

Champion 30V Operation Manual

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1 Safety

Glossary of symbols

	gives additional indications
→	calls on you to act
0	enumerations

This part of the operating manual

- 0 explains the meaning and use of the warning references contained in the operating manual,
- 0 explains how to use the drilling-milling machine properly,
- 0 highlights the dangers that might arise for you and others if these instructions are not obeyed,
- 0 informs you on how to prevent dangers.

In addition to this operating manual please observe




- 0 applicable laws and regulations,
- 0 legal regulations for accident prevention,
- 0 the prohibition, warning and mandatory signs as well as the warning notes on the drilling-milling machine.

Always keep this documentation close to the drilling-milling machine.

1.1 Safety warnings (warning notes)

1.1.1 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.

Symbol	Warning	Definition/Consequences
	DANGER!	Imminent danger that will cause serious injury or death to persons.
	WARNING!	Risk: a danger that might cause serious injury or death to persons.
	CAUTION!	Danger or unsafe procedure that might cause injury to persons or damage to property.
	ATTENTION!	Situation that could cause damage to the drilling-milling machine and to the product and other types of damage. No risk of injury to persons.
	INFORMATION	Application tips and other important/helpful or useful information and notes. No dangerous or harmful consequences for persons or objects.

In the case of specific dangers, we replace the symbol with the following:



1.1.2 Further symbols



Activation forbidden!



Read the operating manual before the machine is first used!



Pull the mains plug!



Use protective goggles!



Use protective gloves!



Use protective boots!



Wear a safety suit!



Use ear protection!



Protect the environment!

1.2 Proper use



WARNING!

In the event of improper use, the drilling-milling machine

- **will endanger the staff,**
- **will endanger the drilling-milling machine and other material property of the operator,**
- **may affect the proper operation of the drilling-milling machine.**


The drilling-milling machine is designed and manufactured to be used for milling and drilling cold metals or other non-flammable materials that do not constitute a health hazard by using commercial milling and drilling tools.

The drilling-milling machine must only be installed and operated in a dry and well-ventilated place.

If the drilling-milling machine is used in any way other than described above, modified without the authorization of the company or operated with different process data, then the drilling-milling machine is being used improperly. We do not take any liability for damages caused by improper use.

We would like to stress that any modifications to the construction or technical or technological modifications that have not been authorized by the company will also render the guarantee null and void. It is also part of proper use that

- the maximum values for the drilling-milling machine are complied with,
- the operating manual is observed,
- inspection and maintenance instructions are observed.

 "Technical data" on page 13



WARNING!

Very serious injury due to improper use.

It is forbidden to make any modifications or alterations to the operating values of the drilling-milling machine. These could endanger the staff and cause damage to the drilling-milling machine.

1.3

Possible dangers caused by the drilling-milling machine.

The drilling-milling machine was built using the latest technological advances.

Nonetheless there remains a residual risk, since the drilling-milling machine operates with

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

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

If the drilling-milling machine is used and maintained by staff who are not duly qualified, there may be a risk by the drilling-milling machine resulting from incorrect operation or unsuitable maintenance.



INFORMATION

All persons involved in assembly, commissioning, operation and maintenance must

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

Disconnect the drilling-milling machine whenever cleaning or maintenance work is being carried out.



WARNING!

The drilling-milling machine may only be used with the safety devices activated.

Disconnect the drilling-milling machine whenever you detect a failure in the safety devices or when they are not fitted!

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

This will be your responsibility being the machine operator!

“Safety devices” on page 8

1.4

Qualification of the staff

1.4.1

Target group

This manual is addressed to

- O the operator,
- O the user,
- O the maintenance staff.



The warning notes therefore refer to both operation and maintenance of the drilling-milling machine.

Always disconnect the drilling-milling machine plug from the mains. This will prevent it from being used by unauthorized staff.



INFORMATION

All persons involved in assembly, commissioning, operation and maintenance must

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

In the event of improper use

- there may be a risk to the staff,
- there may be a risk to the drilling-milling machine and other material property,
- may affect proper operation of the drilling-milling machine.

1.5 Safety devices

Use the drilling-milling machine only with properly functioning safety devices.

Stop the drilling-milling machine immediately if there is a failure in the safety device or if it is not functioning for any reason.

It is your responsibility!

If a safety device has been activated or has failed, the drilling-milling machine must only be used when

- the cause of the failure has been removed,
- it has been verified that there is no danger resulting for the staff or objects.



WARNING!

If you bypass, remove or override a safety device in any other way, you are endangering yourself and other persons working with the drilling-milling machine. The possible consequences are

- **damage as a result of components or parts of components flying off at high speed,**
- **contact with rotating parts,**
- **fatal electrocution.**

The drilling-milling machine includes the following safety devices:

- an EMERGENCY-STOP button,
- a protective cover on the drill-mill head,
- a separating protective equipment on the milling spindle.

1.5.1 EMERGENCY-STOP button

The EMERGENCY-STOP button switches the drilling-milling machine off.

“Switching on the drilling-milling machine” on page 26

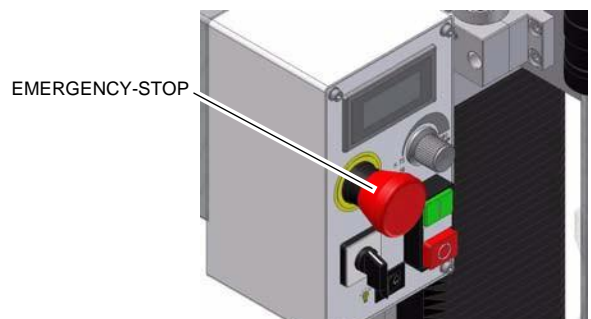


Fig.1-1: EMERGENCY-STOP button



ATTENTION!

The **EMERGENCY-STOP** button switches off the drilling-milling machine immediately.

Only press the **EMERGENCY-STOP** button in case of danger! If the button is actuated in order to stop the drilling-milling machine generally you might damage tools or workpieces.

After activating the button, turn it to the right, in order to restart the machine.

1.5.2

Protective cover



The drill-mill head is fitted with a protective cover.



WARNING!

Remove the protective cover only after the mains plug has been pulled out of the socket.



Protective cover

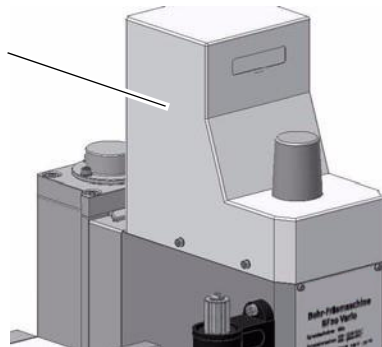


Fig.1-2: Protective cover

1.5.3

Separating protective equipment

Adjust the correct height of the protective equipment before starting work.

Locking screw



Fig.1-3: Separating protective equipment

1.6 Safety check

Check the drilling-milling machine regularly.

Check all safety devices

- ☐ before starting work,
- ☐ once a week (with permanent operation),
- ☐ after every maintenance and repair operation.

General check		
Equipment	Check	OK
Protective covers	Fitted, firmly bolted and not damaged	
Labels, markings	Installed and legible	

Run test		
Equipment	Check	OK
EMERGENCY-STOP button	When the EMERGENCY-STOP button is activated, the drilling-milling machine should switch off. A restart will not be possible until the EMERGENCY-STOP button has been unlocked and the ON switch has been activated.	
Separating protective equipment around the drilling and milling spindle	Only switch on the drilling-milling machine if the protective equipment is closed.	

1.7 Personnel protective equipment



For certain work personnel protective equipment is required.

Protect your face and eyes: During all work and specifically work during which your face and eyes are exposed to hazards, a safety helmet with a face guard should be worn.



Use protective gloves when handling pieces with sharp edges.



Use safety shoes when you position, dismantle or transport heavy components.



Use ear protection if the noise level (emission) in the workplace exceeds 80 dB (A).

Before starting work, make sure that the prescribed individual protection gear is available at the workplace.



CAUTION!

Dirty or contaminated personnel protective equipment can cause disease. Clean it each time after it has been used and once a week.

1.8 For your own safety during operation



WARNING!

Before activating the drilling-milling machine, double-check that this will not endanger other people or cause damage to equipment.

Avoid any unsafe working practices:

Make sure your work does not endanger anyone.

- O The instructions in this manual need to be observed during assembly, handling, maintenance and repair.
- O Use protective goggles.
- O Switch off the drilling-milling machine before measuring the workpiece.
- O Do not work on the drilling-milling machine if your concentration is reduced, for example, because you are taking medication.
- O Stay on the drilling-milling machine until the working spindle has come to a complete halt.
- O Use the prescribed protective equipment. Make sure to wear a well-fitting work suit, when necessary, a hairnet.
- O Do not use protective gloves during drilling or milling work.
- O Unplug the shockproof plug from the mains, before changing the tool.
- O Use suitable devices for removing drilling and milling chips.
- O Make sure your work does not endanger anyone.
- O Clamp the workpiece tightly before activating the drilling-milling machine.

In the description of work with and on the drilling-milling machine we highlight the dangers specific to that work.

1.9 Disconnecting and securing the drilling-milling machine



Pull out the mains plug before starting maintenance and repair work.

1.10 Using lifting equipment



WARNING!

Use of unstable lifting equipment and load suspension devices that break under load can cause very serious injury or even death.

Check that the lifting equipment and load suspension devices are of sufficient load capacity and in perfect condition.

Observe the rules for preventing accidents issued by your association for the prevention of occupational accidents and safety in the workplace or other inspection authorities.

Hold the loads properly.

Never walk under suspended loads!

1.11 Signs on the drilling-milling machine

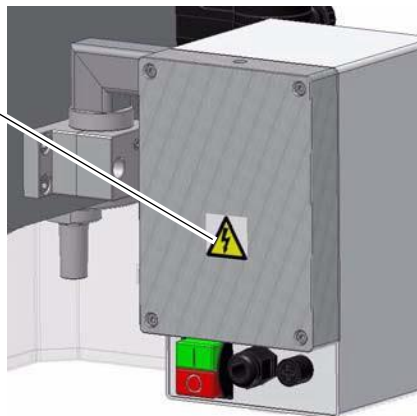


Fig.1-4: CHAMPION 30V

2 Technical data

Power	240V/50HZ/1100W
Drilling capacity	30mm
End Milling capacity	30mm
Face Milling capacity	75mm
Working radius	185mm
Spindle Taper	MT3
Sleeve travel	70mm
Headstock tilt	+ / - 90°
Reduction stages	2
Z-axis travel	350mm
Table length	730mm x 840mm
Table width	210mm
Y-axis travel	200mm
X-axis travel	470mm x 590mm
T - slot size / distance	14mm / 63mm
Height	1030mm
Depth	1030mm x 1140mm
Width	700mm x 700mm
Net Weight	220kg
Height	3000mm
Depth	3500mm
Width	2200mm
Spindle speeds	50-3000rpm

Temperature	5-35 °C
Humidity	25 - 80%
Reduction stage Blank steel parts	Mobilgrease OGL 007 or, Mobilux EP 004, or Mobil XHP acid-free oil, e.g. weapon oil, motor oil
<p style="text-align: center;">Emissions</p> <p>The noise level (emission) of the drilling-milling machine is below 78 dB(A). If the drilling-milling machine is installed in an area where various machines are in operation, the acoustic influence (emission) on the user of the drilling-milling machine may exceed 85 dB(A) at the workplace.</p> <p>We recommended the use of soundproofing ear protection. Remember that the duration of the noise pollution, the type and characteristics of the working area and operation of other machines influence the noise level at the workplace.</p>	

3 Unpacking and connecting



INFORMATION

The drilling-milling machine comes pre-assembled.

3.1 Extent of supply

When the drilling-milling machine is delivered, immediately check that the machine has not been damaged during shipping and that all components are included. Also check that no fastening screws have come loose.

Compare the parts supplied with the information on packing list.

3.2 Transport



WARNING!

Machine parts falling off forklift trucks or other transport vehicles could cause very serious or even fatal injuries. Follow the instructions and information on the transport case:

- centres of gravity
- suspension points
- weights
- means of transport to be used
- prescribed shipping position



WARNING!

Use of unstable lifting equipment and load suspension devices that break under load can cause very serious 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 rules for preventing accidents.

Hold the loads properly.

Never walk under suspended loads!

3.3 Storage



ATTENTION!

Improper storage may cause important parts to be damaged or destroyed.

Store packed or unpacked parts only under the intended environmental conditions.

👉 “Environmental conditions” on page 14

Consult the company if the drilling-milling machine or accessories have to be stored for a period of more than three months or under different environmental conditions than those given here.

3.4 Installation and assembly

3.4.1 Requirements of the installation site

The working area for operation, maintenance and repair work must not be hindered.

The mains plug of the drilling-milling machine must be freely accessible.

3.4.2 Load suspension point



WARNING!

Danger of crushing and overturning. Proceed with extreme caution when lifting, installing and assembling the machine.

- Secure the load suspension device around the drill-mill head. Use a lifting sling for this purpose.
- Clamp all the clamping levers at the drilling-milling machine before lifting the drilling-milling machine.
- Make sure that no add-on pieces or varnished parts are damaged due to the load suspension.

3.4.3 Installation

- Check the horizontal orientation of the base of the drilling-milling machine with a spirit level.
- Check that the foundation has sufficient floor-load capacity and rigidity. The total weight amounts from 230 to 235 kg.



ATTENTION!

Insufficient rigidity of the foundation leads to the superposition of vibrations between the drilling-milling machine and the foundation (natural frequency of components). Insufficient rigidity of the entire milling machine assembly also rapidly causes the machine to reach critical speeds, with unpleasant vibrations, leading to bad milling results.

- Position the drilling-milling machine on the intended foundation.
- Attach the drilling-milling machine using the provided recesses in the machine base.



WARNING!

The quality of the substructure and the kind of fixture of the machine stand to the substructure has to assimilate the loads of the drilling-milling machine. The substructure needs to be even. Please check the horizontal alignment of the substructure of the drilling-milling machine.

Fix the drilling-milling machine to the substructure at the provided recesses at the stand. When using an optionally available machine substructure, it also needs to be anchored safely and firmly. We recommend the use of shear connector cartridges or heavy-duty bolts.

3.4.4 Installation drawing

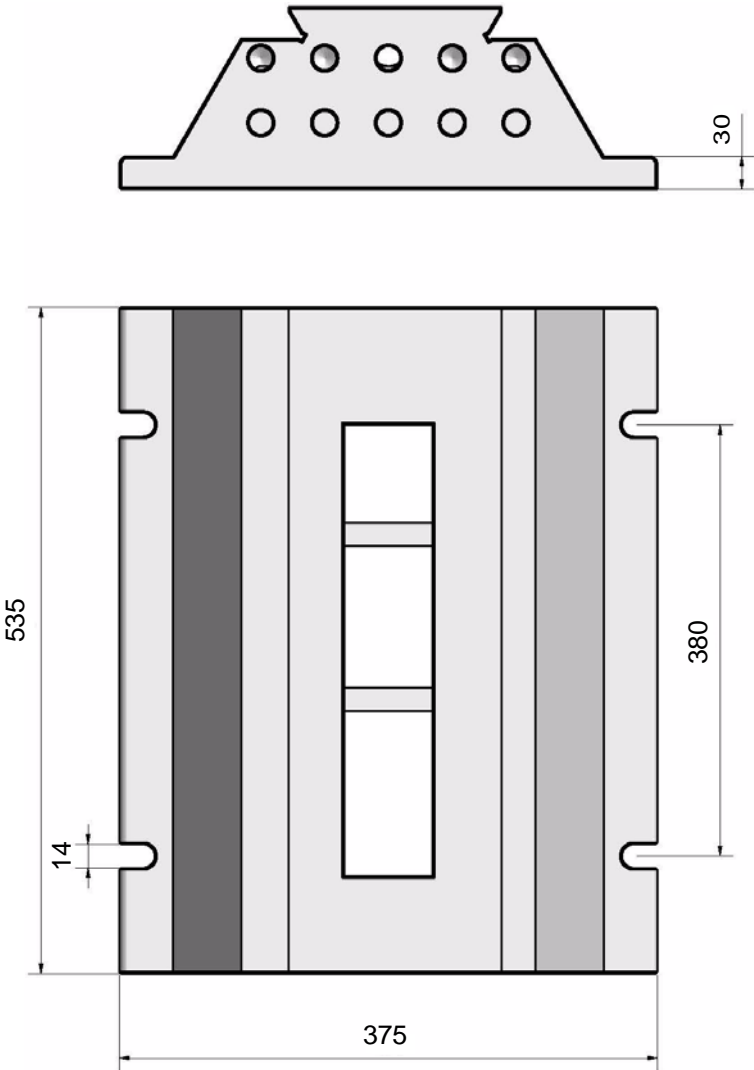
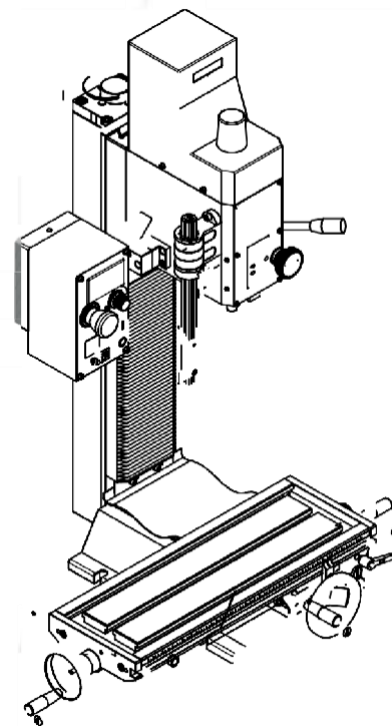
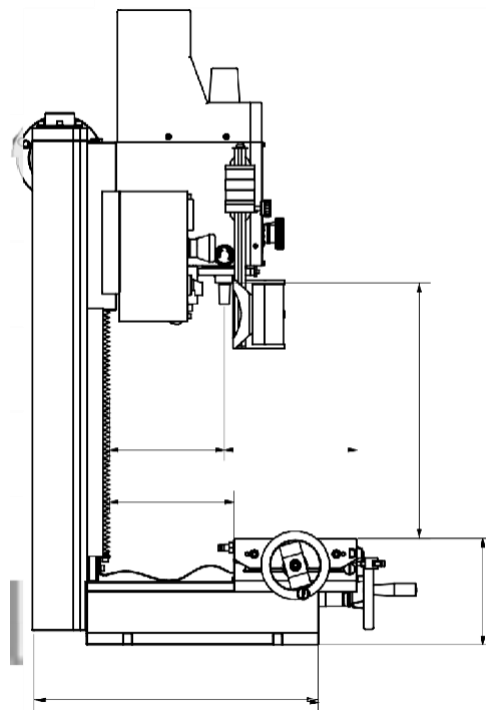
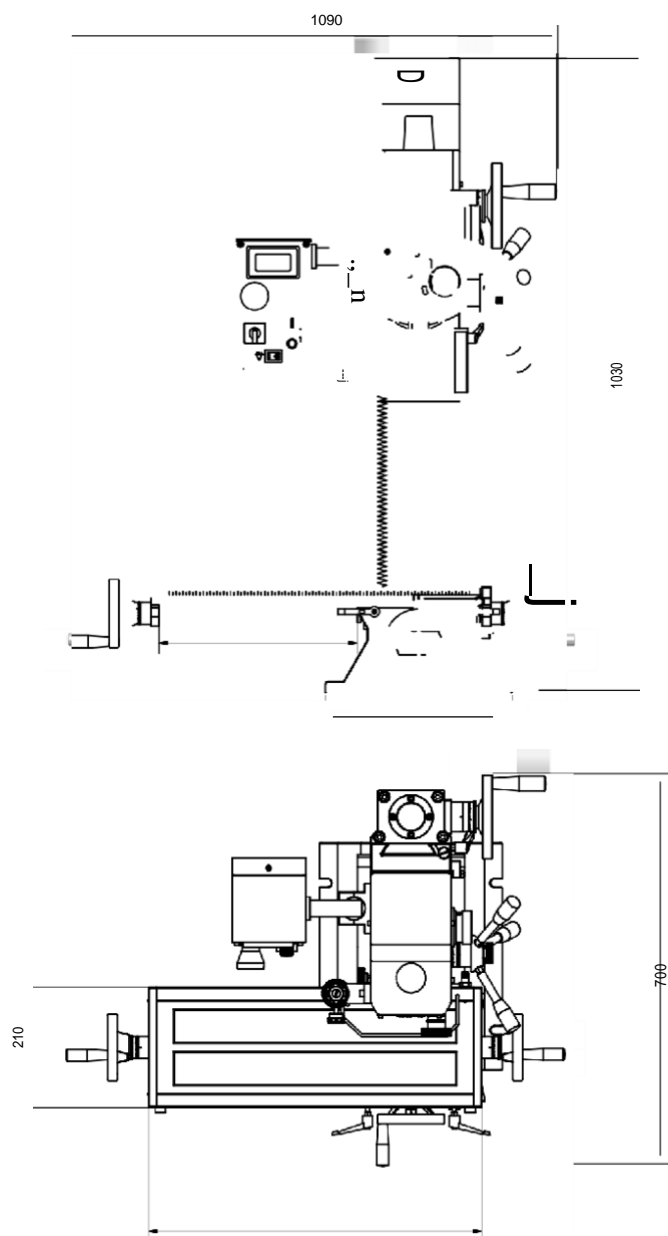
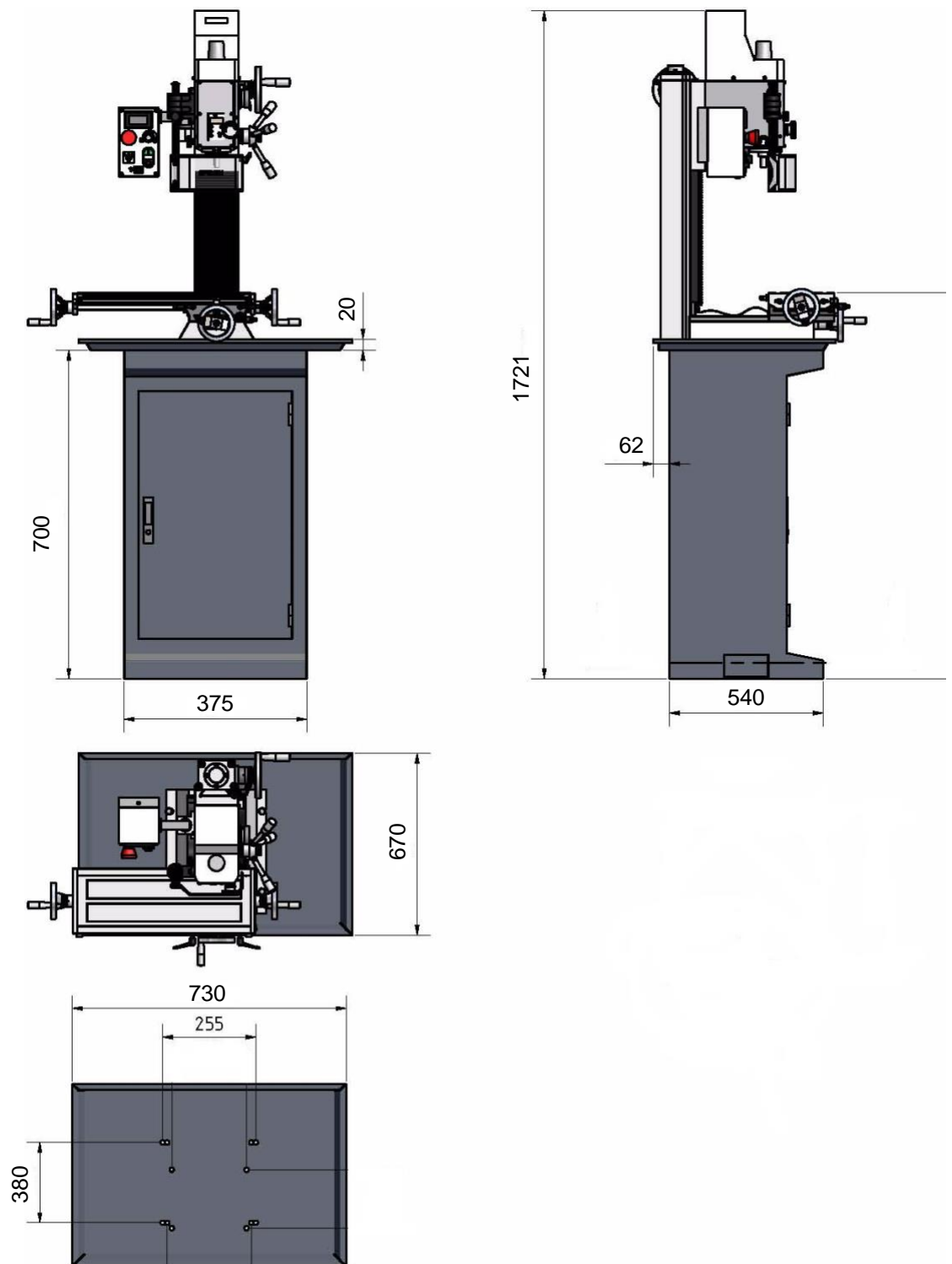


Fig.3-1: Machine base

3.5 Installation plan



3.6 Installation plan of optional substructure



3.7 First use

3.7.1 Cleaning and lubricating

- Remove the anti-corrosive agent to the drilling-milling machine for transport and storage purposes. We recommend the use of paraffin.
- Do not use any solvents, thinners or other cleaning agents which could corrode the varnish on the drilling-milling machine. Follow the specifications and indications of the manufacturer of the cleaning agent.
- Lubricate all bright machine parts with non-corrosive lubricating oil.
- Grease the drilling-milling machine using the lubrication chart.
"Inspection and maintenance" on page 37
- Check the smooth running of all spindles. The spindle nuts can be readjusted.
- Disassembly the taper gibs of the cross table and clean the gibs from the anti-corrosive agent. "Taper gibs" on page 38

4 Operation


4.1 Safety

Use the drilling-milling machine only under the following conditions:

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



All malfunctions should be eliminated immediately. Stop the drilling-milling machine immediately in the event of any abnormality in operation and make sure it cannot be started up accidentally or without authorization.

 "For your own safety during operation" on page 11

4.2 Control and indicating elements

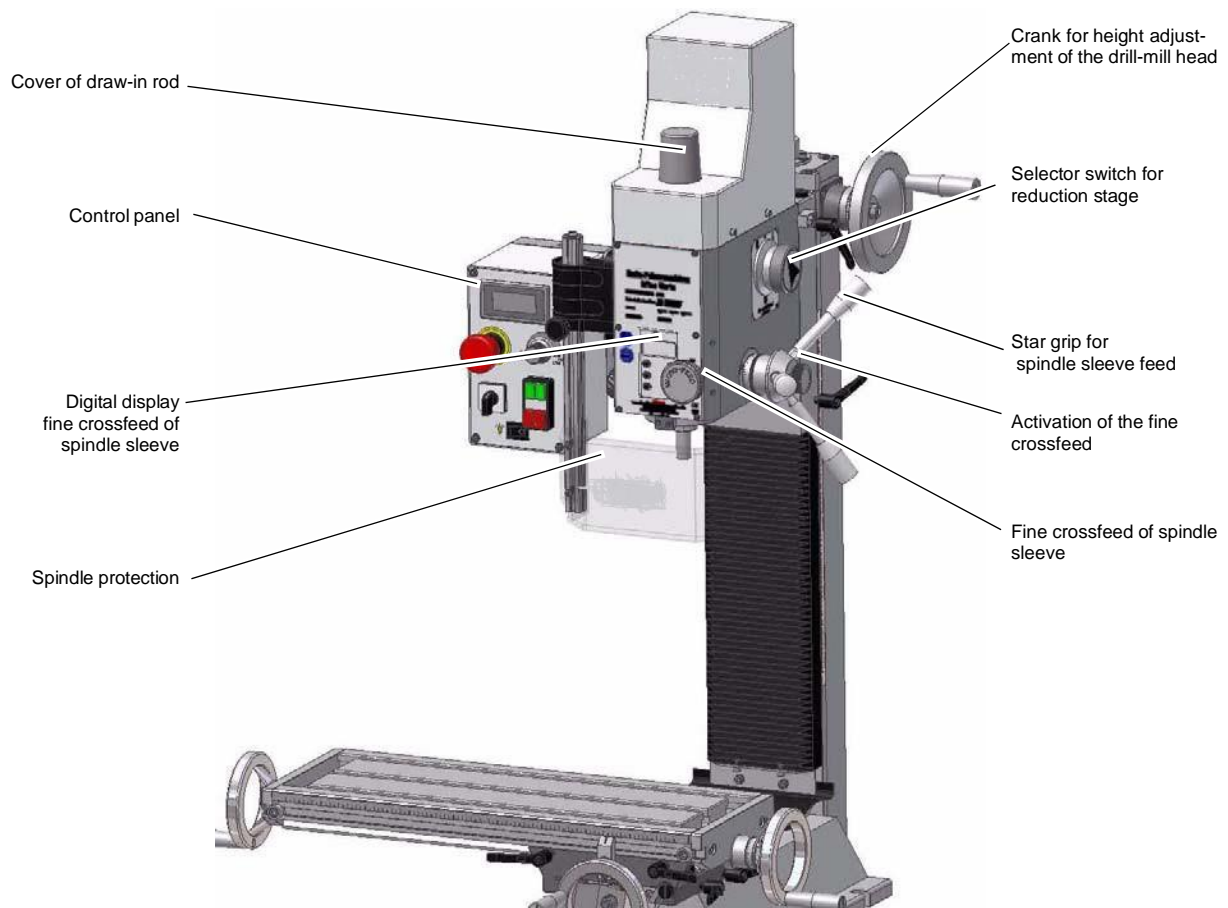
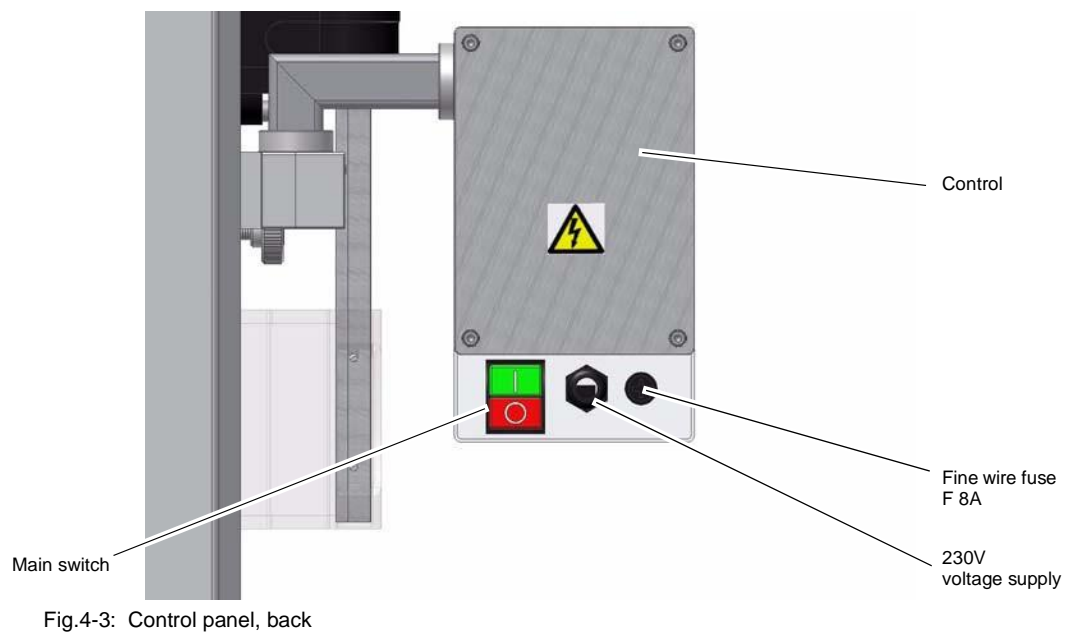
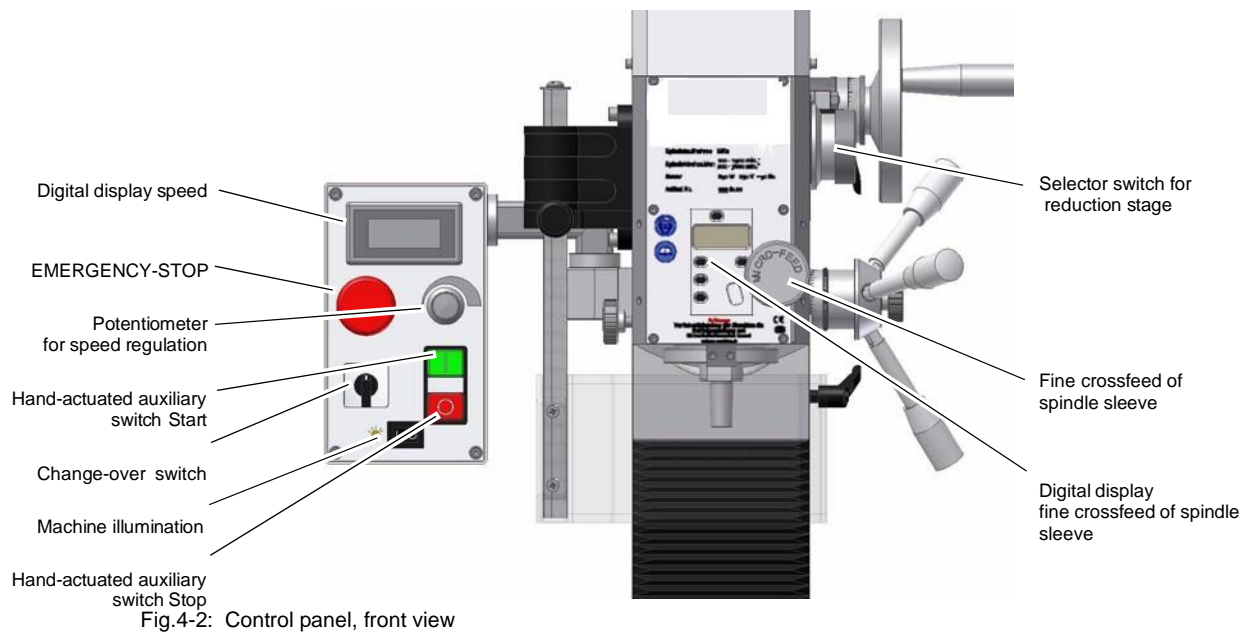


Fig.4-1: CHAMPION 30V

4.2.1 Control panel





Main switch

Switches the voltage supply on.
The main switch is at the back of the control panel.



Hand-actuated auxiliary switch Start / Stop

Switches the machine on or off.



Turning direction

Selection left-handed, right-handed rotating or switch-off position. At the left-handed rotation the speed is about 50% less than at the right-handed rotation. First select the turning direction before switching on the machine with the push button.



Speed

Potentiometer to set the required speed. Set the speed at the potentiometer. The speed and thus the cutting speed are depending of the material of the workpiece, of the cutter diameter and of the type of cutter.

The electronics controls the speed slowly to the target value with a ramp. Therefore, please wait a while before you continue milling or drilling with the feed.



Reduction stage

Selection rotary-type switch to select the reduction stage.

CAUTION!



Wait until the drilling-milling machine has come to a complete halt, before performing any changes on the gear switch.

→ Turn the gear switch to the position "H" for a speed range from approx. approx. 50 - 750 min⁻¹.

→ Turn the gear switch to the position "L" for a speed range from approx. approx. 150 - 2250 min⁻¹.

4.3 Switching on the drilling-milling machine

- Switch the main switch on.
- Select the reduction stage.
- Select the turning direction.
- Set the potentiometer to the lowest speed.
- Close the spindle protection.
- Actuate the hand-actuated auxiliary switch Start.
- Set the required speed at the potentiometer.

4.4 Switching off the drilling-milling machine

- Press the hand-actuated auxiliary switch Stop. During long-term standstill switch the turning direction switch to the zero position.

4.5 Inserting a tool

4.5.1 Installation



CAUTION!

When milling operations are performed the cone seat has to be fixed always to the draw-in rod. Any cone connections with the taper bore of the work spindle without using the draw-in rod are not allowed for milling operations. The cone connection should be released by the lateral pressure. Injuries may be caused by parts flying off.

The mill head is equipped with a draw-in rod M12.

- Remove the cover.
- Clean the seat in the milling spindle / spindle sleeve.
- Clean the taper of your tool.
- Insert the tool into the holding fixture / spindle sleeve.

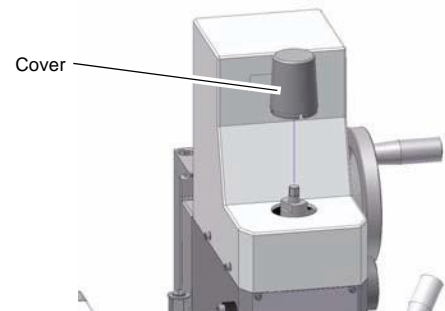


Fig.4-4: Drill-mill head

- Screw the draw-in rod into the tool.
- Tighten the tool with the draw-in rod and hold the spindle onto the end support with a key.

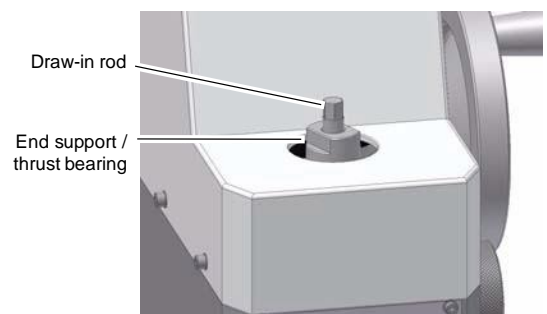


Fig.4-5: Drill-mill head

4.5.2 Disassembly

- Hold the spindle thrust bearing with a wrench and loosen the draw-in rod. Turn the draw-in rod further, so that the tool is squeezed out from the cone admissi



ATTENTION!

When installing a cold morse taper into a heated-up machine those MT seats tend to shrink on the morse taper contrary to the quick-releaser tapers.

4.5.3

Use of collet chucks

When using collet chucks to hold milling tools, a higher operation tolerance can be achieved. The exchange of the collet chucks for a smaller or larger end mill cutter is done in a simple and rapid way and it is not necessary to disassemble the complete tool. The collet chuck is pressed into the ring of the swivel nut and has to rest there by itself. The milling cutter is clamped by fastening the swivel nut on the tool.

Make sure that the correct collet chuck is used for each milling cutter diameter, so that the milling cutter may be fastened securely and firmly.

“Optional accessories” on page 22

4.6

Clamping the workpieces



CAUTION!

Injury by parts flying off.

The workpiece always needs to be fixed by a machine vice, a jaw chuck or by another appropriate clamping tools such as clamping claws.

4.7

Changing the speed range



ATTENTION!

Wait until the drilling-milling machine has come to a complete halt before changing the speed using the gear switch.

- Select reduction stage.
H = rapid
L = low
- Adjust the speed with the potentiometer. The speed and thus the cutting speed are depending on the material of the workpiece, the milling cutter diameter and the cutter type.

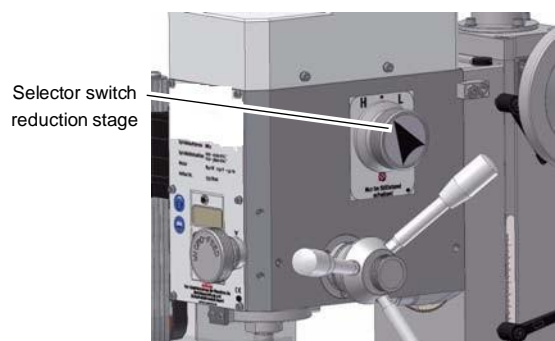


Fig.4-6: Drill-mill head

4.8 Selecting the speed

For milling operations, the essential factor is the selection of the correct speed. The speed determines the cutting speed of the cutting edges which cut the material. By selecting the correct cutting speed, the service life of the tool is increased and the working result is optimized.

The optimum cutting speed mainly depends on the material and on the material of the tool. With tools (milling cutters) made of hard metal or ceramic insert it is possible to work at higher speeds than with tools made of high-alloyed high-speed steel (HSS). You will achieve the correct cutting speed by selecting the correct speed.

In order to determine the correct cutting speed for your tool and for the material to be cut, you may refer to the following standard values or a table reference book.

The required speed is calculated as follows:

$$n = \frac{V}{\pi \times d}$$

n = speed in min^{-1} (revolutions per minute)

V = cutting speed in m/min (meters per minute)

d = tool diameter in m (meters)

4.8.1 Standards values for cutting speeds

[m/min] with high-speed steel and hard metal at conventional milling

Tool	Steel	Grey cast iron	Age-hardened Al alloy
Peripheral and side milling cutters [m/min]	10 - 25	10 - 22	150 - 350
Relieved form cutters [m/min]	15 - 24	10 - 20	150 - 250
Inserted tooth cutter with SS [m/min]	15 - 30	12 - 25	200 - 300
inserted tooth cutter with HM [m/min]	100 - 200	30 - 100	300 - 400

The results are the following standard values for speeds depending on the milling cutter diameter, cutter type and material.

Tool diameter [mm] peripheral and side milling cutters	Steel 10 - 25 m/min	Grey cast iron 10 - 22 m/min	Age-hardened Al alloy 150 - 350 m/min
	Speed [min^{-1}]		
35	91 - 227	91 - 200	1365 - 3185
40	80 - 199	80 - 175	1195 - 2790
45	71 - 177	71 - 156	1062 - 2470
50	64 - 159	64 - 140	955 - 2230
55	58 - 145	58 - 127	870 - 2027
60	53 - 133	53 - 117	795 - 1860

65	49 - 122	49 - 108	735 - 1715
----	----------	----------	------------

Tool diameter [mm] form cutters	Steel 15 - 24 m/min	Grey cast iron 10 - 20 m/min	Age- hardened Al alloy 150 - 250 m/min
	Speed [min ⁻¹]		
4	1194 - 1911	796 - 1592	11900 - 19000
5	955 - 1529	637 - 1274	9550 - 15900
6	796 - 1274	531 - 1062	7900 - 13200
8	597 - 955	398 - 796	5900 - 9900
10	478 - 764	318 - 637	4700 - 7900
12	398 - 637	265 - 531	3900 - 6600
14	341 - 546	227 - 455	3400 - 5600
16	299 - 478	199 - 398	2900 - 4900

4.8.2 Standard values for speeds with HSS – Eco – twist drilling

Material	Cutter diameter										Cooling 3)
		2	3	4	5	6	7	8	9	10	
Steel, unalloyed, up to 600 N/mm ²	n ¹⁾	5600	3550	2800	2240	2000	1600	1400	1250	1120	E
	f ²⁾	0.04	0.063	0.08	0.10	0.125	0.125	0.16	0.16	0.20	
Structural steel, alloyed, quenched and subse- quently drawn, up to 900N/ mm ²	n	3150	2000	1600	1250	1000	900	800	710	630	E/Oil
	f	0.032	0.05	0.063	0.08	0.10	0.10	0.125	0.125	0.16	
Structural steel, alloyed, quenched and subse- quently drawn, up to 1200 N/mm ²	n	2500	1600	1250	1000	800	710	630	560	500	Oil
	f"	0.032	0.04	0.05	0.063	0.08	0.10	0.10	0.125	0.125	
Stainless steels up to 900 N/mm ² e.g. X5CrNi18 10	n	2000	1250	1000	800	630	500	500	400	400	Oil
	f	0.032	0.05	0.063	0.08	0.10	0.10	0.125	0.125	0.16	
1): Speed [n] in r/min											
2): Feed [f] in mm/r											
3): Cooling: E = emulsion; Oil = cutting oil											

- The above mentioned indications are standard 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 (e.g. VA – or NIRO steel sheets) do not center since the material would compact and the drill bit will become rapidly blunt.
- The workpieces need to be tensed in flexibly and stably (vice, screw clamp).



INFORMATION

Friction during the cutting process causes high temperatures at the cutting edge of the tool. The tool should be cooled during the milling process. Cooling the tool with a suitable cooling lubricant ensures better working results and a longer edge life of the cutting tool.



INFORMATION

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



Make sure that the cooling agent is properly retrieved. Respect the environment when disposing of any lubricants and cooling agents. Follow the manufacturer's instructions for disposal.

4.9 Manual spindle sleeve feed with the fine feed

- Turn the handle screw.
The spindle sleeve lever will move towards the drill-mill head and will activate the clutch of the fine feed.
- Turn the spindle sleeve fine feed in order to move the spindle sleeve.

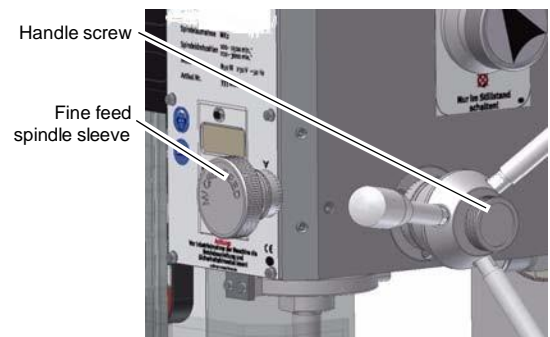


Fig.4-7: Fine feed

4.10 Digital display for spindle sleeve travel

4.10.1 Technical data

Measuring range	mm	0 - 999.9
	inch	0 - 39.371"
Reading accuracy	mm	0.01
	inch	0.0004"
Power supply		round cell CR2032 3 V Ø20 x 3,2mm

4.10.2 Design

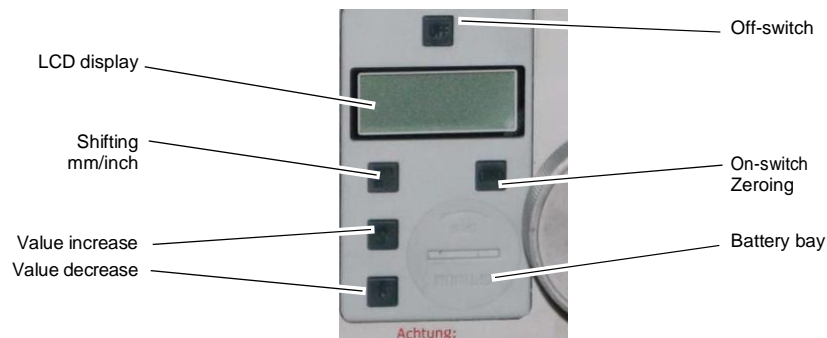


Fig.4-8: Digital display

- ON / O,
switches the display on and resets the reading of the display to "0".
- mm/in,
converts the measuring unit from *millimetres* to *inches* and vice versa.
- OFF,
switches the display off.
- ↑,
performs a value increase.
- ↓,
performs a value decrease.



INFORMATION

Before inserting the new battery, wait about 30 seconds. Please make sure, that the contacts are metallically bright and free from coverings which result from bleeding or gassing batteries. Grip the new batteries only with plastic forceps, if possible not with the hand due to the formation of oxide and never with metal forceps in order to avoid a short circuit. In most cases the round cell will be inserted into the digital display with the marking upside. After inserting the round cell, the battery compartment has to be closed again.

4.10.3 Malfunctions

Malfunction	Cause/ possible consequences	Solution
Flashing of the display	<ul style="list-style-type: none">• Voltage too low	<ul style="list-style-type: none">• Change battery
Screen doesn't refresh	<ul style="list-style-type: none">• Disturbance in the circuit	<ul style="list-style-type: none">• Remove the battery, wait 30 seconds and reinsert the battery
No data visible	<ul style="list-style-type: none">• No power supply• Battery voltage less than 3V	<ul style="list-style-type: none">• Clean battery contacts• Replace battery

4.11 Manual spindle sleeve feed with the spindle sleeve lever



ATTENTION!

The clutch of the fine feed has to be disengaged before the spindle sleeve lever can be used. Activating the spindle sleeve lever when the fine feed is engaged may damage the clutch.

- Loosen the handle screw (Fig.4-7: „Fine feed“ on page 30) .
The spindle sleeve lever moves away from the drill-mill head and disengages the clutch of the fine feed.

4.12 Swiveling the drill-mill head

The drill-mill head may be swiveled to the right and to the left. The two screws will need to be loosened.

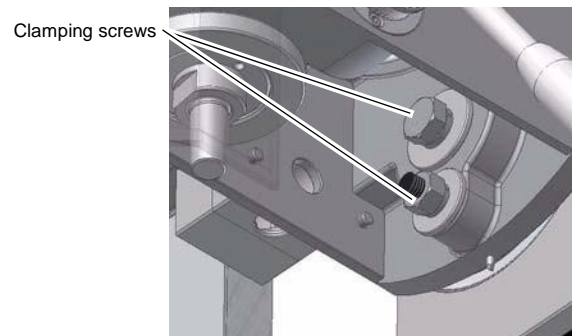


Fig.4-9: Clamping screws

4.12.1 Shifting the drill-mill head

The column of the drill-mill head can be shifted each to the left or to the right.

Use the option of shifting if you need to swivel the drill-mill head to the left or to the right for working.

4.13 Assembly of the optional adapter for a high speed motor



CAUTION!

Two persons are needed to disassemble the milling head since the milling head needs to be held in its position when disassembling the screws.

- Remove spindle protection.
Remove the screw and pull the aluminium profile with blinds from the guiding.

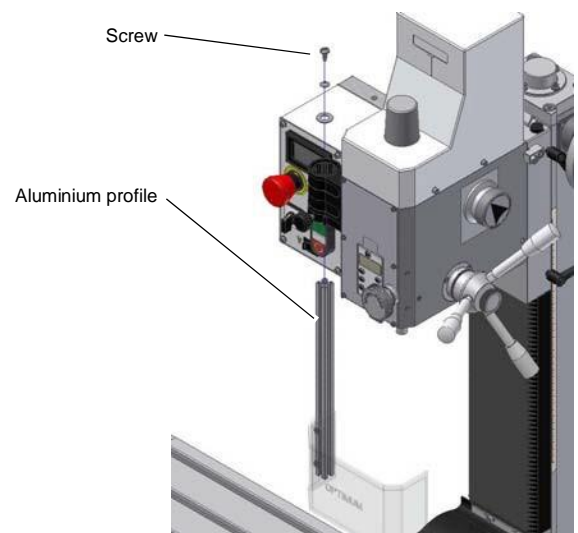


Fig.4-10: Spindle protection

→ Disassemble clamping screw and nut.

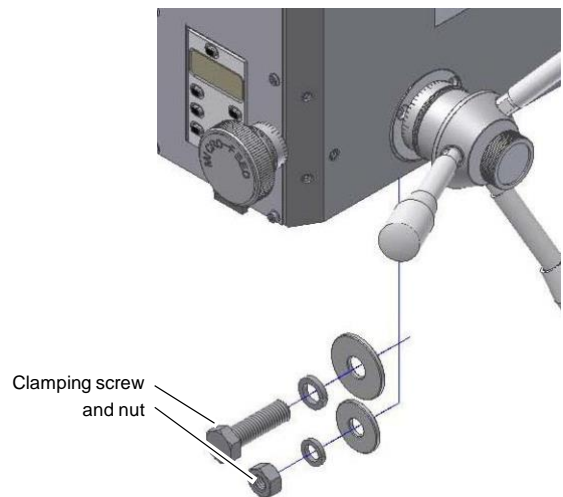


Fig.4-11: Fixing screws

→ Loosen or completely unscrew the screw.

→ Remove the mill head to the front.

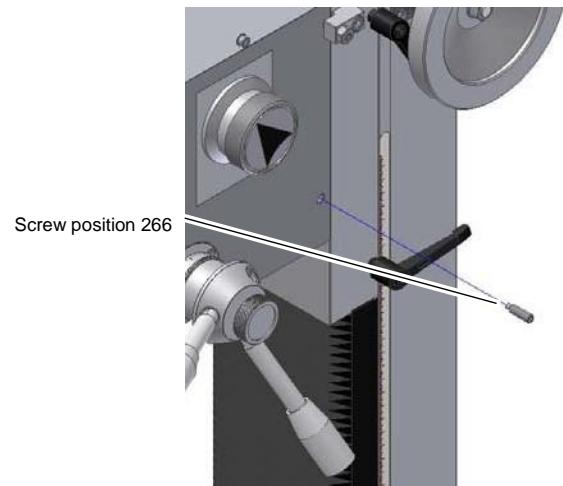


Fig.4-12: Screw

5 Maintenance

In this chapter you will find important information about

- inspection
- maintenance
- repair

of the drilling-milling machine.

The diagram below shows which of these headings each task falls under.

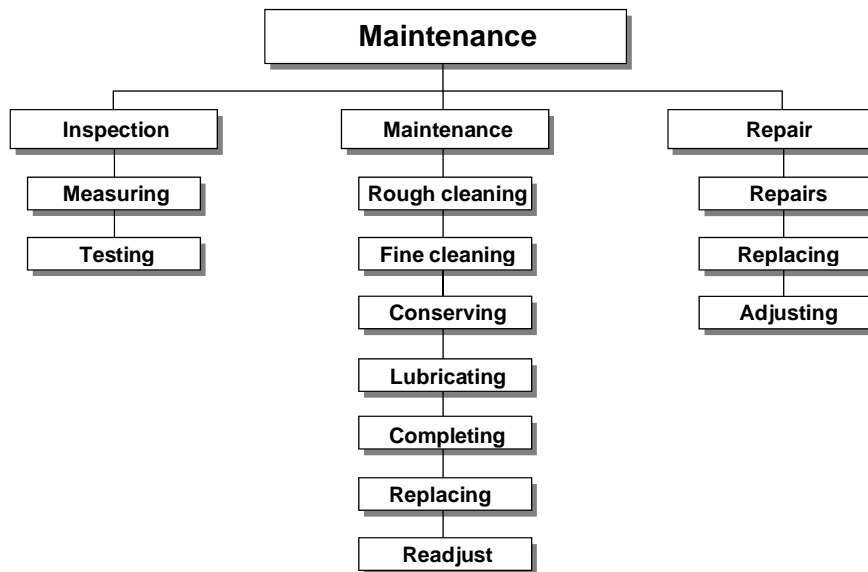


Fig.5-1: Maintenance – definition according to DIN 31051



ATTENTION!

Properly performed regular maintenance is an essential prerequisite for

- safe operation,
- fault-free operation,
- long service life of the drilling-milling machine and
- the quality of the products you manufacture.

Installations and equipment of other manufacturer's must also be in optimum condition.

5.1 Safety



WARNING!

The consequences of incorrect maintenance and repair work may include:

- very serious injury to staff working on the drilling-milling machine,
- damage to the drilling-milling machine.

Only qualified staff should carry out maintenance and repair work on the drilling-milling machine.

5.1.1 Preparation



WARNING!

Only carry out work on the drilling-milling machine if it has been disconnected from the mains power supply.



“Disconnecting and securing the drilling-milling machine” on page 12
Position a warning sign.

5.1.2 Restarting

Before restarting, run a safety check.

“Safety check” on page 10



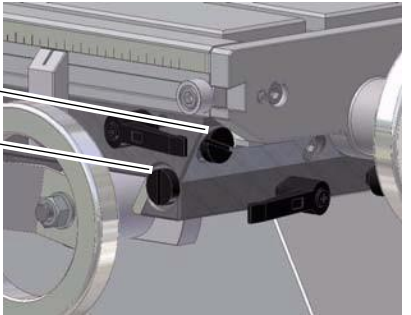
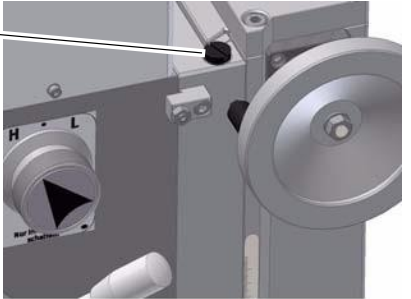
WARNING!

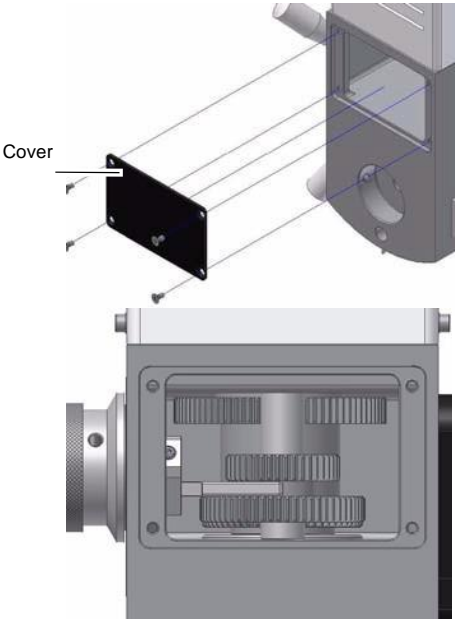
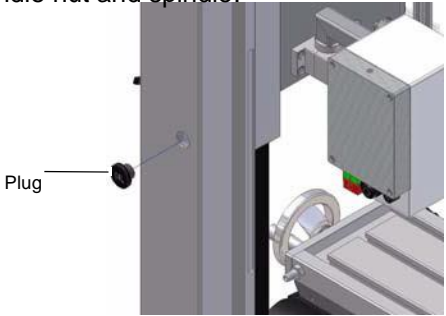
Before starting the drilling-milling machine you have to check that there is no danger for the staff and the drilling-milling machine is undamaged.

5.2 Inspection and maintenance

The type and extent of wear depends to a large extent on individual usage and service conditions. For this reason, all the intervals are only valid for the authorized conditions.

Interval	Where?	What?	How?
Start of work, after each maintenance or repair operation	Drilling-Milling machine	→ “Safety check” on page 10	
Start of work, after each maintenance or repair operation	Dovetail slideways	Lubricate	→ Lubricate all slideways.
Weekly	Cross table	Lubricate	→ Lubricate all blank steel parts. Use acid-free oil, for example weapon oil or engine oil.
As required	Spindle nuts	Readjust	An increased clearance in the spindles of the cross table can be reduced by readjusting the spindle nuts. Refer to spindle nuts position 66 and 71 The spindle nuts are readjusted by reducing the flank of screw thread of the spindle nut with an adjusting screw. By readjusting a smooth-running move over the whole toolpath is to be assured, otherwise the wear by friction between spindle nut /spindle would increase considerably.

Interval	Where?	What?	How?
As required	Taper gibs	Readjust X- and Y- axis	 <p>Fig.5-2: Cross table</p> <ul style="list-style-type: none"> → Turn the adjusting screw of the respective taper gib in the clockwise direction. The taper gib is continued to push in and reduced by it the gap in the guideway. → Control your setting. The respective guideway must be still easily mobile from the adjustment, result in however a stable guidance.
As required	Taper gib	Readjust Z-axis	 <p>Fig.5-3: Mill head</p> <ul style="list-style-type: none"> → Proceed as described under "Readjust X- and Y-axis".

Interval	Where?	What?	How?
Every six months	Gear drill-mill head	Greasing	<ul style="list-style-type: none"> → Turn the drill-mill head as described under “Swiveling the drill-mill head” on page 32 completely by 90° to the right. → Check if the clamping screws are firmly tightened as described under “Swiveling the drill-mill head” on page 32 and that the drill-mill head cannot independently tilt. → Disassemble the cover plate at the rear. → Grease the toothed wheels. “Operating material” on page 14  <p>Fig.5-5: Rear</p>
Every six months	Spindle and spindle nut Z-axis	Greasing	<ul style="list-style-type: none"> → Open the plug. → Crank the milling head into the suitable height. → Oil or grease the spindle nut and spindle.  <p>Fig.5-6: Column</p>



INFORMATION!

The spindle bearing arrangement is continuously lubricated. It is not required to relubricate it.

5.3 Repair

For any repair work, get assistance from an employee of the company supplier's technical service or send us the drilling-milling machine.

If the repairs are carried out by qualified technical staff, they have to follow the indications given in this manual.

The company does not take responsibility nor does it guarantee against damage and operating anomalies resulting from failure to observe this operating manual.

For repairs only use

- faultless and suitable tools,
- original spare parts or serial expressly authorized by the company .

5.4 Setting instructions control

Please find below a description to set the operating parameters, if required after replacement of the control and of the motor.

Vmax

This is the potentiometer to set the maximum possible speed of the motor.

The speed of 2250 min^{-1} must not be exceeded since the spindle bearings and your tools might get damaged.

Vmin

This is the potentiometer to set the minimum possible speed of the motor. Make sure that the speed does not fall below 50 min^{-1} .

With reduced speed also the torque (power of the motor) and the cooling will reduce!

Torque

This is the potentiometer to set the torque when readjusting the motor. Depending on the application set the value by which the control will readjust. If you require less readjustment, turn the potentiometer one to two turns in direction "minus". For a larger readjustment, turn the potentiometer in direction "plus". For thread cutting we recommend little torque.

Slope

This is the potentiometer to set the acceleration time of the motor at the moment when it starts turning. If you require a smoother ramp, turn the potentiometer in direction "plus". In order to achieve a steeper ramp, turn the potentiometer in direction "minus".

CL

This is the potentiometer to set the current limiting as an overload protection for the motor. The current limiting is set by the manufacturer and must not be changed in any way.

General information

The control is charged with high constant-voltage currencies. Please make imperatively sure that the housing will only be opened up in the idle status. Furthermore, make sure that any settings are only being performed when the housing is closed.

The spindle trimmers of the potentiometer are designed with 12 gears. This means in order to achieve the corresponding minimum or maximum value, the spindle trimmer needs to be turned 12 times. Due to this high number of gears of the spindle trimmer it is possible to perform a very sensitive setting over the corresponding potentiometer.

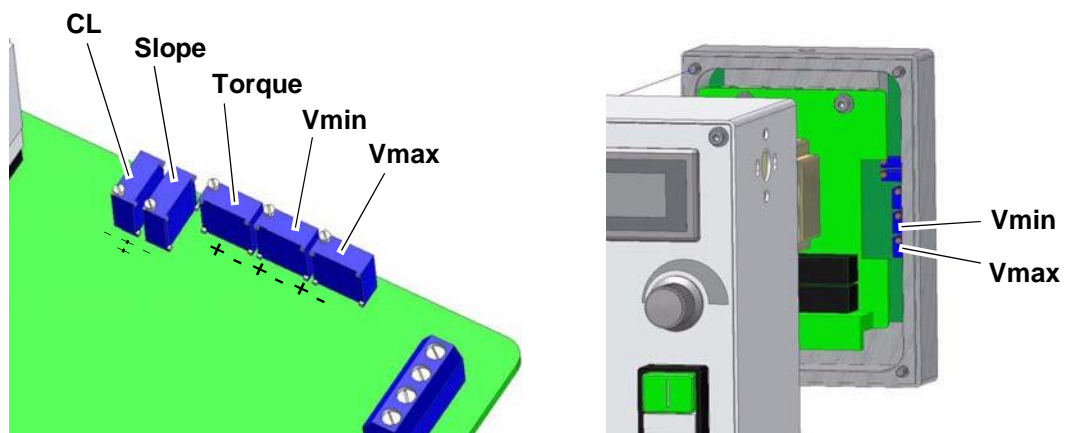


Fig.5-7: Control board 0320297

6 Spare parts CHAMPION 30V

6.1 Cross table

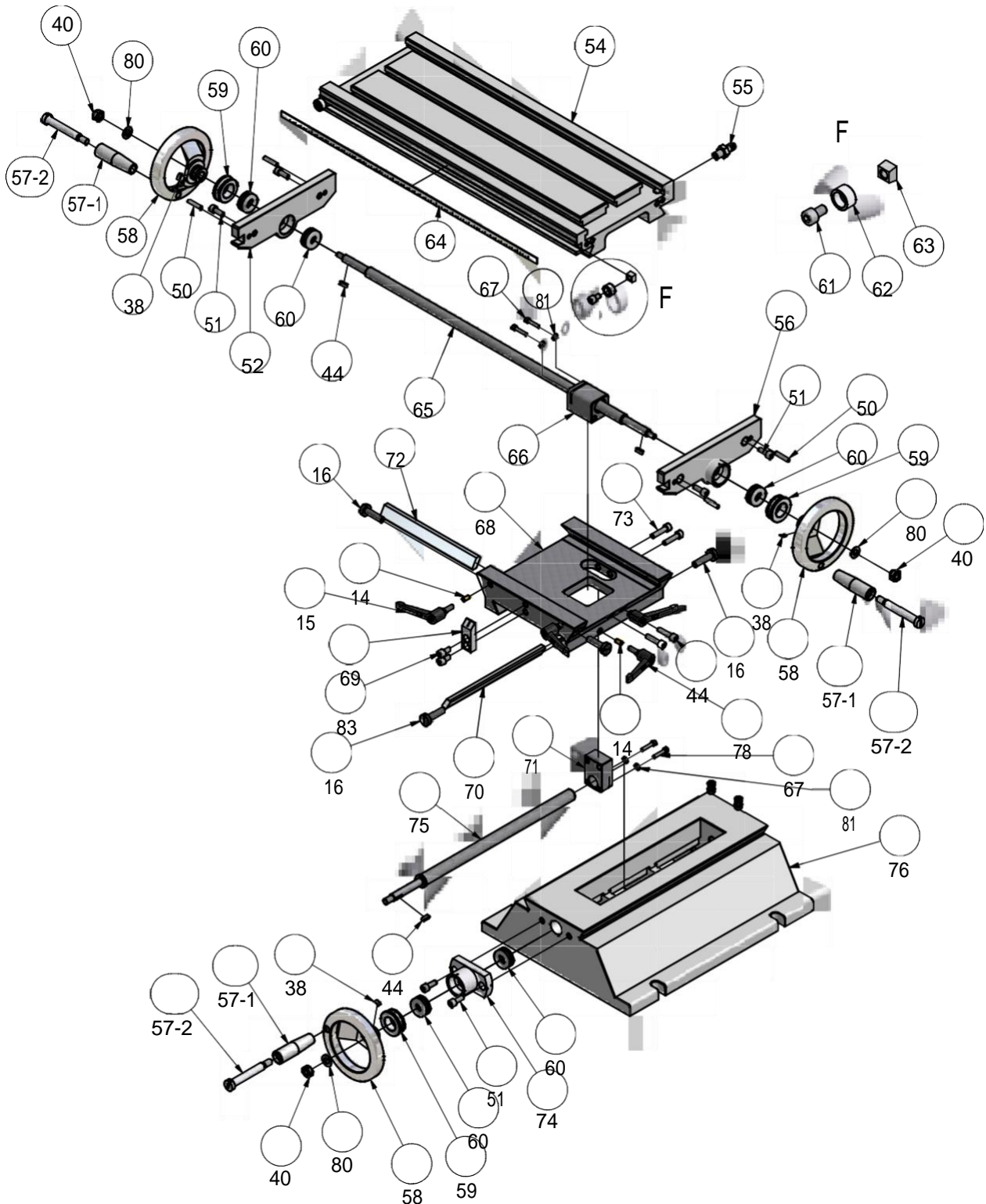


Abb.6-1: Cross table

6.2 Cross table starting from year of construction 2007

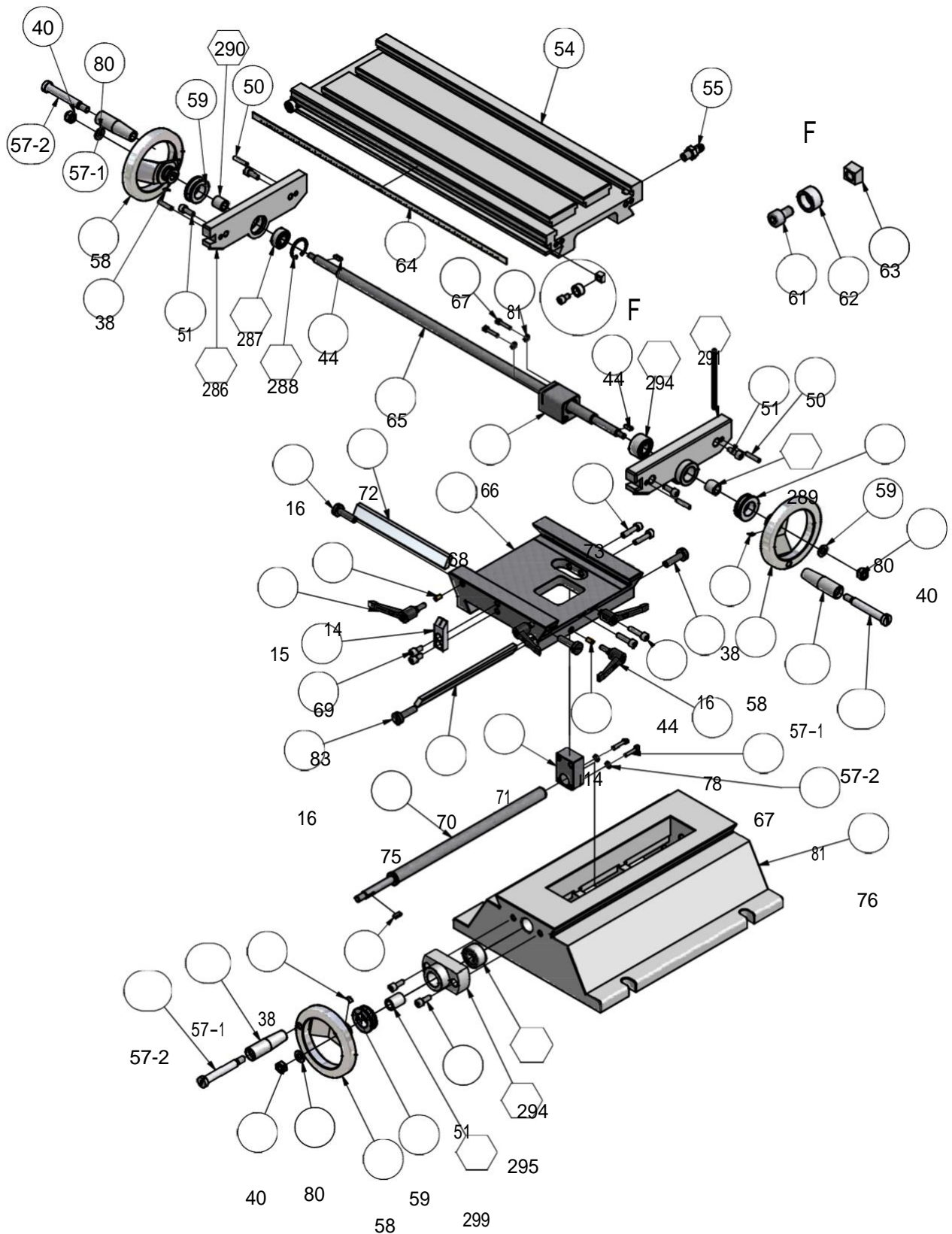


Abb.6-2: Cross table

6.3

Column 1 of 2

220

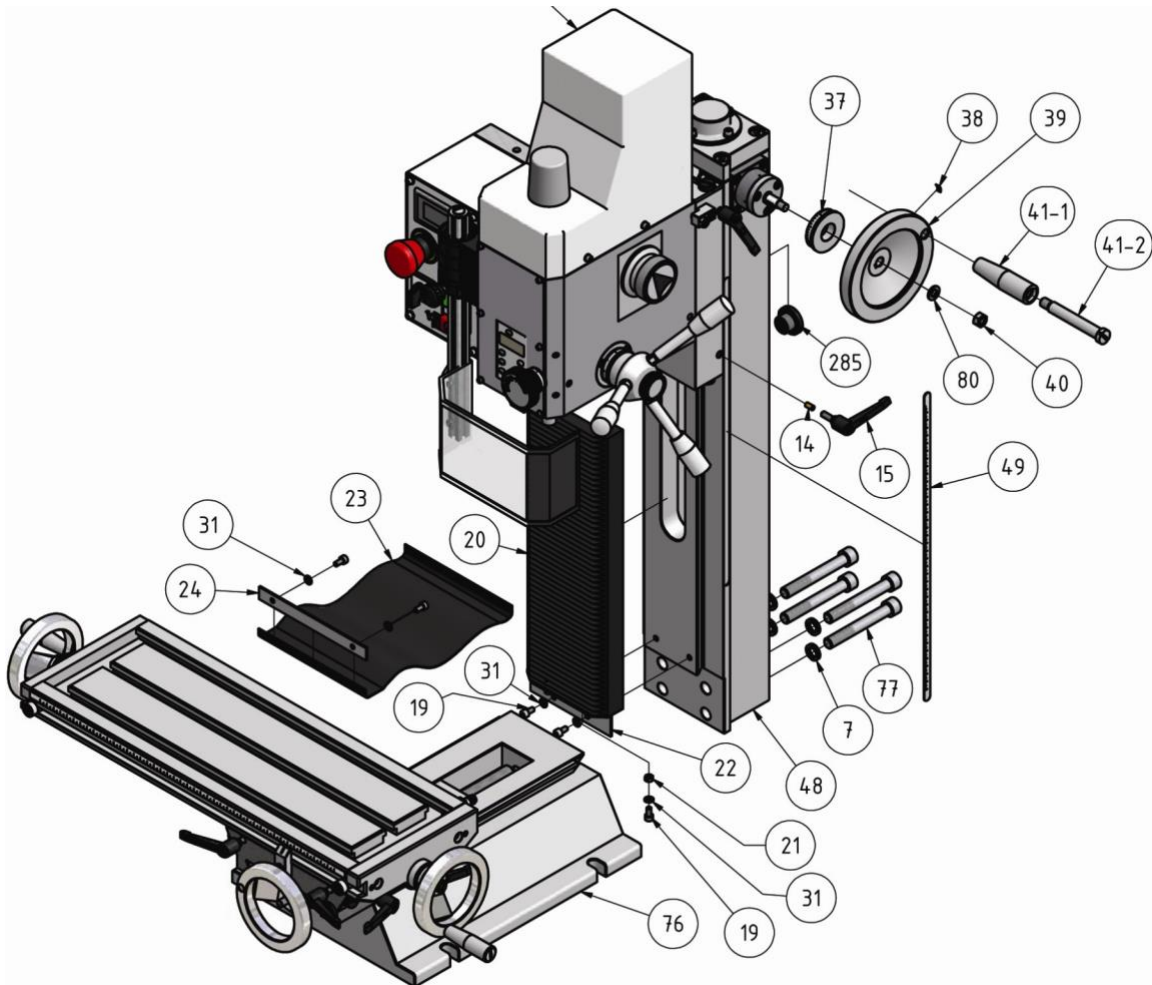


Abb.6-3: Column

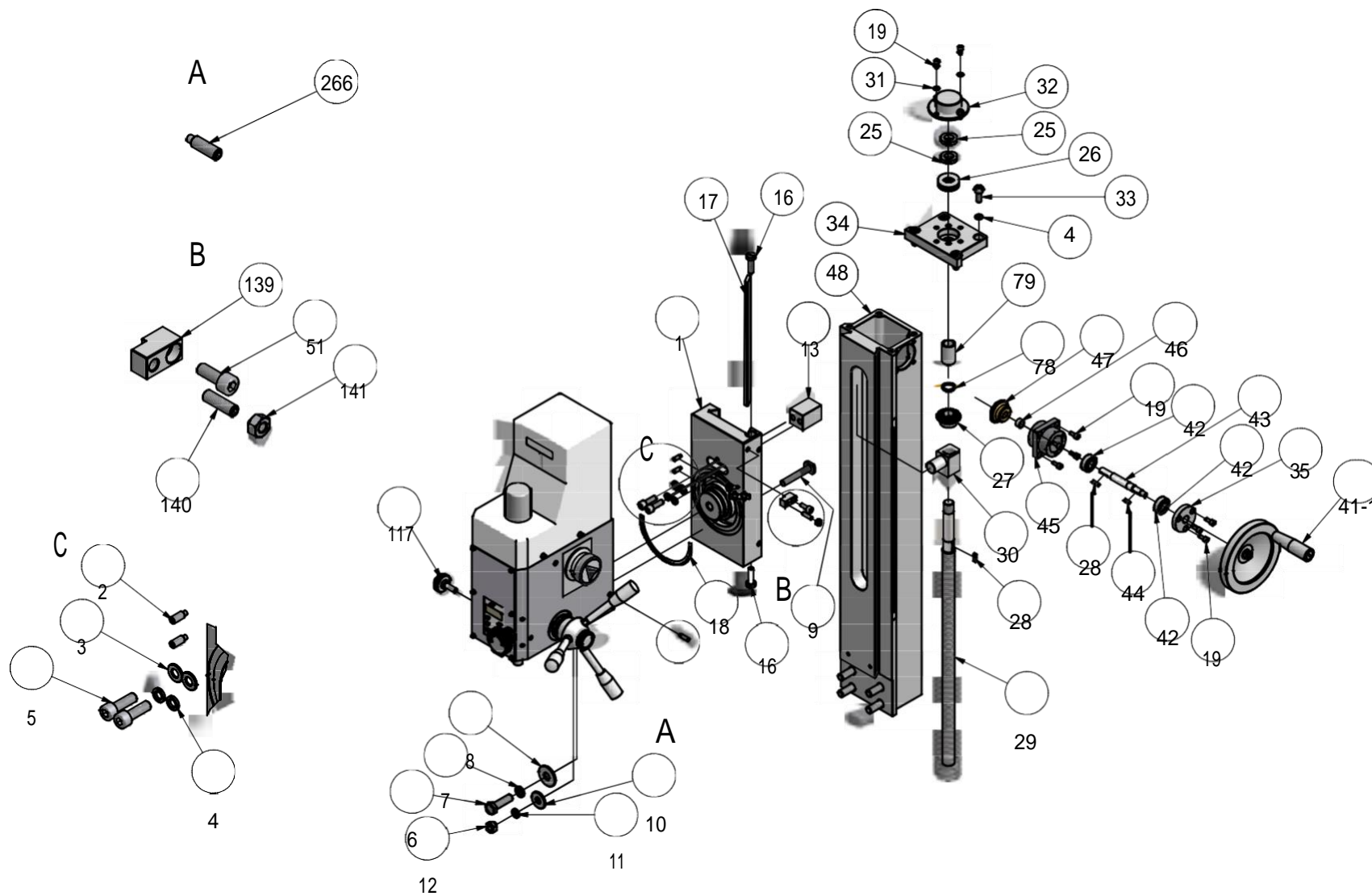
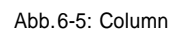


Abb.6-4: Column



6.6 Milling head 1 of 2

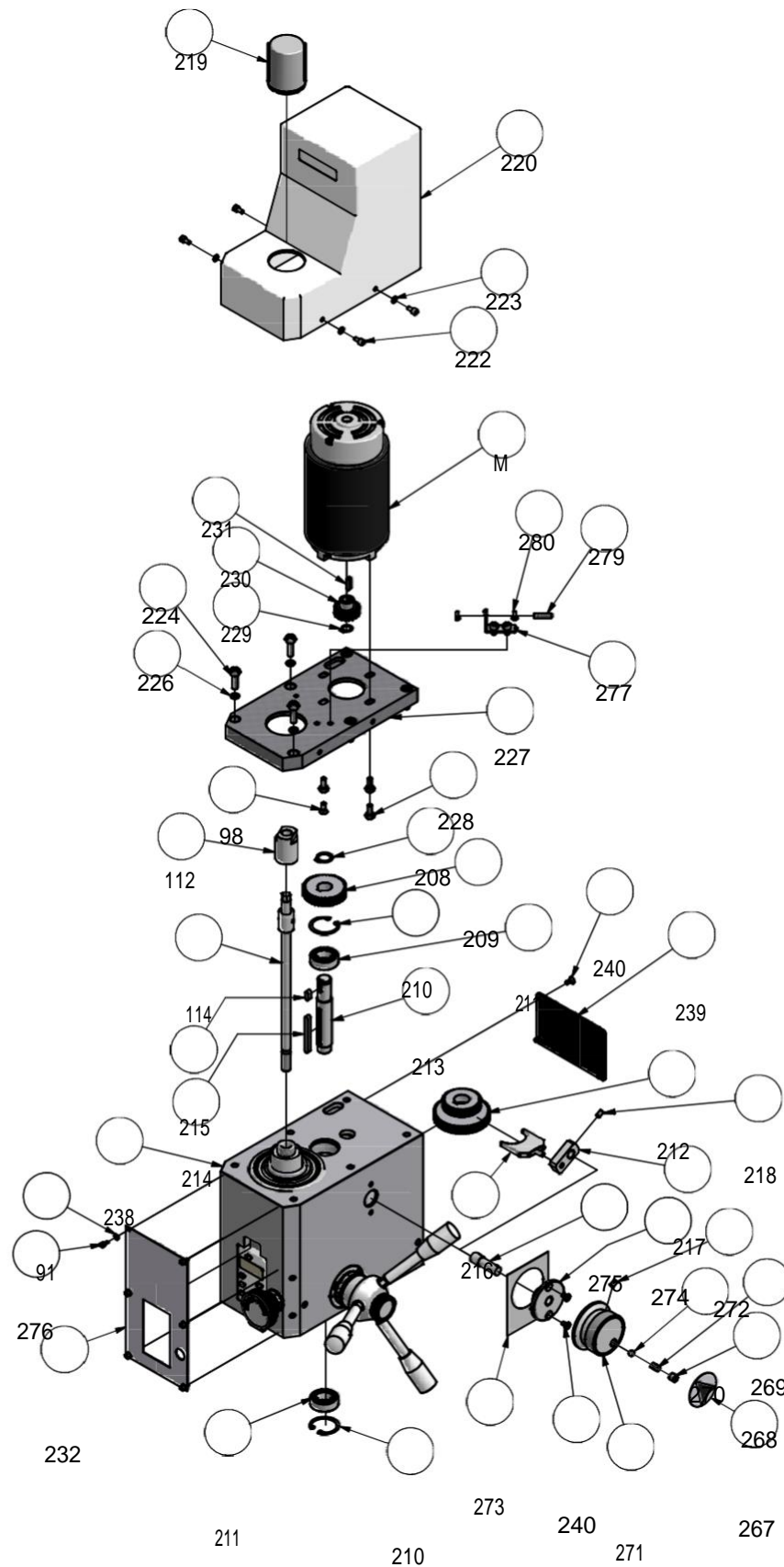
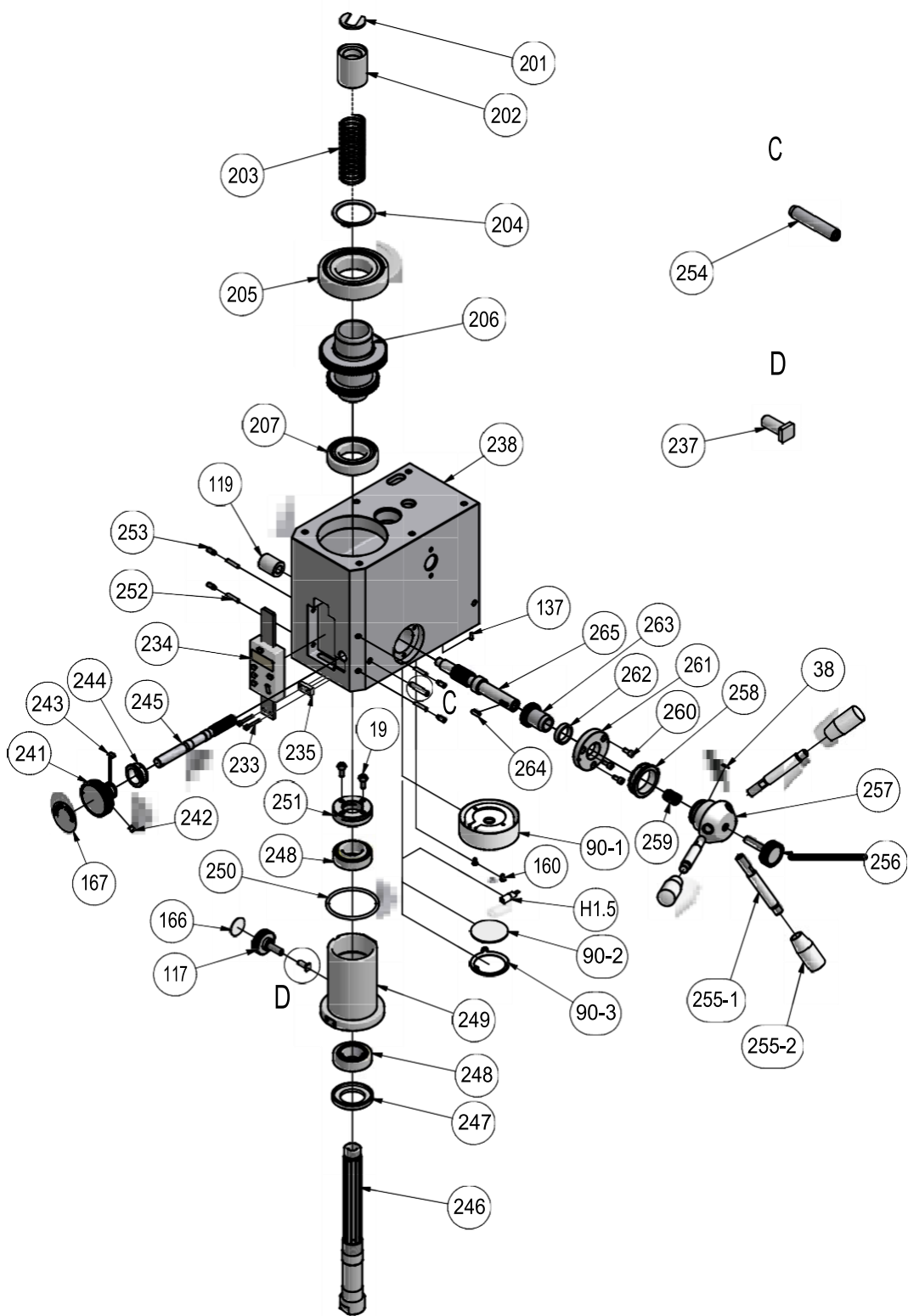


Abb.6-6: Milling head



6.8 Milling head 2 of 2

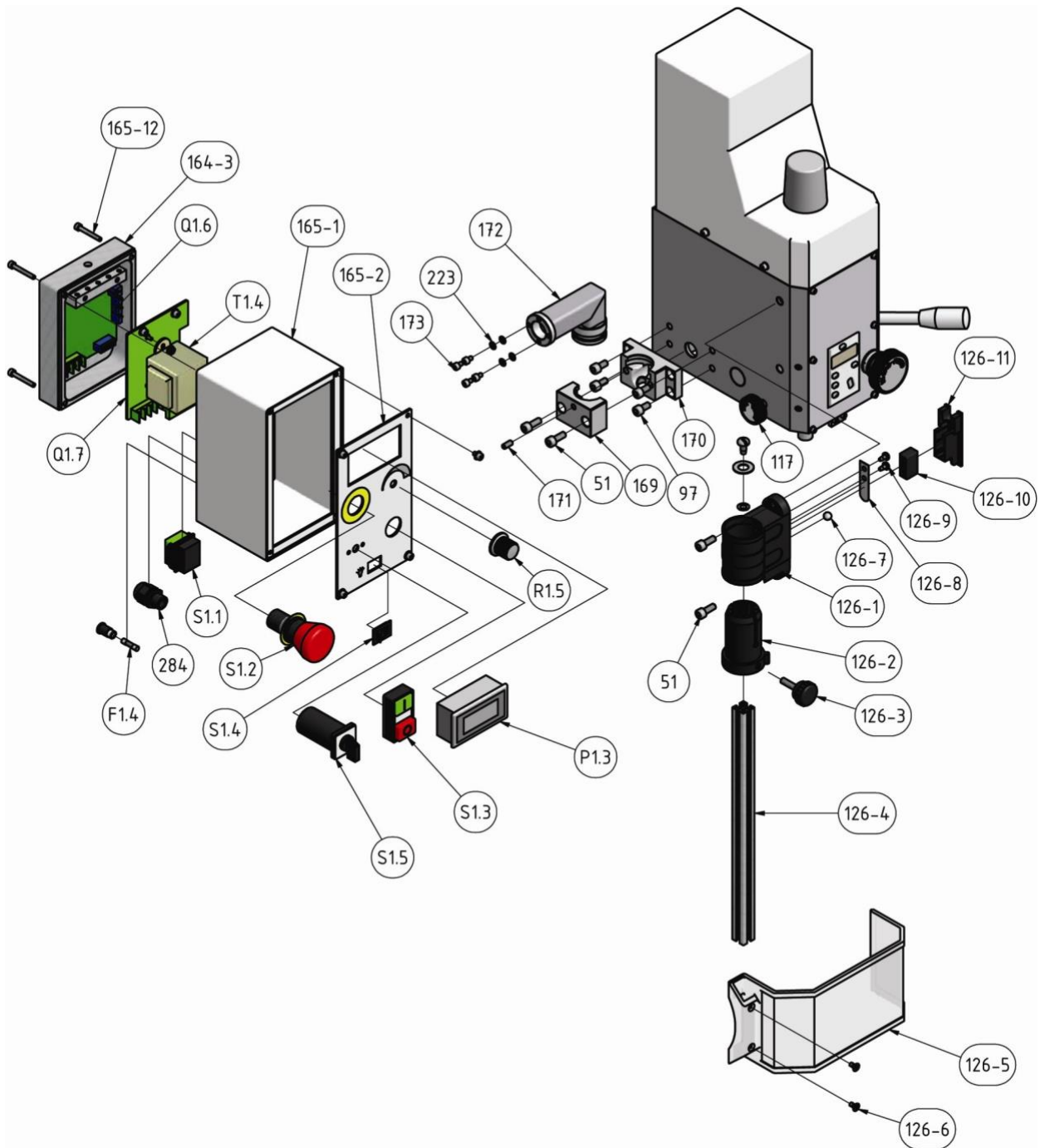


Abb.6-7: t'ane1 ana prmeuon aev1ce

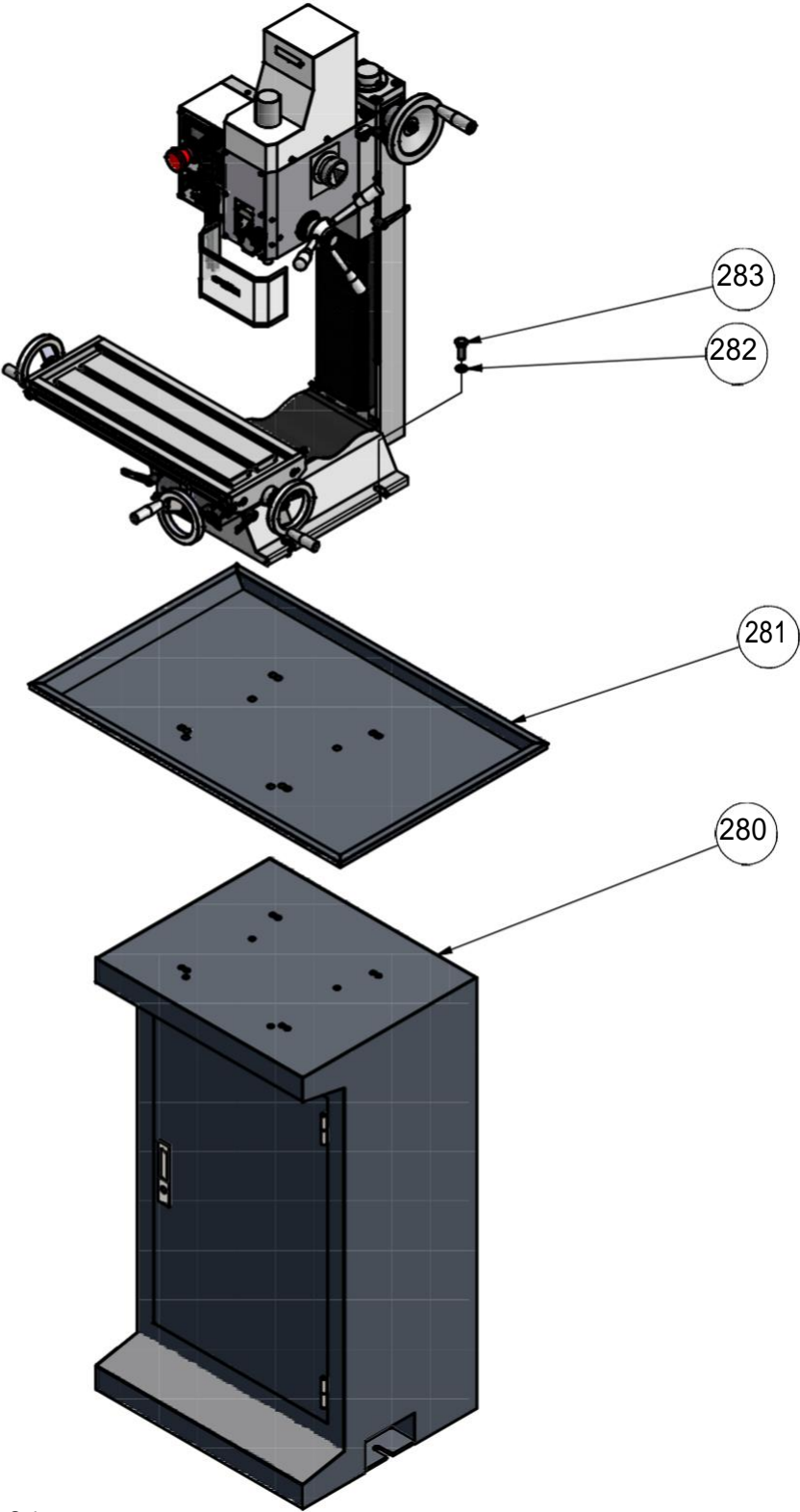
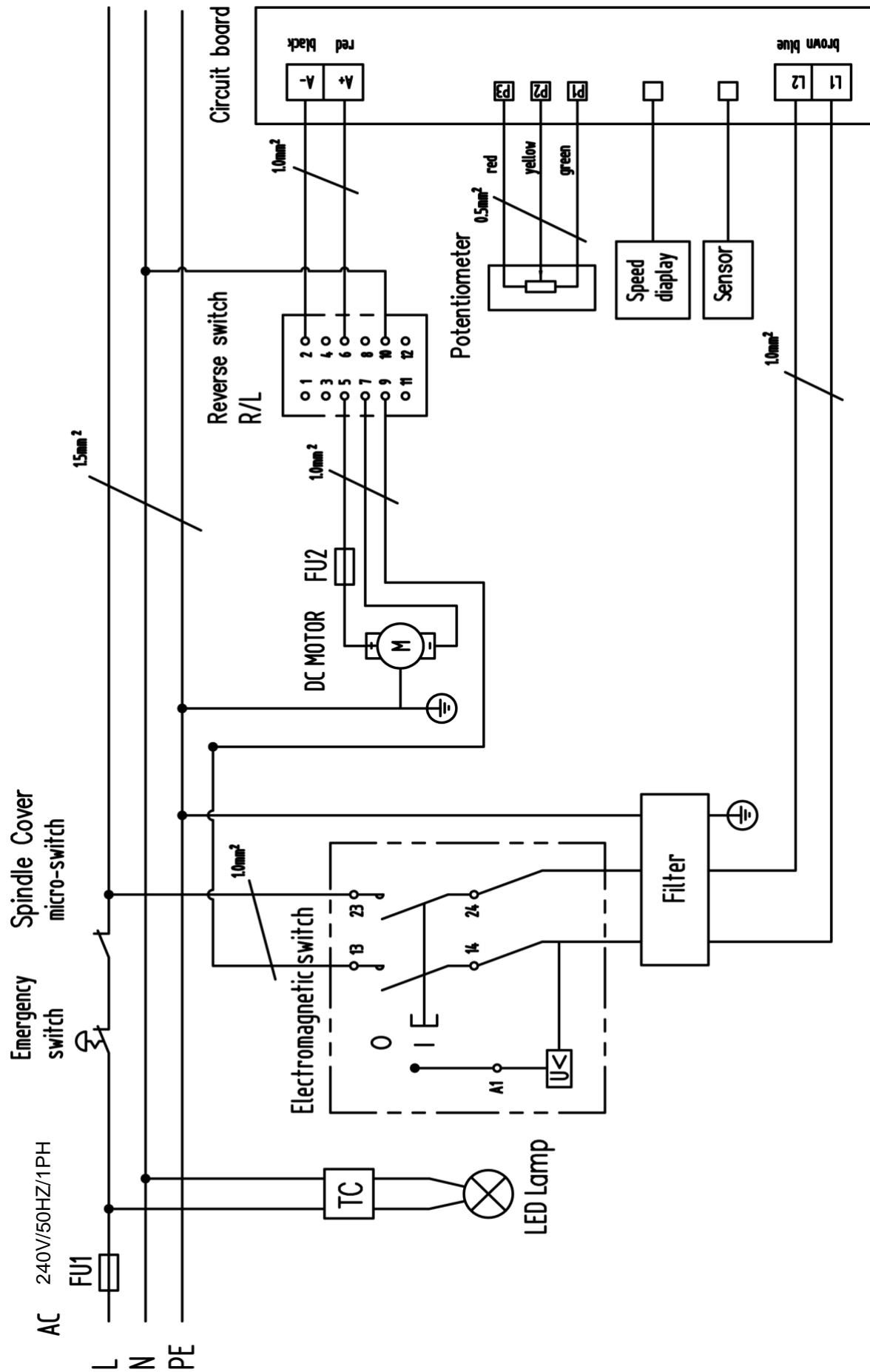


Abb.6-8: Unterbau - Sub structure

6.10 Schaltplan - Wiring diagram



6.10.1 Spare part list

Pos.		Designation	Qty.	Drawing no.	Size.	
1		Connect board	1			
2		Socket head set screw	2	GB 79-85	M6 x 16	
4		Spring washer	6	GB 93-87	M8	
5		Hexagon head cap screw	2	ISO 4762	M8 x 25	
6		Hexagon head screw	1	GB 5783-86	M12 x 40	
7		Spring washer	5	GB 93-87	M12	
8		Washer	1			
9		Screw	1			
10		Washer	1			
11		Spring washer	1	GB 93-87	M10	
12		Hexagon nut	1	GB 6170-86	M10	
13		Connect collar	1			
14		Brass pin	6			
15		Adjust locating handle	4	JBT 7270.12-1994	DM6 x 16	
16		Gib screw	6			
17		Taper gib z axis	1			
18		Angle plate	1			
19		Hexagon head cap screw	20	GB 70-85	M5 x 10	
20		Bellows	1			
21		Hexagon nut	2	DIN EN 24 032	M5	
22		Bellows bracket	1			
23		Rubber splash guard	1			
24		Plate	1			
25		Groove nut	2	GB 810-88	M16x1.5	
26		Axially grooved ball bearing, on one side working	1	51203	51203	
27		Taper gear	1		26 Z ; m 1,5	
28		Key	3	DIN 6885	A 4 x 4 x 16	
29		Lift lead screw	1			
30		Lift lead screw nut	1			
31		Washer	8	GB 97.1-85	5	
32		Nut collar	1			
33		Hexagon head cap screw	4	GB 70-85	M8 x 20	
34		Column cover	1			
35		Bearing cover	1			
37		Lift dial z axis	1			
38		Spring piece	4			
39		Handwheel z axis	1			
40		Hexagon nut	4	ISO 4033	M8	
41		Handle complete	1			
41-1		Handle sleeve	1	JB7270.5-1994-80	80	
41-2		Screw	1	JB7270.5-1994-M10	M10 x 80	
42		Grooved ball bearing single-row	2	6001-2RZ		
43		Lift shaft z axis	1			
44		Key	5	DIN 6885	A 4 x 4 x 12	
45		Lift bearing base	1			
46		Collar	1			
47		Taper gear	1			
48		Column	1			
49		Lift plate	1			
50		Cylindrical pin	4	GB 119-86	A 5 x 24	
51		Hexagon head cap screw	11	GB 70-85	M6 x 16	
52		Table dial support x axis left	1			
54		Cross table	1			
54		Cross table	1			
55		Screwing in screw connection hose connector	1		M10 x 1	
56		Table dial support x axis	1			
57		Handle complete	3			
57-1		Handle sleeve	3	JB7270.5-1994-63	63	
57-2		Screw	3	JB7270.5-1994-M8	M8 x 63	
58		Handwheel cross table	3			
59		Dial	3			
60		Axially grooved ball bearing, on one side working	5	51200		

Pos.		Designation	Qty.	Drawing no.	Size	Item no.
61		Hexagon head cap screw	2	GB 70-85	M6 x 10	
62		Stopper x axis	2			
63		Wedgy nut	2			
64		Table plate x axisBF30	1			
64		Table plate x axisBF30 L	1			
65		Table lead screw x axis BF30	1			
65		Table lead screw				
66		Table lead screw nut x axis	1			
67		Hexagon head cap screw	4	GB 70-85	M4 x 20	
68		Saddle	1			
69		Limit plate x axis	1			
70		Taper gib y axis	1			
71		Lead screw nut y axis	1			
72		Taper gib x axis	1			
73		Hexagon head cap screw	2	GB 70-85	M6 x 25	
74		Saddle dial support	1			
75		Lead screw y axis	1			
76		Base	1			
77		Hexagon head cap screw	4	GB 70-85	M12 x 90	
78		Clamping lever	4	JBT7270.12-1994	DM6x16	
78		Spacer ring for spindle z axis	1			
79		Case for z axis	1			
80		Washer	6	GB 97.1-85	8	
81		Washer	2	GB 97.1-85	4	
83		Hexagon head cap screw	6	GB 70-85	M6 x 12	
90		Machine lightning complete	1			
90-1		Housing machine lightning	1			
90-2		Protection glas	1			
90-3		Cover machine lightning	1			
H 1.5		Halogen lamp 12V , 10 W, Sockel G4	1			
91			6	GB 97.1-85	3	
98		Countersunk screw	1	BS 4183	M5 x 12	
112		Holder screw rod	1			
114		Screw rod	1			
117		Clamping screw collar	1			
119		Endplate	1			
126		Protection device complete	1			
126-1		Housing	1			
126-2		Aluminium profile admission	1			
126-3		Clamping scw	1			
126-4		Aluminium profile	1	B15-04-02	L=290mm	
126-5		Protection	1			
126-6		Screw	2			
126-7		Steel ball	1			
126-8		Spring plate	1			
126-9		Screw	2			
126-10		Micro switch spindle protection	1			
126-11		Cover	1			
127		Hexagon head cap thread pin screw with point	1	GB 78-85	M5 x 6	
137		Scale-pin	1			
139		Stopper	1			
140		Hexagon head cap thread pin screw with flat end	1	GB 77-85	M6 x 20	
141		Hexagon nut	1	GB 6170-86	M6	
160		Cheese head screw	2	ISO 7045	M3 x 6 - 4.8 - H	
164-3		Housing control boards	1			
165-1		Panel housing	1			
165-2		Cover	1			
165-12		Innensechskantschraube	4	GB 70-85	M4 x 30	
166		Label loose / tighten	1			
167		Label Micro feed	1			
168		Morse taper MK2 - B16	1			
169		Mounting plate panel	1			
170		Mounting plate panel	1			
171		Innensechskant-Gewindestift with cup point	1	GB 80-85	M5 x 12	

Pos.		Designation	Qty.	Drawing no.	Size	Item no.
172		Holding arm panel	1			
173		Hexagon head cap screw	4	GB 70-85	M4 x 6	
201		Position washer	1			
202		Spring sleeve	1			
203		Spring	1	GB2089-94	2.5x28x110-3	
204		Retainer ring	1	GB 894.1 - 45		
205		Grooved ball bearing single-row	1	6209-2Z	6209-2Z	
206		Gear combination	1		Z 60 / Z 80, m 1	
207		Grooved ball bearing single-row	1	6007-2Z	6007-2Z	
208		Retainer ring	1	DIN 471	15 x 1	
209		Gear diagonally-toothed	1		Z 37, m 1,25, 9°	
210		Retainer ring	2	DIN 472	32 x 1.2	
211		Grooved ball bearing single-row	2	6002-2Z	6002-2Z	
212		Gear combination	1		Z 62 / Z 42, m 1	
213		Intermediate shaft	1			
214		Key	1	DIN 6885	A 5 x 5 x 50	
215		Key	1	DIN 6885	A 5 x 5 x 12	
216		Fork	1			
217		Fork arm	1			
219		Cover	1			
220		Motor cover	1			
222		Hexagon head cap screw	4	GB 70-85	M4 x 8	
223		Washer	8	GB 848-85	4	
224		Hexagon head cap screw	6	GB 70-85	M6 x 20	
226		Spring washer	6	GB 93-87	M6	
227		Fixed cover	1			
229		Retainer ring	1	GB 894.1	10	
230		Gear diagonally-toothed	1		Z 20, m 1,25, 9°	
232		Screen	1			
233		Hexagon head cap screw	2	GB 70-85	M3 x 20	
234		Digital slide guage	1	DQ1		
235		Base for ruler digital display	1			
237		Clamping and guide pin	1			
238		Housing milling head	1			
239		Cover	1			
240		Counter sunk screw	6	GB 819-85	M4x8	
241		Micro feed knob	1			
242		Hexagon head cap thread pin screw with point	1	GB 78-85	M5 x 6	
243		Spring piece	1			
244		Micro feed dial	1			
245		Worm shaft	1			
246		Spindle	1			
247		Nut	1			
248		Taper roller bearing single-row	2	32005 X/Q		
249		Collar	1			
250		O-ring	1	GB 3452-1	58x2.65	
251		Clamp nut	1			
252		Cylindrical pin	4	GB 119-86	B4x20	
253		Thread pin slit with long tap	4	GB 79-85	M5 x 12	
254		Pin with thread	1	GB 120-86-A	6x30	
255		Handle complete	3			
255-1		Threaded rod	3	JB_T7271.6-1994	BM10x80	
255-2		Handle	3	JBT7271.5-1994		
256		Locking knob	1			
257		Feed handle disc	1			
258		Feed dial	1			
259		Compression spring	1	GB2089-94	1.2x12x25-3	
260		Hexagon head cap screw	3	GB 70-85	M4 x 10	
261		Cover	1			
262		Adjust collar	1			
263		Clutch with gear	1			
264		Key	1	DIN 6885 A	4 x 4 x 12	
265		Toothed shaft	1			
266		Thread pin slit with long tap	1	GB 79-85	M6 x 20	
267		Plate	1			

Pos.		Designation	Qty.	Drawing no.	Size	Item no.
268		Hexagon head cap thread pin screw with flat end	1	GB 77-85	M8 x 8	
269		Compression Spring	1	GBT2089-94	0.8x5x25-3	
270		Steel ball	1	GBT308-1994	6,5	
271		Locating knob	1			
272		Hexagon head cap thread pin screw with point	2	GB 78-85	M5 x 8	
273		Shifting plate	1			
274		Locating base	1			
275		Shifting shaft	1			
276		Hexagon head cap screw	6	GB 70-85	M3 x 6	
277		Angle sensor	1			
278		Hexagon head cap screw	2	GB 70-85	M5 x 8	
279		Sensor, number of revolutions	1			
280		Optional sub structure	1			
281		Optional pan sub structure	1			
282		Washer	4	GB 848-85	10	
283		Hexagon head screw	4	GB 5783-86	M10 x 30	
284		Strain relief connection cable	1			
285		Lubrication catch	1			
286		Table dial				
287		Grooved ball bearing, single-row	1	6000		
288		Snap ring	1	DIN 472	28 x 1,2	
289		Distance case	1			
290		Distance case	1			
291		Table dial support x axis	1			
292		Skew-angle roller bearing, double-row	1	3203		
293		Column cover	1			
294		Skew-angle roller bearing, double-row	2	3200		
295		Saddle dial support	1			
299		Distance case	1			
S1.1		Main switch	1			
S1.2		Emergency push button	1			
S1.3		On- Off push button	1			
S1.4		On- Off switch halogen lamp	1			
S 1.5		Change over switch ZH-A	1			
S1.6		Micro switch spindle protection	1			
R 1.5		Potentiometer 4,7 K Ω	1			
T1.4		Transformer 230V / 12V	1			
F1.4		Fine wire fuse	1			
P1.3		Digital speed indicator	1			
Q 1.6		Control board	1			
Q1.7		Relay board	1			
T1.4		Transformer 230V / 12V , old type	1			
H 1.5		Halogen lamp 12V , 10 W, Socket G4	1			
M		Motor	1			
M - 1		Carbon brush motor	2			
X1		Cable	1			