User's manual

Drilling Machine
B 10110

Read and follow the operating instructions and safety precautions!
All technical changes and printing/typesetting are subject to change!

english

comenius

Dear teachers and pupils!

This user's manual contains information and important advice on operating and handling the machine.

The user's manual is part of the machine and must not be removed. Preserve it for later purposes! Attach it to the machine, especially when you give it to a third person!

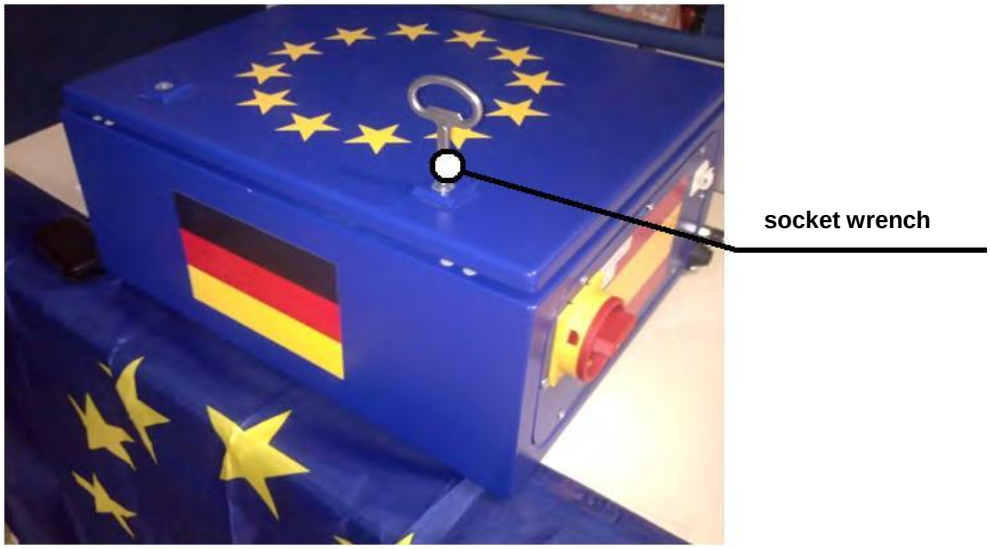
Please observe the safety advice!

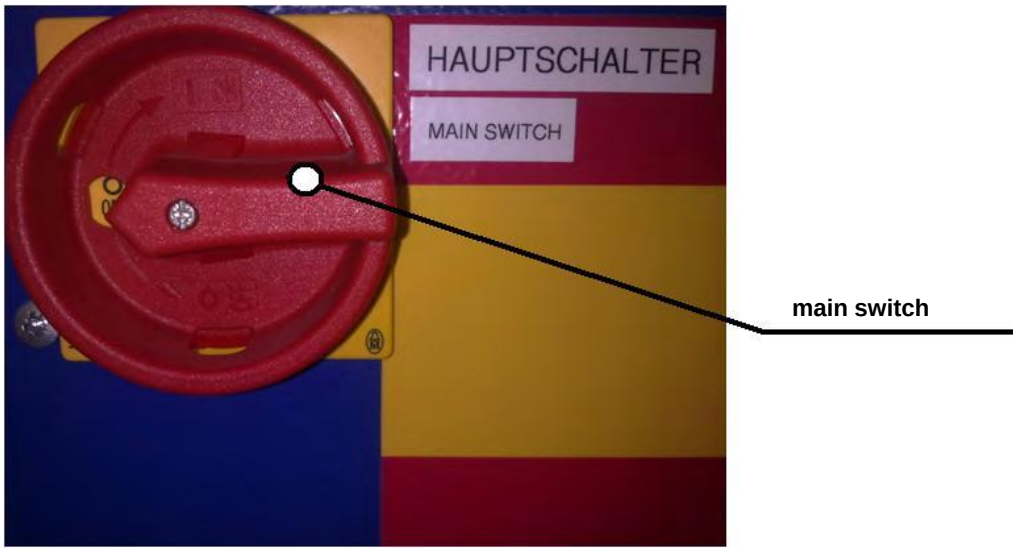
Read this user's manual carefully before putting the machine in operation The appropriate handling will be easier for you, misunderstandings and possible damages can be prevented. Adhere to the warning and safety recommendations. Disregarding the warnings can lead to serious injuries.

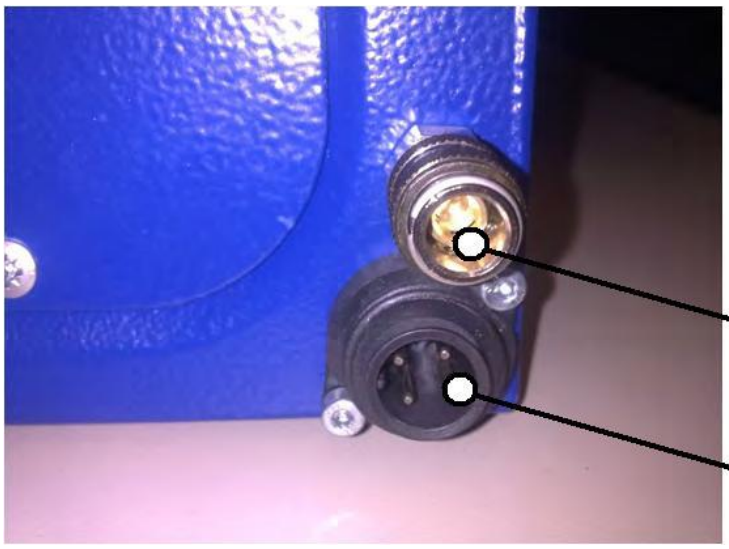
1 TECHNICAL ASPECTS

1.1 Components and operating elements

1.1.1 External appereance







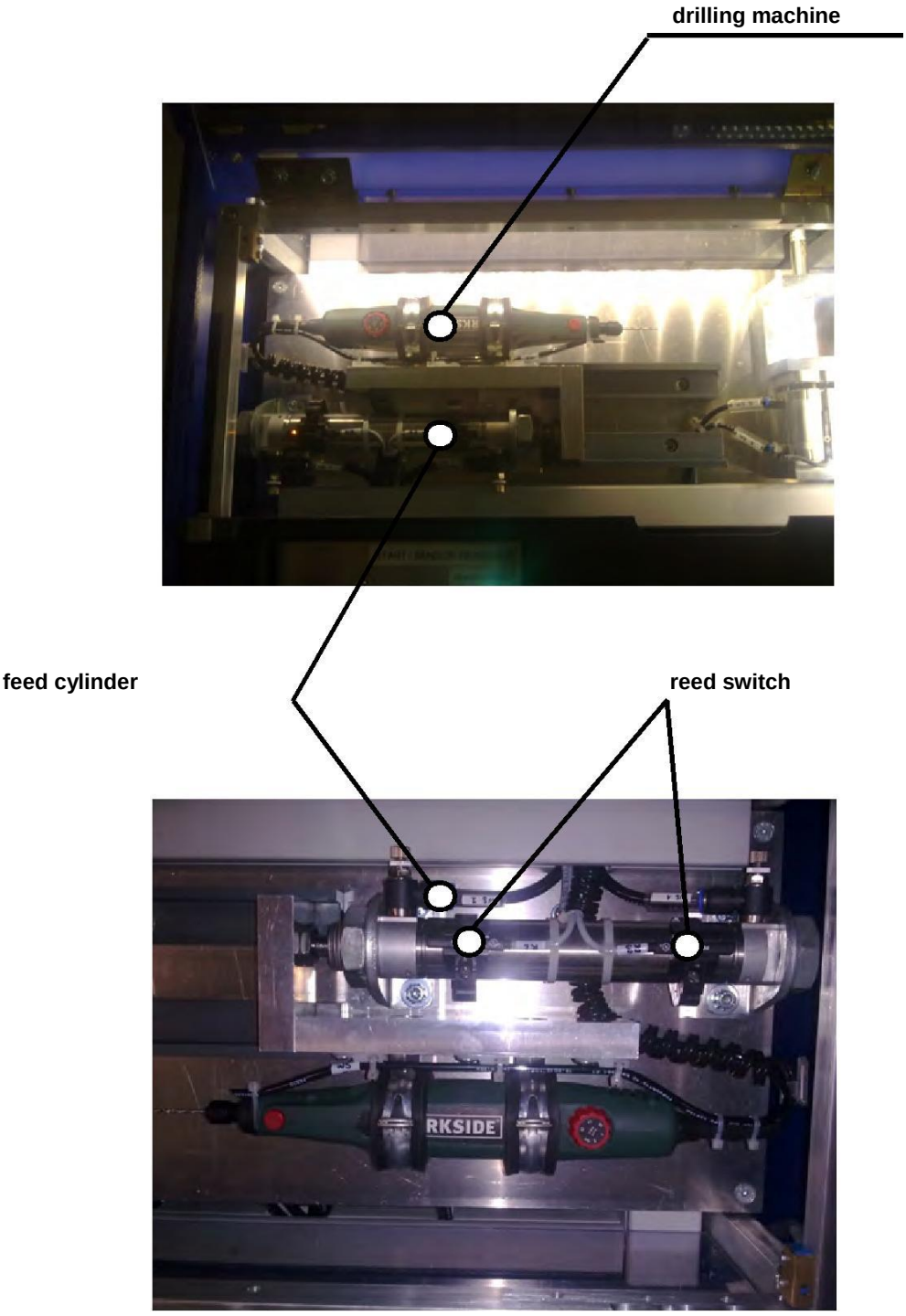
Crompressed
Air connection

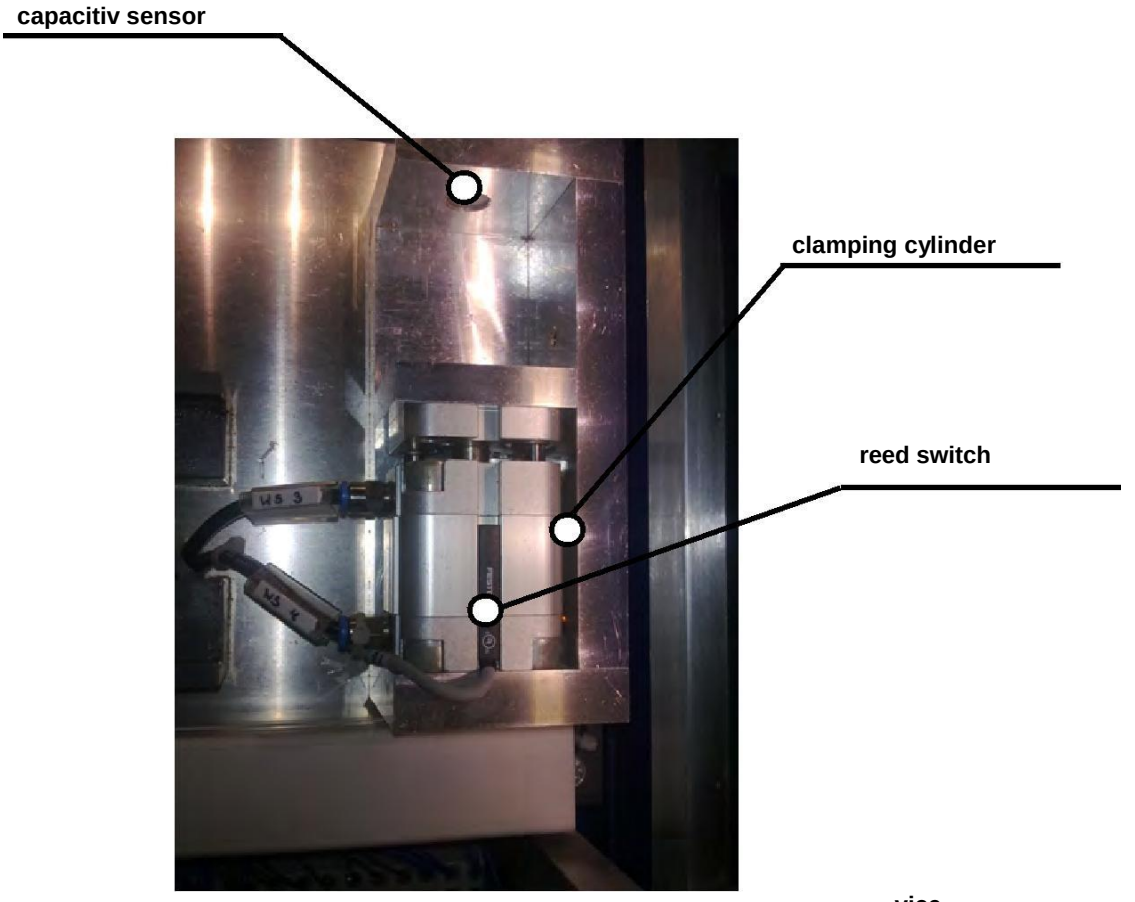
current
connection

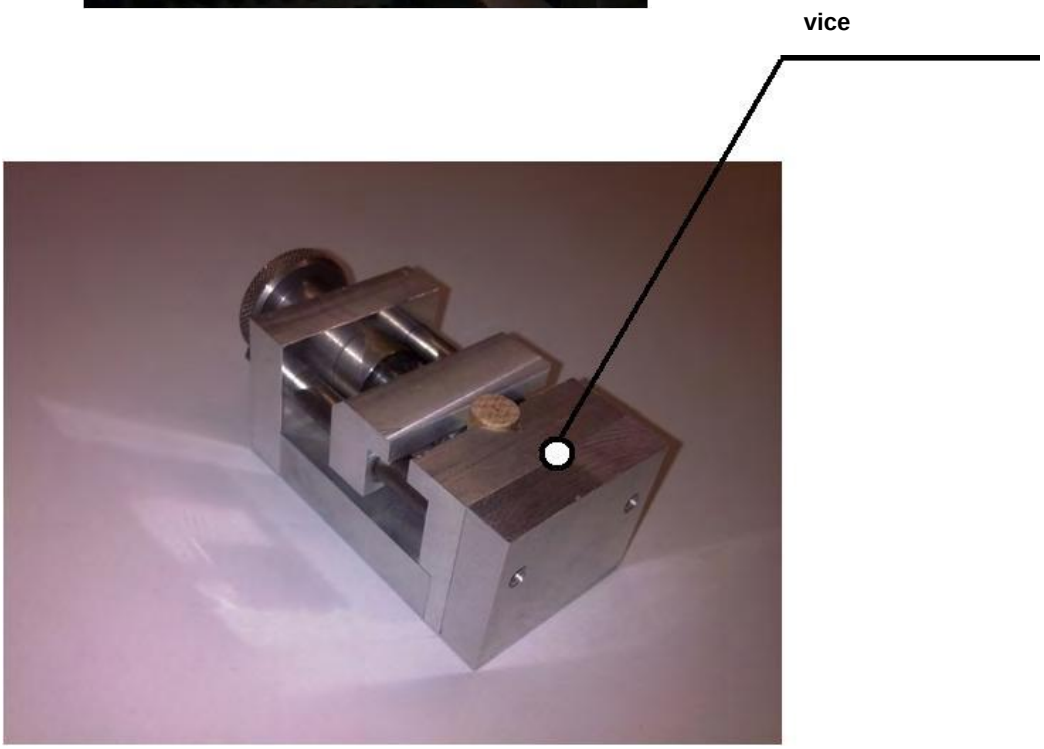
emergency switch

start button

1.1.2 Interior




capacitiv sensor
clamping cylinder
reed switch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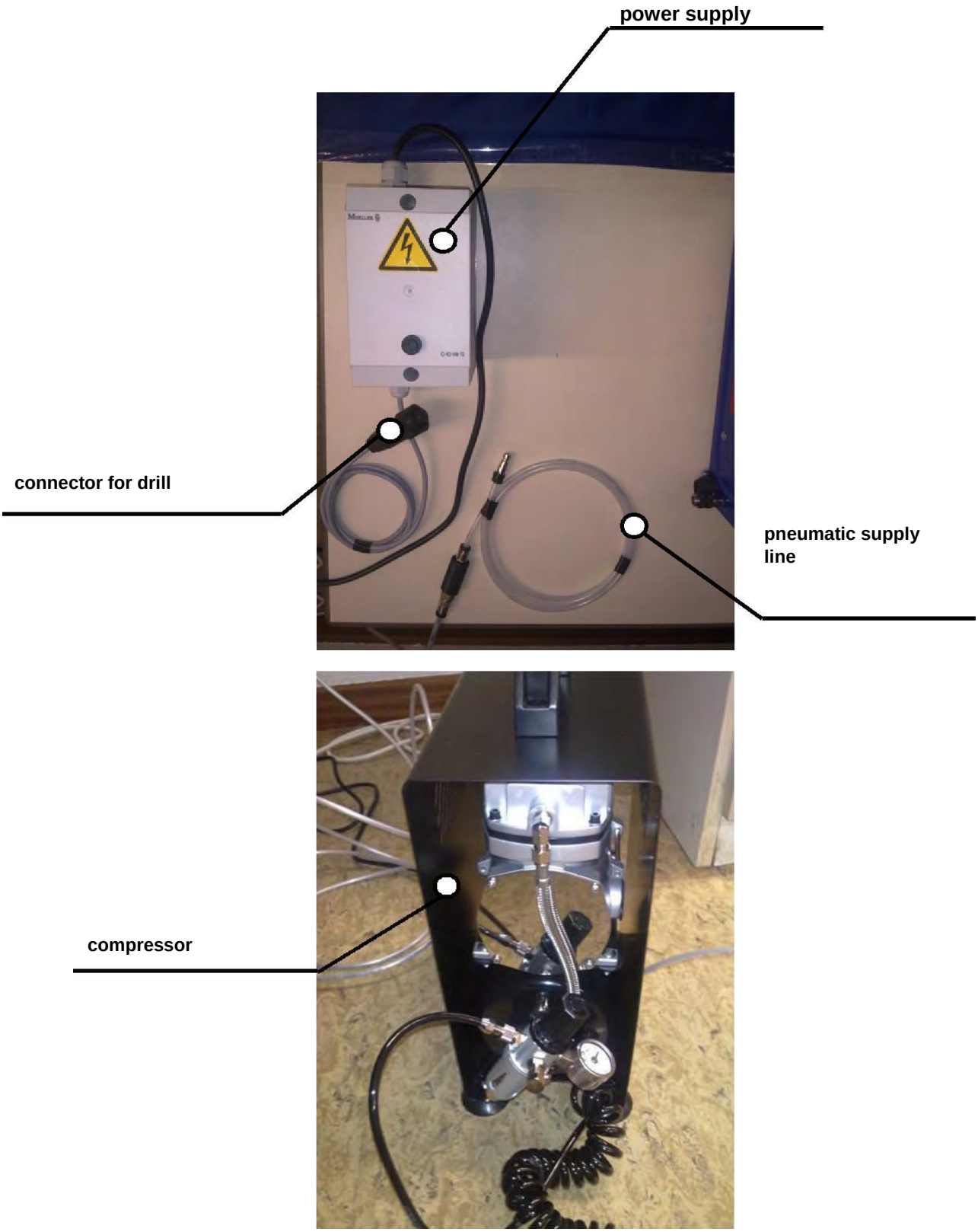
1.1.3 Equipment



1.2 Technical specifications

	Einheit	Maschine
power supply +-	V/Hz	230V/50Hz
operation (DC)	V	15V
power	W	22W
rotational speed	U/min	5000 - 20000 U/min
max. drilling capacity Ø/	mm	3,2 mm

2 SAFETY

2.1 Slated purpose

Only use the machine in a flawless, slated and safe condition.
Interruptions which affect safety have to be removed immediately!

The B 10110 is slated for the following activities:
drill 3,2 mm: metal, wood, plastic
Only use suitable drilling bits!

2.1.1 Operating conditions

Use the machine only if under the following conditions:

moisture max. 70%
temprature from +1°C to+40°C
elevation max. 2000 m

The machine is NOT planed for the operation outside or under explosion-prone conditions.

2.2 Inadmissible purpose

- The operation of the machine under conditions which aren't mentioned in this user's manual is inadmissible.
- The operation of the machine without the slated precautionary measure is inadmissible.
- The disassembly or the removal of the precautionary measure is forbidden.
- Design changes on the Machine are forbidden.
- The operation of the machine is only allowed for the admissible purpose.

2.3 General safety advices

Warning signs and stickers on the machine, which are illegible or removed, have to be replaced immediately!

The following recommendations are **NECESSARY** to avoid malfunctions, damages, and health impairments:

The working space and the floor around the machine have to be free
of oil, grease and material tailings!

Look after a sufficient illuminated and cleaned working space!

Don't use the machine outside!

For your own safety it's forbidden to use the machine if you're tired, distracted or if you took any medicine, alcohol or drugs!

Climbing on the machine is forbidden!
Serious injures caused by falling of or tilting of the machine are possible!

The drilling machine is only allowed to be operated by skilled workers. Unauthorized and unskilled persons, especially children, should maintain a safety distance to the machine!

While working on the machine, don't wear any loose jewellery, wide clothes or loose hair.
Loose objects might get caught by the rotating drill bit and so cause injuries!

Wear suitable protection clothing (protection gloves, protective goggles, eae protection,…) while working on the machine!

Never let the running machine unattended! Before leaving the workplace turn off the machine and wait until the drill stops!

Before performing maintenance or setting changes the machine has to be disconnected from the electricity supply! Before disconnecting from the electricity supply you have to turn the main circuit breaker off.
Never use the power cord for transportation or to manipulate the machine!

Always fix the work piece with a suitable tool. Never fix the work piece with your hand!
Heavy injuries to your hand caused by sharp edges are possible, while the work piece is rotating because of the drill are possible.
Remove the chips only with a hand brush, a brush or a swarf hook.
Never remove the chips with your hand or blow them away!

Don’t use damaged drills or damaged work pieces!
The tool change should be carried out only when the drill is stagnated!
Withdraw the drill chuck key before starting the machine!

Check the precautionary measures and the components for damages before the start-up!
Don’t remove any mechanical or electrical precautionary measures!

2.4 Autocollants d‘avertissements

This sticker remembers the worker to read the users manual before starting the work and to familiarize oneself with the machine.

This sticker refers to the electrical converter of the machine.
Before opening the casing cover, the electricity supply has to be effectively disconnected. Pull out the power plug!

2.5 Remaining risk

Keep in mind these remaining risks even if you observe the precautionary measure and the flawless employment:

- Risk of injury of hands and fingers caused by the rotating drill
- Risk of injury caused by sharp edges of the work piece, especially if you don't fix it correctly.
- Loose Hairs and wide clothes might get caught by the rotating drill! Heavy risk of injury! Precautionary measures have to be observed!
- Risk of injury caused by the contact with energized components
- Risk of cuts, if the borehole isn't deburred.
- Risk of injuries caused by flying pieces even if you wear protective goggles. (the protector minimizes the risk)

These risks can be minimized, when all precautionary measures are observed, the machine is correctly maintained, neat and only used by skilled workers.

3 ASSEMBLY

3.1 Scope of delivery/Workplace

After receipt of the delivery, look if all parts are present and in working order:

- drilling machine
- power cable with converter
- compressed air hose
- workpiece holder
- socket wrench

The workplace

Choose a suitable place for the machine.
Observe the safety requirements of Chapter 2 and the dimensions of the machine from Chapter 1.
The selected location has to ensure an appropriate connection to the electrical grid and to a compressed air supply

3.2 Electrical connection

ATTENTION

Working at a not earthed machine:

Heavy injuries caused by a current pulse in case of a malfunction are possible!

For this reason, you have to observe:
The machine has to be earthed and powered by earthed plug socket.

- Check, if the needed voltage corresponds with the voltage of the local power supply system!
- Too high tensions can cause critical injuries.
- The use of a source of power with higher or lower voltage can lead to serious damages to the engine.
- The electrical connection of the machine is designed for the operation with earthed plug sockets!
- The plug has to be connected with correctly installed and earthed plug sockets!
- It‘s not allowed to change the provided plug! If the plug doesn‘t fit or is damaged; the electrical engineer is the only one authorized to replace it!
- In case of a repair or exchange it’s not allowed to connect the grounding connector with a tensioned plug socket!
- Check with a skilled electrician or service technician if the grounding connector instructions are understandable and if the machine is earthed!
- Damaged cables have to be removed immediately!

Extension cable

Make sure that the extension lead is in a good condition and suitable for power transmission. An undersized cable can minimize the power transmition and will heat up. The following table shows the fitting size in subordination of current and length:

Ampere	extension cable in m					
	8	16	24	33	50	66
< 5	16	16	16	14	12	12
5 a 8	16	16	14	12	10	n.r.
8 a 12	14	14	12	10	n.r.	n.r.
12 a 15	12	12	10	10	n.r.	n.r.
15 a 20	10	10	10	n.r.	n.r.	n.r.
20 a 30	10	n.r.	n.r.	n.r.	n.r.	n.r.

3.4 Work preparation

- Use the drilling machine only if it’s correctly installed and if you read the user’s manual.
- Make sure that the protector of the machine is closed and secured before turning on.
- Check if the drill is correctly installed and not damaged before turning on.
- Check if the drill is suitable for the material and work.
- Never drill without checking, if the work piece is sufficiently fastened.

⚠ A T TE N TI O N

Please observe all the safety advices and precautions mentioned in capitel 2!

4 OPERATION

WARNING

All setting changes etc. only after separation of the machine from the power supply!

4.1 Adjusting of the rotational speed and cutting rate

The cutting rate is conditioned by the rotational speed of the drill spindle and the drill diameter.

The correct choice of the feed and the rotational speed is crucial for the service life of drills.

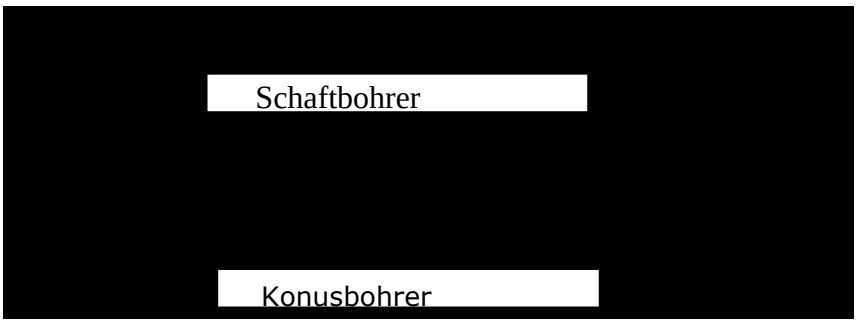
Set appropriate speed:

Numeral at ON/OFF	material to be processed
OFF	**(device switched off)**
5	**plastic and material with a low melting point**
7	**stone, ceramic**
10	**softwood, metal**
17	**hardwood**
20	**steel**

5.2 Drill selection

Depending on material and property there are three drill types with different lead angles. (DIN 1414).

Type N is used for normal materials, type H for brittle materials and type W for soft materials.
Besides, you can arrange the drills in shank drills and Konsubohrer.
Shank drills are fixed in the drill chucks, while Konusbohrer can be directly inserted in spindles.



The point angle also plays an important role

The table shows different application areas for the drill types:

material	drill type	point angle
steel, low resistance	N	118°
steel, high resistance	N	130°
stainless steel	N	130°
cast iron	N	118°
Al-alloy	H	130°
Cu-alloy	H	130°
thermoplastics	H	130°
duroplastics	H	130°

4.3 user's manual

- Connect the pressure- and power supply
- Adjust the pressure to 6 Bar
- Open the cover with the arranged socket key
- Re-lay the main circuit breaker
- With the pulling out of the emergency-stop-switch the control desk comes out
- Open the safety hood
- Take the workpiece holder out and clamp the workpiece
- Werkstückhalterung in Vorrichtung einlegen
- Put the workpiece holder in the gadget
- Close the safety hood
- Drilling process starts
- After finishing the drilling process, the sensor should be cleaned and so the chips can be removed.
- Borrow the workpiece holder and unclamp the work piece Close the safety hood
- Close the safety hood
- Shut the control desk down
- Re-lay the main circuit breaker, to switch the machine off

ADVICE

For safety reasons, the machine runs only when the guard is closed!

5 MAINTENANCE AND REPAIR

ATTENTION

For cleaning and overhauling while the machine is connected: Damage to property and heavy injuries caused by unintentional switching the machine on are possible!
Therefore keep in mind:
Switch the machine of and separate it from the power supply before maintanance works!!

The machine is low-maintenance and contains just a few components, which have to be overhauled.

Troubles or defects which endanger the safety of the machine have to be tackled immediately. Only skilled workers are authorized to do repairs!

A complete cleaning guarantees a long life of the machine and is part of the safety regulations. Check regularly if the warning and safety advices of the machine are available and in a perfectly readable condition.

Inspect the perfect condition of the safety devices before every operation.
Don't store the machine in damp rooms and protect it against the influence of weather conditions.

Lubricate every movable connection part with lubricating oil or grease before the first putting in operation and then after every 100 man hours..

ADVICE

Only skilled workers are allowed to remove defects!
Repairs have to be done by skilled workers!

Just use original spares to exchange components and parts!!

6 TROUBLESHOOTING

Before starting the removal of defects disconnect the machine from the power supply.

mistake	Possible cause	removal
engine doesn't run	power supply incorrect	expert should check
	switch is defect	exchange
	engine is damaged/defect	exchange
drill doesn't rotate	power supply incorrect	check every plug connection
	cable is damaged	exchange cable
drill is dezentralized/ runs imbalance/ "wobbles"	dulled drill	exchange drill
	loose drill	clamp drill correctly in
	spindle is worn out	exchange spindle
	chuck jaws are defect	exchange drill chuck
drill sparks or smokes	friction is too high	use lubricant
	wrong relation between speed and material	reduce speed
	chips get stucks in hole	remove the chips
	dulled drill	sharpen drill or exchange
	feed is to low	increase feed
drill process doesn't start	safety hood not closed	close safety hood
	work piece isn't recognized	Check if the work piece is correctly placed. Check if the sensor is clean.
drill stucks in work piece	drill seized in work piece	fasten the workpiece correctly
	feed is too high	minimize the feed
unusual operating noise	work piece isn't fixed correctly	fix work piece secure
wrong handling of work piece	work piece is in bad condition	exchange work piece
	material is overused	Check if you use the correct material.

7 DECOMMISSIONING AND WASTE MANAGEMENT

If the machine is not ready for use and should be scrapped, it has to be deactivated and dismantled, that means it has to be brought in a condition, in which it can't be used for the same purpose it was designed for.

While the scrapping process you have to observe the recovery of primary materials from the machine..

These materials may be reused in a recycling process.

△ A T TE N TI O N

Deactivation of the machine:

- Block every movable machine part and take the machine to pieces
- Hand every component in controlled waste management places
- Take rubber components off the machine and hand them to the respective office
- Electrical components belong to the hazardous waste and
- have to be thrown away separated from the machine..

After the deactivation and the blocking of movable parts there are no remaining risks.

8 DECLARATION OF CONFORMITY

In sense of EG Machine Directive 2006/42/EG, appendix II A and the
EMV directive 2004/108/EG

We hereby declare that the machine described below according to your conception
And construction and in the version marketed by us in accordance with the relevant
Basic safety and health requirements of Council Directive of 03/05/89 to
Approximation of the laws of the Member States relating to electromagnetic
Compatibility conforms.
Unauthorized changes put this statement out of power

Designation of the machinery:	Drilling Maschine
Type:	B 10110
EU Machine Directive:	EU Machine Directive (2006/42/EG) and relevant amendments And additions EC Low Voltage Directive (93/68/EWG) 2006/95/EG EWG EMV 2004/108 EG.
Applied national Standards And Technical specifications:	EN 292 EN 6204-1 DIN EN 55014-1 DIN EN 55014-2 DIN EN 61558-1 DIN EN 61558-2-6 DIN EN 61000-3-2 DIN EN 61000-3-3 DIN EN 60745-1 DIN EN 60745-2-3 DIN EN 8626-1

Pforzheim, der 4.05.2013