Operating manual

Version 1.0

Geared drill

DH 32GS

Item no. 9680225

US

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Preface

Dear customer,

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

Company metal working machines offer a maximum of quality, technically company 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 main-tenance 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 eco-nomic 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 hesi-tate to contact us.

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

C.H.HANSON
2000 North Aurora Rd.
Naperville,IL 60563
Call 800-827-3398

1 Safety

Glossary of symbols

☞	provides further instructions
➜	calls on you to act
❍	enumerations

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 geared 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 geared drill.

Always keep the operating manual close to the drill for further reference.

INFORMATION

If you are not able to solve a problem using this manual, please do not hesitate to contact us for further professional advice:
Exclusive USA Agent
C.H.HANSON
2000 North Aurora Rd.
Naperville,IL 60563
Call 800-827-3398

1.1 Type plates

1.2 Safety instructions (warning notes)

1.2.1 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.

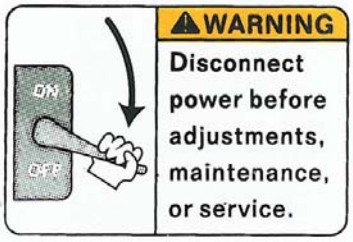
Pictogram	warning alert	definition/consequence
	**DANGER!**	Threatening danger that will cause serious injury or death to people.
	WARNING!	Risk: A danger that might cause serious injury or death to a person.
	CAUTION!	Danger or unsafe procedure that might cause injury to people or damage to property.
	**ATTENTION!**	Situation that could cause damage to the machine and to the product and other types of damages. No risk of injury to personnel.
	**Information**	Application advice and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In the case of specific dangers, we replace the pictogram

or

General danger with a warning of injuries to hands, hazardous electrical voltage, or rotating parts.

1.2.2 Other pictograms



Warning of automatic start-up!

Disconnect main power!

Activation forbidden!

Use ear protection!

Use safety shoes!

Use protective gloves!

Wear a safety suit!

Protect the environment!

Use safety glasses!

Contact address

1.3 Proper use

WARNING!

In the event of improper use of the drill

- **there may be a risk to personnel,**
- **there may be a risk to the machine and other items,**

correct functioning of the drill may be affected.

The drill is designed and manufactured to be used in environments where there is no potential danger of explosion. The drill is designed and manufactured to produce holes in cold metal or other not health hazardous or non- flammable material by using a rotating cutting tool with several chucking grooves.

If the drill is used in any way other than described above, or modified without authorization, then the drill- is being used improperly.

We do not take liability for damage caused through improper use.

We would like to stress that any modifications to the construction, or technical or technological modifications that have not been authorized will also render the warranty null and void.

It is also part of proper use that

- the maximum values of the drill are complied with,
- the operating manual is constantly observed,
- inspection and maintenance instructions are observed.

☞ "Technical Data“ on page 16

WARNING!

Very serious injury.

It is forbidden to make any modifications or alternations to the operating values of the drill! They could endanger employees and cause damage to thedrill.

1.4 Possible dangers caused by the drill.

The drill is state of the art.

Nevertheless, there is a residual risk as the drill operates with

- high revolutions,
- rotating parts,
- electrical voltage and currents.

We have used construction resources and safety techniques to minimize the health risk to persons resulting from these hazards.

If the drill is used and maintained by employees who are poorly qualified, then there might be a risk resulting from incorrect operation and unsuitable maintenance of the drill.

INFORMATION

Everyone involved in the assembly, commissioning, operation and maintenance must

- be duly qualified,
- strictly follow this operating manual.

Due to improper use

- there is a risk for the employee,
- the machine and further property might be endangered,
- the function of the drill could be effected.

Always disconnect the drill if cleaning or maintenance work is being carried out.

WARNING!

The drill may only be used with the safety devices activated.

Disconnect the drill immediately whenever you detect a failure in the safety device or when they are not mounted!

All additional installations carried out by the operator must incorporate the safety devices prescribed.

This is your responsibility being the operator!

☞ **"Safety devices“ on page 10**

1.5 Qualification of employees

1.5.1 Target group

This manual applies to

- ❍ the operators,
- ❍ the users,
- ❍ the maintenance staff.

Therefore, the warning notes refer to both operation and maintenance of the drill.

Determine clearly and make a permanent decision in who will be responsible for the different activities on the machine (operation, maintenance and repair).

Vague and unclear assignment of responsibilities constitute a safety hazard!

Always disconnect the main power of the drill. This will prevent it from being used by unauthorised persons.

1.5.2 Authorized Personnel

WARNING!

Incorrect use and maintenance of the drill constitute a danger for the staff, objects and the environment.

Only authorized persons may operate the drill!

Persons to operate and maintain should be trained technical staff and instructed by the ones who are working for the operator and for the manufacturer.

The user must

Obligations of the operator

- ❍ train the staff,
- ❍ instruct the staff in regular intervals (at least once a year) on
  - all safety standards that apply to the bench drill and upright drill,
  - the operation,
  - accredited technical guidelines,
- ❍ check the knowledge of the staff,
- ❍ document training / instructions,
- ❍ require the staff to confirm participation in training / instructions by means of a signature,
- ❍ check if the staff is aware of safety rules and dangers in the workplace so that they observe the operating manual.

The user must

Obligations of the user

- ❍ have followed a training on the operation of the drill,
- ❍ know the function and performance,
- ❍ before commissioning
  - have read and understood the operating manual,
  - be familiar with all safety devices and regulations.

For working on the following machine parts, additional requirements are being applied:

Further requirements to the qualification

- Electrical parts or operating agents: shall only be performed by an electrician or under the guidance and supervision of an electrician.

Before starting work on electrical parts or operating agents, following measures are to be performed in the following order.

➜ disconnect main electrical power

➜ Ensure that the machine cannot be turned on again

➜ check that there is no voltage

1.6 Safety measures during operation

CAUTION!

Risk due to inhaling health hazardous dusts and mist.

Depending on the material being processed and any additional dusts and mist in the work area, conditions might impair your health.

Make sure that the generated health hazardous dusts and mist are safely removed at the point of origin and are collected and/ or filtered from the working area. Use an appropriate dust collection/ filter unit.

CAUTION!

Risk of fire and explosion by using flammable materials or cooling lubricants.

Take additional preventive measures in order to safely avoid health hazards before processing flammable materials (e.g. aluminum, magnesium) or before using flammable additives (e.g. solvents).

1.7 Safety devices

Operate the drill only with properly functioning safety devices.

Stop the drill immediately if there is a failure in the safety device or if it is not functioning for some reason.

It is your responsibility!

If the safety device has been activated or has failed, the drill must only be operated again when

- the cause of the failure has been removed,
- you have made sure that there is no existing danger for persons or objects.

WARNING!

If you bypass, remove or override a safety device in any other way, you are endangering yourself and other persons working on the drill. The possible consequences are the following

- **injuries due to components or parts of components flying off a high speed,**
- **contact with rotating parts,**
- **fatal electrocution.**

The drill includes the following safety devices:

- an EMERGENCY-STOP switch,
- a drilling machine table with T-slots to fasten the workpiece or a vise,
- a protective cover for the pulleys with positioning switch.

WARNING!

The separating protective equipment which is made available and delivered together with the machine is designed to reduce the risk of workpieces or fractions of them which being expelled, but not to remove them completely.

1.8 Safety check

Check the drill at least once per shift. Inform the person responsible immediately of any defect or change in the operation function.

Check all safety devices

- at the beginning of each shift (with the machine stopped),
- once a week (with the machine in operation),
- after every maintenance and repair work.

Check that the prohibition, warning and information labels as well as the markings on the drill

- are legible (clean them, if necessary),
- are complete.

INFORMATION

Use the following overview to organise the inspections.

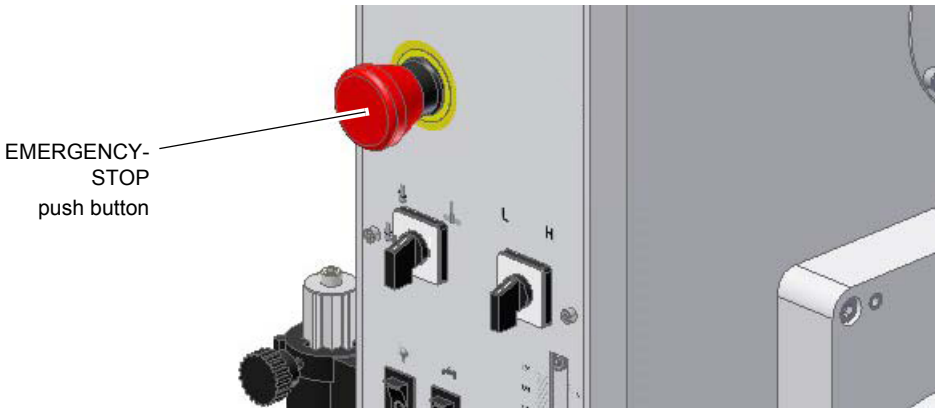
General inspection		
Item	**Inspection**	**OK**
Protective cover	Mounted, securely tightened and not damaged	
Signs, markings	Installed and legible	
Date:	**Inspector (signature):**	

Functional test		
Item	**Inspection**	**OK**
EMERGENCY-STOP-push button	Once the emergency stop button is activated, the drill should be switched off.	
limit switch protective cover V-belts	The drill must not switch on, if the protective cover of the pulleys is opened.	
drill chuck guard	The drill must only switch on when the drill chuck guard is closed.	
Date:	**Inspector (signature):**	

1.9 EMERGENCY-STOP push button

ATTENTION!

Also after actuating the EMERGENCY-STOP switch, the drilling spindle is turning - depending on the previously selected speed - for a few seconds more.



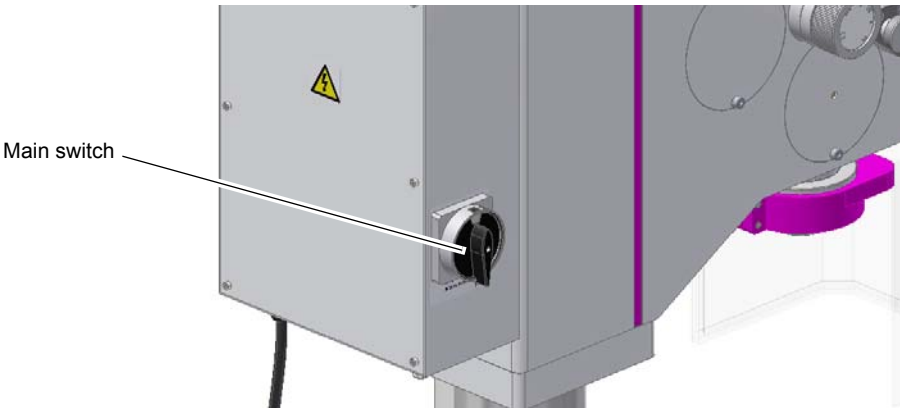
Img. 1-1: Emergency stop

1.9.1 Main switch

In the "0" position, the lockable main switch can be secured against accidental or non-authorised switching on by means of a padlock.

The power supply is interrupted by switchingoff the main plug.

Except for the areas marked by the pictogram in the margin. In these areas there might be voltage, even if the main switch is switched-off.



Img. 1-2: Main switch

WARNING!

Dangerous voltage even if the main switch is switched off.

The areas marked by the pictogram might contain live parts, even if the main switch is switched off.

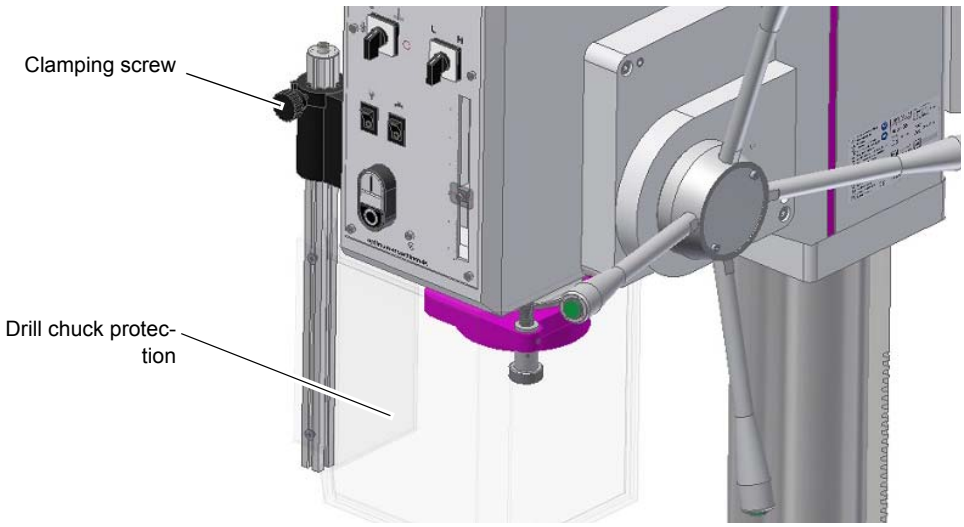
1.9.2 Drill chuck protection

Adjust the protective equipment to the correct height before you start working.
To do so, detach the clamping screw, adjust the required height and re-tighten the clamping screw.

A switch is integrated in the fixture of the spindle protection which monitors that the cover is closed.

INFORMATION

You cannot start the machine if the drill chuck protection is not closed.



Img. 1-3: Drill chuck protection

1.10 Personal protective equipment

For certain work individual protection gear as protective equipment. This includes:

- 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!

Dirty or contaminated personnel protective equipment can 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 works where your face and eyes are exposed to hazards.

Use protective gloves when handling pieces with sharp edges.

Wear safety shoes when you assemble, disassemble or transport heavy components.

1.11 Safety during operation

We specifically point out the dangers when describing the work with and on the geared drill.

WARNING!

Before switching on the geared drill make sure that there are no

- **no dangers generated for persons,**
- **no objects are damaged.**

Avoid any unsafe work methods:

- Make sure that nobody is endangered by your work.
- The instructions mentioned in these operating instructions have to be strictly observed during assembly, operation, maintenance and repair.
- Do not work on the geared 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 responsible for your company.
- Inform the supervisor about all hazards or faults.
- Stay at the geared drill until all movements have come to a complete standstill.
- Use the prescribed personnel protective equipment. Make sure to wear a well-fitting work suit and, if necessary, a hairnet.
- Do not use protective gloves when drilling.

1.12 Safety during maintenance

Inform the operators in good time of any maintenance and repair works.

Report all safety relevant changes and performance details of the geared drill. Any changes must be documented, the operating instructions updated and machine operators instructed accordingly.

1.12.1 Disconnecting and securing the geared drill.

Switch off the geared drill with the main switch and secure the main switch with a padlock against unauthorised switching-on or switching-on by accident.

All machine parts as well as any dangerous voltages are switched off. Excepted are only the positions which are marked with the adjoining pictogram.

1.13 Using lifting equipment

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death.

Check that the lifting and load suspension gear

- **they have sufficient load carrying,**
- **and that it is in perfect condition.**

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities responsible for your company.

Fasten the loads properly. Never walk under suspended loads!

1.13.1 Mechanical maintenance work

Reinstall all protection and safety devices after any maintenance work once the work has been completed.This includes:

- covers,
- safety instructions and warning signs,
- grounding cables.

Check if they are working properly!

1.13.2 Mechanical maintenance work

Remove all protection and safety devices before starting maintenance work and re-install them once the work has been completed, such as:

- covers,
- safety indications and warning signs,
- earth (ground) cables.

If you remove protection or safety devices, refit them immediately after completing the work. Check if they are working properly!

1.14 Electrical

Have the machine and / or the electrical equipment checked regularly, at least every six months.

Eliminate immediately all defects such as loose connections, defective wires, etc.

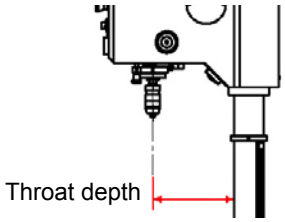
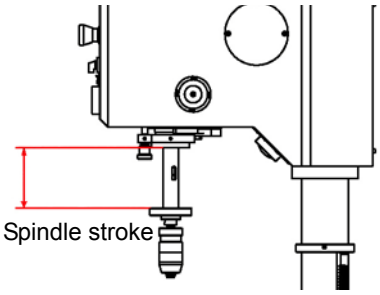
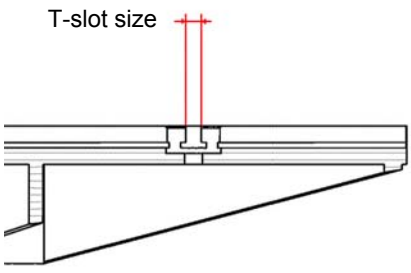
A second person must be present during work on live components, to disconnect the power in case of an emergency.

Disconnect the drill immediately if there is a malfunction in the power supply!

☞ "Maintenance“ on page 38

2 Technical data

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

Motor	230V ~60 Hz, 3Ph 2.0 / 3.0 HP
Drilling capacity in steel	32mm (1.26")
Continuous drilling capacity in steel	29mm (1.14")
	285mm (11.22")
	125mm (4.92")
Spindle seat	MT4
Table size Length x Width of the working surface	400 x 420mm (15.75" x 16.54")
	14mm (0.55")
Distance spindle - table	820mm (32,28")
Maximum distance spindle - stand	1280mm (50.39")
Working surface stand Length x Width of the working surface	420 x 644mm (16.54" x 25,35")
Rotatable table	360°
Dimensions of the machine	☞ Page 18
Required space	Keep a work area of at least one metre around the machine free for operation and maintenance.

Spindle speeds [rpm]	90 I 130 I 290 440 I 510 I 770 1650 I 2480
Number of speeds	8
Environmental conditions temperature	40 - 95 °F
Environmental conditions Relative humidity	25 - 80 %
Operating material gear	Anti-friction bearing grease
Operating material Toothed rod and drill column	Commercial lubricating grease
Coolant equipment	Water mixable, nebular arm, high flash point, nitrite content of the emulsion is less than 20 mg/l
	Filling quantity 6 litres

2.1 Emissions

The generation of noise emitted by the geared drill is 76 dB(A).
If the geared drill is installed in an area where various machines are in operation, the noise exposure (immission) on the operator of the geared drill at the working place may exceed 80 dB(A).

INFORMATION

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.

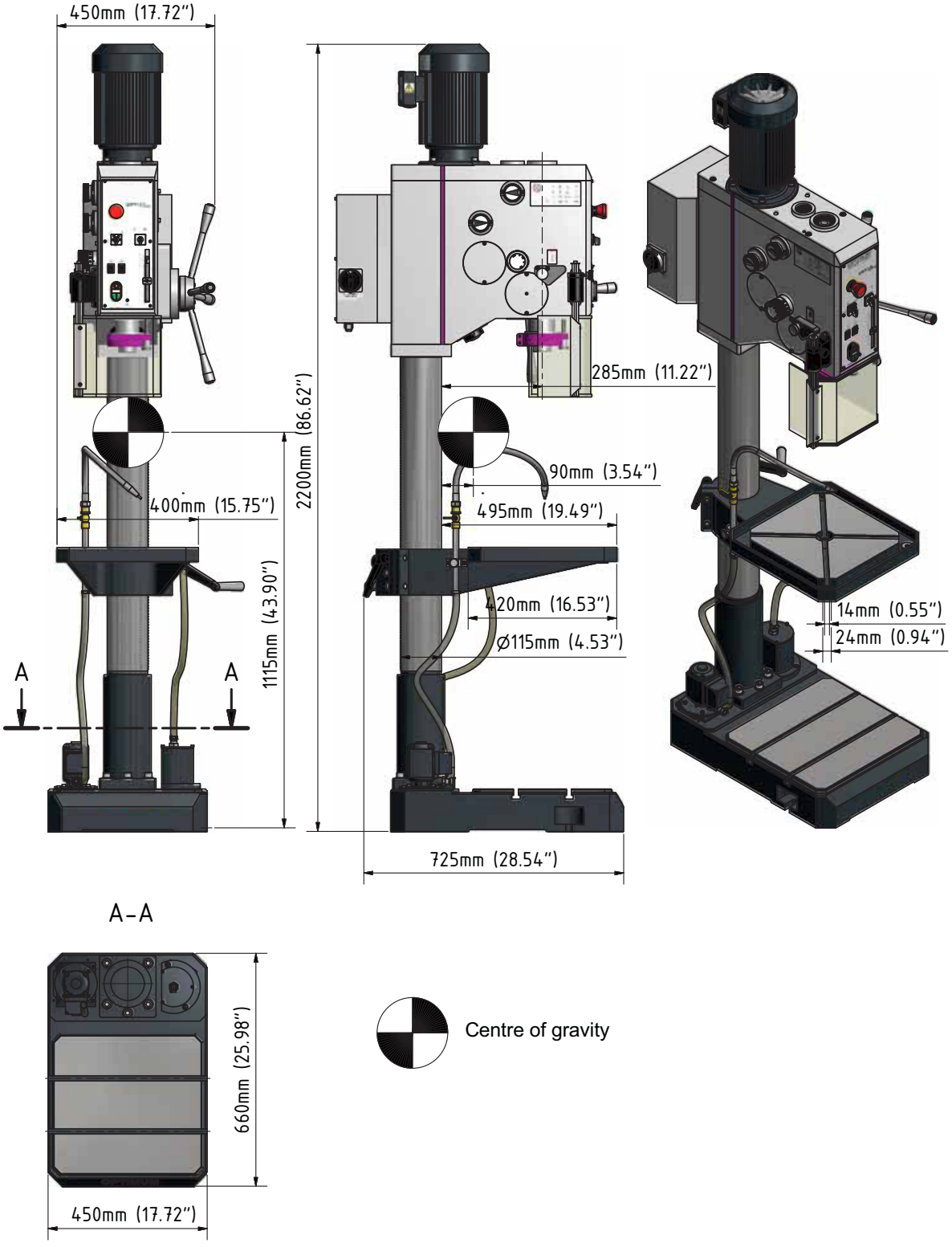
Furthermore, it is possible that the admissible exposure level might be different from country to country due to national regulations.
This information about the noise emission should, however, allow the operator of the machine to more easily evaluate the hazards and risks.

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 protection and hearing protection.

2.2 Dimensions



Img. 2-1: Dimensions

3 Assembly

3.1 Scope of delivery

When the machine is delivered, check immediately that the machine has not been damaged during transport and that all components are included. Compare the parts supplied the information on the packaging list.

3.2 Transport

- Centres of gravity

- Load suspension points
  (Marking of the positions for the load suspension gear)

- Prescribed transportation position
  (Marking of the top surface)

- Means of transport to be used
- Weights

WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box.

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load capacity and that it is in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities responsible for your company.

Fasten the loads properly.

Never walk under suspended loads!

3.3 Installation and assembly

3.3.1 Requirements regarding the installation site

Organize the working area around the geared drill according to the local safety regulations.

INFORMATION

In order to provide for good functionality and high machining accuracy as well as long durability of the machine the site should fulfill certain criteria.

Observe the following items:

- The device must only be installed and operated in dry ventilated places.
- Avoid places nearby machines generating chips or dust.
- The site has to be vibration-free, i.e. at a distance from presses, planing machines, etc.

- The substructure has to be appropriate for drill. Also make sure that the load bearing capacity and the evenness of the floor are appropriate.
- The substructure has to be prepared in a way that possibly used coolant cannot penetrate into the ground.
- Protruding parts such as stops, handles, etc. need to be secured by measures provided by the customer if necessary in order to avoid dangers for persons.
- Provide sufficient space for assembly and operating staff as well as for material transport.
- Also allow for accessibility for setting and maintenance works.
- Make sure that the main power of the drilling machine is freely accessible.
- Provide for sufficient illumination (minimum value: 47 Lumens/ft², measured at the tool tip). In case of insufficient intensity of illumination provide for additional illumination i.e. by a separate workplace illuminator.

INFORMATION

The main switch of the geared drill must be freely accessible.

3.3.2 Assembly

WARNING!

Danger of crushing and overturning.

The geared drill must be installed by at least 2 people.

INFORMATION

The geared drill is delivered pre-assembled.

3.4 Installation

➜ Check the horizontal orientation of the base of the geared drill with a spirit level.

➜ Check that the foundation has sufficient floor-load capacity and rigidity. The total weight amounts.

➜ Position the geared drill on the intended foundation.

➜ Fix the geared drill in the provided through-holes on the machine foot.

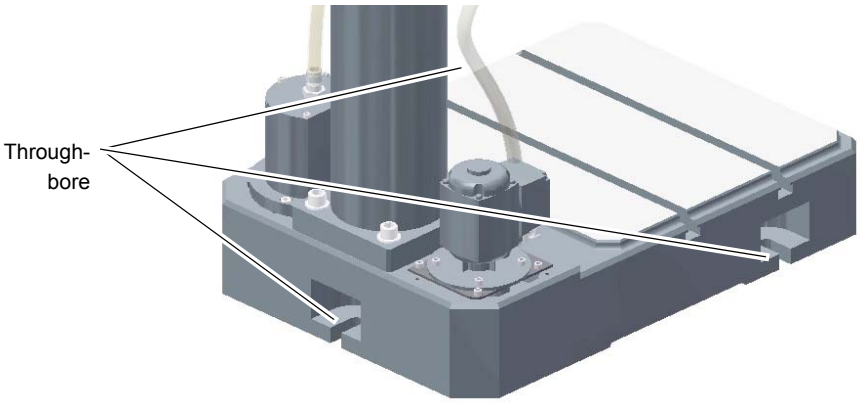
WARNING!

The condition of the underground and the fixing type of the machine foot to the underground must be in a way that it can bear the loads of the geared drill. The underground must be level. Check if the underground of the geared drill is level using a spirit level.

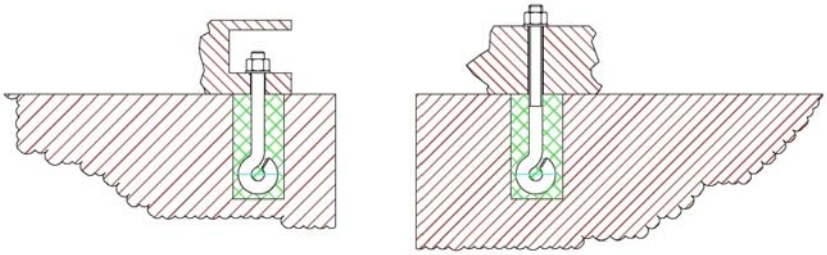
3.5 Fixing

In order to provide for the necessary stability of the geared drill,
it is necessary to firmly connect the geared drill with its foot to the substructure. We recommend you to use shear connector cartridges resp. heavy-duty anchors.

➜ Fix the foot of the geared drill to the substructure with the provided through-holes.



Img. 3-1: Marking of the fixing points



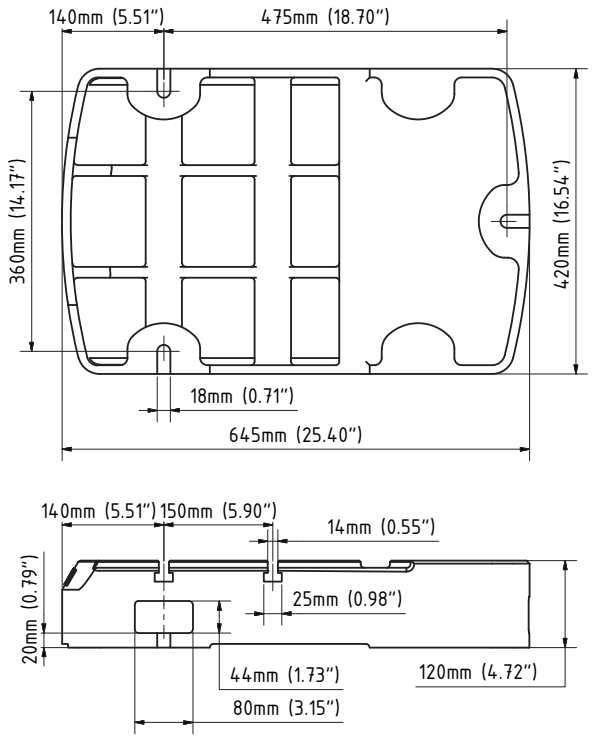
Img. 3-2: Example for the floor fixture

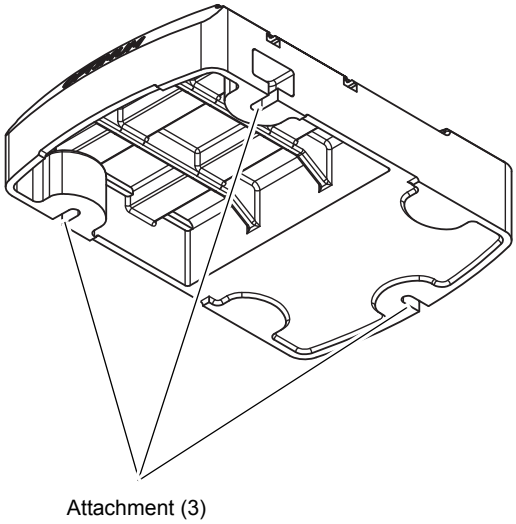
ATTENTION!

Tighten the fixing screws of the geared drill only as much that it is safely fixed and cannot break away or tilt over.

If the fixing screws are too tight in particular in connection with an uneven substructure it may result in a broken stand.

3.5.1 Assembly drawing





Attachment (3)

Img. 3-3: Assembly drawing

3.6 First commissioning

ATTENTION!

Before commissioning the machine, check all screws, fixtures and/or safety devices and tighten up the screws if necessary!

WARNING!

Risk by using improper tool holders or operating them at inadmissible speeds.
Only use the tool holders (e.g. drill chuck) which were delivered with the machine or which are offered as optional equipment by company.

Only use tool holders in the intended admissible speed range.

Tool holders may only be modified in compliance with the recommendation of company or of the manufacturer of the clamping devices.

WARNING!

When first commissioning the geared drill by inexperienced staff you endanger people and the machine.

We do not accept any liability for damages caused by incorrectly performed commissioning.

☞ „Qualification of employees“ auf Seite 9

3.6.1 Warming up the machine

ATTENTION!

If the geared drill and in particular the drilling spindle is immediately operated at maximum load when it is cold it may result in damages.

If the machine is cold, e.g. directly after having transported the machine, it should be warmed up at a spindle speed of only 500 1/min for the first 30 minutes.

3.6.2 Power supply

➜ Connect the electrical supply cable.

➜ Check the fuse protection (fuse) of your electrical supply according to the technical specifications for the total connected load of the upright drill.

3.6.3 Connecting the optional foot switch

for thread cutting on DH32GS.

The foot switch is used to reverse the direction of rotation for thread cutting.

Img.3-4: Connector plug foot switch

➜ Connect the foot switch to the connector. Compare the PIN assignment of the connector in the cabinet.

INFORMATION

The connection cable has no polarity. The contact (2 wires) is designed as looped signal.

4 Operation

4.1 Safety

Commission the machine only under the following conditions:

- The machine is in proper working order.
- The machine is used as prescribed.
- The operating manual is followed.
- All safety devices are installed and activated.

All failures should be eliminated immediately. Stop the machine immediately in the event of any anomaly in operation and make sure it cannot be started up accidentally or without authorization

Notify the person responsible immediately of any modification. ☞ "Safety during operation“ on page 14

A frictionally engaged connection keeps and centres the quick-action drill chuck with the taper mandrel in the drill spindle.

4.2 Before starting work

Before starting work, select the desired speed. It is depending on the used drilling diameter and on the material.

☞ "Determining the cutting speed and the speed“ on page 90

INFORMATION

The data of the speed tables are guide values. In some cases it may be advantageous to increase or decrease these values.

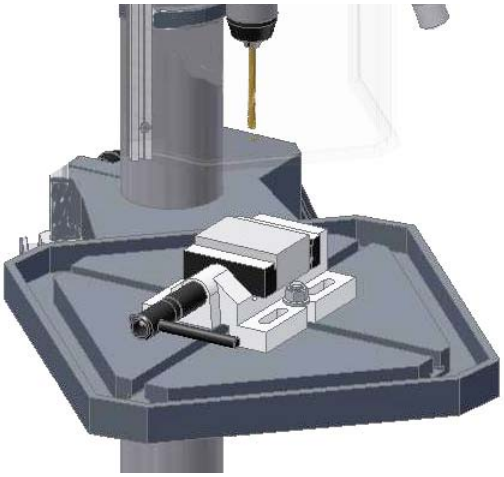
When drilling a cooling or lubricating agent should be used.

For stainless materials do not center as the material would compact and the drill bit will become rapidly blunt.

WARNING!

For drilling jobs, it is necessary to clamp the workpiece firmly to prevent the bit catching on the pieces. A machine vice or clamping claws is a suitable clamping device.

The workpieces need to be tensed in flexibly and stably (vice, screw clamp).



Img.4-1: seats for clamping blocks

Put a wooden or plastic board beneath the workpiece to avoid drilling through to the work table, vice, etc.

If required, adjust the desired drilling depth by means of the drilling depth stop in order to obtain a uniform drilling depth.

Please make sure to use a suitable dust suction when treating wood since wood dust may be health hazardous. Wear a suitable dust mask when performing works at which dust is generated.

4.3 During work

The spindle sleeve is advanced by means of the star wheel. Make sure that the feed is constant and not too fast.

The spindle sleeve is returned to its initial position by the return spring.

WARNING!

Seizing of clothes and / or hair.

- **Make sure to wear well-fitting work during drilling work.**
- **Do not use gloves.**
- **If necessary, use a hairnet.**

CAUTION!

Danger of bumps from the levers on the star wheel.

Do not release the star wheel when repositioning the drilling spindle sleeve.

Pull back the drilling spindle sleeve by hand.

CAUTION!

Danger of crushing. Do not place your hand between the drilling head and the spindle sleeve.

INFORMATION

The smaller the bit the more easily it may break.

In the case of deep drilling, remove the bit from time to time to remove filings from the drill. Add a few drops of oil to reduce friction and prolong the service life of the bit.

4.4 Cooling

CAUTION!

Danger of injury due to brushes getting caught or pulled in. Use a spray gun or a squeeze bottle for cooling, or the coolant system of the machine.

The friction generated during rotation can cause the edge of the tool to become very hot.

The tool should be cooled during the drilling process. Cooling the tool with a suitable cooling lubricant ensures better working results and a longer edge life of the tools. Use a spray gun or a squeeze bottle for cooling the tool.

INFORMATION

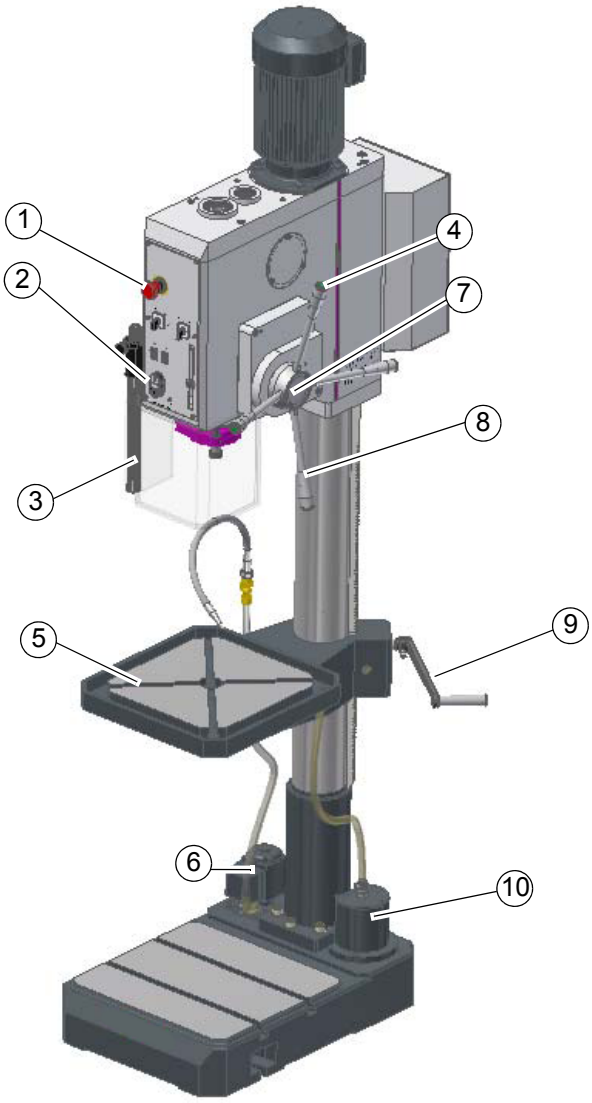
Use a water-soluble and non-pollutant drilling emulsion as a cooling agent.This can be acquired from authorised distributors.

Make sure that the cooling agent is being collected.

Respect the environment when disposing of any lubricants and coolants.

Follow the manufacturer’s disposal instructions.

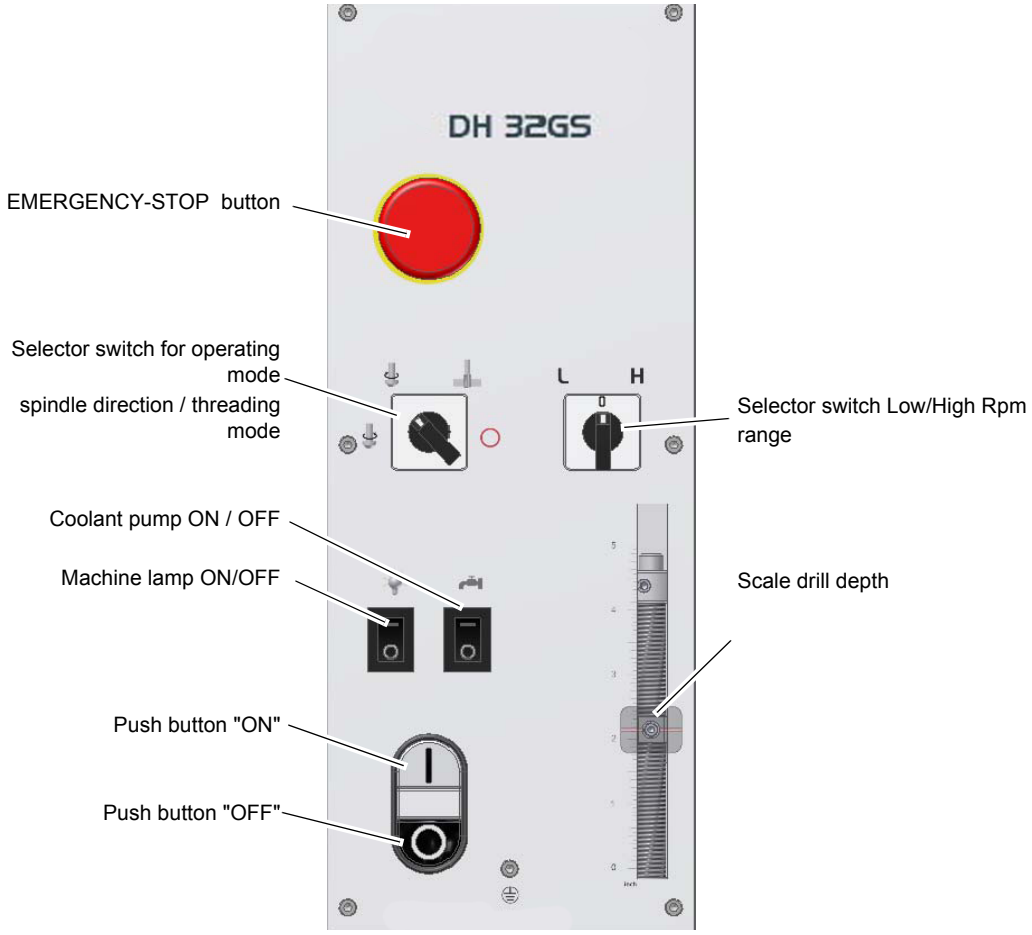
4.5 Control and indicating elements



Img.4-2: Control and indicating elements

Pos.	Designation	Pos.	Designation
1	EMERGENCY-STOP button	2	Push button ON / OFF
3	Drill chuck protection	4	Push button in lever for spindle sleeve feed
5	Drilling table	6	Coolant pump
7	Magnetic clutch feed	8	Lever for spindle sleeve feed
9	Table height adjustment	10	Chip filter

4.6 Control panel



Img.4-3: Operating element on the control panel

Selection switch for operating mode

The operating mode "Threading or Drilling" is selected with the selector switch

Operating mode "Threading"

In the thread cutting mode the motor automatically starts up according to a predefined path over the drilling depth stop and automatically changes the turning direction as soon as the predefined depth had been achieved. The screw-tap is drawn out of the workpiece.

Note: when in thread cutting mode, motor will also reverse every time the button switch at the end of feed handles is pressed.

Rotation direction switch

The direction of spindle rotation can be switched by setting operating mode switch to clock-wise or counterclockwise position.

It is possible to select two speed stages for each direction of rotation using the switch.

- The labelling "L" means low range Rpm
- The labelling "H" means high range Rpm

☞ "Speed table“ on page 30

ATTENTION!

Wait until the rotation of the drill spindle has come to a complete halt before changing the rotation direction using the rotation direction switch.

A change over of the rotation direction during operation may result in a destruction of the motor and of the rotation direction switch.

Push button ON

The push button "ON" switches on the rotation of the drilling spindle.

Push button OFF

The "push button OFF“ switches the rotation of the drilling spindle off.

Operation control lamp

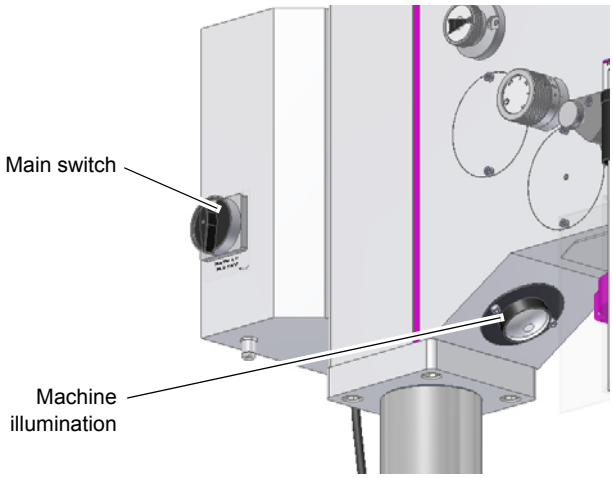
The operating control lamp on the operating panel has to flash.

Coolant pump ON / OFF

Switches the coolant pump.

Machine illumination ON/OFF

Switches the backlight on or off.



Img.4-4: Machine illumination

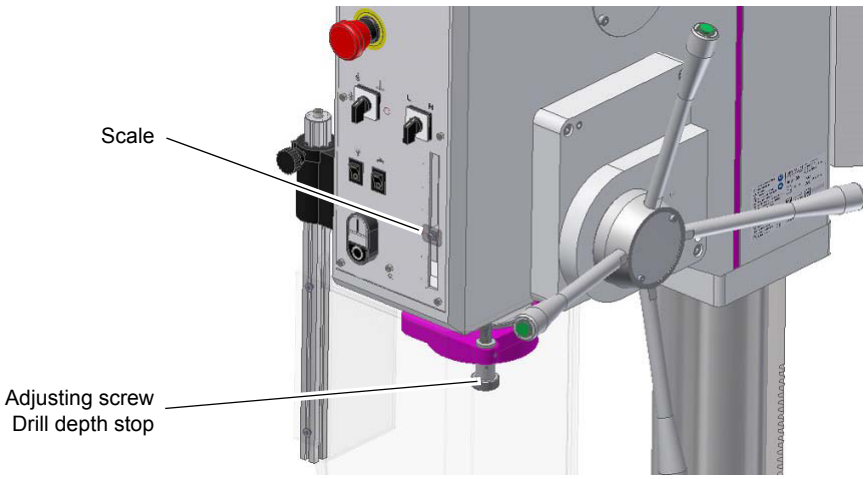
Main switch

Interrupts or connects the power supply.

4.6.1 Drill depth stop

When drilling several holes of the same depth you can use the drill depth stop.

➜ Adjust the desired drilling depth by means of the scale and of the adjusting screw



Img.4-5: Drill depth stop

4.7 Switching on the machine

INFORMATION

You cannot start the machine if the drill chuck protection is not closed.

➜Switch on the main switch.

➜Close drill chuck protection

Img.4-2: “Control and indicating elements“ on page 26

➜Select the direction of rotation.

➜Select the gear stage ☞ "Speed table“ on page 30.

➜Actuate the push button "ON".

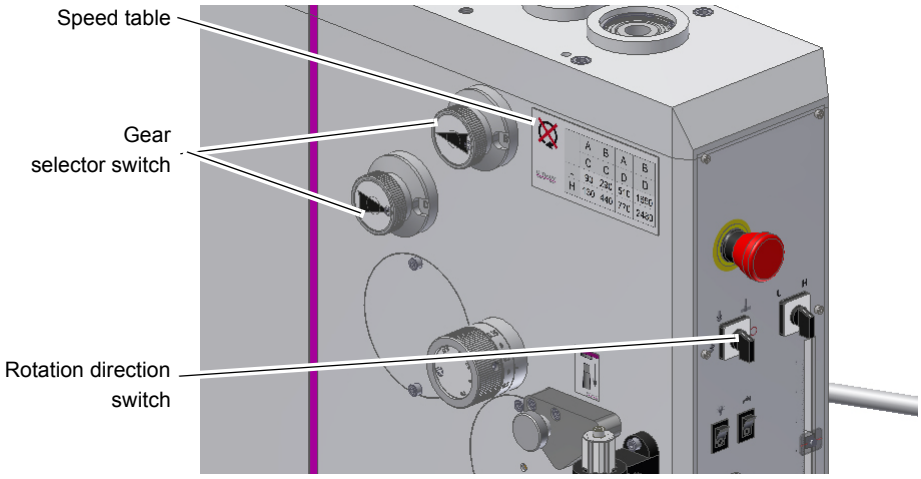
4.8 Switching off the machine

➜Actuate the push button "OFF".

➜For a long-term standstill of the machine switch it off at the main switch.

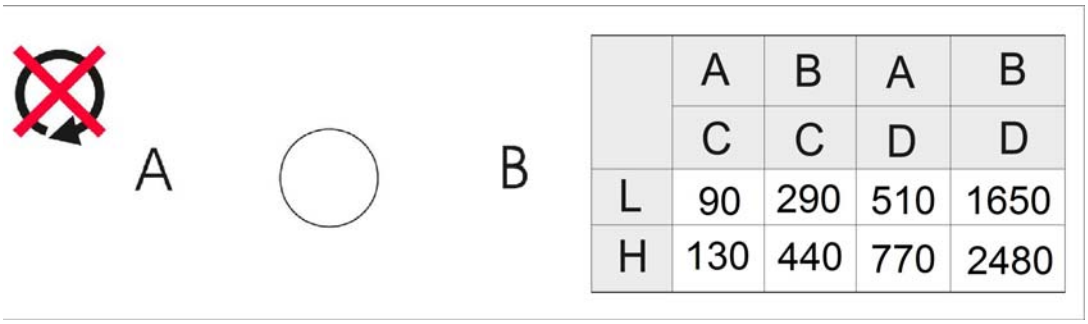
4.8.1 Gear selector switch

The speed is selected by means of the gear selector switches. You obtain a total of 8 speed ranges in connection with the speed stages on the rotation direction switch.



Img.4-6: Gear selector switch

4.8.2 Speed table



	A	B	A	B
	C	C	D	D
L	90	290	510	1650
H	130	440	770	2480

Img.4-7: Speed table

INFORMATION

Observe the speed table on the drilling head when selecting the speed.

ATTENTION!

Wait until the rotation of the drill spindle has come to a complete halt before changing the speed using the gear selector switches.

A change over of the gearing during operation may result in a destruction of the gear.

4.9 Quill feed

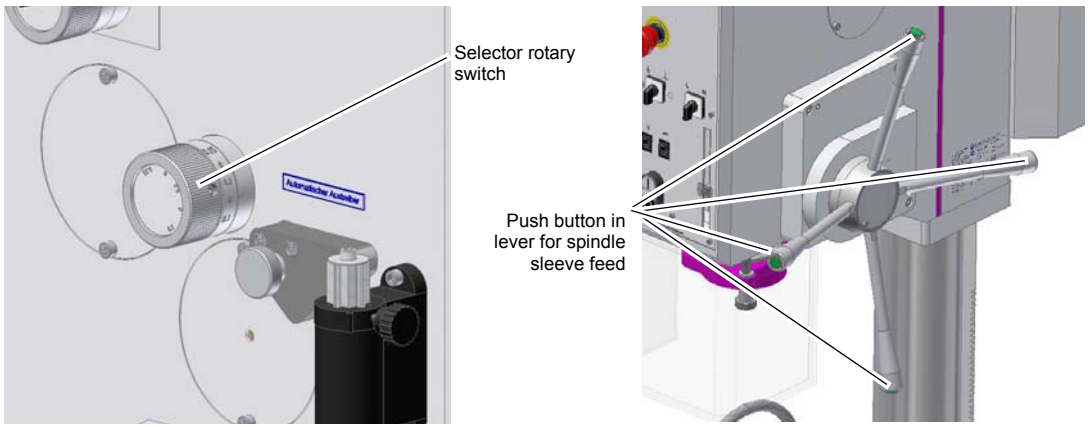
The spindle sleeve feed is performed manually by actuating the spindle sleeve lever or automatically.

4.9.1 Manual spindle sleeve feed

Move the sleeve downward by means of the spindle sleeve lever. The sleeve is returned to its initial position by means of the spring force.

4.9.2 Automatic spindle sleeve feed

The feed is activated by pressing the push buttons in the spindle sleeve lever. The feed is performed by an electromagnetic coupling. The feed is switched off by the drilling depth stop or by pressing the push button in the spindle sleeve lever again.



Img.4-8: Automatic spindle sleeve feed

➜ Select the speed of the spindle sleeve feed actuating the selector rotary switch:
- 0.10 mm (0.004") / Spindle revolution (up to Ø 30 mm / 1.18")
- 0.15 mm (0.006") / Spindle revolution (up to Ø 24 mm / 0.94")
- 0.20 mm (0.008") / Spindle revolution (up to Ø 20 mm / 0.79")

INFORMATION

The higher the pre-set speed the more rapid is the feed speed on the sleeve. Adjust the correct speed depending on the used material and on the drill diameter.

➜ Adjust the depth stop ☞ "Drill depth stop“ on page 29.

➜ Press the push button in the spindle sleeve lever. The electromagnetic spindle sleeve feed is activated.

❍ As soon as the preset drilling depth in the drilling depth stop is attained the micro switch deactivates the drill feed. The drilling sleeve returns to the top position by spring force.

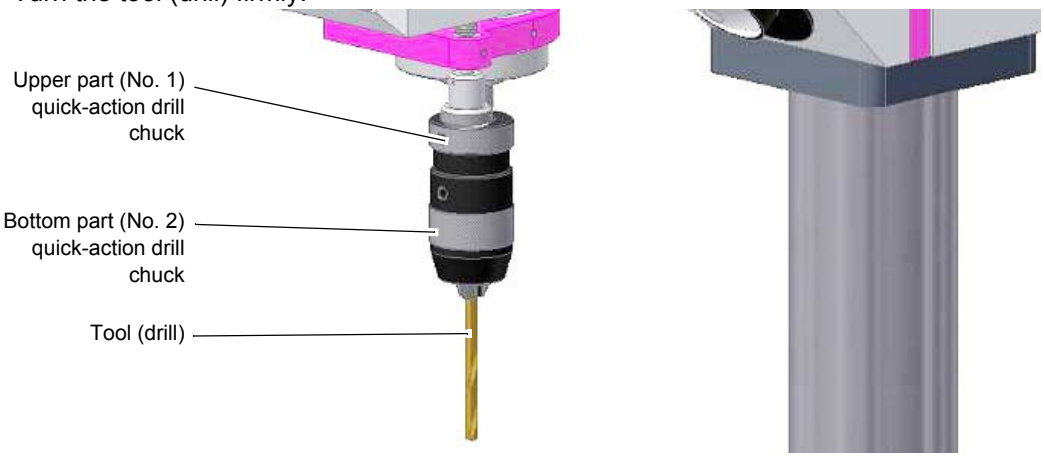
4.10 Disassembly, assembly of drill chucks and drill bits

4.10.1 Use the quick-action drill chuck

The drill chuck consists of two parts(1 and 2).

➜ Hold the upper part (No.1) of the drill chuck. With the bottom part of the drill chuck (No. 2) it is possible to tighten or loosen the jaws of the quick-action drill chuck.

➜ Turn the tool (drill) firmly.

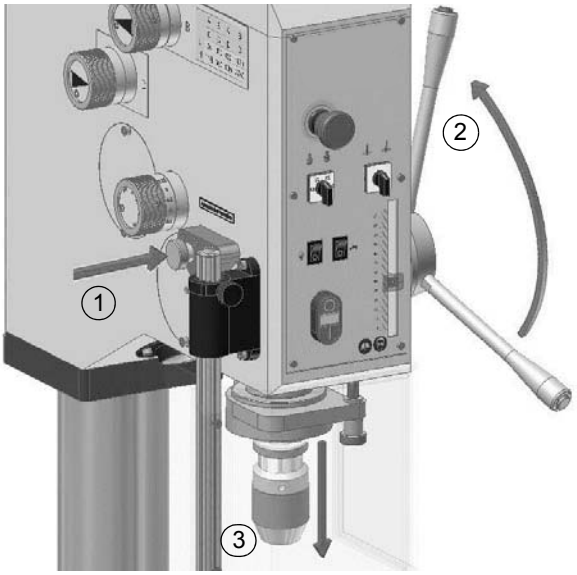


Img.4-9: Quick action drill chuck

CAUTION!

Make sure that the clamped tool is firmly and correctly fitted.

4.10.2 Disassembly with integrated drill drift



Img.4-10: Disassembly

ATTENTION!

The tool and/or the drill chuck will fall down. Hold the tool ③ or the drill chuck while drifting it out.

ATTENTION!

Do not try to expel the tool when it is in the intermediate position. This might cause damages of the integrated drill drift or of the feed handle.

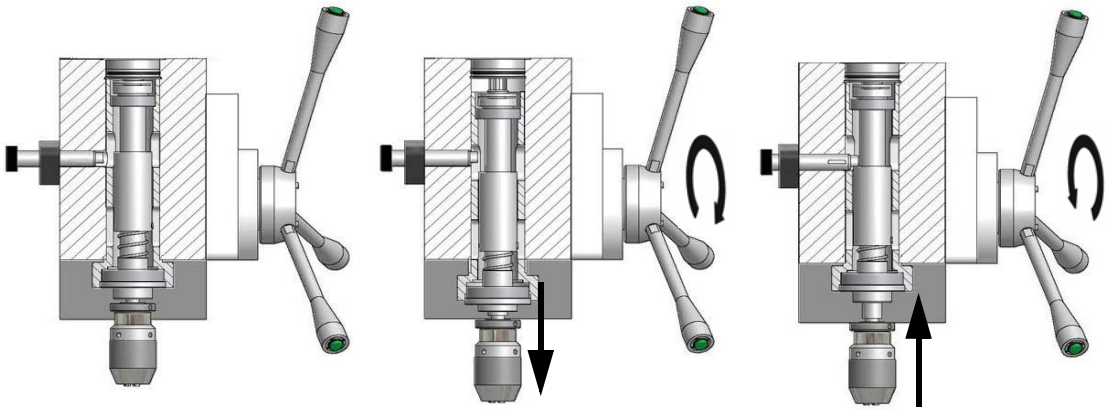
With the below described procedure the taper mandrel is being loosened from the drilling spindle.

➜ Move the sleeve as far down until the locking pin ① can be moved a little bit (Img. 4-11 (b) intermediate position).

➜ Move the locking pin ① so far, until the locking pin engages completely (Img. 4-11 (c) expulsion position).

➜ Press the sleeve lever ② with a fast and powerful movement upwards.

❍ The taper mandrel is pressed out of the drill spindle.

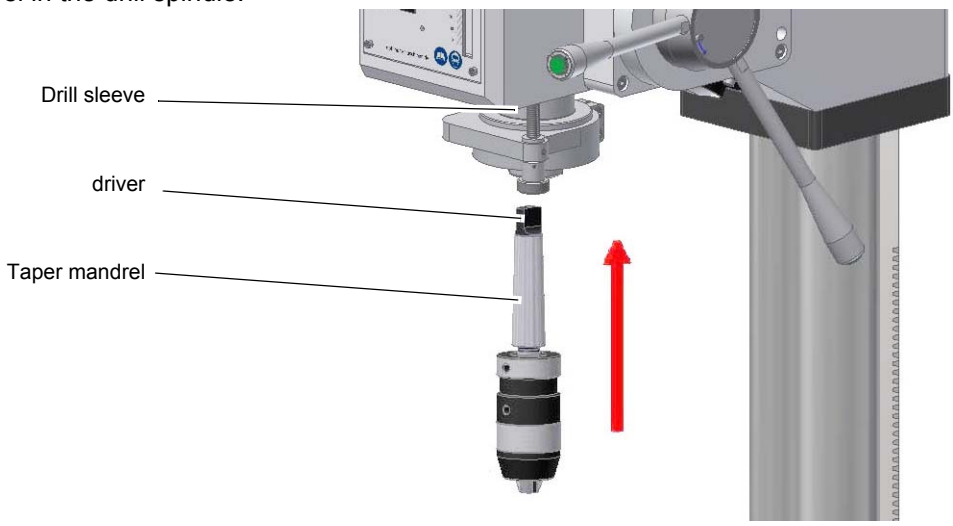


Img.4-11: Functional diagram of the drill drift (sectional view)

4.10.3 Fitting the drill chuck

The quick-action drill chuck is secured against turning over in the drill spindle by means of a form-locking connection.

A frictionally engaged connection keeps and centres the quick-action drill chuck with the taper mandrel in the drill spindle.

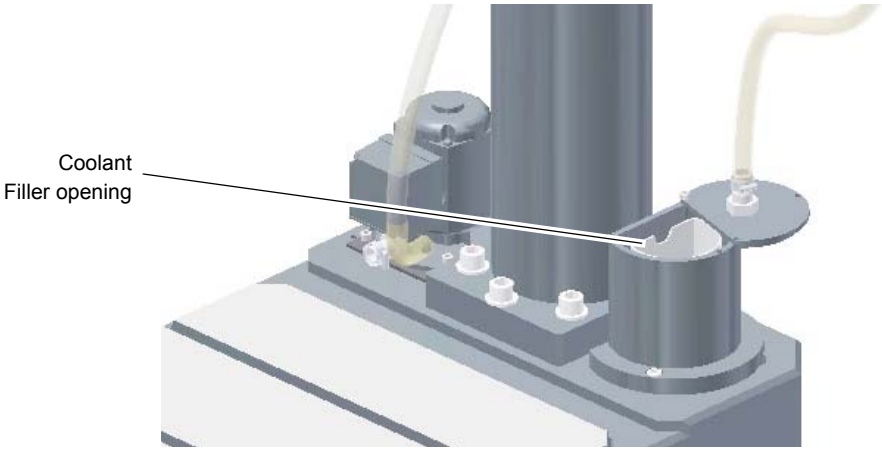


Img.4-12: Taper mandrel

➜ Check or clean the conical seat in the drill spindle and on the taper mandrel of the tool or of the quick-action drill chuck.

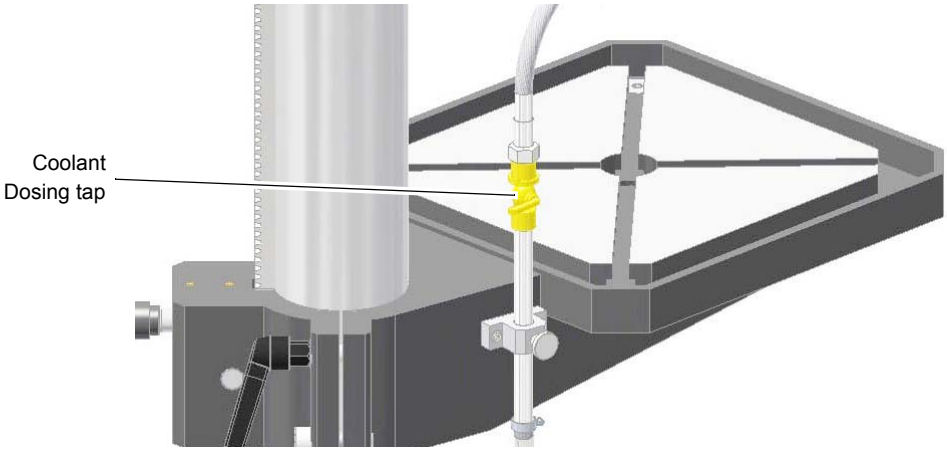
➜ Press the taper mandrel into the drilling spindle.

4.11 Coolant equipment



Img.4-13: Filler opening

Filling quantity ☞ "Coolant equipment“ on page 17.



Img.4-14: Coolant shut-off tap and doser

➜ Adjust the flow using the shut-off and dosing tap.

ATTENTION!

Destruction of the pump due dry running.

The pump is lubricated by the cooling agent. Do not operate the pump without coolant. Clean the collection container of the chip trap in regular intervals.

5 Determining the cutting speed and the speed

5.1 Table cutting speeds / infeed

Material table						
Material to be processed	Recommended cutting speed **Vc** in m/min	Recommended infeed **f** in mm/revolution				
		Drill bit diameter **d** in mm				
		2...3	>3...6	>6...12	>12...25	>25...50
Unalloyed construction steels < 700 N/mm²	30 - 35	0.05	0.10	0.15	0.25	0.35
Alloyed construction steels > 700 N/mm²	20 - 25	0.04	0.08	0.10	0.15	0.20
Alloyed steels < 1000 N/mm²	20 - 25	0.04	0.08	0.10	0.15	0.20
Steels, low stability < 800 N/mm²	40	0.05	0.10	0.15	0.25	0.35
Steel, high stability > 800 N/mm²	20	0.04	0.08	0.10	0.15	0.20
non-rust steels > 800 N/mm²	12	0.03	0.06	0.08	0.12	0.18
Cast iron < 250 N/mm²	15 - 25	0.10	0.20	0.30	0.40	0.60
Cast iron > 250 N/mm²	10 - 20	0.05	0.15	0.25	0.35	0.55
CuZn alloy brittle	60 - 100	0.10	0.15	0.30	0.40	0.60
CuZn alloy ductile	35 - 60	0.05	0.10	0.25	0.35	0.55
Aluminum alloy up to 11% Si	30 - 50	0.10	0.20	0.30	0.40	0.60
Thermoplastics	20 - 40	0.05	0.10	0.20	0.30	0.40
Thermosetting materials with organic filling	15 - 35	0.05	0.10	0.20	0.30	0.40
Thermosetting materials with anorganic filling	15 - 25	0.05	0.10	0.20	0.30	0.40

5.2 Speed table

Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100
Drill bit **Ø** in mm	Speed **n** in rpm															
1.0	1274	1911	2548	3185	3822	4777	5732	6369	7962	9554	11146	12739	15924	19108	25478	31847
1.5	849	1274	1699	2123	2548	3185	3822	4246	5308	6369	7431	8493	10616	12739	16985	21231
2.0	637	955	1274	1592	1911	2389	2866	3185	3981	4777	5573	6369	7962	9554	12739	15924
2.5	510	764	1019	1274	1529	1911	2293	2548	3185	3822	4459	5096	6369	7643	10191	12739
3.0	425	637	849	1062	1274	1592	1911	2123	2654	3185	3715	4246	5308	6369	8493	10616
3.5	364	546	728	910	1092	1365	1638	1820	2275	2730	3185	3640	4550	5460	7279	9099
4.0	318	478	637	796	955	1194	1433	1592	1990	2389	2787	3185	3981	4777	6369	7962
Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100

Drill bit **Ø** in mm	Speed **n** in rpm															
4.5	283	425	566	708	849	1062	1274	1415	1769	2123	2477	2831	3539	4246	5662	7077
5.0	255	382	510	637	764	955	1146	1274	1592	1911	2229	2548	3185	3822	5096	6369
5.5	232	347	463	579	695	869	1042	1158	1448	1737	2027	2316	2895	3474	4632	5790
6.0	212	318	425	531	637	796	955	1062	1327	1592	1858	2123	2654	3185	4246	5308
6.5	196	294	392	490	588	735	882	980	1225	1470	1715	1960	2450	2940	3920	4900
7.0	182	273	364	455	546	682	819	910	1137	1365	1592	1820	2275	2730	3640	4550
7.5	170	255	340	425	510	637	764	849	1062	1274	1486	1699	2123	2548	3397	4246
8.0	159	239	318	398	478	597	717	796	995	1194	1393	1592	1990	2389	3185	3981
8.5	150	225	300	375	450	562	674	749	937	1124	1311	1499	1873	2248	2997	3747
9.0	142	212	283	354	425	531	637	708	885	1062	1238	1415	1769	2123	2831	3539
9.5	134	201	268	335	402	503	603	670	838	1006	1173	1341	1676	2011	2682	3352
10.0	127	191	255	318	382	478	573	637	796	955	1115	1274	1592	1911	2548	3185
11.0	116	174	232	290	347	434	521	579	724	869	1013	1158	1448	1737	2316	2895
12.0	106	159	212	265	318	398	478	531	663	796	929	1062	1327	1592	2123	2654
13.0	98	147	196	245	294	367	441	490	612	735	857	980	1225	1470	1960	2450
14.0	91	136	182	227	273	341	409	455	569	682	796	910	1137	1365	1820	2275
15.0	85	127	170	212	255	318	382	425	531	637	743	849	1062	1274	1699	2123
16.0	80	119	159	199	239	299	358	398	498	597	697	796	995	1194	1592	1990
17.0	75	112	150	187	225	281	337	375	468	562	656	749	937	1124	1499	1873
18.0	71	106	142	177	212	265	318	354	442	531	619	708	885	1062	1415	1769
19.0	67	101	134	168	201	251	302	335	419	503	587	670	838	1006	1341	1676
20.0	64	96	127	159	191	239	287	318	398	478	557	637	796	955	1274	1592
21.0	61	91	121	152	182	227	273	303	379	455	531	607	758	910	1213	1517
22.0	58	87	116	145	174	217	261	290	362	434	507	579	724	869	1158	1448
23.0	55	83	111	138	166	208	249	277	346	415	485	554	692	831	1108	1385
24.0	53	80	106	133	159	199	239	265	332	398	464	531	663	796	1062	1327
25.0	51	76	102	127	153	191	229	255	318	382	446	510	637	764	1019	1274
26.0	49	73	98	122	147	184	220	245	306	367	429	490	612	735	980	1225
27.0	47	71	94	118	142	177	212	236	295	354	413	472	590	708	944	1180
28.0	45	68	91	114	136	171	205	227	284	341	398	455	569	682	910	1137
29.0	44	66	88	110	132	165	198	220	275	329	384	439	549	659	879	1098
30.0	42	64	85	106	127	159	191	212	265	318	372	425	531	637	849	1062
31.0	41	62	82	103	123	154	185	205	257	308	360	411	514	616	822	1027
32.0	40	60	80	100	119	149	179	199	249	299	348	398	498	597	796	995
33.0	39	58	77	97	116	145	174	193	241	290	338	386	483	579	772	965
34.0	37	56	75	94	112	141	169	187	234	281	328	375	468	562	749	937
35.0	36	55	73	91	109	136	164	182	227	273	318	364	455	546	728	910
36.0	35	53	71	88	106	133	159	177	221	265	310	354	442	531	708	885
37.0	34	52	69	86	103	129	155	172	215	258	301	344	430	516	689	861
38.0	34	50	67	84	101	126	151	168	210	251	293	335	419	503	670	838
Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100

Drill bit Ø in mm	Speed **n** in rpm															
39.0	33	49	65	82	98	122	147	163	204	245	286	327	408	490	653	817
40.0	32	48	64	80	96	119	143	159	199	239	279	318	398	478	637	796
41.0	31	47	62	78	93	117	140	155	194	233	272	311	388	466	621	777
42.0	30	45	61	76	91	114	136	152	190	227	265	303	379	455	607	758
43.0	30	44	59	74	89	111	133	148	185	222	259	296	370	444	593	741
44.0	29	43	58	72	87	109	130	145	181	217	253	290	362	434	579	724
45.0	28	42	57	71	85	106	127	142	177	212	248	283	354	425	566	708
46.0	28	42	55	69	83	104	125	138	173	208	242	277	346	415	554	692
47.0	27	41	54	68	81	102	122	136	169	203	237	271	339	407	542	678
48.0	27	40	53	66	80	100	119	133	166	199	232	265	332	398	531	663
49.0	26	39	52	65	78	97	117	130	162	195	227	260	325	390	520	650
50.0	25	38	51	64	76	96	115	127	159	191	223	255	318	382	510	637

5.3 Examples to calculatory determine the required speed for your drilling machine

The necessary speed is depending on the diameter of the drill bit, on the material which is being machined as well as on the cutting material of the drill bit.

Material which needs to be drilled: St37

Cutting material (drill bit): HSS spiral bit

Set point of the cutting speed [V_c] according to the table: 40 meters per minute

Diameter [d] of your drill bit: 30 mm = 0.03 m [meters]

Selected infeed [f] according to the table: about 0.35 mm/rev

$$\text{Speed } n = \frac{\vartheta c}{\pi \times d} = \frac{40\text{m}}{\text{min} \times 3,14 \times 0,03\text{m}} = 425(\text{rpm})$$

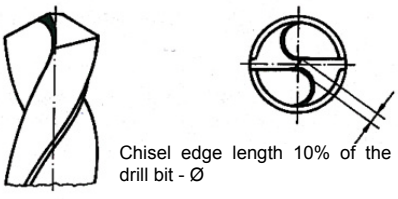
Set a speed on your drilling machine which is less than the determined speed.

INFORMATION

In order to facilitate the production of larger drill holes they need to be pre-drilled. This way, you reduce the cutting forces and improve the guiding of the drill bit.

The pre-drilling diameter is depending on the length of the chisel edge. The chisel edge does not cut, but it squeezes the material. The chisel edge is positioned at an angle of 55° to the major cutting edge.

As a general rule of thumb it applies: The pre-drilling diameter is depending on the length of the chisel edge.



Chisel edge length 10% of the drill bit - Ø

Recommended working steps for a drilling diameter of 30 mm

Example:

1st working step: Pre-drilling with Ø 5 mm (0.2").

2nd working step: Pre-drilling with Ø 15 mm (0.6").

3rd working step: Drilling with Ø 30 mm (1.2").

6 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repair

ATTENTION!

Properly performed regular maintenance is an essential prerequisite for

- **operational safety,**
- **failure-free operation,**
- **long service life of the machine and**
- **the quality of the products which you manufacture.**

Installations and equipment from other manufacturers must also be in good order and condition.

ENVIRONMENTAL PROTECTION

During work on the spindle head, please make sure that

- **collecting containers with sufficient capacity for the amount of liquid to be collected are used.**
- **liquids and oils should not be split on the ground.**

Clean up any spilt liquid or oils immediately using proper oil-absorption methods and dispose of them in accordance with current legal requirements on the environment.

Collect leakages

Do not re-introduce liquids spilt outside the system during repair or as a result of leakage from the reserve tank; collect them in a collecting container for disposal.

Disposal

Never dump oil or other environmentally hazardous substances which are harmful to the environment in water inlets, rivers or channels.

Used oils must be delivered to a collection centre. Please consult your supervisor for further information on your nearest collection point.

6.1 Safety

WARNING!

The consequences of incorrect maintenance and repair work may include:

- **very serious injury to personnel working on the machine,**
- **damage to the machine.**

Only qualified personnel should carry out maintenance and repair work on the machine.

6.1.1 Preparation

WARNING!

Only carry out work on the machine if it has been unplugged from the mains power supply.

Attach a warning sign which secures against unauthorized switching on.

6.1.2 Restarting

Before restarting, run a safety check.

☞ "Safety check“ on page 11

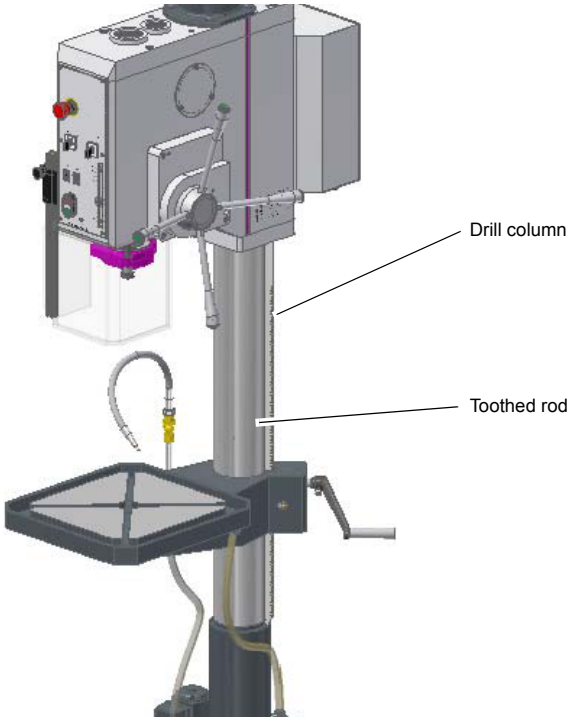
WARNING!

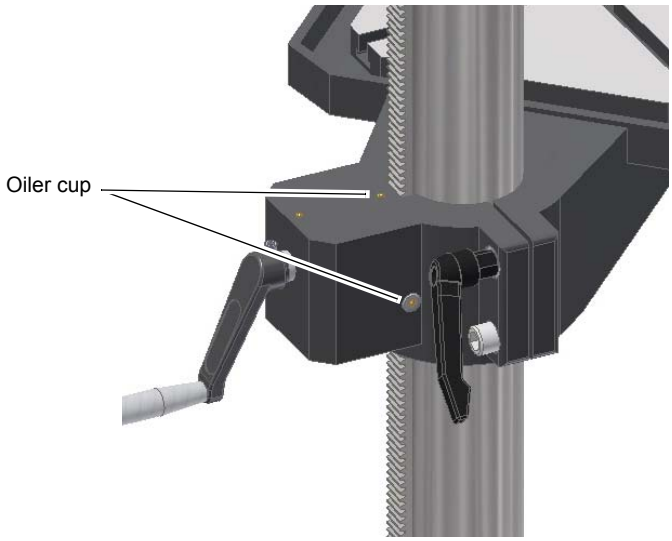
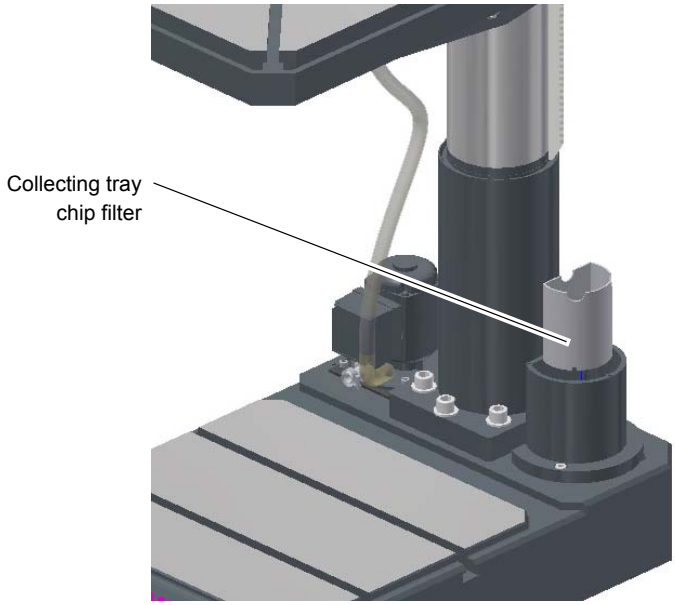
Before starting the machine you must be sure that

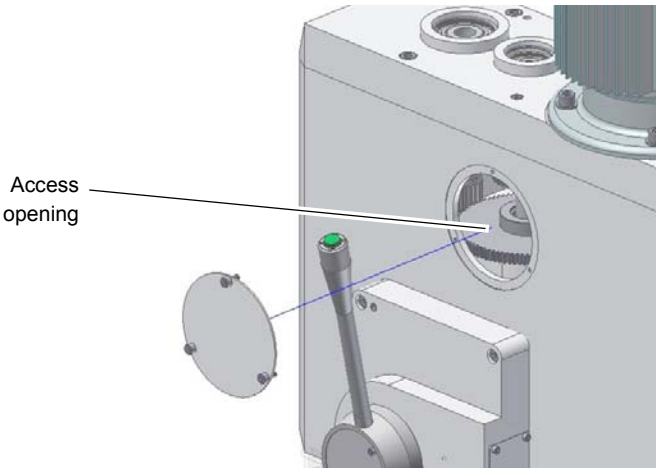
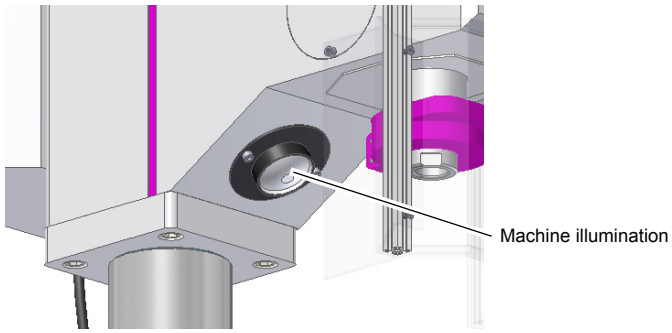
- ❍ **no dangers generated for persons,**
- ❍ **the machine is not damaged.**

6.2 Inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.

Interval	Where?	What?	How?
Start of shift After each maintenance or repair work	**Geared drill**	Examination for outside damages. ☞ "Safety check“ on page 11	
Every month	**Drill column and toothed rack**	**Oiling**	➜ Lubricate the drilling upright regularly with commercial oil, machine oil, engine oil. ➜ Lubricate the rack regularly with commercial grease (e.g. friction bearing grease).  Img.6-1: Drill column

Interval	Where?	What?	How?
every month	**Oiler cup**	**Oiling**	➜ Lubricate all oilers with machine oil, do not use grease guns or the like. ☞ "Operating material“ on page 17  Img.6-2: Oiler cup
Every month	**Chip filter**	**Cleaning**	The chip separator prevents the reflux of chips in the coolant tank. Clean the chip separator regularly. Impurities in the cooling lubricant cause blockages and reducing the life of the cooling lubricant pump. Replace the cooling agent regularly, depending on usage. ➜ To do so, unscrew the chip container and remove the chips or other soiling. ➜ Empty and clean the chip separator.  Img.6-3: Chip separator

Interval	Where?	What?	How?
As required	**Gear**	**Lubricate**	The gear is lubricated with the grease STABURAGS NBU 12. Depending on the usage the gear has to be lubricated in regular intervals. We recommend you to lubricate the gear every 3 months. ☞ "Operating material“ on page 17  Img.6-4: Gear opening
As required	**illumination**	**Replacing the light bulb**	If the light bulb is defective: ➜ Disconnect the plug from the power supply. ➜ Unscrew the glass cover of the machine illumination. ➜ Unscrew the light bulb by turning it to the left and by slightly pressing the bulb into the socket (bayonet). ➜ Replace the light bulb. ➜ Screw the glass cover onto the machine illumination.  Img.6-5: Machine illumination
As required	**Spindle return spring**	**Readjusting**	**ATTENTION!** **Parts may fly off at high speed. When disassembling the key housing, please make sure that the machine is only maintained and prepared by qualified staff.**

INFORMATION

The spindle bearing is lifetime-lubricated. It is not necessary to lubricate it again.

6.3 Repair

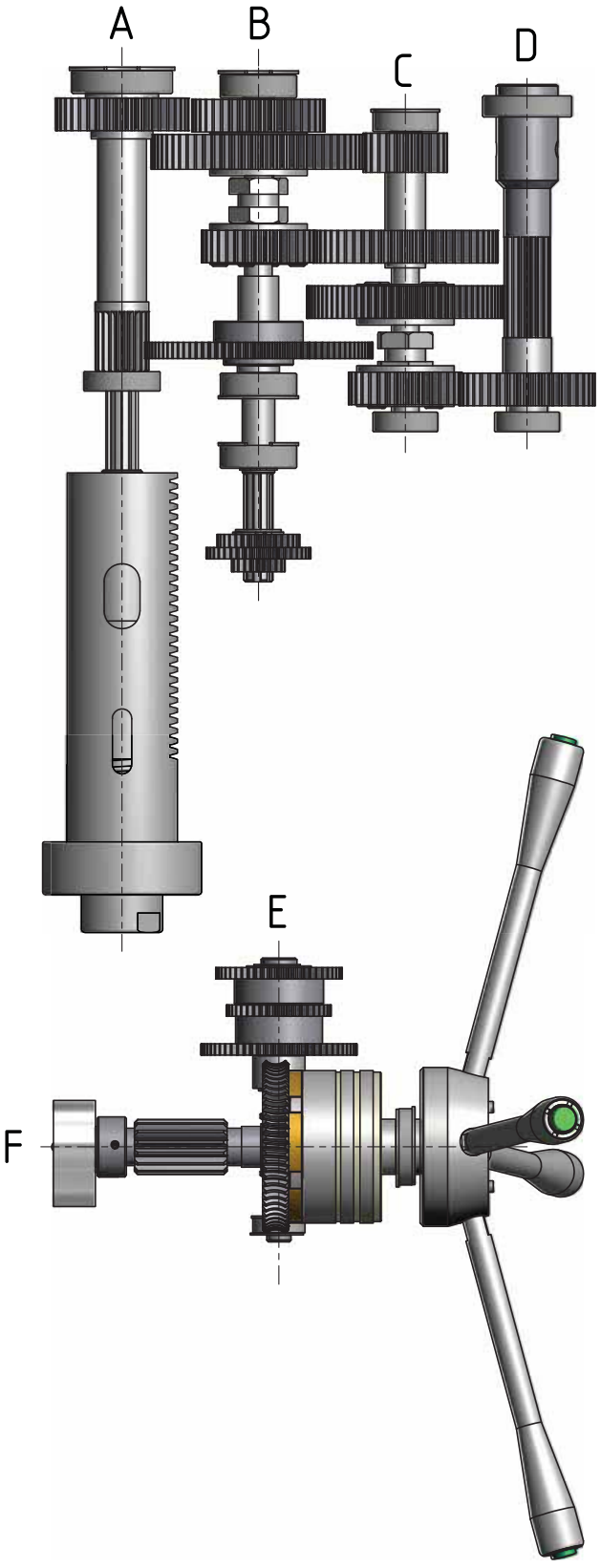
6.3.1 Customer service technician

Repairs must be carried out only by qualified technical staff; and must follow the instructions and guidelines given in this manual. Should technical assistance be required, contact
C.H.HANSON 2000 North Aurora Rd. Naperville,IL 60563
Call 800-827-3398
Company and C.H.HANSON Industries are not liable for, nor do they guarantee against, damage or operating malfunctions resulting from alteration, abuse, lack of mainte-nance or this product's use for other than its intended purpose. Failure to read and follow this operating manual is not covered.
For repairs only use

- Proper and suitable tools,
- Parts purchased from company, or its authorized agent.

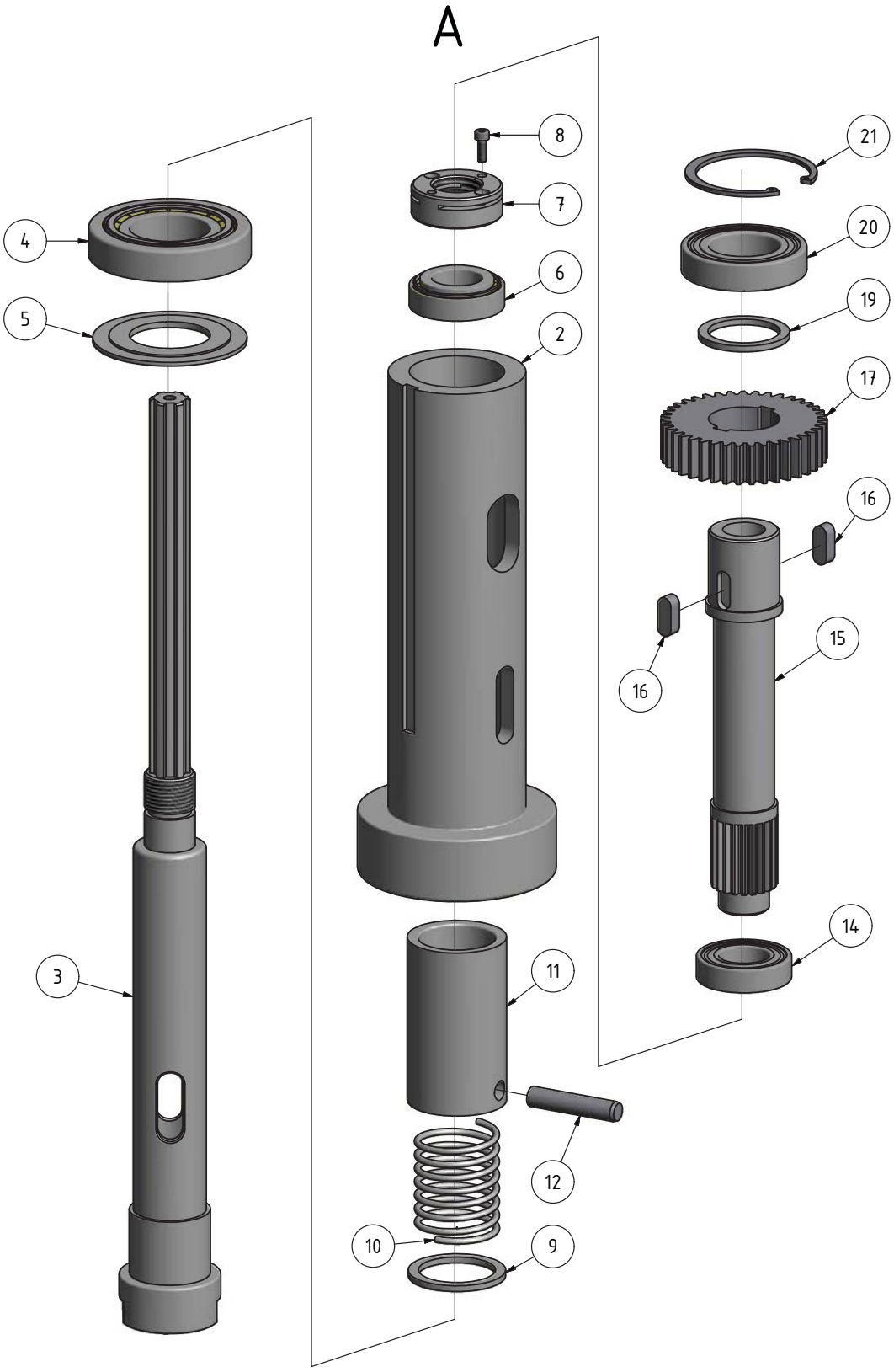
7 Spare parts

7.1 Bohrkopf- Drilling head



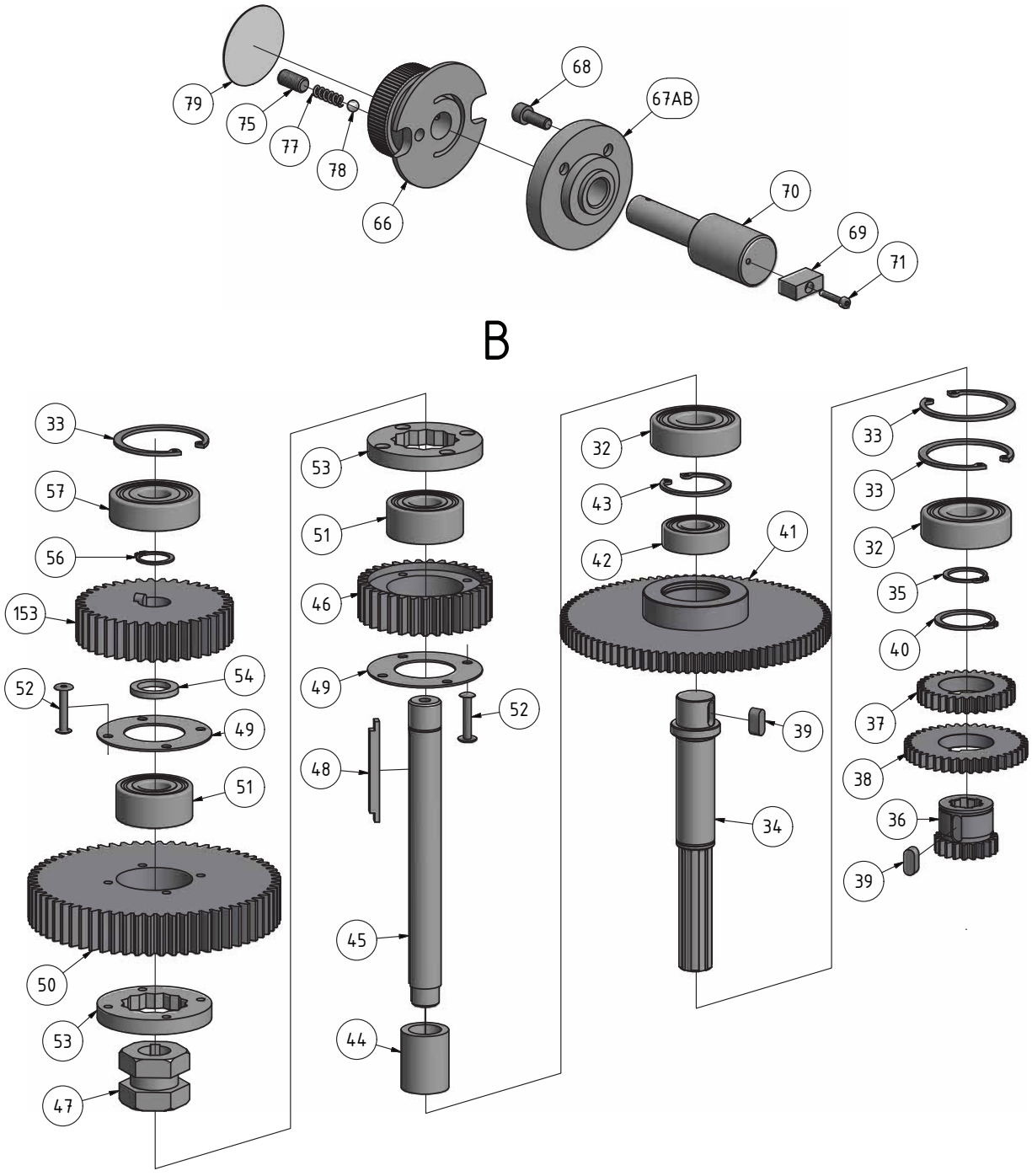
Img. 7-1: Bohrkopf - Drilling head

7.2 Drilling head



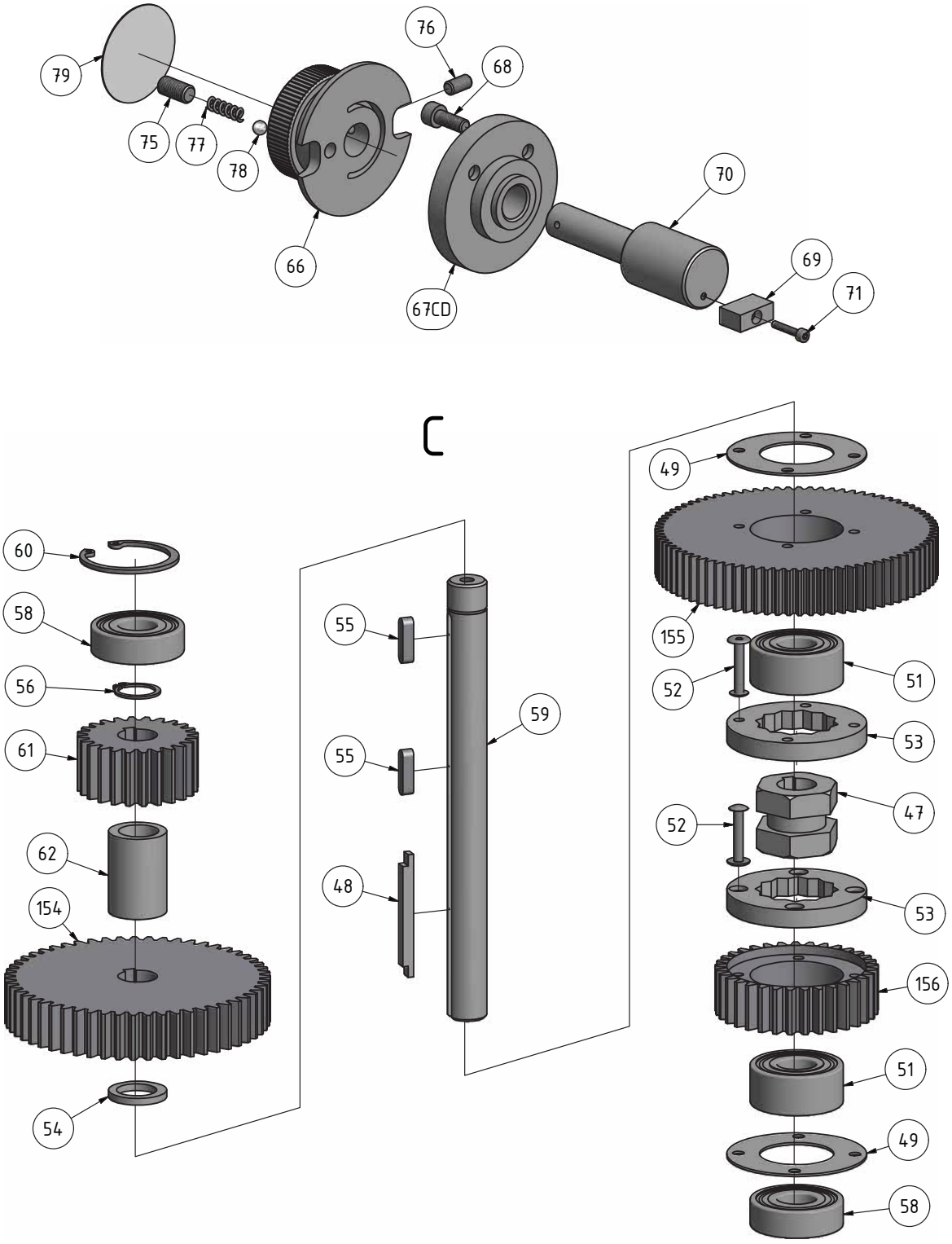
Img. 7-2: Drilling head

7.3 Drilling head



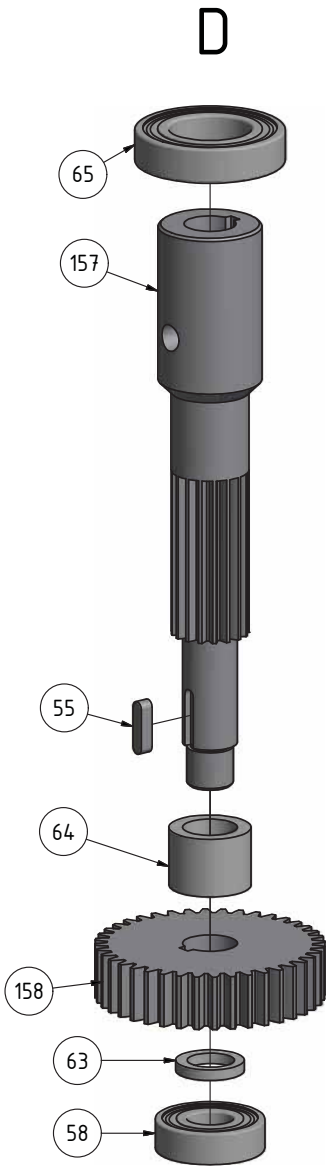
Img. 7-3: Drilling head

7.4 Drilling head



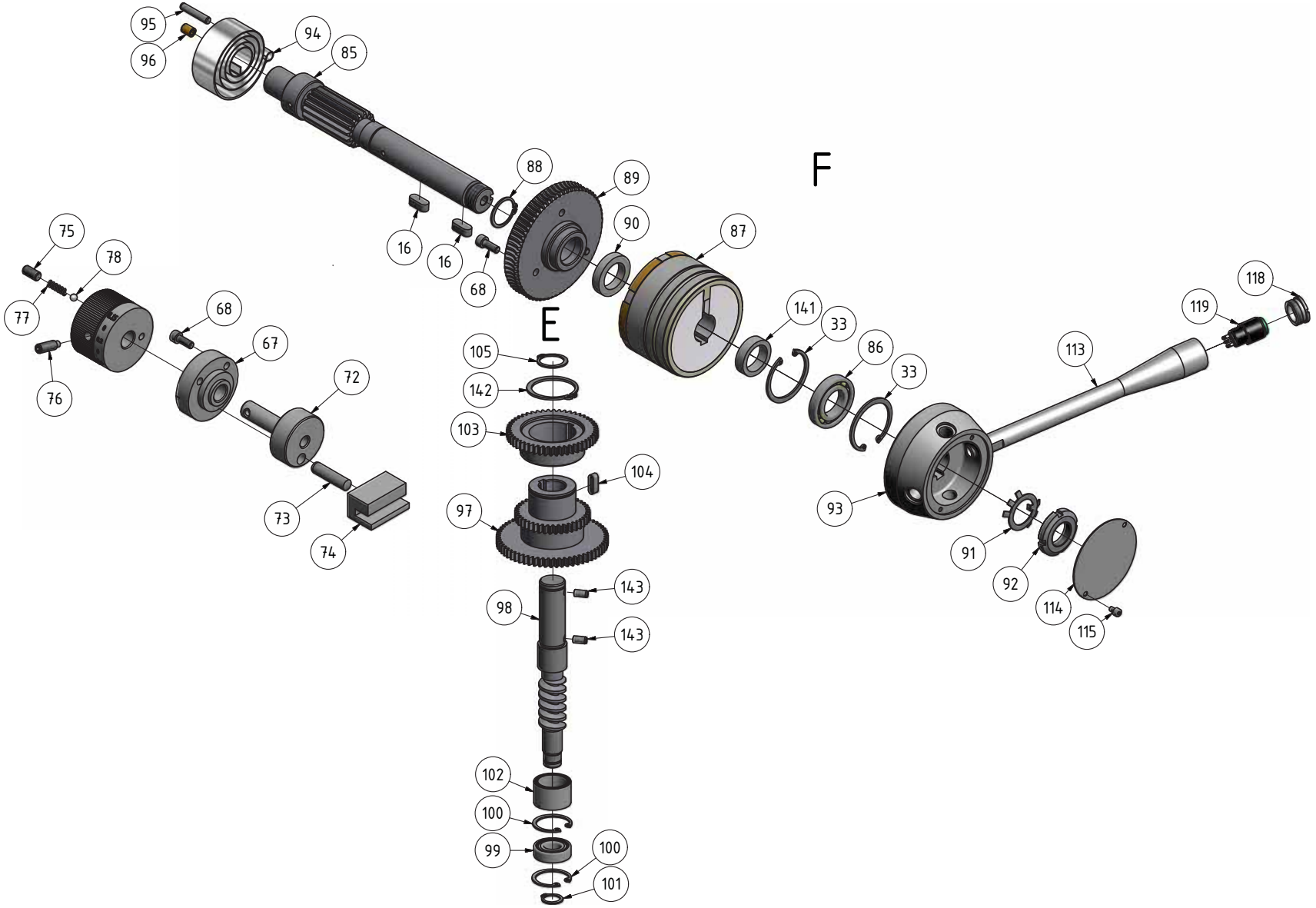
Img.7-4: Drilling head

7.5 Drilling head



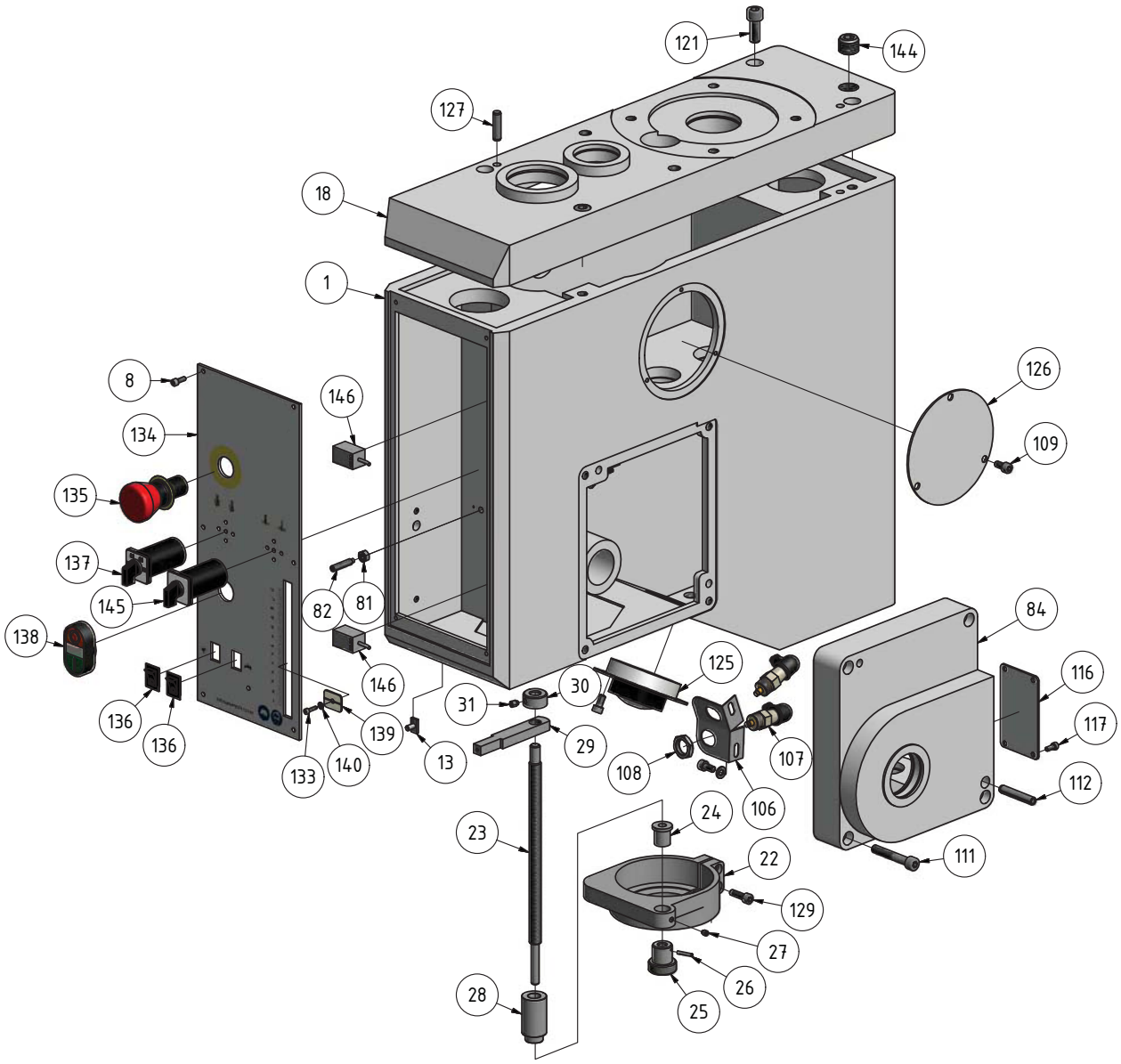
Img. 7-5: Drilling head

7.6 Drilling head



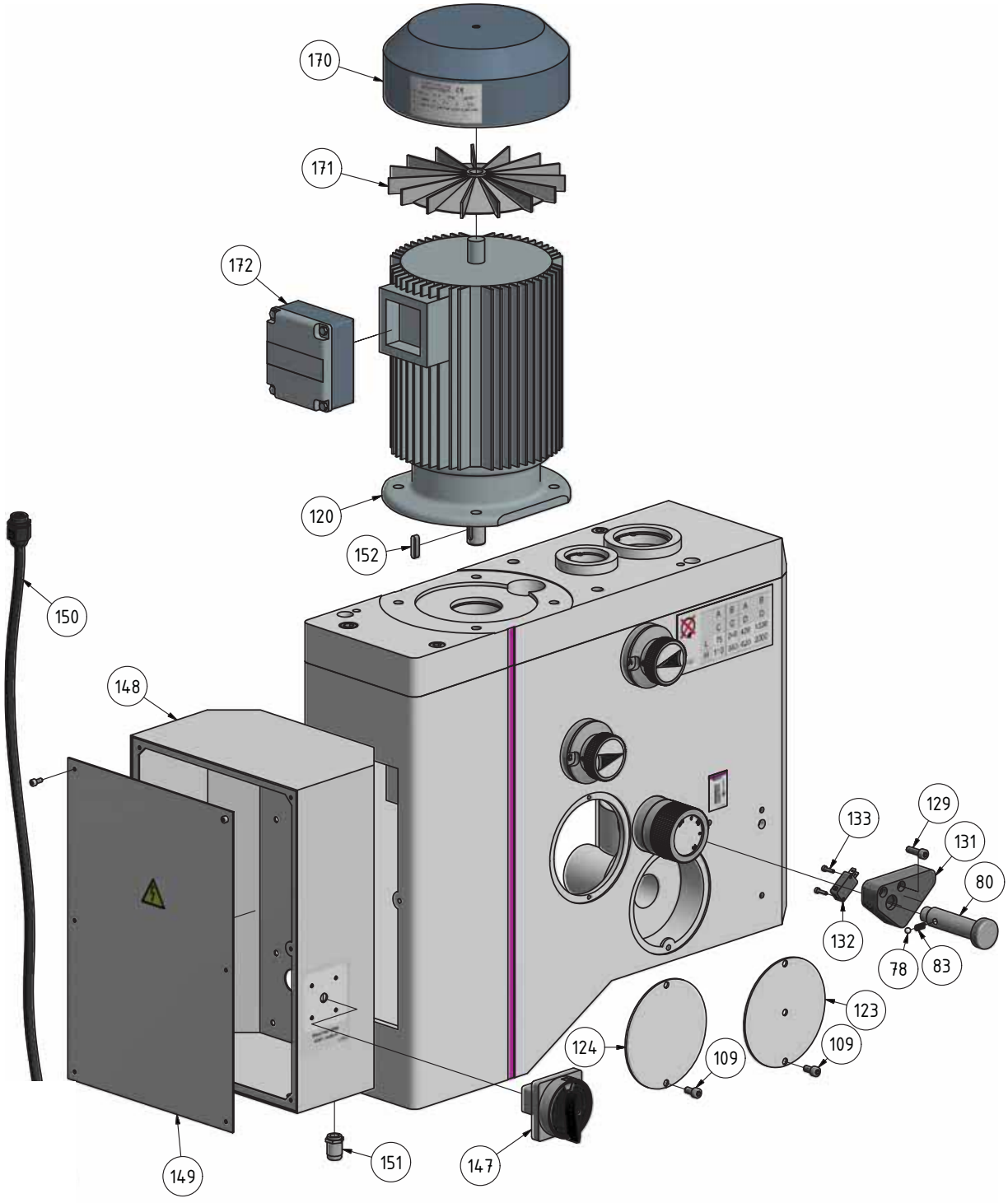
Img. 7-6: Drilling head

7.7 Drilling head



Img. 7-7: Drilling head

7.8 Drilling head



Img. 7-8: Drilling head

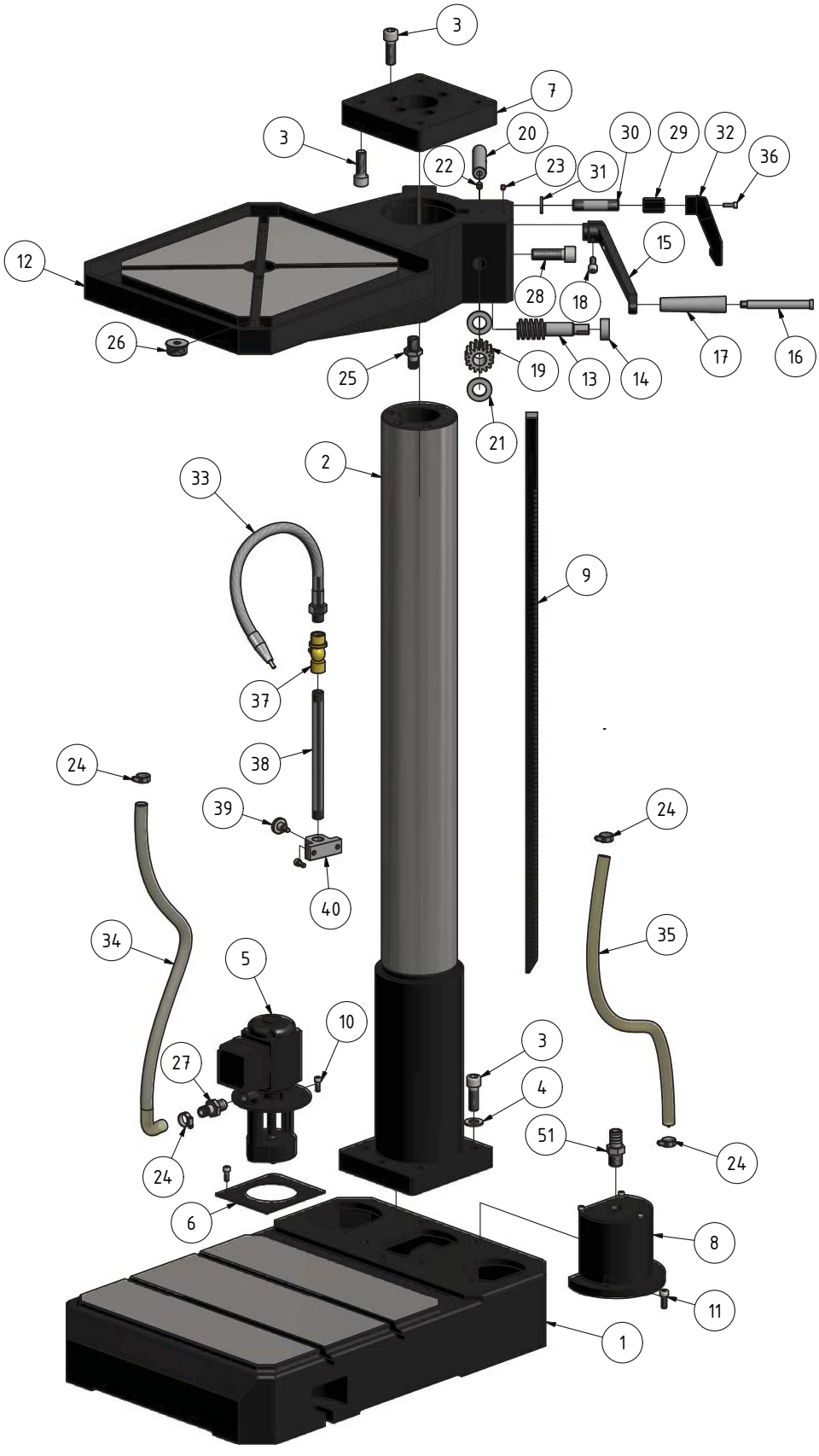
Spare part list drilling head

Pos.	Description	Qty.	Size	Item no.
1	Gehäuse	1		0303424001
2	Sleeve	1		0303424002
3	Drill spindel	1		0303424003
4	Taper roller bearing	1		0303424004
5	Ring	1		0303424005
6	Taper roller bearing	1	32005	04032005
7	Groove nut	1		0303424007
8	Socket head screw	8	ISO 4762 - M4 x 12	
9	Ring	1		0303424009
10	Spring	1		0303424010
11	Sleeve	1		0303424011
12	Cylindrical pin	1	GB 119-86 - A 10 x 50	
13	Slot nut	1		0303424013
14	Ball bearing	1	6005-2R	0406005.2R
15	Shaft	1		0303424015
16	Fitting key	4	DIN 6885 - A 8 x 7 x 20	
17	Gear	1	M2/48Z	0303424017
18	Plate	1		0303424018
19	Ring	1		0303424019
20	Ball bearing	1	6007-2Z	0406007.2R
21	Retaining ring	1	DIN 472 - 62 x 2	0303424021
22	Collet	1		0303424022
23	Threaded rod	1		0303424023
24	Bushing	1		0303424024
25	Bushing	1		0303424025
26	Spring pin	1	GB 879-86 - 3 x 16	
27	Grub screw	1	ISO 4028 - M5 x 6	
28	Bushing	1		0303424028
29	Holder	1		0303424029
30	Bushing	1		0303424030
31	Grub screw	1	ISO 4028 - M6 x 8	
32	Ball bearing	2	6204-2Z	0406204.2R
33	Retaining ring	5	DIN 472 - 47 x 1.75	
34	Shaft	1		0303424034
35	Retaining ring	1	DIN 471 - 20x1,2	
36	Gear	1	M1,5x28	0303424036
37	Gear	1	M1,5x36	0303424037
38	Gear	1	M1,5x42	0303424038
39	Fitting key	2	DIN 6885 - A 6 x 6 x 14	
40	Retaining ring	1	DIN 471 - 28x1,5	
41	Gear	1	M1,5/92Z	0303424041
42	Ball bearing	1	6202-2RSL	0406202.2R
43	Retaining ring	1	DIN 472 - 35 x 1,5	
44	Bushing	1		0303424044
45	Shaft	1		0303424045
46	Gear	1	M2/53	0303424046
47	Bushing	2		0303424047
48	Fitting key	2		0303424048
49	Ring	4		0303424049
50	Gear	1	M2/Z58	0303424050
51	Ball bearing	5	3203-2Z	0403203.2R
52	Rivet	24	GB 873 4 x 28 x 23,4	
53	Ring	4		0303424053
54	Ring	2		0303424054
55	Fitting key	4	DIN 6885 - A 5 x 5 x 20	
56	Retaining ring	2	DIN 471 - 17x1	
57	Ball bearing	1	6303-2Z	0406303.2R
58	Ball bearing	3	6203-2Z	0406203.2R
59	Shaft	1		0303424059
60	Retaining ring	1	DIN 472 - 40 x 1,75	
61	Gear	1	M2/Z30	0303424061
62	Sleeve	1		0303424062
63	Ring	1		0303424063
64	Bushing	1		0303424064
65	Ball bearing	1	6006-2RZ	0406006.2R
66	Knob	3	alt	0303424066
66	Knob	3	neu	03034240661
67	Collet	3	alt	0303424067
67AB	Collet	3	neu AB	0303424067AB
67CD	Collet	3	neu CD	0303424067CD
68	Socket head screw	9	ISO 4762 - M6 x 16	
69	Block	2		0303424069
70	Shaft	2		0303424070
71	Socket head screw	2	ISO 4762 - M3 x 16	
72	Shaft	1		0303424072
73	Cylindrical pin	1	GB 119-86 - A 10 x 40	
74	Fork	1		0303424074
75	Grub screw	3	GB 77-85 - M8 x 16	
76	Grub screw	3	GB 79-85 - M8 x 25	
77	Spring	3		0303424077
78	Steel ball	4		0303424078
79	Indicator	3		0303424079
80	Bolt	1		0303424080
81	Hexagon nut	1	GB 6170-86 - M6	
82	Grub screw	1	GB 79-85 - M6 x 30	0303424082
83	Spring	1		0303424083
84	Collet	1		0303424084
85	Shaft	1		0303424085
86	Ball bearing	1	16005	0303424086
87	Electrical clutch	1		0303424087
88	Retaining ring	1	DIN 471 - 25x1,2	
89	Worm gear	1		0303424089
90	Ring	1		0303424090

Spare part list drilling head

Pos.	Description	Qty.	Size	Item no.
91	Lock washer	1	GB 858-88 - 24 x 34	
92	Groove nut	1	GB 812-88 - M24x1,5	
93	Collet	1		0303424093
94	Spring	1		0303424094
95	Cylindrical pin	1	ISO 2338 - 6 h8 x 32 - B	
96	Lubrication cup	1	JB-T7940.4-1995-1_8mm	0303424096
97	Gear	1		0303424097
98	Worm	1		0303424098
99	Angular ball bearing	1	6002-2Z	0406002.2R
100	Retaining ring	2	DIN 472 - 32 x 1.2	
101	Retaining ring	1	DIN 471 - 15 x 1	
102	Needle bearing	1	25x32x20	
103	Gear	1		03034240103
104	Fitting key	1	DIN 6885 - A 6 x 6 x 18	
105	Retaining ring	1	DIN 471 - 22 x 1.2	
106	Holder	1		03034240106
107	Contact maker	2		03034240107
108	Hexagon nut	2		03034240108
109	Socket head screw	17	ISO 4762 - M6 x 12	
110	Washer	2	DIN 125 - A 6.4	
111	Socket head screw	4	ISO 4762 - M8 x 50	
112	Lock pin	2	GB 879-86 - 8 x 45	
113	Lever	3		03034240113
114	Cover	1		03034240114
115	Socket head screw	2	ISO 4762 - M4 x 6	
116	Cover	1		03034240116
117	Socket head screw	4	ISO 4762 - M4 x 10	
118	Plug	3		03034240118
119	Feed button switch	3		03034240119
120	Motor	1	230V, 60Hz	0303424012-USA
121	Socket head screw	8	ISO 4762 - M10 x 25	
122	Washer	4	DIN 125 - A 10.5	
123	Cover	1		03034240123
124	Cover	1		03034240124
125	Machine lamp	1		03034240125
126	Cover	1		03034240126
127	Cylindrical pin	2	ISO 8734 - 8 x 30 - A	
129	Socket head screw	4	ISO 4762 - M6 x 20	
131	Cover	1		03034240131
132	Micro switch	1		03034240132
133	Socket head screw	3	ISO 4762 - M3 x 12	
134	Lable	1		03034240134
135	Emergency stop button	1		03034240135
136	Rocker switch	2		03034240136
137	Change over switch	1		03034240137
138	On-Off switch	1		03034240138
139	Scale	1		03034240139
140	Washer	1	DIN 125 - A 3,2	
141	Ring	1		03034240141
142	Retaining ring	1	DIN 471 - 40x1,75	
143	Cylindrical pin	2	GB 119/6 m6 x 12	
144	Plug	1	ISO 4026 - M20 x 16	
145	Mode switch	1		03034240145
146	Sensor	2	Omron	03034240146
147	Main switch	1		03034240147
148	Switch box	1		03034240148
149	Cover	1		03034240149
150	Connector cable	1		03034240150
151	Plug, foot pedal	1		03034240151
152	Fitting key	1	6x6x25	
153	Zahnrad	1	M2/33Z	030342401523
154	Zahnrad	1	M2/55Z	
155	Zahnrad	1	M1,5/79Z	03034220192
156	Zahnrad	1	M2/33Z	03034220193
157	Gear shaft			03034220122
158	Gear	1	M2/40Z	03034220194
170	Motor cover	1		03034240170
171	Motor fan	1		03034240171
172	Terminal box	1		03034240172

7.9 Drilling table

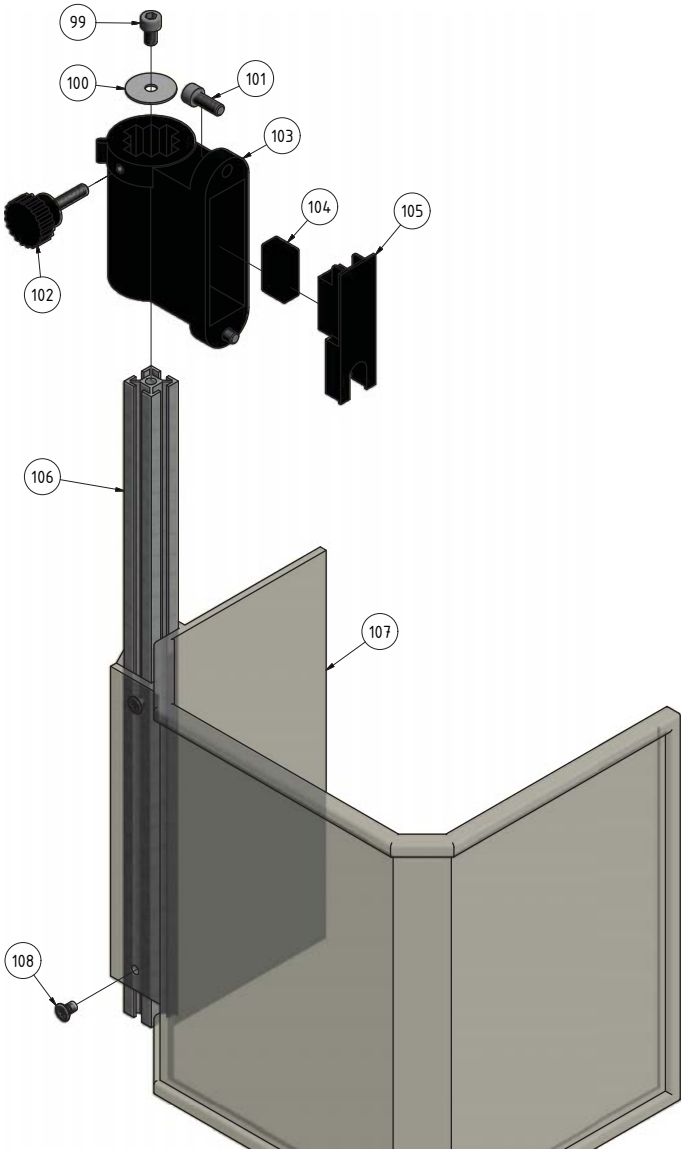


Img. 7-9: Drilling table

Spare part list drilling table

Pos.	Description	Qty.	Size	Item no.
1	Machine base	1		0303424021
2	Drill column	1		0303424022
3	Socket head screw	13	ISO 4762 - M14 x 40	
4	Washer	5	DIN 125-A 14	
5	Coolant pump	1	230V, 60Hz	0303424025-USA
6	Plate	1		0303424026
7	Plate	1		0303424027
8	Chip filter	1		03020285304
9	Rack	1		0303424029
10	Socket head screw	8	ISO 4762 - M6 x 16	
11	Socket head screw	2	ISO 4762 - M8 x 20	
12	Drilling tabel	1		03034240212
13	Shaft	1		03034240213
14	Ring	1		03034240214
15	Crank	1		03034240215
16	Screw	1		03034240216
17	Grip	1		03034240217
18	Socket head screw	1	ISO 4762 - M8 x 16	
19	Gear	1		03034240218
20	Shaft	1		03034240219
21	Washer	2	20	
22	Lubrication cup	1	JB-T7940.4-1995-1_8mm	03034240222
23	Lubrication cup	2	JB-T7940.4-1995-1_6mm	03034240223
24	Hose fitting	4		
25	Connector	1		03034240225
26	Plug	1		03034240226
27	Connector	1		03034240227
28	Socket head screw	1	ISO 4762 - M16 x 50	
29	Bushing	1		03034240229
30	Shaft	1		03034240230
31	Washer	1		
32	Lever	1		03034240232
33	Coolant unit	1		03034240233
34	Coolant hose	1		03034240234
35	Coolant hose	1		03034240235
36	Socket head screw	1	ISO 4762 - M5 x 16	
51	Fitting	1		03034240251

7.10 Drilling chuck protection

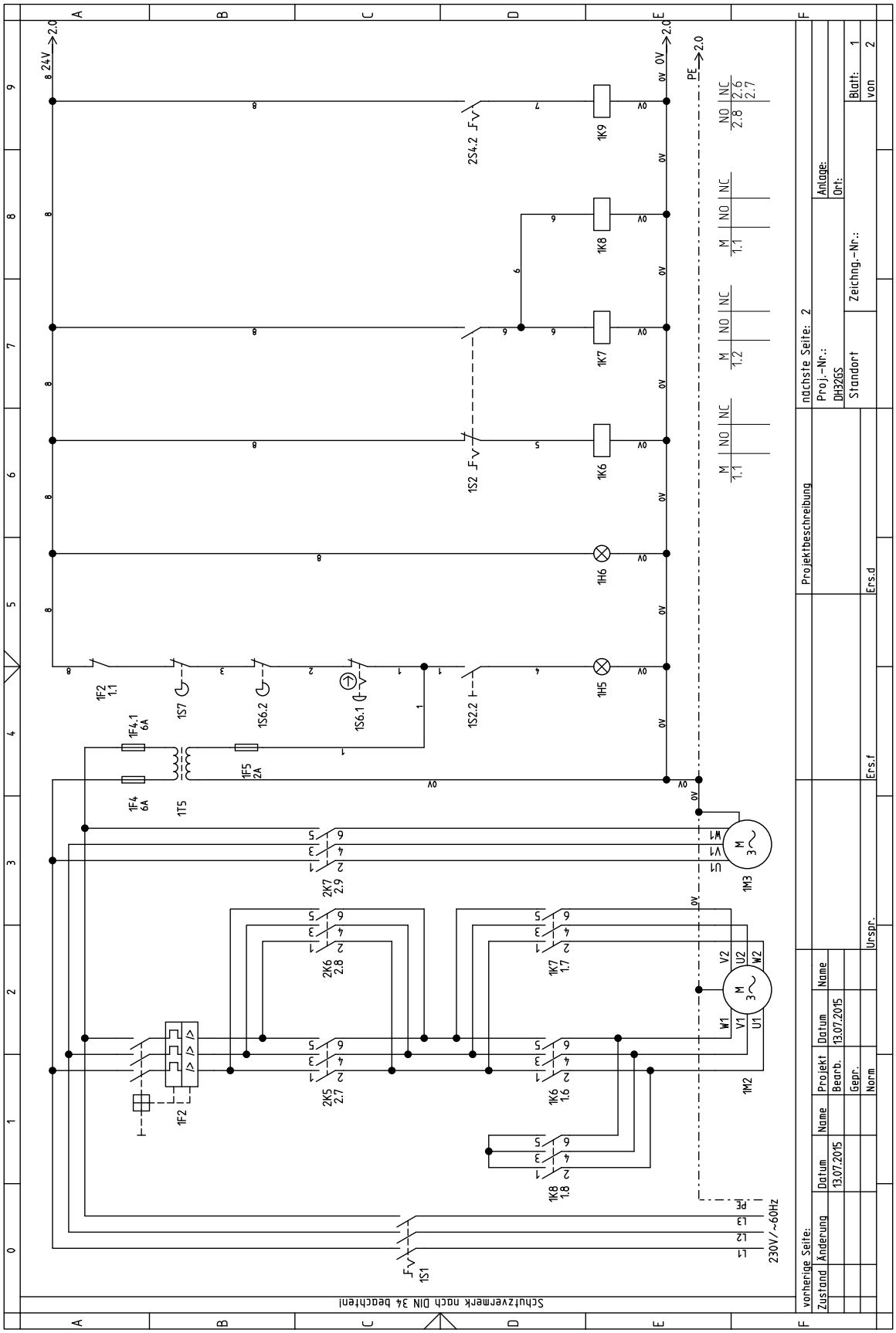


Img. 7-10: Drilling chuck protection

Spare part list drilling chuck protection

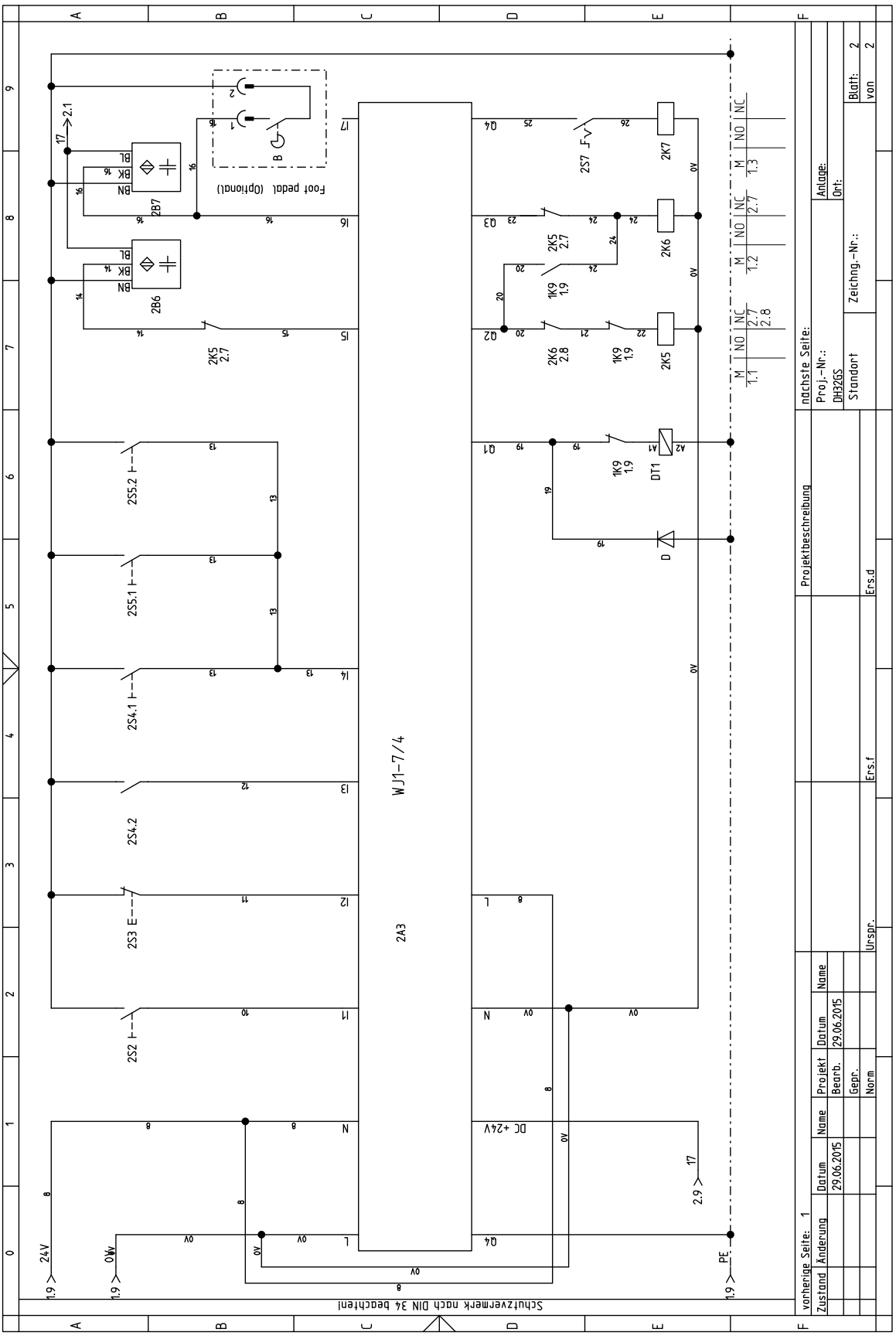
Pos.	Description	Qty.	Item no.
99	Socket head screw	1	03034230199
100	Washer	1	030342301100
101	Socket head screw	1	030342301101
102	Knurled screw	1	030342301102
103	Fixture	1	030342301103
104	Microswitch	1	030342301104
105	Plate	1	030342301105
106	Aluminium profile	1	030342301106
107	Drill chuck protection	1	030342301107
108	Screw	1	030342301108
109	Drilling chart	1	030342301109
110	Label switch position	1	030342301110

7.11 Wiring diagram - 1 of 2



Img.7-11: Wiring diagram

7.12 Wiring diagram - 2 of 2



Img.7-12: Wiring diagram

Spare part electrical component				
Pos.	Description	Qty.		Item no.
1S1	Main switch	1		030342401S1
1F2	Motor thermal overload	1	5A-8A	030342401F2-USA
1M2	Drive motor	1	230V, 60Hz	03034240120-USA
1M3	Coolant pump motor	1	230V, 60Hz	030342401M3 -USA
1F5	Fuse	1		030342401F5
1T5	Transformer	1	230V/24V	030342401T5-USA
1F4	Fuse	1		030342401F4
1F4.1	Fuse	1		030342401F4.1
1H6	Work light	1		030342401H6
1S7	Drill chuck safety switch	1		030342301104
1S6.2	Ejector pin micro switch	1		03034240132
1S6.1	Emergency stop switch	1		03034240135
1H5	Machine lamp	1		03034240125
1S2.2	Switch machine lamp	1		03034240136
1S2	Change over switch	1		03034240137
1K6	Motor contactor	1	230V	K030.342.401-USA
1K7	Motor contactor	1		
1K8	Motor contactor	1		
2K5	Motor contactor right run	1		
2K6	Motor contactor left run	1		
2K7	Motor contactor coolant pump	1		
1K9	Control relay	1		030342401K9
2S4.2	Mode switch	1		03034240145
2S2	Switch On	1		03034240138
2S3	Switch Off	1		
2S4.2	Mode switch	1		03034240145
2S5.1	Feed button switch	1		03034240119
2S4.1	Feed button switch	1		03034240119
DT1	Electromagnetic clutch	1		0303424087
2S5.2	Feed button switch	1		03034240119
2B6	Sensor top position	1		03034240146
2B7	Sensor down position	1		03034240146
B	Foot pedal (Optional)	1		03034240B
2S7	Coolant pump switch	1		03034240136
2A3	PLC	1		030343032A3
D1	Diode	1	6A10	03034303D1

8 Malfunctions

Malfunction	Cause/ possible effects	Solution
Motor is hot	• Wrong electrical connection of 400 V machines	• ☞ "Power supply“ on page 23
Noise during work.	• Spindle is too little lubricated • Tool is blunt or wrongly clamped • Gear is too little lubricated	• Lubricate spindle (only possible when disassembled) • Use new tool and check tension (fixed setting of the bit, drill chuck and taper mandril) • Lubricate gear “+ "Operating material“ on page 17“ on page 41
Bit „burnt“	• Drill speed too high /feed too high • Chips do not come out of the drill hole. • Drill blunt • No or too little cooling	• Select another speed • Extract drill more often during work • Sharpen or use new drill • 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
Drill is defective	• No base / support used.	• Use support and clamp it with the workpiece
Drill is running non-round or shaking	• Drill deformed • Worn out spindle bearings • Drill is not correctly clamped. • Drill chuck defective	• Use new drill • Have the spindle bearings replaced • Correctly clamp drill • Replace the drill chuck
It is not possible to insert the drill chuck or the taper mandrel	• 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
Motor does not start	• Motor is wrongly connected • Defective fuse • Drill chuck protection not closed	• Have it checked by authorised personnel • Close drill chuck protection
Motor is overheating and there is no power	• Motor overloaded • Too low mains voltage • Motor is wrongly connected	• Reduce feed rate Disconnect immediately and have it checked by authorized personnel • Have it checked by authorised personnel
Precision of the work deficient	• Irregularly heavy or tensed work-piece • Inexact horizontal position of the work-piece holder	• Balance the piece statically and secure without straining • Adjust workpiece-holder
Drilling spindle sleeve does not return to its initial position	• Spindle return spring does not work	• Check spindle return spring, replace it, if necessary
The drilling spindle cannot be moved downwards.	• Swivel integrated drill drift in • Drill depth adjustment no released	• Swivel integrated drill drift out • Release drill depth adjustment

Malfunction	Cause/ possible effects	Solution
Spindle bearing overheating	• Bearing worn down • Bearing pretension is too high • Working at high drilling speed over a longer period of time.	• Replace • Increase bearing clearance for fixed bearing (taper roller bearing) • Reduce drill speed and feed rate
Working spindle rattling on rough piece surfaces	• Excessive slack in bearing • Working spindle moves up and down • Clamping chuck is loose • Tool is blunt • Workpiece is loose	• Reduce bearing clearance or replace bearing • Readjust bearing clearance (fixed bearing) • Check, re-tighten. • Sharpen or replace tool • Clamp the workpiece firmly.

9 Appendix

9.1 Copyright

9.2 Terminology/Glossary

Term	Explanation
Drill drift	Tool to release the bit or the drill chuck from the drill spindle
Drill chuck	Drill bit adapter
Drill head	Upper part of the geared drill
Drill sleeve	fixed hollow shaft which runs in the drill spindle.
Drilling spindle	Shaft activated by the motor
Drilling table	Supporting surface, clamping surface
Taper mandrel	Cone of the drill or of the drill chuck
Spindle sleeve lever	Manual operation for the drill feed
Quick-action drill chuck	drill holding fixture to be clamped manually.
Workpiece	part to be drilled, part to be machined.
Tool	Milling cutter, drill bit, countersink, etc.

9.3 LIMITED WARRANTY

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