



Drilling machine with vacuum base

# TFC.50<sub>S</sub>



Congratulations on purchasing this premium drilling machine with vacuum base. At TOOL FRANCE we strive to exceed our customers' expectations by developing and providing premium and innovative portable drilling and cutting solutions. We believe that a professional like you must be able to rely on a professional supplier. Which has led us to become a major player in the industrial world, with our own factory and several offices worldwide. All because we have always listened to our customers and to the demands from the market.

Our vision is focused on developing innovative portable tools that add value for our customers and facilitate them in their daily work. We never lose sight of sustainability, time savings and cost savings.

Enjoy your new machine!

Before operating your new vacuum drilling machine, please first read all instructions. You find the instructions in this manual and on the warning label on your machine. With proper use, care and maintenance your machine will provide you with years of premium drilling performance.

**TO REDUCE THE RISK OF INJURY USER MUST READ AND UNDERSTAND ALL INSTRUCTIONS**

To view all our offices and their contact information please visit: [www.toolfrance.com](http://www.toolfrance.com)

The original manual has been produced in the English language. If any discrepancies should occur in translations, reference must be made to the original version for clarification.

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# 1. Safety

## 1.1 General safety instructions

Do not use this vacuum drilling machine before you have thoroughly read and completely understood this manual, specifically the “General safety instructions” and “Specific safety information” , including the figures, specifications, safety regulations and the signs indicating DANGER, WARNING and CAUTION.



**WARNING:** *When using electrical tools basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury.*

Please also observe the relevant national industrial safety regulations. Non-observance of the safety instructions can lead to an electric shock, burns and/or severe injuries.

This manual should be kept for later use and enclosed with the machine, should it be passed on or sold.

### Work area

1. Keep your work area clean and well lit. Cluttered and dark work areas increase the chance of accidents;
2. Do not operate a vacuum drilling machine in explosive atmospheres, such as in the presence of flammable liquids, gases or dust, the machine may create sparks which could ignite the dust or fumes;
3. Keep bystanders, children and visitors away while operating a vacuum drilling machine. Distractions can cause you to lose control.

### Electrical safety

1. A machine plug must match the outlet. Never modify the plug in any way. Do not use any adapter plugs;
2. Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is grounded;
3. Do not expose the drilling machine to rain or wet conditions. Water entering a machine will increase the risk of electric shock;
4. Do not abuse the cord. Never use the cord to carry the machine or pull the plug from an outlet. Keep the cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately. Damaged cords increase the risk of electric shock;
5. When operating a drilling machine, use an extension cord suitable for outdoor use, this reduces the risk of electric shock;
6. If operating a vacuum drilling machine in a damp location is unavoidable, use a residual current device (RCD), this reduces the risk of electric shock.

## Personal safety

1. Stay alert, watch what you are doing and use common sense when using a vacuum drilling machine. Do not use the machine while tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating the machine may result in serious personal injury;
2. Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts;
3. Avoid accidental starting. Be sure the switch is off before plugging the machine in. Carrying a vacuum drilling machine with your finger on the switch or plugging in the machine that has the switch on increases the chance of accidents;
4. Never place hands, fingers, gloves or clothing near drilling area or rotating machine parts;
5. Remove adjusting keys or switches before turning the machine on. A wrench or a key that is left attached to a rotating part of the machine may result in personal injury;
6. Do not overreach. Keep proper footing and balance at all times. Proper footing and balance enables better control of the machine in unexpected situations;
7. Use safety equipment. Always wear eye protection. Dust mask, non-skid safety shoes, hard hat and hearing protection must be used for optimal safety;
8. Always use supplied safety chain during any work on non-horizontal surfaces. The drilling machine with vacuum base can release from surface.



**WARNING:** *Wear ear and eye protection when using this machine.*

## Machine use and care

1. Always place the machine on a surface that is clear of shavings, chips, swarf and dirt;
2. Use the TFC.50S machine on horizontal or light sloping and flat surfaces only. The gravity pulling at the machine applied on steep slopes, vertically or upside down reduces the suction force of the vacuum base;
3. Do not use the machine when the switch does not turn it on or off. Any machine that can't be controlled with the switch is dangerous and must be repaired;
4. Use clamps or other practical solutions to secure and support the workpiece to a stable platform. Holding the workpiece by hand or against your body is unstable and may lead to loss of control;
5. Apply cutting paste instead of oil or spray to lubricate the annular cutter or drill. Cutting oil or spray on the seal may affect the working of the seal by reducing the amount of friction required to hold the vacuum base with the machine in position on the workpiece while drilling;



**DANGER:** *When the suction force or the amount friction becomes too low, the machine may release itself from the workpiece.*

6. Always remove the slug from the annular cutter after each hole;



**WARNING:** *The metal slug can be sharp and very hot!*

7. Maintain your machine with care. Keep cutting tools sharp and clean. Properly maintained tools, with sharp cutting edges are less likely to break and are easier to control;



**ATTENTION:** *Keep the rubber sealing ring clean and free of debris and swarf!*

8. Check for misalignment of moving parts, breakage of parts and any other condition that may affect the machine's operation. If you detect damage, have the machine serviced before use. Many accidents are caused by poorly maintained tools;
9. Only use accessories that are recommended by TOOL FRANCE for your machine model. Accessories that are suitable for one machine may become hazardous when used on another machine.
10. Disconnect the plug from the power source before making any adjustments, changing accessories or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally;
11. Store your machine out of reach for children and other untrained persons. Tools are dangerous in the hands of untrained users.

## Service

1. Tool service must be performed only by qualified repair personnel. Service or maintenance performed by unqualified personnel could result in risk of injury;
2. When servicing a tool, use only identical replacement parts. Follow instructions in the maintenance section of this manual. Use of unauthorised parts or failure to follow maintenance instructions may create a risk of electric shock or injury.

## 1.2 Specific safety information

- Keep your fingers away from the drilling area;
- Avoid touching the slug that is automatically ejected by the pilot pin when the working procedure is finished. Contact with the slug when it is hot, or if it falls, can cause personal injuries;
- Always use the safety chain;
- The drilling machine with vacuum base is particularly suitable for use on non-magnetic stainless steel, aluminium and thin carbon steel with zero air gap between rubber sealing ring and the mounting surface. Curvature, unfirm coats of paint or uneven surface will cause a vacuum leak. The VACU-TEC sensor in the machine will detect this and in such case, for your own safety, the motor will not start;
- Always place the machine on a flat surface;
- Do not clamp the vacuum base of the drilling machine on small or irregular shaped objects;
- Do not switch on the machine before checking whether the base has been tightened firmly to the mounting surface;
- Adjust the machine so cutter does not extend into the workpiece before drilling. Do not perform any design, assembly or construction activities on the workpiece while the machine is switched on;
- Do not switch on the machine until it has been prepared and correctly placed according to all above mentioned instructions;
- Always use the recommended speed for the accessories and material you are working with;
- Do not use the machine on the same workpiece on which electric welders are working;
- Only use an appropriate cutting paste, for example TOOL FRANCE IBP.70 for high alloy metals like stainless steel;
- In case of a jammed cutter, turn off the machine, disconnect the machine from the power supply and then remove the reason for the jam before turning on the machine again.

## **Residual risk**

In spite of following the relevant safety regulations and their implementation, certain residual risks can't be avoided. These are:

- Impairment of hearing;
- Risk of personal injury from flying particles;
- Risk of burns due to accessories becoming hot during operation;
- Risk of personal injury due to prolonged use.

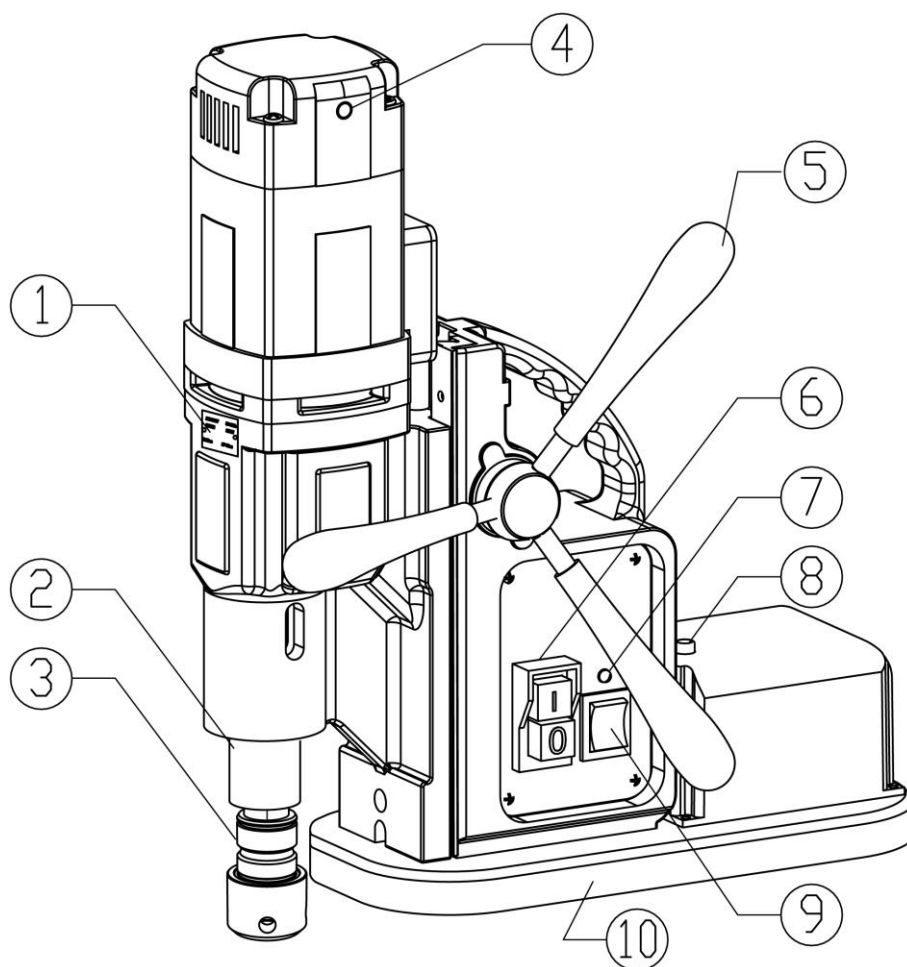
Always try to reduce these risks as much as possible.

## 2. Description

### 2.1 Intended use

This professional electric drilling machine with vacuum base must be used in a weather-protected environment. It is particularly suited for drilling materials with a flat, dry, non-magnetic surface like for example aluminium, stainless steel and thin carbon steel, using annular cutters, twist drills, reamers and countersinks as recommended by TOOL FRANCE. The vacuum drilling machine can be used horizontally or on light slopes.

### 2.2 Description and features



[image 2-1]

- |   |                            |    |                             |
|---|----------------------------|----|-----------------------------|
| 1 | Gearbox guide              | 6  | Motor switch                |
| 2 | Output shaft               | 7  | Vacuum sensor LED indicator |
| 3 | Morse taper spindle        | 8  | Pressure release button     |
| 4 | Carbon brush LED indicator | 9  | Vacuum pump switch          |
| 5 | Feed handle                | 10 | Vacuum base                 |



## 2.3 Case content

- 1 x TFC.50S drilling machine with vacuum base
- 3 x handles
- 1 x hex key 2.5 mm
- 1 x hex key 4 mm
- 1 x hex key 5 mm
- 1 x safety chain
- 1 x can (100 ml) of IBP.70 cutting paste\*
- 1 x arbor MT3 - 19.05 mm (3/4")
- 1 x Morse taper ejector drift key
- 1 x user manual
- 1 x safety ear protection
- 1 x safety goggles
- 1 x safety gloves
- 1 x safety guard\*\*
- 1 x seal EPDM\*\*

\* Optional, may vary per geographical area

\*\* Machine series from 2022

## 2.4 Serial number

The serial number is mentioned on the machine two times: engraved on the frame, and on the serial no. sticker on the motor housing. Additional serial no. stickers are provided with the machine for your administration.

The serial number will help you, your dealer and TOOL FRANCE to validate and identify the machine.

For example:

V50S2107001

breaks down to:

V50S   21   07   001

Machine series

Year of manufacture

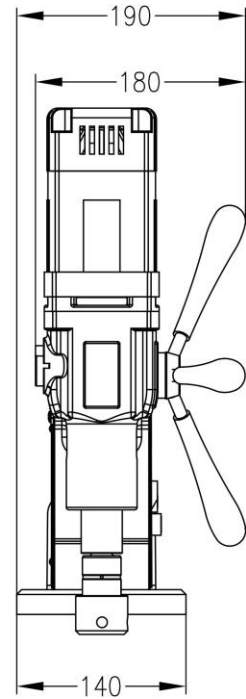
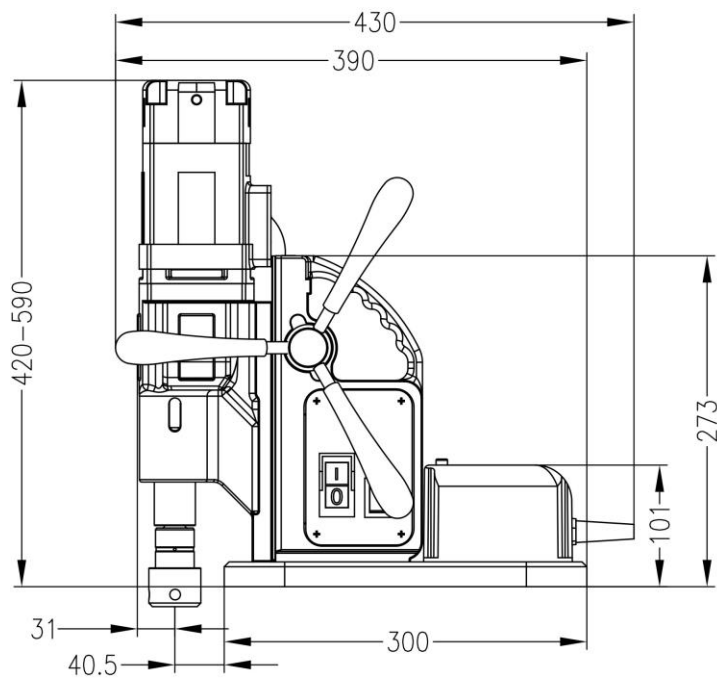
Month of manufacture

Identification number

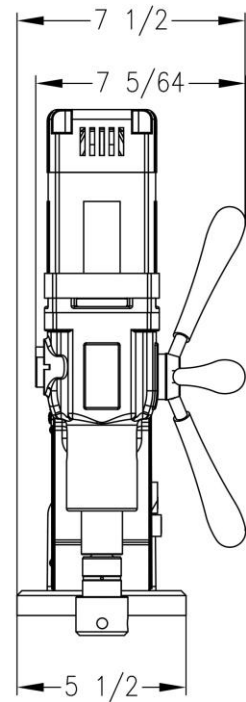
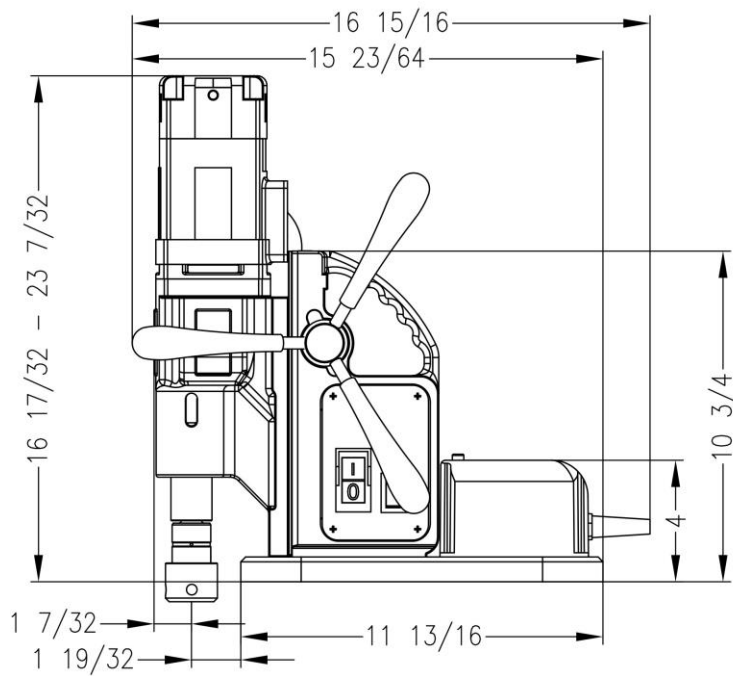
## 2.5 Technical data

	Metric	Imperial
<b>Annular cutting</b>		
- Steel and hard metals	Ø 12 - 30 mm	Ø 7/16" - 1 3/16"
- Other metals and plastics	Ø 12 - 50 mm	Ø 7/16" - 2"
<b>Twist drilling</b>		
- Steel and hard metals	Ø 1 - 13 mm	Ø 1/16" - 1/2"
- Other metals and plastics	Ø 1 - 23 mm	Ø 1/16" - 15/16"
<b>Tapping</b>	-	-
<b>Countersinking</b>	Ø 10 - 55 mm	Ø 3/8" - 2 3/16"
<b>Length</b>	430 mm	16 15/16"
<b>Width</b>	190 mm	7 1/2"
<b>Height</b>	420 - 590 mm	16 17/32" - 23 7/32"
<b>Stroke</b>	170 mm	6 11/16"
<b>Weight</b>	10.7 kg	23.6 lbs
<b>Vacuum base (l x w x h)</b>	300 x 140 x 21 mm	11 13/16" x 5 1/2" x 13/16"
<b>Adsorption force</b>	300 kg	661 lbs
<b>Vacuum motor (integrated)</b>		
- Air flow	15 L/min	0.53 cfm
- Gauge pressure	-80 kPa	-11.6 psi
- Power	12W	1A
- Voltage	12V	12V
<b>Machine motor power</b>	1,250 W	11.4 A
<b>Machine total power</b>	1,300 W	11.8 A
<b>Machine motor speed (no load)</b>	(I) 380 rpm (II) 690 rpm	
<b>Machine motor speed (load 1,250 W)</b>	(I) 235 rpm (II) 415 rpm	
<b>Spindle (Weldon)</b>	MT3 19.05 mm	MT3 3/4"
<b>Machine voltage</b>	220 - 240 V / 50 - 60 Hz	110 - 120 V / 60 Hz











## Dimensions (mm)



## Dimensions (inches)



## 2.6 Symbols

Symbol	Term, meaning	Explanation
	Read documentation	Be sure to read the documentation in this user manual and specifically the “General safety instructions” and “Specific safety information”
	Wear ear protection	Use ear protection during operation
	Wear eye protection	Use eye protection during operation
	Danger/warning/caution	Read and apply the information in the adjacent text!
	European conformity symbol	Confirms the conformity of the machine with the directives of the European Community
	Class of protection I	Product with basic insulation and exposed (touchable) conductive parts additionally connected to the protective earth conductor
	Electromagnetic Compatibility	Able to function acceptably in its electromagnetic environment
	International Electrotechnical Commission	Conformity with international electrotechnical safety standards
	ISO9001	Certified in accordance with ISO9001:2015 quality management system
	UL	Certified by Underwriters Laboratories (UL), a recognized laboratory for safety testing approved by US federal agency OSHA
mm	Millimetre	Unit of measure for the dimensions
"	Inch	Unit of measure for the dimensions
kg	Kilogram	Unit of measure for the mass
lbs	Pound	Unit of measure for the mass
L/min	Litres per minute	Unit of measure for the air flow
cfm	Cubic feet per minute	Unit of measure for the air flow
kPa	Kilopascal	Unit of measure for the pressure
psi	Pounds per square inch	Unit of measure for the pressure

Symbol	Term, meaning	Explanation
V	Volt	Unit of measure for the electric voltage
A	Ampere	Unit of measure for the electric current intensity
W	Watt	Unit of measure for the output
rpm	Revolutions per minute	Unit of measure for the revolutions

## 2.7 Environmental



Separate collection. This product must not be disposed of with normal household waste.



Separate collection of used products and packaging allows materials to be recycled and used again. Re-use of recycled materials helps prevent environmental pollution and reduces the demand for raw materials.

Local regulations may provide for separate collection of electrical products from the household, at municipal waste sites or at the retailer when you purchase a new product.

## 3. Preparation & adjustment

### 3.1 Assembly



**WARNING:** To reduce the risk of injury, turn machine off and disconnect from power source before installing and removing accessories, before adjusting or changing set-ups or when making repairs. Be sure all switches are in the OFF position. An accidental start-up can cause injury.

#### Fitting the feed handles

1. Fit each of the three feed handles by screwing them into the hub in clockwise direction;
2. Tighten firmly by hand.

The handles are supposed to face slightly outward. Be careful not to cross-thread any of the components.

#### Mounting the safety guard

The safety guard protects against chippings and accidental contact and must always be mounted before operation.

1. Hold the guard in front of the vacuum base, align the slots in the guard with the holes in the frame;
2. Fix the guard with the provided screws.



**WARNING:** Always use the safety guard.

#### Fitting the safety chain

1. Pass the safety chain through the frame grip opening.
2. Wrap the chain around the workpiece.
3. Securely close the chain using the lock.



**WARNING:** Always use the safety chain. The safety chain does not replace the adsorption force of the vacuum drilling machine: it is simply used to secure against falling in the event of a vacuum pump malfunction.

### 3.2 Prior to use

Please make sure that the contact surface for the vacuum base is level, clean and greaseless. Remove any varnish or primer.

Check the machine for possible damage. Before using the machine, you must carefully check the protective components or slightly damaged components to ensure they are operating perfectly and as intended. Check that moving parts are in perfect working order, do not jam and check whether the parts are damaged. All parts must be correctly installed and fulfill all conditions necessary to ensure perfect operation of the machine. Damaged protective components must be repaired or replaced according to specifications by TOOL FRANCE or any authorised TOOL FRANCE dealer.

**DO NOT** use under wet conditions or in presence of flammable liquids or gases.

**DO NOT** let children come into contact with the machine. Supervision is required when inexperienced operators use this machine.

### **Electrical safety**

The electric motors have been designed for one voltage only. Always check that the power supply corresponds to the voltage on the rating plate. Your TOOL FRANCE vacuum drilling machine is designed in class I (grounded) according to EN 61029-1. Earth wire is required. If the supply cord is damaged, it must be replaced by a specially prepared cord available at TOOL FRANCE or your TOOL FRANCE dealer.

### **Extension cord**

If an extension cord is required, use an approved 3-core extension cable suitable for the power input of this machine (see technical data). The minimum conductor size is 1.5 mm<sup>2</sup> (for 220V) or 14 AWG (Amperage Wire Gauge for 110V). The maximum length is 30 m (± 100 feet).



**WARNING:** *When using a reel, always unwind the cable completely!*

### **Useful tips**

- Try a few simple projects using scrap material until you develop a “feel” for the drilling machine with vacuum base;
- Let the machine run in for a period of eight to ten hours before starting with big operations. Do not load the machine too much during this run-in period;
- Never use the machine with serious overload;
- Keep the machine clear from moisture at all times to protect the machine, yourself and others.

## 4. Using the machine



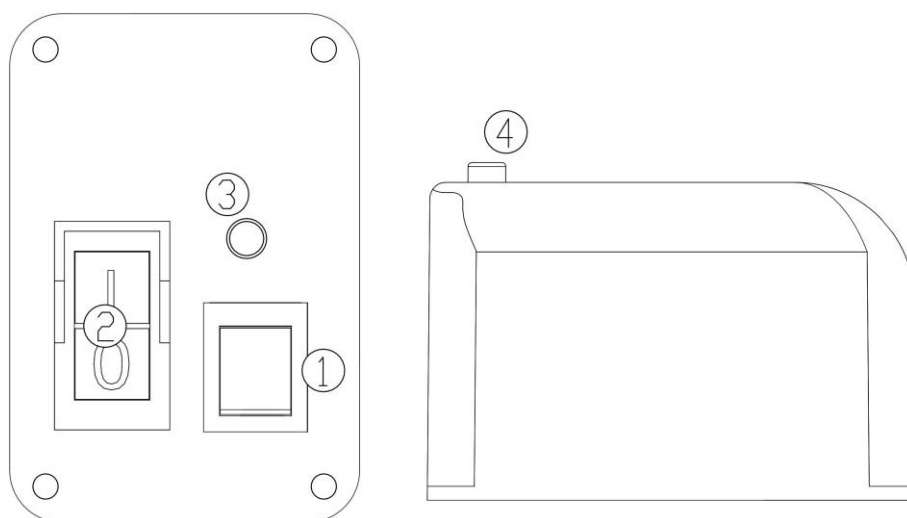
**WARNING:** Always observe the safety instructions and applicable regulations.



**WARNING:** To reduce the risk of serious personal injury, turn the machine off and disconnect the machine from power source before making any adjustments or removing/installing attachments or accessories.

### 4.1 Control panel

The control panel is designed for maximum ease of use and safety.

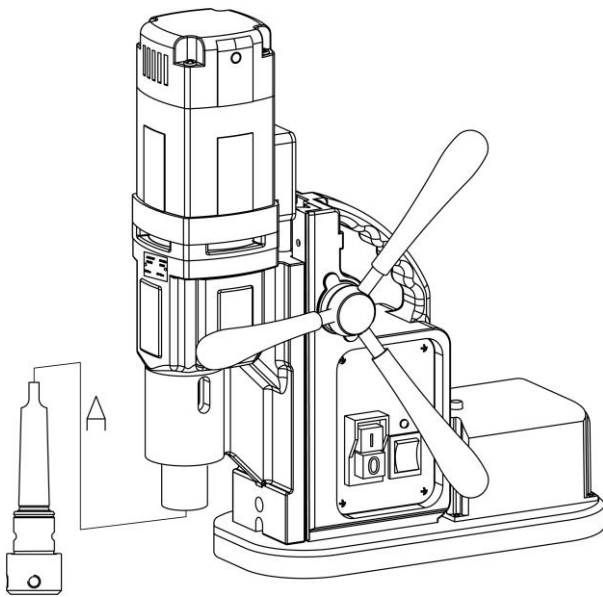


1. Vacuum pump switch
2. Motor switch
3. Vacuum sensor LED-indicator
4. Pressure release button

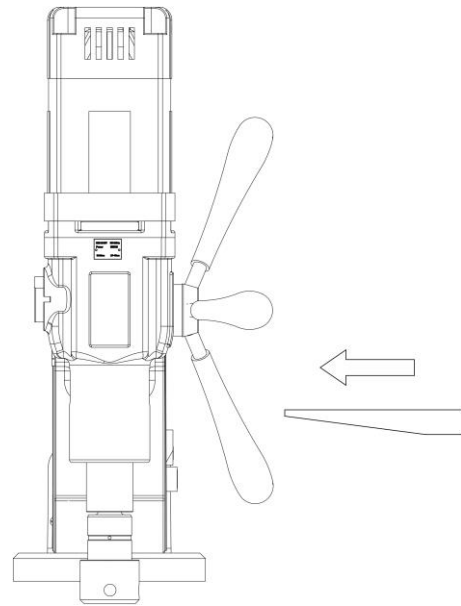
[image 4-1]



## 4.2 Morse taper arbor



[image 4-2]



[image 4-3]

1. Make sure the inside of the output shaft and the Morse taper arbor are clean and free of grease;
2. Firmly slide the Morse taper arbor into the output shaft by hand (A). Make sure the arbor properly positioned. You should not be able to pull it out by hand;
3. To remove the Morse taper arbor:
  - Switch off the motor;
  - Rotate the mechanical gear switch to neutral (see paragraph 4.3 Gearbox);
  - Rotate the output shaft until the slots on the shaft align with the slots on the gearbox;
  - Gently tap the supplied drift into the slots to push the Morse taper arbor out.

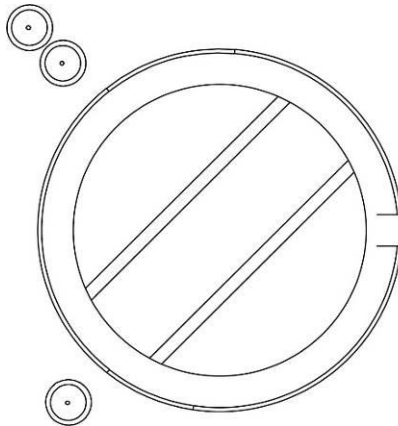
## 4.3 Gearbox

1. To select the correct gear from neutral (horizontal) position:
  - a. Rotate the switch counter clockwise to position **O**, this is gear I;
  - b. Rotate the switch clockwise to position **OO**, this is gear II.
2. A gear is only correctly selected when the gearbox switch is aligned with the indicators on the gearbox:

In case you have trouble fully and correctly selecting a gear, the gears in the gearbox might be misaligned. Slightly rotating the output shaft by hand will help you to align the gears and correctly and fully select the intended gear;

3. Speed selection for annular cutters (also see plate on gearbox):

- |    |                             |                |
|----|-----------------------------|----------------|
| o  | Ø 27 - 50 mm (1 1/16" - 2") | Speed 380 rpm; |
| oo | Ø 12 - 26 mm (1/2" - 1")    | Speed 690 rpm. |



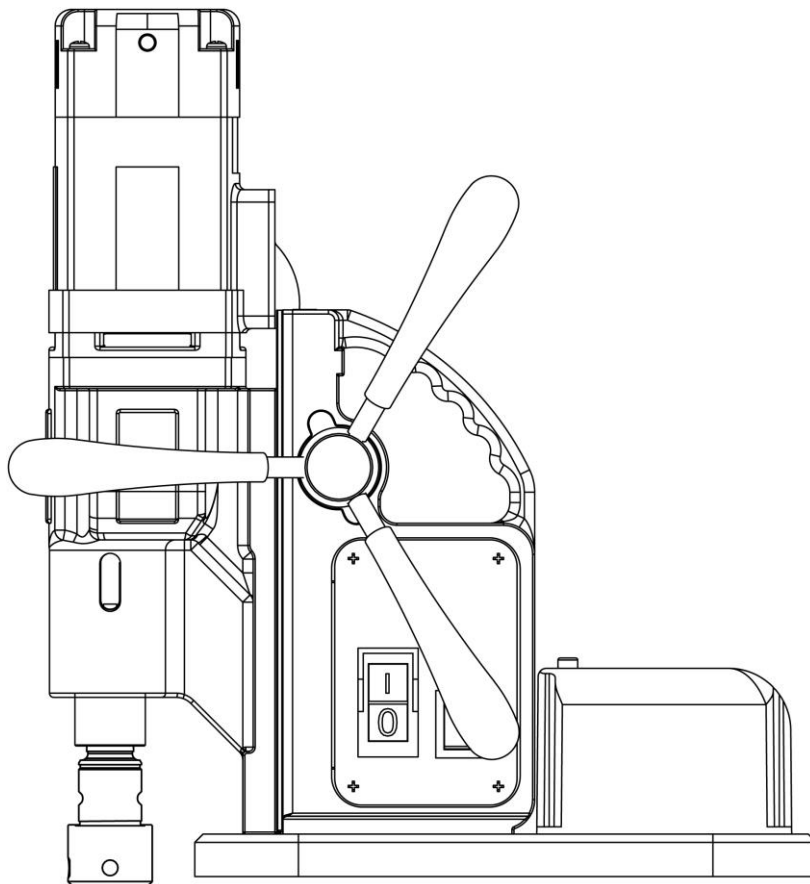
[image 4-4]



**WARNING:** *Never touch moving machine parts!*

#### 4.4 Vacuum clamping system

Make sure the vacuum base of the drilling machine is placed on a smooth, clean, and solid surface without any objects or debris to guarantee maximum adhesion.



[image 4-5]

When the base is not able to create enough suction force, this may be caused by:

- Surface not being flat;
- Damage of rubber sealing ring;
- Vacuum pump failure

In this situation the pressure indicator LED indicator won't light up GREEN. Make sure to solve any of these matters before proceeding in any way and creating unsafe situations.

#### **Enable vacuum clamping system:**

1. Place and position the machine on the workpiece;
2. To activate the vacuum pump for suction force, press the RED vacuum pump switch, the switch will be lit. The vacuum sensor LED indicator lights up GREEN when the generated vacuum suction force is sufficient to hold the machine in position while drilling;
3. To deactivate the vacuum clamping system, first press the vacuum pump switch to switch off the pump, then press the RED pressure release button for pressure relief.



**WARNING:** Do not use this machine when vacuum sensor LED indicator is not lit. Vacuum clamping system may not generate sufficient suction force.

**We want to point out that above mentioned precautions and indicators do not guarantee that the vacuum base will not release from the material. TOOL FRANCE accepts no liability when it comes to the vacuum base or indicators not functioning or functioning poorly.**

Make sure that the vacuum base attaches tightly to the work piece before turning on the motor unit of the machine. Make sure that the rubber sealing ring is in complete contact with the material. Do not connect any other machine to the same electrical outlet to which the vacuum drilling machine is plugged into, as it may result in the loss of suction force.

Always use the safety chain included.

## **4.5 Switching motor on and off**

The motor unit can only be switched ON when the GREEN vacuum sensor LED is lit up. To switch the motor ON, press the GREEN button with marking "I". To switch the motor OFF, press the RED button with marking "O".

## **4.6 VACU-TEC air pressure safety**

This TOOL FRANCE vacuum drilling machine is equipped with VACU-TEC air pressure safety functionality. It features a negative-pressure sensor which measures the vacuum pressure of the base. Whenever the sensor recognises lower vacuum pressure than the rated value, the vacuum LED indicator turns off and the motor will be shut down automatically by the machine's electronics. VACU-TEC offers protection to the user in the circumstance of no or low holding force of the base while in operation. By the motor shutting down automatically, the risk of damaging the machine, tools or workpiece and hurting the operator is reduced.

It is very important to note that this functionality raises the safety level, but does not prevent the operator from using the machine incorrectly. The operator should always follow instructions described in this manual and take all necessary safety precautions.

## 4.7 Power surge protection

Special safety components built into the electronics of the machine make it more reliable in situations where power supply can be of varying quality due to factors:

- Around the workplace, for example caused by switching on high power or unreliable electrical devices, a broken circuit breaker or faulty wiring;
- Outside the workplace, for example caused by an instable power grid or lightning.

A machine with this feature is able to cope with standard rated voltage fluctuations ranging from 110-130 Volt or 220-240 Volt, reducing the probability of breakdown and minimising down-time and repair cost.

### Power surge protection

Beyond the rated voltage, a machine with this feature is able to cope with voltage spikes up to 6,000 Volt (1-2 $\mu$ s)\*. Depending on the height of the spike, it may be necessary to replace the built-in fuse, and in rare cases the control unit or the power switch. But other valuable parts like the motor will be protected.

**\*Disclaimer: TOOL FRANCE is not liable for any damage caused to the machine due to electrical problems in the workplace. Above mentioned protection is not guaranteed in all cases of voltage spikes. TOOL FRANCE accepts no liability when it comes to the power protection not functioning or functioning poorly.**

In the situation of the motor being shut off automatically as self-protection, you should:

- Shut off the vacuum pump;
- Disconnect the machine from the power source;
- Replace the built-in fuse;
- Fix the source of the problem, by either:
  - Making sure the issues with the power source is fixed;
  - Connect the machine to a different and reliable power source;
- Continue using the machine as described in this user manual.

## 4.8 Carbon brushes

This machine is equipped with carbon brushes with two protection features. The purpose of both features is to schedule timely service and avoid additional costs by unexpected downtime or unnecessary part replacement.

### Carbon brush wear indicator

On top of the motor housing you will find an integrated LED light. Under normal circumstances this light is off. The LED light will start burning red when the carbon brushes are worn to a level where it is advised to replace them. The actual remaining operating time depends on the use of the machine, but can be 10-12 operating hours. This makes it possible to schedule service of the machine and avoid unexpected downtime.

### Automatic shut-off

As additional protection, when the carbon brushes are actually worn to a level where replacement is needed, the motor will shut off automatically. This prevents the armature from being damaged. During automatic shut-off, the carbon brush wear indicator is not lit.

It is critical to replace both carbon brushes in the motor unit simultaneously. Otherwise the LED warning function may be affected, and damage the motor in the end. For replacement of carbon brushes, see chapter 6. Maintenance.

## 4.9 Tool lubrication

Proper lubrication will help you create better and faster results, and extend the lifetime of your tools. Make sure to use a suitable cutting paste, for example TOOL FRANCE IBP.70 for high alloy metal like stainless steel.



**WARNING:** Do not use fluid lubricants like cutting oil or spray. Excessive use of greasy fluids may affect the function of the rubber seal in the vacuum base and reduce the adsorption force or cause the vacuum base to slide away on the workpiece.



**CAUTION:** Use a non-aggressive degreaser suitable for closed cell EPDM to clean the rubber in the vacuum base after every drilling operation with cutting paste.

## 5. Working with drilling accessories

### 5.1 Annular cutters

Annular cutters only cut material at the periphery of the hole, rather than converting the entire hole to shavings. As a result, the energy required to make a hole is lower than for a twist drill. When drilling with an annular cutter, it is not necessary to drill a pilot hole.



**WARNING:** Do not touch the cutter or the parts close to the cutter immediately after operation, as they may be extremely hot and cause burns to the skin. Ensure nobody is in the work area where the metal core (slug) is ejected.

#### Drilling conditions

The ease with which material can be drilled depends on several factors including tensile strength and abrasion resistance. Whilst hardness and/or strength is the usual criterion, wide variations in machinability can exist among material showing similar physical properties.

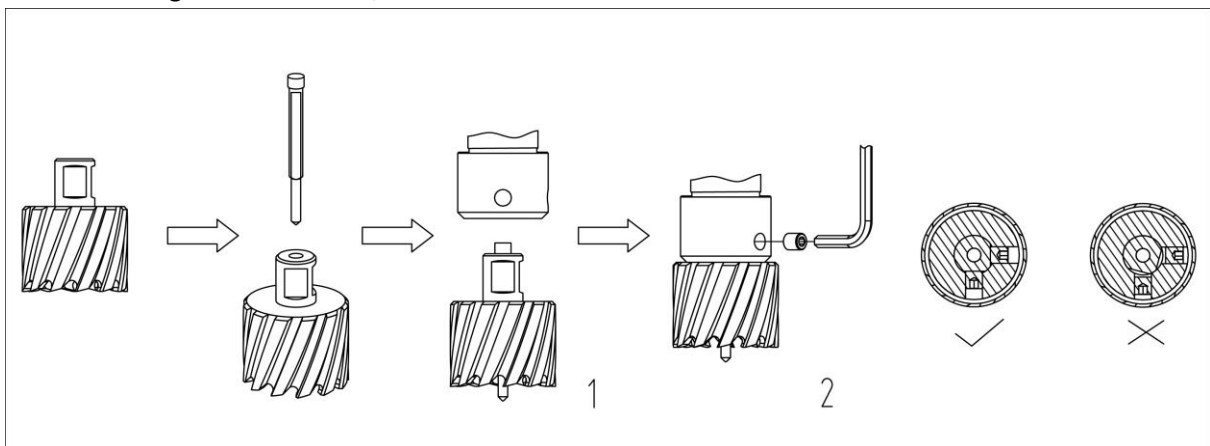
The drilling conditions are dependent on requirements for tool life and surface finish. These conditions are further restricted by the rigidity of the tool and the workpiece, lubrication and machine power available. The harder the material, the lower the cutting speed.

Some materials of low hardness contain abrasive substances leading to rapid cutting edge wear at high speeds. Feed rates are governed by rigidity of set-up, volume of material to be removed, surface finish and available machine power.

#### Drilling a hole

Now that you have read the information and safety recommendations above, you are ready to actually start drilling. Follow these 12 steps for best drilling result:

1. Install the annular cutter:
  - Place the pilot pin into the cutter;
  - Align the flat faces on the cutter shank with the screws in the tool holder;
  - Make sure the cutter shank is entered fully and correctly;
  - Tighten the screws;



[image 5-1]

2. Precisely mark the center of the hole;

3. Use the pilot pin to manoeuvre the machine in the correct position, with the tip of the pilot pin to meet the marked center of the hole;
4. Apply cutting paste onto the annular cutter;
5. Switch the motor on and allow it to run at the required speed;
6. Turn the feed handles to start drilling. Apply only a slight pressure when the annular cutter touches the metal. Do not push the annular cutter with force into the metal;
7. Apply a regular pressure while drilling. The drilling performance does not improve by putting more pressure on the machine. Too much pressure will overload the motor and your annular cutter will be worn sooner;

***A continuous, non-discoloured iron swarf is a sign of correct drilling speed and a well-cooled, sharp cutter. Let the cutter do the job and give it time to cut the metal!***

8. Apply less pressure when the drill cuts through the material. The slug will be pushed out of the cutter by the pilot pin;
9. Turn the feed handles to put the motor in highest position and switch off the motor unit;
10. Remove any burrs and metal chips, and carefully clean the cutter and surface.



**CAUTION:** *The slug can be sharp and very hot!*

## **5.2 Twist drills**

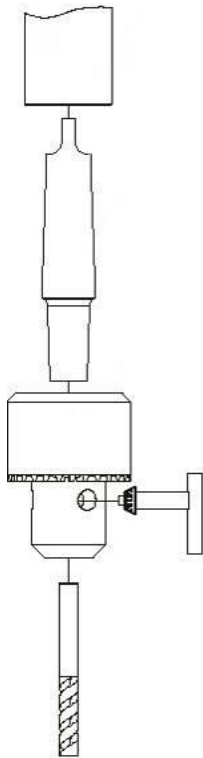
### **Weldon shank 19.05 mm (3/4")**

Fit the twist drill with 19.05 mm (3/4") Weldon shank (TOOL FRANCE code SPI or SSPI) into the provided arbor and fasten the screws with the provided Allen key.

Follow the further steps in paragraph Annular cutters.

### Standard parallel shank (DIN338)

1. Remove the Morse Taper 3 (MT3) arbor for Weldon shanks (see paragraph Morse Taper arbor)
2. Fit a MT3 arbor connection
  - a. TOOL FRANCE code 1/2UNF-MC3 for 1/2" x 20 UNF drill chuck connections
  - b. TOOL FRANCE code B16-MC3 for B16 drill chuck connections
3. Fit an appropriate twist drill chuck to the arbor
  - a. TOOL FRANCE code IBK.13 or IBK.13Q for 1/2" x 20 UNF connections
  - b. TOOL FRANCE code IBK.13-B16 or IBK.16 for B16 connections
4. Fit the drill and fasten it



[image 5-2 | Example of fastening a drill with a key]

5. Precisely mark the center of the hole, and use the tip of the twist drill to position the machine.

For further steps see paragraph Annular cutters.

Make sure the machine runs at maximum speed for twist drills!

### 5.3 Countersinks

Use drills for countersinking (for example TOOL FRANCE set code CBS.620) and follow the steps mentioned in the previous paragraphs.



## 6. Maintenance

Your TOOL FRANCE drilling machine with vacuum base has been designed to operate over a long period of time. Continuous satisfactory operation depends upon proper tool care and regular cleaning.



**CAUTION:** *To reduce the risk of injury, turn the machine off and disconnect machine from power source before installing and removing accessories, before adjusting or changing set-ups or when making repairs. Be sure the switch is in the OFF position. An accidental start-up can cause injury.*

Just as every drilling machine with moving parts, your TOOL FRANCE drilling machine with vacuum base also needs regular maintenance service. A few recommendations follow :

### Visually check the machine for damage

The machine must be checked before operating for any signs of damage that will affect the operation of the machine. Particular notice must be taken of the main cable, if the machine appears to be damaged it should not be used. Failure to do so may cause injury or death.

### Cleaning

- Clean all dirt, dust, metal chips and burrs of your vacuum drilling machine;
- Blow dirt and dust out of the main housing with dry air as often as dirt is seen collecting in and around the air vents. Wear approved eye protection and an approved dust mask;
- Never use solvents or other harsh chemicals for cleaning the non-metallic parts of the tool, especially the rubber sealing ring of the vacuum base. These chemicals may weaken the materials used in these parts. Use a cloth dampened only with water and mild soap;
- Never let any liquid get inside the tool;
- Never immerse any part of the tool into a liquid.

### Operation of the machine

The machine operation must be checked to ensure that all components are working correctly. Replace any defective parts immediately. This prevents properly functioning parts from being damaged.

### Check the vacuum base

Before every operation the base should be checked to make sure that it is flat and there is no damage of rubber sealing ring present. A non-airtight base will not generate enough suction force and may cause injury to the operator. When the machine is put out of use for a long period, apply a small amount of rubber protective agent to the rubber sealing ring of the base for aging resistance.

### Check gearbox oil (IBO.G101)

The oil should be checked once a month to ensure all moving components are covered to prevent wear. The oil should be changed at least once a year to ensure you gain the best from the machine.

### Carbon brush replacement

Schedule to replace the carbon brushes when the carbon brush LED indicator lights up. The remaining operating time depends on the use of the machine. When the carbon brushes are fully worn, the machine will shut-off automatically. Replace the carbon brushes to get it working again.



**WARNING:** *Replace both carbon brushes in the motor unit always simultaneously. Failing to do so may affect the LED warning function and lead to motor damage.*

### Check armature

This should be checked at least once a month to check if there are visual signs of damage to the body or to the commutator. Some signs of wear will be seen on the commutator over a period of time this is normal as this is the part that comes in contact with the brushes but any signs of abnormal damage means the part should be replaced.

### Adjustment of slide

An essential requirement of the machine is that the slide can be move in a smooth and controlled manner, free of lateral movement and vibration. This situation can be maintained by periodic adjustment of the slide and can accomplished in the following manner:

1. Place the machine in an upright position and, by means of the capstan, raise the slide to its highest position. Clean the aluminum rails and apply a small amount of light machine oil to the wear surfaces;
2. Gently feed in setting screw with supplied Allen key 2.5 until slight resistance is encountered. Follow your way down adjusting all setting nuts and screws;
3. Operate the slide up and down a few times to test the movement and make any further necessary adjustments. Try to ensure that all the screws are exerting a uniform pressure on the slide from top to bottom. A perfectly adjusted slide will operate freely up and down without any sideways movement.

### Lubricating the feed travel

The feed travel should be lubricated periodically with grease to ensure smooth operation.

- Raise the motor unit to the highest position possible;
- Lubricate the dove-tail guideway at both sides;
- Lubricate the gear rack.

After repeated use, the gear rack may become loose. If necessary, adjust the four self-locking set screws at the left side. Tighten screws in series until the gear rack moves freely in the dove-tail guideway but does not allow the motor to wobble.

### Repair, modification and inspection

Repair, modification and inspection of TOOL FRANCE vacuum drilling machines must be done by TOOL FRANCE or an TOOL FRANCE authorised dealer. The spare parts list will be helpful if presented with the machine to the TOOL FRANCE dealer for service when requesting repair or other maintenance.

TOOL FRANCE machines are constantly being improved and modified to incorporate the latest technological advancements. Accordingly, some parts (i.e. part numbers and/or design) may be changed without prior notice. Also, due to TOOL FRANCE's continuing program of research and development, the specifications of machines are subject to change without prior notice.



**WARNING:** *Since accessories, other than those offered by TOOL FRANCE, have not been tested with this machine, use of such accessories with this tool could be hazardous. To reduce the risk of injury, only TOOL FRANCE recommended accessories should be used with this machine.*

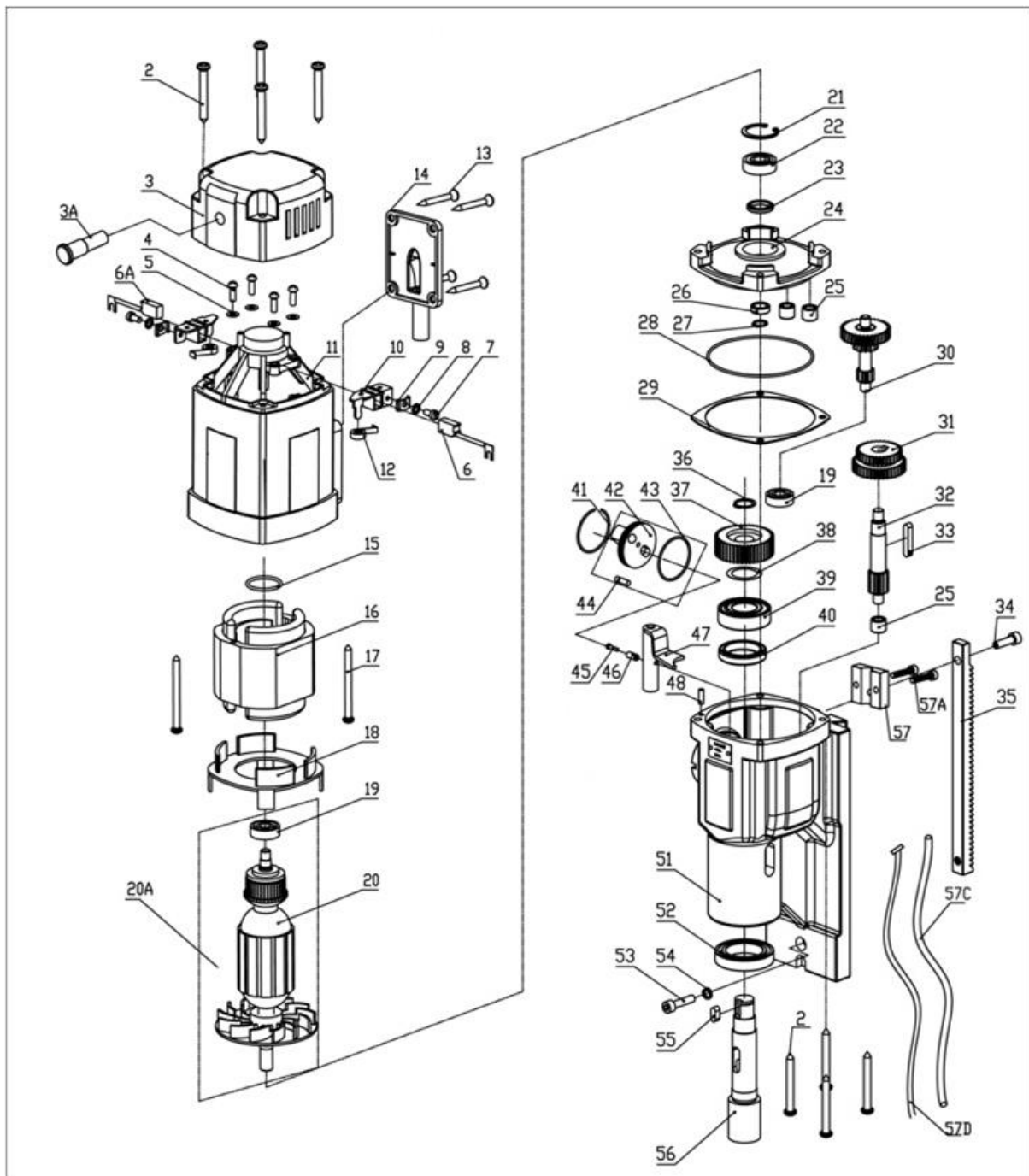
Consult your dealer for further information on the appropriate accessories.

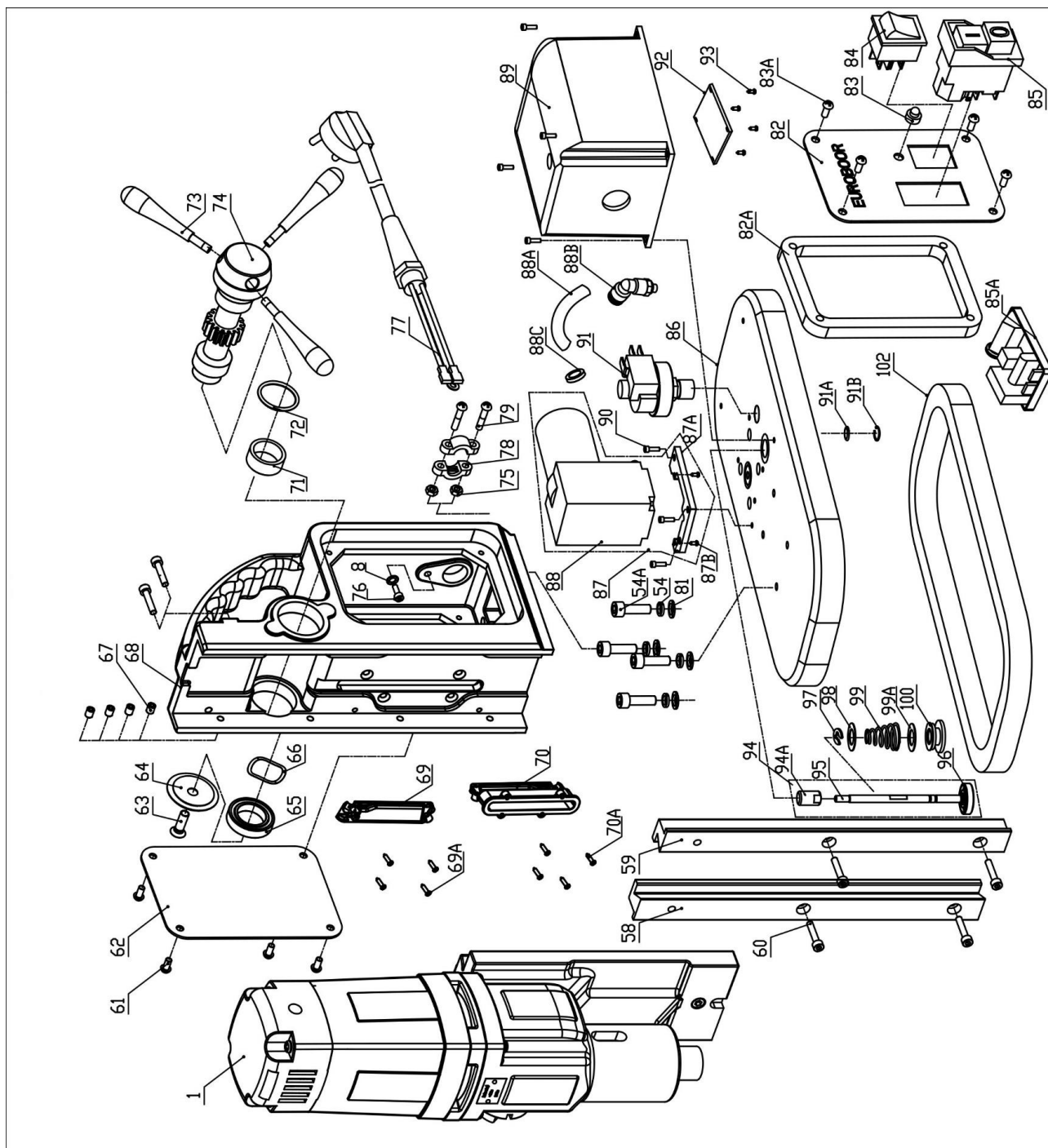
## 7. Trouble shooting

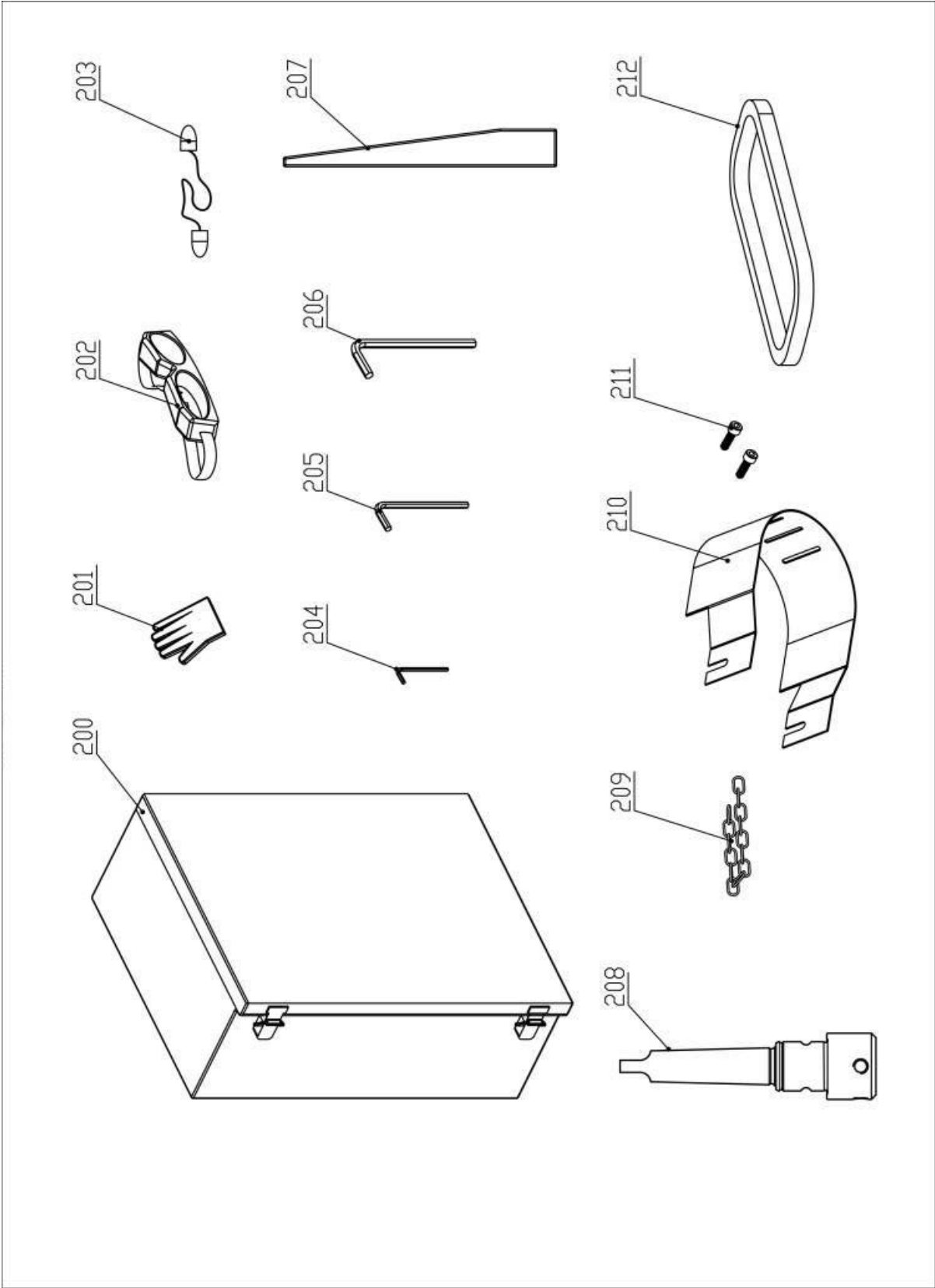
Vacuum pump and motor do not function	<ul style="list-style-type: none"> <li>- The vacuum pump switch is not connected to the power supply</li> <li>- Damaged or defective wiring</li> <li>- Defective fuse</li> <li>- Defective vacuum pump switch</li> <li>- Defective control unit</li> <li>- Defective power supply</li> </ul>
Vacuum pump does function, the motor does not work	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Carbon brushes are stuck or worn out</li> <li>- Defective On / Off switch</li> <li>- Defective control unit</li> <li>- Defective armature and/or field</li> </ul>
Annular cutters break quickly, holes are bigger than the annular cutter	<ul style="list-style-type: none"> <li>- Clearance in the guide</li> <li>- Bent spindle</li> <li>- Shaft extending from the motor is bent</li> <li>- Bent pilot pin</li> </ul>
Motor running roughly and/or seizing up	<ul style="list-style-type: none"> <li>- Bent spindle</li> <li>- Shaft extending from the motor is bent</li> <li>- Triangular guide not mounted straight</li> <li>- Dirt between spindle and triangular guide</li> </ul>
Motor making a rattling sound	<ul style="list-style-type: none"> <li>- Gear ring (bottom of the armature) worn out</li> <li>- Gear(s) worn out</li> <li>- No oil in gearbox</li> </ul>
Motor humming, big sparks and motor has no force	<ul style="list-style-type: none"> <li>- Armature damaged (burned)</li> <li>- Field burned</li> <li>- Carbon brushes worn out</li> </ul>
Motor does not start or fails	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Dirt in sensor control unit</li> <li>- Defective or loose magnet on top of armature</li> <li>- Damaged or defective (sensor) control unit</li> <li>- Damage to armature or field coil</li> <li>- Damaged or defective carbon brushes</li> </ul>
Guiding takes a great deal of effort	<ul style="list-style-type: none"> <li>- Guide is set too tight</li> <li>- Guide is dry, needs to be greased</li> <li>- Guide/gear- rack/rotation system dirty or damaged</li> </ul>
Insufficient suction force	<ul style="list-style-type: none"> <li>- Damaged or defective vacuum pump</li> <li>- Defective rubber sealing ring</li> <li>- Bottom of base not flat</li> <li>- Workpiece is not clean or flat</li> <li>- Defective control unit</li> </ul>
Frame under voltage	<ul style="list-style-type: none"> <li>- Damaged / defective wiring</li> <li>- Motor seriously dirty</li> </ul>
Fuse blows when motor is started	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Wrong value fuse</li> <li>- Motor running roughly</li> <li>- Defective armature and / or field</li> <li>- Carbon brushes worn out</li> <li>- Defective control unit</li> </ul>
Rotation system free stroke too long	<ul style="list-style-type: none"> <li>- Loose or defective gear rack</li> <li>- Defective rotation system</li> </ul>

## 8. Exploded views & spare parts list

### 8.1 Exploded views







## 8.2 Spare parts list

No.	Part. no.	Description	Qty
1	045.1001ZN	Motor 220V TFC.50S	1
	045.1001ZAN	Motor 110V TFC.50S	
2	050.0106	Screw 4.8 x 45	8
3	050.0111Z	End cover 110V / 220V	1
3A	P020.0278	Led indicator red alarm 220V	1
	P020.0278A	Led indicator red alarm 110V	
4	050.0371	Carbon brush holder	2
5			
7			
8			
9			
10			
11			
12			
6	Carbon.50+	Carbon brush set 220V	1
	Carbon.50A+	Carbon brush set 110V	
8	040.0286F	Washer M4	1
13	020.0243	Screw M5 x 15	4
14	050.0586N	Cable housing	1
15	050.0116	Adapter ring Ø27 x 2.45	1
16	050.0276	Field 220V	1
	050.0277	Field 110V	
17	020.0024	Screw M4 x 60	2
18	050.0261	Baffle	1
19	032.0126	Bearing 608ZZ 8 x 22 x 7	2
20A	050.0181	Armature 220V	1
	050.0186	Armature 110V	
21	032.0166	Circlip 472/28/1.2	1
22	050.9070	Bearing 6001V V	1
23	050.0064	Oil bearing 15 x 21 x 3	1
24	050.0236/Y	Inner gear plate	1
25	040.0161	Needle bearing HK0810	3
26	050.0065	Metal ring Ø40	1
27	100.0571	Circlip 471 11 x 1	1
28	050.0071	O-ring 82 x 1.8	1
29	050.0207	Gasket middle	1
30	050.0252	Gear assembly	1
31	050.0171	Gear 34/40Z	1
32	050.0231	Axle 13T	1
33	040.0301	Key	1
34	020.0361	Screw M6 x 8	1
35	050S.0074	Rack 1.5 x 39T	1

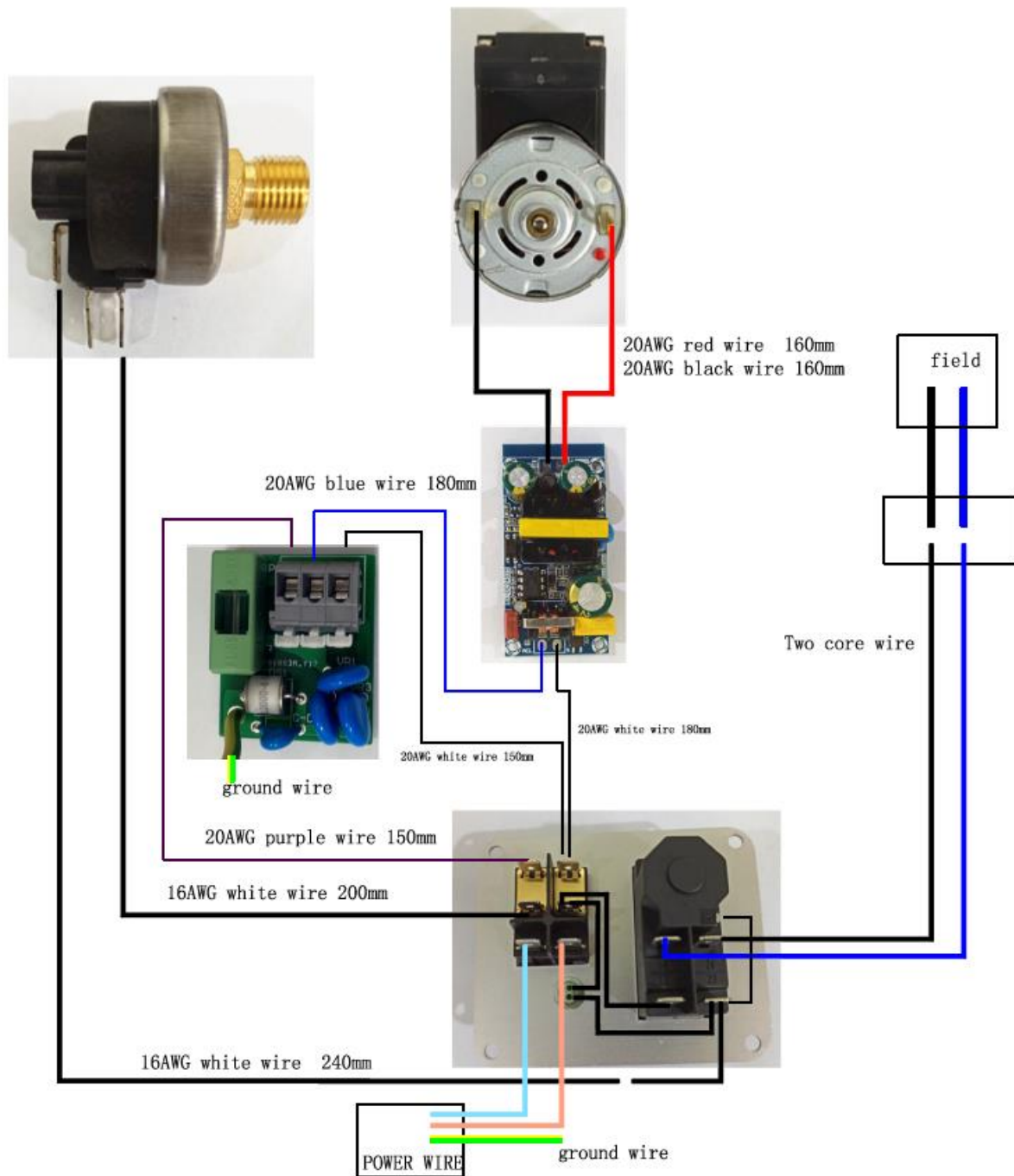
No.	Part. no.	Description	Qty
36	050.0076	Circlip Ø20	1
37	050.0463	Gear 1 x 45T	1
38	050.0462	Washer 20.5 x 28 x 0.2	1
39	030.0009	Bearing 6004 DDU	1
40	050.0066	Oil bearing 28 x 38 x 7	1
41	050.0078	Ring 41.5 x 36.5 x 1.5	1
42	050.1014	Gear switch	1
43	050.0081	O-ring	1
44	050.0025	Pin 4 x 10	1
45	020.0329	Screw M4 x 16	1
46	050.0082	Screw holder	1
47	050.1005A	Clutch shaft	1
48	032.0211	Casing pin 4 x 12	1
51	040.1008N	Gear box integrated cable	1
52	050.0068	Bearing 61906 DDU	1
53	020.0146	Screw M6 x 25	1
54	020.0111	Washer M6 DIN7980	5
54A	020.0156	Bolt M6 x 20	4
55	050.0077	Key 6 x 6 x 12	1
56	050.0461	Spindle drive shaft 34 x 146 #3	1
57	020.0198	Adapter	1
57A	020.0102	Hex bolt M4 x 12	2
57C	040S.0017	Spring sleeve 250 x 8.5 x 0.6	1
57D	040S.0016-2	Cable two wires 520 x 6.8	1
58	P040S.0193D	Rail set aluminium (R/L)	1
59			
60	100.0022	Bolt M5 x 20	6
61	020.0101	Panel screw BKVZ M4 x 8	4
62	PP.RSEU-220	Rear panel EB 220V	1
	PP.RSEU-110	Rear panel EB 110V	
63	020.0081	Screw BKVZ M6 x 16	1
64	050.0030	End cover Ø36 X 3	1
65	050.0063	Bearing 6804 ZZ	1
66	040.0023	Washer	1
67	020.0231	Screw M5 x 6	4
68	X032.0056X	Frame	1
69	040S.0014	Cover	1
69A	040S.0026	Screw	4
70	040S.0013	Cable box	1
70A	040S.0027	Screw M4 x 16	4

No.	Part. no.	Description	Qty
71	032.0127A	Adapter ring v2	1
72	030.0027	Washer	1
73	020.0315	Arm for capstan	3
74	020.0061/Z	Capstan hub assembly	1
75	020.0037	Cable clamp complete	1
78			
79			
76	036.0007	Screw M4 x 8	1
77	030.B125	Main cable set 220V EU	1
	030.B125A	Main cable set 110V US	
	020.0036/AU	Main cable 220V AU	
	020.0036/UK	Main cable 220V UK	
	020.0036/UK 110-16A	Main cable 110V UK 16A	1
	020.0031	Coupling nut PG11 (main cable)	
81	020.0112	Washer M6	4
82	X050.0001	Front panel TFC.50S	1
83	X050.0002	Led indicator suction 220V	1
	X050.0002A	Led indicator suction 110V	
83A	020.0183	Screw M4 x 20	4
84	020.0011/1	Vacuum pump switch (aka magnet switch)	1
85	030E.0091/Y	Motor switch 220V (5-pin) YELLOW	1
	030E.0092/Y	Motor switch 110V (5-pin) YELLOW	
85A	020.1011	Surge module	1
	020.0017	Fuse 5 x 20 F2A	1
86	050.0506-1	Vacuum base	1

No.	Part. no.	Description	Qty
87	030.0503S	Vacuum pump	1
89	030.0502	Cover vacuum pump	1
90	036.0007	Screw M4 x 8	7
91	030.0504	Switch	1
91A	030.0509	Dust plug	1
91B	020.0400	Retaining ring Ø 15 mm	1
92	030.0505	Power supply board	1
92A	032T.0009	Spacer	1
93	020.0054	Screw M3 x 6	4
94	X020.0005S	Pressure relief set	1
102	X020.0003	Seal EPDM 15 x 15	1
200	X050.0101S	Case for TFC.50S	1
201	PRM.61	TOOL FRANCE working gloves size M	1
	PRM.62	TOOL FRANCE working gloves size L	
	PRM.63	TOOL FRANCE working gloves size XL	
202	SAF.100	Safety goggles	1
203	SAF.200	Ear plugs	1
204	IMB.US2.5	Allen key 2.5 mm	1
205	IMB.US4	Allen key 4.0 mm	1
206	IMB.US5	Allen key 5.0 mm	1
207	DRIFT3	Drift MT3	1
208	MC.3	Arbor MT3 - 19.05 (3/4") Weldon	1
209	SAF.400	Safety chain (1 mtr) with lock	1
210	0017	Safety guard	1
211	020.0045	Screw M5 x 6	2
212	X020.0003	Seal EPDM 15 x 15	1
	IBO.G1	Gearbox oil 1LTR	1
	IBP.70	Cutting paste 1KG	1



### 8.3 Wiring diagram



## 8.4 Warranty and service

### Warranty

TOOL FRANCE B.V. warrants this vacuum drilling machine to be free of material defects and workmanship errors under normal use for a period of 12 months after date of purchase. This 12 month period can be extended to 24 months in total by registering the product on our website: <https://TOOL FRANCE.com/support/register/>.

Serial number:

Date of purchase:

### Service

To maximise the lifetime of your TOOL FRANCE machine always use service and parts from an official TOOL FRANCE distribution channel. Whenever in need of such, always contact original point of sales or, if no longer existent, the distributor of TOOL FRANCE products in your country.

## 8.5 Declaration of conformity

### CE DECLARATION OF CONFORMITY



**Société TOOL France SAS**

9, Rue des Pyrénées  
91090 LISSES  
France

declares that the following appliance complies with the appropriate basic safety and health requirements of the EC guidelines based on its design and type, as brought into circulation by Société TOOL France SAS.

<i>Designation/function</i>	Vacuum drilling machine
<i>Brand</i>	PROMAC
<i>Type</i>	TFC-50S
<i>Ratings and principal</i>	220 - 240 V, 50 - 60 Hz, Class I 110 - 120 V, 60 Hz, Class I
<i>Characteristics</i>	Motor power 1,300 W Speed (I) 380 rpm ; Speed (II) 690 rpm
<i>Applicable guidelines</i>	2006/42/EC on machinery 2014/30/EU on Electromagnetic Compatibility (EMC)
<i>Used standards</i>	EN 55014-1:2017 EN 61000-3-2:2019 EN 61000-3-3:2013+A1:2019 EN 62841-1:2015

Lisses. May 2022

Président directeur général

**Christophe SAINT SULPICE**