

Operating manual

Version 1.3.2

Drill bit grinder

DG 20

Item No. 9682910

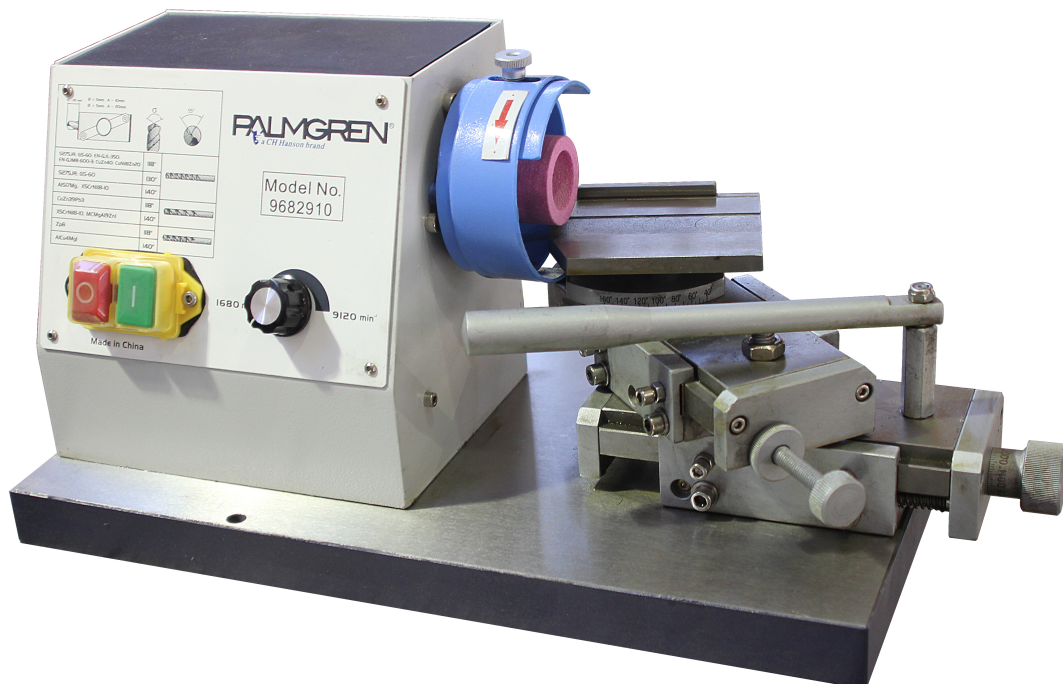


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Preface

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 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 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

This part of the operating instructions

- explains the meaning and use of the warning references contained in the operating manual,
- explains how to use the drill bit grinder properly,
- highlights the dangers that might arise for you or others if these instructions are not obeyed,
- tells you how to avoid dangers.

In addition to this operating manual please observe

- applicable laws and regulations,
- legal regulations for accident prevention,
- the prohibition, warning and mandatory signs as well as the warning notes on the drill bit grinder.

Consult OSHA, state and local regulations in order to determine compliance, danger and risks to the operator.

Always keep this documentation close to the drill bit grinder.

If you would like to order another operating manual for your machine, please indicate the serial number of your machine. Please find the serial number on the type plate.

1.1 Type plate



INFORMATION




If you are unable to solve a problem using these operating instructions, please contact us for advice:

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

1.2 Safety warnings (warning notes)

1.2.1 Classification of hazards

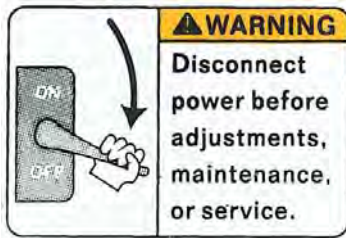
We classify the safety warnings into various levels. The table below gives an overview of the classification of symbols (pictograms) and warnings for the specific danger and its (possible) consequences.

Pictogram	Alarm Expression	Definition/Consequences
	DANGER!	Imminent danger that will cause serious injury or death to personnel.
	WARNING!	Risk: a danger that might cause serious injury or death to personnel.
	CAUTION!	Danger of unsafe procedure that might cause injury to personnel or damage to property.
	ATTENTION!	Situation that could cause damage to the drill bit grinder and product and other types of damage. No risk of injury to personnel.
	INFORMATION	Application tips and other important or useful information and notes. No dangerous or harmful consequences for personnel or objects.

In the case of specific dangers, we replace the pictogram



1.2.2 Other pictograms



Warning of automatic start-up!



Disconnect main power!



Activation forbidden!



Use ear protection!



Use protective boots!



Use protective gloves!



Wear a safety suit!



Protect the environment!



Use protective goggles!



Contact address

1.3 Proper use

Use

The drill bit grinder is designed and manufactured to be used in environments where there is no potential danger of explosions. The drill bit grinder is designed and manufactured exclusively for repointing twisted drills or sintered carbide drills.

If the drill bit grinder is used in any way other than described above, modified without authorization or operated with different process data, then it is being used improperly.

We do not take liability for the damage caused by improper use.

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

It is also part of proper usage that

- the maximum values and the adjustment data of the drill bit grinder are complied with,
- the operating manual is to be observed,
- the inspection and maintenance instructions are observed.

☞ "Technical data" on page 13

WARNING

Very serious injuries.

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



1.4 Possible dangers caused by the drill bit grinder

The drill bit grinder is state of the art.

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

- high revolutions,
- rotating parts,
- an abrasive wheel (flying sparks)
- 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 bit grinder is used and maintained by personnel who are poorly qualified, then there may be a risk resulting from incorrect operation and unsuitable maintenance.

INFORMATION

All persons 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 personnel,
- the drill bit grinder and further property might be endangered,
- the function of the drill bit grinder could be affected.

Always disconnect the drill bit grinder when cleaning or maintenance work is being carried out.



WARNING!

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

Disconnect the drill bit grinder immediately from the electrical power 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 as the operator!

☞ "Safety devices" on page 10

1.5 Qualification of personnel

1.5.1 Target group

This manual applies to

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

The warning notes refer to both operation and maintenance of the drill bit grinder.

Determine clearly and irrevocably who will be responsible for the different activities on the drill bit grinder (operation, maintenance and repair).

Vague or unclear assignment of responsibilities constitute a safety hazard!

1.5.2 Authorized personnel

WARNING!

Incorrect use and maintenance of the drill bit grinder constitutes a danger for personnel, objects and the environment.



Only authorized persons may operate the drill bit grinder!

The technical staff is authorized to operate and to maintain the drill bit grinder.

The operator must

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

Obligations of the operator

The user must

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

Obligations of the user

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

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

Further requirements to the qualification

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

- ➔ disconnect all electrical power
- ➔ secure against switching on

→ check dead circuit

1.6 User's position

The user must stand in front of the drill bit grinder.

INFORMATION

The electrical power plug of the drill bit grinder must be freely accessible.



1.7 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).



1.8 Safety devices

Operate the drill bit grinder only with properly functioning safety devices.

Stop the drill bit grinder immediately if there is a failure in the safety device or if it is not functioning for any reason. It is your responsibility!

If the safety device has been activated, the drill bit grinder 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 way, you are endangering yourself and other persons working on the drill bit grinder. The possible consequences are:

- serious injuries due to bursting of the cup wheel,
- injuries to eyes by flying sparks,
- injuries to hands,
- fatal electrocution.

The drill bit grinder includes the following safety devices:

- an ON/OFF switch with EMERGENCY-STOP function
- a guard for the cup wheel.



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 being expelled, but not to remove them completely.



1.9 Safety check

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

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 bit grinder

- 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
Off switch	Once the off switch is activated, the drill bit grinder should be switched off.	
Date:	Inspector (signature):	

ATTENTION!

After actuating the ON / OFF switch, the drill bit grinder coasts for about 10 seconds.



1.9.2 Spark-guard

The protective cover over the cup wheel reduces the number of flying sparks getting into your eyes during grinding.

Use safety glasses!

1.10 Personal protective equipment for special works

Protect your face and your eyes: wear a safety helmet with a face guard for all work, especially during a task where your face and eyes are exposed to hazards.



Wear safety shoes when carrying the drill bit grinder.



1.11 Safety during operation

In the description of work with and on the drill bit grinder, we need to highlight the dangers specific to that work.



WARNING!

Before activating the drill bit grinder, double check that this

- will not endanger other persons,
- cause damage to equipment.



WARNING!

Fire- or explosion hazard by flying sparks.

- Do not operate the drill bit grinder nearby combustible or explosive material.



Avoid unsafe working practice:

- Make sure that, your work does not endanger anyone.
- Use safety glasses.
- The instructions of this manual must be observed strictly during assembly, operation, maintenance and repair.
- Do not work on the drill bit grinder if your concentration is reduced, for example, because you are taking medication.
- Observe the regulations for the prevention of accidents issued by OSHA or other inspection authorities.
- Inform the inspector of any danger or failure.

INFORMATION

In the description of execution of work with and on the drill bit grinder, we highlight the dangers specific to that work.



1.12 Electrical system

☞ "Maintenance" on page 24

Have the machine and / or the electrical equipment checked / maintained regularly i.e. 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 bit grinder immediately from the electrical power if there is a malfunction in the power supply!

2 Technical data

The following information provides you with the the dimensions and weights of the machine. It also refers as manufacturer's authorized service information.

2.1 Power Supply	
Motor	3/4 HP, 115V, 1Ph, 60 Hz
2.2 Speed	
Continuously variable	1680 - 9120 RPM
Max. grinding speed	16 M/sec (3150 FPM)
2.3 General	
Grinding capacity bit	3 - 20 mm/ 1/8 - 7/8"
Angle of point sharpening	90° - 150°
2.4 Dimensions	
Height	235 mm/ 9.3"
Depth	220 mm/ 8.7"
Depth w/ water basin	270 mm/ 10.6"
Width	490 mm/ 19.3"
Weight	26,7 Kg./ 59 Lbs.
2.5 Cup wheel	
Outside diam.	40 mm/ 1.6" diam.
Inside diam.	26 mm/ 1.0" diam.
Embedded material	20 mm/ 0.8"
Thread	M10
2.6 Working area	
Height	2000 mm /79"
Depth	1800 mm/ 71"
Width	1200 mm/ 47"
2.7 Environmental conditions	
Temperature	5 - 35 °C/ 40 - 95 ° F
Humidity	25 - 80%

2.8 Emissions

The noise level (emission) of the drill bit grinder is below 76 dB(A). If the drill bit grinder is installed in an area where various machines are in operation, the acoustic influence on the operator of the drill bit grinder may exceed 85 dB(A).

INFORMATION

This numeric value had been measured on a new machine under conventional operating conditions. Depending on the age or wear of the machine, the noise behavior of the machine might change.

Furthermore, the extent of the noise emission is also depending on manufacturing influence factors, such as speed, material and clamping conditions.

INFORMATION

The mentioned numerical value is an emission level and not necessarily a safe working level.

Unless the degree of noise emission and the degree of noise disturbance are depending on one another it is not possible to use it in order to reliably determine if it is necessary to take further preventive measures or not.

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

- Characteristics of the working chamber, e.g. size or damping behavior,
- Other noise sources, e.g. the number of machines,



- Other processes proceeding nearby and the period during which the operator is exposed to the noise.

Consult OSHA, state and local regulations in order to determine compliance, dangers and risks to the operator.

CAUTION!

The machine operator has to wear an appropriate ear protection depending on the overall stress caused by noise and on the basic limit values.

We generally recommend using a sound and ear protection.



2.9 Dimensions

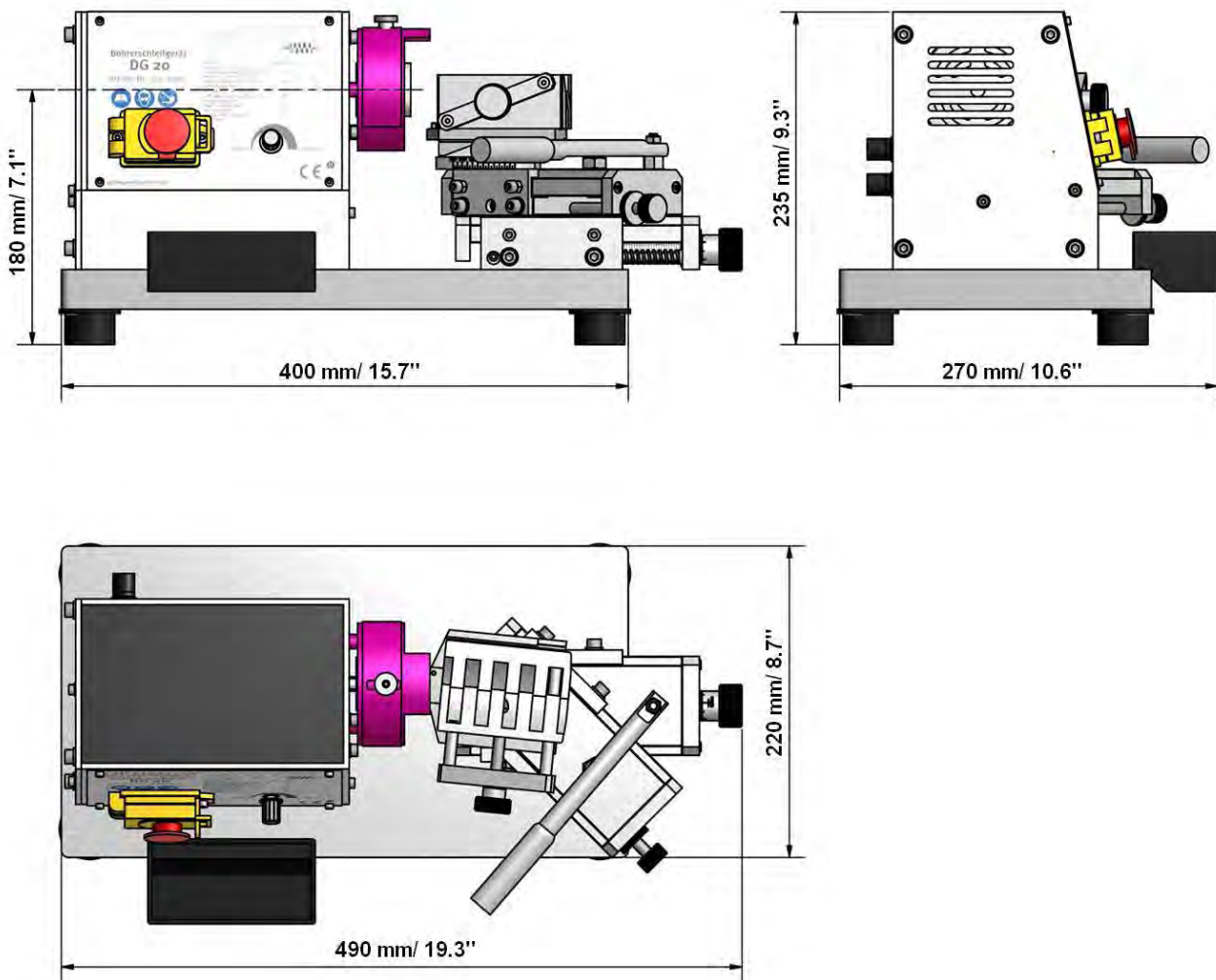


Fig.2-1: DG 20

3 Assembly

3.1 Delivery volume

When the machine is delivered, please check immediately that it has not been damaged during transport and that all components are included. Take all parts off and compare them to the following list.

- drill bit grinder
- 1 x water basin
- 1 x cup wheel (mounted)
- operation manual

The use of other cup wheels or abrasive wheels is only possible when the maximum admissible speed for the application "grinding of twist drills, sintered carbide drills" coincides with the maximum speed of the drill bit grinder. It is further necessary that the maximum grinding speed does not exceed 16 m/s (3150 RPM) or that the outer diameter of the cup wheel / abrasive wheel does not exceed 42mm (1.6").

3.2 Storage

ATTENTION!

**Improper storage may cause important parts to be damaged or destroyed.
Store packed or unpacked parts only under the following ambient conditions.
Please follow the instructions and indications on the transportation box.**



- Fragile goods (goods require careful handling)



- Protect against humidity and humid environments

 "Environmental conditions" on page 13



- Prescribed position of the packaging box (marking the top side – arrows pointing upward)



- Maximum stacking height

Example: non-stackable – do not pile any further packaging boxes on top of the first packaging box



3.3 Installation and assembly

3.3.1 Site requirements

Organize the working space around the drill bit grinder 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 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.
- 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 power switch of the drill bit grinder must be freely accessible.



3.4 First use

ATTENTION!

The cup wheel might have been damaged during transport.

Let the drill bit grinder run in for about 15 minutes at maximum speed before you start the resharpening of a bit



☞ "Personal protective equipment for special works" on page 12.

4 Operation

4.1 Safety

Operate the drill bit grinder only under the following conditions:

- The drill bit grinder is in proper working condition.
- The drill bit grinder is used as prescribed.
- The operating manual is followed.
- All safety devices are installed and activated.

Any problem should be eliminated immediately. Stop the drill bit grinder immediately in the event of any problem in operation and make sure it cannot be started up by accident or without authorization.

Notify the person responsible immediately of any problem.

☞ "Safety during operation" on page 12



4.2 Control and indicating elements

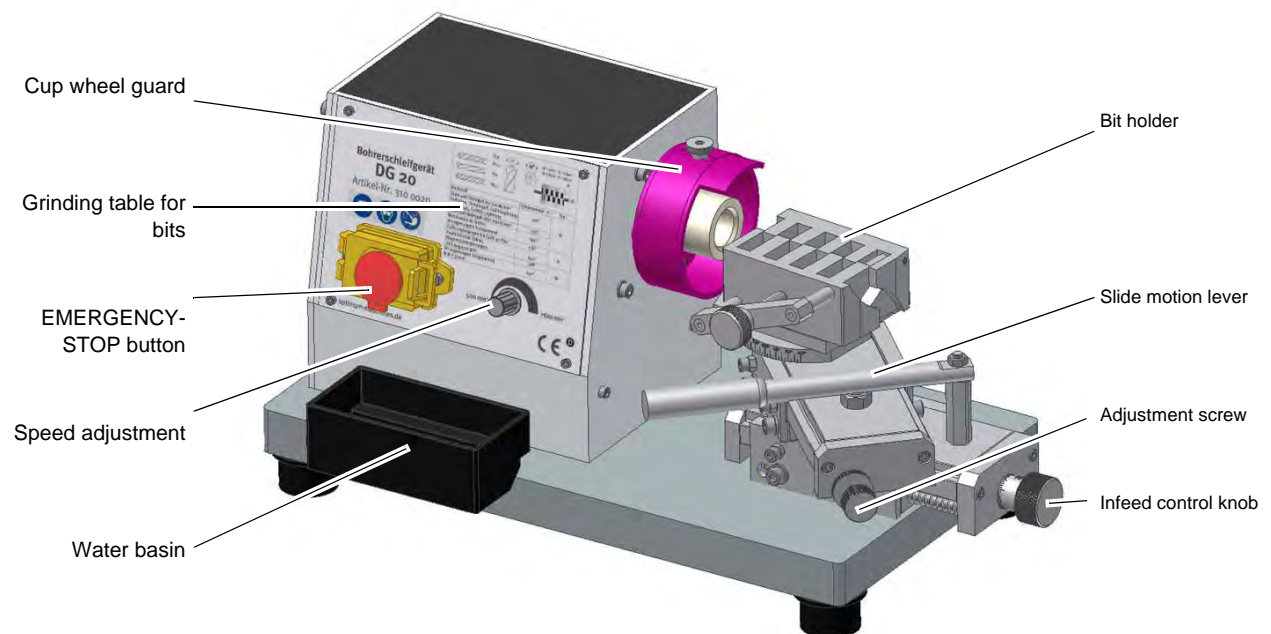


Fig.4-1: DG20 controls

4.3 General

4.3.1 Bit geometry

Bit grinding terms:

Chisel edge angle Ψ .

- The chisel edge angle depends on the kind of *relief produced by grinding*. An angle of 55° is best. Deviations from 55° increases the necessary drilling feed power. An unfavourable cut ratio beneath the chisel edge (more "rubbing" than "cutting") requires a reduction of the chisel edge of the bit for ductile steel or other ductile material if large drills are drilling directly into solid material. This procedure is also called "drilling with pointed tooth". It could also be performed by means of a drill bit grinder.

Pointed angle ϕ .

- The pointed angle is determined for various materials by experience, i.e. 118° for steel.

The angle α_0 on the twist drill is called clearance angle or relief angle.

- In general, a relief angle of 6° on the outer diameter rises up to over 20° on the point.

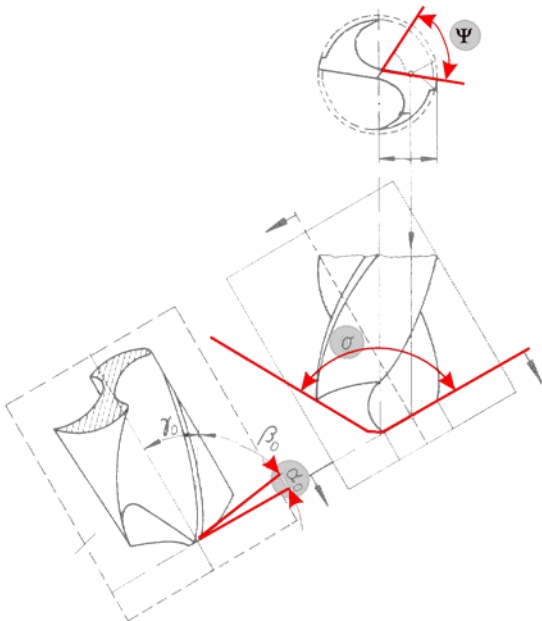


Fig.4-2: Drill bit geometry

4.4 Adjusting the angles on the drill bit grinder

- The chisel edge angle of about 55° is adjusted by properly placing the drill bit into the bit holder.
- The pointed angle is adjusted on the angle scaling of the base.
- The clearance angle (relief produced by grinding) is realized by the radius of the cup wheel and by properly placing the drill bit into the bit holder. Enlarging or reducing of the relief angle may additionally be changed by slight inclining of the supporting plane.

4.5 Standard repointing of a twist drill

4.5.1 Fixing the drill

- Fix the drill into the bit holder.
- Drill with a diameter of less than 5 mm (0.2") should jut out of the bit holder with its bit by about 10mm (0.4").
- Drill with a diameter of more than 5mm should jut out of the bit holder with its bit by about 20 mm (0.8").

INFORMATION!

Even slightly bent drills cannot be repointed on the drill bit grinder.

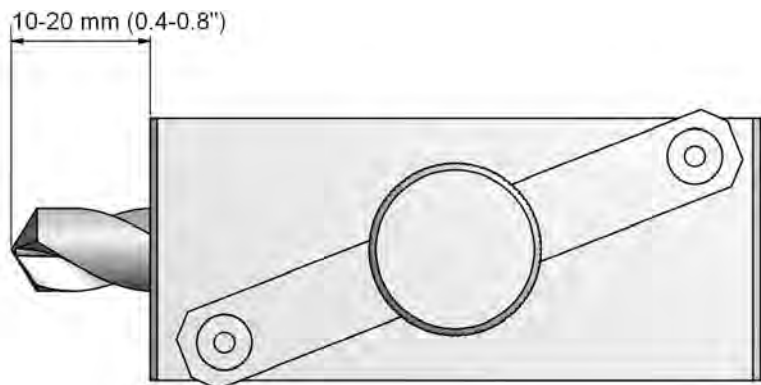


Fig. 4-3: Bit holder (side view)

- Adjust the drill in the bit holder such that the match edge and the cutting edge are offset by same line. The more the drill is turned towards the match edge, the larger is the clearance angle (relief produced by grinding).

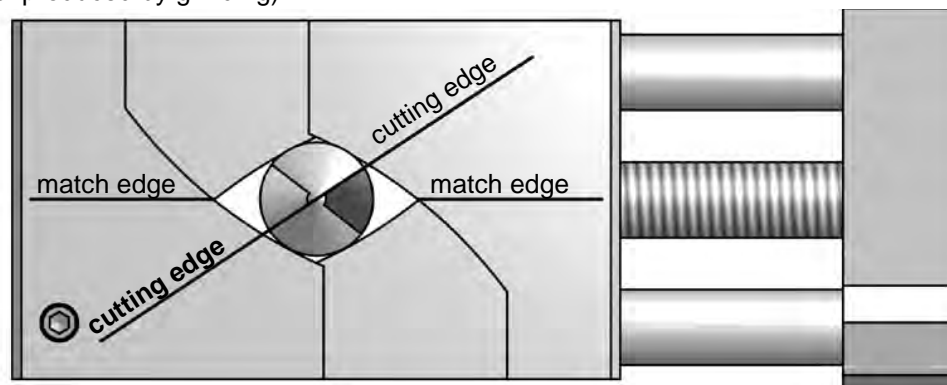


Fig. 4-4: Bit holder match edge

The result of the repointing is determined by the position of the drill in the bit holder. Note that when the drill is repointed, the position of the cutting edges might change. Therefore it is recommended to control the adjusting of the drill in the bit holder regularly.

4.5.2 Before starting the work cycle

Before starting to repoint the drill, always check that the drill is free from oil, grease and paint. This will prevent glazing and soiling the cup wheel.

It is not necessary to trim the cup wheel for concentric running.

Adjusting the pointed angle

Adjust the pointed angle of the drill. Use the scale for the base in order to adjust the angle.

The match edge for the adjustment of the angle is the top slide.

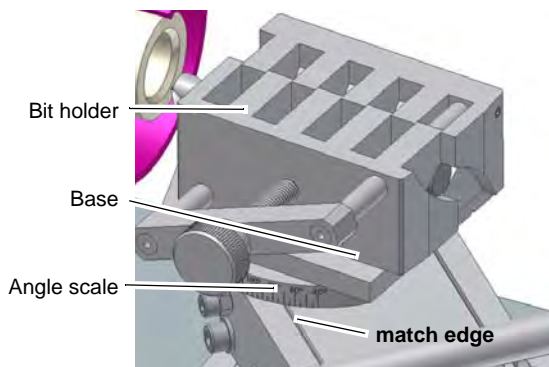


Fig.4-5: Adjusting the pointed angle

Inclining the supporting plane

The base should be horizontal to the top slide. Inclining it to the rear reduces the clearance angle (relief produced by grinding). Inclining it to the front, enlarges the relief produced by grinding.

The possibility of inclining the base is only intended for the reduction of the chisel edge of drills and / or for the reinforcing of the cutting edges of a twist drill.

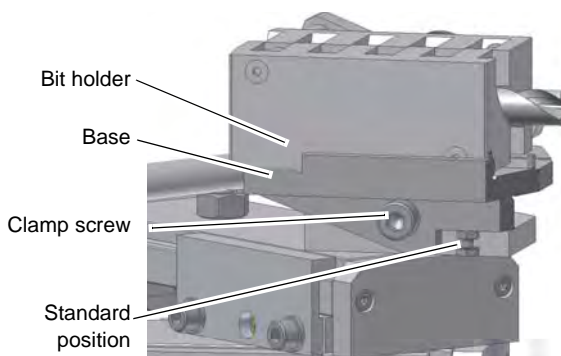


Fig.4-6: Inclining the base

☞ "Sharpening the cutting edges" on page 22

4.5.3 Placing the bit holder on the base

Before placing the bit holder on the base, clean

- the bit holder
- and the base

The bit holder must fit closely to the stop points.

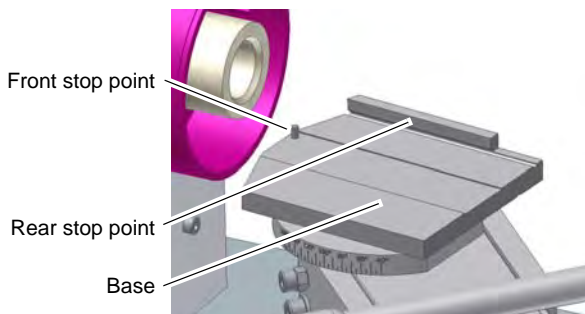


Fig.4-7: Base for bit holder

4.5.4 Adjustment of limit stop and infeed of drill

Do not turn on the drill bit grinder. Adjust the position of the drill using the infeed screw and the limit stop screw.

- Screw or unscrew the infeed screw so that the cutting edge of the drill does not touch the cup wheel.

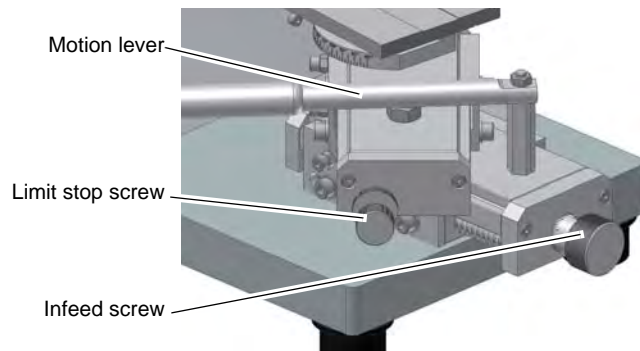


Fig.4-8: Adjusting screws

- Adjust the limit stop screw so that if you move the top slide by means of the motion lever, the bit holder won't contact the cup wheel, but the drill inserts into the cup wheel as much as possible.

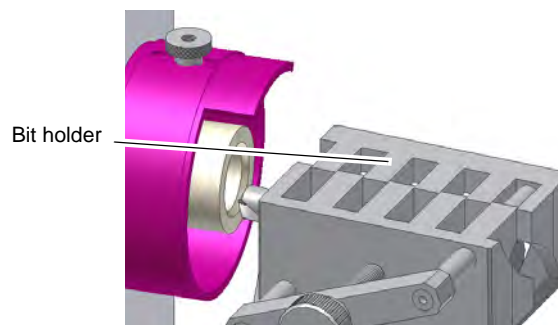


Fig.4-9: Adjustment

4.6 Turning on the drill bit grinder

- Turn the drill bit grinder on.
- Actuate the green on-button beneath the EMERGENCY-STOP cover.
- Close the EMERGENCY-STOP cover a little - but not completely - in order to guarantee the EMERGENCY-STOP function.
- Turn the potentiometer to 225% in order to attain full speed.

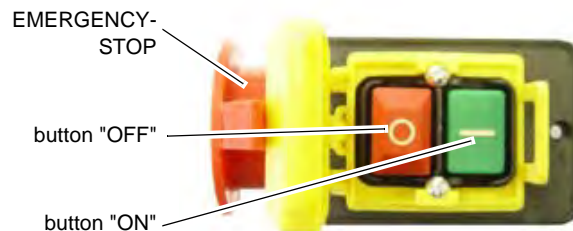


Fig.4-10: ON / OFF button

4.7 Repointing the drill

To repoint the drill, the bit holder must be turned by 180° on the base.

ATTENTION!

When you turn the infeed screw, the bit holder will approach the cup wheel. Check and correct the adjusted limit stop in short intervals.

- Use protective glasses.
- Do not use protective gloves.
- Hold the bit holder and the drill in your right hand. Make sure that the bit holder is positioned very close to the stop points.
- Move the slide slowly back and forth by means of the motion lever.
- Turn the infeed screw clockwise in small steps until it is in contact to the cup wheel.
- Turn the bit holder by 180° in short and regular working steps on the base.
- Turn the infeed screw clockwise in small steps only.
- Terminate the pointing procedure when you recognize a regular grinding pattern on the drill.



INFORMATION!

Even slightly bent drills cannot be repointed on the drill bit grinder.





4.8 Sharpening the cutting edges

ATTENTION!

Sharpening the cutting edges will increase the power necessary for drilling, the wear and tear of the cutting edges of a twist drill will be greatly reduced.

Sharpening the cutting edges is only recommended when the drill is used on an NC or CNC machine tool.

- Perform a standard repointing as described under  "Standard repointing of a twist drill" on page 19.
- Leave the adjustment of the pointed angle at i.e. 118°.
- Do not change the position of the drill in the bit holder.
- Incline the base about 10° to the rear halfway. The more you incline the base, the longer the sharpened cutting edge.
- Sharpen the cutting edge only a small amount using the infeed screw. Perform the further working steps as described under  "Adjustment of limit stop and infeed of drill" on page 21.

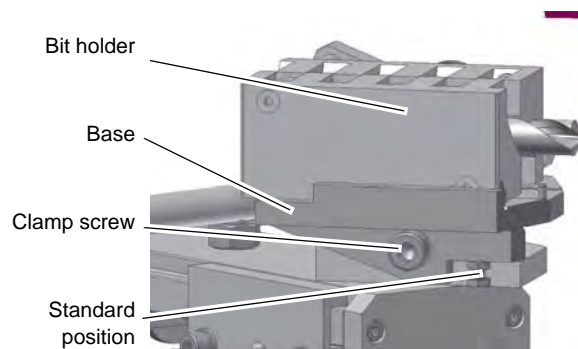



Fig.4-11: Inclining the base

4.9 Reduction of the chisel edge

Also refer to  "Bit geometry" on page 18

The reducing of the chisel edge is only performed by infeed. The motion lever is not actuated. The limit stop must be adjusted in a way that the left half of the twist drill is located on the right outside of the cup wheel. The infeed is taken back again and the bit holder is turned by 180° when the first side of the drilling with reduced chisel edge is being performed.

- Incline the base completely to the rear.
- Turn the drill in the bit holder as far as the cutting edges of the drill are offset by 45° to the match edges on the bit holder.

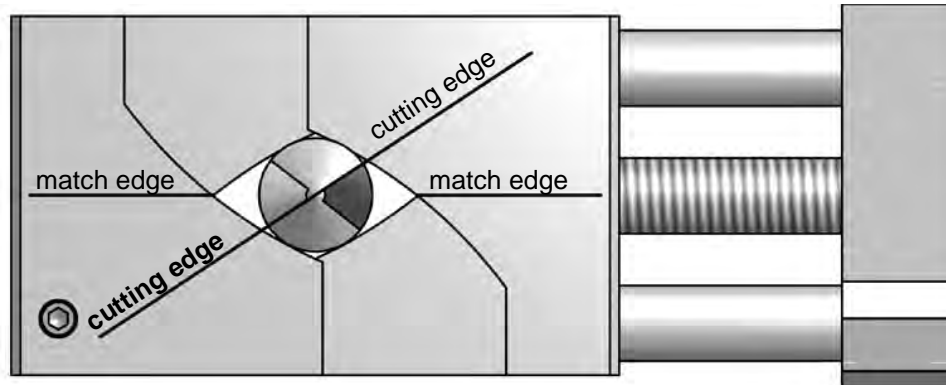


Fig. 4-12: Match edge on the bit holder

- Loosen the clamp screw and incline the base completely to the rear.
- Tighten the clamp screw again.

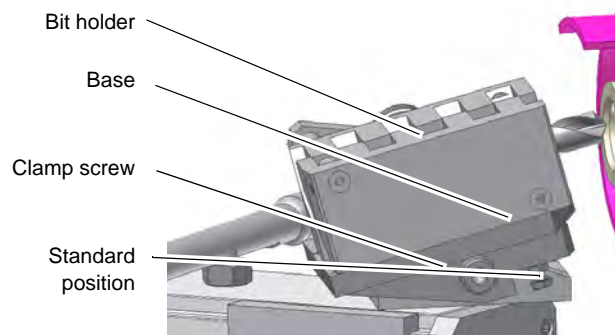


Fig. 4-13: Inclining the base

- Adjust the base by 90°.
- Adjust the drill in a way that the left half of the twist drill is located on the right outside of the cup wheel.
- Use the infeed screw to reduce the chisel edge on first side of drill.
- Turn the drill with complete bit holder on base and reduce the second side of edge.

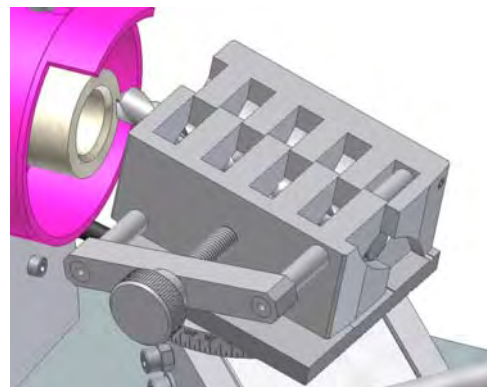


Fig. 4-14: Reduction of the chisel edge

5 Maintenance

In this chapter you will find important information on

- inspection
- maintenance
- repair

of the drill bit grinder.

ATTENTION!

Properly performed regular maintenance work is an essential pre-requisite for

- safe operation,
- faulty-free operation,
- long service-life of the drill bit grinder and
- the quality of the products manufactured.

Installations and equipment of other manufacturers must also be in company condition.



5.1 Safety

WARNING!

The consequences of incorrect maintenance and repair work may include:

- very serious injury to employees working on the drill bit grinder
- damage to the drill bit grinder

Only qualified employees should carry out maintenance and repair work on the drill bit grinder.



5.1.1 Preparation

WARNING!

Only carry out work on the drill bit grinder if it has been switched off using the electric power switch.



5.1.2 Restarting

WARNING!

Before starting the drill bit grinder, make sure that there exists

- no danger for employees,
- no damage to the drill bit grinder.



5.2 Inspection and maintenance

The type and extent of wear depends to a large scale on individual usage and service conditions.

- Regularly clean the drill bit grinder from grinding dust. Soiling by grinding dust in the slideways leads to relevant wear. If necessary - use compressed air to clean the drill bit grinder from grinding dust.
- If you observe excessive "play" in the slideways, fasten the adjustment screws accordingly.

5.2.1 Replacing the cup wheel

The cup wheel must be replaced when the inner recess only amounts to about 5mm.

WARNING!

Before assembling, check the cup wheel for damage and cracks.

If a new cup wheel is damaged or shows fractures, it must not be used.

- Use an 10 mm open end wrench to hold the cup wheel from turning.
- Unscrew the cup wheel by hand by turning it counter clockwise.
- In order to mount a new cup wheel, proceed in opposite sequence.
- Only hand tighten the cup wheel.

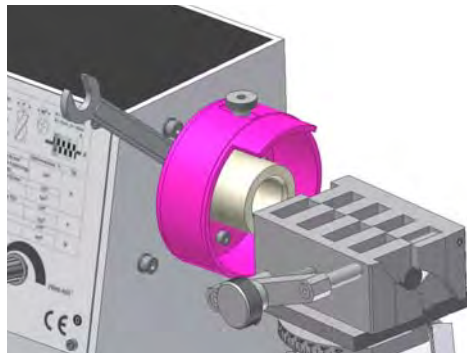


Fig.5-1: Holding the cup wheel



5.3 Repair

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 Industries at (630) 785-6437.

Company are not liable for, nor do they guarantee against, damage or operating malfunctions resulting from alteration, abuse, lack of maintenance 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.

6 Spare parts - DG20

6.1 Spare parts 1 of 2

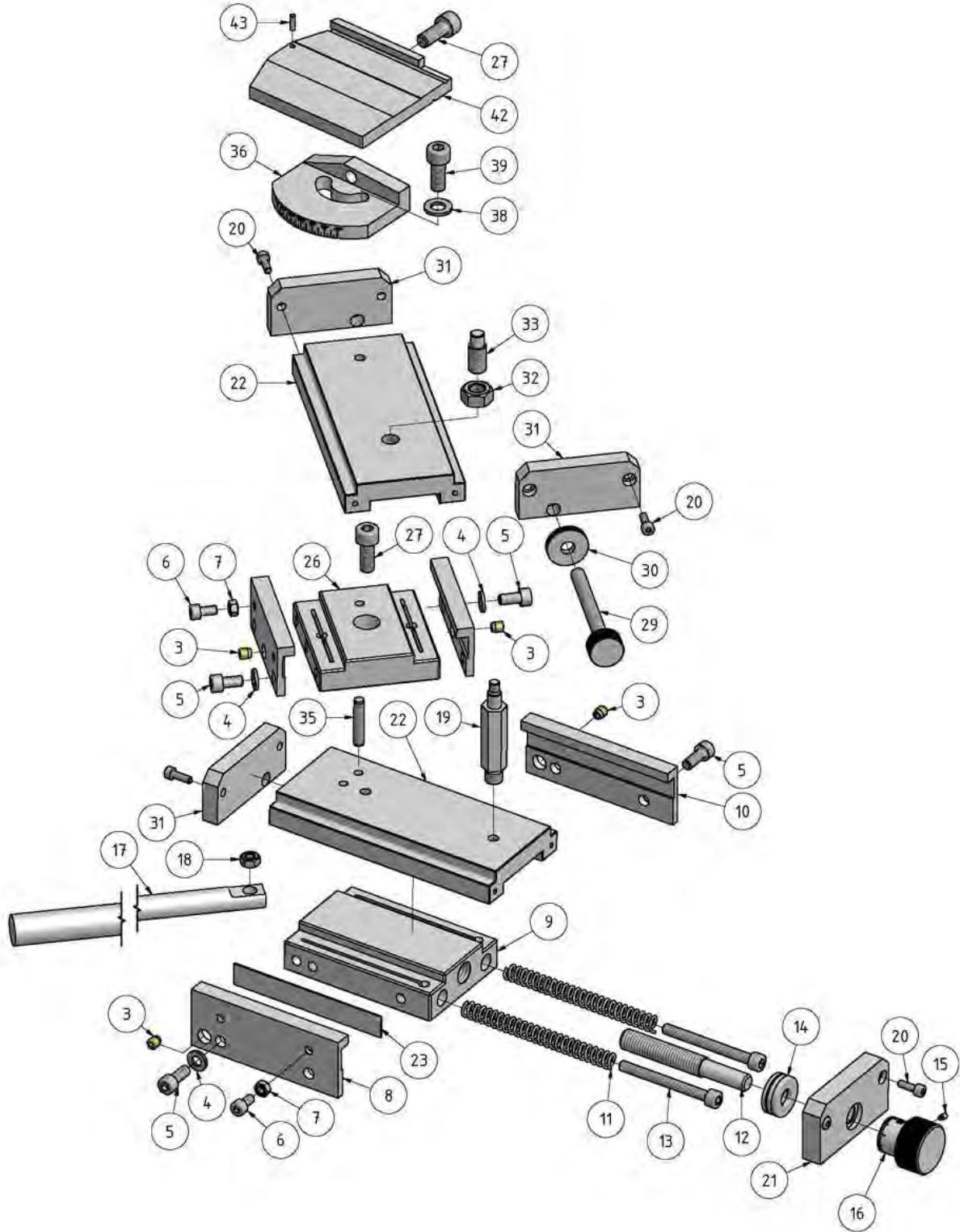


Fig.6-1: DG20 - 1 of 2

6.2 Spare parts 2 of 2

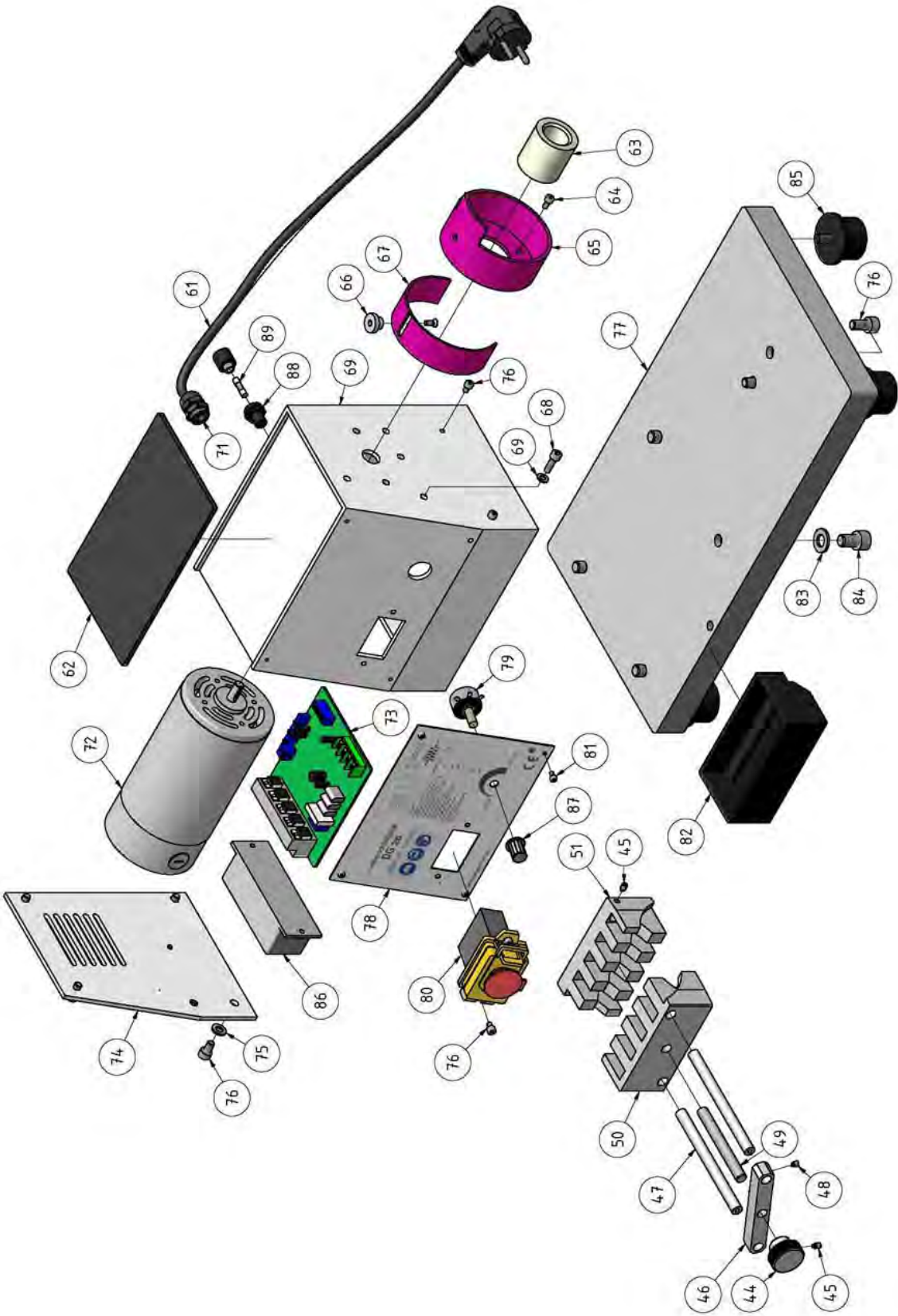


Fig.6-2: DG20 - 2 of 2

6.2.1 Spare parts list

Pos.	Description	Qty.	Size	Item no.
1	Hexagon head cap screw	2	DIN4762/M8x16	031000201
2	Washer	2	DIN125/8	031000202
3	Oil-port	4		0372038
4	Washer	8	DIN125/6	031000204
5	Hexagon head cap screw	8	M6x14	031000205
6	Hexagon head cap screw	4	M5x10	031000206
7	Hexagon nut	4	M5	031000207
8	Keep plate	1		0372029
9	Bottom slide	1		03100209y
10	Keep plate	1		0372017
11	Compression spring	2	1.4x8x35-3	0372033
12	Feed lead screw	1		031002012y
13	Hexagon head cap screw	2	DIN4762/M6x60	0310002013
14	Bearing	1	51100	04051100
15	Socket head set screw M4x6	3	M4x6	0310002015
16	Feed dial	1		031002016y
17	Feed handle	1		0372019
18	Hexagon nut	1	DIN4032/M6	0310002019
19	Feed screw shaft	1		0372020
20	Hexagon head cap screw	8	DIN4762/M4x12	0310002020
21	Check plate (1)	1		0372015
22	Slide	1		0372003
23	Gib (2)	1		0372032
24	Check plate (2)	2		0372031
25	Keep plate (1)	1		0372030
26	Top-slide	1		0372004
27	Hexagon head cap screw	1	DIN4762/M8x20	0310002027
28	Keep plate (2)	1		0372025
29	Normal screw	1		0372013
30	Nut	1	DIN4032/M8	0372059
31	Check plate (3)	1		0372021
32	Nut	1	DIN4032/M10	0310002032
33	Feed screw	1		0372018
34	Gib (1)	1		0372009
35	Pin	1	A5x10	0310002035
36	Rotary plate	1		0372006
37	Hexagon head cap screw	1	DIN4032/M8x20	0310002037
38	Washer	1	DIN125/8	0310002038
39	Hexagon bolt	1	DIN4017/M8x20	0310002039
40	Hexagon bolt	1	DIN4017/M4x16	0310002040
41	Hexagon nut	1	DIN4032/M4	0310002041
42	Base	1		0372007
43	Spring pin	1	3x10	
44	Handle sleeve	1		
45	Socket head set screw	1	DIN4762/M4x5	
46	Connect pole	1		
47	Guide pole	2		
48	Socket head set screw	2	DIN4762/M4x3	
49	Double screw	1		
50	Top-holder	1		
51	Bottom-holder	1		
61	Cable & plug	1	SJT 3C 14AWG	0310002061y
62	Rubber gasket	1		0372010
63	Grinding wheel	1		3107120
64	Hexagon head cap screw	3	DIN4762/M5x14	0310002064
65	Check plate	1		0372022
66	Nut	1	M5	0310002066
67	Guard cover	1		0372027
68	Hexagon head cap screw	4	DIN4762/M5x16	0310002068
69	Washer	4	DIN125/5	0310002069
70	Box	1		0372024
71	Screw coupling	1		0310002071
72	Motor	1	115V	031002072y
73	Control motherboard	1	115V	031002073y
74	Cover	1		0310002074
75	Washer	5	DIN125/6	0310002075
76	Hexagon head cap screw	5	DIN4762/M6x10	0310002076
77	Soleplate	1		0372023
78	Main plate	1		0372067
79	Variable speed control knob	1		0320298
80	Magnetic switch	1		0372028

complete set
look on position 99

Pos.	Description	Qty.	Size	Item no.
81	Hexagon head cap screw	2	DIN4762/M4x12	0310002081
82	Coolant tray	1		0372039
83	Washer	4	DIN125/8	0310002083
84	Hexagon head cap screw	4	DIN4762/M8x20	0310002084
85	Cushion	4		0372065
86	Line filter	1		0310002086
87	Knob	1		0310002087
88	Fuse casing			0310002088
89	Fuse	2	F10AL250V (size 5x20mm)	0310002089y
Complete sets				
99	Holder complete	1	44-51,15	0372008

6.3 Wiring diagram

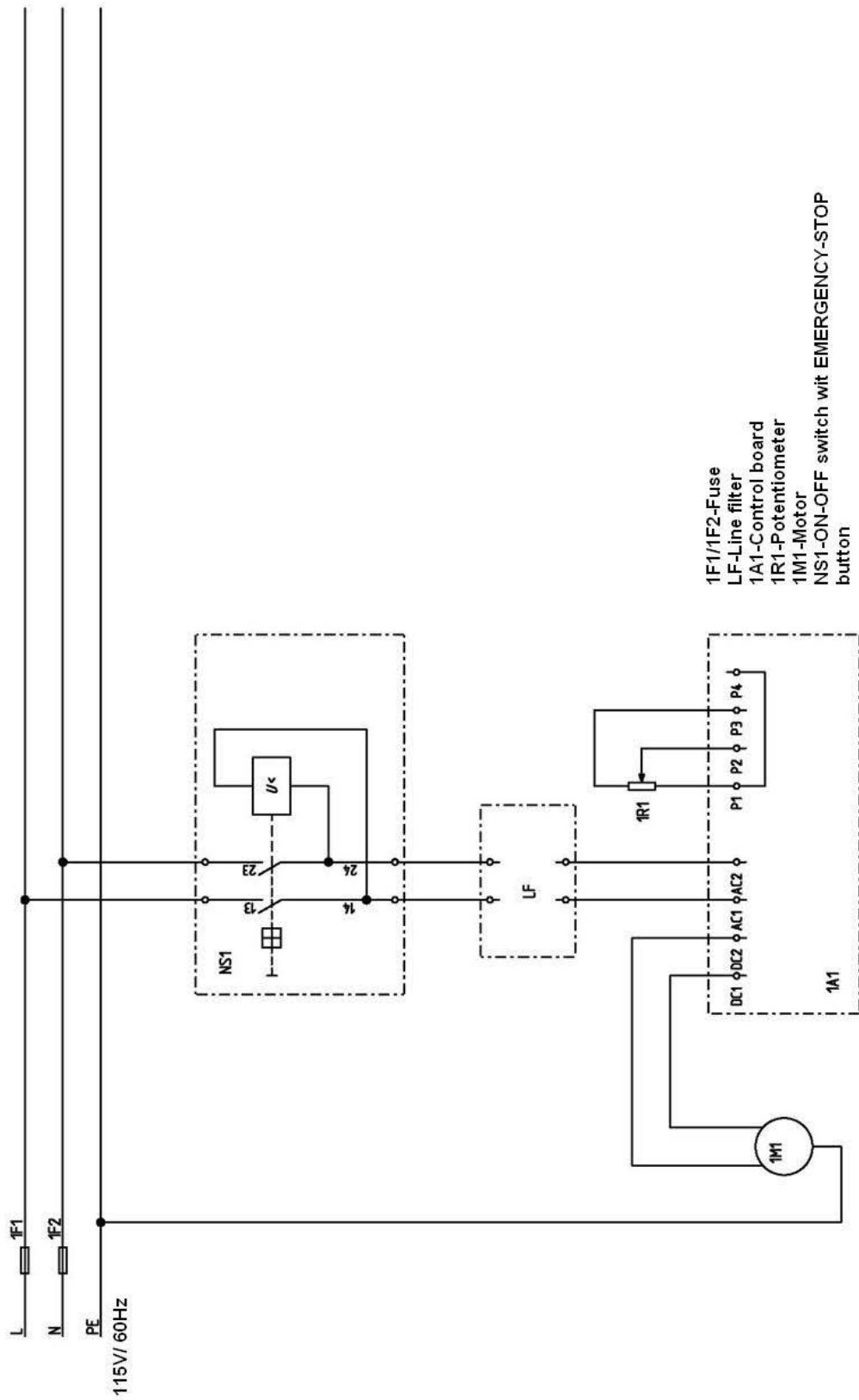


Fig.6-3: Wiring diagram

6.3.1 Spare parts list electrical components

Pos.	Designation	Qty.	Size	Item no.
1F1/1F2	Fuse	2		031000201F1
LF	Line filter	1		03100020LF
1A1	Control board	1		031002073
1R1	Potentiometer	1		031002079
1M1	Motor	1		031002072
NS1	On-Off switch with Emergency Stop button	1		031002080

7 Appendix

7.1 Copyright

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The company reserves the right to make technical alternations without prior notice.

7.2 Terminology/Glossary

Term	Explanation
Protection cap	Cover of the grinding wheel and the motor shaft
Protection cover	Protection cap
Spark-guard	Cover to retain sparking during grinding
Pointed angle	Angle of the complete bit
Clearance angle	Relief produced by grinding on the drill
Chisel edge	Bit
Cutting edge	Cutting line of the bit

7.3 RoHS , 2002/95/CE

The sign on the product or on its packing indicates that this product complies with the European guideline 2002/95/EC .



7.4 LIMITED WARRANTY

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