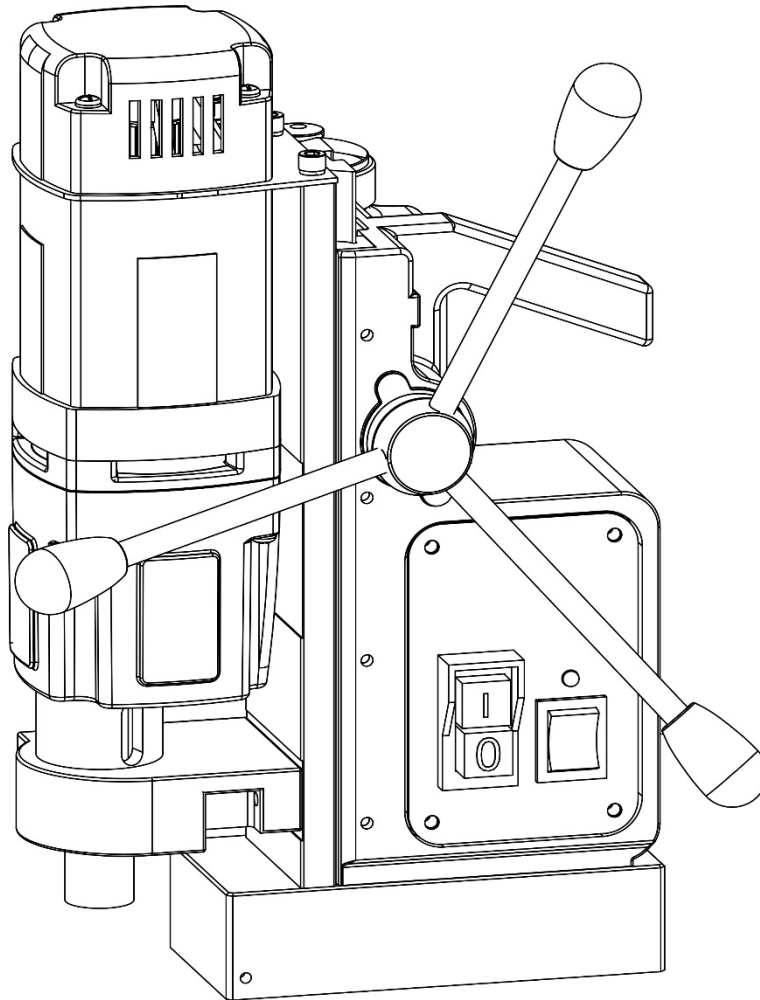




## Magnetic drilling machine

# SMART.50/2

Serial number:

Date of purchase:

Congratulations on your purchase of the SMART.50 portable magnetic drilling machine. Your model is designed to produce superior holes quickly and efficiently.

Before operating your new magnetic drilling machine, please read all instructions first. These include the Operators Manual and warning label on the unit itself. With proper use, care and maintenance your model will provide you with years of effective hole drilling performance.

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

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.

# Table of contents

|                                                       |           |
|-------------------------------------------------------|-----------|
| <b>SMART.50/2.....</b>                                | <b>1</b>  |
| <b>Table of contents.....</b>                         | <b>3</b>  |
| <b>1. Safety.....</b>                                 | <b>4</b>  |
| 1.1 General safety instructions                       | 4         |
| 1.2 Specific safety information                       | 6         |
| <b>2. Description.....</b>                            | <b>8</b>  |
| 2.1 Intended use                                      | 8         |
| 2.2 Description and features                          | 8         |
| 2.3 Case content                                      | 8         |
| 2.4 Serial number                                     | 10        |
| 2.5 Technical data                                    | 10        |
| 2.6 Symbols                                           | 12        |
| 2.7 Environmental                                     | 12        |
| <b>3. Preparation &amp; adjustment.....</b>           | <b>13</b> |
| 3.1 Assembly                                          | 13        |
| 3.2 Prior to use                                      | 14        |
| <b>4. Using the machine .....</b>                     | <b>15</b> |
| 4.1 Control panel                                     | 15        |
| 4.2 Morse taper spindle                               | 17        |
| 4.3 Gearbox                                           | 18        |
| 4.4 Electromagnet                                     | 18        |
| 4.5 Switching motor on and off                        | 20        |
| 4.6 Tool lubrication                                  | 20        |
| <b>5. Working with operation tools.....</b>           | <b>21</b> |
| 5.1 Annular cutters                                   | 21        |
| 5.2 Twist drills                                      | 22        |
| 5.3 Step drills and countersinks                      | 22        |
| <b>6. Maintenance.....</b>                            | <b>23</b> |
| <b>7. Trouble shooting .....</b>                      | <b>25</b> |
| <b>8. Exploded views &amp; spare parts list .....</b> | <b>27</b> |
| 8.1 Exploded views                                    | 27        |
| 8.2 Spare parts list                                  | 30        |
| 8.3 Wiring diagram                                    | 32        |

# 1. Safety

## 1.1 General safety instructions

Do not use this power tool before you have thoroughly read and completely understood this Instruction Manual and the “General Safety Instructions”, 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, electrical shock and personal injury including following.

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

This Operator’s Manual including the “General Safety Instructions” should be kept for later use and enclosed with the power tool, should it be passed on or sold.

### WORK AREA

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

### ELECTRICAL SAFETY

1. Magnetic drilling machine plugs 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 magnetic drilling machines 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 magnetic drilling machine or pull the plug from an outlet. Keep 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 magnetic drilling machine, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.
6. If operating a magnetic drilling machine in a damp location is unavoidable, use a residual current device (RCD) protected supply. Use of an RCD reduces the risk of electric shock.

## **PERSONAL SAFETY**

1. Stay alert, watch what you are doing and use common sense when using a magnetic drilling machine. Do not use machine while tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating magnetic drilling machines may result in serious personal injury.
2. Dress properly. Do not wear loose clothing or jewelry. Contain long hair. 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 switch is off before plugging in. Carrying magnetic drilling machines with your finger on the switch or plugging in magnetic drilling machines that have the switch on invites accidents.
4. Never place hands, fingers, gloves or clothing near cutting 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 magnetic drilling machine in unexpected situations.
7. Use safety equipment. Always wear eye protection. Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.
8. Always use supplied safety chain during any work on non-horizontal components. Mounting can release.

## **MACHINE USE AND CARE**

1. When using the machine on non-horizontal surfaces, you must use cutting paste. Do not use oil because the oil can drip into the motor unit
2. During machine operations, the annular cutter must be cooled and lubricated with good quality cutting or lubrication oil. Remove the slug from the annular cutter after each hole. Caution, the slug may be hot!
3. Use clamps or other practical way to secure and support the work piece to a stable platform. Holding the work by hand or against your body is unstable and may lead to loss of control.
4. Do not use machine if switch does not turn it on or off. Any tool that cannot be controlled with the switch is dangerous and must be repaired.
5. 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.
6. Store idle magnetic drilling machines out of reach of children and other untrained persons. Tools are dangerous in the hands of untrained users.
7. Maintain machines with care. Keep cutting tools sharp and clean. Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
8. Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the machine operation. If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.
9. Use only accessories that are recommended for your model. Accessories that may be suitable for one machine, may become hazardous when used on another machine.

## SERVICE

1. Tool service must be performed only by qualified repair personnel. Service or maintenance performed by unqualified personnel could result in a 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.
3. When using this machine, you **MUST** wear ear and eye protection.

### 1.2 Specific safety information

- Keep your fingers well out of the drill area;
- Avoid touching the drilled core that is automatically ejected by the centering pin when the working procedure is finished. Contact with the core when it is hot, or if it falls, can cause personal injuries;
- Always use the drill guard. Before switching on machine ensure the guard is closed securely;
- Always use the safety chain;
- The magnetic drilling machine is suitable for use on steel with a thickness starting from 5 mm, with zero air gap between the magnet core surface and the mounting surface. Curvature, coats of paint and surface irregularities will create an air gap. Keep the air gap to a minimum;
- Always place the machine on a flat surface;
- Do not clamp the magnetic drilling machine on small or irregularly shaped objects;
- Always place the machine on a surface that is clear of shavings, chips, swarf and surface dirt;
- Keep the magnet clean and free of debris and swarf;
- Do not switch on the machine until it has been mounted and installed according to these instructions;
- Do not switch on the machine before having checked that the magnetic stand has been tightened firmly to the mounting surface;
- Adjust the table so cutter does not extend into the work piece before drilling. Do not perform any design, assembly or construction activities on the work piece while the machine is switched on;
- Before switching on the machine, make sure all accessories have been mounted correctly;
- Always use the recommended speed for the accessories and the material;
- Do not use the machine on the same work piece on which electric welders are being used;
- Use only an appropriate cutting fluid. We offer a range of premium lubricants which are specially developed and selected for optimum performance and maximum tool life;
- Do not use liquid cutting fluids while drilling vertically or overhead. Dip the cutter in cutting paste or apply an appropriate spray for these applications;
- Do not pour cutting fluid into the reservoir while it is mounted in the bracket. Do not allow cutting fluid to enter the drill motor;
- Before use, ensure movable chuck guard operates properly;
- Ensure that metal chips or resinous residue cannot lead to blockage of the function;
- In case of jammed cutter disconnect the machine from the power supply, remove the reason for the jam before turning on the machine again.

## **RESIDUAL RISKS**

In spite of the application of the relevant safety regulations and the implementation of safety devices, certain residual risks cannot 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.

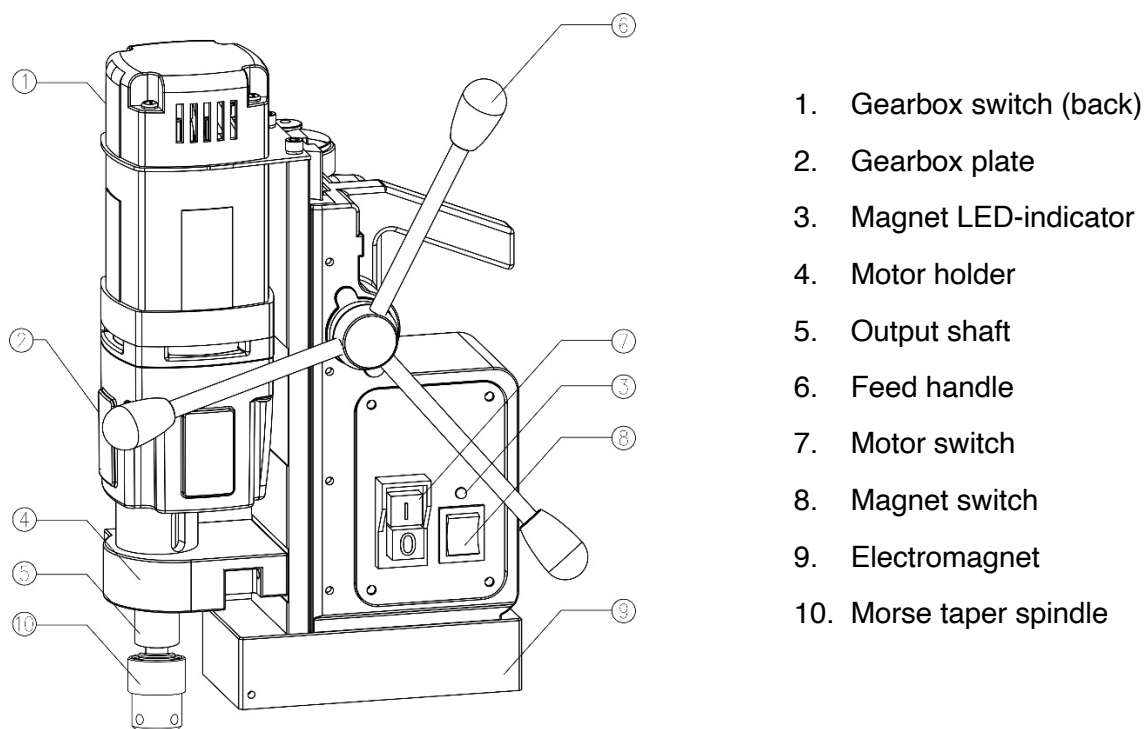
Always try to reduce these risks as much as possible.

## 2. Description

### 2.1 Intended use

This magnetic drilling machine is intended for commercial use as a drilling machine for drilling materials with a magnetisable surface using annular cutters and twist drills, and for countersinking in a weather-protected environment using application tools and accessories. The magnetic drilling machine can be used horizontally, vertically or overhead.

### 2.2 Description and features



[image 2-1]

### 2.3 Case content

- 1 x SMART.50/MT2 magnetic drilling machine
- 1 x safety guard
- 3 x handles
- 1 x hex key 2.5 mm
- 1 x hex key 3 mm
- 1 x hex key 4 mm
- 1 x hex key 5 mm
- 1 x lubrication system
- 1 x safety chain
- 1 x arbor MT2-19.05 mm (3/4"), including lubrication ring
- 1 x Morse taper ejector drift key
- 1 x user manual



## 2.4 Serial number

The serial number is mentioned on the machine 3 times: engraved on the frame and magnet, plus 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 and your sales point validate and identify the machine.

As example:

0502010001

breaks down to:

050 20 10 001

Machine series

Year of manufacture

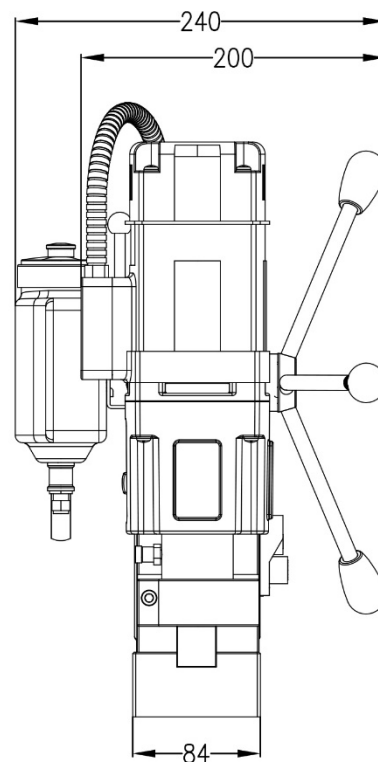
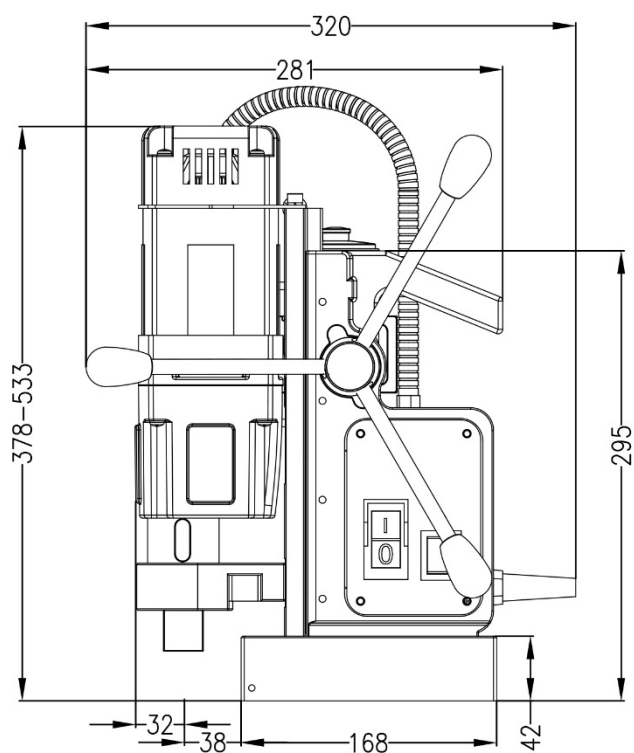
Month of manufacture

Identification number

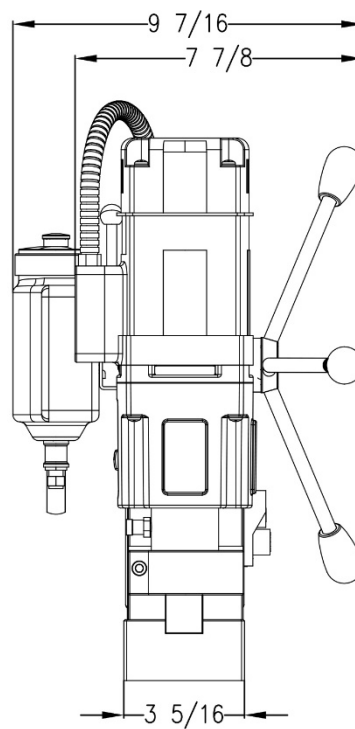
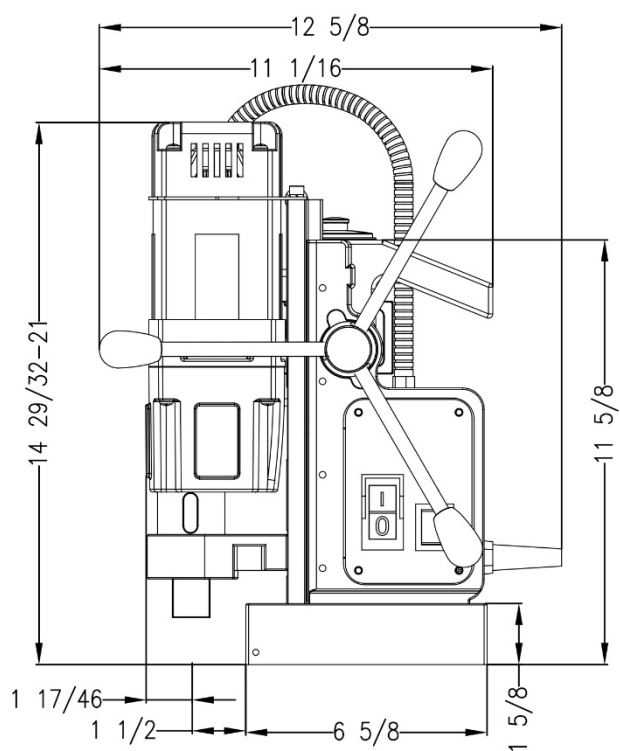
## 2.5 Technical data

|                           | Metric                     | Imperial                |
|---------------------------|----------------------------|-------------------------|
| <b>Annular cutting</b>    | Ø 12 - 50 mm               | Ø 7/16 - 2"             |
| <b>Twist drilling</b>     | Ø 1 - 20 mm                | Ø 1/16 - 13/16"         |
| <b>Tapping</b>            | -                          | -                       |
| <b>Countersinking</b>     | Ø 10 - 50 mm               | Ø 3/8 - 2"              |
| <b>Length</b>             | 320 mm                     | 12 5/8"                 |
| <b>Width</b>              | 200 mm                     | 7 7/8"                  |
| <b>Height</b>             | 378 - 533 mm               | 14 29/32 - 21"          |
| <b>Stroke</b>             | 155 mm                     | 6 3/32"                 |
| <b>Weight</b>             | 13.5 kg                    | 29.8 lbs                |
| <b>Magnet (l x w x h)</b> | 168 x 84 x 42 mm           | 6 5/8 x 3 5/16 x 1 5/8" |
| <b>Magnetic force</b>     | 1,600 kg                   | 3,527 lbs               |
| <b>Motor power</b>        | 1,200 W                    | 10 A                    |
| <b>Total power</b>        | 1,250 W                    | 10.4A                   |
| <b>Speed (no load)</b>    | (I) 380 rpm                |                         |
|                           | (II) 690 rpm               |                         |
| <b>Speed (loaded)</b>     | (I) 235 rpm                |                         |
|                           | (II) 425 rpm               |                         |
| <b>Spindle (Weldon)</b>   | 19.05 mm                   | 3/4"                    |
| <b>Voltage</b>            | 220 - 240V AC / 50 - 60 Hz | 110 - 120V AC / 60 Hz   |

## Dimensions (mm)



## Dimensions (inches)



## 2.6 Symbols

| Symbol                                                                            | Term, meaning              | Explanation                                                                                                                      |
|-----------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|  | Read documentation         | Be absolutely sure to read the enclosed documentation such as the Instruction Manual and the General Safety Instructions         |
|  | Wear ear protection        | Use ear protection during operation                                                                                              |
|  | Wear eye protection        | Use eye-protection during operation                                                                                              |
|  | Danger/warning/caution     | Observe the information in the adjacent text!                                                                                    |
|  | European conformity symbol | Confirms the conformity of the power tool 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 |
| 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                                                                                                     |
| V                                                                                 | Volt                       | Unit of measure for the electric voltage                                                                                         |
| A                                                                                 | Ampere                     | Unit of measure for electric current intensity                                                                                   |
| W                                                                                 | Watt                       | Unit of measure for the output                                                                                                   |
| rpm                                                                               | revolutions per minute     | Unit of measure for motor speed                                                                                                  |

## 2.7 Environmental



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



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 by the retailer when you purchase a new product.

## 3. Preparation & adjustment

### 3.1 Assembly



**WARNING:** To reduce the risk of injury, turn unit off and disconnect machine 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 directions;
2. Tighten firmly by hand.

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

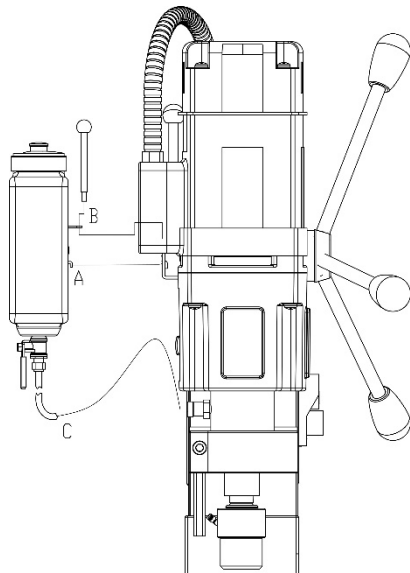
#### MOUNTING THE DRILL GUARD

The guard protecting against chippings and accidental contact must always be mounted during operation.

1. Hold the guard in front of the magnet, aligning the slots in the guard with the holes in the magnet;
2. Fit the screws into the hole located in the side of the magnet.



**WARNING:** Always use the safety guard



#### FITTING THE LUBRICATION SYSTEM

The lubrication system can be used for horizontal drilling applications (the drill being used vertically).

1. Hang the tank (A) on the tank holder
2. Position and tighten the attachment pin (B)
3. Connect the hose (C) to the fitting on the gearbox. Make sure the hose is connected fully and tightly.
4. To disconnect the hose, press the blue ring on the connection and gently pull out the hose

[image 3-1]

#### FITTING THE SAFETY CHAIN

1. Wrap the chain around the work piece and machine frame handle
2. Ensure the chain is taut
3. Securely close the chain using the lock



**WARNING:** Always use the safety chain when using machine vertically. For safety reasons we advise against using the machine upside-down in overhead applications

## 3.2 Prior to use

Please make sure that the contacting surface for the magnet is level, clean and rust-free. Remove any varnish or primer. When working on materials that are not magnetisable, suitable fixation devices, obtainable as accessories, e.g. suction plate, vacuum plate or pipe-drilling device must be used. When work on steel materials with a material thickness of less than 5 mm (3/16"), the work piece must be reinforced with an additional steel plate in order to guarantee the magnetic holding power.

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

**DO NOT** use under wet conditions or in presence of flammable liquids or gases. This magnetic drilling machine is a professional power tool.

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

### **ELECTRICAL SAFETY**

The electric motor has been designed for one voltage only. Always check that the power supply corresponds to the voltage on the rating plate.

Your magnetic 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 through the service organisation.

### **EXTENSION CABLE**

If an extension cable is required, use an approved 3-core extension cable suitable for the power input of this tool (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 35 metre. When using a cable reel, always unwind the cable completely.

**TRY A FEW SIMPLE PROJECTS USING SCRAP MATERIAL UNTIL YOU DEVELOP A "FEEL" FOR THE MACHINE.**

**LET THE MACHINE RUN IN FOR A PERIOD OF 8-10 HOURS BEFORE STARTING WITH BIG OPERATIONS. DO NOT LOAD THE MACHINE TOO MUCH DURING RUN-IN PERIOD.**

**NEVER USE THE MACHINE IN 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.

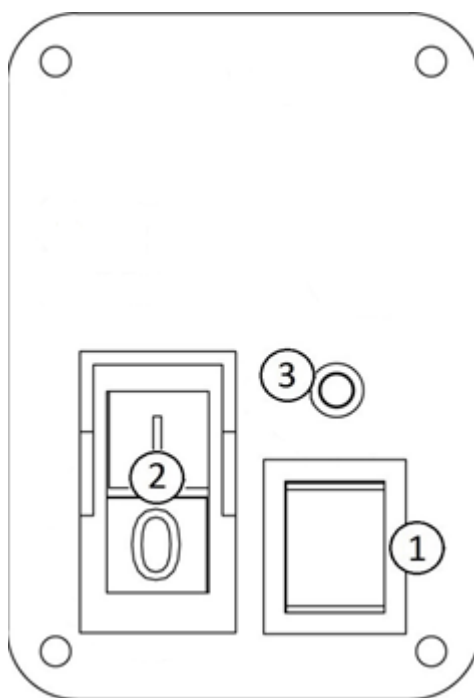


**WARNING:** To reduce the risk of serious personal injury, turn tool off and disconnect tool from power source before making any adjustments or removing/installing attachments or accessories.

### 4.1 Control panel

The control panel on your magnetic drilling machine is designed for maximum operating facility and safety.

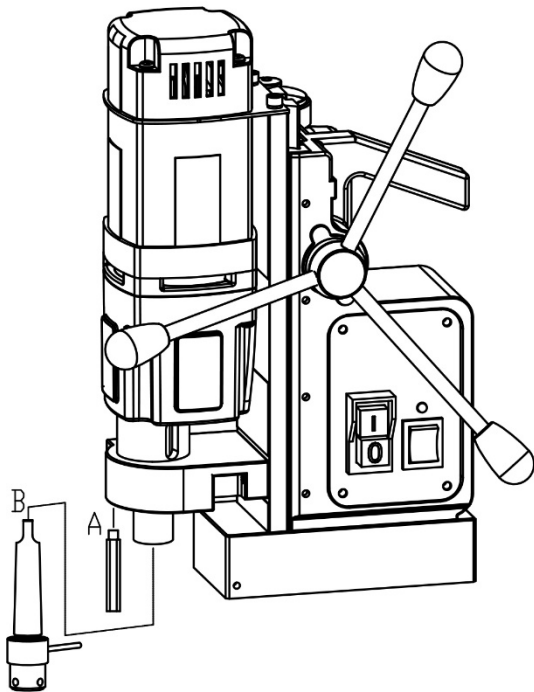
1. Magnet switch
2. Motor switch
3. Magnet LED-indicator



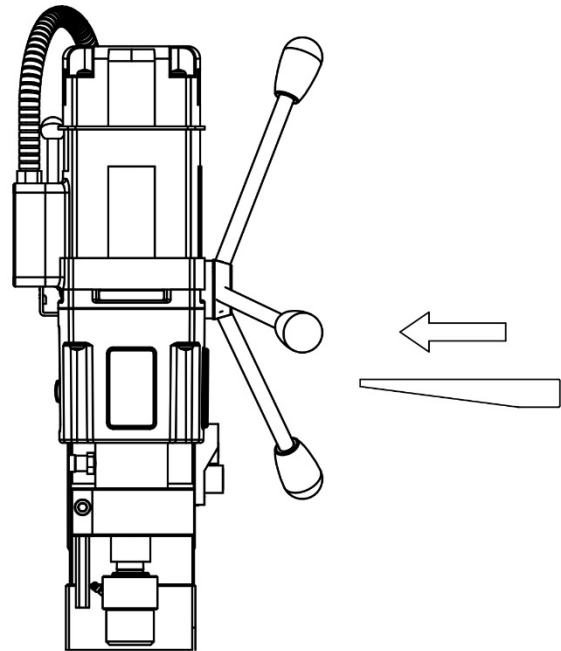
[image 4-1]



## 4.2 Morse taper spindle



[image 4-2]



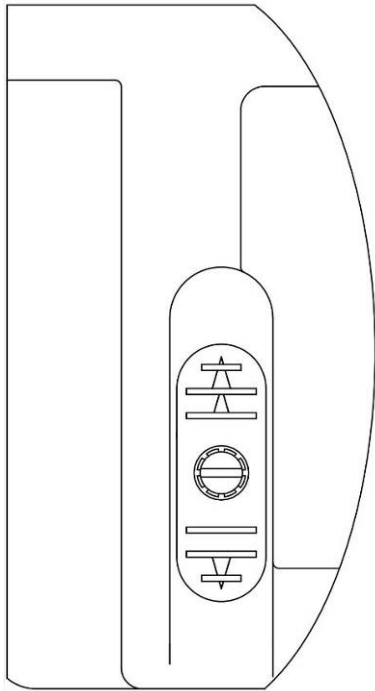
[image 4-3]

1. Make sure the inside of the output shaft and the Morse taper spindle are clean and free of grease;
2. Align the lubrication ring rotation limiter with the recess in the gearbox (A);
3. Firmly slide the Morse taper spindle into the output shaft by hand (B). Make sure the spindle is properly positioned. You should not be able to pull it out by hand;
4. To remove the Morse taper spindle:
  - Switch of 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.

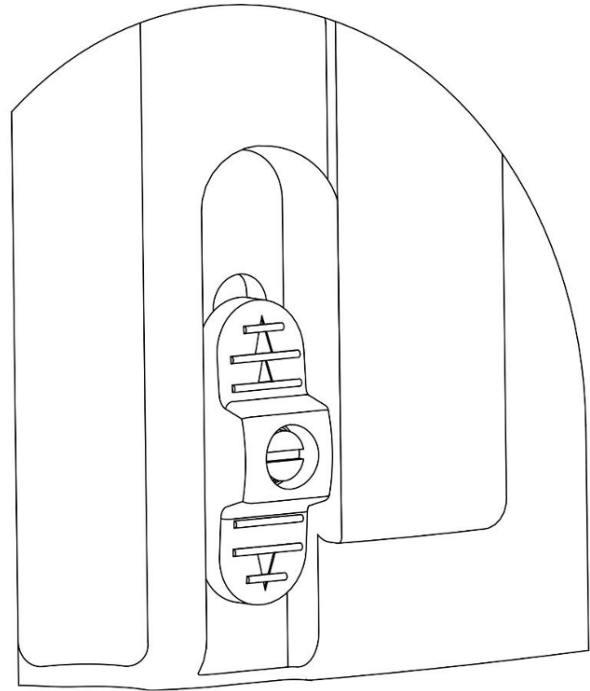
## 4.3 Gearbox

The exchange of the mechanical speed is done by shifting the black slider on the side of the gearbox (image 4-2 and 4-3).

1. To select the correct gear from neutral (horizontal) position:
  - a. Slide the gear switch down, this is gear 1;
  - b. Slide the gear switch up, this is gear 2.



[image 4-2]



[image 4-3]

**NOTE:** Only change the mechanical speed after the machine has come to a complete stop!

2. Speed selection (also see plate on gearbox):

|        |                           |                    |
|--------|---------------------------|--------------------|
| Gear 1 | Ø 27-50 mm (1 1/16" - 2") | Speed: 235-380 rpm |
| Gear 2 | Ø 12-26 mm (1/2" - 1")    | Speed: 425-690 rpm |

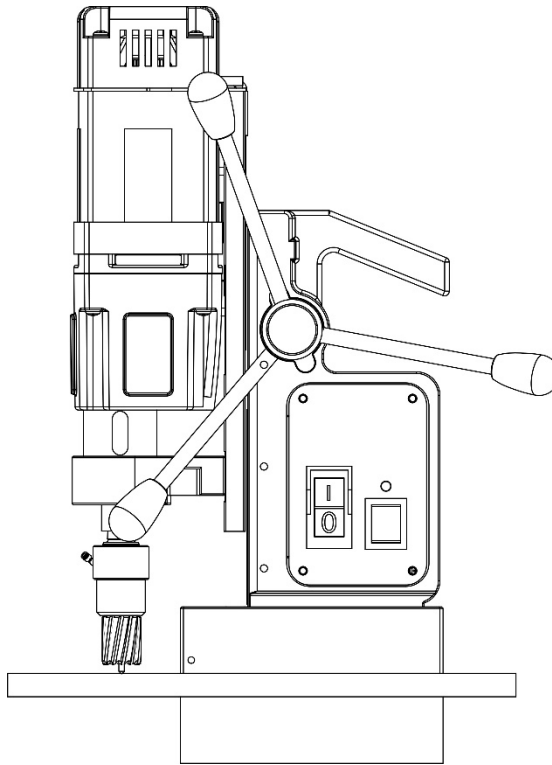


**WARNING:** never touch moving machine parts!

## 4.4 Electromagnet

Make sure the magnetic drilling machine is placed on a smooth, clean, level and solid surface without any objects or debris in between to guarantee maximum adhesion.

The workpiece must be at least 6 mm (1/4") thick for the magnet to stick, but minimal 3 mm (1/8") thick to hold the weight of the machine and to drill safely. In case the workpiece is between 3 mm (1/8") and 6 mm (1/4"), make sure to make a proper base to create a good magnetic field as shown below.



[image 4-4]

The electromagnet will work best on surfaces of at least 10 mm (3/8") thickness.

The electromagnet may not be able to create a good enough magnetic field. Causes may be:

- Surface not flat
- Workpiece not magnetisable (e.g. aluminium)
- Workpiece coated or painted
- Workpiece not thick enough

In this situation the magnet indicator will light up red. Make sure to solve any of these matters before proceeding in any way and creating unsafe situations

1. Connect the machine to the mains/work piece;
2. To activate the magnet, press the red magnet switch:  
The magnet switch will be lit (red);  
The LED-indicator lights up GREEN when generated magnetic force is sufficient;
3. To deactivate the magnet, press the same switch again.



***WARNING:*** Do not use this machine when LED-indicator is RED. Magnet may not generate sufficient attachment force

**We need to point out that this is only an indication and not a certainty that the magnet will not release from the material. We accept no liability ensuring from the magnet indicator not functioning or functioning poorly.**

Make sure that the magnet attaches tightly to the work piece before turning on the motor unit of the magnetic drilling machine. Our magnets have 2 coils; make sure that both coils are in contact with the material. Do not connect any other machines to the electrical outlet the magnetic drilling machine is plugged into, as it may result in the loss of magnetic force.

Always use the safety chain included. Drilling above your head is extremely dangerous and is not recommended. For the use of magnetic drilling machines on pipes, not-flat or non-magnetic materials, we refer to several vacuum tightening systems and pipe clamping systems are mentioned.

## 4.5 Switching motor on and off

The motor unit can only be switched ON when the magnet is activated. 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 Tool lubrication

### HORIZONTAL APPLICATIONS

In order to use the lubrication system, the tank must be filled with a cutting fluid or oil

1. Make sure the flow regulator is closed;
  2. Unscrew the cap;
  3. Fill the container with cutting fluid or oil;
  4. Screw the cap back on.
- Adjust the fluid flow as required using the flow regulator;
  - Add more cutting fluid if the shavings (metal chips) become blue.

### VERTICAL APPLICATIONS

Dip the cutter in cutting paste or apply an appropriate spray.



**WARNING:** Do not use the lubrication system in vertical applications. Instead use cutting paste or spray

Make sure to use only suitable cutting oil or fluid. Proper lubrication will help you create better and faster results, and extend the lifetime of your tools.

## 5. Working with operation tools

### 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 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.

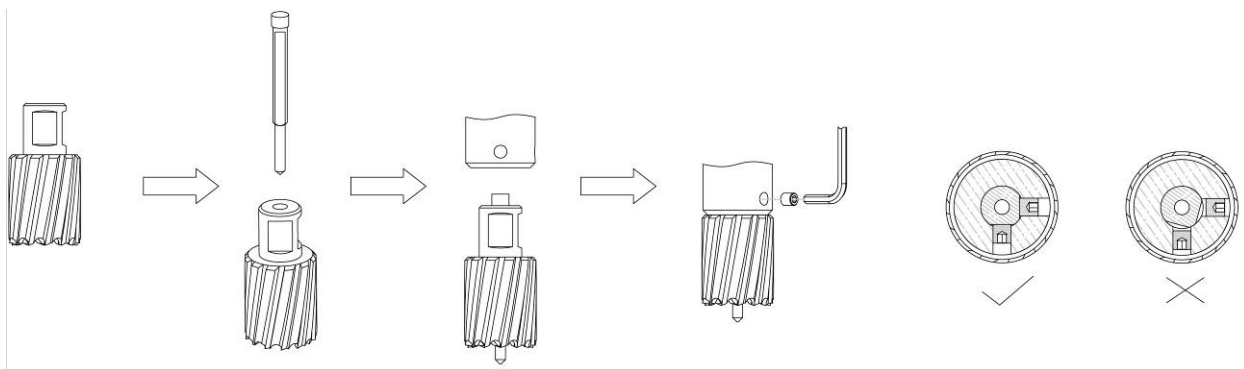
The drilling conditions are dependent on requirements for tool life and surface finish. These conditions are further restricted by the rigidity of the tool and the work piece, lubrication and machine power available. The harder the material, the lower the cutting speed.

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 explanatory information and safety recommendations above, you are ready to actually start drilling. Follow these steps for the 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 centre of the hole;
3. Use the pilot pin to position the machine and in the correct position, with the tip of the pilot pin to meet the marked center of the hole;

4. Switch on the magnet and verify that the drill is in the right position and that the machine is pushed tight against the work piece;
5. If your machine is equipped with a lubrication system, put open the valve to release the oil. If your machine does not have such a system, fill the holes of the spindle with oil;
6. Switch the motor on at and allow it to run at the required speed;
7. Turn the arms to start drilling. Apply only a slight pressure when the annular cutter touch the metal. Do not push the annular cutter with force into the metal;
8. Apply a regular pressure while drilling. The drilling performance does not improve by putting more pressure on the tool. 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!!!***

9. Adjust the oil supply when necessary, if your drill does not have a lubrication system, stop drilling regularly, refill the holes of the spindle and continue drilling;
10. Apply less pressure when the drill cuts through the material. The slug will be pushed out of the cutter by the pilot pin;
11. Turn the arms to put the motor in highest position and switch off the motor unit;
12. Remove the burrs, metal chips and clean the cutter and surface without getting injuries.

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

## **5.2 Twist drills**

Use twist drills with 19.05 mm (3/4") Weldon shank. Align the flat faces on the cutter shank with the screws in the spindle. Make sure the shank is entered fully and correctly. Fasten the screws with the provided Allen key.

## **5.3 Step drills and countersinks**

Use step drills for reaming or countersink drills for countersinking with 19.05 mm (3/4") Weldon shank and follow the steps mentioned in the previous paragraphs.

## 6. Maintenance

Your power tool has been designed to operate over a long period of time with a minimum of maintenance. Continuous satisfactory operation depends upon proper tool care and regular cleaning.



**CAUTION: To reduce the risk of injury, turn unit 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 magnetic drilling machine with moving parts, your magnetic drilling machine also needs regular maintenance service. A few recommendations follow :

### **VISUALLY CHECK THE MACHINE FOR DAMAGE**

Machine must be checked before operation for any signs of damage that will affect the operation of the machine. Particular notice must be taken of the mains 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 magnetic 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. 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 machines operation must be checked to ensure that all components are working correctly. Replace any defective parts immediately. This prevents properly function parts from being damaged.

### **CARBON BRUSHES**

Brushes should be checked to make sure there is no abnormal wear present. This should be checked at least once a week if used frequently. If the carbon brush has worn more than 2/3 the original length the brushes should be changed. Failure to do so may cause damage to the machine.

### **CHECK MAGNETIC BASE**

Before every operation the magnetic base should be checked to make sure that the base is flat and there is no damage present. An uneven magnet base will cause the magnet not to hold as efficiently and may cause injury to the operator. When the machine is put out of use for a longer period, apply a small amount of machine oil to the underside of the magnetic base for rust protection. Clean the magnetic base again with next use.

### **CHECK MACHINE GREASE**

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

## CHECK ARMATURE

This should be checked at least 1 per month to check that 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 and the part should be replaced.

## ADJUSTMENT OF SLIDE

An essential requirement of the machine is that the slide can 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 is 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 guide way at both sides;
- Lubricate the gear rack.

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

## REPAIR, MODIFICATION AND INSPECTION

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

Our 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 our continuing program of research and development, the specifications of machines are subject to change without prior notice.



**WARNING:** *If accessories have not been tested with this product, use of such accessories with this tool could be hazardous. To reduce the risk of injury, only recommended accessories should be used with this product.*

Consult your dealer for further information on the appropriate accessories.

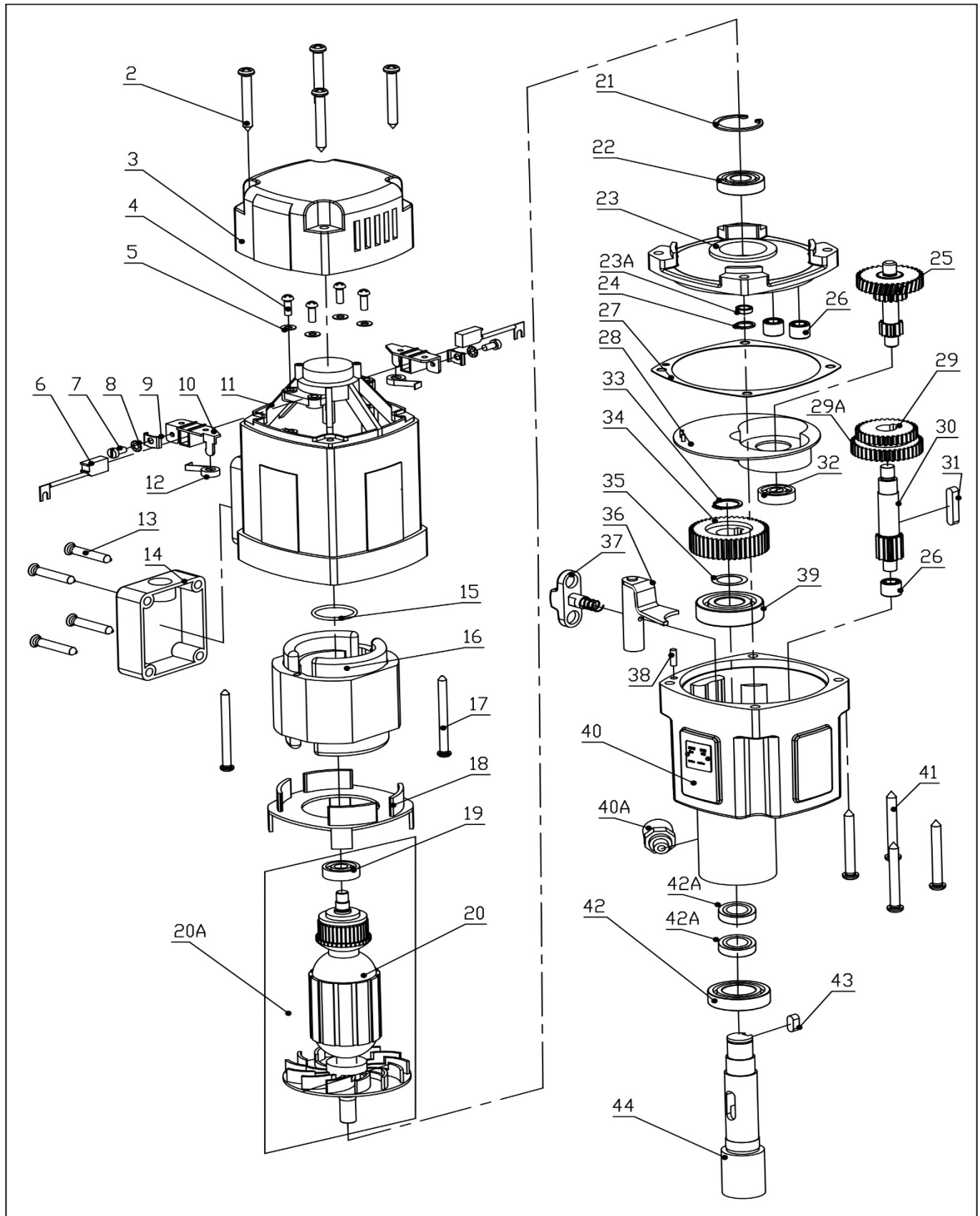
## 7. Trouble shooting

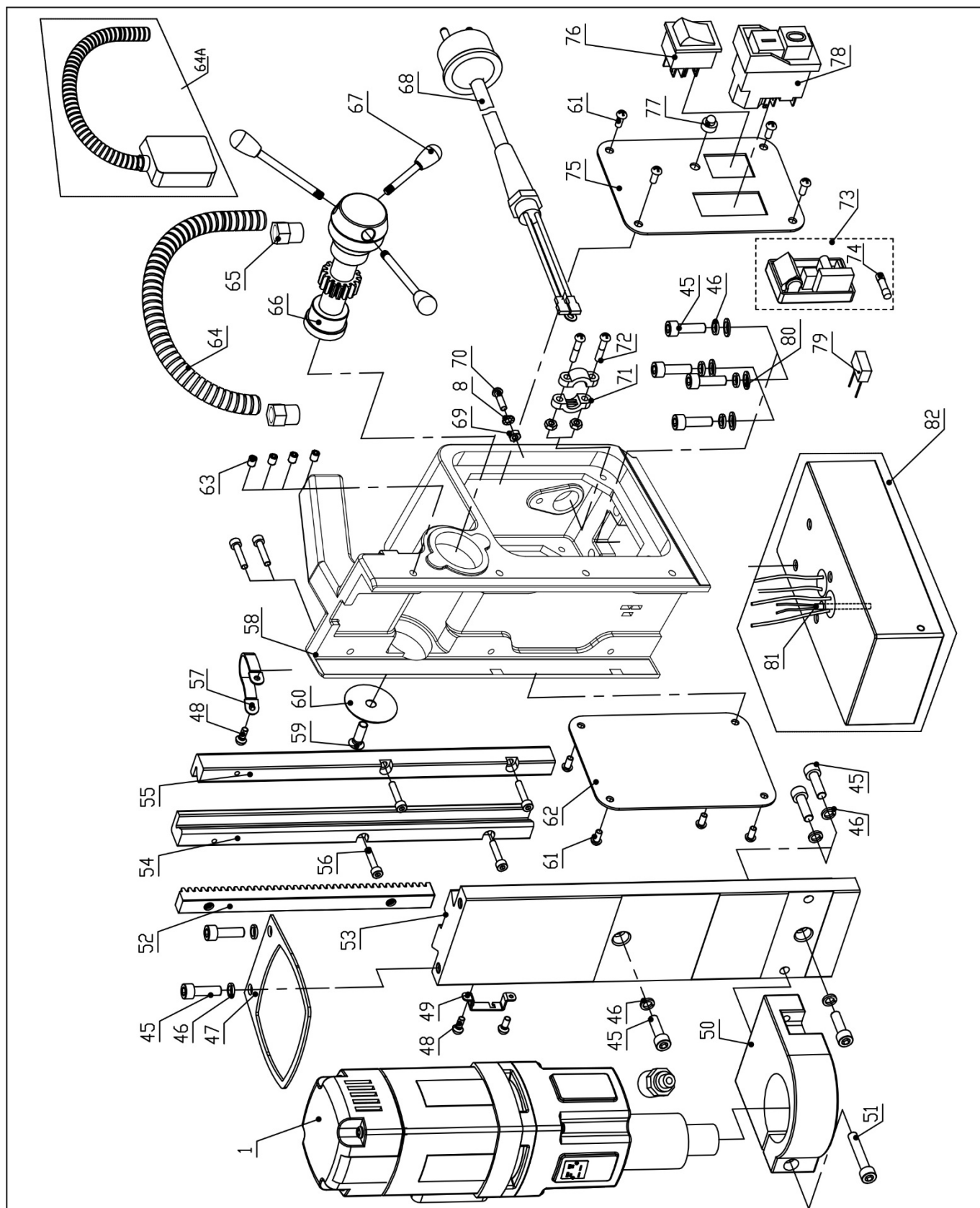
|                                                                      |                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Magnet and motor do not function                                     | <ul style="list-style-type: none"> <li>- The magnet switch is not connected to the power supply</li> <li>- Damaged or defective wiring</li> <li>- Defective fuse</li> <li>- Defective magnet switch</li> <li>- Defective control unit</li> <li>- Defective power supply</li> </ul>                                                                                      |
| Magnet 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 magnet switch</li> <li>- Defective On / Off switch</li> <li>- Defective control unit</li> <li>- Defective armature and/or field</li> </ul>                                                                                    |
| Magnet does not function, the motor does                             | <ul style="list-style-type: none"> <li>- Defective magnet</li> <li>- Defective wiring of magnet</li> <li>- Defective control unit</li> </ul>                                                                                                                                                                                                                            |
| Annular cutters break quickly, holes are bigger than the hole 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 starts running when magnet switch is turned on                 | <ul style="list-style-type: none"> <li>- Damage or defective relay in control unit</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 grease 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 speed control unit</li> <li>- Defective or loose magnet on top of armature</li> <li>- Damaged or defective (sensor) speed 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 magnetic force                                          | <ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Bottom of magnet not clean and dry</li> <li>- Bottom of magnet not flat</li> <li>- Work piece is not bare metal</li> <li>- Work piece is not clean or flat</li> <li>- Work piece is less than 10 mm (too thin)</li> <li>- Defective control unit</li> <li>- Defective magnet</li> </ul> |

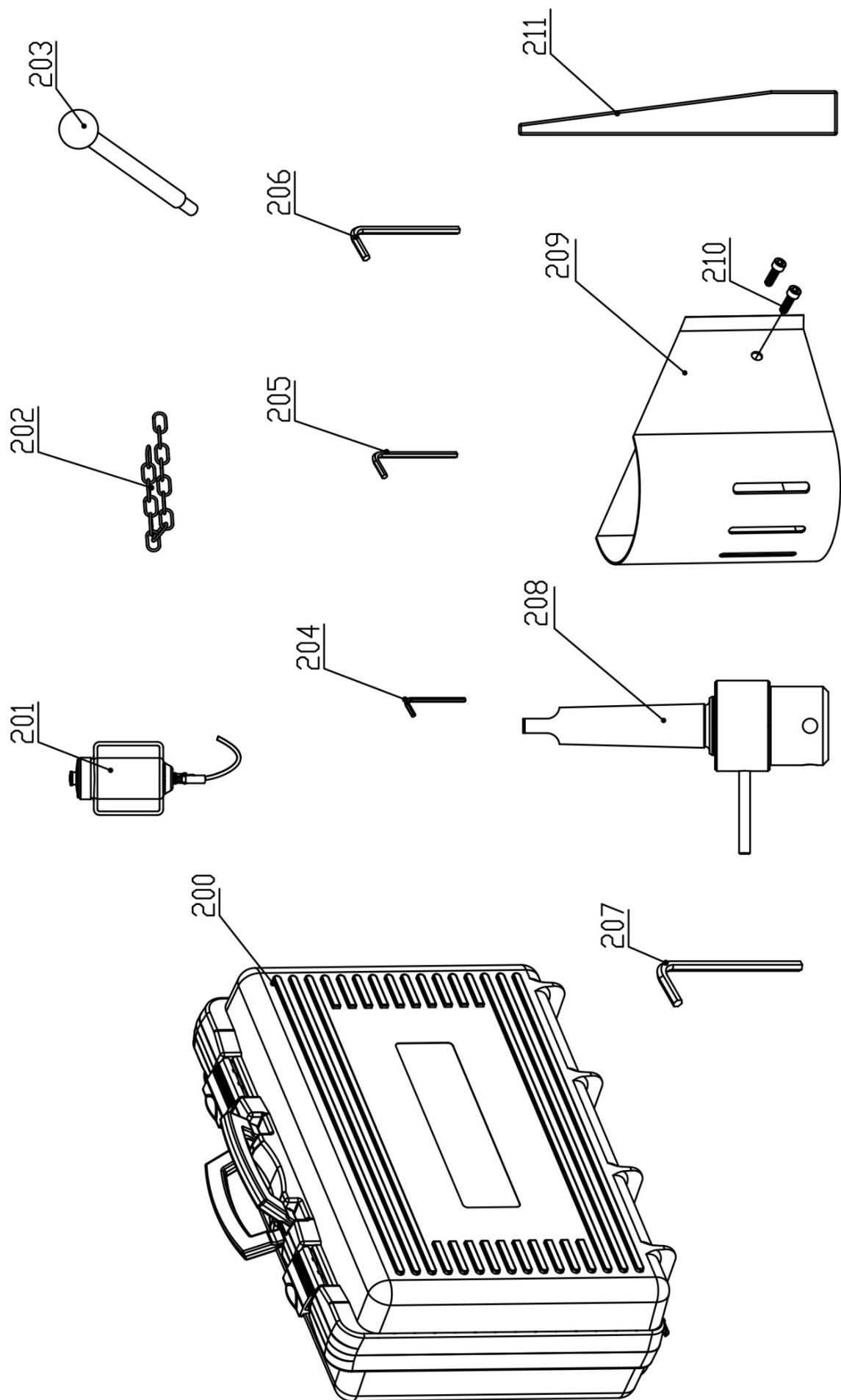
|                                            |                                                                                                                                                                                                                                                              |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frame under voltage                        | <ul style="list-style-type: none"> <li>- Damaged / defective wiring</li> <li>- Defective magnet</li> <li>- Motor seriously dirty</li> </ul>                                                                                                                  |
| Fuse blows when magnet switch is turned on | <ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Wrong value fuse</li> <li>- Defective magnet switch</li> <li>- Defective control unit</li> <li>- Defective magnet</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   | 050M.1001      | Motor unit 220V               | 1   |
|     | 050M.1001A     | Motor unit 110V               |     |
| 2   | 050.0106       | Screw 4.8 x 45                | 4   |
| 3   | 050.0111       | End cover                     | 1   |
| 4   | 050.0371       | Carbon brush holder           | 2   |
| 5   |                |                               |     |
| 7   |                |                               |     |
| 8   |                |                               |     |
| 9   |                |                               |     |
| 10  |                |                               |     |
| 6   | 050.0147-1     | Carbon brush 220V             | 2   |
|     | 050.0147A-1    | Carbon brush 110V             |     |
| 11  | 050.0142       | Housing                       | 1   |
| 13  | 050.0587       | Screw 5 x 30                  | 4   |
| 14  | 050.0586       | Cable housing                 | 1   |
| 15  | 050.0116       | Adapter ring<br>Ø27x2.45      | 1   |
| 16  | 050.1013-CK-1  | Field 220V                    | 1   |
|     | 050.1013A-CK-1 | Field 110V                    |     |
| 17  | 020.0024       | Screw M4 x 60                 | 2   |
| 18  | 050.0261       | Baffle                        | 1   |
| 19  | 032.0126       | Bearing 608ZZ<br>8x22x7       | 1   |
| 20A | 050.1016-1     | Armature 220V                 | 1   |
|     | 050.1011-1     | Armature 110V                 |     |
| 21  | 032.0166       | Circlip 472/28/1.2            | 1   |
| 22  | 032.0171       | Bearing 6001ZZ 12 x<br>28 x 8 | 1   |
| 23  | 050.0236HX     | Inner gear plate<br>SMART     | 1   |
| 23A | 050.0065       | Metal ring Ø40                | 1   |
| 24  | 100.0571       | Circlip 471 11 x 1            | 1   |
| 25  | 050.1007E      | Gear set                      | 1   |
| 26  | 040.0161       | Needle bearing<br>HK0810      | 3   |
| 27  | 050.0207       | Gasket middle                 | 1   |
| 28  | 050.0211       | Plate for gear casing         | 1   |
| 29  | 050.0171-1     | Gear 34T                      | 1   |
| 29A | 050.0171-2     | Gear 40T                      | 1   |
| 30  | 050.0231E      | Gear 13T                      | 1   |
| 31  | 040.0301       | Key                           | 1   |
| 32  | 032.0221       | Bearing 608 8x22x7            | 1   |
| 33  | 050.0426       | Circlip 471/15/1              | 1   |
| 34  | 050.0177E      | Gear 45T                      | 1   |
| 35  | 050.0182       | Adapter ring                  | 1   |
| 36  | 050.0291       | Clutch shaft                  | 1   |
| 37  | 040.0286       | Gear switch                   | 1   |
| 38  | 032.0211       | Casing pin 4 x 12             | 1   |
| 39  | 050.0221       | Bearing 17 x 40 x 12          | 1   |

| -   | -           | -                                         |     |
|-----|-------------|-------------------------------------------|-----|
| No. | Part no.    | Description                               | Qty |
| 40  | 050M.1015   | Gearbox 220V                              | 1   |
|     | 050M.1015A  | Gearbox 110V                              |     |
| 40A | KSP.S       | Coolant connector<br>Quick straight brass | 1   |
| 41  | 032.0106    | Screw M5 x 50                             | 4   |
| 42  | 050.0466    | Bearing 20 x 37 x 9                       | 1   |
| 42A | 030E.5033   | Seal                                      | 2   |
| 43  | 050.0431    | Key for spindle drive 5<br>x 5 x 10 mm    | 1   |
| 44  | 050.0191    | Spindle-drive-shaft                       | 1   |
| 45  | 020.0156    | Bolt M6 x 20                              | 10  |
| 46  | 020.0111    | Washer M6 DIN7980                         | 10  |
| 47  | 040.0041    | Motor fixing plate 110<br>mm              | 1   |
| 48  | KSP.MS      | Screw M5 x 10                             | 3   |
| 49  | KSP.M/3     | Tank holder                               | 1   |
| 50  | 050.0141HX  | Motor holder                              | 1   |
| 51  | 020.0146B   | Screw M6 x 35                             | 1   |
| 52  | 032.0016    | Rack                                      | 1   |
| 53  | 050.0011    | Slide                                     | 1   |
| 54  | 020.0086/X  | Rail set Aluminium<br>(L/R) L-profile     | 1   |
| 55  |             |                                           |     |
| 56  | 020.0086/S  | Rail screw M4 x 20                        | 6   |
| 57  | 020.0298    | Motor cable clamp                         | 1   |
| 58  | 050M.1002   | Frame                                     | 1   |
| 59  | 020.0081    | End screw BKVZ M6<br>x 16                 | 1   |
| 60  | 020.0077    | End plate                                 | 1   |
| 61  | 020.0101    | Panel screw BKVZ<br>M4 x 8                | 8   |
| 62  | 050.0009    | Rear panel<br>SMART.50 220V               | 1   |
|     | 050.0009A   | Rear panel<br>SMART.50 110V               |     |
| 63  | 020.0056/S  | Screw SS M5 x 6                           | 4   |
| 64  | 050.B060    | Motor cable assembly                      | 1   |
| 65  | 020.0041/H  | Coupling nut PG9<br>(motor cable)         | 2   |
| 66  | 020.0061/X  | Capstan hub<br>assembly                   | 1   |
| 67  | 020.0066    | Arm for capstan                           | 3   |
| 68  | 032.1016    | Main cable set 220V<br>EU                 | 1   |
|     | 032.1016A   | Main cable set 110V<br>US                 |     |
|     | 020.0036/AU | Main cable 220V AU                        |     |
|     | 020.0036/UK | Main cable 220V UK                        |     |

|            |                        |                               |            |
|------------|------------------------|-------------------------------|------------|
|            | 020.0036/UK<br>110-16A | Main cable 110V UK<br>16A     |            |
|            | 020.0031               | Coupling nut PG11             |            |
| <b>No.</b> | <b>Part no.</b>        | <b>Description</b>            | <b>Qty</b> |
| 8          | 020.0182               | Grounding<br>screw/washer/nut | 1          |
| 69         |                        |                               |            |
| 70         |                        |                               |            |
| 69         | 020.0037               | Cable clamp complete          | 1          |
| 71         |                        |                               |            |
| 72         |                        |                               |            |
| 73         | 020.0001/2             | Control unit 220V             | 1          |
|            | 020.0001/21            | Control unit 110V             |            |
| 74         | 020.0017               | Fuse 5 x 20 F2A               | 1          |
| 75         | 050.0008B              | Front panel                   | 1          |
| 76         | 020.0011/1             | Magnet switch                 |            |
| 77         | 020.0206               | LED indicator set             | 1          |
| 78         | 030E.0091/Y            | Motor switch 220V             | 1          |
|            | 030E.0092/Y            | Motor switch 110V             |            |
| 79         | 020.0257               | Capacitance                   | 1          |

|            |                 |                                  |            |
|------------|-----------------|----------------------------------|------------|
| 80         | 020.0112        | Washer M6                        | 4          |
| <b>No.</b> | <b>Part no.</b> | <b>Description</b>               | <b>Qty</b> |
| 81         | 020.0201        | Sensor                           | 1          |
| 82         | 050.1025        | Magnet 220V                      | 1          |
|            | 050.1025A       | Magnet 110V                      |            |
| 200        | 050M.1009       | Case SMART.50                    | 1          |
| 201        | KSP.Q2          | Coolant tank                     | 1          |
| 202        | SAF.400         | Safety chain (1 mtr)             | 1          |
| 203        | KSP.P           | Pin and knob                     | 1          |
| 204        | IMB.US2.5       | Allen key 2.5 mm                 | 1          |
| 205        | IMB.US3         | Allen key 3.0 mm                 | 1          |
| 206        | IMB.US4         | Allen key 4.0 mm                 | 1          |
| 207        | IMB.US5         | Allen key 5.0 mm                 | 1          |
| 208        | 050.2001        | Arbor MT2-19.05mm                | 1          |
| 209        | SAF.MDMB        | Safety guard                     | 1          |
| 210        | 020.0223        | Screw M5 x 10                    | 2          |
| 211        | 050.0192        | Morse taper ejector<br>drift key | 1          |

### 8.3 Wiring diagram

