User manual

V 1.0 EN | November 2026

EUROBOOR

FOR PROFESSIONALS BY PROFESSIONALS



Brushless Magnetic Drilling Machine

ECO.i20

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

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

Enjoy your new machine!

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

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

To view all our offices and their contact information please visit: www.euroboor.com

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

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2 Safety

2.1 General safety instructions

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

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

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

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

2.2 Work area

1. Keep your work area clean and well lit. Cluttered and dark work areas increase the risk of accidents;
2. Do not operate a magnetic drilling machine in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. A magnetic drilling machine may create sparks which could 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.

2.3 Electrical safety

1. A magnetic drilling machine plug must match the outlet. Never modify the plug in any way. Do not use any adapter plugs;
2. Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is grounded;
3. Do not expose the magnetic drilling machine to rain or wet conditions. Water entering a machine will increase the risk of electric shock;
4. Do not abuse the cord. Never use the cord to carry the magnetic drilling machine or pull the plug from an outlet. Keep the cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately. Damaged cords increase the risk of electric shock;

iMC Integrated motor cable

The frame of your magnetic drilling machine is designed for maximum safety and comfort. It is provided with an ergonomic handle and an integrated motor cable. This offers increased safety as the cable is completely incorporated in the frame. This prevents the user from getting caught in the cable and the cable from tearing or snapping off.

5. When operating a magnetic drilling machine, use an extension cord suitable for outdoor use, this 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), this reduces the risk of electric shock.

2.4 Personal safety

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



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

2.5 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. While operating the machine, the annular cutter must be cooled and lubricated with high-quality cutting lubricants;
3. Always remove the slug from the annular cutter after each hole.



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

4. Use clamps or other practical solutions to secure and support the workpiece to a stable platform. Do not use the machine when the switch does not turn it on or off. Any machine 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 your magnetic drilling machine out of reach for children and other untrained persons. Tools are dangerous in the hands of untrained users;
7. Maintain your machine with care. Keep cutting tools sharp and clean. Properly maintained tools, with sharp cutting edges are less likely to break and are easier to control;
8. Check for misalignment of moving parts, breakage of parts and any other condition that may affect the machine's operation. If you detect damage have the machine serviced before use. Many accidents are caused by poorly maintained tools;
9. Only use accessories that are recommended by EUROBOOR for your machine model. Accessories that are suitable for one machine may become hazardous when used on another machine.

2.6 Service

1. Tool service must be performed only by qualified repair personnel. Service or maintenance performed by unqualified personnel could result in risk of injury;
2. When servicing a tool, use only identical replacement parts. Follow instructions in the maintenance section of this manual. Use of unauthorised parts or failure to follow maintenance instructions may create a risk of electric shock or injury;
3. EUROBOOR offers Armature kits containing official EUROBOOR spare parts suitable for your magnetic drilling machine.

2.7 Specific safety information

- Keep your fingers away from the drilling area;
- Avoid touching the slug that is automatically ejected by the pilot pin when the working procedure is finished. Contact with the slug when it is hot, or if it falls, can cause personal injuries;
- Always use the safety chain;
- The magnetic drilling machine is suitable for use on steel with a thickness starting from 6 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 irregular 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 before checking whether the magnetic stand has been tightened firmly to the mounting surface;
- Adjust the machine so cutter does not extend into the workpiece before drilling. Do not perform any design, assembly or construction activities on the workpiece while the machine is switched on;
- Before switching on the machine, make sure all accessories have been mounted correctly;
- Do not switch on the machine until it has been mounted and installed according to all above mentioned instructions;
- Always use the recommended speed for the accessories and material you are working with;
- Do not use the machine on the same workpiece on which electric welders are working;
- Only use an appropriate cutting lubricant. EUROBOOR offers a wide range of well-considered cooling and lubrication products to match your requirements;
- 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 safety guard operates properly;
- In case of a jammed cutter, turn off the machine, disconnect the machine from the power supply and then remove the reason for the jam before turning on the machine again.

2.8 Residual risk

Despite following the relevant safety regulations and their implementation, 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.

3 Description

3.1 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, twist drills, reamer and for countersinking in a weather-protected environment using the application tools and accessories recommended by EUROBOOR. The magnetic drilling machine can only be used horizontally or vertically.

3.2 Description and features

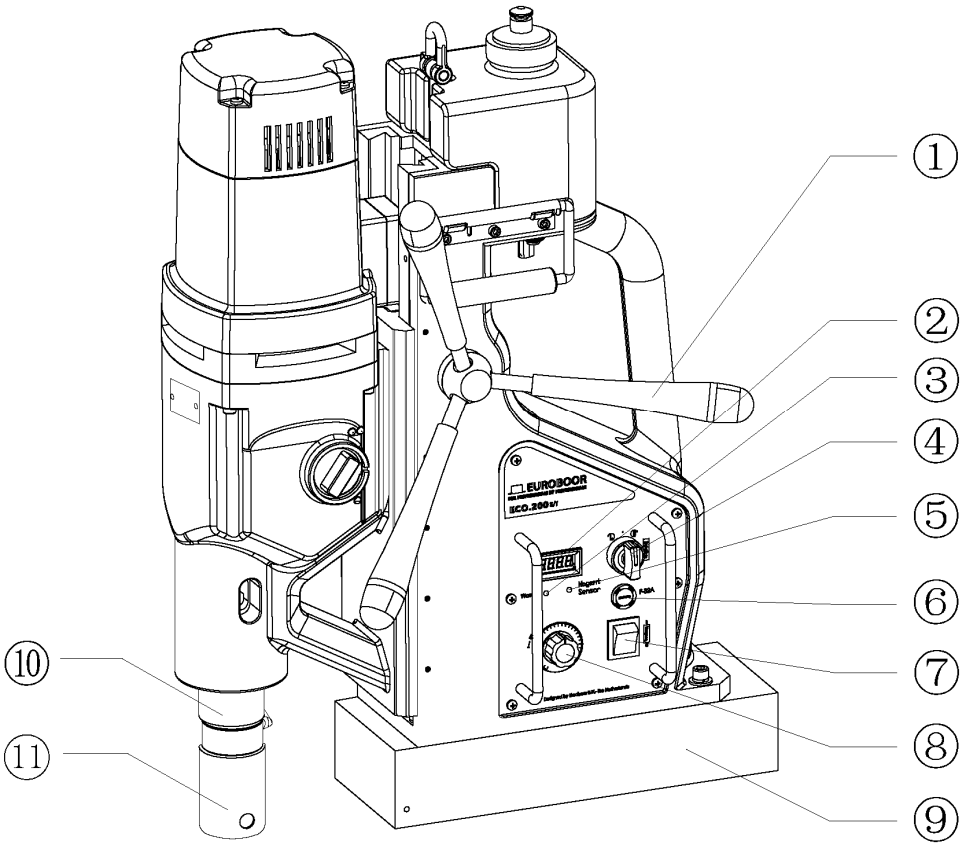


Figure 3.2.1 Main machine components

1. Feed handle
2. Digital display with RPM Meter
3. Trouble alarm lamp
4. Motor L/R knob
5. Magnet LED indicator
6. Fuse holder
7. Electromagnet switch
8. Electronic speed-control knob
9. Electromagnet
10. Output shaft
11. Morse taper spindle

3.3 Case content

1 x ECO.i20 Magnetic drilling machine
3 x handles
1 x hex key 2.5 mm
1 x hex key 5 mm
1 x hex key 6 mm
1 x lubrication system
1 x safety chain
1 x arbor MT4 to Weldon 31.75 mm (1 1/4") incl. lubrication ring
1 x arbor MT3 to Weldon 19.05 mm (3/4") incl. lubrication ring
1x Morse taper adapter MT4 to MT3
1 x Morse taper MT4 ejector drift key
1 x safety ear protection
1 x safety goggles
1 x safety gloves

3.4 Serial number

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

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

For example:

i2002003001

breaks down to:

i20 26 09 001

Machine series
Year of manufacture
Month of manufacture
Identification number

3.5 Technical data

	Metric	Imperial
Annular cutting	Ø 12 - 200 mm	Ø 1/2" - 8"
Twist drilling	Ø 1 - 50 mm	Ø 1/16" - 2"
Tapping	M3 - M52	Ø 1/8" – 2 3/64"
Reaming	Ø 10 - 50 mm	Ø 3/8"- 2"
Countersinking	Ø 10 - 205 mm	Ø 3/8" – 8 1/16"
Length	515 mm	20 9/32"
Width	265 mm	10 7/16"
Height	650 - 905 mm	25 19/32" - 35 5/8"
Stroke	255 mm	10 3/64"
Weight	58.5 kg	129 lbs
Magnet (l x w x h)	350 x 125 x 66 mm	13 25/32"x 4 59/64" x 2 19/32"
Magnetic force	3,680 kg	8,113 lbs
Motor power	2,800 W	25.0 A
Total power	2,950 W	26.3 A
Speed (no load)	(I) 39 - 110 rpm (II) 87 - 248 rpm (III) 146 - 413 rpm (IV) 327 - 916 rpm	
Spindle	MT4 to Weldon 31.75 mm	MT4 to Weldon 1 1/4"
Voltage	220 - 240 V / 50 - 60 Hz	110 - 240 V / 60 Hz

Figure 3.5.1 Dimensions (mm)

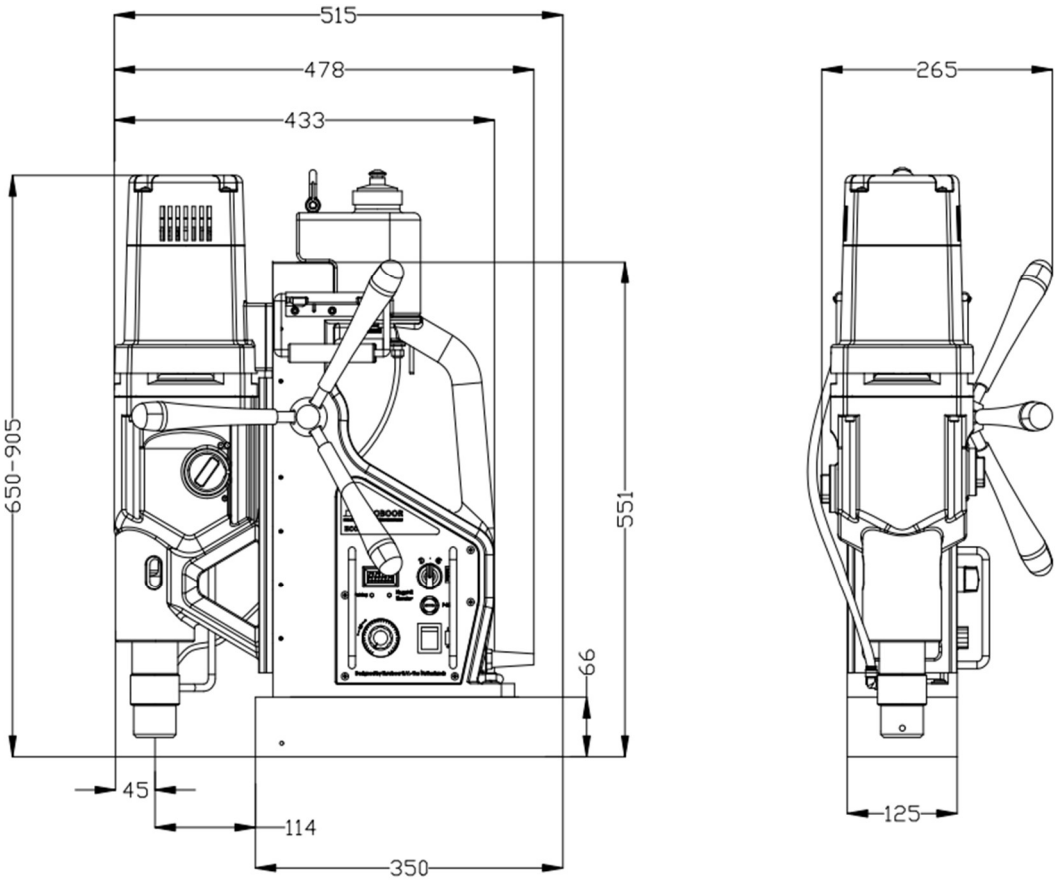
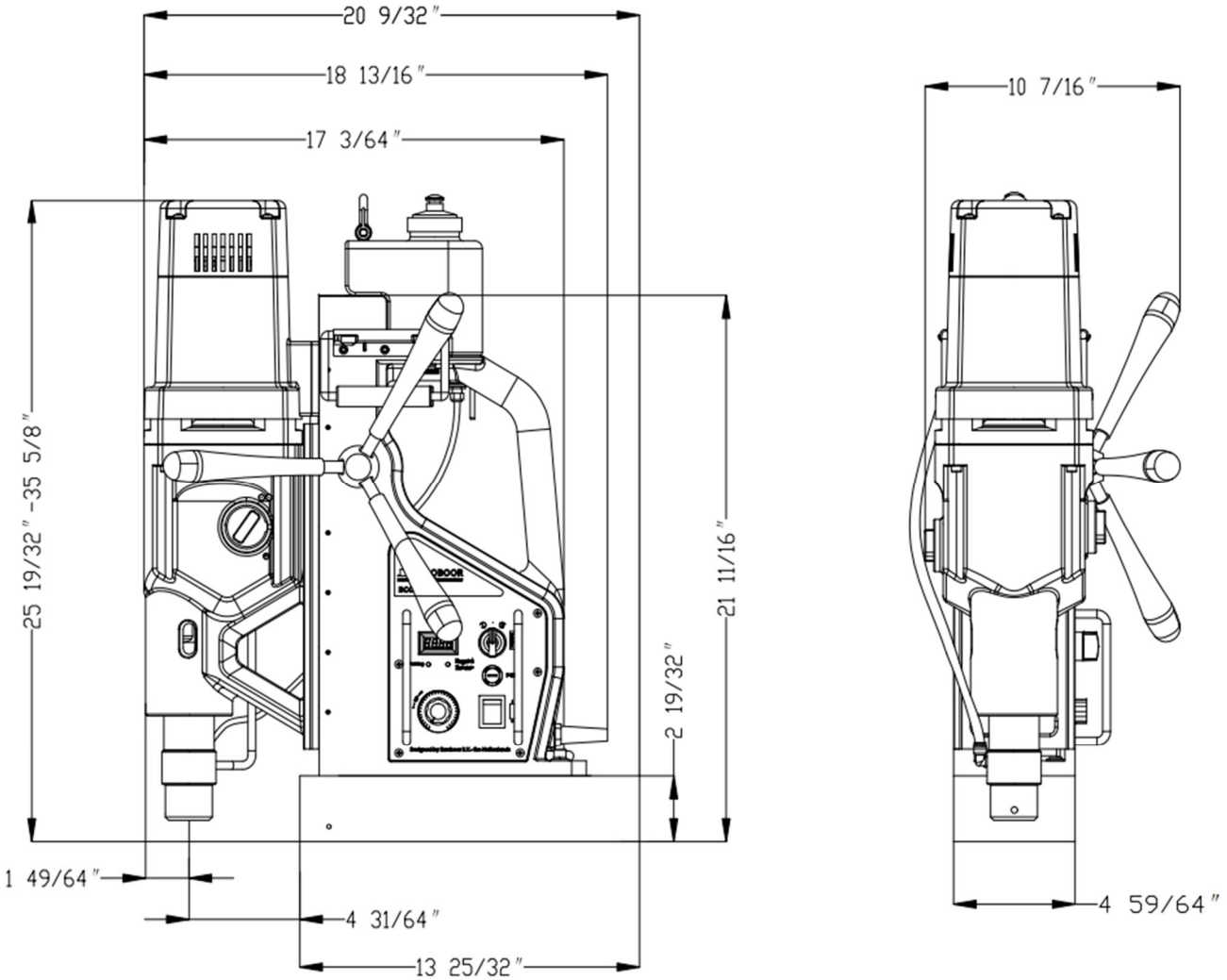


Figure 3.5.2 Dimensions (inches)



3.6 Symbols

Symbol	Term, meaning	Explanation
	Read documentation	Be sure to read the documentation in this user manual and specifically the “General safety instructions” and ‘’Specific safety information’’
	Wear ear protection	Use ear protection during operation
	Wear eye protection	Use eye protection during operation
	Danger/warning/caution	Read and apply the information in the adjacent text!
	European conformity	Conformity with EEA machine regulations

Symbol	Term, meaning	Explanation
	Class of protection I	Product with basic insulation and exposed (touchable) conductive parts additionally connected to the protective earth conductor
	Electromagnetic Compatibility	Able to function acceptably in its electromagnetic environment
	International Electrotechnical Commission	Conformity with international electrotechnical safety standards
	ISO9001	Certified in accordance with ISO9001:2015 quality management system
	UL	Certified by Underwriters Laboratories (UL), a recognized laboratory for safety testing approved by US federal agency OSHA
mm	Millimetre	Unit of measure for the dimensions
"	Inch	Unit of measure for the dimensions
kg	Kilogram	Unit of measure for the mass
lbs	Pound	Unit of measure for the mass
V	Volt	Unit of measure for the electric voltage
A	Ampere	Unit of measure for the electric current intensity
W	Watt	Unit of measure for the output
rpm	Revolutions per minute	Unit of measure for the revolutions

3.7 Environmental



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



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

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

4 Preparation & adjustment

4.1 Assembly

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

4.2 Fitting the feed handles

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

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

4.3 Filling the container with cutting fluid

To use the lubrication system, it must be filled with enough cutting fluid.

1. Make sure the flow regulator is closed;
2. Unscrew the cap;
3. Fill the container with cutting fluid;
4. Screw the cap back on.

WARNING: *Do not use the lubrication system in vertical drilling applications.*

4.4 Fitting the safety chain

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

WARNING: *The safety chain does not replace the magnetic force of the magnetic drilling machine: it is simply used to protect the operator in the event of machine slipping.*

4.5 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 flat, a pipe-drilling machine must be used.

- ✓ When working on steel materials with a material thickness of less than 6 mm, the workpiece must be reinforced with an additional steel plate to guarantee the magnetic holding power.

- ✓ Check the machine for possible damage; Before using the machine, you must carefully check the protective components or slightly damaged components to ensure they are operating perfectly and as intended.

- ✓ Check that moving parts are in perfect working order, do not jam and check whether the parts are damaged. All parts must be correctly installed and fulfil all conditions necessary to ensure perfect operation of the machine.

- ✓ Damaged protective components must be repaired or replaced according to specifications by EUROBOOR or any authorised EUROBOOR dealer.

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

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

4.6 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 at EUROBOOR or your EUROBOOR dealer.

4.7 Extension cord

If an extension cord is required, use an approved 3-core cable suitable for the power input of this machine (see technical data):

- The minimum conductor size is 2.5 mm² (for 220 V) or 14 AWG (Amperage Wire Gauge for 110 V) for 7.5 m (± 25 ft)
- The minimum conductor size is 2.5- 4 mm² (for 220 V) or 12 AWG (Amperage Wire Gauge for 110 V) for 15 m (± 50 ft).

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

4.8 Useful tips

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

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5 Using the machine

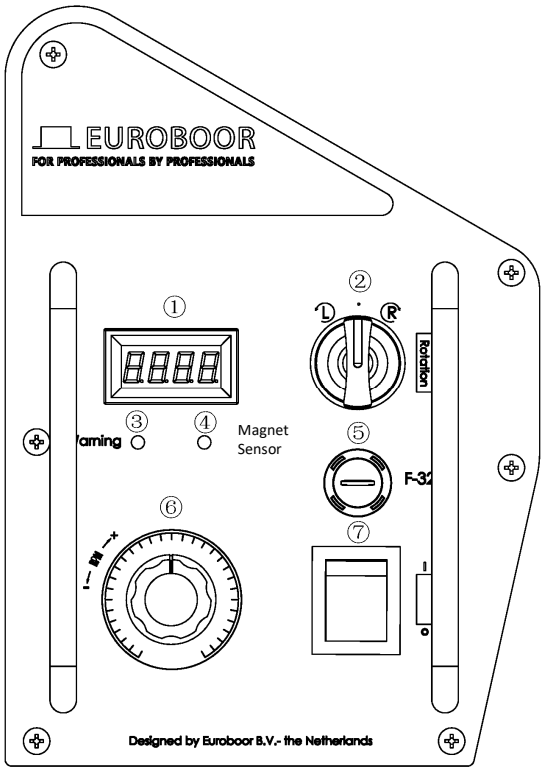
WARNING: *Always observe the safety instructions and applicable regulations.*

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

5.1 Control panel

The control panel on your magnetic drilling ma

1. Digital display and RPM Meter
2. Motor L/R knob
3. Trouble alarm lamp
4. Magnet LED indicator
5. Fuse holder
6. Electronic speed control knob
7. Electromagnet switch



5.2 Morse taper spindle

1. Make sure the inside of the output shaft and the Morse taper spindle are clean and free of grease;
2. Position the lubrication ring rotation limiter behind the bridge between the output shaft and the frame;
3. Firmly slide the Morse taper spindle into the output shaft by hand (A). Make sure the spindle is properly positioned. You should not be able to pull it out by hand;

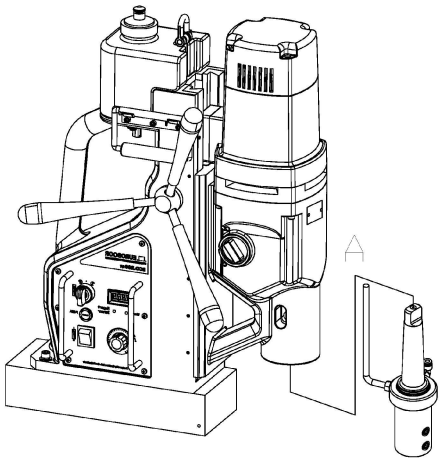


Figure 5.2.1 Morse taper spindle

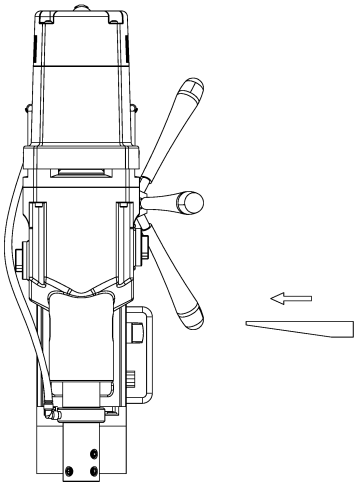


Figure 5.2.2 Drift

4. To remove the Morse taper spindle:
   - Switch off the motor by turn the motor L/R knob in neutral position;
   - Rotate the mechanical gear switch to neutral;
   - 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.

5.3 Electromagnet

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

The workpiece must at least be 6 mm (1/4") thick for the magnet to stick 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.

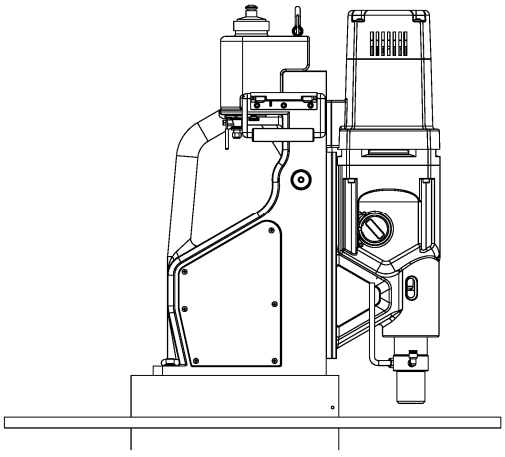


Figure 5.3.1 Electromagnet

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

When the electromagnet cannot create a good enough magnetic field, this may be caused by:

- Surface not being flat;
- Workpiece is not magnetisable (e.g. aluminium);
- Workpiece is coated or painted;
- Workpiece is 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.



The magnet LED indicator lights up GREEN when the generated magnetic force is sufficient to hold the machine in position while not drilling;

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

We want to point out that the precautions mentioned above, and indicators do not guarantee that the magnet will not release from the material. EUROBOOR accepts no liability when it comes to the magnet indicator not functioning or functioning poorly.

Make sure that the magnet attaches tightly to the workpiece before turning on the motor unit of the magnetic drilling machine. This electromagnet has two coils; make sure that both coils are in contact with the material. Do not connect any other machine to the same electrical outlet which 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, non-flat or non-magnetic materials, we refer to our catalogue or our website www.euroboor.com where several vacuum tightening systems, pipe clamping systems and Tube machines can be found.

5.4 Speed regulating system

This machine is equipped with a four-speed gearbox and electronic speed control.

Gear switches on both sides make it possible to select 4 different speeds manually. Select the closest gear and speed for the intended operation.

1. To select the correct gear from neutral (horizontal) position:

a) Rotate the switch counterclockwise to position “o”;

b) Rotate the switch clockwise to position “oo”.

2. A gear is only correctly selected when the gearbox switches are both aligned with the indicators on the gearbox: In case you have trouble fully and correctly selecting a gear, the gears in the gearbox might be misaligned. Slightly rotating the output shaft by hand will help you to align the gears and correctly and fully select the intended gear;

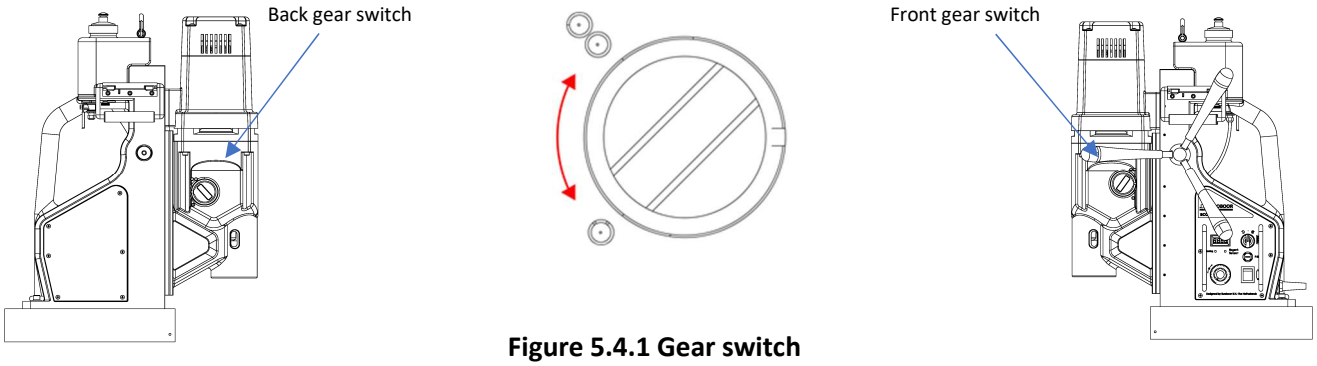


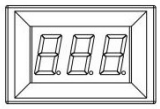
Figure 5.4.1 Gear switch

The optimal drilling speed depends on the material being drilled, the type of drill bit, and its diameter. Selecting the correct speed will make your work safer, more efficient, and longer lasting. It will also result in a smoother, more professional finish and extend the lifespan of your tools.

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



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 exact spindle speed can be read on the Digital display and RPM Meter after you have turned on the motor.

5.5 Recommended speed parameter setting

With the combined application of both mechanical and electronic speed control, ECO.i20 can provide precise output speed for your drilling work.

Gear switch		Minimum Speed	Maximum Speed
Front switch	Back switch		
◯ ◯	◯	39 RPM	110 RPM
◯	◯	87 RPM	248 RPM
◯ ◯	◯ ◯	146 RPM	413 RPM
◯	◯ ◯	327 RPM	916 RPM

Use the Cutting Speed Calculator to select the right speed for your cutter and the material to be cut. Scan the QR Code for a direct link to the Cutting Speed Calculator.

5.6 Switching motor on and off

To switch the motor ON, turn the motor L/R knob to “L” or “R” position. To switch the motor OFF, turn the motor L/R knob to neutral position.

⚠ ***WARNING:*** *Before switching the motor on, please switch on the magnet and make sure that the magnet LED indicator is green.*

5.7 Motor rotation

The rotational direction of the motor can be changed:

- Rotate the L/R knob in position (R) will make the motor rotate clockwise;
- Rotate the L/R knob in position (L) will make the motor rotate counterclockwise;
- Rotate the L/R knob in middle position will not make the motor rotate (neutral position).

5.8 Overload Protection



Built-in electronic torque control will automatically stop the motor in case of overload. Once the torque control program is activated, turn the R/L knob in the neutral position, then turn the knob in “L” or “R” again to restart the drilling work.

5.9 Overheat protection



This machine is supplied with an all-time electronic overheat protection. If the temperature of the motor unit runs up to 70° C (148 °F), 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.

5.10 GYRO-TEC safety



This EUROBOOR magnetic drilling machine is equipped with GYRO-TEC safety functionality. It features a gyroscopic sensor which detects acceleration and displacement in any direction. Whenever the machine recognises a sudden or unwanted movement the motor will be shut down automatically by the machine’s electronics.

This safety functionality offers protection to the user in various circumstances, such as:

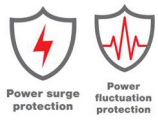
- Sudden loss of magnetic force while in operation;
- Excessive vibration caused by incorrect drilling procedure, worn-out cutting tools, etc;
- Sudden displacement of the workpiece to which the magnetic drilling machine is attached.

By the motor shutting down automatically, risk of damaging or hurting the machine, tools, workpiece and operator is reduced.

Every time the motor is started, the machine’s electronics need a moment to run a systems check and initiate the safety system. The GYRO-TEC safety feature engages 3 seconds after the motor is started.

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

5.11 Power protection



The power protection feature is two-fold; it consists of both power fluctuation protection and power surge protection. Special safety components built into the electronics of the machine make it more reliable in situations where power supply can be of varying quality due to factors:

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

A machine with this feature can cope with standard rated voltage and frequency fluctuations ranging from:

- 110-120 V~60Hz, or
- 220-240 V~50/60Hz

reducing the probability of breakdown and minimising down-time and repair cost.

5.12 Tool lubrication

Horizontal applications

To use the lubrication system, the tank must be filled with a cutting lubricant.

1. Make sure the flow regulator is closed;
2. Unscrew the cap;
3. Fill the container with cutting lubricant;
4. Screw the cap back on.

- Adjust the fluid flow as required using the flow regulator;
- Add more cutting lubricant when the shavings (metal chips) become blue.

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

Make sure to use only suitable cutting lubricants. EUROBOOR offers a wide range of cutting lubricants for all tool and material combinations. Proper lubrication will help you create better and faster results and extend the lifetime of your tools.

6 Working with drilling accessories

6.1 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 with a twist drill.
When drilling with an annular cutter, it is not necessary to drill a pilot hole.

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

6.2 Drilling conditions

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

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

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

6.3 Drilling a hole

Now that you have read the information and safety recommendations above, you are ready to start drilling. Follow these 12 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;

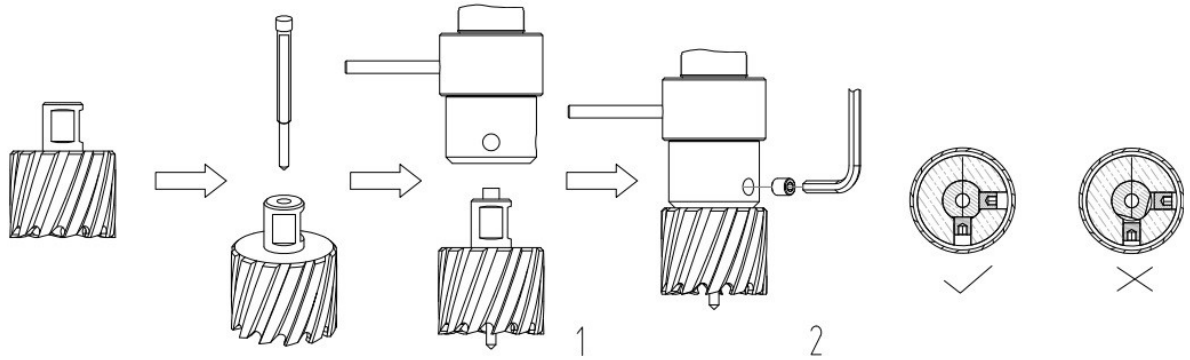


Figure 6.3.1 Annular cutter installation

2. Precisely mark the centre of the hole;

3. Use the pilot pin to position the machine in the correct position, with the tip of the pilot pin to meet the marked centre of the hole;

4. Make sure that the motor L/R knob is in neutral position ,then switch on the electromagnet and verify that the drill is in the right position and that the machine is pushed tight against the workpiece;

5. Fill the holes of the spindle with oil;

6. Rotate the L/R knob and allow the spindle to run at the required direction of rotation;

7. Turn the feed handles to start drilling. Apply only a slight pressure when the annular cutter touches the metal. Do not push the annular cutter with force into the metal;

8. Apply a regular pressure while drilling. The drilling performance does not improve by putting more pressure on the machine. Too much pressure will overload the motor, and your annular cutter will be worn sooner;

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

9. 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 feed handles to put the motor in highest position and turn the L/R knob in neutral position, then turn the motor and electromagnet off

12. Remove the burrs, metal chips and clean the cutter and surface without getting injuries.

⚠ ***WARNING:*** *The slug is sharp and may be hot!*

6.4 Twist drills

Morse taper 4 shank(MT4)

Fit the MT4 twist drill into the output shaft directly.

Weldon shank 19.05 mm (3/4")

1. Fit the adapter (Code IBK.MC4-MC3) and Morse Taper 3 (MT3) arbor for Weldon shank provided.
2. Fit the twist drill with 19.05 mm (3/4") Weldon shank (EUROBOOR code SPI or SSPI) and tighten the screws with the provided Hex key.

Follow the further steps in paragraph 6.3 Drilling a hole.

Standard parallel shank (DIN338)

1. Fit the adapter(code IBK.MC4-MC3) provided.
2. Fit a MT3 arbor connection
    a. EUROBOOR code 1/2UNF-MC3 for 1/2" x 20 UNF drill chuck connections
    b. EUROBOOR code B16-MC3 for B16 drill chuck connections
3. Fit the appropriate twist drill chuck to the arbor.
4. Fit the drill with parallel shank and fasten it
5. Precisely mark the centre of the hole and use the tip of the twist drill to position the machine.

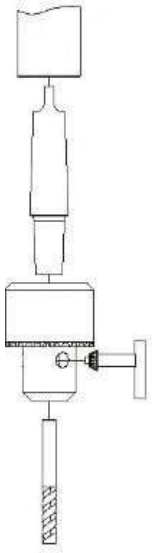


Figure 6.4.1
Example of fastening a drill with a key]

For further steps see paragraph 6.3 Drilling a hole.

Morse Taper shanks (MT2 or MT3)

1. Fit the adapter (code IBK.MC4-MC3) provided.
2. Fit a twist drill with a MT3 shank
3. For twist drills with a MT2 shank fit an MT3-MT2 adapter (EUROBOOR code IBK.MC3-MC2) before fitting the drill (see below)

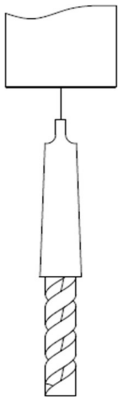


Figure 6.4.2 Fitting drill with MT3 shank

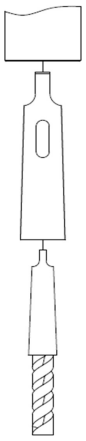


Figure 6.4.3 Fitting drill with MT3-MT2 adapter

4. Precisely mark the centre of the hole and use the tip of the twist drill to position the machine.

For further steps see paragraph 6.3 Drilling a hole.

6.5 Machine taps

The machine is equipped with counterclockwise rotation and can therefore also be used for tapping.

Drill tap combination with Weldon 19.05 mm (3/4") shank

6. Fit the adapter (code IBK.MC4-MC3) provided.
7. Fit the drill tap (EUROBOOR code EDT) into a spindle with 19.05 mm (3/4") connection and fasten by tightening the screws with the provided Hex key;
8. Switch on the electromagnet and set the L/R knob from the neutral position to R position.
9. Drill the required hole and tap simultaneously;
10. Switch off the motor and set the L/R knob from the neutral position to L position.
11. Guide the motor unit upwards with the feed handles to allow the drill tap to come completely out of the workpiece.

Machine taps (DIN 371/376) with Weldon adapter

1. Drill the hole for the tap on the recommended size;
2. Switch off the motor and change the cutter or drill for the tap holder and the machine tap;

⚠ ***WARNING:*** *Do not change the position of the machine!*

3. Install the machine tap into the tap holder (EUROBOOR code TCM) and tighten the screws;
4. Fit the tap holder into a spindle with 19.05 mm (3/4") or 31.75 mm (1 1/4") Weldon connection (depending on tap size);

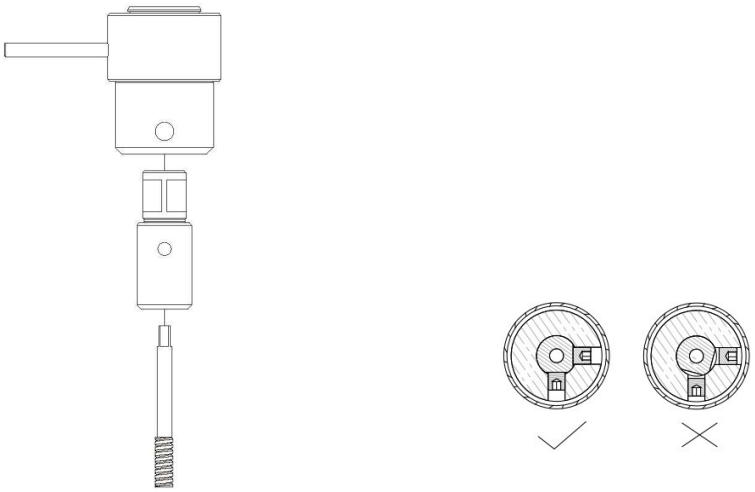


Figure 6.5.1 Using machine taps

5. Follow the steps mentioned in paragraph drill tap.

6. Make sure to properly lubricate while performing tapping work.

⚠ ***WARNING:*** *Do not let your tap push up the motor unit by itself!*

6.6 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 paragraph 6.3 Drilling a hole.

7 Maintenance

Your EUROBOOR magnetic drilling machine has been designed to operate over a long period of time. Continuous satisfactory operation depends upon proper tool care and regular cleaning.

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

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

Cleaning
- Clean all dirt, dust, metal chips and burrs of your 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 functioning parts from being damaged.

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 to hold not 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 gearbox oil (IBO.G101)
The oil should be checked once a month to ensure all moving components are covered to prevent wear. The oil should be changed at least once a year to ensure you gain the best from the machine.

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 can be 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 aluminium rails and apply a small amount of light machine oil to the wear surfaces;

2. Gently feed in setting screw with supplied Hex key 2.5 until slight resistance is encountered. Follow your way down adjusting all setting nuts and screws;
3. Operate the slide up and down a few times to test the movement and make any further necessary adjustments. Try to ensure that all the screws are exerting a uniform pressure on the slide from top to bottom. A perfectly adjusted slide will operate freely up and down without any sideways movement.

Lubricating the feed travel

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

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

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

Repair, modification and inspection

Repair, modification and inspection of EUROBOOR Magnetic drilling machines must be done by EUROBOOR or an EUROBOOR authorised 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 machine, 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 machine.*

Consult your dealer for further information on the appropriate accessories.

8 Troubleshooting

Magnet and motor do not function	- 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	- Damaged or defective wiring - Defective magnet switch - Defective On / Off switch - Defective control unit - Defective armature and/or field
Fault code: 0001 displayed	- Motor overload - Power protection program activated
Magnet does not function, the motor does	- Defective magnet - Defective wiring of magnet - Defective control unit
Annular cutters break quickly; holes are bigger than the annular cutter	- Clearance in the guide - Bent spindle - Shaft extending from the motor is bent - Bent pilot pin
Motor running roughly and/or seizing up	- 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	- Damage or defective relay in control unit
Motor making a rattling sound	- Gear ring (bottom of the armature) worn out - Gear(s) worn out - No oil in gearbox
Motor does not start or fails	- Damaged or defective wiring - Dirt in sensor control unit - Defective or loose magnet on top of armature - Damaged or defective (sensor) control unit - Damage to armature or field coil
Guiding takes a great deal of effort	- Guide is set too tight - Guide is dry, needs to be greased - Guide/gear- rack/rotation system dirty or damaged
Insufficient magnetic force	- Damaged or defective wiring - Bottom of magnet not clean and dry - Bottom of magnet not flat - Workpiece is not bare metal - Workpiece is not clean or flat - Workpiece is less than 6 mm (too thin) - Defective control unit - Defective magnet

Frame under voltage	- Damaged / defective wiring - Defective magnet - Motor seriously dirty
Fuse blows when magnet switch is turned on	- Damaged or defective wiring - Wrong value fuse - Defective magnet switch - Defective control unit - Defective magnet
Fuse blows when motor is started	- Damaged or defective wiring - Wrong value fuse - Motor running roughly - Defective armature and / or field - Defective control unit
Rotation system free stroke too long	- Loose or defective gear rack - Defective rotation system

8.1 Detailed Fault Code Description

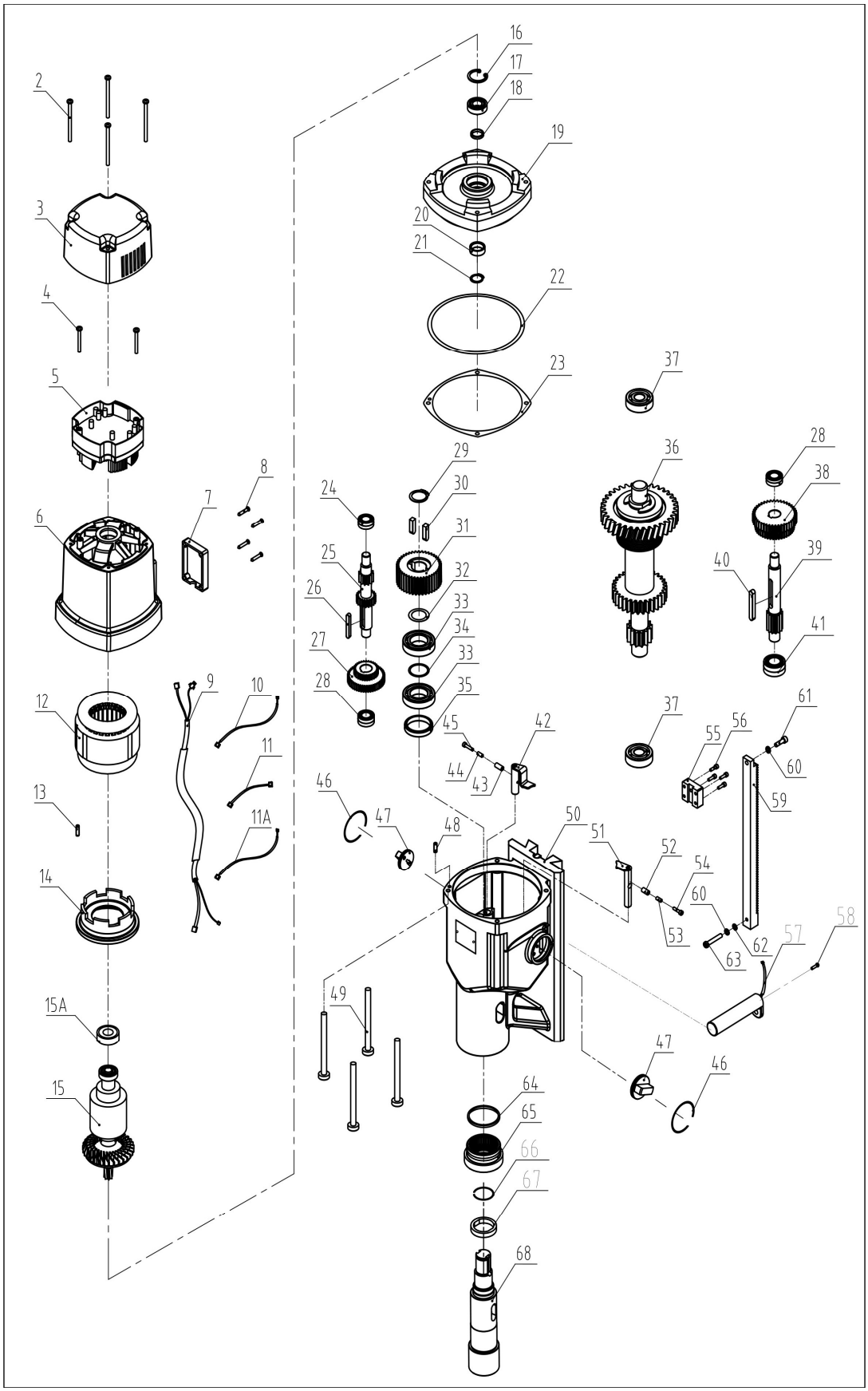
Display Code	**Cause**
E01	Acceleration overcurrent
E02	Deceleration overcurrent
E03	Constant speed overcurrent
E04	Acceleration overvoltage
E05	Deceleration overvoltage
E06	Constant speed overvoltage
E07	Drive board heat sink overheating
E08	Inverter module protection
E09	Overvoltage during shutdown
E10	Undervoltage during operation
E12	EEPROM read/write fault
E16	Control board heat sink overheating
E18	Inverter overcurrent protection
E21	Gyroscope initialisation failure
E22	Angle deviation fault
E23	Gyroscope data read fault

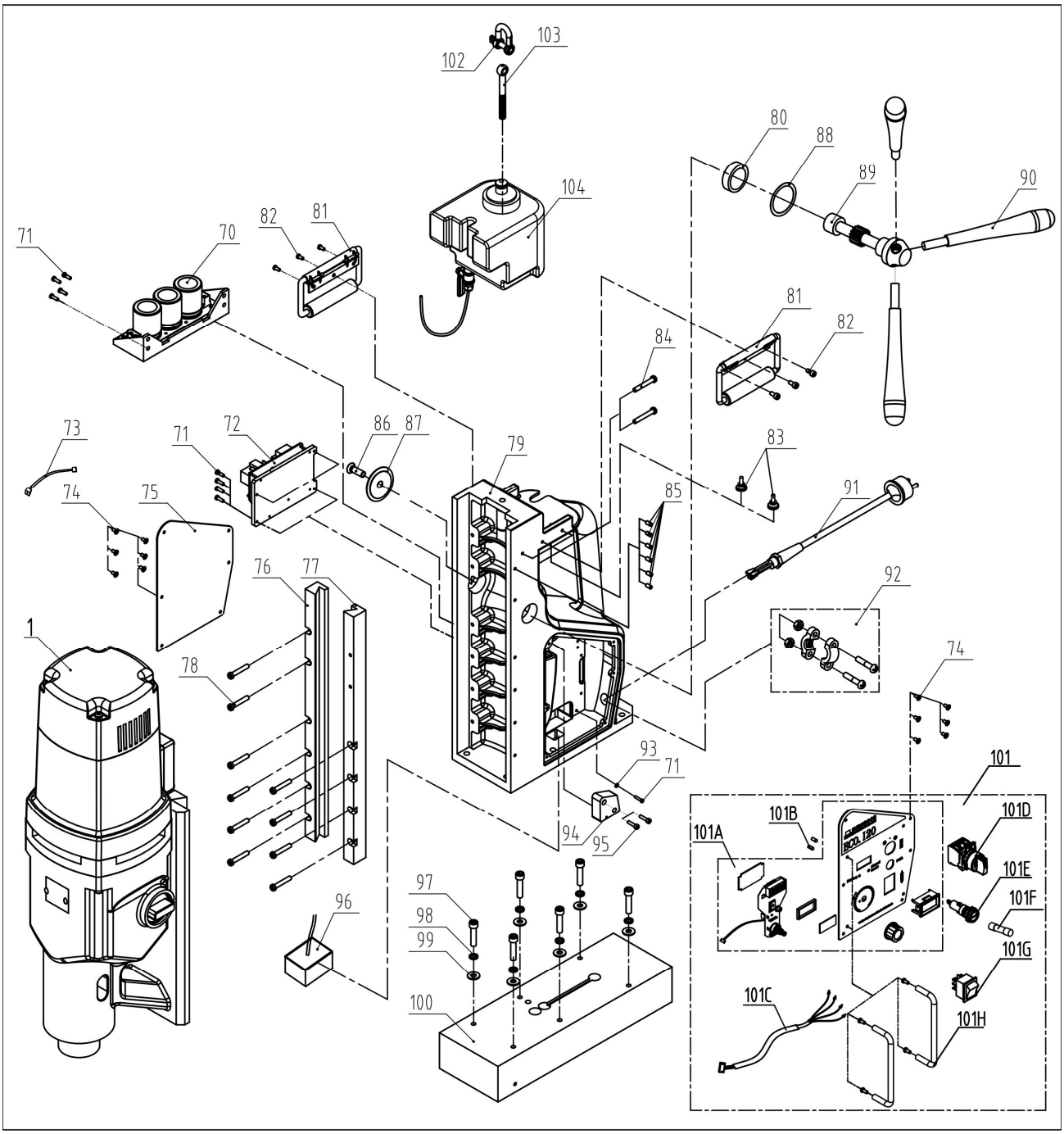
⚠ ***Special Reminder:*** *If it is necessary to open the top cover, side cover, front panel, rear panel, or disconnect wiring for machine maintenance, it is essential to discharge the machine. The specific operation is as follows: First, start the machine without load, allowing the motor to run freely. Then, adjust the potentiometer to maximum. After the speed stabilises, directly turn off the power switch, unplug the power cord, and then set the selector switch to the reset "0" position (middle position). Proceed with the next steps of maintenance and inspection.*

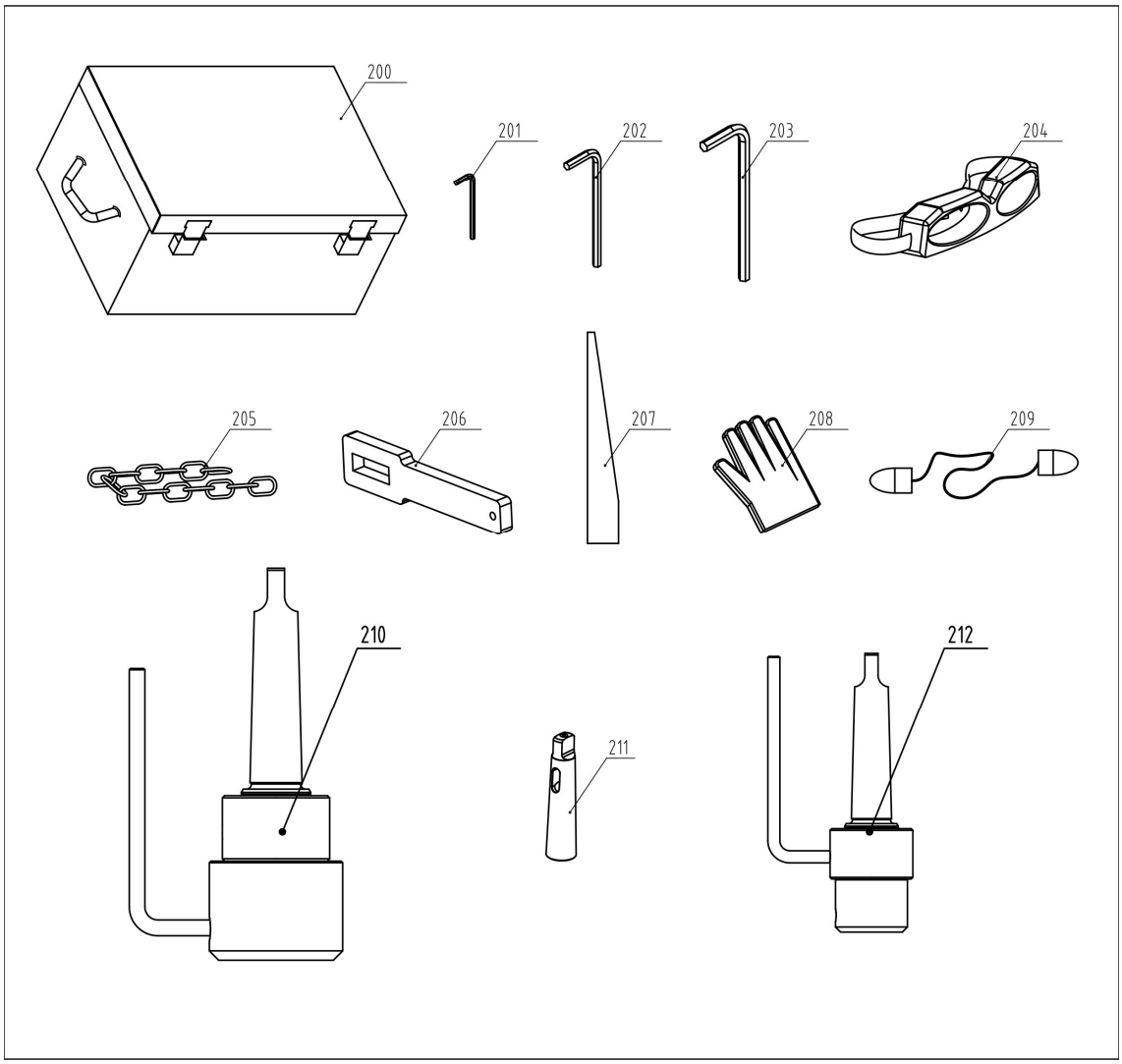
⚠ ***Caution!*** *Perform this step only when machine inspection or repair is required.*

9 Exploded views & spare parts list

9.1 Exploded views




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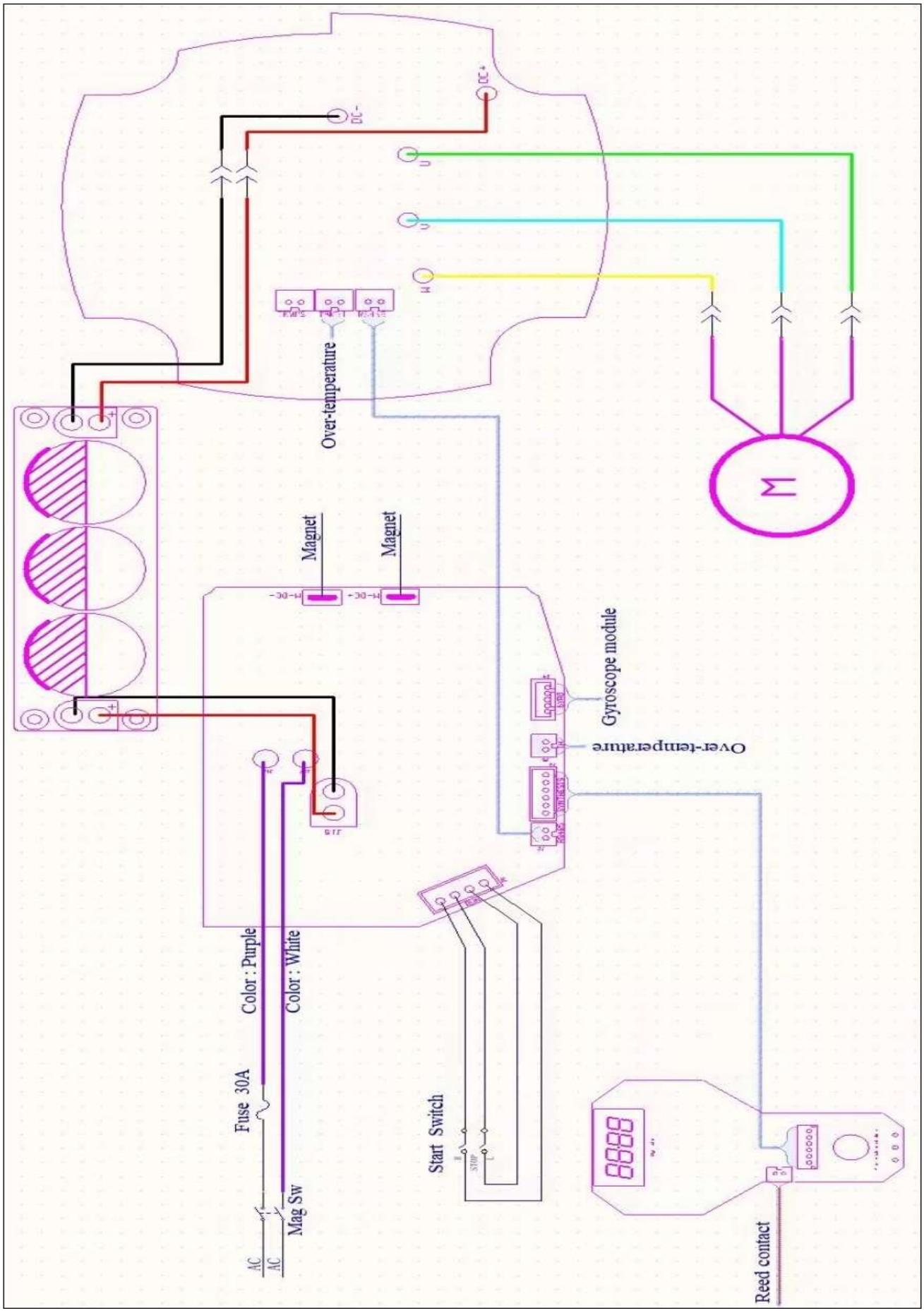

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9.2 Spare parts list

No.	Part no.	Description	Qty
1	200.1001R	Motor unit 220V	1
	200.1001RA	Motor unit 110V	1
2	200.0030	Screw	4
3	200.0107	End-Cover	1
4	200.0031	Screw	2
5	P200.0187	control panel PCB 220V	1
	P200.0187A	control panel PCB 110V	1
6	200.0195	Housing	1
7	200.0024	Cable-housing	1
8	200.0036	Screw	4
9	200.1011	Combo Cable	1
10	200.0115	Two-core cable	1
11	200.1012	R&B line components 1 220V	
	200.1012A	R&B line components 1 110V	1
11A	200.0188	Sensor three core wire	1
12	200.0027-CK	Stator set 220V	1
	200.0027A-CK	Stator set 110V	1
13	200.0133	Pin	1
14	200.0023	Plastic plate	1
15A	200.0046	Rubber-Bearing	1
15	200.1010	Armature set	1
16	200.0048	Circlip	1
17	032.0196	Bearing	1
18	200.0049	Sealant	1
19	200.0042	Gearbox cover	1
20	200.0065	Rotor iron seal	1
21	200.0071	Circlip	1
22	200.0051	O-ring	1
23	200.0128	Gasket	1
24	200.0052	Bearing	1
25	200.0157	Gear	1
26	200.0053	Key	1
27	200.0019	Double row gear 1	1
28	200.0054	Bearing	2
29	036.0018	Circlip	1
30	200.0055	Key	2
31	200.0018	Gear	1
32	100.0441	Gasket	1
33	100.0466	Bearing	2
34	200.0056	Gasket	1
35	050.0143E	Sealant	1
36	200.1002	Helical-gear set	1
37	AIR.0049	Bearing	2
38	200.0158	Large double gear 1	1
39	200.0021	3# Shaft gear	1
40	200.0064	Key	1
41	200.0066	Bearing	1
42	200.1003	S-shaped fork plate set	1
43	200.0068	Screw column	1
44	200.0131	Isolation column	1
45	020.0229	Screw	1
46	200.0069	Stop ring for hole	2
47	200.1004	Potentiometer set	2
48	100.0549	locating tab	1
49	200.0073	Inside hexagonal bolt	4
50	200.1030	Gearbox set	1
51	200.1005	Parallel fork set	1
52	200.0076	Screw column	1
53	200.0132	Isolation column	1
54	020.0229A	Screw	1
55	200.0037	Rack adapter block	1
56	020.0229	Screw	5
66	150.0035	Axle stop ring	1
67	150.0129	ferrite ring	1
68	200.0467	Output shaft	1
70	200.1006	Capacitance unit 220V	1
	200.1006A	Capacitance unit 110V	1
71	020.0327	Screw	9

No.	Part no.	Description	Qty
72	P200.0139S	Control Board PCB 220V	1
	P200.0139	Control Board PCB 110V	1
73	200.1013	R&B line components 2 220V	
	200.1013A	R&B line components 2 110V	1
74	020.0101	Screw	12
75	200.0082R	Rear-panel 220V	1
	200.0082RA	Rear-panel 110V	1
76	200.0039	Aluminium-rail（left）	1
77	200.0040	Aluminium-rail（right）	1
78	020.0146B	Screw	10
79	200.1015	Frame set 220V	1
	200.1015A	Frame set 110V	1
81	200.0097	Handle	2
82	200.0134	Screw	6
83	200.0103	Hand screw	2
84	200.0078	Screw	2
85	020.0301	Screw	6
86	020.0081	Screw	1
87	050.0030	Rocker arm cover plate	1
88	030.0027	Spacer	1
89	200.0101	Rocker shaft	1
90	020.0314X	Rocker arm handle	3
91	030.B125	Main cable set 220V	1
	200.B125A	Main cable set 110V	1
92	032.1020-CK	Cable clamp set	1
93	040.0286F	Pattern gasket	1
94	200.0041	Cable pressing plate	1
95	020.0229A	Screw	2
96	055.1041	GYRO-PCB	1
97	080.0014	Screw	6
98	100A.0015	Spring washers	6
99	020.0305	Black flat mat	6
100	200.1007	Electromagnet set 220V	1
	200.1007A	Electromagnet set 110V	1
101	200.1016RS	Front panel set 220V	1
	200.1016RA	Front panel set 110V	1
101A	200.1017RS	Potentiometer control unit (incl. front-panel) 220V	1
	200.1017RA	Potentiometer control unit (incl. front-panel) 110V	1
101B	200.0106	Light guide	2
101C	200.0086	Black four-core wire	1
101D	200.0085	Starting switch	1
101^{E}	200.1008	Tube fuse set (incl. fuse) 220V	1
	200.1008A	Tube fuse set (incl. fuse) 110V	1
101F	200.0087	Ceramic tube fuse 220V	1
	200.0087A	Ceramic tube fuse 110V	1
101G	P200.0130	Magnet-switch 220V	1
	P200.0130A	Magnet-switch 110V	1
101H	P200.0098	Handle	1
102	200.0092	D shackle	1
103	200.0093	Rings	1
104	200.1009	Coolant-tank set	1
200	200.0203S	ECO.i20 iron box	1
201	020.0111	Hex key	1
202	020.0113	Hex key	1
203	080.0006	Hex key	1
204	020.0107	Eyeglasses	1
205	032.2013	Anti-falling chain	1
206	200.0063	Knob wrench	1
207	200.0096	Drift	1
208	020.1008S	Gloves Small	1
	020.1008L	Gloves Large	1
209	020.0109	Earplugs	1
210	200.2001	Arbor MT4	1
211	IBK.MC4-MC3	Morse adapter	1
212	200.2003	Arbor MT3	1
	IBO.G101	Gearbox oil	

9.3 Wiring diagram



10 Warranty and service

10.1 Warranty

Euroboor B.V. warrants this magnetic drilling machine to be free of material defects and workmanship errors under normal use for a period of 12 months after date of purchase.

This 12-month period can be extended to 24 months in total by registering the product on our website: www.euroboor.com/int-en/support/register-your-machine/.

Serial number:

Date of purchase: / /

Do not forget to register your machine at:
https://www.euroboor.com/int-en/support/register-your-machine/
[only when registered you benefit from extended warranty]

10.2 Service

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