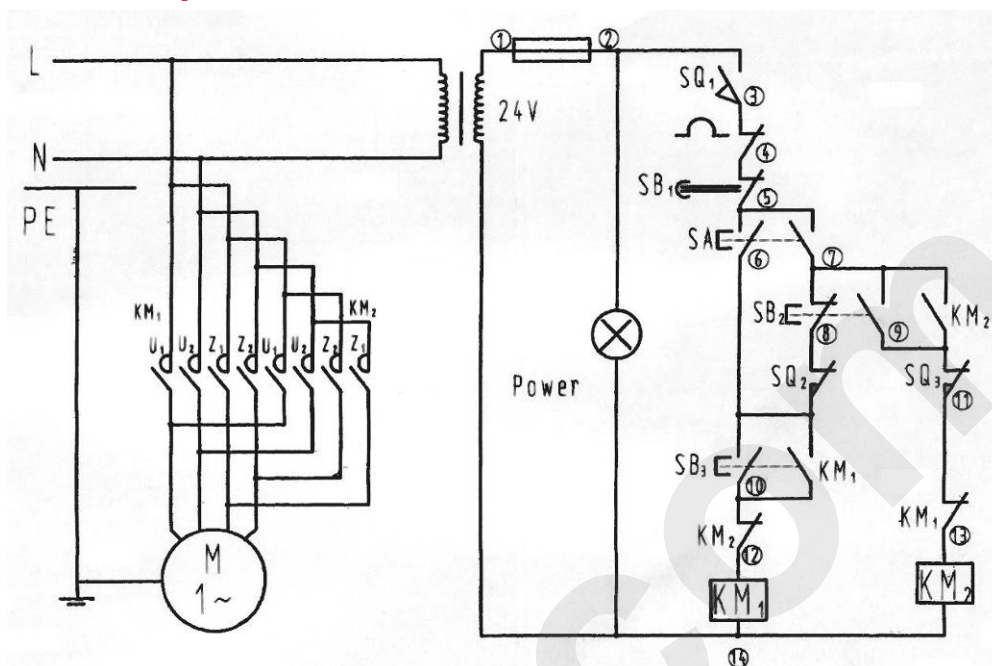




Code	Description	Code	Description
T044/301	Square column	T044/325	Bolt
T044/302	Washer	T044/326	Washer
T044/303	Bolt	T044/327	Gear
T044/304	Hex nut	T044/328	Tube
T044/305	Washer	T044/329	Gear
T044/306	Gear	T044/330	Key
T044/307	Adjustment tube	T044/331	Support base
T044/308	Ball bearing	T044/332	Washer
T044/309	Flat key	T044/333	Bolt
T044/310	Screw	T044/334	Bolt
T044/311	Key	T044/335	Spring knob
T044/312	Casing	T044/336	Linchpin
T044/313	Bearing support	T044/337	Support
T044/314	Bearing	T044/338	Bolt
T044/315	Tube	T044/339	Spacer
T044/316	Nut	T044/340	Nut
T044/317	Bolt	T044/341	Protective device
T044/318	Guide plate	T044/342	Nut
T044/319	Support	T044/343	Spacer
T044/320	Sphere	T044/344	Bolt
T044/321	Bolt	T044/345	Flat
T044/322	Bar	T044/346	Spacer
T044/323	Washer	T044/347	Bolt
T044/324	Bolt		

15. ELECTRICAL CIRCUIT

15.1 Version T044/230V



15.2 Version T044/400V

