

Operators manual
version 1.0 EN

 **EUROBOOR**
FOR PROFESSIONALS BY PROFESSIONALS

Magnetic drilling machine

ECO.60S

Serial no.:

Date of purchase:

Congratulations on your purchase of the Euroboor ECO.60S portable magnetic drilling machine. Your model is designed to produce superior holes quickly and efficiently. Through years of experience, constant innovation and development, Euroboor is committed to provide you with metal cutting tools and products to help you be more productive.

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

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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 by Euroboor for your model. Accessories that may be suitable for one machine, may become hazardous when used on another machine.

SERVICE

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

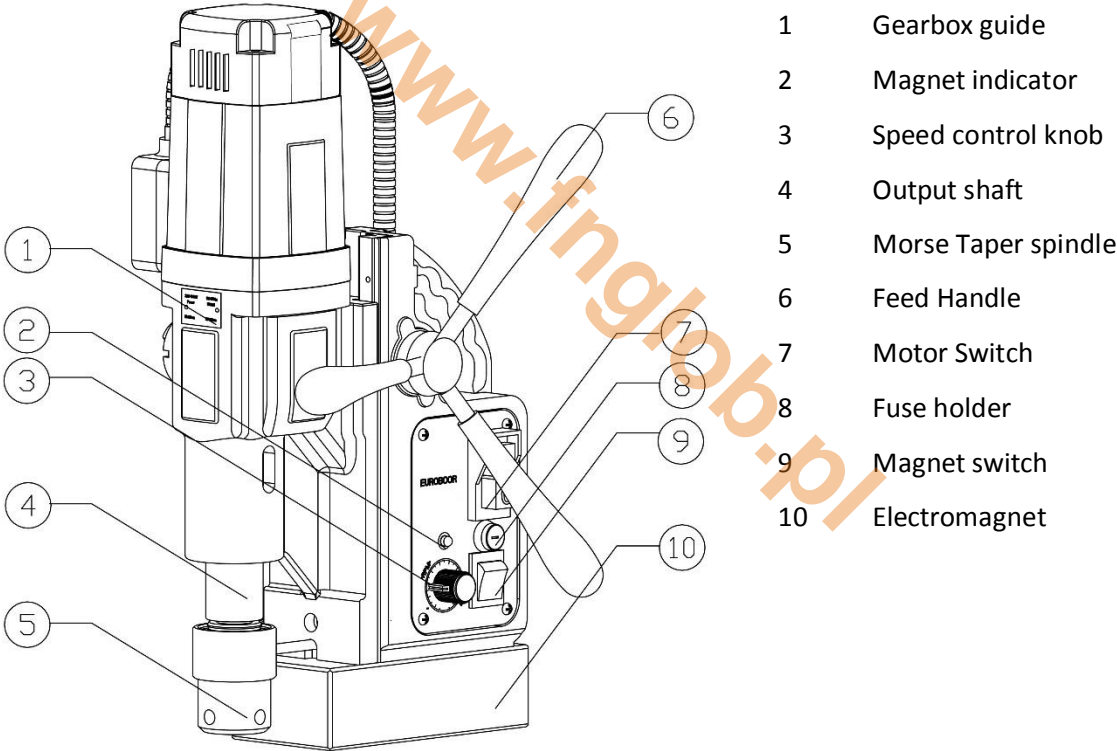
2. Description

2.1 Intended use

This magnetic drilling machine is intended for commercial use as a drilling machine for drilling materials with a magnetizable surface using annular cutters and twist drills, and for countersinking in a weather-protected environment using the application tools and accessories recommended by EUROBOOR.

The magnetic drilling machine can be used horizontally, vertically or overhead.

2.2 Description and features



[image 1-1]

2.3 Box contents

- 1 Carrying case
- 1 Magnetic drilling machine
- 1 Instruction manual
- 3 Handles
- 1 Drill guard + 2 bolts
- 1 Oil tank + attachment pin
- 1 Bottle cutting oil
- 3 Allen keys (2.5, 4, 5)
- 1 Safety chain
- 1 Morse Taper 3 spindle
- 1 Spindle drift
- 1 Set of ear plugs
- 1 Pair of safety glasses
- 1 Pair of gloves

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:

0501501001






breaks down to:

<i>050</i>	<i>15</i>	<i>01</i>	<i>001</i>
Machine series			
	Year of manufacture		
		Month of manufacture	
			Identification number

2.5 Technical data

	ECO.60S	
ANNULAR CUTTERS	Ø 12 – 60 mm	Ø 7/16 – 2 3/8 mm
TWIST DRILLS	Ø 1 – 23 mm	Ø 1/16 – 15/16"
THREADING	-	-
COUNTERSINKING	Ø 10 – 65 mm	Ø 3/8 – 2 9/16"
LENGTH	320 mm	12 5/8"
WIDTH	200 mm	7 1/2"
HEIGHT	452 – 622 mm	17 3/4" – 24 7/16"
STROKE	170 mm	6 11/16"
WEIGHT	13,0 kg	28,6 lbs
MAGNET	168 x 84 x 49 mm (L x W x H)	6 5/8 x 3 5/16 x 1 5/16"
MAGNETIC FORCE	1850 kg	4100 lbs
MOTOR POWER	1600 W	14.5 A
TOTAL POWER	1700 W	15.5 A
SPEED	[I] 60-275 ^{min-1} [II] 100-500 ^{min-1}	[I] 60-275 ^{min-1} [II] 100-500 ^{min-1}
SPINDLE	Morse Taper 3 – 19,05mm Weldon	Morse Taper 3 – 19,05mm Weldon
POWER SOURCE	110 – 120V AC / 60 Hz 220 – 240V AC / 50 – 60 Hz	

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	Millimeter	Unit of measure for length, width, height or depth
kg	Kilogram	Unit of measure for the mass
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
N	Newton	Unit of measure for the force
min	Minutes	Unit of measure for the time
no	No-load speed	Revolution speed at no-load
1/min	per minute	Unit of measure for number of revolutions, strokes, impacts or oscillations per minute.

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 by the retailer when you purchase a new product.

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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.

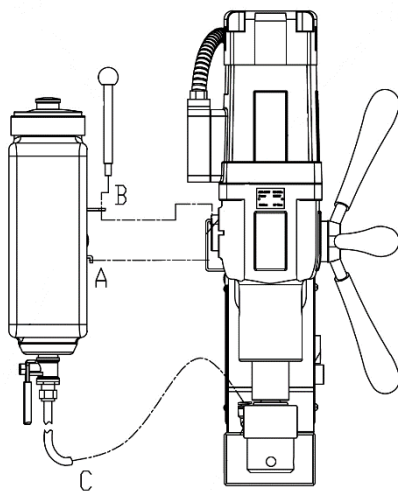
MOUNTING THE DRILL GUARD

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.



[image 2-1]

FITTING THE LUBRICATION SYSTEM

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

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

FITTING THE SAFETY CHAIN

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



WARNING: Always use the safety chain when using machine vertically and/or up-side-down.

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 magnetizable, suitable fixation devices, obtainable as accessories from EUROBOOR, 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, 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 EUROBOOR or any authorized EUROBOOR 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 EUROBOOR 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 EUROBOOR service organization.

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 mm²; the maximum length is 30 meter. 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

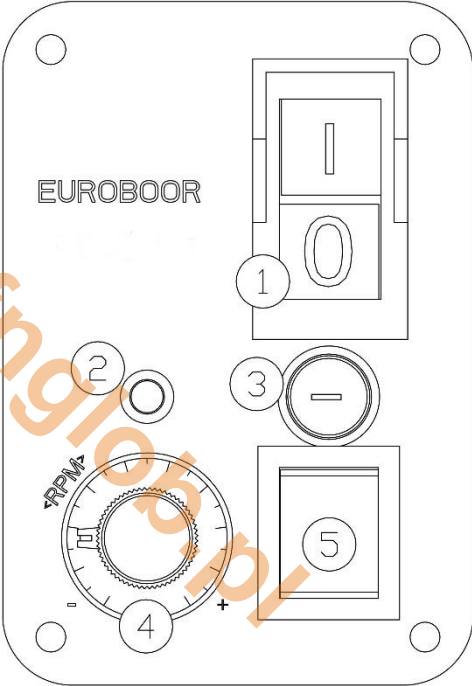
 **WARNING:** Always observe the safety instructions and applicable regulations.

 **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

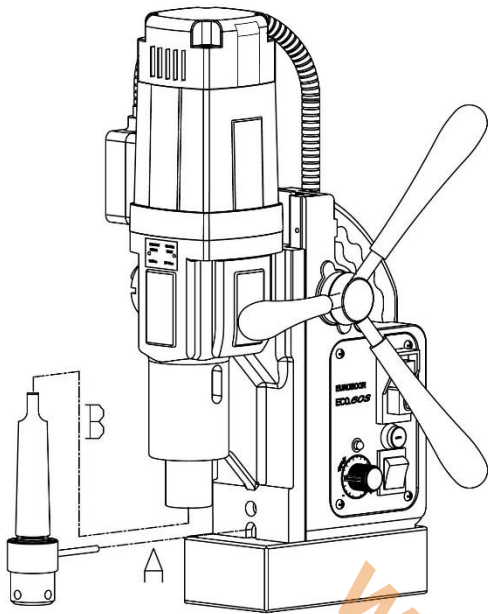
The control panel on your magnetic drilling machine is designed for maximum operating facility and safety.

- 1. Magnet Switch
- 2. Motor Switch
- 3. Magnet LED Indicator

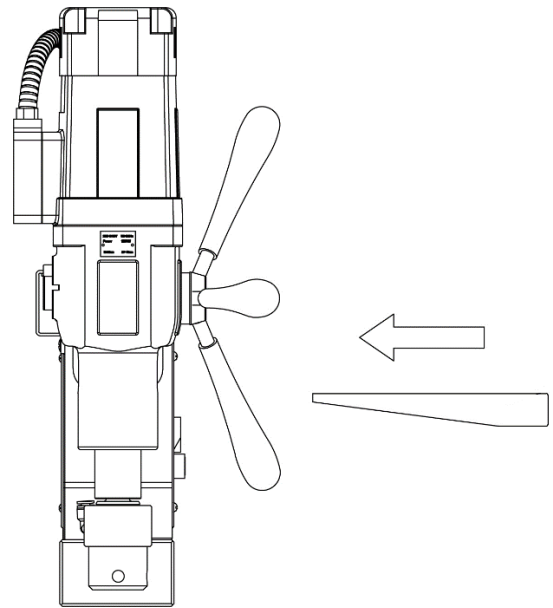


[image 2-2]

4.2 Morse taper spindle



[image 2-3]



[image 2-4]

1. Make sure the inside of the output shaft and the Morse Taper spindle are clean and free of grease
2. Align the coolant 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 chapter 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

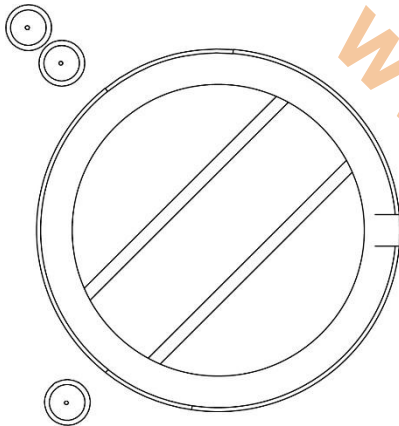
1. To select the correct gear from neutral (horizontal) position:
 - a. Rotate the switch counterclockwise to position **o**, this is gear 1
 - b. Rotate the switch clockwise to position **oo**, this is gear 2
2. A gear is only correctly selected when the gearbox switch is aligned with the indicators 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 align the gears and correctly and fully selecting the intended gear.

NOTE: never touch moving machine parts!

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

fo	Ø 27-60 mm	Rotating speed 60-275 ^{min-1}
oo	Ø 12-26 mm	Rotating speed 100-500 ^{min-1}



[image 2-5]

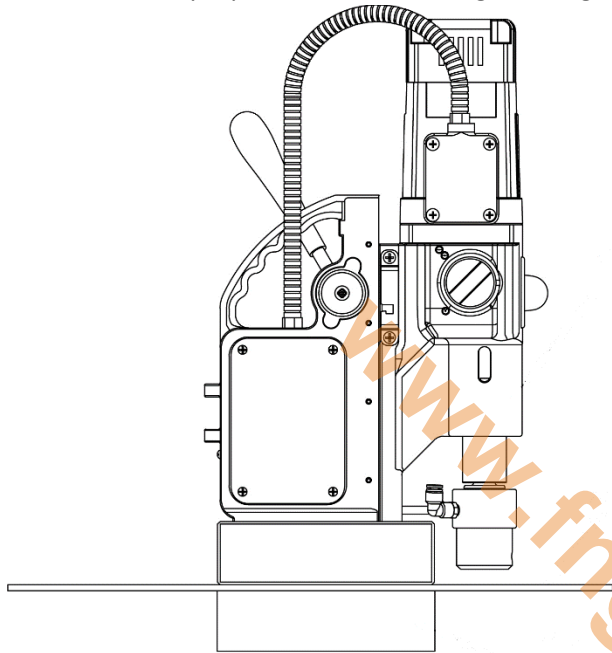


WARNING: *never touch moving machine parts!*

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 5 mm thick for the magnet to stick, but minimal 3 mm thick to hold the weight of the machine and to drill safely. In case the workpiece is between 3 and 5 mm, make sure to make a proper base to create a good magnetic field as shown in image 2-6.



[image 2-6]

The electromagnet will work best on surfaces of at least 10 mm thickness.

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

- Surface not flat
- Workpiece not magnetizable (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. Euroboor accepts 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. Euroboor 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 our brochure or our website www.euroboor.com where 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 Motor speed control

The speed control knob (potentiometer) allows you to electronically control the speed of the motor (in both clockwise and anticlockwise direction).

- The indicator of the potentiometer in bottom left corner is minimum speed
- The indicator of the potentiometer in bottom right corner is maximum speed

The electronic motor speed control works for both mechanical gears.

Be careful not to overturn the knob.

4.7 Temperature control

This machine is equipped with an all-time electronic temperature protection. If the temperature of the motor unit runs up to 70 Degree Celsius the motor unit will stop. After a few minutes it can be started again.

When it is possible to start the motor again, let the motor run idle at full speed for a couple of minutes to let the motor cool down more in an efficient way.

4.8 Tool lubrication

IN 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 AND OVERHEAD APPLICATIONS

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



WARNING: Do not use the lubrication system in vertical or overhead drilling applications.
Instead use Euroboor cutting paste

Make sure to use only suitable cutting oil or fluid. Euroboor offers a wide range of cutting lubricants for all tool and material combinations. Proper cooling 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.

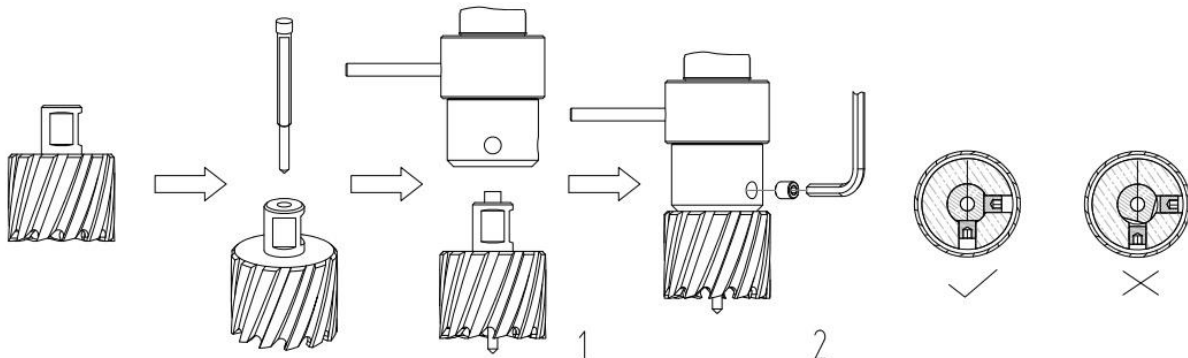
The drilling conditions are dependent on requirements for tool life and surface finish. These conditions are further restricted by the rigidity of the tool and the work piece, lubrication and machine power available. The harder the material, the lower the cutting speed.

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 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 (1)
 - Tighten the screws (2)



[image 3-1]

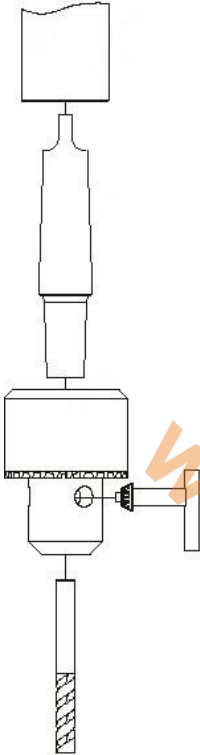
2. Precisely mark the centre of the hole

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 auto coolant system, put open the valve to release the oil. If your machine does not have an auto coolant 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 an auto coolant 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 metal piece drilled out can be sharp and very hot!!

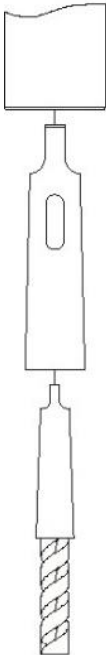
5.2 Twist drills

- 1. Remove the Morse Taper arbor (see chapter Gearbox)
- 2. Fit the twist drill
 - a. Straight shank twist drills

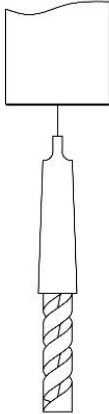


[image 3-2]

- b. Morse Taper shank twist drills



[image 3-3] Morse Taper 2



[image 3-4] Morse Taper 3



3. Precisely mark the center of the hole, and use the tip of the twist drill to position the machine and in the correct position, with the tip of the twist drill to meet the marked center of the hole.

Steps 4-12: see chapter Annular cutters. Make sure the machine runs at maximum speed for twist drills!

5.3 Countersinks

Thanks to its wide range of operating speeds, the machine can also be used for reaming or counter-sinking.

Follow the steps mention in chapter Twist drills

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6. Maintenance

Your EUROBOOR 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 Euroboor 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 OIL

The gearbox oil should be checked and replaced at least once a year to ensure maximum lubrication and cooling, and thus the best performance of 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 5 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 Euroboor Magnetic drilling machines must be done by EUROBOOR or an EUROBOOR authorized dealer. The spare parts list will be helpful if presented with the machine to the Euroboor dealer for service when requesting repair or other maintenance.

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

Consult your dealer for further information on the appropriate accessories.

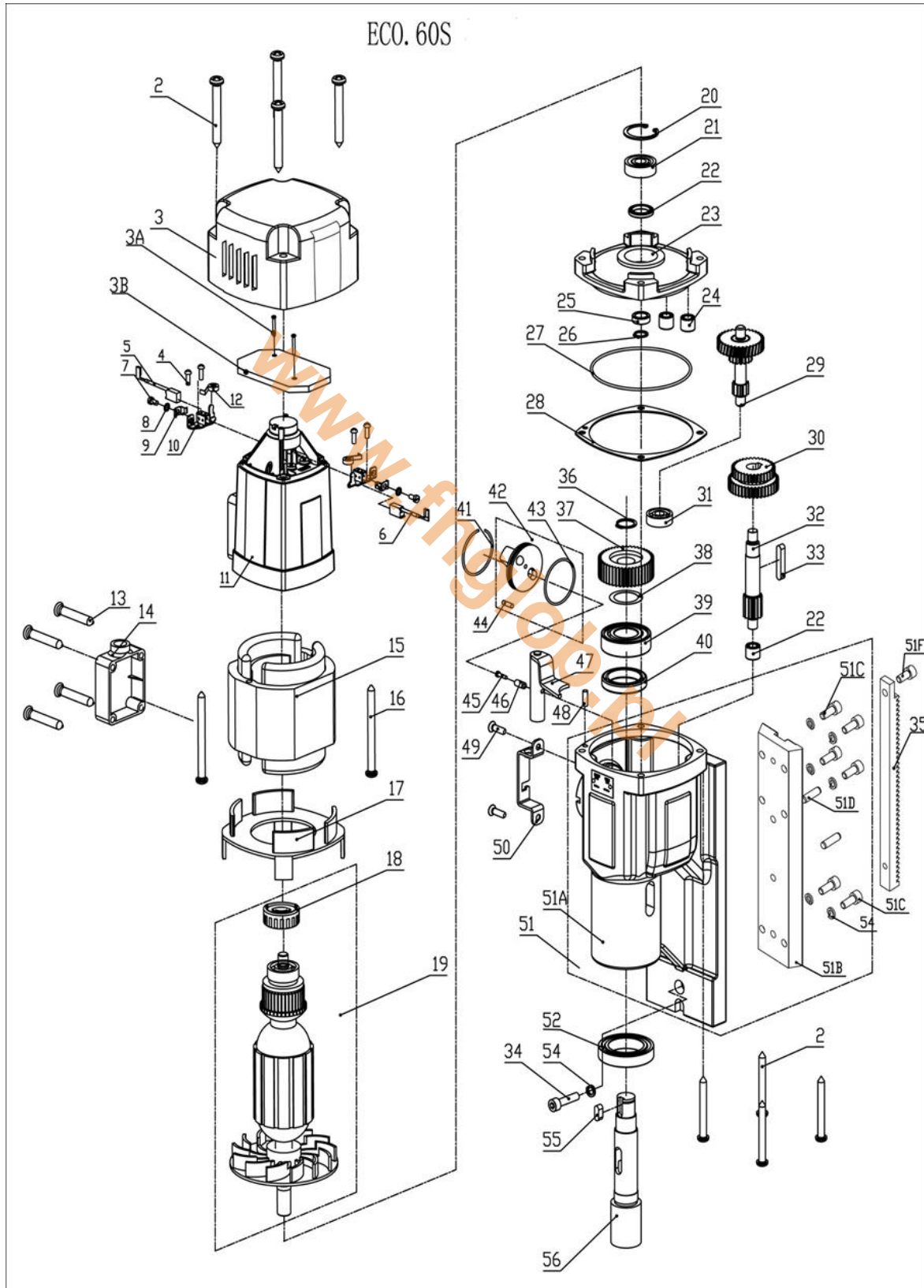
7. Trouble shooting

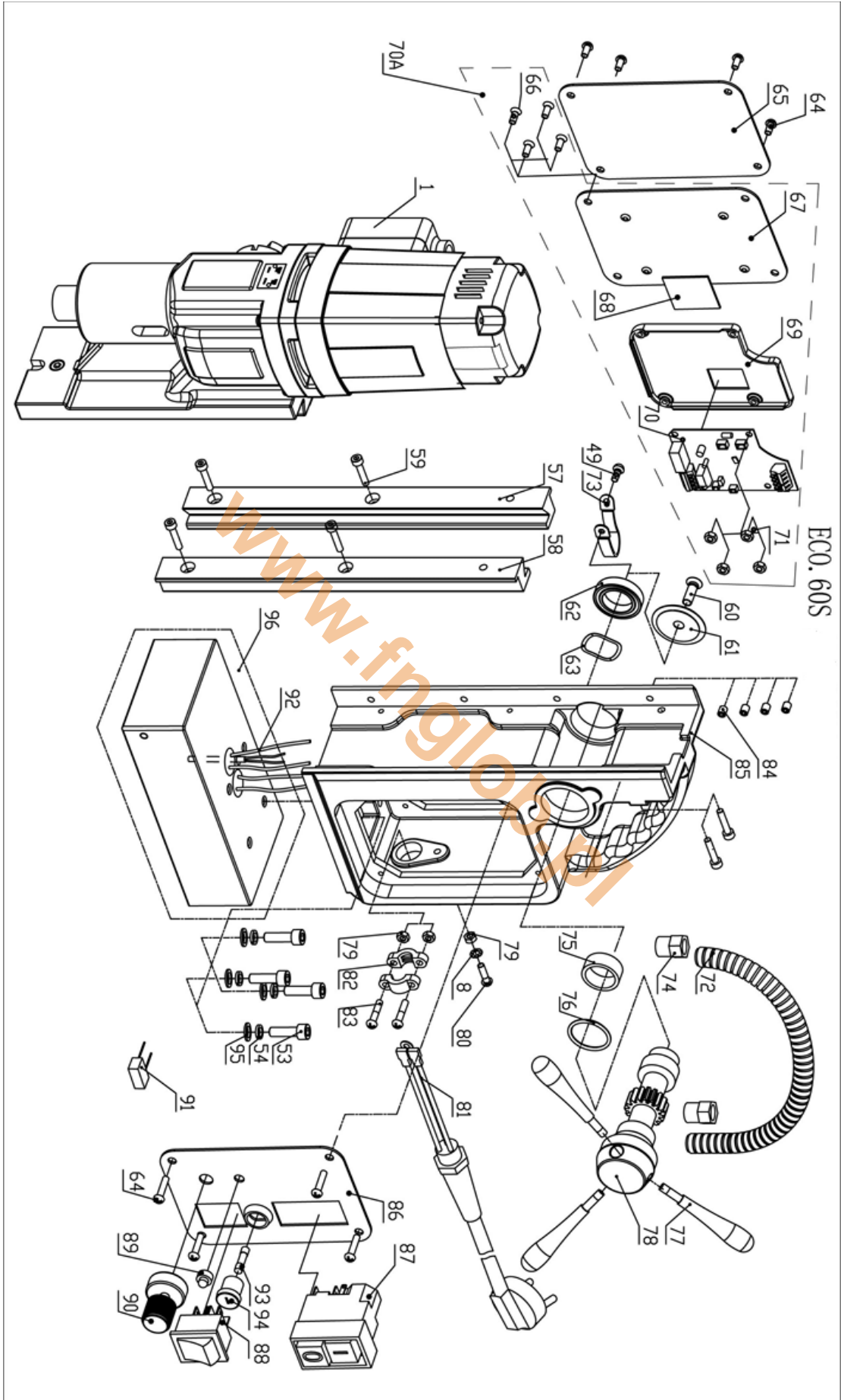
Magnet and motor do not function	<ul style="list-style-type: none"> - The magnet switch is not connected to the power supply - Damaged or defective wiring - Defective fuse - Defective magnet switch - Defective Control Unit - Defective power supply
Magnet does function, the motor does not work	<ul style="list-style-type: none"> - Damaged or defective wiring - Carbon brushes are stuck or worn out - Defective magnet switch - Defective On / Off switch - Defective Control Unit - Defective armature and/or field
Magnet does not function, the motor does	<ul style="list-style-type: none"> - Defective magnet - Defective wiring of magnet - Defective Control Unit
Annular cutters break quickly, holes are bigger than the hole cutter	<ul style="list-style-type: none"> - Clearance in the guide - Bent spindle - Shaft extending from the motor is bent - Bent pilot pin
Motor running roughly and/or seizing up	<ul style="list-style-type: none"> - Bent spindle - Shaft extending from the motor is bent - Triangular guide not mounted straight - Dirt between spindle and triangular guide
Motor starts running when magnet switch is turned on	<ul style="list-style-type: none"> - Damage or defective relays in control unit
Motor making a rattling sound	<ul style="list-style-type: none"> - Gear ring (bottom of the armature) worn out - Gear(s) worn out - No grease in gear box
Motor humming, big sparks and motor has no force	<ul style="list-style-type: none"> - Armature damaged (burned) - Field burned - Carbon brushes worn out
Motor does not start or fails.	<ul style="list-style-type: none"> - Damaged or defective wiring - Dirt in sensor Speed Control Unit - Defective or loose magnet on top of armature - Damaged or defective (sensor) Speed Control Unit - Damage to Armature or field coil - Damaged or defective carbon brushes
Guiding takes a great deal of effort	<ul style="list-style-type: none"> - Guide is set too tight - Guide is dry, needs to be greased - Guide/gear- rack/rotation system dirty or damaged

Insufficient magnetic force	<ul style="list-style-type: none"> - Damaged or defective wiring - Bottom of magnet not clean and dry - Bottom of magnet not flat - Work piece is not bare metal - Work piece is not clean or flat - Work piece is less than 10 mm (too thin) - Defective Control Unit - Defective magnet
Frame under voltage	<ul style="list-style-type: none"> - Damaged / defective wiring - Defective magnet - Motor seriously dirty
Fuse blows when magnet switch is turned on	<ul style="list-style-type: none"> - Damaged or defective wiring - Wrong value fuse - Defective magnet switch - Defective Control Unit - Defective magnet
Fuse blows when motor is started	<ul style="list-style-type: none"> - Damaged or defective wiring - Wrong value fuse - Motor running roughly - Defective Armature and / or Field - Carbon brushes worn out - Defective Control Unit
Rotation system free stroke too long	<ul style="list-style-type: none"> - Loose or defective gear-rack - Defective rotation system

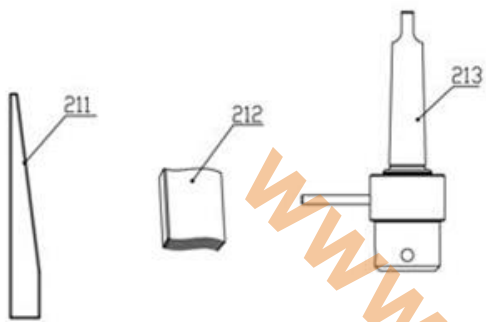
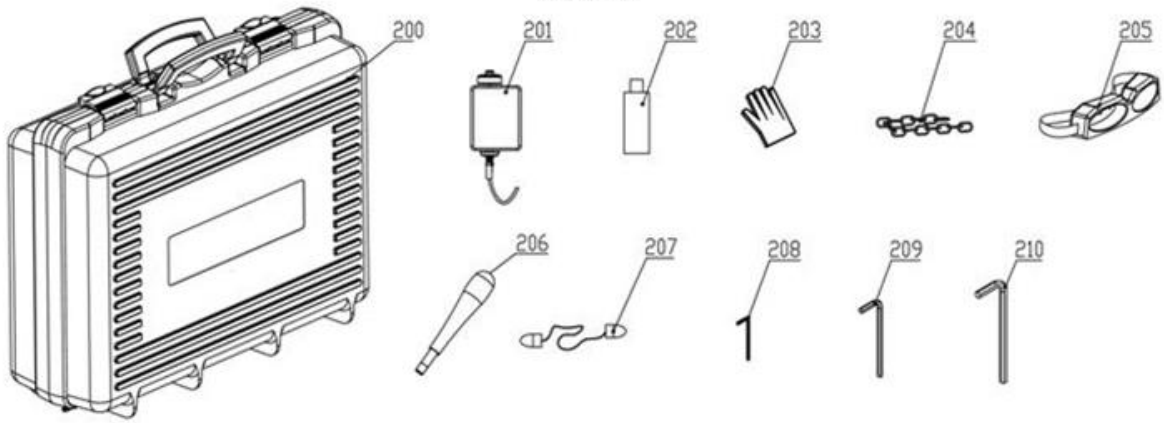
8. Exploded view & spare part list

8.1 Exploded view





ECO. 60S



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8.2 Spare part list

No.	Part number	Description	Qty used
1	060.1001	Motor unit 220V	1
	060.1001A	Motor unit 110V	
2	100.0306	Screw	8
3	050.0111	End cover	1
3A	050T.0332	Screw	2
3B	050T.0006	Test-circuit-board	1
5-6	050.0069	Carbon brush set 220V	1
	050.0070	Carbon brush set 110V	
4, 7-10, 12	050.0067	Carbon brush holder assembly	2
11	050.0131	Housing	1
13	050.0587	Screw	4
14	050.0586	Cable housing	1
15	050T.0278	Field 220V	1
	050T.0278A	Field 110V	
16	020.0328	Screw	2
17	050.0261	Baffle	1
18-19	050T.0183	Armature set 220V	1
	050T.0183A	Armature set 110V	
20	032.0166	Circlip	1
21	032.0171	Bearing	1
22	050.0064	Oil bearing	1
23	050.0236/Y	Inner gear plate	1
24	040.0161	Bearing	3
25	050.0065	Metal ring	1
26	050.0176	Circlip	1
27	050.0071	O-ring	1
28	050.0207	Gasket	1
29	050.0252	Gear set	1
30	050.0171	Gear	1
31	032.0126	Bearing	1
32	050.0231	Gear	1
33	100.4496	Key	1
34	020.0146	Screw	1
35	050.0074	Rack	1
36	050.0076	Circlip	1
37	050.0463	Gear	1
38	050.0462	Washer	1
39	030.0009	Bearing	1
40	050.0066	Oil bearing	1
41	050.0078	Ring	1
42	050.1014	Gear switch set	1
43	050.0081	O-ring	1
44	050.0025	PIN	1
45	020.0329	Screw	1
46	050.0082	Screw holder	1
47	050.1005A	Clutch shaft set	1
48	032.0211	Pin	1
49	KSP.MS	Screw	3
50	KSP.M/3	Coolant hanger	1
51	060.1019	Gear box set	1
51A	055.0008G	Gear casing	1
51B	055.0028G	Slide	1
51C	020.0106	Screw	6
51D	020.0003	Pin	2
51F	030.0012	Screw	1
52	050.0068	Bearing	1
53	020.0156	Screw	4

No.	Part number	Description	Qty used
54	020.0111	Washer	1
55	050.0077	Key	1
56	050.0461	Spindle drive shaft	1
57-58	020.0086/Z	Rail set Alu (L+R) Z-profile	1
59	020.0063	Screw	6
60	020.0081	Screw	1
61	050.0030	End cover	1
62	050.0063	Bearing	1
63	040.0023	Washer	1
64	020.0101	Screw	8
65	055.0002	Rear panel plate 220V	1
	055.0002A	Rear panel plate 110V	
66-71	050T.1018	Speed control unit 220V	1
	050T.1018A	Speed control unit 110V	
72	020.0046	Motor cable tube	1
73	020.0298	Motor cable clamp	1
74	020.0041/H	Coupling Nut for motor cable	2
75	032.0127	Powder metal bearing	1
76	030.0027	Washer	1
77	020.0315	Feed arm	3
78	020.0061/XB	Capstan hub	1
79-80, 82	020.0182	Grounding screw/washer/nut	3
81	020.0036	Main cable complete 220-240V	1
	020.0036/AU	Main cable Australia	
	020.0036/UK	Main cable UK 220V	
	020.0036/UK 110-16A	Main cable UK 110V 16A	
	020.0036/USA	Main Cable USA	
79, 82-83	020.0037	Cable clamp	1
84	020.0231	Screw	4
85	020.0056/Z	Frame	1
86	PP.F-ECO.60S	Front panel plate	1
87	030E.0091/Y	On/off switch 220V	1
	030E.0092/Y	On/off switch 110V	
88	020.0011	Magnet switch	1
89	020.0206	LED set	1
90	060.1009	Potentiometer set	1
91	060.1030	Capacitor set	1
92	100.1008	Sensor	1
93	020.0017	Fuse	1
94	020.0016	Fuse holder	1
95	020.0112	Washer	4
96	050.1003	Magnet (specify voltage)	1
200	CAS.50s	Machine case	1
201	KSP.Q2	Coolant tank	1
202	IBO.10.200	Oil bottle	1
203	SAF.300	Glove	1
204	SAF.400	Safety chain	1
205	SAF.100	Glasses	1
206	020.0315	Arm for capstan	3
207	SAF.200	Ear plug	1
208	IMB.US2.5	Allen key	1
209	IMB.US4	Allen key	1
210	IMB.US5	Allen key	1
211	drift3	Drill drift	1
212	website download	Manual	1
213	IMC.30/19-N	Spindle set	1

8.3 Wiring diagram

