OPTIMUM®
MASCHINEN - GERMANY

Operating manual

Version 2.0

Magnetic drill

OPTI drill®

DM35	3071036
DM35V	3071136
DM48VT	3071248
DM50	3071051
DM50V	3071151
DM50PM	3071550
DM60V	3071161

DM35 | DM50

DM35V | DM50V

DM60V

DM50PM

DM48VT

Preface

Dear customer,

Thank you very much for purchasing a product made by OPTIMUM.

OPTIMUM metal working machines offer a maximum of quality, technically optimum solutions and convince by an outstanding price performance ratio. Continuous enhancements and product innovations guarantee state-of-the-art products and safety at any time.

Before commissioning the machine please thoroughly read these operating instructions and get familiar with the machine. Please also make sure that all persons operating the machine have read and understood the operating instructions beforehand.
Keep these operating instructions in a safe place nearby the machine.

Information

The operating instructions include indications for safety-relevant and proper installation, operation and maintenance of the machine. The continuous observance of all notes included in this manual guarantee the safety of persons and of the machine.

The manual determines the intended use of the machine and includes all necessary information for its economic operation as well as its long service life.

In the paragraph "Maintenance" all maintenance works and functional tests are described which the operator must perform in regular intervals.

The illustration and information included in the present manual can possibly deviate from the current state of construction of your machine. Being the manufacturer we are continuously seeking for improvements and renewal of the products. Therefore, changes might be performed without prior notice. The illustrations of the machine may be different from the illustrations in these instructions with regard to a few details. However, this does not have any influence on the operability of the machine.
Therefore, no claims may be derived from the indications and descriptions. Changes and errors are reserved !

Your suggestion with regard to these operating instructions are an important contribution to optimising our work which we offer to our customers. For any questions or suggestions for improvement, please do not hesitate to contact our service department.

If you have any further questions after reading these operating instructions and you are not able to solve your problem with a help of these operating instructions, please contact your specialised dealer or directly the company OPTIMUM.

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1 Safety

Glossary of symbols

▶	provides further instructions
→	calls on you to act
□	listings

This part of the operating instructions

- □ explains the meaning and use of the warning notes included in these operating instructions,
- □ defines the intended use of the magnetic drill,
- □ points out the dangers that might arise for you or others if these instructions are not observed,
- □ informs you about how to avoid dangers.

In addition to these operation instructions, please observe

- □ the applicable laws and regulations,
- □ the statutory provisions for accident prevention,
- □ the prohibition, warning and mandatory signs as well as the warning notes on the magnetic drill.

Always keep this documentation close to the magnetic drill.

INFORMATION

If you are unable to rectify an issue using these operating instructions, please contact us for advice:

Optimum Maschinen Germany GmbH
Dr. Robert-Pfleger-Str. 26

D-96103 Hallstadt

email: info@optimum-maschinen.de

Download EN:

Machine variants

The variant for you machine is specified on the rating plate.

- □ OPTIdrill DM35 - with built in cooling system.
- □ OPTIdrill DM35V - with stepless speed and built in cooling system.
- □ OPTIdrill DM48VT - with thread tapping function, 2 gear stages, push button for rotation reversal.
- □ OPTIdrill DM50 - with built in cooling system.
- □ OPTIdrill DM50V - with stepless speed and built in cooling system.
- □ OPTIdrill DM50PM - with permanent magnet and stepless speed.
- □ OPTIdrill DM60V - with stepless speed and built in cooling system.

1.1 Safety instructions (warning notes)

1.1.1 Classification of hazards

We classify the safety warnings into different categories. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Symbol	Alarm expression	Definition / consequence
	**DANGER!**	Impending danger that will cause serious injury or death to people.
	WARNING!	A danger that can cause serious injury or death.
	CAUTION!	A danger or unsafe procedure that can cause personal injury or damage to property.
	**ATTENTION!**	Situation that could cause damage to the magnetic drill and product, as well as other types of damage. No risk of injury to persons.
	**Information**	Practical tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

1.1.2 Other pictograms

Use by unauthorised persons prohibited!

Use with implants prohibited!

Do not climb onto the machine!

Warning: strong magnet!

Warning: dangerous electrical voltage!

Warning: hot surface!

Warning: danger of slipping!

Warning: risk of explosion!

Warning: rotating parts!

Use ear protection!

Use a securing belt!

Read the operating instructions before commissioning!

Only switch when stopped!

Pull out the mains plug!

Wear protective glasses!

Wear protective gloves!

Wear safety shoes!

Magnetisation check!

1.2 Intended use

WARNING!

If the magnetic drill is not used properly

- **there is a risk of personal injury,**
- **the machine and other material property of the operating company will be endangered,**

the function of the magnetic drill may be affected.

The magnetic drill is intended to make precise holes in magnetisable materials, such as steel.

The magnetic drill can be used horizontally, vertically and overhead. Ensure that the holding surface is even, at least corresponds to the base of the magnets and that the base is made of magnetisable, clean material that is at least 10mm thick.

Continuous operation of the magnetic drill for more than 2 to 3 hours is not permitted.

The magnetic drill is designed and constructed for use in an environment that is not at risk of explosion, within buildings or protected roofing. The use of the magnetic drill in an open environment is not permitted.

The magnetic drill must only be used by persons who are qualified and familiar with handling it, or are appropriately trained.

If the magnetic drill is used in any way other than described above, modified without authorization of Optimum Maschinen Germany GmbH, then the magnetic drill is being used improperly.

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee will expire, if any constructive, technical or procedural changes are not performed by the company Optimum Maschinen Germany GmbH.

It is also part of the intended use that you

- observe the limits of the magnetic drill,
- observe the operating manual.

1.3 Reasonably foreseeable misuse

Any use other than that specified under "Intended use" or any use beyond that described will be deemed non-intended use and is not permissible. Any other use has to be discussed with the manufacturer. In order to avoid misuse, it is necessary to read and understand the operating instructions before first commissioning. Operators must be qualified.

1.3.1 Avoiding misuse

WARNING!

The use of the magnetic drill in the equipment with electromagnet or permanent magnet in an inclined or vertical position is only permitted if the magnetic drill is secured with the securing belt supplied. If there is a power cut, or too great a load, the magnetic force is not maintained. The magnetic drill may drop and cause accidents.

Magnetic holding force

CAUTION!

Injury due to removal of the connection of the permanent magnet or electromagnet from the substrate. The substrate must be magnetisable. The magnetic force is only present on correctly prepared surfaces.

The adhesion of the magnetic drill to the substrate depends considerably on the thickness of the material, the correctly prepared surface and the material itself. Smooth out any unevenness, such as, for example, welding splatter and remove any lose rust, dirt, grease and liquids.

INFORMATION

Working with stainless steel

Example for stainless steel: Stainless steel 1.4300 (V2A) has an austenitic microstructure and is unmagnetic. Stainless steel 1.4016 has a ferritic microstructure and is magnetisable. The higher the proportion of nickel or manganese in the steel, the greater the magnetic property and the possible holding force of the magnetic drill onto the component.

In the case of non-magnetizable components, a magnetizable component must first be securely attached to the stainless steel.

WARNING!

Injury due to unwanted removal of the magnet from the substrate. Only pull the mains plug of the magnetic drill with electromagnet out of the socket if the magnet has been shut down intentionally.

WARNING!

Do not work with the magnetic drill in environments at risk of explosion, in which combustible liquids, gases or dusts are located. Electrical tools generate sparks which may ignite the dust or vapours.

CAUTION!

When operating for a long time, the electromagnet heats up.

WARNING!

Strong Magnet. Persons with a pacemaker or other medical implants may not use the magnetic drill. Carrying metal parts and watches is prohibited.

CAUTION!

Observe the weight of the magnetic drill and the recommended limits for lifting and carrying loads.

Recommended threshold values when lifting and carrying loads				
	Reasonable load in kg and frequency of lifting and carrying			
	Occasionally		More frequently	
Age in years	Women	Men	Women	Men
15 - 18	15	35	10	20
19 - 45	15	55	10	30
from 45	15	45	10	25

WARNING!

Risk of falling due to sudden vibration from the magnetic drill. When working on scaffolding, the magnetic drill may cause a sudden vibration when starting or if there is a power cut. Secure the magnetic drill with the securing belt supplied.

CAUTION !

Pull the plug from the socket before making adjustments to the magnetic drill or changing any accessories. Many accidents are caused by the drill starting unintentionally.

CAUTION !

Observe the maintenance interval for load attachments from your insurance association. The securing belt supplied with the magnetic drill is a load attachment and must be checked regularly.

1.4 Personal protective equipment

For some works you need personnel protective equipment as protective equipment. These are

- Safety helmet,
- protective glasses or face guard,
- protective gloves,
- safety shoes with steel toe caps,
- ear protection.

Before starting work make sure that the required personnel protective equipment is available at the work place.

CAUTION!

Soiled personal protection equipment that may be contaminated may cause illness.

Clean your personal protective equipment

- **after each use,**
- **regularly once a week.**

Personal protective equipment for special works

Protect your face and your eyes: Wear a safety helmet with facial protection when performing work where your face and eyes are exposed to hazards.

Wear protective gloves when handling pieces with sharp edges.

Wear safety shoes when you are transporting the magnetic drill, attaching or removing heavy parts or transporting any parts.

1.5 Safety during operation

WARNING!

Before switching on the magnetic drill, make sure that:

- **there is no risk to persons,**
- **no objects are damaged.**

Avoid any unsafe work methods:

- Make sure that your operation does not create a safety hazard.
- The rules specified in these operating instructions must be observed during assembly, operation, maintenance and repair.
- Do not work on the magnetic drill if your concentration is reduced, for example, because you are taking medication.
- Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities applicable to your company.
- Inform the supervisor about all hazards or faults.
- Remain by the magnetic drill until it has come to a complete stop.
- Do not let the magnetic drill with electromagnet be unintentionally re-magnetised at the work site.
- Use the prescribed head protection. Ensure you wear close-fitting clothing and, if necessary, a hairnet.

1.6 Electronics

Craftsman or industrial use

Have the machine and/or the electric equipment checked regularly. Immediately eliminate all defects such as loose connections, defective wires, etc.

A second person must be present during work on live components to disconnect the power in the event of an emergency. Disconnect the magnetic drill immediately if there is a malfunction in the power supply!

Comply with the required inspection intervals in accordance with the factory safety directive, operating equipment inspection.

The operator of the machine must ensure that the electrical systems and operating equipment are inspected with regards to their proper condition, namely,

- by a qualified electrician or under the supervision and direction of a qualified electrician, prior to initial commissioning and after modifications or repairs, prior to recommissioning
- and at set intervals.

The deadlines must be set so that arising, foreseeable defects can be detected in a timely manner.

The relevant electro-technical rules must be followed during the inspection.

No check is required before first commissioning, if the manufacturer or installer has confirmed to the operator that the electrical system and operating materials have been procured in accordance with the stipulations of the accident prevention regulations.

1.7 Inspection deadlines

Technical or Industrial Use

Define and document the inspection deadlines for the machine in accordance with § 3 of the Factory Safety Act and perform an operational risk analysis in accordance with § 6 of the Work Safety Act.

2 Technical specification

The following information represents the dimensions and indications of weight and the manufacturer‘s approved machine data for following stated machines.

Modell	OPTIdrill DM35	OPTIdrill DM50	OPTIdrill DM35V	OPTIdrill DM50V	OPTIdrill DM60V	OPTIdrill DM48VT	OPTIdrill DM50PM
Item number	3071036	3071051	3071136	3071151	3071161	3071248	3071550
Electrical connection	230V ~1Ph	230V ~1Ph	230V ~1Ph	230V ~1Ph	230V ~1Ph	230V ~1Ph	230V ~1Ph
Motor power [W]	1600	1650	1600	1700	1890	1700	1700
Core drilling bit Ø max. [mm]	35	50	35	50	60	36	50
max. core drilling bit depth [mm]	35	50	35	50	50	50	50
Twist drill bit Ø max.	13	16	18	16	23	22	16
max. thread tapping bit	-	-	-	-	-	M 20	-
Spindle seat	Weldon 3/4"	Weldon 3/4"	Weldon 3/4"	Weldon 3/4"	Weldon 3/4" / MT 2	Weldon 3/4" / MT 2	Weldon 3/4"
Weldon tool shaft	Ø 19 mm (3/4”)	Ø 19 mm (3/4”)	Ø 19 mm (3/4”)	Ø 19 mm (3/4”)	Ø 19 mm (3/4”)	Ø 19 mm (3/4”)	Ø 19 mm (3/4”)
Cutting depth [mm]	35	40	30	35	40	35	40
Spindle sleeve stroke [mm]	210	230	120	130	220	230	230
Speed under no load in rpm	830	780	100 - 550	100 - 530	310 - 550	320 | 560	780
Magnetic foot dimensions [mm]	166x80	166x80	166x80	166x80	202x102	165x80	240x165
Magnetic holding force [N]	16000	16500	14800	15600	16000	14500	16500
Net weight	11 kg	12 kg	12 kg	13 kg	18.3 kg	13 kg	11.6 kg
Gross weight	15 kg	16.5 kg	15 kg	16 kg	24.3 kg	18.2 kg	20 kg
Plastic box [mm]	580x215x420	580x215x420	580x215x420	580x215x420	665x535x235	580x215x420	370x275x450

Noise emission values

The A-evaluated noise level of the magnetic drill at a one metre distance is 66 dB(A) to 69 dB(A). The sound power level is less than 85 dB(A).

This numerical value was measured on a new machine under the operating conditions specified by the manufacturer. The noise behaviour of the machine might change depending on the age and wear of the machine.

Furthermore, the noise emission also depends on production engineering factors, e.g. speed, material and clamping conditions.

INFORMATION

The specified numerical value represents the emission level and does not necessarily a safe working level.

Though there is a dependency between the degree of the noise emission and the degree of the noise disturbance it is not possible to use it reliably to determine if further precaution measures are required or not.

The following factors influence the actual degree of the noise exposure of the operator:

- Characteristics of the working area, e.g. size or damping behaviour,
- other noise sources, e.g. the number of machines,
- other processes taking place in proximity and the period of time, during which the operator is exposed to the noise.

Furthermore, it is possible that the admissible exposure level might be different from country to country due to national regulations.
This information about the noise emission should, however, allow the operator of the machine to more easily evaluate the hazards and risks.

CAUTION!

Depending on the overall noise exposure and the basic threshold values, machine operators must wear appropriate hearing protection.

We generally recommend the use of noise and ear protection.

3 Commissioning

Take the hand levers from the suitcase and fasten it.

Observe the mains voltage. The voltage of the power source must correspond to the specifications on the rating plate of the magnetic drill. Your power source must be equipped with a protective earth connection. Permissible voltage fluctuations in normal operation: + 5% - 5% volts. Permitted frequency fluctuations: ± 1Hz (50/60 Hz).

The magnetic drills have protection class IP42, protected against solid foreign bodies ≥ 1 mm and dripping water hitting at an angle (15° inclination).

Magnetic drills that are equipped with a coolant tank. The coolant tank is fastened to the frame of the magnetic drill with two screws. Only use an oil-water mixture that is available in the specialist trade. Clean the drilling spindle after use, to prevent any associated formation of corrosion.

CAUTION!

The magnetic drills with stepless speed setting

- OPTIdrill DM35V
- OPTIdrill DM36VT
- OPTIdrill DM50V
- OPTIdrill DM60V
- OPTIdrill DM98V

are constructed to standard EN 61000-6-3 Class C2. The operation of this magnetic drill is not provided for use in mixed areas and domestic appliances, in which the power supplied is through a public low voltage supply system. In these areas, it may be difficult to guarantee electromagnetic compatibility due to conducted and emitted interference.

Do not touch both poles of the 230 V plug immediately after unplugging it. The capacitors may still be charged for some time after the mains plug has been removed. Discharging the capacitors in the ambient air takes a certain amount of time depending on the humidity.

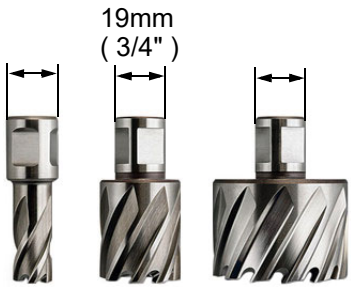
4 Operation

INFORMATION

Magnetic drilling machines with electromagnet are equipped with a sensor that monitors the magnetisability of the workpiece. If the workpiece cannot be magnetised, the drill cannot be switched on.

- Permanent operation of the magnetic drill of more than 2 to 3 hours is not permitted. There is a risk of fire due to high load. The magnetic drill first has to be cooled down before it starts to be run continuously again.
- Motor cooling by the fan in the motor is correspondingly low at low speed. Pay attention to this criterion especially for machines with stepless speed adjustment under high load and low speed setting at the same time to prevent overheating.
- If the drill bit jams, the magnetic drill must be shut down immediately.
- Operation of the magnetic drill in an open environment is not permitted.
- For magnetic drills with automatic feed, when starting work, the lowest speed and the lowest feed must be selected first.
- Drilling into non-magnetisable surfaces is only possible if a steel plate of a sufficient size has been fastened to the non-magnetisable surface.
- First switch on the electromagnetic and then the drilling spindle. When switching off, first switch off the drilling spindle and then the electromagnet.
- For drilling work in a vertical position overhead, two people must be present.
- The securing belt must also be used when working with horizontal drilling work, to secure the magnetic drill against falling from the elevated working locations.
- The manually-operated drill feed should not exceed 0.05 mm per rotation.
- Only use a suitable core hole drill for the machining task envisaged.

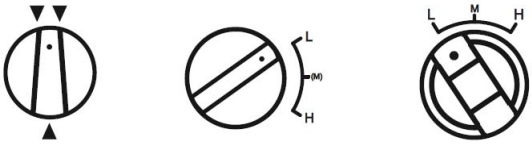
Usable tools: Weldon type; Clamping of tools with 19mm cylindrical shank and lateral driving surface similar to DIN 1835-B and DIN 6535-HB.



On magnetic drills with additional gear shift:

Only switch at standstill. If necessary, start the spindle for a short time and switch it off again.

Gear stage



Low gear speed: ▼▼ for hard materials, large drills, cutting tools, screw taps.

High gear speed: ▲ for soft materials, small drills, small cutting tools.

OPTIdrill DM36VT

Switching to left-hand rotation is done by additionally pressing the yellow pushbutton. The magnetic drill stops and changes the direction of rotation after about 3 to 5 seconds. Keep the push button pressed to maintain the changed direction of rotation.

OPTIdrill DM35PF

Pull out the quill lever to activate the automatic feed. To deactivate the feed, push the quill lever back in. By reactivating the feed, a return in the feed with reversal of the direction of rotation takes place.

WARNING!

Spurting and overrun of coolants and lubricants. Ensure that the cutting fluids are removed immediately after you have finished working. Close the stopcock of the coolant tank again.

On magnetic drilling machines with coolant ring, the stop must be mounted to prevent rotation.

4.1 Fitting of the tool in the holder

4.1.1 Standard

Insert tool and firmly clamp with side screw.

4.1.2 Quick change

Push sleeve upwards and insert tool. Release the sleeve and check for secure attachment.

Standard

Quick change

4.2 Placing the magnetic drill on the workpiece

INFORMATION

A sensor controls the possible magnetic holding force. With insufficient magnetic holding force on the component, the magnetic drill can not be turned on.

To permit the magnetic drill to adhere properly to material that is to be drilled, the surface must be clean and smooth. Loose rust, dirt or grease must be removed before mounting the magnetic drill; any welding beads or surface irregularities must be smoothened. Thin coats of paint will not impair adhesion. Clean the magnet block as well if necessary. After switching the magnet on, shake the magnetic drill firmly to ensure that the magnetic drill is adhering properly. If it is not, then check the condition of the surface of the material and that of the bottom of the magnet block.

Please also observe ► Working with stainless steel on page 7

4.2.1 Use on thin steel

The magnetic drill adheres best to low-carbon steel that is at least 12 mm thick. For drilling a hole into thin steel, a 12mm steel plate can be secured under the material at the place where the magnetic stand is to be positioned.

4.2.2 Non-ferrous metals

To drill a hole in non-ferrous metal, the steel plate should be secured on the surface of the material and the magnetic drill stand then placed on the steel plate.

4.2.3 Round or cambered surfaces

If you need to drill into a round or cambered surface, then the magnet block should be positioned with its longitudinal axis parallel to the axis of the camber. The open space between the magnet block and the camber should be packed with steel wedges on both sides along the entire length of the magnet block so that after switching on the magnet as many as possible magnetic lines of force are conducted from the magnet pole through the wedges and the material to the magnet block housing.

Ensure that the steel wedges on both sides of the magnet block are distributed such that the axis of the drill bit is aligned directly to the centre of curvature; otherwise it could be diverted to one side. By shaking the magnetic drill, make sure that the stand adheres properly to the material.

5 Maintenance

- Always keep the drill stand and magnetic base clean, to be able to work well and securely.

CAUTION!

If the replacement of the connecting line is required, then this must be done by an electrician, to avoid any safety risks.

CAUTION!

Check the surface of the magnetic base for damage and replace if necessary. Damaged magnetic surfaces reduce the holding force and cause the magnetic drill to move away from the surface with the maximum possible torque of the drilling spindle.

- After an operating time of approximately 90 days, the carbon brushes of the drive motor should be replaced.
- Gears running in the oil bath are maintenance-free. It is not necessary to replace the oil.

6 Malfunctions

Malfunction	Cause/ Possible Effects	Solution
Magnetic base not functioning	• Switch contact faulty. • The power supply is faulty, plug is loose. • Overload, the fuse has blown. • Short circuit in the electromagnet or faulty electromagnet. • Magnetisability of the substrate too low. • Conductor plate faulty.	• Replace the switch. • Replace the cable and plug. • Replace the fuse. Replace or repair the electromagnet. • Check the thickness and material properties of the substrate. • Replace the conductor plate
Drilling spindle does not switch on.	• Electromagnet is not switched on. • The sensor detects too little magnetic holding force on the component. • Switch contact faulty. • Bad contact of the carbon brush. • Faulty rotor or stator winding.	• Before switching on the drilling spindle, first switch on the electromagnet. • ► Magnetic holding force on page 7 • Replace the switch. • Replace the carbon brushes of the electric motor. • Completely replace the drilling head.

Malfunction	Cause/ Possible Effects	Solution
Problems on the drive motor	• The spark colour on the electric motor is orange. • Sparks are flying out. • Sparks are flying in a ring from fire.	• Reduce the drilling feed. • Please replace the carbon brushes. • Check whether the rotor or stator winding is faulty. Motor burnt out.
Drill or core hole drill "burnt up"	• Feed too fast. • Chips are not coming out of the drilled hole. • Drill blunt. • No or too little cooling.	• Reduce feed. • Extract drill more often during work. • Sharpen drill bit/ use a new drill bit. • Use cooling agent
Drill tip is running off centre, the drilled hole is non-round	• Hard points on the workpiece • Length of the cutting spirals/or angles on the tool are unequal • Drill deformed	• Use new drill
The drill chuck or the taper mandrel cannot be inserted.	• Dirt, grease or oil on the taper inside of the drill chuck or on the taper surface of the drill spindle • Positioning the follower in the drill spindle is not considered	• Clean surfaces well • Keep surfaces free of grease
Drilling feed does not operate	• Feather key sheared from the shaft. • Transmission for manual feed worn.	• Replace key. • Replace transmission.

7 Appendix

7.1 Copyright

This document is protected by copyright. All derived rights are reserved, especially those of translation, re-printing, use of figures, broadcast, reproduction by photo-mechanical or similar means and recording in data processing systems, either partial or total.

Subject to technical changes without notice.

7.2 Liability claims/warranty

Besides the legal liability claims for defects of the customer towards the seller, the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or were promised as part of a single contractual provision.

- Liability or warranty claims are processed at OPTIMUM GmbH's discretion either directly or through one of its dealers.
  Any defective products or components of such products will either be repaired or replaced by components which are free from defects. Ownership of replaced products or components is transferred to OPTIMUM Maschinen Germany GmbH.
- The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- Defects resulting from the following circumstances are excluded from liability and warranty claims:
  - Using the product beyond the technical options and proper use, in particular due to overstraining of the machine.
  - Any defects arising by one's own fault due to faulty operations or if the operating manual

is disregarded.
- Inattentive or incorrect handling and use of improper equipment
- Unauthorized modifications and repairs
- Insufficient installation and safeguarding of the machine
- Disregarding the installation requirements and conditions of use
- atmospheric discharges, overvoltage and lightning strokes as well as chemical influences

- Neither are the following items covered by liability or warranty claims:
  - Wearing parts and components which are subject to normal and intended wear, such as V-belts, ball bearings, lighting, filters, seals, etc.
  - Non reproducible software errors
- Any services, which OPTIMUM GmbH or one of its agents performs in order to fulfil any additional warranty are neither an acceptance of the defects nor an acceptance of its obligation to compensate. These services neither delay nor interrupt the warranty period.
- The court of jurisdiction for legal disputes between businessmen is Bamberg.
- If any of the aforementioned agreements is totally or partially inoperative and/or invalid, a provision which nearest approaches the intent of the guarantor and remains within the framework of the limits of liability and warranty which are specified by this contract is deemed agreed.

7.2.1 Decommissioning

CAUTION!

Used devices need to be decommissioned in a professional way in order to avoid later misuses and endangerment of the environment or persons.

- **Unplug the power cord and cut the connection cable.**
- **Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.**
- **Dispose of machine components and operating fluids using the intended disposal methods.**

7.3 Storage

ATTENTION!

Incorrect and improper storage might result in damage or destruction of electrical and mechanical machine components.

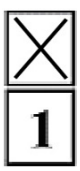
Follow the instructions and information on the transport box.

- Fragile goods (Goods require careful handling)

- Protect against moisture and humid environment

- Prescribed position of the packing case (Marking of the top surface - arrows pointing to the top)

- Maximum stacking height
  Example: not stackable - do not stack further packing case on top of the first one.



- Consult Optimum Maschinen Germany GmbH if the machine and accessories are stored for more than three months or are stored under different environmental conditions than those specified here.

7.4 Advice for disposal / Options of reuse:

Please dispose of your equipment in an environmentally friendly manner, by not placing waste in the environment but in a professional manner.

Please do not simply throw away the packaging and later the disused machine, but dispose of both in accordance with the guidelines laid down by your city council/local authority or by an authorised disposal company.

7.4.1 Disposal of new device packaging

All used packaging materials and packaging aids from the machine are recyclable and generally need to be supplied to the material reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are passed to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow direct reuse.

7.4.2 Disposal of the old device

INFORMATION

Please take care in your interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and admitted way.

Please note that the electrical devices comprise a variety of reusable materials as well as environmentally hazardous components. Please ensure that these components are disposed of separately and professionally. In case of doubt, please contact your municipal waste management. If appropriate, call on the help of a specialist waste disposal company for the treatment of the material.

7.4.3 Disposal of electrical and electronic components

Please make sure that the electrical components are disposed of professionally and according to the statutory provisions.

The device is composed of electrical and electronic components and must not be disposed of as household waste. According to the European Directive 2015/863/EU regarding electrical and electronic used devices and the implementation of national legislation, used power tools need to be collected separately and supplied to an environmentally friendly recycling centre.

As the machine operator, you should obtain information regarding the authorised collection or disposal system which applies for your company.

Please make sure that the electrical components are disposed of professionally and according to the legal regulations. Please only throw depleted batteries in the collection boxes in shops or at municipal waste management companies.

7.5 Disposal via municipal collection facilities

Disposal of used electrical and electronic components (Applicable in the countries of the European Union and other European countries with a separate collecting system for those devices).

The sign on the product or on its packing indicates that the product must not be handled as common household waste, but that is needs to be disposed of at a central collection point for

recycling. Your contribution to the correct disposal of this product will protect the environment and the public health. Incorrect disposal constitutes a risk to the environment and public health. Recycling of material will help reduce the consumption of raw materials. For further information about the recycling of this product, please consult your District Office, municipal waste collection station or the shop where you have purchased the product.

7.6 Product follow-up

We are required to perform a follow-up service for our products which extends beyond shipment.

We would be grateful if you could inform us of the following:

- Modified settings
- Any experiences with the magnetic drill which might be important for other users
- Recurring malfunctions

Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26

D-96103 Hallstadt

Fax +49 (0) 951 - 96 555 - 888
email: info@optimum-maschinen.de

7.7 Change information operating manual

Chapter	Short summary	new version number
3	Capacitor discharge on speed-controlled machines	1.1.2
all	new types and constructive reworked magnetic drills	2.0

OPTIMUM®
MASCHINEN - GERMANY

EC Declaration of Conformity

according to Machinery Regulation 2023/1230 Annex V Part A

The manufacturer / distributor	Optimum Maschinen Germany GmbH Dr.-Robert-Pfleger-Str. 26 D - 96103 Hallstadt

hereby declares that the following product

Product designation:	Magnetic drill
Type designation:	OPTIdrill DM35
	OPTIdrill DM35V
	OPTIdrill DM50
	OPTIdrill DM50V
	OPTIdrill DM50PM
	OPTIdrill DM60V
	OPTIdrill DM48VT

fulfils all the relevant provisions of the Machinery Regulation specified above and the additionally applied directives (in the following) - including the changes which applied at the time of the declaration.

Description:

Magnetic drill

The following other EU Directives have been applied:

EMC Directive 2014/30/EU; Restriction of the use of certain hazardous substances in electrical and electronic equipment 2015/863/EU

The following harmonized standards were applied:

EN60204-1: 2019-06 Safety of machinery - Electrical equipment of machines - Part 1: General requirements

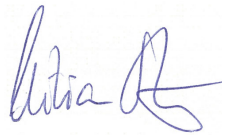
EN 62841-1:2023-03 Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery - Safety - Part 1: General requirements

EN IEC 61000-6-1:2019-11 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments

EN IEC 61000-6-3:2022-06 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

Name and address of the person authorized to compile the technical file:

Kilian Stürmer, phone: +49 (0) 951 96555 - 800



Kilian Stürmer (CEO, General Manager)
Hallstadt, 2025-02-26

8 Ersatzteile - Spare parts

8.1 DM35

8.1.1 Bohrkopf- Drilling head

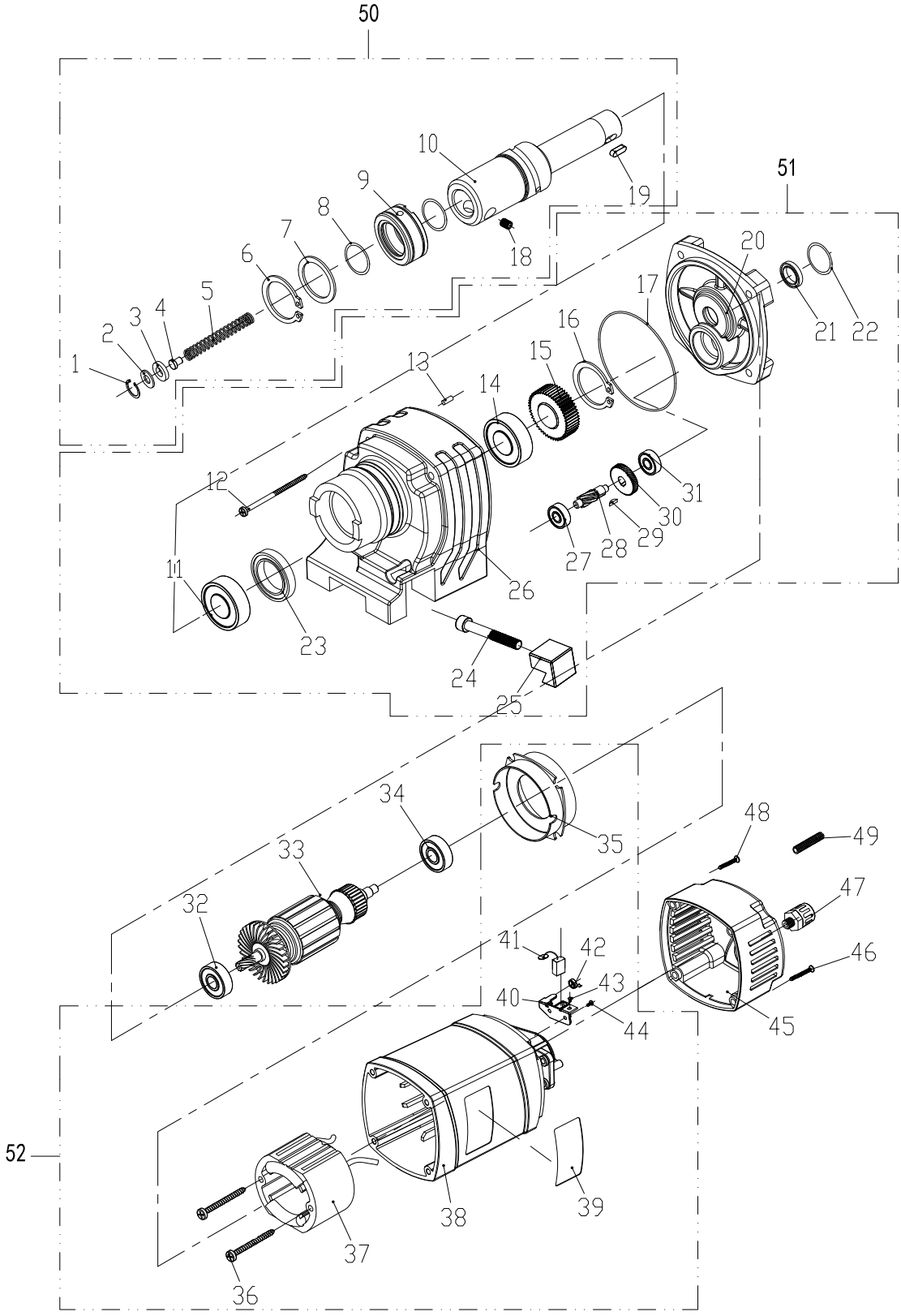


Fig.8-1: Bohrkopf - Drilling head - DM35

DM35_parts_V2.fm

Ersatzteilliste Bohrkopf- Spare part list drilling head - DM35

Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.	Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.
1	Sicherungsring, innen	Circlip, Inner	Ø19 mm	042SR19W	30	Rotor Zahnrad	Rotor gear		03071050130
2	Dichtung	Gasket			31	Lager	Bearing	LFB608	0406008R
3	Polyurethanscheibe	PU washer			32	Lager	Bearing	NSK6000	0406000ZZ
4	Federkleme für Feder	Pin for spring		03071036104	33	Rotor	Rotor		03071036133
5	Feder	Spring		03071036105	34	Lager	Bearing	NSK608	0406008ZZ
6	Sicherungsring, innen	Circlip, Inner	Ø33 mm		35	Luftleitring	Air conducting ring		03071036135
7	Ring	Ring	33x48x1 mm		36	Blechschraube	Tapping screw		
8	Pressspannscheibe	Pressboard washer			37	Stator	Stator		03071036137
9	Kühlwasserring	Coolant water ring			38	Motorgehäuse	Motor Housing		03071036138
10	Spindel	Spindle		03071036110	39	Typenschild	Nameplate		
11	Lager	Bearing	JVB6904		40	Bürstenhalter	Brush holder		
12	Gehäuseschraube	Casing screw	M5x70		41	Kohlebürste	Carbon brush		03071050141
13	Zylindrischer Stift	Cylindrical pin			42	Bürstenfeder	Brush spring		
14	Lager	Bearing	JVB6904		43	Schraube	Screw	M4x8	
15	Zahnrad	Gear		03071050115	44	Schraube	Screw	M4x12	
16	Sicherungsring, außen	Circlip, outter	Ø20 mm	042SR20W	45	Motor Abdeckung	Motor cover		03071236150
17	O Ring	O ring			46	Gehäuseschraube	Casing screw	M4x45	
18	Stiftschraube	Set screw	M10x12		47	Zugentlastung Kabel	Strain relief cable		
19	Stift	Pin	6x10 mm		48	Gehäuseschraube	Casing screw	M5x40	
20	Getriebedeckel	Gear Cover		03071036120	49	Kabelschutz	Cable protection		
21	Wellendichtring	Shaft sealing ring	10x16x4 mm		50	Komplette Spindel	Complete spindle		03071036150
22	O Ring	O ring	29x1,8 mm		51	Komplettes Getriebe	Complete gear		03071036151
23	Wellendichtring	Shaft sealing ring	20x32x7 mm	04120327	52	Kompletter Motor	Complete motor		03071036152
24	Schraube	Screw	M8x50		K	Transportkoffer	Tranport case		03071036K
25	Schwalbenschwanznut - Stahl	Dovetail groove - steel							
26	Getriebegehäuse	Gear Box		03071036126					
27	Lager	Bearing	LFB608	0406008R					
28	Rotorritzel	Rotor pinion		03071050128					
29	Passfeder	Key	9x9x3 mm						

8.1.2 Magnetstand - Magnetic stand

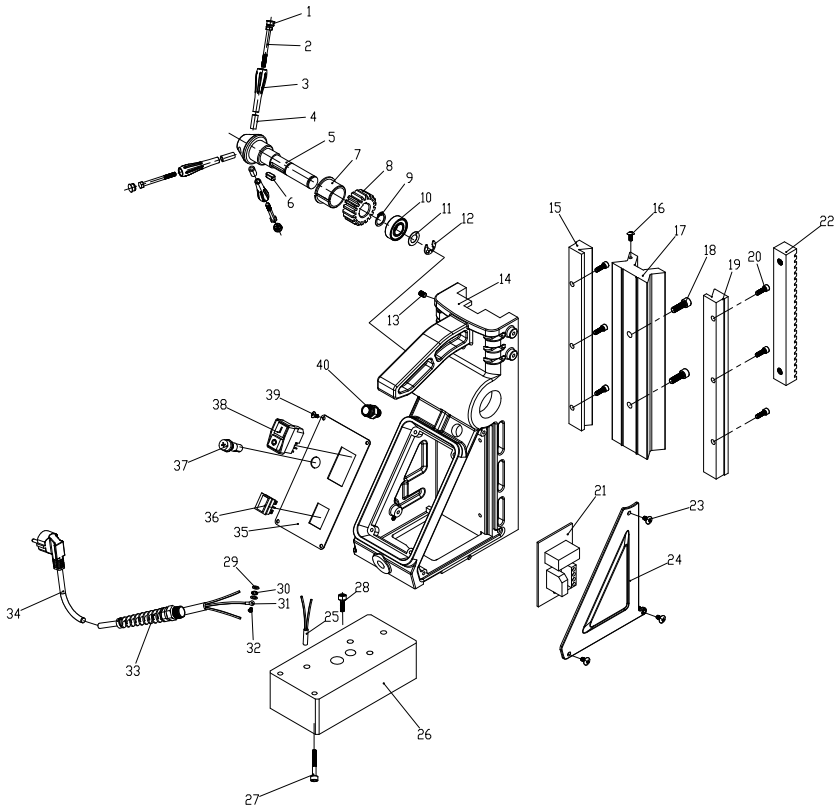
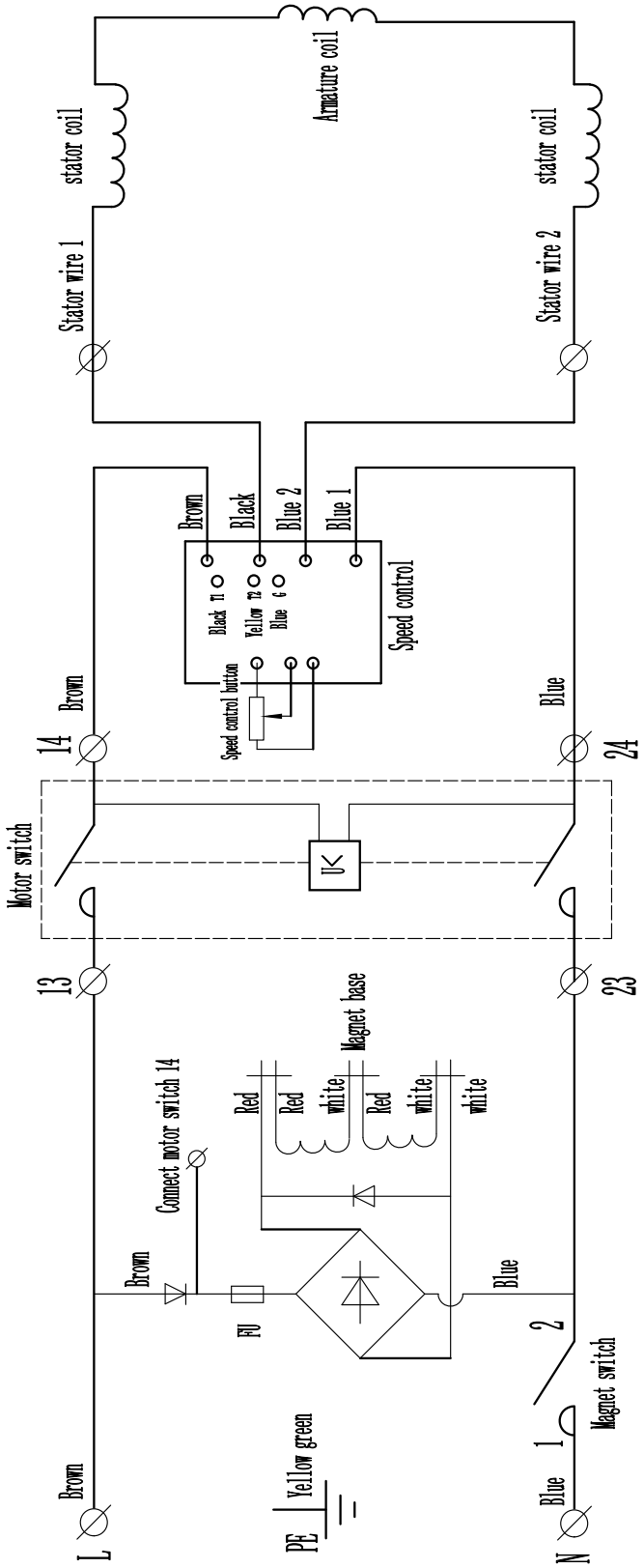


Fig. 8-2: Magnetstand - Magnetic stand - DM35

DM35_parts_V2.fm

Ersatzteilliste Magnetstand- Spare part list magnetic stand - DM35				
Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.
1	Anschlag	Stopper		
2	Schraube	Screw	M10x150	03071050203CPL
3	Griff	Handle		
4	Griffhülse	Handle sleeve		03071050204
5	Vorschubwelle	Feed shaft		03071036205
6	Stift	Pin	6x6x12 mm	042P6612
7	Kupferring	Copper ring		03071036207
8	Vorschubzahnrad	Feed gear		03071050208
9	Sprengring	Snap spring		
10	Lager	Bearing	LFB6903	0406903ZZ
11	Lagerdeckel	Bearing cover	17x30x1 mm	
12	Sicherungsring	E-Circlip	Ø15mm	042SR15I
13	Schraube	Screw	M5x12	
14	Ständer	Stand		
15	Linke Führungsschiene	Left rail track bar		03071036215
16	Schraube	Screw		
17	Schwalbenschwanzführung	Dovetail groove guide rail		03071036217
18	Schraube	Screw	M6x16	
19	Rechte Führungsschiene	Right rail track bar		03071036219
20	Schraube	Screw	M4x20	
21	Leiterplatte	Circuit board		03071050221
22	Zahnstange	Toothed rack		03071036222
23	Schraube	Screw	M4x6	
24	Dreieckplatte	Triangle plate		
25	Näherungsschalter	Reed switch		03071036225
26	Magnet	Magnet		03071036226
27	Schraube	Screw	M6x55	
28	Schraube	Screw	M6x20	
29	Flache Dichtung	Flat gasket		
30	Dichtung	Gasket		
31	Verbindung	Joint		
32	Schraube	Screw	M4x8	
33	Knickschutz	Kink protection		
34	Anschlusskabel	Connecting lead		
35	Typenschild	Nameplate		
36	Schalter	Switch		03071050236
37	Sicherung	Fuse	F 0,75A	03071036237
38	Schalter	Switch		03071050238
39	Schraube	Screw	M3x6	
40	Zugentlastung	Strain relief		

8.1.3 Schaltplan - Wiring diagram



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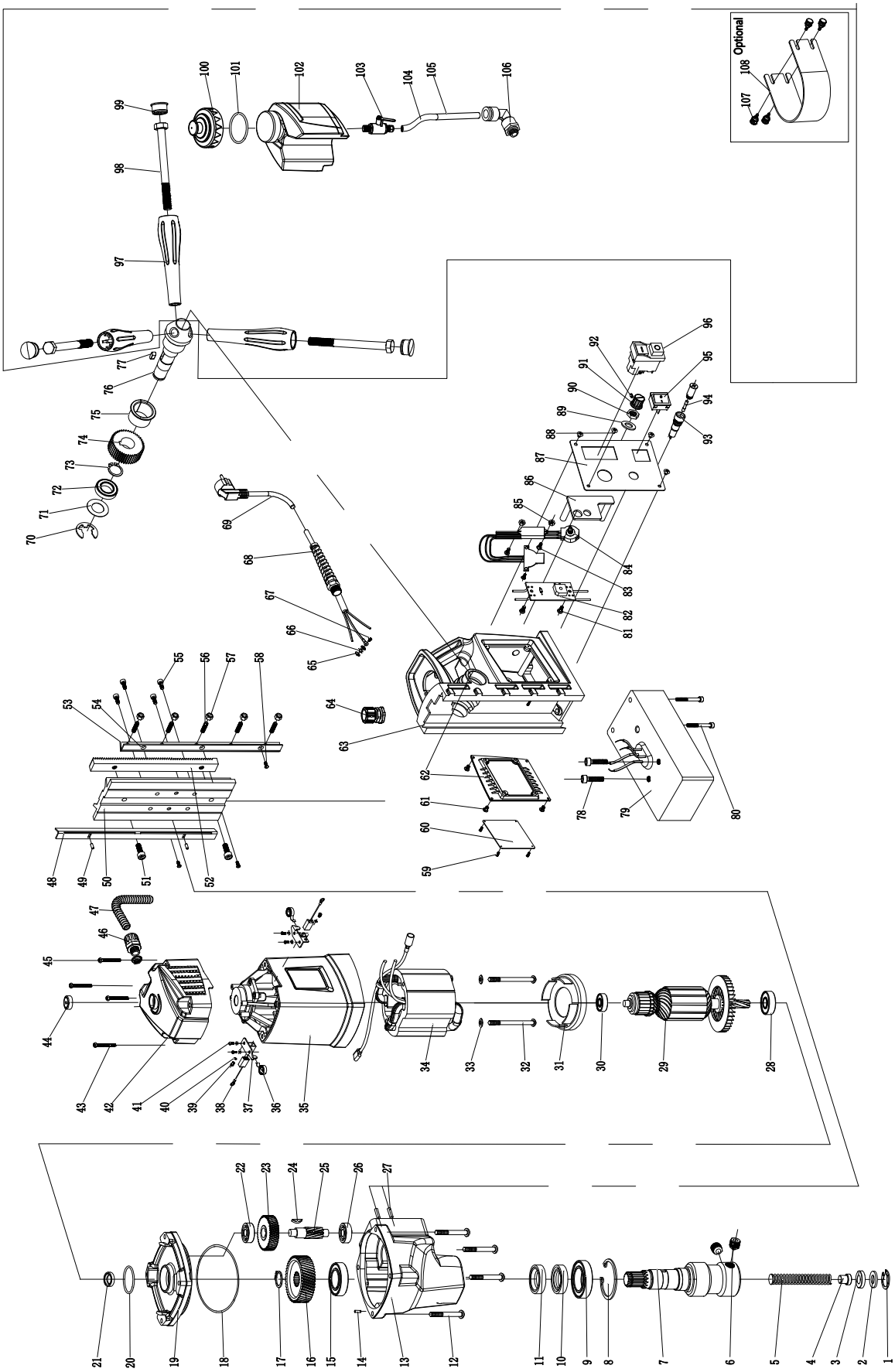


8.2 DM35V

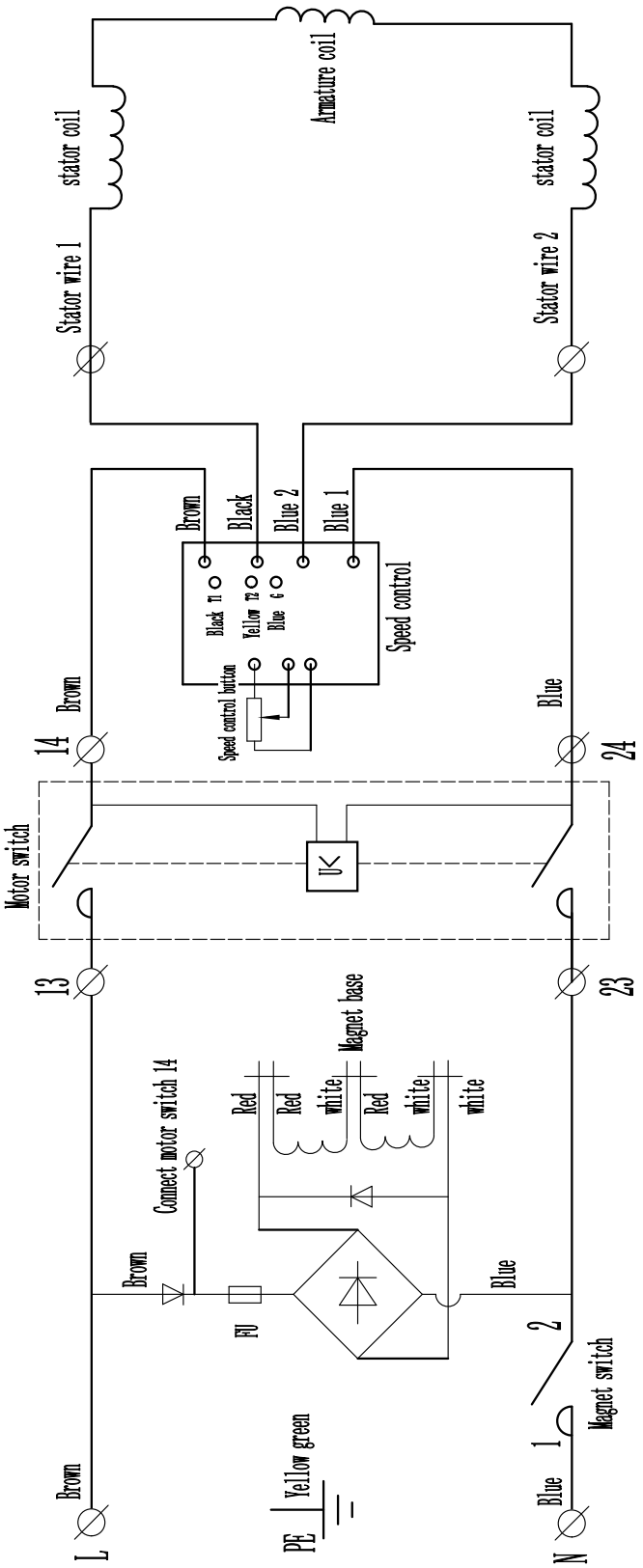
DM35V_parts_V2.fm

Ersatzteilliste -Spare part list - DM35V

Pos.	Bezeichnung	Description	Größe / Size	Art. nummer / Item no.	Pos.	Bezeichnung	Description	Größe / Size	Art. nummer / Item no.
1	Innensicherungsring	Inner circlip	Ø 19	0307113601	55	Schraube	Screw		0307113655
2	Dichtung	Gasket	9.4 x 18.5 x 2	0307113602	56	Schraube	Screw		0307113656
3	Dichtung	Gasket	9.5 x 19.2 x 3.8	0307113603	57	Mutter	Nut		0307113657
4	Feder	Spring		0307113604	58	Schraube	Screw		0307113658
5	Feder	Spring		0307113605	59	Schraube	Screw		0307113659
6	Schraube	Screw		0307113606	60	Abdeckplatte	Cover panel		0307113660
7	Spindel	Spindle		0307113607	61	Schraube	Screw		0307113661
8	Innensicherungsring	Inner circlip	Ø 42	0307113608	62	Rahmen der Platte	Panel frame		0307113662
9	Lager	Bearing	6905	0307113609	63	Rahmen	Frame		0307113663
10	Wasserdichtung	Water seal		0307113610	64	Schlauchanschluss	Hose connector		0307113664
11	Öldichtung	Oil seal	22 x 32 x 7	0307113611	65	Flachdichtung	Flat gasket		0307113665
12	Schraube	Screw		0307113612	66	Gewellte Dichtung	Corrugated gasket		0307113666
13	Getriebekasten	Gear box		0307113613	67	Schraube	Screw		0307113667
14	Zylinderstift	Cylinder pin		0307113614	68	Anti-Biege-Gelenk	Anti-bending joint		0307113668
15	Lager	Bearing	6904	0307113615	69	Kabel	Cable		0307113669
16	Hauptwellenzahnrad	Main shaft gear		0307113616	70	E-Schraube	E-screw		0307113670
17	Äußerer Sicherungsring	Outer circlip	Ø 16	0307113617	71	Dichtung der Nadelrolle	Needle roller gasket		0307113671
18	O-Ring	O-ring		0307113618	72	Lager	Bearing		0307113672
19	Mittlere Abdeckung	Middle cover		0307113619	73	Äußerer Sicherungsring	Outer circlip		0307113673
20	O-Ring	O-ring		0307113620	74	Hebezahnrad	Lifting gear		0307113674
21	Öldichtung	Oil seal		0307113621	75	Kompositlager	Composite bearing		0307113675
22	Lager	Bearing		0307113622	76	Heberwelle	Lifter shaft		0307113676
23	I Getriebe	I gear		0307113623	77	Vierkantstift	Square pin		0307113677
24	Halbmondnadel	Crescent pin		0307113624	78	Schraube	Screw		0307113678
25	I Zahnradwelle	I gear shaft		0307113625	79	Magnetbefestigung	Magnet assembly		0307113679
26	Lager	Bearing	608	0307113626	80	Schraube	Screw		0307113680
27	Zylinderstift	Cylinder pin		0307113627	81	Schraube	Screw		0307113681
28	Lager	Bearing	6000	0307113628	82	Leiterplatte	Circuit board		0307113682
29	Armatur	Armature		0307113629	83	Schraube	Screw		0307113683
30	Lager	Bearing	608	0307113630	84	Speeder	Speeder		0307113684
31	Windabweiser	Windshield		0307113631	85	Mutter	Nut		0307113685
32	Schraube	Screw		0307113632	86	Leiterplattenhalter	Circuit board holder		0307113686
33	Flachdichtung	Flat gasket		0307113633	87	Knopfleiste	Button panel		0307113687
34	Spule	Coil		0307113634	88	Schraube	Screw		0307113688
35	Statorgehäuse	Stator housing		0307113635	89	Dichtung	Gasket		0307113689
36	Spiralfeder	Coil spring		0307113636	90	Mutter	Nut		0307113690
37	Bürstenhalter	Brush holder		0307113637	91	Knopf	Knob		0307113691
38	Kohlebürste	Carbon brush		0307113638	92	Schraube	Screw		0307113692
39	Schraube	Screw		0307113639	93	Sicherung	Fuse		0307113693
40	Gewellte Dichtung	Corrugated gasket		0307113640	94	Sicherung	Fuse		0307113694
41	Schraube	Screw		0307113641	95	Schalter	Switch		0307113695
42	Obere Abdeckung	Top cover		0307113642	96	Schalter	Switch		0307113696
43	Schraube	Screw		0307113643	97	Vorschubgriff	Feed handle		0307113697
44	Gradienter	Gradienter		0307113644	98	Schraube	Screw		0307113698
45	Schraube	Screw		0307113645	99	Verschlusskappe	Plug		0307113699
46	Schlauchanschluss	Hose connector		0307113646	100	Deckel Wassertank	Water tank cover		03071136100
47	PE-Schlauch	PE hose		0307113647	101	O-Ring	O-ring		03071136101
48	Winkelschieber	Angle slide bar		0307113648	102	Wassertank	Water tank		03071136102
49	Stift	Pin		0307113649	103	Kugelhahn für Wassertank	Water tank ball valve		03071136103
50	Führungsplatte	Guide plate		0307113650	104	Feder	Spring		03071136104
51	Schraube	Screw		0307113651	105	Schlauch	Hose		03071136105
52	Zahnstange	Rack		0307113652	106	Gelenk	Joint		03071136106
53	Verstellschieber	Adjusting slide		0307113653	107	Schraube	Screw		03071136107
54	Schieberegler	Slider		0307113654	108	Spanablenkung	Iron filings baffle		03071136108

DM35V_parts_V2.fm

8.2.1 Schaltplan - Wiring diagram



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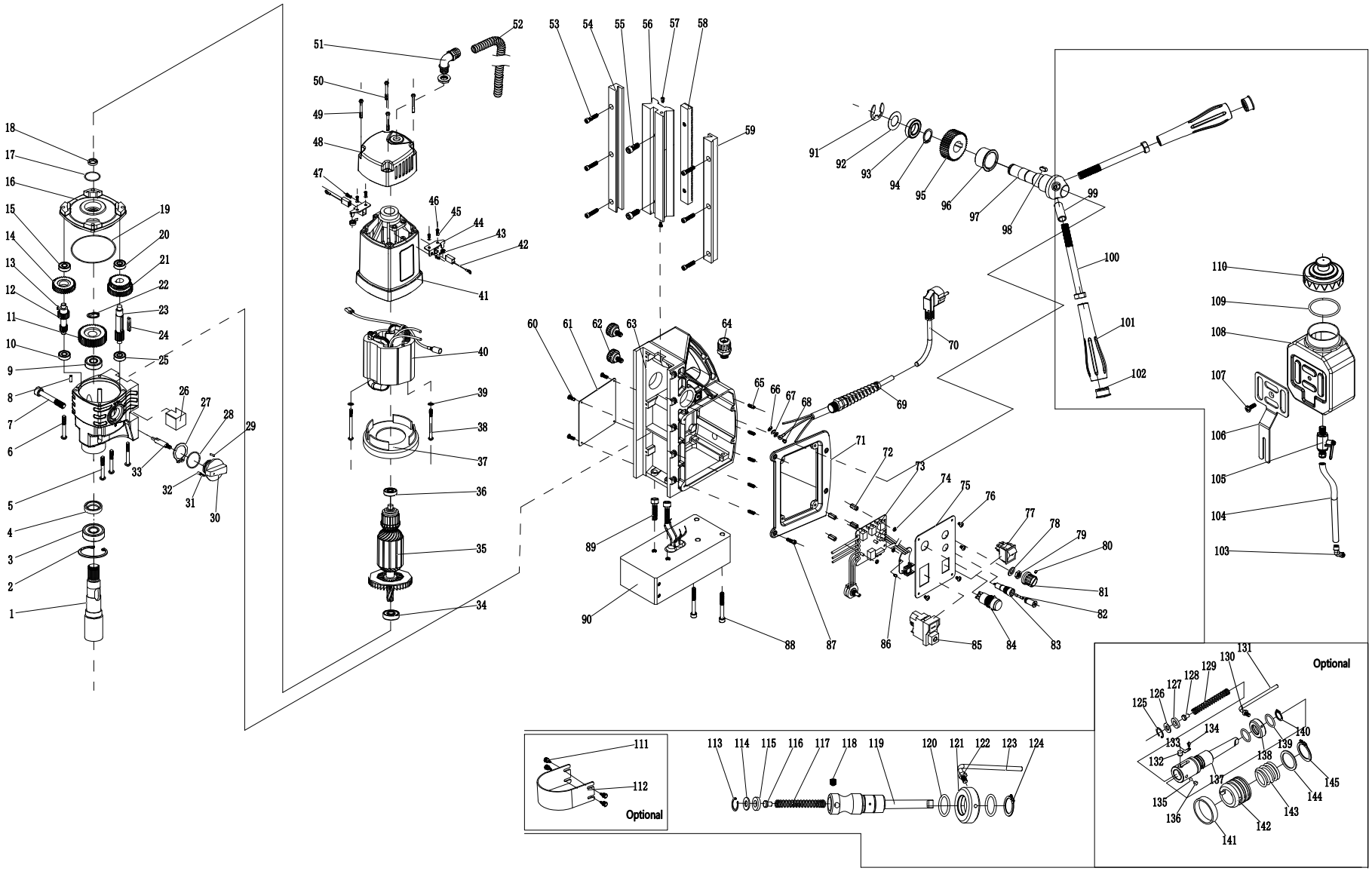
8.3 DM48VT

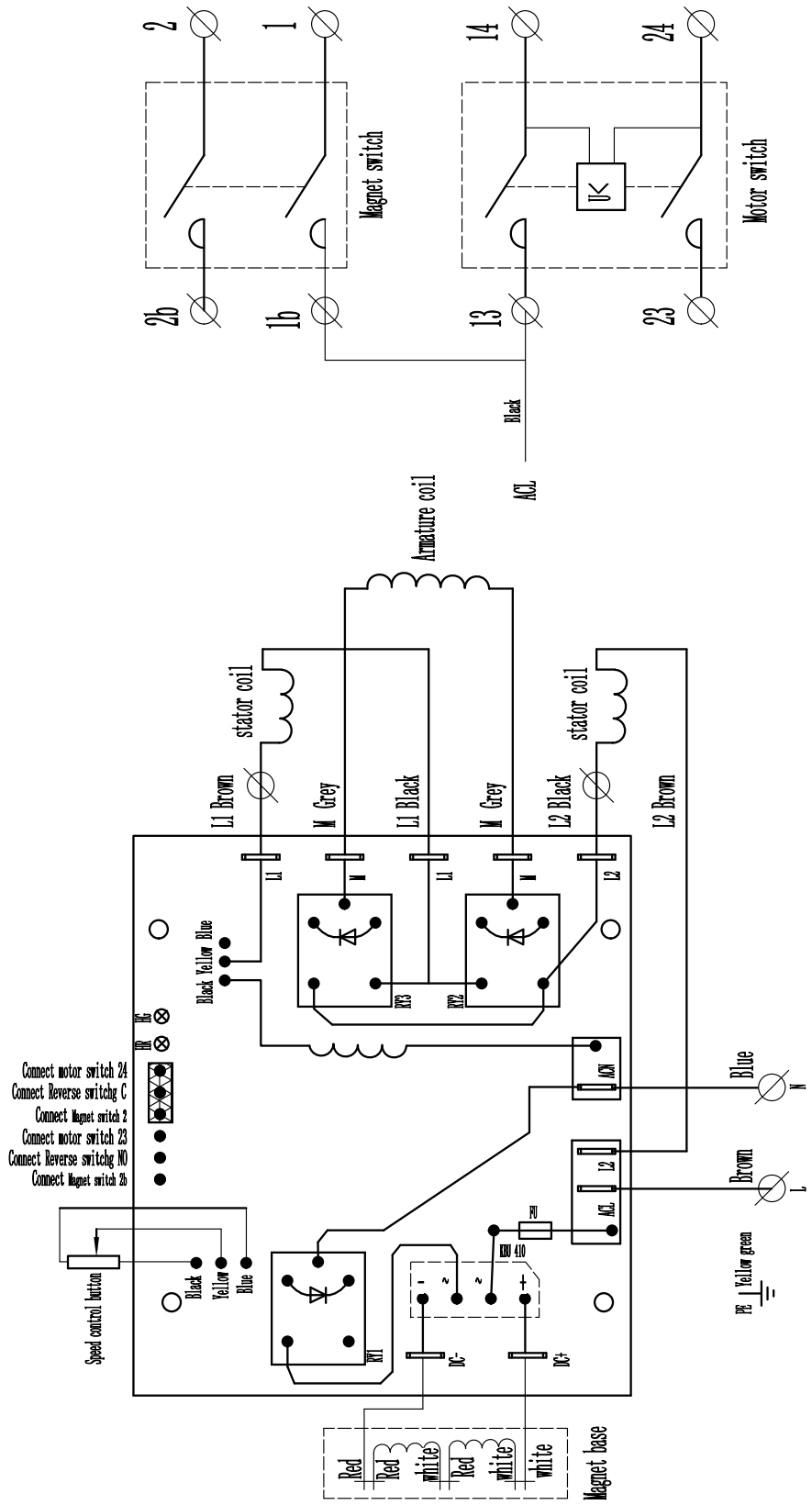


DM48VT_parts.fm

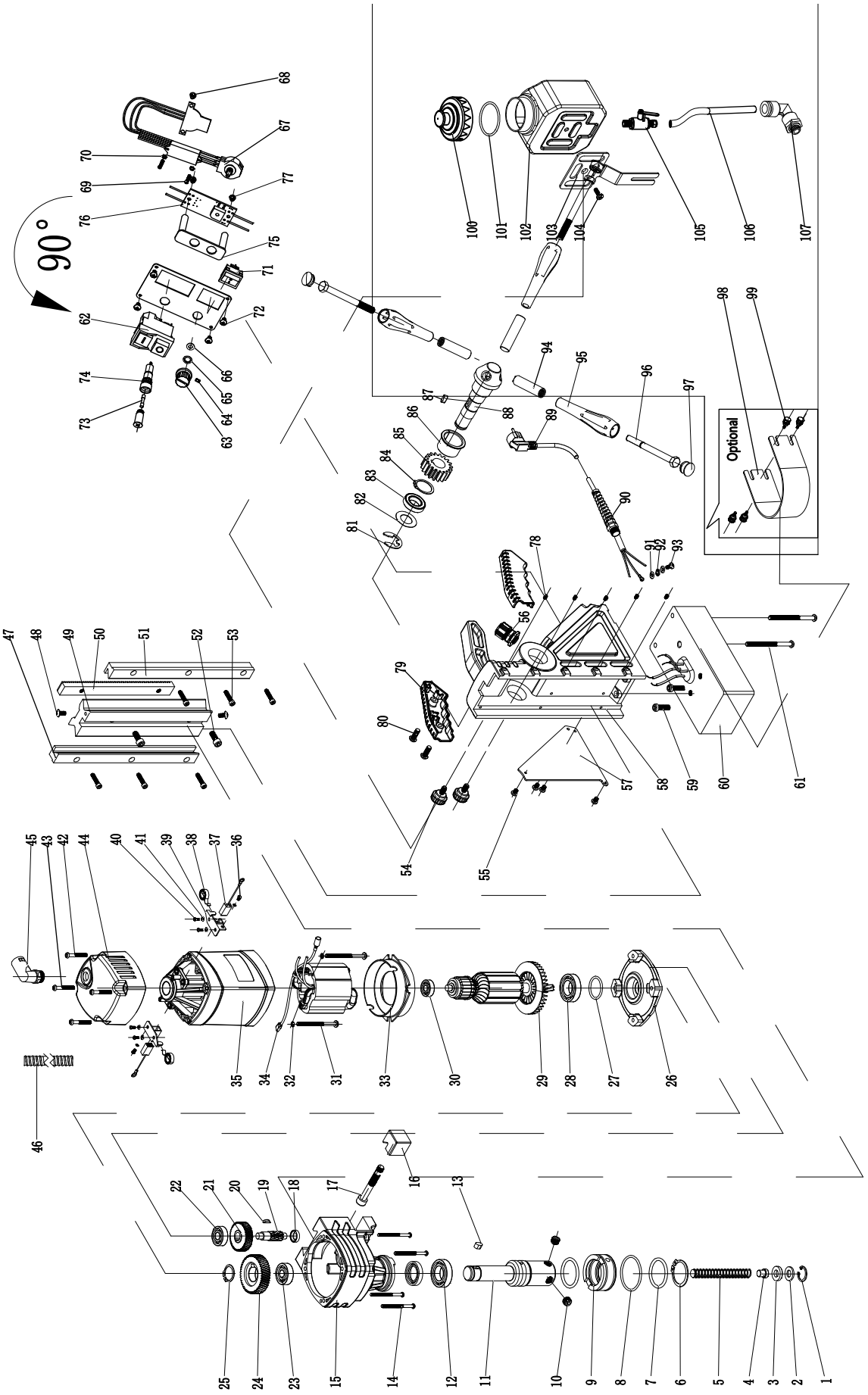
Ersatzteilliste -Spare part list - DM48VT

Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.	Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.
1	Spindel	Spindle		0307124801	74	Mutter	Nut		0307124874
2	Innensicherungsring	Inner circlip	Ø42	0307124802	75	Knopfleiste	Button panel		0307124875
3	Lager	Bearing	6905	0307124803	76	Schraube	Screw		0307124876
4	Wellendichtring	Oil seal	20 x 32 x 7	0307124804	77	Schalter	Switch		0307124877
5	Schraube	Screw		0307124805	78	Dichtung	Gasket		0307124878
6	Getriebekasten	Gear box		0307124806	79	Mutter	Nut		0307124879
7	Schraube	Screw		0307124807	80	Schraube	Screw		0307124880
8	Zylinderstift	Cylinder pin		0307124808	81	Knopf	Knob		0307124881
9	Lager	Bearing		0307124809	82	Sicherung	Fuse		0307124882
10	Lager	Bearing		0307124810	83	Sicherung	Fuse		0307124883
11	Zahnrad der Welle	Shaft gear		0307124811	84	Druckknopfschalter	Push button switch		0307124884
12	I Zahnradwelle	I gear shaft		0307124812	85	Magnetschalter	Magnetic switch		0307124885
13	Vierkantstift	Square pin		0307124813	86	Schraube	Screw		0307124886
14	I Getriebe	I gear		0307124814	87	Schraube	Screw		0307124887
15	Lager	Bearing		0307124815	88	Schraube	Screw		0307124888
16	Mittlere Abdeckung	Middle cover		0307124816	89	Schraube	Screw		0307124889
17	O-Ring	O-ring		0307124817	90	Magnetbefestigung	Magnet assembly		0307124890
18	Öldichtung	Oil seal		0307124818	91	E-Schraube	E-screw		0307124891
19	O-Ring	O-ring		0307124819	92	Dichtung der Nadelrolle	Needle roller gasket		0307124892
20	Lager	Bearing	608	0307124820	93	Lager	Bearing	6903	0307124893
21	II Getriebe	II gear		0307124821	94	Äußerer Sicherungsring	Outer circlip	Ø18	0307124894
22	Äußerer Sicherungsring	Outer circlip	Ø16	0307124822	95	Hebezahnrad	Lifting gear		0307124895
23	II Getriebewelle	II gear shaft		0307124823	96	Kompositlager	Composite bearing		0307124896
24	Vierkantstift	Square pin		0307124824	97	Heberwelle	Lifter shaft		0307124897
25	Lager	Bearing	608	0307124825	98	Vierkantstift	Square pin		0307124898
26	Einstellblock	Adjusting block		0307124826	99	Verlängerungshülse	Extension sleeve		0307124899
27	Äußerer Sicherungsring	Outer circlip	Ø26	0307124827	100	Schraube	Screw		03071248100
28	O-Ring	O-ring		0307124828	101	Vorschubgriff	Feed handle		03071248101
29	Zylinderstift	Cylinder pin		0307124829	102	Verschlusskappe	Plug		03071248102
30	Knopf	Knob		0307124830	103	Gelenk	Joint		03071248103
31	Feder	Spring		0307124831	104	Schlauch	Hose		03071248104
32	Nietdraht Federhülse	Rivet wire spring sleeve		0307124832	105	Wassertank-Kugelhahn	Water tank ball valve		03071248105
33	Schalthebel	Shift lever		0307124833	106	Halterung für Wassertank	Water tank bracket		03071248106
34	Lager	Bearing	6001	0307124834	107	Schraube	Screw		03071248107
35	Armatur	Armature		0307124835	108	Wassertank	Water tank		03071248108
36	Lager	Bearing	608	0307124836	109	O-Ring	O-ring		03071248109
37	Windschutz	Windbreak		0307124837	110	Abdeckung des Wassertanks	Water tank cover		03071248110
38	Schraube	Screw		0307124838	111	Schraube	Screw		03071248111
39	Flachdichtung	Flat gasket		0307124839	112	Ablenkung durch Eisenspäne	Iron filings baffle		03071248112
40	Spule	Coil		0307124840	113	Innensicherungsring	Inner circlip	Ø19	03071248113
41	Statorgehäuse	Stator housing		0307124841	114	Dichtung	Gasket		03071248114
42	Kohlebürste	Carbon brush		0307124842	115	Dichtung	Gasket		03071248115
43	Spiralfeder	Coil spring		0307124843	116	Feder	Spring		03071248116
44	Kohlebürste	Carbon brush		0307124844	117	Feder	Spring		03071248117
45	Gewellte Dichtung	Corrugated gasket		0307124845	118	Schraube	Screw		03071248118
46	Schraube	Screw		0307124846	119	Morsekegel MK2	Morse Tape MT2		03071248119
47	Schraube	Screw		0307124847	120	O-Ring	O-ring		03071248120
48	Obere Abdeckung	Top cover		0307124848	121	Wasserring	Water ring		03071248121
49	Schraube	Screw		0307124849	122	Mutter	Nut		03071248122
50	Schraube	Screw		0307124850	123	Stopphebel	Stop lever		03071248123
51	Schlauchanschluss	Hose connector		0307124851	124	Äußerer Sicherungsring	Outer circlip	Ø28	03071248124
52	PE-Schlauch	PE hose		0307124852	125	Innensicherungsring	Inner circlip	Ø19	03071248125
53	Schraube	Screw		0307124853	126	Unterlegscheibe aus rostfreiem Stahl	Stainless steel washer		03071248126
54	Strache	Strake		0307124854	127	Dichtung	Gasket		03071248127
55	Schraube	Screw		0307124855	128	Feder	Spring		03071248128
56	Führungsplatte	Guide plate		0307124856	129	Feder	Spring		03071248129
57	Schraube	Screw		0307124857	130	Mutter	Nut		03071248130
58	Zahnstange	Rack		0307124858	131	Stopphebel	Stop lever		03071248131
59	Strache	Strake		0307124859	132	Schraube	Screw		03071248132
60	Schraube	Screw		0307124860	133	Schraube	Screw		03071248133
61	Abdeckplatte	Cover panel		0307124861	134	Schraube	Screw		03071248134
62	Schraube	Screw		0307124862	135	Stahlkugel	Steel ball	Ø8	03071248135
63	Rahmen	Frame		0307124863	136	Schraube	Screw		03071248136
64	Schlauchanschluss	Hose connector		0307124864	137	Schnellspann-Futter	Quick-release chuck		03071248137
65	Schraube	Screw		0307124865	138	Wasserring	Water ring		03071248138
66	Flachdichtung	Flat gasket		0307124866	139	O-Ring	O-ring		03071248139
67	Gewellte Dichtung	Corrugated gasket		0307124867	140	Äußerer Sicherungsring	Outer circlip	Ø28	03071248140
68	Schraube	Screw		0307124868	141	Schnelles Entfernen der Gummimanschette	Quick removal of rubber sleeve		03071248141
69	Anti-Biege-Gelenk	Anti-bending joint		0307124869	142	Automatisches Entfernen der Wellenschutzhülse	Automatic removal of shaft sleeve		03071248142
70	Kabel	Cable		0307124870	143	Schnellspannfeder	Quick release spring		03071248143
71	Rahmen der Platte	Panel frame		0307124871	144	Dichtung	Gasket		03071248144
72	Sechseckige Isolationssäule	Hexagonal isolation column		0307124872	145	Äußerer Sicherungsring	Outer circlip	Ø35	03071248145
73	Leiterplatte	Circuit board		0307124873					

8.3.1 Schaltplan - Wiring diagram



DM48VT_parts.fm



8.4 DM50

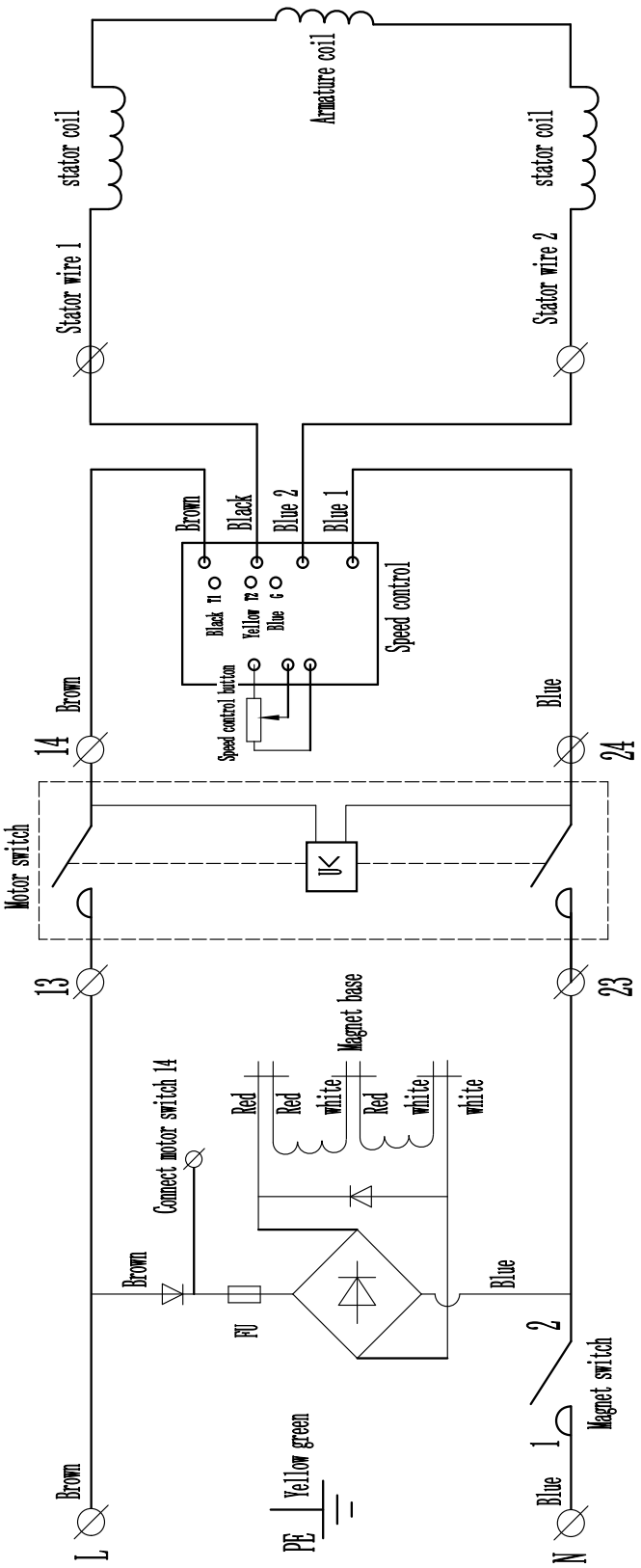
DM50_parts_V2.fm

Ersatzteilliste -Spare part list - DM50

Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.	Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.
1	Innensicherungsring	Inner circlip	Ø19	0307105101	55	Screw	Schraube		0307105155
2	Dichtung	Gasket		0307105102	56	Hose connector	Schlauchanschluss		0307105156
3	Dichtung	Gasket		0307105103	57	Cover	Abdeckung		0307105157
4	Feder	Spring		0307105104	58	Frame	Rahmen		0307105158
5	Feder	Spring		0307105105	59	Screw	Schraube		0307105159
6	Äußerer Sicherungsring	Outer circlip	Ø32	0307105106	60	Magnet assembly	Magnetbefestigung		0307105160
7	Dichtung der Nadelrolle	Needle roller gasket		0307105107	61	Screw	Schraube		0307105161
8	O-Ring	O-ring		0307105108	62	Switch	Schalter		0307105162
9	Wasserring	Water ring		0307105109	63	Knob	Knopf		0307105163
10	Schraube	Screw		0307105110	64	Screw	Schraube		0307105164
11	Spindel	Spindle		0307105111	65	Nut	Mutter		0307105165
12	Lager	Bearing	6904	0307105112	66	Flat gasket	Flachdichtung		0307105166
13	Vierkantstift	Squar pin		0307105113	67	Speeder	Speeder		0307105167
14	Schraube	Screw		0307105114	68	Screw	Schraube		0307105168
15	Getriebekasten	Gear box		0307105115	69	Screw	Schraube		0307105169
16	Einstellblock	Adjusting block		0307105116	70	Nut	Mutter		0307105170
17	Schraube	Screw		0307105117	71	Switch	Schalter		0307105171
18	Lager	Bearing	608	0307105118	72	Screw	Schraube		0307105172
19	I Zahnradwelle	I gear shaft		0307105119	73	Fuse	Sicherung		0307105173
20	Halbmondnadel	Crescent pin		0307105120	74	Fuse	Sicherung		0307105174
21	I Getriebe	I gear		0307105121	75	Circuit board holder	Leiterplattenhalter		0307105175
22	Lager	Bearing	608	0307105122	76	Circuit board	Leiterplatte		0307105176
23	Lager	Bearing	6904	0307105123	77	Screw	Schraube		0307105177
24	Zahnrad der Welle	Shaft gear		0307105124	78	Screw	Schraube		0307105178
25	Äußerer Sicherungsring	Outer circlip		0307105125	79	Handle	Griff		0307105179
26	Mittlere Abdeckung	Middle cover		0307105126	80	Screw	Schraube		0307105180
27	O-Ring	O-ring		0307105127	81	E-screw	E-Schraube		0307105181
28	Lager	Bearing	6000	0307105128	82	Needle roller gasket	Dichtung der Nadelrolle		0307105182
29	Armatur	Armature		0307105129	83	Bearing	Lager	6903	0307105183
30	Lager	Bearing	608	0307105130	84	Outer circlip	Äußerer Sicherungsring	18	0307105184
31	Schraube	Screw		0307105131	85	Lifting gear	Hebezahnrad		0307105185
32	Flachdichtung	Flat gasket		0307105132	86	Composite bearing	Kompositlager		0307105186
33	Windabweiser	Windshield		0307105133	87	Square pin	Vierkantstift		0307105187
34	Spule	Coil		0307105134	88	Lifter shaft	Heberwelle		0307105188
35	Statorgehäuse	Stator housing		0307105135	89	Cable	Kabel		0307105189
36	Schraube	Screw		0307105136	90	Anti-bending joint	Anti-Biege-Gelenk		0307105190
37	Kohlebürste	Carbon brush		0307105137	91	Flat gasket	Flachdichtung		0307105191
38	Spiralfeder	Coil spring		0307105138	92	Corrugated gasket	Gewellte Dichtung		0307105192
39	Bürstenhalter	Brush holder		0307105139	93	Screw	Schraube		0307105193
40	Schraube	Screw		0307105140	94	Extension sleeve	Verlängerungshülse		0307105194
41	Gewellte Dichtung	Corrugated gasket		0307105141	95	Feed handle	Vorschubgriff		0307105195
42	Schraube	Screw		0307105142	96	Screw	Schraube		0307105196
43	Schraube	Screw		0307105143	97	Plug	Verschlusskappe		0307105197
44	Obere Abdeckung	Top cover		0307105144	98	Water tank lid	Wassertankdeckel		0307105198
45	Schlauchanschluss	Hose connector		0307105145	99	Iron filings baffle	Ablenkung durch Eisenspäne		0307105199
46	PE-Schlauch	PE Hose		0307105146	100	Screw	Schraube		03071051100
47	Linke Leiste	Left bar		0307105147	101	O-ring	O-Ring		03071051101
48	Schraube	Screw		0307105148	102	Water tank	Wassertank		03071051102
49	Führungsplatte	Guide plate		0307105149	103	Water tank bracket	Halterung für Wassertank		03071051103
50	Zahnstange	Rack		0307105150	104	Screw	Schraube		03071051104
51	Rechte Leiste	Right bar		0307105151	105	Water tank ball valve	Wassertank-Kugelhahn		03071051105
52	Schraube	Screw		0307105152	106	Hose	Schlauch		03071051106
53	Schraube	Screw		0307105153	107	Joint	Gelenk		03071051107
54	Schraube	Screw		0307105154					

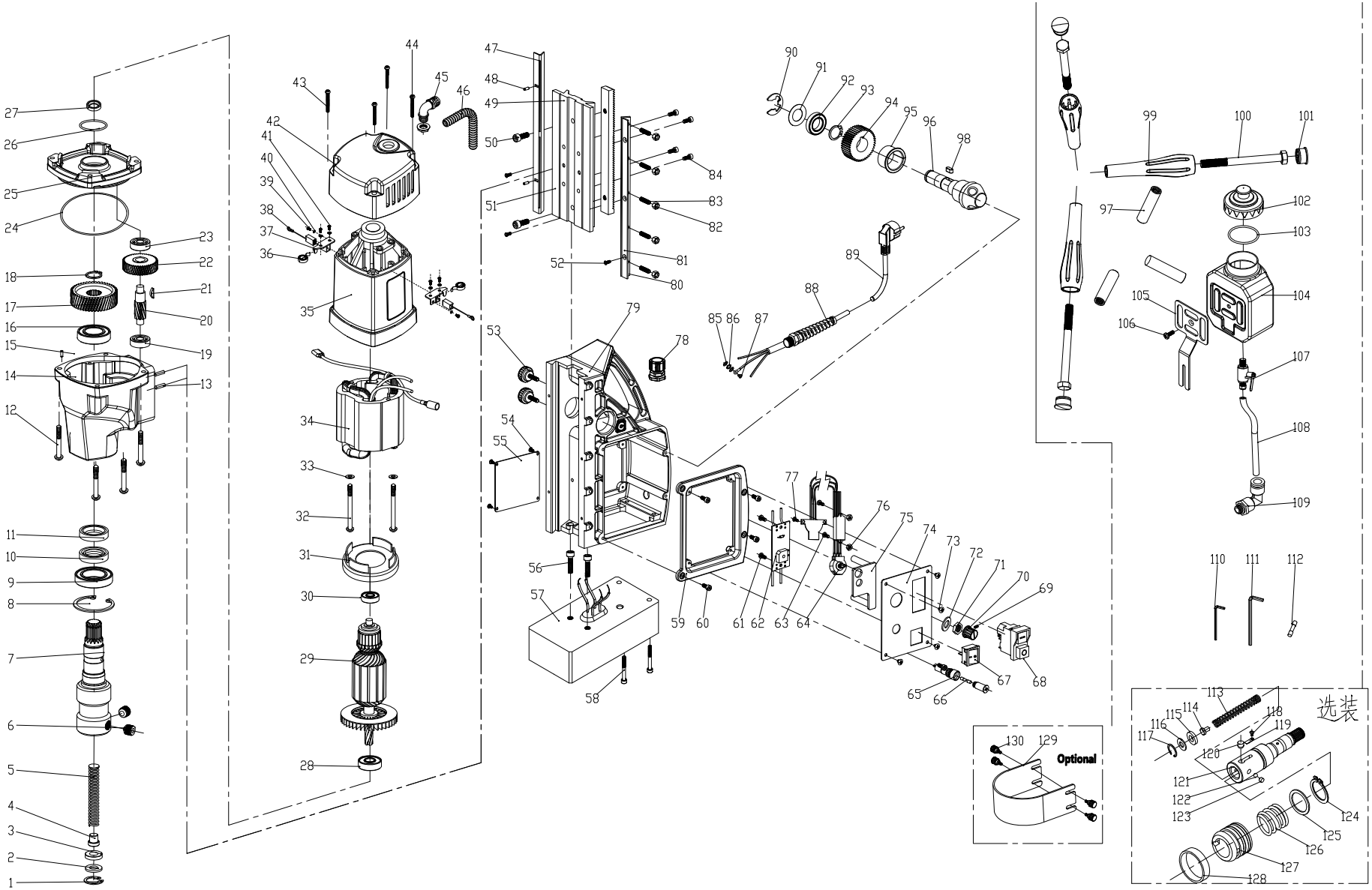
DM50_parts_V2.fm

8.4.1 Schaltplan - Wiring diagram



DM50_parts_V2.fm

8.5 DM50V



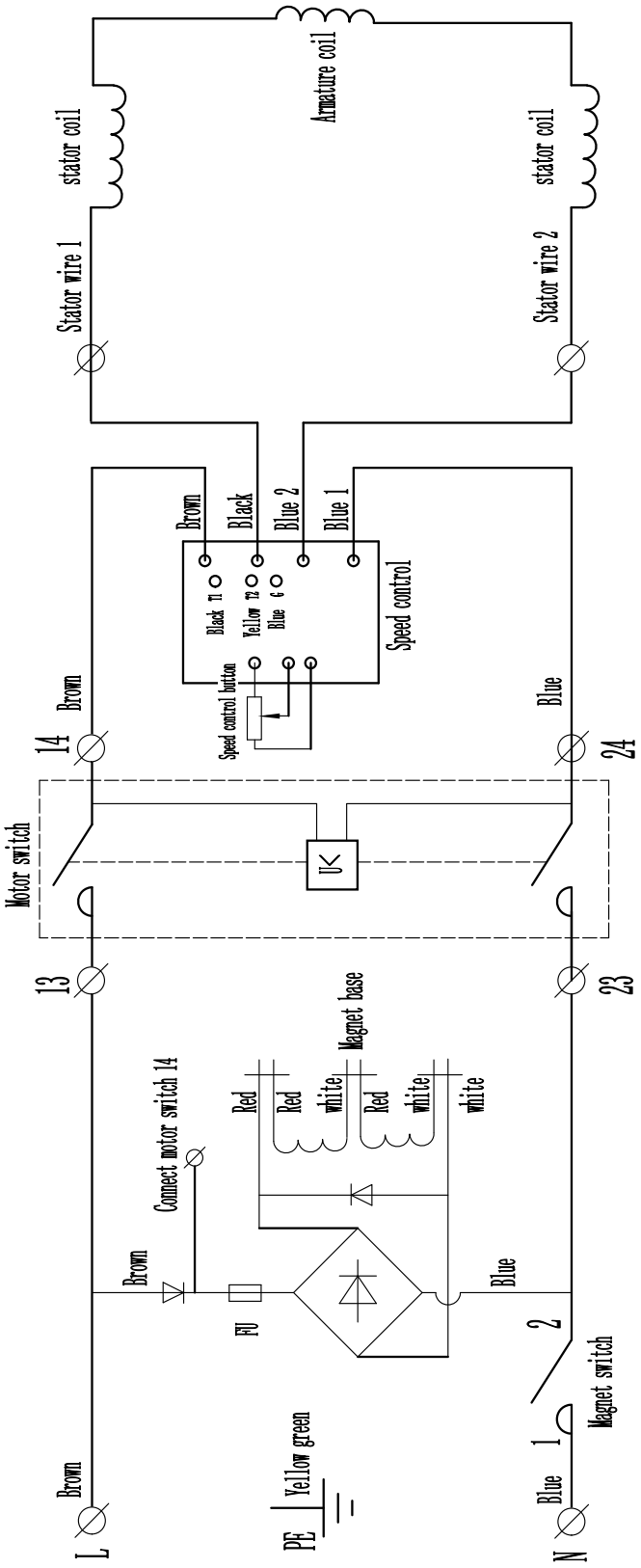
DM50V_parts_V2.fm

Ersatzteilliste -Spare part list - DM50V

Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.	Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.
1	Innensicherungsring	Inner circlip	Ø19	0307115101	66	Sicherung	Fuse		0307115166
2	Dichtung	Gasket		0307115102	67	Schalter	Switch		0307115167
3	Dichtung	Gasket		0307115103	68	Schalter	Swtich		0307115168
4	Feder	Spring		0307115104	69	Schraube	Screw		0307115169
5	Feder	Spring		0307115105	70	Knopf	Knob		0307115170
6	Schraube	Screw		0307115106	71	Mutter	Nut		0307115171
7	Spindel	Spindle		0307115107	72	Dichtung	Gasket		0307115172
8	Innensicherungsring	Inner circlip	Ø42	0307115108	73	Schraube	Screw		0307115173
9	Lager	Bearing	6905	0307115109	74	Knopfleiste	Button panel		0307115174
10	Wasserdichtung	Water seal		0307115110	75	Leiterplattenhalter	Circuit board holder		0307115175
11	Öldichtung	Oil seal		0307115111	76	Mutter	Nut		0307115176
12	Schraube	Screw		0307115112	77	Schraube	Screw		0307115177
13	Getriebekasten	Gear box		0307115113	78	Schlauchverbindung	Hose joint		0307115178
14	Zylinderstift	Cylinder pin		0307115114	79	Rahmen	Frame		0307115179
15	Getriebekasten	Gear box		0307115115	80	Verstellschieber	Adjusting slide		0307115180
16	Lager	Bearing	6904	0307115116	81	Schieberegler	Slider		0307115181
17	Hauptwellenzahnrad	Main shaft gear		0307115117	82	Mutter	Nut		0307115182
18	Äußerer Sicherungsring	Outer circlip	Ø16	0307115118	83	Schraube	Screw		0307115183
19	Lager	Bearing	608	0307115119	84	Schraube	Screw		0307115184
20	I Zahnradwelle	I gear shaft		0307115120	85	Flachdichtung	Flat gasket		0307115185
21	Halbmondnadel	Crescent pin		0307115121	86	Gewellte Dichtung	Corrugated gasket		0307115186
22	I Getriebe	I gear		0307115122	87	Schraube	Screw		0307115187
23	Lager	Bearing	608	0307115123	88	Schraube	Screw		0307115188
24	O-Ring	O-ring		0307115124	89	Kabel	Cable		0307115189
25	Mittlere Abdeckung	Middle cover		0307115125	90	E-Schraube	E-screw		0307115190
26	O-Ring	O-ring		0307115126	91	Dichtung der Nadelrolle	Needle roller gasket		0307115191
27	Öldichtung	Oil seal		0307115127	92	Lager	Bearing	6903	0307115192
28	Lager	Bearing	6000	0307115128	93	Äußerer Sicherungsring	Outer circlip	18	0307115193
29	Armatur	Armature		0307115129	94	Hebezahnrad	Lifting gear		0307115194
30	Lager	Bearing	608	0307115130	95	Kompositlager	Composite bearing		0307115195
31	Windabweiser	Windshield		0307115131	96	Heberwelle	Lifter shaft		0307115196
32	Schraube	Screw		0307115132	97	Verlängerungshülse	Extension sleeve		0307115197
33	Flachdichtung	Flat gasket		0307115133	98	Vierkantstift	Square pin		0307115198
34	Spule	Coil		0307115134	99	Vorschubgriff	Feed handle		0307115199
35	Statorgehäuse	Stator housing		0307115135	100	Schraube	Screw		03071151100
36	Spiralfeder	Coil spring		0307115136	101	Verschlusskappe	Plug		03071151101
37	Bürstenhalter	Brush holder		0307115137	102	Wassertankdeckel	Water tank lid		03071151102
38	Kohlebürste	Carbon brush		0307115138	103	O-Ring	O-ring		03071151103
39	Schraube	Screw		0307115139	104	Wassertank	Water tank		03071151104
40	Gewellte Dichtung	Corrugated gasket		0307115140	105	Halterung für Wassertank	Water tank bracket		03071151105
41	Schraube	Screw		0307115141	106	Schraube	Screw		03071151106
42	Obere Abdeckung	Top cover		0307115142	107	Wassertank-Kugelhahn	Water tank ball valve		03071151107
43	Schraube	Screw		0307115143	108	Schlauch	Hose		03071151108
44	Schraube	Screw		0307115144	109	Gelenk	Joint		03071151109
45	Schlauchverbindung	Hose joint		0307115145	110	Schlüssel	Wrench		03071151110
46	PE-Schlauch	PE hose		0307115146	111	Schlüssel	Wrench		03071151111
47	Winkelschieber	Angle slide bar		0307115147	112	Sicherung	Fuse		03071151112
48	Stift	Pin		0307115148	113	Feder	Spring		03071151113
49	Führungsplatte	Guide plate		0307115149	114	Feder	Spring		03071151114
50	Schraube	Screw		0307115150	115	Dichtung	Gasket		03071151115
51	Zahnstange	Rack		0307115151	116	Unterlegscheibe aus rostfreiem Stahl	Stainless steel washer		03071151116
52	Schraube	Screw		0307115152	117	Innensicherungsring	Inner circlip		03071151117
53	Schraube	Screw		0307115153	118	Schraube	Screw		03071151118
54	Schraube	Screw		0307115154	119	Schraube	Screw		03071151119
55	Rückwand	Rear panel		0307115155	120	Schraube	Screw		03071151120
56	Schraube	Screw		0307115156	121	Spindel	Spindle		03071151121
57	Magnetbefestigung	Magnet assembly		0307115157	122	Stahlkugel	Steel ball	Ø8	03071151122
58	Schraube	Screw		0307115158	123	Schraube	Screw		03071151123
59	Rahmen der Platte	Panel frame		0307115159	124	Äußerer Sicherungsring	Outer circlip	Ø35	03071151124
60	Schraube	Screw		0307115160	125	Dichtung	Gasket		03071151125
61	Schraube	Screw		0307115161	126	Schnellspannfeder	Quick release spring		03071151126
62	Leiterplatte	Circuit board		0307115162	127	Automatisches Entfernen der Wellenschutzhülse	Automatic removal of shaft sleeve		03071151127
63	Schraube	Screw		0307115163	128	Gummimanschette	Rubber sleeve		03071151128
64	Speeder	Speeder		0307115164	129	Ablenkung durch Eisenspäne	Iron filings baffle		03071151129
65	Sicherung	Fuse		0307115165	130	Schraube	Screw		03071151130

DM50V_parts_V2.fm

8.5.1 Schaltplan - Wiring diagram



DM50V_parts_V2.fm

8.6 DM50PM

8.6.1 Bohrkopf- Drilling head

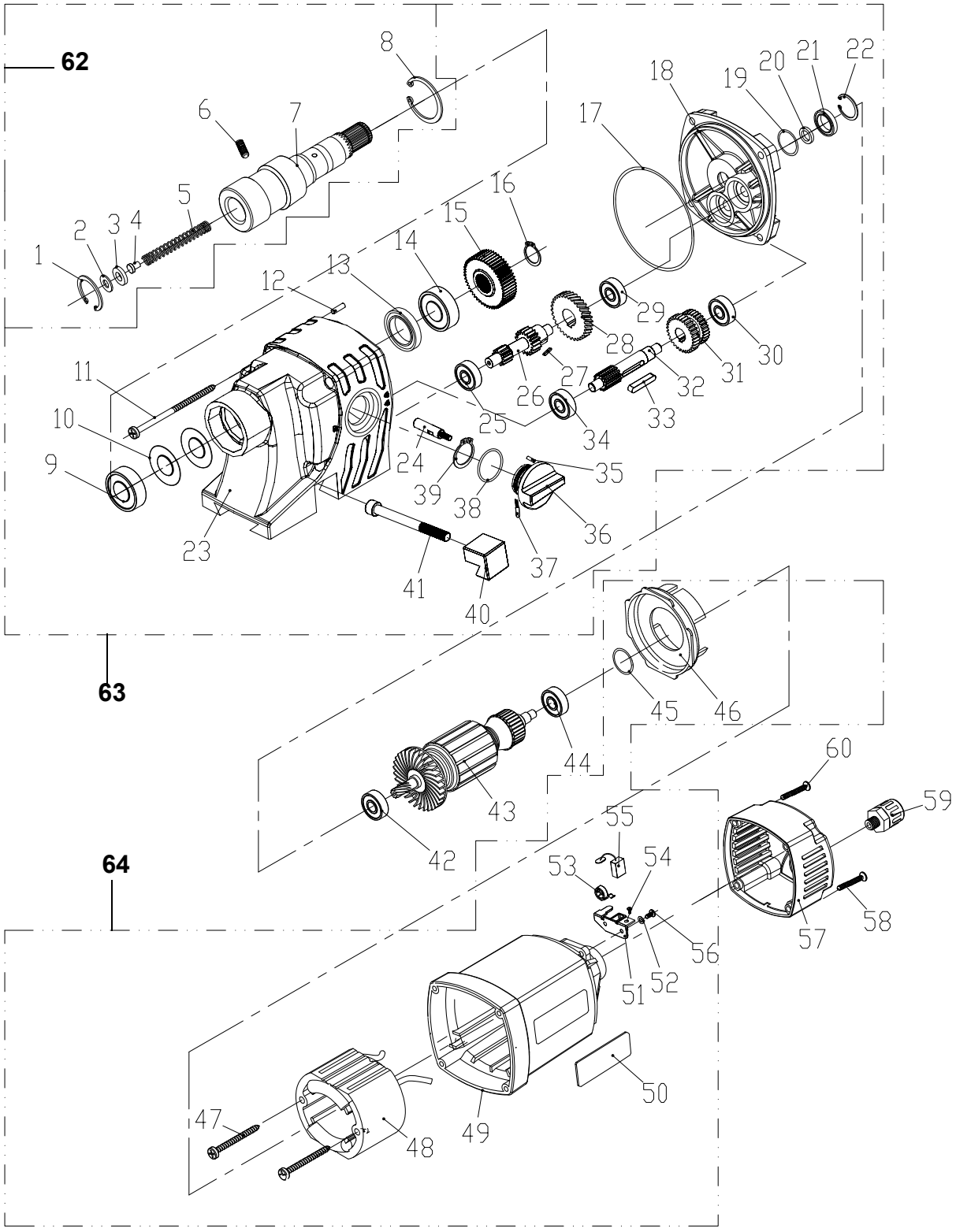


Fig. 8-3: Bohrkopf - Drilling head - DM50PM

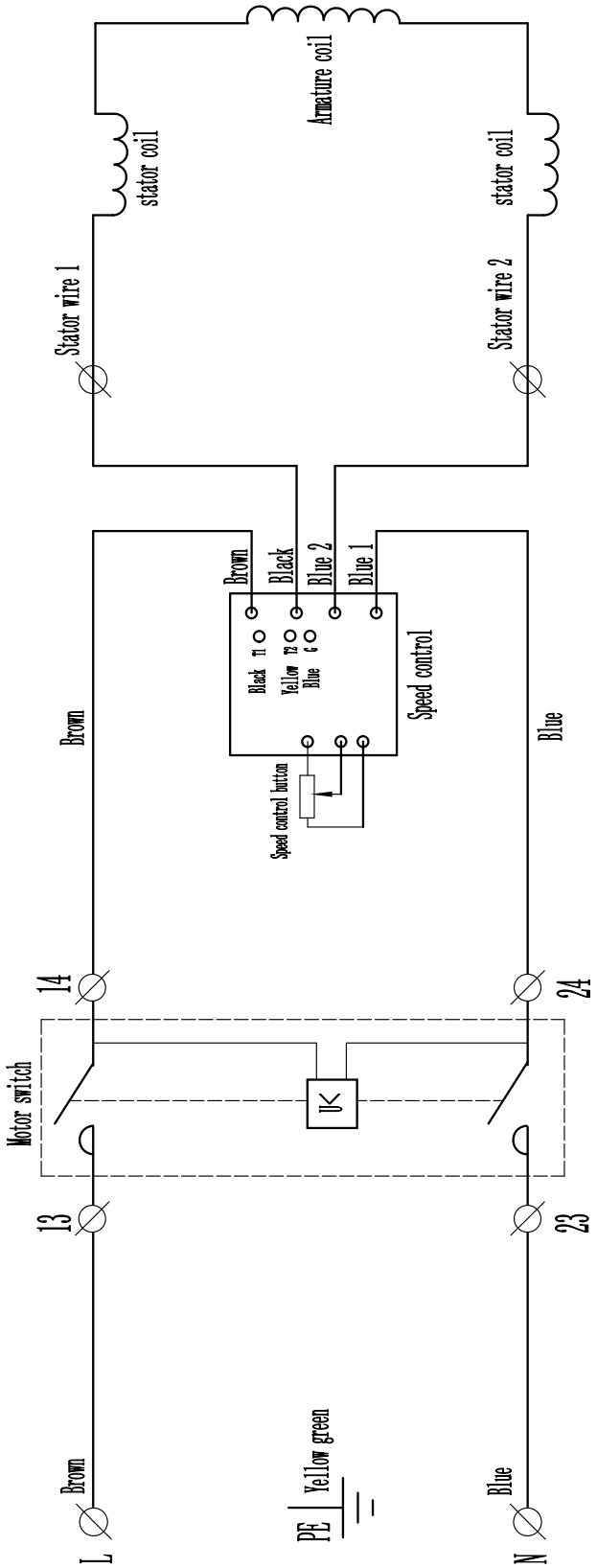
DM50PM_parts.fm

Ersatzteilliste Bohrkopf - Spare part list drilling head - DM50PM

Pos.	Bezeichnung	Description	Größe / Size	Art. nummer / Item no.
1	Sicherungsring, innen	Circlip, inner	19	042SR19W
2	Dichtung	Gasket		
3	Polyurethanscheibe	PU washer		
4	Stift für Feder	Pin for spring		03071550104
5	Feder	Spring		03071550105
6	Stiftschraube	Set screw	M10x12	
7	Spindel	Spindle		
8	Sicherungsring	Circlip	42	042SR42W
9	Lager	Bearing	6905	0406905R
10	Dichtung	Gasket	17x30x1	
11	Gehäuseschraube	Casing screw	M5x60	
12	Stift	Pin	4x12	
13	Wellendichtring	Shaft sealing ring	20x32x7	04120327
14	Lager	Bearing	16904	
15	Zahnrad	Gear		03071550115
16	Sicherungsring, innen	Circlip, inner	16	
17	O Ring	O ring	92x2	
18	Getriebedeckel	Gear cover	40	
19	O Ring	O-ring	28x1,8	
20	Stahlring	Steel ring	15x30x27	
21	Wellendichtring	Shaft sealing ring	15x21x3	
22	Sicherungsring, außen	Circlip, outer	27	
23	Getriebegehäuse	Gearbox	40	
24	Schaltstange	Selector rod		
25	Lager	Bearing	LFB608	
26	Rotor Getriebewelle	Rotor gear shaft		03071550126
27	Passfeder	Key	4x6	
28	Rotor Zahnrad	Rotor gear		03071550128
29	Lager	Bearing	LFB608	
30	Lager	Bearing	LFB609	
31	Rotorritzel	Rotor pinion		03071550131
32	Rotorzahnwelle	Rotor toothed shaft		03071550132
33	Passfeder	Key	5x30	
34	Lager	Bearing	LFB608	
35	Stift	Pin	3x9	
36	Getriebeschalter	Gear switch		03071550136
37	Spannstift	Dowel pin	4x15	
38	O Ring	O-ring	22.4x2.65	
39	Sicherungsring, innen	Circlip, inner	26	
40	Schwalbenschwanznut	Dovetail groove	25x25x25	
41	Schraube	Screw	M8x50	
42	Lager	Bearing	NSK6001	
43	Rotor	Rotor		03071550143
44	Lager	Bearing	NSK608	
45	O Ring	O-ring	22.4x2.65	
46	Luftleitring	Air conducting ring	40	
47	Blechschraube	Tapping screw	M4x70	
48	Stator	Stator		03071550148
49	Motorgehäuse	Motor housing		03071550149
50	Typenschild	Nameplate		
51	Halter Kohlebürste	Brush holder	300-2	03071550151
52	Scheibe	Washer	4	
53	Sicherungsring	Circlip	40	
54	Schraube	Screw	M4x8	
55	Kohlebürste	Carbon brush	40	03071550155
56	Kreuzschlitzschraube	Cross Screw	M4x12	
57	Motordeckel	Motor cover	40	03071550157
58	Gehäuseschraube	Casing screw	M5x40	
59	Zugentlastung	Strain relief	M12x1.2	
60	Gehäuseschraube	Casing screw	M5x45	
62	Spindel komplett	Spindle complete		03071550161
63	Getriebe mit Spindel komplett	Gear with spindle complete		
64	Motor komplett	Motor complete		03071550163
K	Transportkoffer	Transport case		03071550K

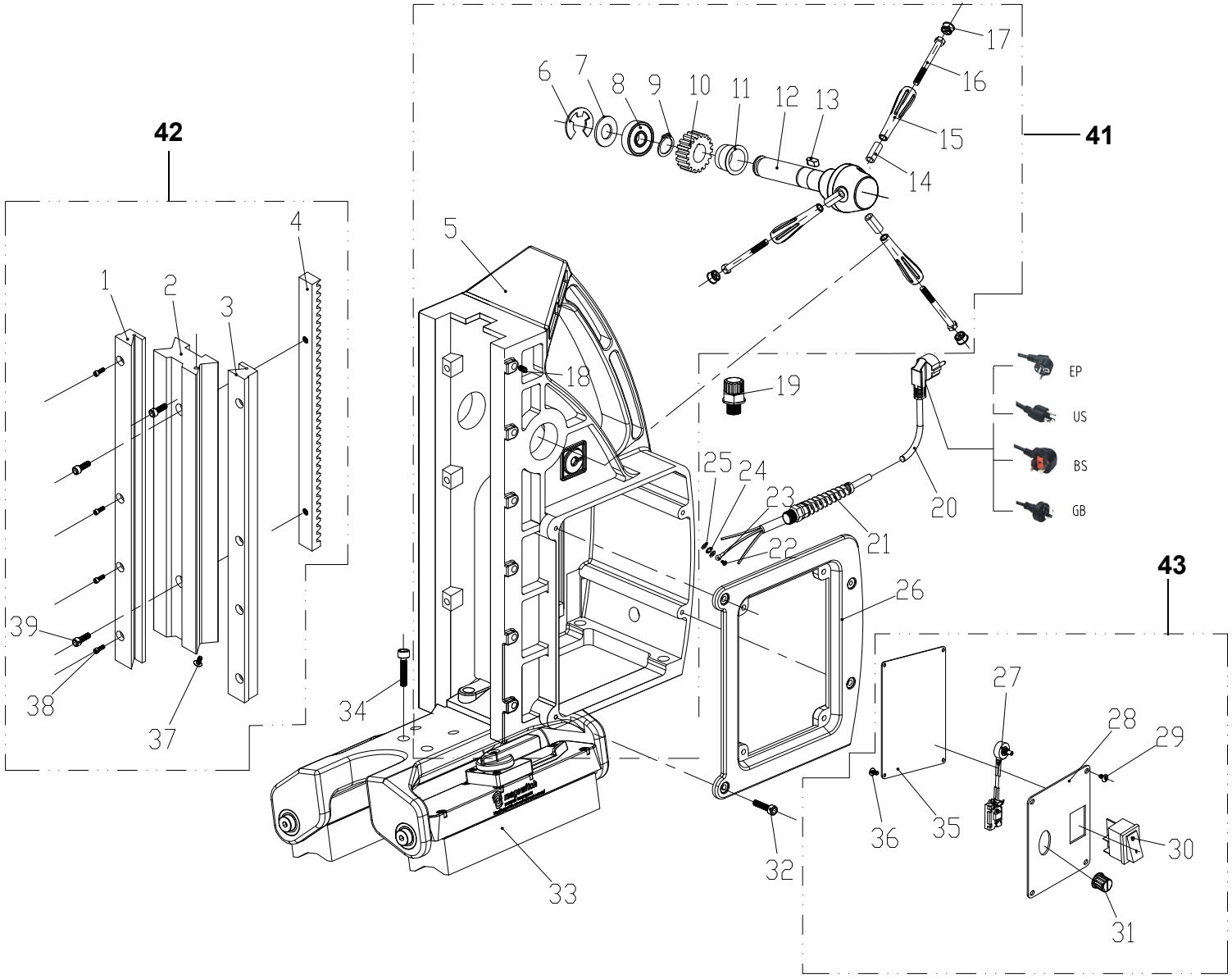
DM50PM_parts.fm

8.6.2 Schaltplan - Wiring diagram



DM50PM_parts.fm

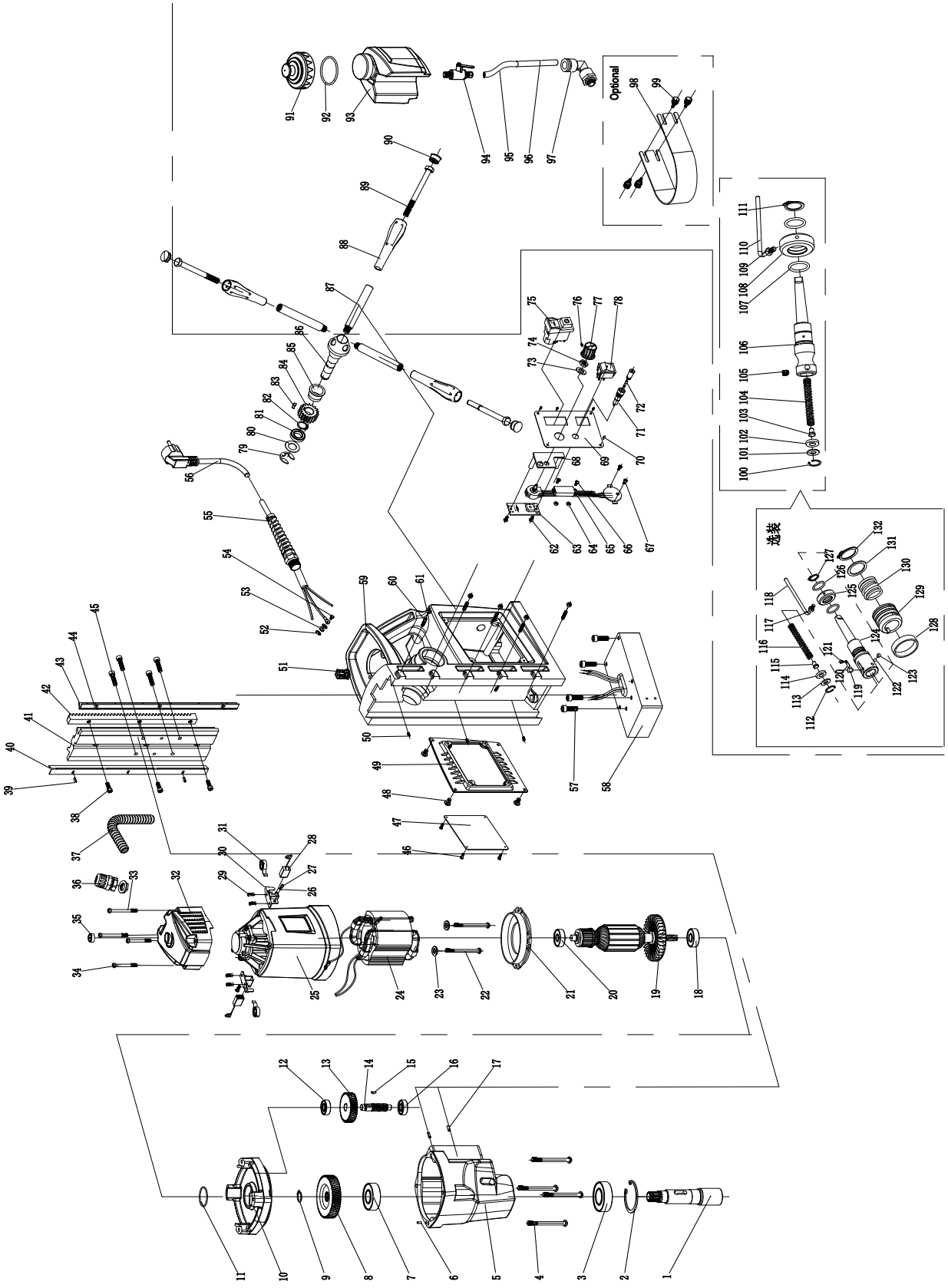
8.6.3 Magnetstand - Magnetic stand



DM50PM_parts.fm

Ersatzteilliste Magnetstand- Spare part list magnetic stand - DM50PM									
Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.	Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.
1	Linke Führungsschiene	Left rail track bar	17x230		25	Flachdichtung	Flat seal		
2	Schwalbenschwanz-führung	Dovetail groove guide rail			26	Einbaurahmen	Panel frame		
3	Rechte Führungsschiene	Right rail track bar	17x230		27	Drehzahregler	Speed controller	22	03071550227
4	Zahnstange	Toothed rack	10x16x180		28	Schaltertafel	Switch panel		
5	Ständer	Stand	13		29	Rostfreie Schraube	Stainless screw	M3x6	
6	Sicherungsring	Circlip	15	042SR15W	30	Schalter	Switch		03071550230
7	Rostfreie Scheibe	Stainless washer	17x30x0.5		31	Drehzahlknopf	Speed knob		03071550231
8	Lager	Bearing	6903	0406903	32	Rostfreie Schraube	Stainless screw	M4x10	
9	Sicherungsring, außen	Circlip, outer	18	042SR18W	33	Magnet	Magnet		03071550233
10	Vorschubzahnrad	Feed gear			34	Schraube	Screw	M6x20	
11	Gleitlager	Plain bearing	58x26x30		35	Rückwand	Back panel		
12	Vorschubwelle	Feed shaft			36	Rostfreie Schraube	Stainless screw	M3x20	
13	Passfeder	Key	5x14	042P5516	37	Rostfreie Schraube	Stainless screw	M5x8	
14	Griffhülse	Handle sleeve	10.5x16x38		38	Innensechskantschraube	Socket head cap screws	M4x20	
15	Griff	Handle			39	Innensechskantschraube	Socket head cap screws	M6x16	
16	Schraube	Screw	M10x150		41	Bohrständer mit Vorschubhebel komplett	Drill stand with feed lever complete		
17	Anschlag	Stopper			42	Gleitschlitten komplett	Sliding carriage complete		
18	Innensechskant-schraube	Socket head cap screws	M4x10		43	Schalterplatte komplett	Switch plate complete		
19	Zugentlastung	Strain relief	M12x1.5						
20	Anschlusskabel	Connecting lead							
21	Knickschutz	Kink protection							
22	Schraube	Screw	4						
23	Verbindung	Joint	4						
24	Dichtung	Gasket	13						

8.7 DM60V

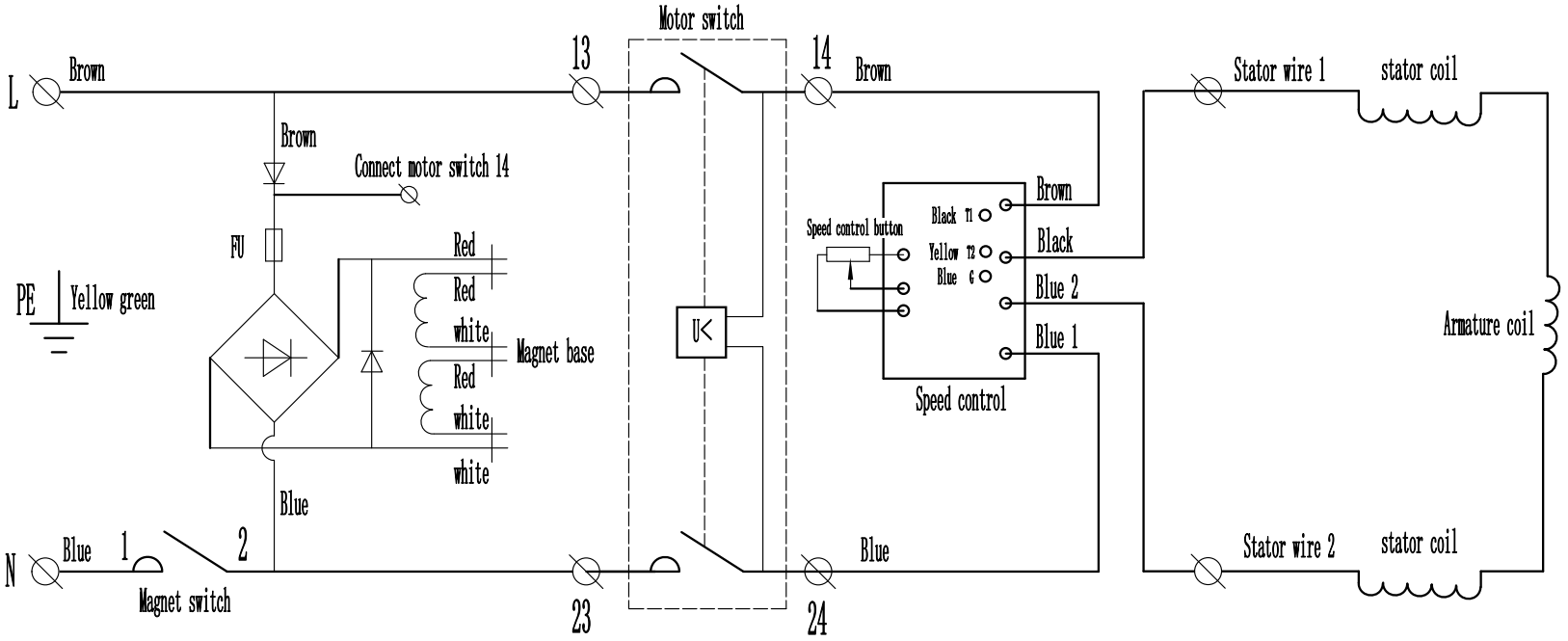


DM60V_parts_V2.fm

Ersatzteilliste -Spare part list - DM60V

Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.	Pos.	Bezeichnung	Description	Größe Size	Art. nummer Item no.
1	Spindel	Spindle		0307116101	67	Schraube	Screw		0307116167
2	Innensicherungsring	Inner circlip	Ø52	0307116102	68	Leiterplattenhalter	Circuit board holder		0307116168
3	Lager	Bearing		0307116103	69	Knopfleiste	Button panel		0307116169
4	Schraube	Screw		0307116104	70	Schraube	Screw		0307116170
5	Getriebekasten	Gear box		0307116105	71	Sicherung	Fuse		0307116171
6	Zylinderstift	Cylinder pin		0307116106	72	Sicherung	Fuse		0307116172
7	Lager	Bearing	6204	0307116107	73	Dichtung	Gasket		0307116173
8	Hauptwellenzahnrad	Main shaft gear		0307116108	74	Mutter	Nut		0307116174
9	Äußerer Sicherungsring	Outer circlip	Ø16	0307116109	75	Schalter	Switch		0307116175
10	Mittlere Abdeckung	Middle cover		0307116110	76	Schraube	Screw		0307116176
11	O-Ring	O-ring		0307116111	77	Knopf	Knob		0307116177
12	Lager	Bearing	629	0307116112	78	Schalter	Switch		0307116178
13	I Getriebe	I gear		0307116113	79	E-Schraube	E-screw		0307116179
14	I Zahnradwelle	I gear shaft		0307116114	80	Dichtung der Nadelrolle	Needle roller gasket		0307116180
15	Halbmondnadel	Crescent pin		0307116115	81	Lager	Bearing	6903	0307116181
16	Lager	Bearing	629	0307116116	82	Äußerer Sicherungsring	Outer circlip	Ø18	0307116182
17	Zylinderstift	Cylinder pin		0307116117	83	Vierkantstift	Square pin		0307116183
18	Lager	Bearing	6201	0307116118	84	Hebezahnrad	Lifting gear		0307116184
19	Armatur	Armature		0307116119	85	Kompositlager	Composite bearing	35HD	0307116185
20	Lager	Bearing	6200	0307116120	86	Heberwelle	Lifter shaft		0307116186
21	Windfang	Windshield		0307116121	87	Gelenk	Joint		0307116187
22	Schraube	Screw		0307116122	88	Vorschubgriff	Feed handle		0307116188
23	Flachdichtung	Flat gasket		0307116123	89	Schraube	Screw		0307116189
24	Spule	Coil		0307116124	90	Verschlusskappe	Plug		0307116190
25	Statorgehäuse	Stator shell		0307116125	91	Wassertankdeckel	Water tank lid		0307116191
26	Gewellte Dichtung	Corrugated gasket		0307116126	92	O-Ring	O-ring		0307116192
27	Schraube	Screw		0307116127	93	Wassertank	Water tank		0307116193
28	Kohlebürste	Carbon brush		0307116128	94	Wassertank-Kugelhahn	Water tank ball valve		0307116194
29	Schraube	Screw		0307116129	95	Feder	Spring		0307116195
30	Bürstenhalter	Bursh holder		0307116130	96	Schlauch	Hose		0307116196
31	Spiralfeder	Coil spring		0307116131	97	Gelenk	Joint		0307116197
32	Obere Abdeckung	Top cover		0307116132	98	Schraube	Screw		0307116198
33	Schraube	Screw		0307116133	99	Ablenkung durch Eisenspäne	Iron filings baffle		0307116199
34	Schraube	Screw		0307116134	100	Innensicherungsring	Inner circlip	Ø19	03071161100
35	Gradienter	Gradienter		0307116135	101	Dichtung	Gasket		03071161101
36	Schlauchanschluss	Hose connector		0307116136	102	Dichtung	Gasket		03071161102
37	PE-Schlauch	PE hose		0307116137	103	Feder	Spring		03071161103
38	Schraube	Screw		0307116138	104	Feder	Spring		03071161104
39	Stift	Pin		0307116139	105	Schraube	Screw		03071161105
40	Winkelschieber	Angle slide bar		0307116140	106	Morsekegel MK2	Morse taper MT2		03071161106
41	Führungsplatte	Guide plate		0307116141	107	O-Ring	O-ring		03071161107
42	Zahnstange	Rack		0307116142	108	Wasserring	Water ring		03071161108
43	Verstellschieber	Adjusting slide		0307116143	109	Mutter	Nut		03071161109
44	Schieberegler	Slider		0307116144	110	Stopphebel	Stop lever		03071161110
45	Schraube	Screw		0307116145	111	Äußerer Sicherungsring	Outer circlip	Ø28	03071161111
46	Schraube	Screw		0307116146	112	Innensicherungsring	Inner circlip	Ø19	03071161112
47	Abdeckplatte	Cover panel		0307116147	113	Unterlegscheibe aus rostfreiem Stahl	Stainless steel washer		03071161113
48	Schraube	Screw		0307116148	114	Dichtung	Gasket		03071161114
49	Rahmen der Platte	Panel frame		0307116149	115	Feder	Spring		03071161115
50	Schraube	Screw		0307116150	116	Feder	Spring		03071161116
51	Schlauchanschluss	Hose connector		0307116151	117	Mutter	Nut		03071161117
52	Flachdichtung	Flat gasket		0307116152	118	Stopphebel	Stop lever		03071161118
53	Gewellte Dichtung	Corrugated gasket		0307116153	119	Schraube	Screw		03071161119
54	Schraube	Screw		0307116154	120	Schraube	Screw		03071161120
55	Anti-Biege-Gelenk	Anti-bending joint		0307116155	121	Schraube	Screw		03071161121
56	Kabel	Cable		0307116156	122	Stahlkugel	Steel ball		03071161122
57	Schraube	Screw		0307116157	123	Schraube	Screw		03071161123
58	Magnetbefestigung	Magnet assembly		0307116158	124	Schnellspann-Futter	Quick-release chuck		03071161124
59	Rahmen	Frame		0307116159	125	Wasserring	Water ring		03071161125
60	Schraube	Screw		0307116160	126	O-Ring	O-ring		03071161126
61	Mutter	Nut		0307116161	127	Äußerer Sicherungsring	Outer circlip	Ø28	03071161127
62	Schraube	Screw		0307116162	128	Schnelles Entfernen der Gummimanschette	Quick removal of rubber sleeve		03071161128
63	Leiterplatte	Circuit board		0307116163	129	Automatisches Entfernen der Wellenhülse	Automatic removal of shaft sleeve		03071161129
64	Mutter	Nut		0307116164	130	Schnellspannfeder	Quick release spring		03071161130
65	Drehzahlpoti	Speed potentiometer		0307116165	131	Dichtung	Gasket		03071161131
66	Schraube	Screw		0307116166	132	Äußerer Sicherungsring	Outer circlip	Ø35	03071161132

8.7.1 Schaltplan - Wiring diagram



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