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KT32 USER MANUAL

CUSTOMER	
SERIAL N°	
MODEL	
DATE	

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Index

1. GENERAL INFORMATIONS

1.1. Preface

Congratulations, you have just bought a KT32 CNC. To facilitate, we, the constructor, have included a manual of our product. We advice you to read this manual carefully, it contains useful information about installation, use and maintenance of your CNC Machine. It will result in longer life and easier use.

1.2. Constructor

The company AitalMAC has been constituted by Mr. Romeo Toniolo, which has big, long-time experiences in designing and constructing of machines for working of natural stones. After years of searching and tightening contacts with producers and trading companies all around the world it is just acquired technological know-how what represents the best guarantee for the AITALMAC'S customers.

1.3. General description

KT32 is a stone processing CNC.

Machine characteristics:
The mod. KT32 main structure is made in welded steel with a particular sandblast treatment that includes a final coating of epoxide painting enamel.
The axis motors are stepper motor, for move the X axis at a variable speed from 0 to 20m/min the Y from 0 to 10m/min and the Z from 0 to 3m/min, the stepper motor system guarantee high torque and precise movements.
The Main Motor is a vector spindle with 48Nm of torque at maximum 8000RPM, this power is transferred by belt to the mechanical spindle with automatic tool change for ISO BT40 cones.
The cable-drag chain and the electric cables used on the mod. KT32 is purposely made for a use at high speed (robot materials).
All sensors used on the mod. KT32 are watertight.
The power electric box is positioned on the right of the machine and is equipped with a computer, with user friendly Aitek's software.
The water system is automatic controlled.
The machine is provided with a vacuum pump, the vacuum pump can reach pressure of -9BAR, the vacuum is used by the suction cups to hold the working pieces in place, the machine also need compressed air while working.

1.4. Certification „CE"

The CNC mod. KT32 is designed to operate correctly in an electromagnetic atmosphere of industrial type and is equipped with all the mechanical and electrical safety protections in conformity with the following European CEE rules and regulations:

Directive machines 2006/42/EC
Directive low tension 73/23 CEE
Directive Electro-magnetic compatibility 89/336 CEE - 2004/108 EC
EN ISO 12100-1 : 2003 - EN ISO 12100-2 : 2003 - 89/391/EEC - 89/656/EEC (Machine safety)
EN-60204-1:2006 - EN-60204-11:2000 (Electric equipment safety)
2006/95/EC (Low tension electricity)
CE/108/2004 (Electromagnetic compatibility)

EN-55011 (CEI 110-6) (Limits and methods of measure of characteristics of radio disturb of industrial, scientific and medical apparatuses (ISM)
EN-61000-4-2 / 4-4 / 4-6 (1996)
EN 61800-3 (1996)

Results of all tests make part of the technical issue and we send it only over against the special request.
The machine is delivered with the CE mark exposed.

1.5. Guarantee

The guarantee of the machine is 1 (one) year from the date of the effective installation by AitalMAC's or third party engineers. In case of eventual faults or defects on material or manufacture the customer has to inform the producer or the relevant sale agent about the problem by registered letter immediately. If the complaint is accepted from the producer – he will replace and/or repair the components (the machine or its parts). In the guarantee are not included expenses for disassembling, assembling, sending of parts, and expenses regarding the producer's engineer (food, accommodation, trip). The reparation of the respective component does not mean reopen of the guarantee period for the all machine (only in case of replacing of the machine). The producer is not responsible for damages brought about from customer or third party due to wrong handling with the machine. From the guarantee are excluded parts which were accidentally damaged during the transport, during the lifting and placing of the machine, due to wrong connection to the electrical feeding line (these are included if those operations provide the producer). From the guarantee are excluded components mechanically or atmospherically wearied due to insufficient maintenance or unpresumed or forbidden use. The producer is not responsible for not authorized modifications or repairs. The validity of the guarantee is subordinated to the corrected execution of the maintenance like described in this manual. For components supplied from third party valid guarantees of third party.

1.6. Settlement of customer's expenses

On the base of documentation by constructor (if there is no another agreement between customer and constructor) customer has to provide on his expenses following:

- preparation of the hall – basement, drainage (see chapter 2.3.),
- water supply in conformity of norms in the country of use, (see 2.4.),
- supply of air in conformity of norms in the country of use, (see 2.5.),
- supply of electricity in conformity of norms in the country of use, (see 2.6.).

1.7. Assistance centre

AitalMAC has the assistance centre just in its residence. For every help or information contact sale agents of AitalMAC in your country to ensure the assistance centre which is close to you or contact directly the head office of AitalMAC company. Agents will help you to detect all problems, and solve them by retailer or constructor over against dates of product marked on the label (see 4.10.) on the machine.

1.8. About manual

The Customer must read with extreme attention all information written in this manual. Exhaustive study of manual, preparation, installation and right use of the machine constitute the base of the good relationship between constructor and producer.

- **Purpose of the manual**
  The purpose of the manual is to give the customer all necessary information so that he would be able to install and work with the machine by his own in the most independent and sure way. It comprises inherent technical information, information about function of the machine, security and maintenance.

NOTE: Before starting of whichever operation on the machine the customer must read carefully contained instructions in this manual. In case of any doubts on the corrected interpretation the constructor must contact producer or sale agent for necessary clarifications.

- **Addressees of the manual**
  The manual is appointed to the operator of the machine and to the customer's technician as well. The customer must explain carefully function of the product to both of them.

NOTE: The constructor is not responsible for any of damages eventuate from insufficient perusing of this manual.

- **Conservation of the manual**
  The manual must be conserved nearby the machine and, above all, in a safe place protected from liquids and another harmful impacts. It is recommended to make another copy of this manual (with attachments) and keep it in a safe place in office.

NOTE: The machine does not have to be yielded to thirds party without informing the constructor. (The constructor must verify that the machine respect all norms in the country of use at the moment of the cession in case of incident. All parties, which have contracted the machine, are incumbent in pecuniary penalty).

2. INSTALLATION

2.1. Transport and store

- **While transporting the machine beware:**
  - the machine axis are all locked and cannot move.
  - the machine is always straight loaded,
  - the carriage is blocked (you can use strings),
  - the machine is standing always on a dry place,
  - the machine is nailed with steel to the floor so it cannot move.

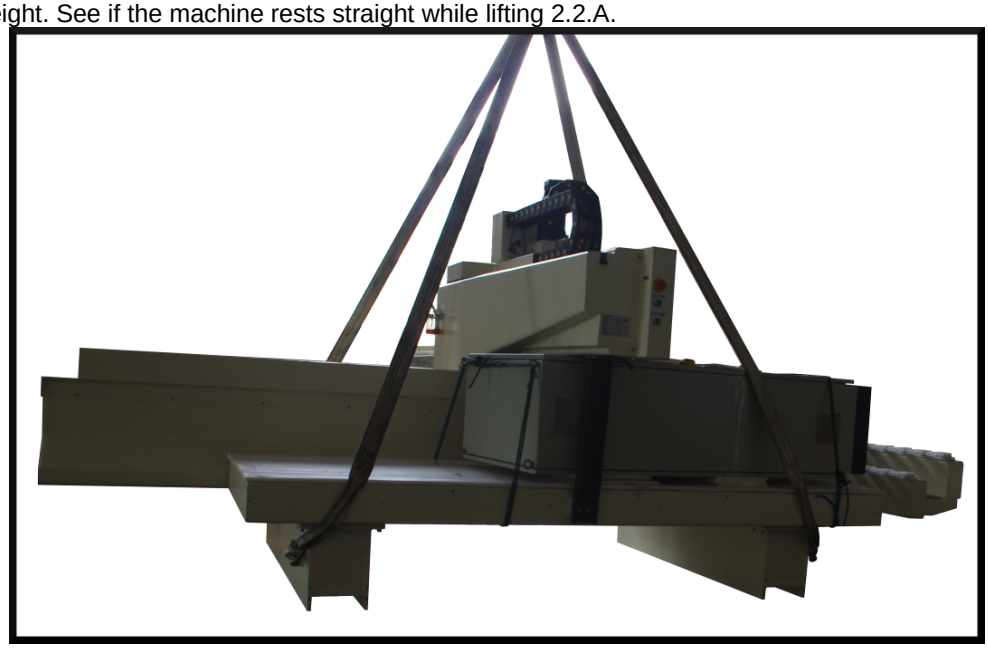
- **While lifting the machine beware:**
  - your lifting equipment is supporting 4000 kg,
  - you are using only the lifting points,
  - when the strings are tight you will not damage any part of the machine.
  - when using a forklift truck, you are lifting the machine from behind,
  - when using a forklift truck, see if the machine rests straight while lifting.

- **While storing the machine beware:**
  - the machine is stored on a dry and clean place,
  - all the guides and the moving parts are greased with a special grease to store metal parts.

  Do not store the machine outside.

Lifting and handling

Use the appropriate hooks and holes to lift the machine 2.2.B. Be sure that your lifting chains can hold the weight. See if the machine rests straight while lifting 2.2.A.

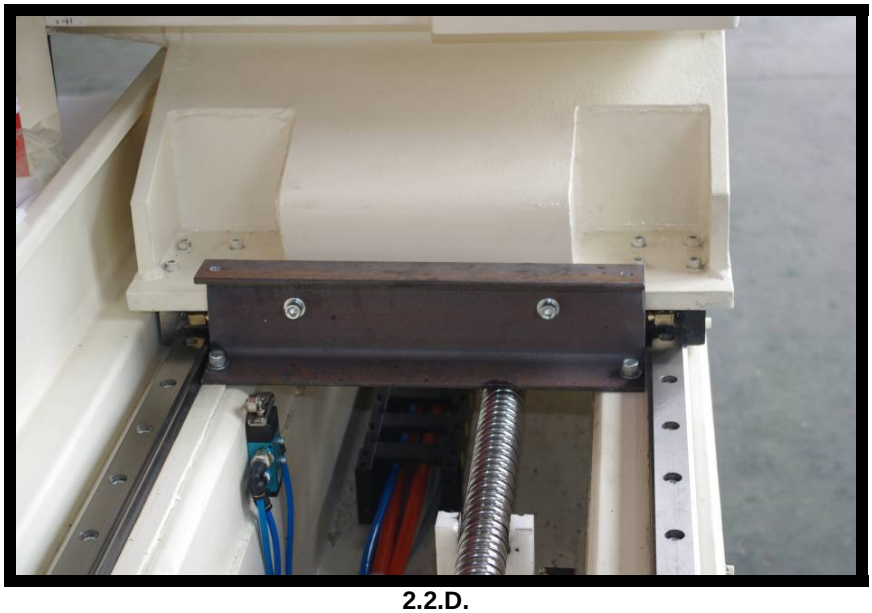


2.2.A.

2.2.B.

Unlock the axis of the machine by removing the locking steel displayed in this pictures

2.2.C.



2.2.D.

2.2.E.

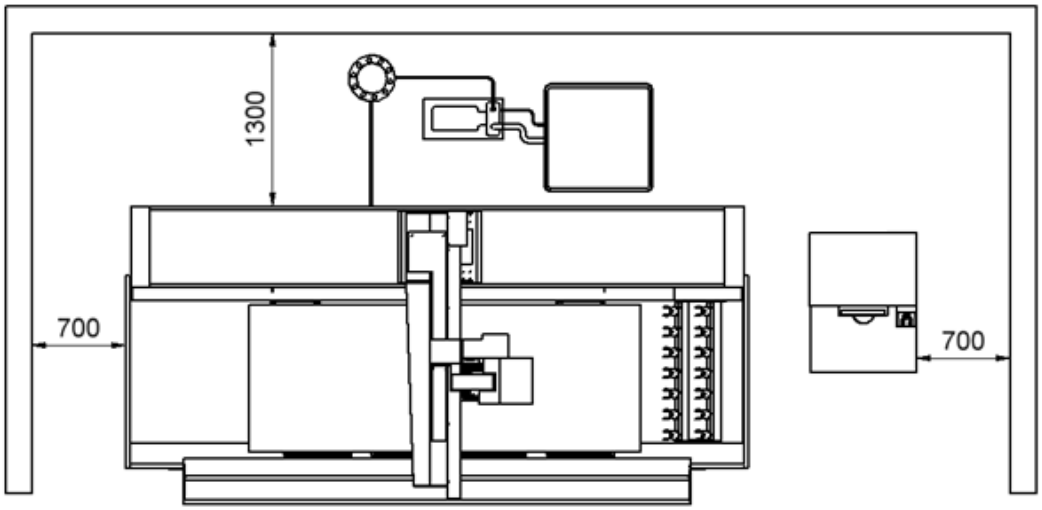
2.3. Placing + environmental conditions

The machine does not demand particular environmental conditions. It must be installed indoor – in production hall. The hall has to be illuminated, ventilated and provided with flat concrete pavement at least 200mm of thickness. To place the "KT32" study first the design 2.3.A. Regarding dimensions, beware both doors of electrical box can be open (front and back door), see that there is enough space to open both doors to do maintenance.

See the attached installation file for more information.

Beware the machine is standing immovable on every foot. Control if the "KT32" is not moving while working. Use anchor bolts to fix machine to the concrete foundation.
The minimum temperature of the place does not have to be less than 4/5 °C (40 F); the maximum temperature does not have to exceed 40 °C (104 F).

NOTE: Never expose the machine to direct solar beams. If the temperatures exceed the standards contact the technical service.



2.3.A.

2.3.1. Lighting system

The lighting system in production hall must respect the norms EN 12464 the lighting of workplaces or ISO 8955 the customer need to make the light night system for the machine at norms. It has to provide good visibility in every parts of the machine. It must eliminate reflections, which would be dangerous during operating. The lighting system has to ensure good visibility of the display and the emergency button.
On special demand the working zone can be equipped with one ulterior source of light.

2.3.2. Vibrations

In consistent and correct way using of the machine, vibrations are not in such levels to make danger situations.

2.3.3. Sonorous emissions

The machine is designed to avoid or reduce the level of sonorous emission maximally. The level of emitted acoustic emission in the workplace does not exceed 85 dB. The measured value for the machine is 83,9 dB and declaration constant K = 4 dB.
NOTE: values of indicated noisiness are levels of emission and they do not represent real operating levels necessarily.

2.4. Water connection

Refer to attached installation instruction

2.6. Electricity

Refer to attached installation instruction

2.7. Vacuum

Refer to attached installation instruction

2.8. Compressed Air

Refer to attached installation instruction

ATTENTION: Only the electricians can open the box and execute maneuvers or repairs

3. PUT TO USE

3.1. Preliminary controls

Installation and the first start of the machine have to be tracked or executed from AitalMAC technician. In the best way the technician of AitalMAC should collaborate with the technician of the customer who will have therefore possibility to acquire a maximum of information for working with the machine and maintenance subsequently. Before putting in the function it is necessary to make following checks to avoid errors or incidents during the starting of the machine:

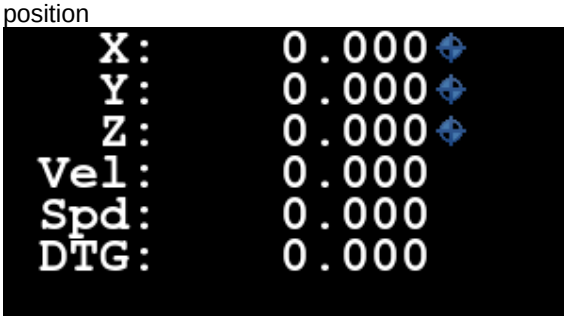
- check if the machine is not damaged after shipment and puttying on its place,
- check (with a multimeter) interconnection between the electrical box, control panel and other connections,
- check connections of all external sources (water, electricity), check for leaking,
- check the free movement and eventual free spin of all mobile parts of the machine.

Turn the main-switch and push the “power” button (see 3.3.(2)). If the power button does not light you have to check the fuse and release the emergency buttons by turning them clockwise.
Also power on the PC, and double click on the CNC shortcut on the desktop to open the machine control program.

Press the Power on button on the interface  , if you are not able to move the machine and you are welcome by a “Joint0 on limit switch” error message, is because one of the limit sensors is on the limit, Joint0 will be X, Joint1 Y and Joint2 Z, to move the machine out of the limit, simply click the override limits check in manual page, then press the power button on software interface  , you will now be able to move the machine out of the limit.

3.2. Home position

Before you start first working on the “KT32”, you have to find the Home position by pressing the “Home all” button on the manual page of the CNC software.
The Home position must be done every time you start the machine program before start working, the program cannot start any automatic job if the Home position is not found.
The Home position is used so the machine know where it is, to find the home position the head will go up then to the right, then the bridge will go back; once the home position is acquired the machine is ready to work, you can see that home is done when you see the blue point icon beside the axis position



3.3. Description of the control board

	(1) Screen		(2) POWER BUTTON to give power to the machine, the light indicate that the power is on
	(3) EMERGENCY STOP for stop the machine in emergency cases (one on the control panel and one on the side of the bridge)		(4) I\O selector for turn on and off the machine
	(5) Pump switch when the light is on the Vacuum pump is active		

3.4. Starting the machine

- **Starting the machine.**

Switch on the PC and press the POWER ON button on the electrical box (see 3.3)
Open the CNC program and open the manual page.
Press the power on button on interface
click the Home All button

3.5. Working with the machine

The operator of the machine must have pre knowledge of a CAD program, the operator must read carefully and understand the CAM and CNC programs manuals, and watch carefully the video tutorials in the machine PC.
The machine was designed and constructed to cut and polish sink cut outs, to do this design the shape of the sink in a CAD program and save it as a DXF file (Draftsight a free CAD program is provided in the machine PC), then import the DXF in the CAM program to place the vacuums to hold the piece, and setup the tools to cut and polish the sink cut out, then export the vacuum g-code and the sink cut out g-code.
Open the CNC application and home the machine, from the automatic page load and start the vacuum g-code, the machine will move to show with the laser where to place the vacuum cups, at this point the vacuum cups bottoms that are on the table must be locked, do that by attaching a tube from the valves on the front of the machine to the vacuum cups connectors at the bottom, turn on the vacuum pump and open the valves, the pump must go off after reaching high pressure, check for leaks if it doesn't.
Place the stone on the vacuums (polish down), connect the vacuum cups like the bottom were, open the valves to hold the stone in place, always check that the pump reaches a good pressure on the pressure gauge.
Load and start the sink cut out g-code to let the machine cut and polish the stone with tools selected in the CAM.

3.6. Stopping the machine

Stopping the machine during automatic process

Press the Esc button on your keyboard to stop the machine (this will only work if the CNC program is active)
In case of emergency push the button (3)

Stopping the machine when finish working

To stop the machine use the emergency button (3) then close taps (water and air supply). Then shut down the PC and turn off the main switch on the electrical box. If there is a risk that ambient temperature will go under 5°C (40 F) it is recommended to leave the machine on to avoid damage of electronic cards.

4. INTERPRETATION OF TERMS

4.1. Main switch

The main switch on the electrical box has to be switched on to start the KT32.
You must power off the switch in order to open the door of the electrical box.

4.2 PC or Computer

The PC with his monitor are the operator interface with the machine, the PC is provided with CAD, CAM and CNC programs.

4.3. Head

On the head there is a main motor, where the diamond tools will be mounted to allow the machine to cut the stone. The vertical movement of the head is called Z axis, and the side movement of the head is the X axis

4.4. Table

The table is where you place the vacuum cups that will hold your parts, on the side of the table you have valves to connect your vacuums with tubes.

4.5. Tool change

The tool change is on the back of the machine, it consist of 10 clamps that can hold tools, the KT32 can automatically load and unload tool in this tool positions.

4.5. Vacuum pump

On a standard “KT32” there is a vacuum pump for the vacuum cups, the pump need to cycle water to suck air, the pump is provided with a plastic box used to cycle water.

4.6. Electrical box

The electrical box contains all electric parts, you should keep this locked and open only after power off the machine from the main switch.

4.7. Lubrication

Oil used for lubrication of guide rail:

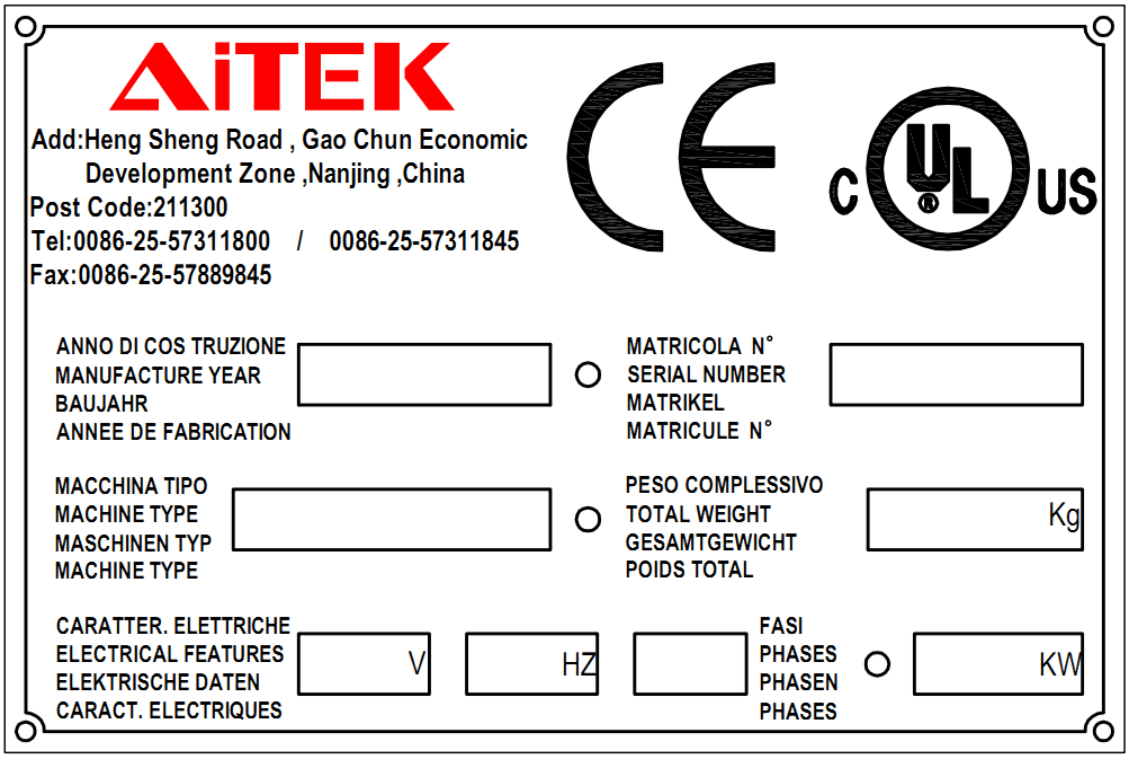
KLUBER Lamora 150	MOBIL Mobilgear 629	OLEOBLITZ Erpol 150	OLIO FIAT EPZ 150	PERSIANOIL Redoil EP 150
ROL EP 150	SHELL Omala Oil 150	SINOL Sinetrex EP 12	TAMOIL Carter EP Lub 150	TEXACO Meropa 150
TOTAL Carter EP 150	VALVOLINE Gear EP 150	VANGUARD Gearing EP 150	VISCOL Signal VL/EP 150	WEBER Fargo EP 150

The machine must be lubricate periodically
Put oil in the oil lubrication system and pump a couple of times a day.

For the compressed air use oil for air, place oil in the left canister you see in the picture, regulate the flow of oil to the minimum with the top regulator

4.8. Label

The label with data regarding the machine is situated on the left side of the KT32. There are marked data which producer will ask for in case of complaint.



5. OPERATION

The KT32 need three program to be able to process any automatic job. The CAD (DraftSight or any CAD) is used to draw the shapes the machine has to work. The CAM (AitekCAM or any other CAM with appropriate post processor) is used to add the tools on the CAD shapes, and save as g-code. The CNC program is used to play this g-code on the machine, the CNC program can also move the machine in manual.
Parts on the KT32 are held by vacuum cups, the CAM can also save a vacuum g-code to help you place your vacuum with a laser pointer.

5.1. Auto emergency

The auto emergency starts automatically and the machine controls it.
There are following auto emergency functions:

- The security stop of X, Y and Z axis by sensors. If the axis reaches the limit positions the security sensor stop the machine in all its functions. The machine stops also if any of working sensors is wrong.
- The compressed air sensor, if the machine has no air it will stop.
- Driver alarms, all axis and spindle will stop the machine if in alarm.

The alarms are displayed on the alarm label on the electric box, each alarm has a LED to signal the alarm state, if the LED is ON, the alarm is active, all alarms but water and vacuum will completely stop the machine, the software will be in emergency state and the alarm must be fixed before continuing.

5.2. Manual emergency

The operator controls manual emergencies. If the operator notices any anomaly in function of the machine during the working he has to immediately stop the machine. In case of emergency press always emergency stop button (3) on the control board. After finding and solving the cause of the problem the operator can restart the machine again (see 5.3.).

5.3. Restoration

To restart the machine unblock (turn) the emergency stop button and press POWER ON button on the control board.
If the emergency situation come up during working it is necessary to Home again the machine, after home has been done, the operator can start the g-code from the beginning or he can run from a point on the g-code, for more information see program section of this manual.

5.4. Reparations precautions

Attention: In case of detection of any anomaly or problems first of all check that the operator follows all instructions in this manual. In case of real problems all reparations has to be executed immediately after finding the problem or anomaly to avoid increasing of problems or breaking another of components. For every reparation is necessary to switch off the main switch.

6. SAFETY

SAFETY DEVICES AND SAFETY INSTRUCTIONS:

6.1. Presuppose use

The machine is designed and constructed to make necessary operations required for machining marble and granite.
Thanks to easy programmable software with which the machine is supplied, operator can preset all necessary operations in short time.

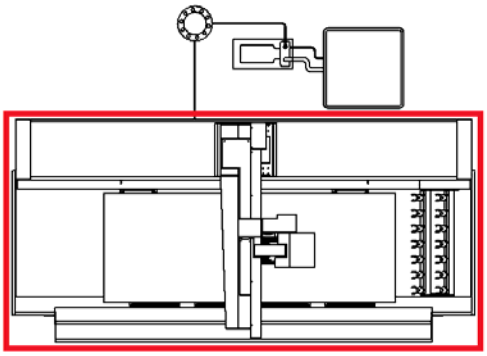
6.2. Forbidden use

The machine does not have to be used:

- For uses different from those present in chapter 6.1.
- In explosive, aggressive atmosphere or where is high concentration of powders or oil substances in the air
- In place with risk of fire
- In place with inclement conditions
- In place with electromagnetic radiation
- In place which not allow save operating of the machine
- For machining of not suitable materials.

6.3. Dangerous zones

There are zones around the machine, which contain shifting parts. It is dangerous to occur in this area during working in automatic mode (see 6.3.A.).



6.3.A.

6.4. Arrest functions

Functions of arrest of the machine are following:

- The main switch - general interrupting
- Button (4) to stop the automatic cycle
- Emergency button

6.5. Security work

The KT32 is developed to eliminating all risks correlated to its use. But it is no possible to eliminate risks of eventual accidental contacts between the machine and hands of operator. Correlated residual risks would be cause of unskilled or uninstructed operator, they are following:

- Position - due to not correct position of the operator during operating the machine.
- Tangling up - due to incorrect working dress (or not opportunely adapted).
- Training - due to lack of the training regarding operating of the machine.

NOTE: To reduce all consequences of the aforesaid dangers is always necessary to follow all instructions in the manual in scrupulous way.

6.6. Residual risks

During the normal cycle of working and the maintenance the operator is exposed to some residual risks, which, for the nature of operations, cannot be totally eliminated.

6.7. Before you start:

- a new operator must always read the manual and get safety instructions from an habituate user,
- check always the electric connections on eventually damages,
- do always the daily checks before starting the machine,
- check always the safety devices:
  - is the machine clean?
  - nobody during repair or maintenance took off a piece of the machine?
  - is the remote control on the right place?

6.8. Working:

- when operating machine beware you are alone in neighborhood of the machine,
- do not leave the machine when working automatically,

6.9. After working:

- clean always the machine and his environment properly,
- switch off the machine with the main switch always when you stop working,

6.10. The workshop:

- the machine has to stand immovable,
- avoid cables and hoses being in the way.

6.11. Equipment:

- wear always safety shoes when use the machine,
- wear always safety gloves while loading and unloading the table,
- wear always safety gloves while controlling a work piece,
- wear always ear protectors during working with the machine

6.12 operator

The machine is constructed that one operator can work with it.

- The operator has to be inform about all information necessary for operating the machine and trained for it.
- The operator has to study the manual carefully and understand it clearly.
- The operator has to be able to understand and interpret designs and outlines in manual correctly.
- The operator has to know all hygiene and technical norms and norms for safety working on the machine.
- The operator has to know the work environment of the machine.
- The operator must have experiences in work with natural stone.
- The operator has to know what to do in case of emergency (where provide aids, how to use them).
- The operator must have adequate technical preparation.

7. ACCESSORIES

- **Remote control**

On a standard “KT32” is mounted one remote control

The remote control can be connected next to the PC or next to the machine head, it has an axis selector and a speed selector, to move the machine you must press the red button on the side and spin the wheel.
Remote control is functional only when CNC program is open and in manual panel.

7. TECHNICAL DATA

TECHNICAL DATA	CA32 CNC	
Max. Tool Diameter	mm.	STANDARD: 100 MANUAL CHANGE :120
Travel in **- X axis**	mm.	Standard 3470
Travel in **- Y axis**	mm.	1170
Travel in **- Z axis**	mm.	340
Max. Spindle nose to table	mm.	390
Tool holder cone 		Cone ISO 40
Automatic tool change stations	positions	15
Electric spindle Power	KW	9
	Nm	35/40
Variable cutting and return speed	m/min	0 - 8
Air pressure	BAR	8
Total Weight	Kg.	3200 (3.2 Ton)
Water consumption	L/min	20 / 50
	gal/min	5.28 / 13.2
Vacuum pump motor power	KW	1,5
Vacuum pump capacity	m3/min	0,45
Max. Install Power	KW	16
	HP	20

9. SCHEMES

9.1 Electrical Schemes

Attached after the manual

9.2. Setting of motors drivers

Attached after the manual

10. SPARE PARTS

Attached after the manual

11. MAINTENANCE

Note: never use the grease with the graphite on any part of the machine.

11.1. Cleaning

For clean the machine is necessary to obey all following points:

- use always protecting glasses, mask, and jackboots during purification of the machine,
- in case of using special cleaners or products (petroleum) use always protecting gloves,
- never use thinners or solvents on rubber parts of the machine,
- in case of using water for washing do not use hot water and keep out of electrical parts

ATTENTION: Before washing always unlink the machine from electrical source. Never wash the control board or interior of the electrical box with water. Do not wash the bellow the bridge or the head with water

Daily purification

After working switch off the machine and wash it with water (use pressure pipe).

- clear away stone dust and abrasives from the table,
- clear carefully the floor under and around the machine,

11.2. Check EVERY DAY:

- THE TABLE:
    - see if the table is clean because the dirt on the table can damage the work piece.
- WATERLEAKS
- AIRLEAKS
- VACUUM LEAKS

11.3.1. Water

- check the main connection,
- check the water valve, if you no water open the valve and clean it,

11.3.2. Electrical system

- check the main electrical-connection,
- check the electrical box on waterproof,
- check place where the display is mounted on waterproof,
- check all the functions of the machine,
- check the remote control on functioning and the cable on damages,
- Check if the cables are on the right place, if there is no damage, replace in case of damage,

11.3.3. Mechanical parts

LUBRICATION:

- Tweak a couple of times the oil pump on the side of the machine.

MAIN MOTOR:

- check the electric connection on waterproof

PAINTING

- control if there is damage of paint, repair it.
- rub all the painted parts in with petrol, it will avoid rust and the dirt will not stick to the paint.

PROTECTORS:

- check the protection carter of the head,
- check the bellows, they are protecting the ball bearing way,

13. DISMISSAL

By renewal of the oil the dirty oil has to be collected carefully (also in case of leaks) and send to a specialized company to recycle.

By total dismissal of the machine, it can be send back to the constructor who will take care of the dismantling and recycling.