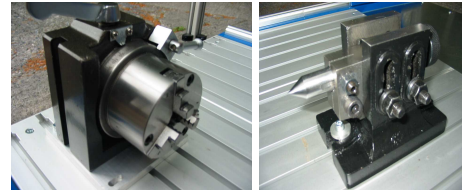




# OPERATING INSTRUCTIONS



## **Xcalibur** **CNC Router** **XYZ604012**

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# 1 Introduction

## 1.1 Preface

Dear customer

Congratulations to you on your acquisition of the Xcalibur CNC Router from our AL Series. All you have to do now is to set up this machine.

Please follow the operating instructions in this responsible task. It serves as a reference manual and should be stored in the vicinity of the router for your convenience.

As an operator and user of this router, you are obligated to read and to understand these operating instructions and especially the chapter on safety tips. It concerns your security!

The safety tips in the operating instructions of the respective accessories parts / annex part are to be kept.

The operator when fully trained to operate the router should only allow qualified people use it for production – this will prevent accidents and / or damage to the machine.

Some images or sketches in these instructions serve only the illustration and can deviate therefore from the original.

In questions regarding this router , we are available to assist you most promptly.

## 1.2 Meaning of the related symbols

### DANGER

Symbols and texts, that are marked with the addition "DANGER, "warn against a directly threatening danger (serious injury, remaining damages, death)

**Please note these texts unconditionally!**

### WARNING

Symbols and texts, that are marked with the addition "WARNING, "warn against a possibly threatening danger (serious injury, remaining damages, death)

**Please note these texts unconditionally!**

### CAUTION

Symbols and texts, that are marked with the addition "CAUTION, "warn against a possibly threatening danger (easy injuries, property damages)

**Please note these texts unconditionally!**



Where marked with this symbol, it contains very important references, whose compliance to the avoidance of people and property damages is unconditionally required.

**Please note these texts unconditionally!**

**TIP**

Where "TIPP ", contain commentaries, tips and useful information



Danger through electric shock.



Danger through mechanical movements.



Danger through here crashing loads.



**DANGER**

Danger through here flying around chips / gravel. Carry unconditionally visibility protection

### **1.3 Delivery**

Test the delivery in acceptance of the router for totality.

### **1.4 Carrier damage**

Announce carrier damage immediately.

If the carrier was transmitted to the manufacturer, the carrier damages must both on the bill of lading of the receiver and the carrier business described..

The bill of lading of the receiver must be made available for the damages preparation the manufacturer.

### **1.5 Storage**

If the delivered good is not taken immediately after the extradition in operation, the delivery is to be stored at a place protected before moisture entrance and strong variations in temperature.

### **1.6 Liability and guarantee**



All statements in this operating instructions serve the certain and undisturbed business of the CNC Router.

The operating instructions is a very important component of the machine and must be carefully read.

Improper handling or due use of the machine cannot lead to damages or injuries. For this the manufacturer receives no liability.

The manufacturer reserves variations in the frame in the event of further developments.

**2.1****General**

All routers of the series AL are acknowledged to be of the highest Standards of Technology and left the manufacturer in a safe and flawless condition.

Nevertheless – please be attentive to the pertinent maintenance works for the respective operator of the machine.

Operator and user must inform themselves before work start about threatening dangers. Please carefully read the instructions before operating the machine and act with due diligence always. You must especially note the following references as an operator and user of the machine:

- Remember and note these references before you use the machine. Store the safety tips well.
- Disorder in the field of work yields accident danger.
  
- Do not let other people into the field of work of the machine without proper supervision.
  
- Do not overburden the machine. Please work within the indicated achievement area.
  
- Always use the correct tool. Do not use low quality or weak tools for heavy works. Do not use tools for purposes and works for what they are not determined.
  
- Always wear suitable work clothing. Do not wear jewelry. They can be grasped by moving parts.
  
- Always wear safety spectacles or goggles.
- Please ensure that all connection cables and connectors are secure before using the machine to avoid any damage. In the event of any damage only allow a qualified person remedy the problem. Keep all connection cable within the sphere of influence of the machine.
- Always secure the workpiece.
- Always be comfortable when using the machine – do not over stretch in the standing area. Avoid abnormal body bearing especially in the loading of the machine. Provide for certain position and hold always the balance.
- Let you be always attentive. Observe your work. Advance sensibly. Do not use the machine if you are not trained in its operation.

In the event of injury to people who have improperly used the machine and its application - no liability is received on the part of the manufacturer.

**2.2****Obligations of the operator**

The operator is obligated to instruct all users of the router in the strict requirement of the basic directions of the work security and accident prevention. Please ensure no unqualified people or children attain access to the machine. The operator must insist on proper instruction for all users.

Operate the router only in the technically flawless and reliable condition. Use suitable protection arrangements and security arrangements in order to minimize the latent dangers.

Review the machine at regular intervals to maintain its flawless function.

## 2.3 Due use



The routers of the series AL serve for milling, boring, engraving on following materials: - Wood - plastics - aluminum and other NE metals - Fiber composites (GFK / CFK)

Further these machines with corresponding accessories suit themselves for cutting of foil, paper, Cardboard and similar materials.

The materials must be secured firmly with suitable clamp means on the machine table.

If the machine is used for milling or boring, the maximal **Fräser-** may / do not exceed drilling diameter 6mm. The maxim allowable numbers of revolutions of the tools are to be kept unconditionally.

## 2.4 More foreseeable false use



The machine may not be used for the preparation of unfit materials such as for example: Steel or other very hard metals, glass, stone or ceramics.

The maximal **Fräser-** / 6mm may not exceed drilling diameter.

An insufficient reinforcement / security of the workpieces against slipping, removing or ejecting leads to unassessable dangers. The operator of the machine must ensure that the workpieces are absolutely secure before work is started. In insufficient reinforcement of the work pieces the machine may not be operated securely.

In recognizable damage of the machine, the related accessory parts of the machine may not be able to be used any longer.

The use in explosive and dangerous environment is prohibited.

People with limited physical capacities and handicap may not use the machine.

Children and minor, visitor and other untrained people may not use the machine.



## 2.5 Protection measure



**WARNUNG**

In the use of the machine, risks and impairment can emerge

- for body and life of the operators or third
- for the machine itself,
- at other material asset.

Base for the security and the undisturbed business of this machine is the knowledge of the safety tips and user considerations in these instructions.

Always wear suitable protection clothing when using the machine and the tasks to be carried out. In addition for example, wear safety spectacles or goggles, protective gloves, ear protection and protection shoes.

At work at the machine, garment, jewelry, long hair and other objects carried at the body can lead to injury or damage to the machine or themselves.

Carry therefore always closely fitting work clothing with slight tear stability. Avoid necktie and take chains, rings and other jewelry off.

## 2.6

### Danger places



**WARNUNG**

The milling machine tools and cutting edge tools have sharp cutting edges and tip. Improper contact can lead easily to cut wounds and sting wounds.

Separate the milling machine motor from the current network before the tool change. Turn in addition the choice switch for the spindle motor in that "OUT OF" -position (cf. Chapter 4.7 and 4.8). A mistakenly starting router motor can evoke considerable injuries.

The milled material can show sharp edges. Carry in the material change of security gloves in order to prevent cut and [Schürfverletzungen](#).



Warning before mechanical movements. These can lead above all to hand injuries – especially bruise -.

Note also the alerts appropriate at the machine to the avoidance of damage to health.



The coupling bushing for Kress milling machine motors (cf. Fig. 3.1) is turned over the control computer and is according to **stale condition spannungsführend**.

Turn the choice switch in the connecting or separating of the Kress of milling machine motor of the coupling bushing for the spindle motor in that "OUT OF" -position (cf. Chapter 4.7 and 4.8). Through it the possible energy conveyance is interrupted to the coupling bushing.

**The machine works with high electric tension.**



**Pull with all its deed genes, cleanings or repair work the Power plug**

## 2.7 Behavior in dangers

The machine is with a NEED-OUT OF-switch in the control panel. The NEED-OUT OF-switch is to be actuated only in dangers situations – it does not serve as machines a/from switch (cf. Chapter 4.7 and 4.8).

Inform yourself before work start about the situation of the controls and its function.

Hold always association box and fire extinguisher handy.

## 2.8 Carrier reference



**WARNUNG**

In the transport, lifting and moving of the machine and the packaging, injury / danger exists through lifting. Do not stay in the transport area where the unloading of the machine is taking place.

CAUTION: Danger through unequal weight distribution. The router can arrive sliped in transport and become out of balance. During transportation in vehicles, the router can slip and can cause some damage. Always be certain that the machine in the vehicle always so that it cannot slip.

Caution in the lifting of the machine: If the machine is transported on edge or in angle, or is lifted at parts of the portal system, can shift themselves the sleds of the portal system. This can lead to bruise.

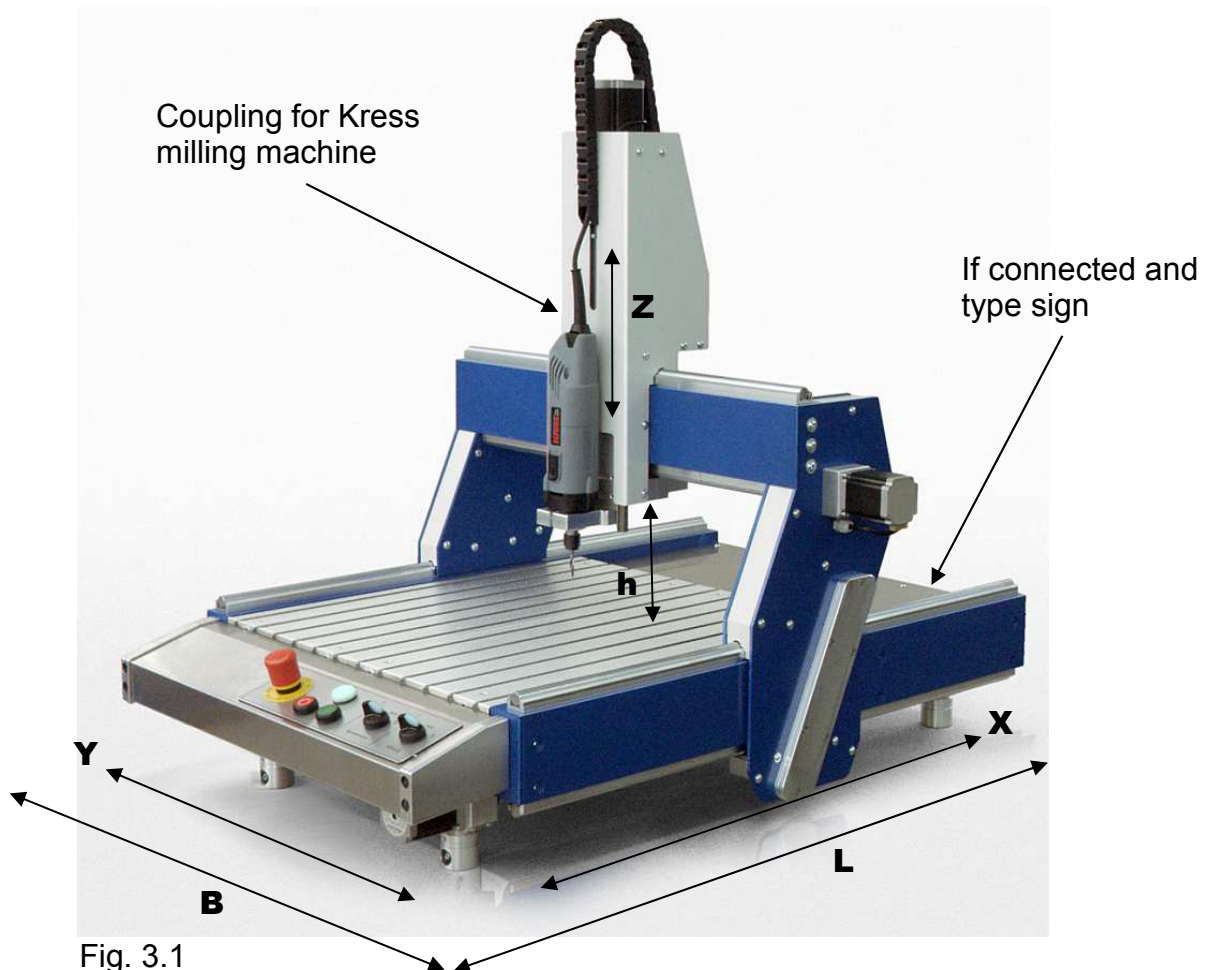
Carry protective gloves and security shoes!

### 3

## Technical data

### 3.1

## Dimensions, procedure areas and weights



Model	XYZ604012
Procedure way X	600 mm
Procedure way Y	400 mm
Procedure way Z	125 mm
Passage height (h)	150 mm
Overall length (L)	1030 mm
Entire width (B)	775 mm
Entire height	ca. 990mm
Weight according to execution	60 – 75 kg

**NB:** When the enclosure is built around the CNC Router the control panel is re-configured to be mounted outside the frame.

## 3.2 Steppermotors

In the standard execution and the pro execution, all axes will be driven over Steppermotor (X, Y, Z), will be operated that by the head for electronics with 1600 steps (1/8 steps) per revolution.

In the expert version, all axes are driven over Servostepper, that are operated by the head for electronics with 1000 steps per revolution.

TIP The related trapezoid thread spindles of the standard version have 3mm rise. The related ball thread spindles of the pro version and expert version have 10mm rise.

The type sign is on the back of the frame (cf. Fig. 3.1 and chapter 4.3). It includes information such as: - Machine type - serial number - model - tension and power requirement - manufacturer

Next to the type sign, the connections are for the computer and the tension provision of the machine.

## 3.3 Know data

Max. Position speed X / Y	6000 mm / min
Max. Position speed Z	3000 mm / min
Increment	0,00625 mm
Repeatedly accuracy*	+/- 0,020 mm
Position mistake	calibrate bar
Environments-/business temperature	18-23 °C
Supply voltage	230V / 50Hz
Max. Achievement reception	1,4kW

Repeatedly accuracy: The reproducibility of a reading under same conditions and the movement out of same direction.

## **4 Assembly and starting**

### **4.1 Set up place**



**Place machine on an even surface. Uneven surfaces can lead permanently to warping the of the machine housing!**

**Reassure yourself before the assembly of the machine that the table and/or the undercarriage durably endures the load of the machine.**

**Do not set up the machine on soft or fragile underground. Reassure yourself before assembly of the machine over a sufficient load capacity of the surface under the machine.**

**You take the weight of the machine out of chapter 3.1 from the table**

**The machine is to be secured against slipping and/or [Herunterstürzen!](#) Note also the safety tips out of chapter 2.8!**

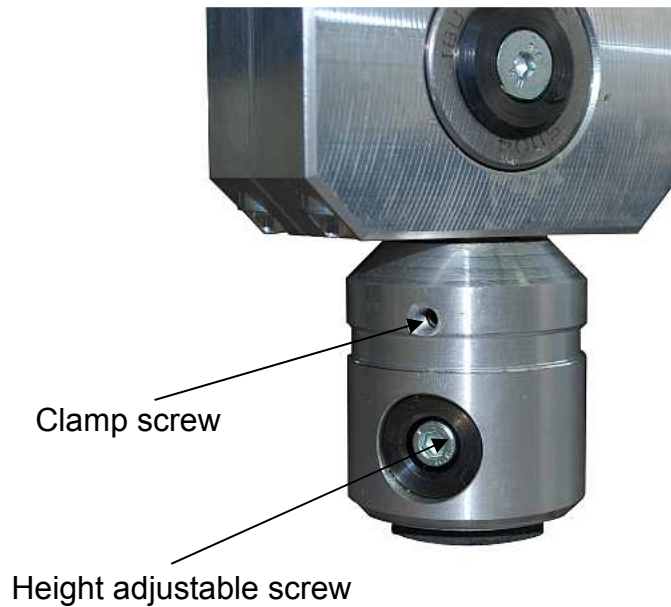
**For damages, that are to be attributed to an improper assembly, the manufacturer receives no liability.**

## 4.2 Aligning of the machine



### **Place machine on an even surface.**

Align the machine both in X of precise and in Y direction horizontally with some **precise water scales**. Adjust every foot individually. Solve in addition first of all the clamp screw about a full revolution and adjust then the machine height with the adjustable screw.



**In the clockwise turn sink = Lift machine**  
**Turn against clockwise = Sink machine**

After resulted attitude, you turn the clamp screw firmly.

## 4.3



### Connection

The machine is part of a plant. First through the connecting of the machine with a PC and deploy. The machining of the control software the plant becomes operable

Before connecting the PC please ensure that the machine is turned off and not connected to the current network. Connect first of all the machine with the PC. The connection for the connection cable to the PC is on the back of the frame (cf. Fig. 3.1).



Main switch and current connection

PC-Connection

Type sign

**Review the details about tension and achievements on the data label. Please ensure that the local tension provision agrees with these statements. Connect the machine to the current network.**

Transfer the cables so that no stumble places emerge.

**The sticking and pulling of the PC connections when the machine is switched on leads to damage in the head for electronics. Separate the power supply of the machine and turn the PC from before you infect or draw-off the PC connector!**

## 4.4

### Software

The machine is supplied with control software. Deploy this software on the machine control computer.

You take further information to the installation and to the contact with this software please for WinPC NC and/or cncGraF from the handbook of the respective software as well as the supplement with the standard configuration.



## 4.5 Starting

The function of the machine was tested in the factory. It is therefore ready for operation and can be connected with the PC and connected to a local tension provision. Note at the same time also the references out of chapter 4.2

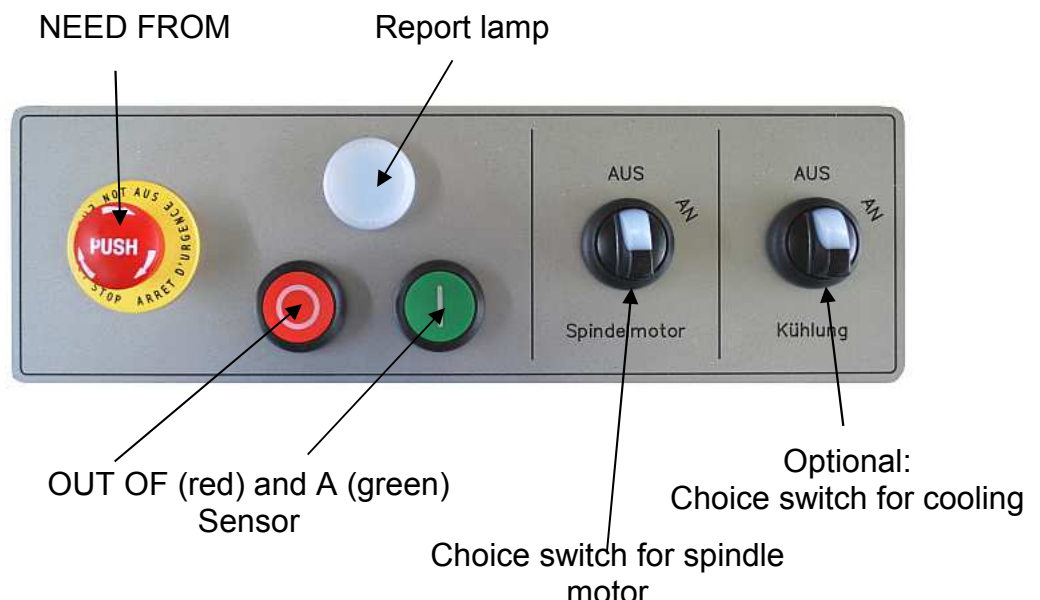
After the connection, the machine is to be turned on at the skin switch. The main switch is on the back of the frame (cf. Fig. 3.1 and chapter 4.3). Through pressing of the green key in the serve pulpit (cf. Chapter 4.7 and 4.8) the control is started.

## 4.6 Außerbetriebsetzen

Stop the machine per PC control. Press that OUT OF sensor in the serve pulpit (cf. Chapter 4.7 and 4.8) for turning off the control. Over the main switch, the machine can be turned completely *stromless*.

## 4.7 Serve pulpit and -elements

Elements comprised following the serve pulpit:



## 4.8



### Function of the controls

Please see the position and arrangement of the Control panel items Chapter 4.5. The function of the controls as follows:

NEED FROM	Pressing the NEED OUT OF sensor leads to an immediate stop of the machine. The machine can be taken no longer in operation before that is NEED OUT OF sensor again <b>entsperrt</b> . The <b>Entsperrung</b> of the sensor results through TURNING of the red cap in arrow direction.
OUT OF sensor	Pressing of the OUT OF sensor leads to an immediate stop of the machine, however this can be taken again in operation.
A sensor	Pressing of the A sensor transfers the machine in operational readiness.
Report lamp	The report lamp illuminates green as soon as the machine is operative.
Choice switch for spindle motor	Over the choice switch for the spindle motor, the starting of the machine spindle can be deactivated per software. In the turned on condition, a green control lamp illuminates in the choice switch.
<b>Optional: Choice switch for cooling</b>	<b>Over the choice switch for the cooling, the engaging of the cooling can be deactivated per software if the milling machine process is supposed to be carried out without Kühl- / lubricant. In the turned on condition, a green control lamp illuminates in the choice switch.</b>

The serve pulpit can control optionally yet marked Rotary potentiometer to the regulation of the spindle number of revolutions and/or the stroke frequency of the oscillating knife on or two with its function.

## 5

### Maintenance

#### 5.1

#### General



Please use clean cloths on the machine. Pollutions on the moving parts and spindle lead to an increased friction and wear.

The maintenance works may be carried out only when the machine is switched Off and disconnected from the PC.

The maintenance works is to be carried out only by a fully qualified operator.

Note also all relevant safety tips out of chapters 2.

#### 5.2

#### Maintenance and care product



**WARNUNG**

Oil and grease are damaging to health. Note always the processing directions and securities referred to by the manufacturer. Avoid unnecessary skin contact. Use suitable skin care products or gloves. Only use protective gloves when handling spilled lubricants.

Use a soft, dust-free rag for the cleaning of the machine housing.

To the maintenance of the utility of the thread drive, these must be greased sufficiently. For greasing the spindle the same lubricants come to the use how they are used for [Wälzlager](#). Lubricants that contain MOS2 or graphite may not be used. A unique service life lubrication of the thread drive will be according to experience not sufficiently because the spindle expedites permanently small quantities of lubricant out of the housing. We recommend fats on mineral oil basis in the quality K2K, DIN 51825.

The references of the lubricant manufacturers are to be noted.

Use a thin fine oil for oiling the leadership poles (z. B. weapon oil or sewing machine oil).

### 5.3



#### **Maintenance intervals**

The required grease time period depends on the environment conditions. In general trapezoid thread spindles must be greased more frequently and more strongly than a ball thread spindle.

The fat is to be tested independent of the utilization of the machine after two to three months for pollution. In the case grease fat becomes old by pollution replace with new grease. In every case once annually exchange grease fat

Handle the machine cleanly. Pollutions on the spindles and the leadership poles lead to an increased friction and therewith a loss of speed. Further the risk of a Step loss increases.

Clean the machine therefore regularly.

### 5.4



#### **Maintenance of the standard version**

The trapezoid thread spindles regularly must be greased. If run dry the machine tends to labour and block. The fat consumption depends strongly on the machine stress and the condition of the [Mutern](#)

If a squeaking is heard in the course sound, the spindles must be greased immediately. The machine when new should be greased between 10-15 hours of operation in any case. At the same time also the leadership poles must be oiled.

The fat can apply become directly on the spindle. Use in addition a brush in order to distribute the fat up to the kernel of the spindle. A thin fat layer suffices.

## **5.5 Maintenance of the pro version and expert version**



Dependent on the environment conditions and the degree of useage of the machine – it should be greased after 200 – 600 hours of operation.

## **5.6 Reopening**

### **TIP**

Connect the machine again to the current network. Start the control software and turn the machine first of all at the main switch and after that over the green key in the serve pulpit ( control panel ) again on.

Let now the machine per software a diagonal of the zero out of until into the opposed corner of the procedure area go. Repeat this process repeatedly (ca. 20 times). Through it the freshly applied grease distributes uniformly and the surplus grease gathers itself at the inlet.

Remove the surplus grease from the inlet of the machine.

## 6

### Mistake removal

#### 6.1

#### Step losses

The most frequent interference is the Step losses.

Step losses emerge in to strong load of the Steppermotors. Causes for this can be too fast procedure speeds, stiff-ness of the axes or too short acceleration ramps and brake ramps.

Mistake removal: - select a speed suitable to the machine and review the machine for smoothness then clean the machine if necessary –

place longer acceleration and braking distances on

#### 6.2



GEFAHR

#### Standstill

Mistake: The machine reacts no longer to the software. There is no travel possible on all axes.

Mistake removal: - Check the connection between PC and machine – check the configuration of the software – check the securities in the main switch (cf. Fig. 3.2)

Separate the machine before the removal of the securities from the current network and note the relevant Safety information from chapter 2.

#### 6.3

#### Other interferences

In all other interferences, you must check with the manufacturer.

# **EC conformity explanation**

**In the sense of the EC machine guideline 2006/42/EG, Anh. II, 1. A**

**Description and identification of the machine:**

**Product / product: Milling machine machine and serious machine types: AL640standard / AL640profi / AL640expert AL1065standard / AL1065profi / AL1065expert AL1290standard / AL1290profi / AL1290expert AL665Sstandard / AL665Sprofi / AL665Sexpert AL1040Sstandard / AL1040Sprofi / AL1040Sexpert AL1240Sstandard / AL1240Sprofi / AL1240Sexpert AL1265Sstandard / AL1265Sprofi / AL1265Sexpert function: Computer-controlled milling, boring, engraving, cutting edges, fairs on following materials: Wood, plastics, aluminum and other NE metals, fiber association materials (GFK / CFK), foil and carton (only cutting edges)**

**It specifically is explained that the machine corresponds to all pertinent determinations of the following EC guidelines: 2006/42/EG:2006-05-17 EC machine guideline 2006/42/EG**

**2004/108/EG: (Electromagnetic compatibility) guideline 2004/108/EG of the European parliament and the advice of the 15th of December 2004 to the assimilation of the legal specifications of the members states over the electromagnetic compatibility and to the lifting of the guideline 89/336/EWG**

**2006/95/EG: (Low voltage guideline) guideline of the European parliament and the advice of the 12th of December 2006 to the assimilation of the legal specifications of the member countries concerning electric business means to the use within certain tension boundaries (codified frame) (1)**

**Finding place of the used harmonized standards corresponding to articles 7 paragraph 2: E ISO 12100-1/A1:2009 security of machines - fundamental ideas, general formation guiding principles - part 1: Basic terminology, methodology**

**E ISO 12100-2:2003/A1 security of machines - fundamental ideas, general formation guiding principles - parts 2: Technical guiding principles**

**Additional information: In a change voted not in writing with the manufacturer of the machine as well as in not use appropriate for use of the machine, this explanation loses its validity!**

**Neuss, 11.01.2010**

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