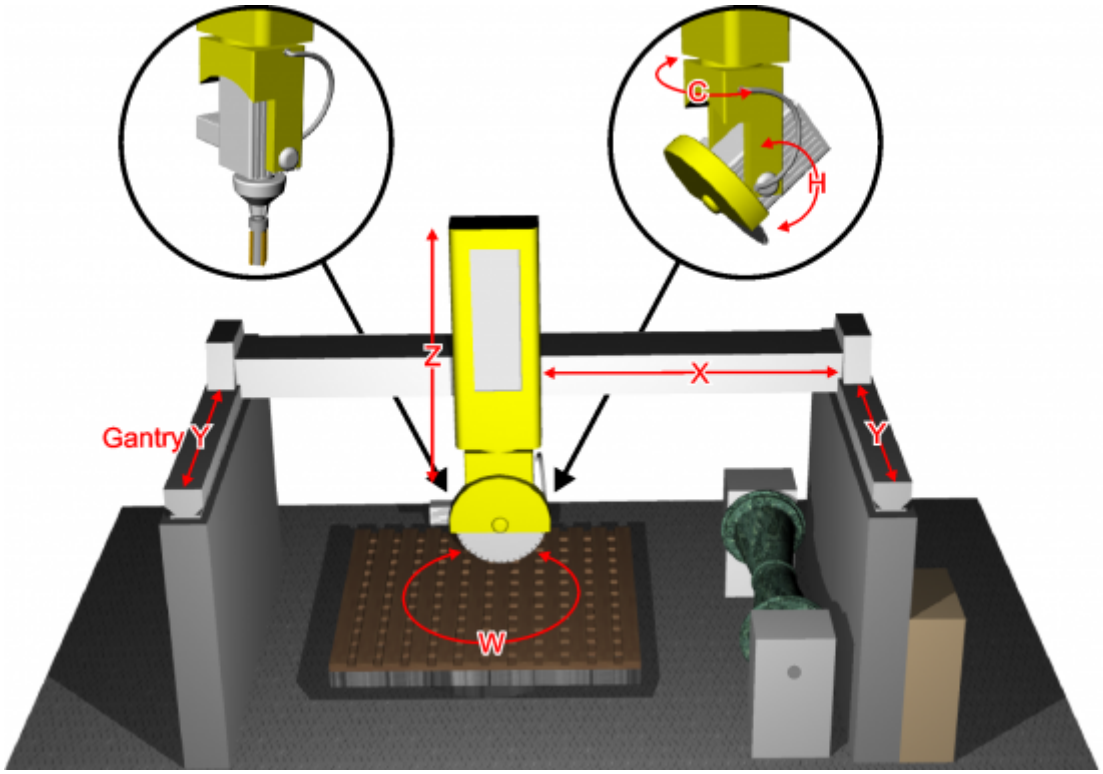
Sommario

P1K31FB30-002Q - 3 axis bridge saw: User Manual



Document	**P1K31FB30-002Q**
Description	User manual
Drawn up	Riccardo Furlato
Approved	Draft
Link:	http://www.qem.eu/doku/doku.php/en/strumenti/qmoveplus/j1k31/mdu_p1k31fb30-002q/funzionamento
Languages	English

Release	Description	Notes	Date
01	New Manual		22/08/13

Indice

Index

1. General Characteristics

Description

The **P1K31FB30 - 002q** software can be installed on the ***Qmove+ J1-K31-FB30, J1-P31, J1-P51, J1P71*** hardware and is designed to control a bridge saw with 3 to 5 axes, for marble and granite. The salient features of the **P1K31FB30 - 002** are described below.

Axes

- Axes X, Y, Z controlled by PID on space (brushless motors with servo drives and brushless motors).
- Axis W for the table rotation is manually controlled, with the operator entering the position on the controller
- Axis H for the disk inclination is manually controlled, with the operator entering the angle on the controller

Optional

- Axis W for the table rotation, with positioning accounting for inertia (asynchronous motor and V/F inverter) without interpolation.
- Axis H for the disk inclination, with positioning accounting for inertia (asynchronous motor and V/F inverter) without interpolation.

Work Processes

- Semiautomatic functions for positioning the axes and for single cuts.
- Multiple cuts for block and slab cutting, with table rotation (W) for tile cutting.
- Straight profiling with horizontal or vertical disk.
- Step cutting with inclined disk (on machines that have disk inclination).
- Straight profile finishing, using the face of the disk (interpolation of YZ).

Drawing

- Profile programming by a miniCAD, embedded on the controller.
- Import of profiles, saved on DXF file, by the “Profile Importer” conversion software (optional).

Work modes

- Repeat the programmed shape.
- Set the precision of the finishing.
- Modify the speed of disk motion during the work cycle.
- Compensation of the disk thickness and the disk diameter

Accessory functions, messages and alarms

- Select the language
- View the profile and the disk position, during the work cycle.
- Diagnostics of the inputs and the outputs.
- Backup and restore of the data on non volativle memory (FLASH EPROM).
- Messagges for active faults, to assist troubleshooting.
- Help Messagges.
- Modbus interface for reading the absorbed current of the disk.

Optional Features (some not documented in this manual)

- Profiles made with rotating table (similar to a vertical lathe).
- Profiling with horizontal disk or vertical disk (XZ or XY interpolation).
- Copying by photocell from a cardboard shape or black drawing on a whiteboard.
- ISO manager with G code interpreter

Modbus Interface

- The USER serial port can create a MODBUS RTU (RS485) network, for reading the disk rpm.
- Serial port connection for a magnetic rule, for reading the absolute position of the axis.

1.1 Typical work results

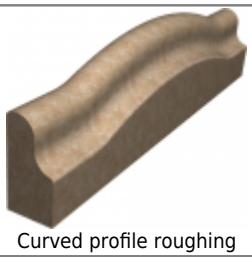

Multiple cuts

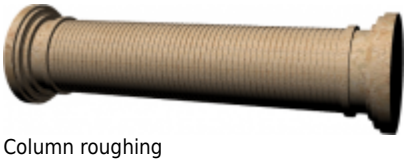

Tile cuts


Arc tiles

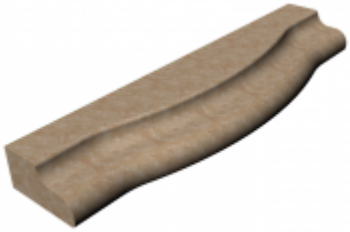

Profile roughing

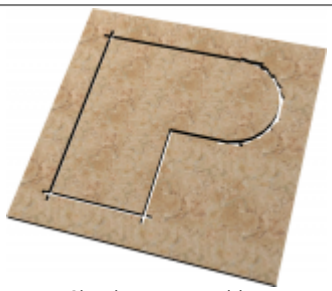

Profile finishing

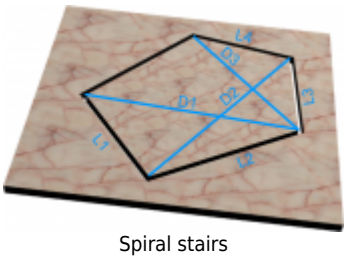

Curved profile roughing


Column roughing


Column finishing


Horizontal profile roughing


Circular Top roughing



Spiral stairs


G-code relief


Top milling


Sinks & drains

G-code texting

2. Function Keys and Led's

Key		Function	Led
F1		**START CYCLE OR HOMING** Start a cycle or the homing procedure.	**Automatic Cycle** **OFF:** stopped. **ON:** in course.
F2		**STOP** Stop a cycle and the homing procedure.	not used.
F3		**SEMIAUTOMATIC** Fix Me! Enable the semiautomatic mode, for one axis positioning. After the single positioning is returns to manual.	**Semiautomatic** **OFF:** not in mode. **ON:** in mode.
F4		**WATER Open/closed** The water valve opens automatically, when the automatic cycle starts.	**Water SV:** **OFF:** shut. **ON:** open.
F5		**ALARMS.** Open the alarm screen.	**Alarm Message** **OFF:** no alarm. **ON:** alarm.
F6		**EXIT** Return to the previous screen.	not used

Standard Buttons and Commands

1. Yellow settings can be modified. Press the setting and confirm with  .

2. Multiple choice parameters - to select press 

3.  Previous screen and  Next screen

4.  General Setup (protected by password)

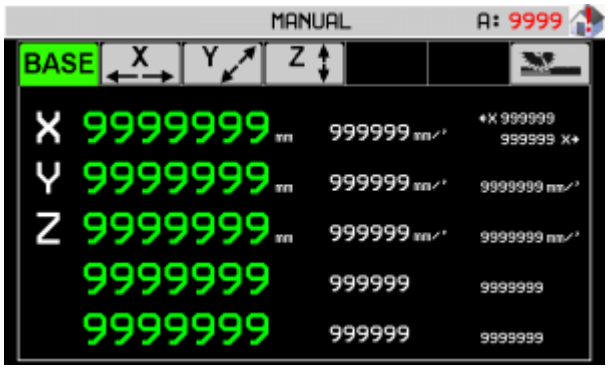
3. The Startup Screens

The start screen

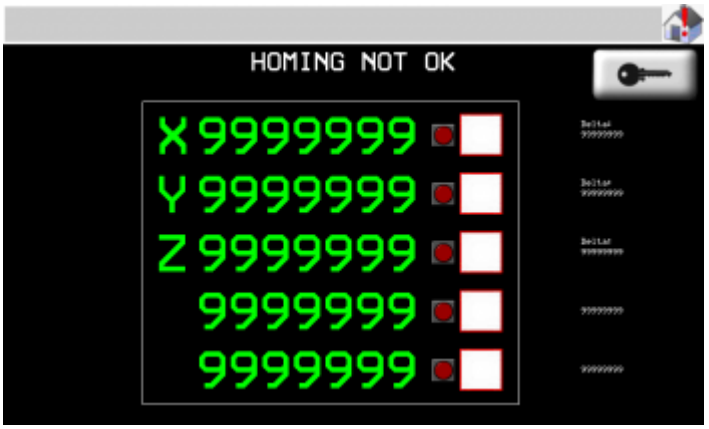
Icon	Description
	Top bar with Program code
	Select language Standard languages: ITALIANO - ENGLISH (all languages/alphabets with Unicode)
	Enter program
	Backup - Restore

Homing

Manual



3.1 Homing



homing not ok

homing in progress

homing ok

bypass homing

Run homing

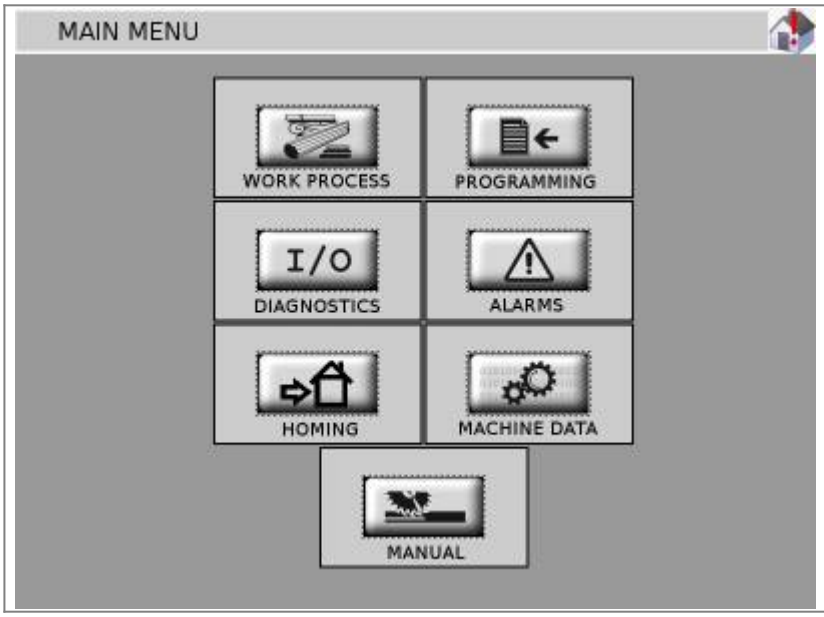
Homing not OK

Homing OK

Key	Description		Key	Description
	START HOMING.			STOP HOMING.

ALWAYS run the Homing procedure before going from **HOMING** to **MANUAL**.
Failure to do the Homing will limit the machine operation. These limits are in the Setup section protected by password.

3.2 Main Menu




Work menu


Programming menu

Diagnostics

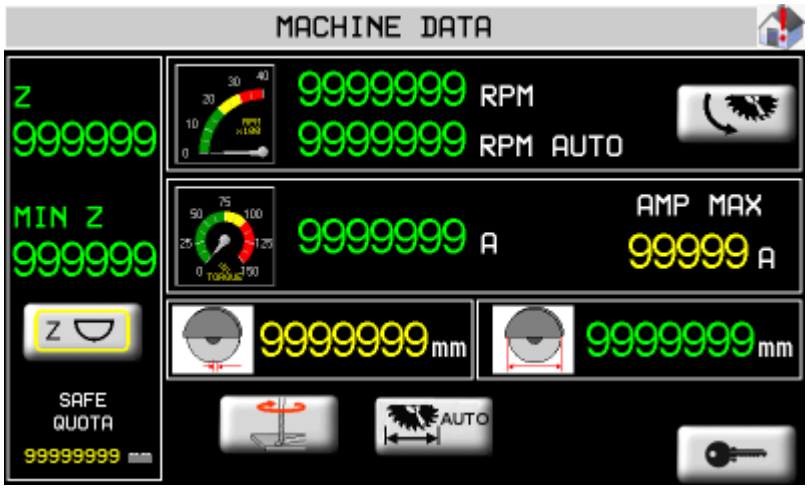

Manual/semiautomatic

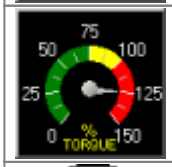
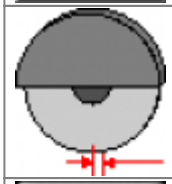
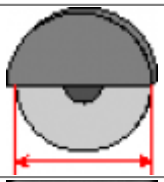
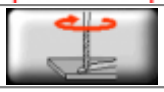

Homing


Machine Data

3.3 Machine Data

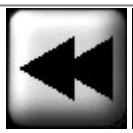
MAIN MENU Press 



	Disk RPM		Press for RPM setup in automatic mode
	Disk absorbed current	**AMP MAX**	Maximum absorbed current (press setting to change)
	Disk thickness (press setting to change)		Disk diameter (press for setup)
	Self-learn disk diameter		Tool diameter screens
Z	Actual Z-axis position	MIN Z	Set Z-axis down position
SAFE QUOTA	Self-learn safe Z-Axis down position		
	Safe quota ON and self-learn		Safe quota OFF
	Disk auto speed table (password)		

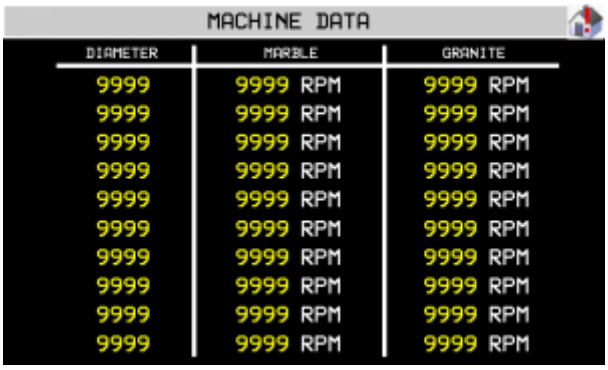
DISK and TOOL SPEEDS

Press 

Ø	Disk / Tool diameter.  Change diameter.
MARBLE / GRANITE	Select the type of stone
A speed is given for the diamenter and type of stone. The speed is taken from the setup table	
RPM AUTO	Preset RPM based on diameter. The setting can be changed by 30%. The setting is a 0-10 Vdc given by: Vdc = (10 * RPM AUTO) / MAX DISK RPM. See generic setup for MAX DISK RPM (parameter PG-04)

DISK and TOOL SPEED Tables

Press  and enter the password (default = 462)



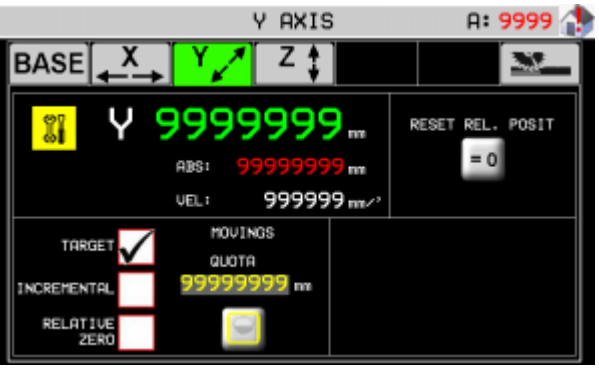
Set the diameters and related speeds for the two types of stone.

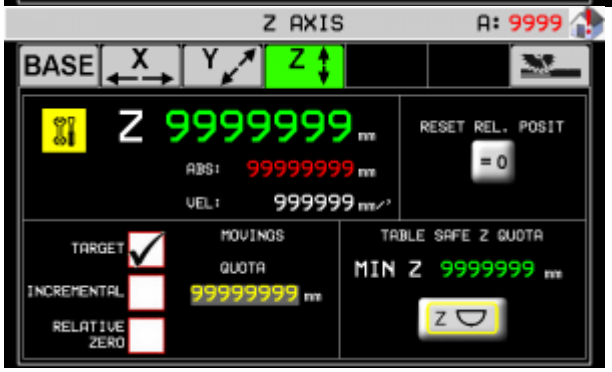
3.4 Manual / Semiautomatic

MAIN MENU > Press 

Press  to view the 5 axis positions (distance from zero) and speeds.

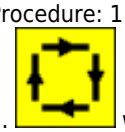
For the axis pages, Press 

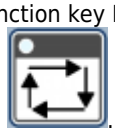




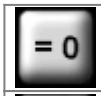
Here you can move the axis as the base page and further you can start a moving to a quota.

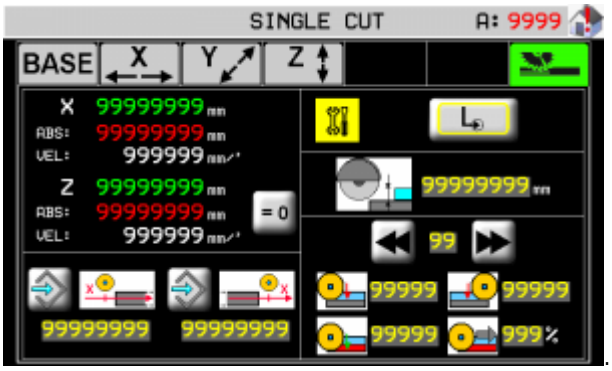
Procedure: 1. Press semiautomatic  .

2.  will show and the function key LED lights up.

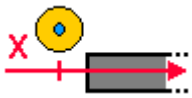
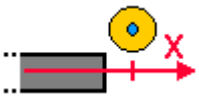
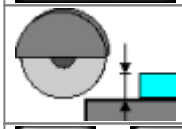
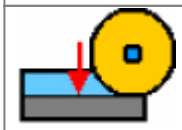
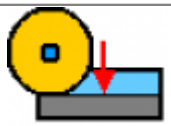
3. Press the start function button  .

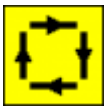
- TARGET ☑: Axis goes to target setting in “MOVINGS QUOTA”.
- INCREMENTAL ☑: Axis goes to the sum of POSITION + “MOVINGS QUOTA”.
- RELATIVE ZERO ☑: Axis goes to selflearn zero position.

	Reset the axis position and selflearn a new zero position
	Disk thickness correction ON-OFF.
	The minimun safe position is the setup quota.
	The minimun safe position is the selflearn quota. Press to selflearn Z position for the minimun safe quota.

Press  ⇒ 

Single cut screen:

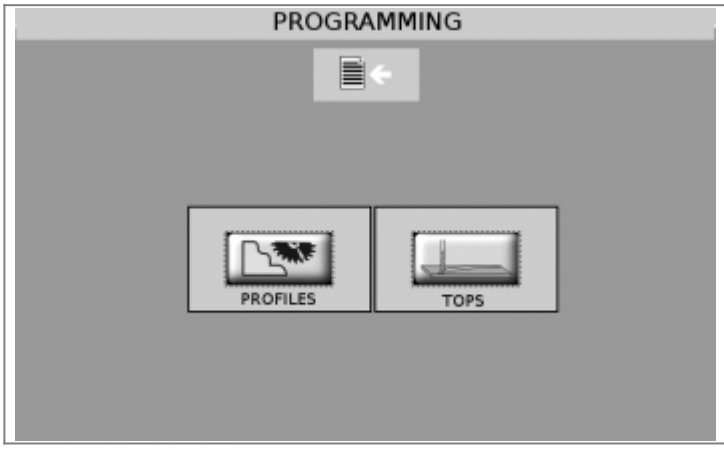
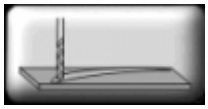
	Press to selflearn the quotas.		
	X-Axis position of start cut.		X-Axis position of end cut.
	Single cut.		Step cuts with multiple depth increases.
	Cut depth position.		
 99	Material type. Up to 10 materials can be stored.		
	Depth increase at start cut.		Depth increase at end
	Final depth increase to complete the cut.		Speed during the final depth cut.

To start the SINGLE CUT press Semiautomatic  (LED lights up and  is shown). Then press Start  .

IMPORTANT. IN SEMIAUTOMATIC MODE THE AXES CAN ONLY MOVE ONE AT A TIME. FOR THE NEXT POSITIONING (OR SINGLE CUT), RE-START THE SEMIAUTOMATIC MODE.

4. Programming and Work Cycle

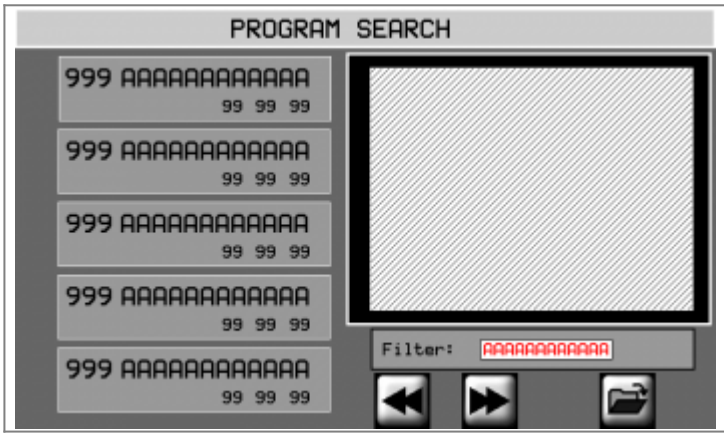
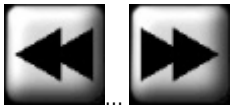
MAIN MENU > Press  **for Programming**

		**Profiles**
		**Tops**

Select a program

	**PROGRAM N.**	Press & enter number
	PROGRAM NAME	Press & enter name
		Open the program
		Program list and search

Select from preview

	Press a program to select	
	Filter by name	
		Scroll the list
		Open the program.

	**CAD EDITOR**
	**WORK CYCLE**
	Go to **WORK**
	Save a Program
	Import from Memory card

4.0.1 DXF file import

N.B. DXF Import is only possible with the optional Qem Profile Importer software (see manual Fix Me! insert link)

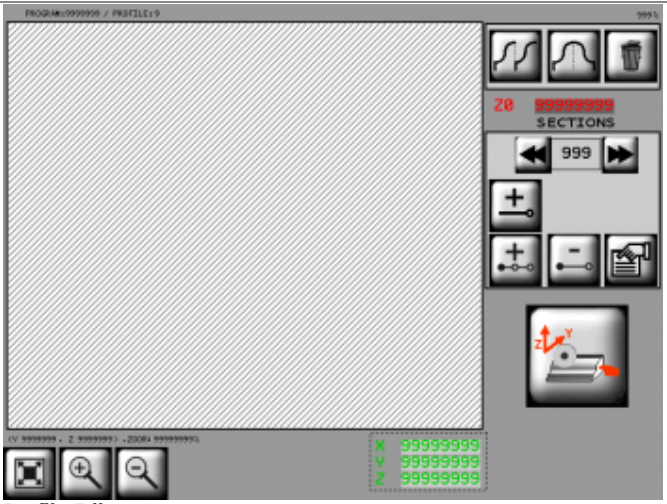
MMC/SD card: press 

Ethernet: transmit the file from PC only in this page,  will flash and press to save.

4.1 Drawing Editor

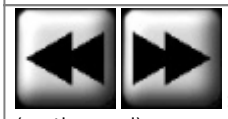
Press 

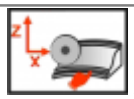
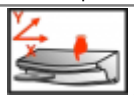
Top Editor



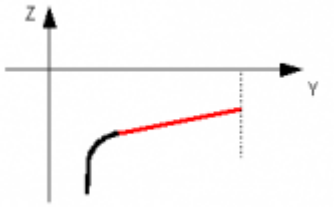
Profile Editor

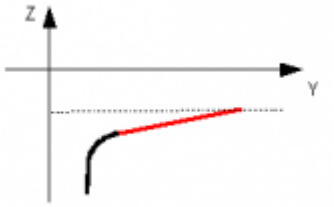
A Drawing is a series of Sections. Section 2 starts at the end of section 1.

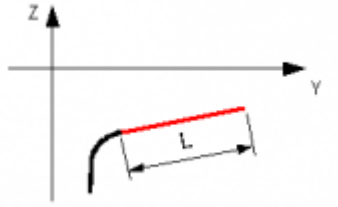
 Fit and center	 Zoom in	 Zoom out
 Select drawing/section (section=red)	 Section properties	 Delete the drawing
 Add a new drawing.	 Delete the selected drawing.	
 Add a section	 Insert a section	 Delete the section
 Copy a Profile	 Copy a Top	 Rotate a drawing
 Mirror a Profile	 Mirror a Top	 Move a drawing
 Scale a drawing	 Parallel Trace a drawing	

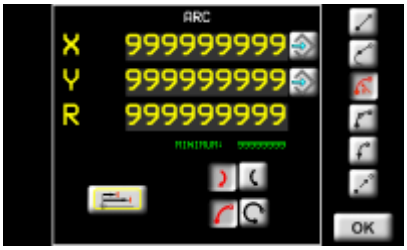
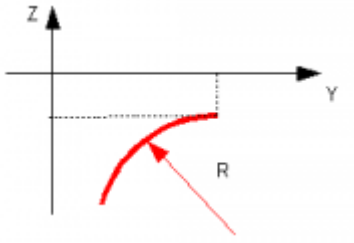
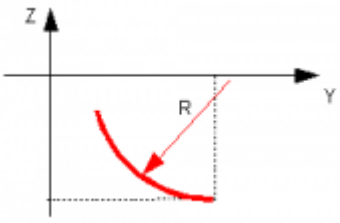
Profile Editor - Plane selector. First select a vertical or horizontal disk		
Vertical disk	 Profile on the YZ plane.	 XZ plane of the profile. The shape of the cuts.
Horizontal disk	 Profile on the YZ plane.	 XY plane of the profile. The shape of the cuts.
	There must be always a drawing in YZ plane.	If there is no drawing for the XZ or XY plane a profile is not drawed, the cut will be straight. Just set the cut start and end for the work cycle.

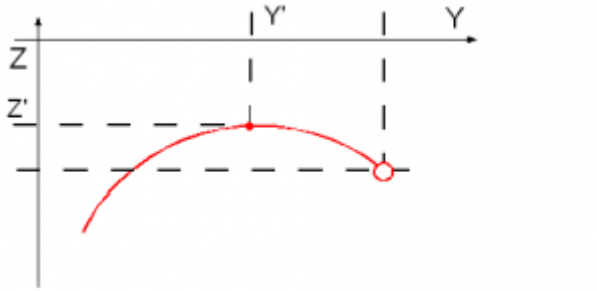
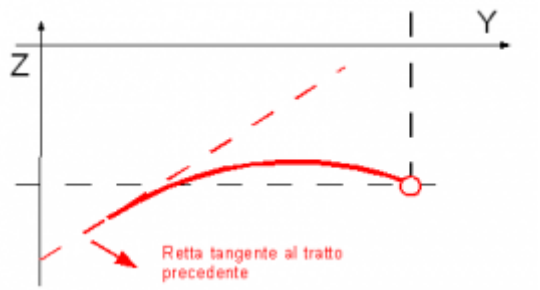
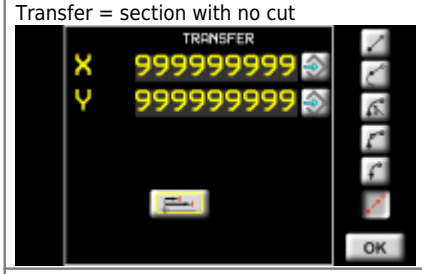
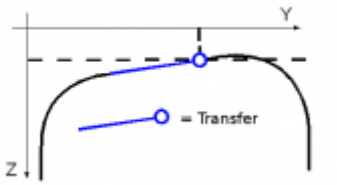
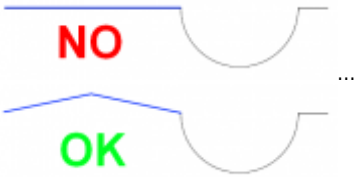
4.1.1 Drawing tools

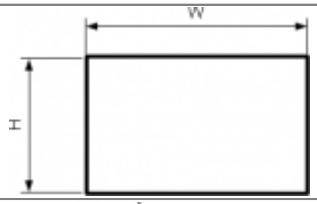
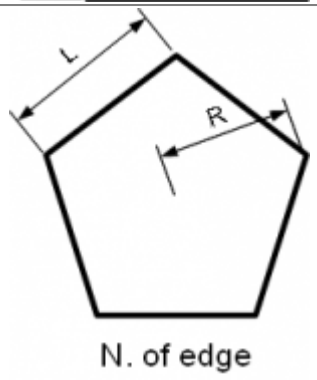
<table>
<tr><td colspan="3">Press Add  , Insert  or Modify  </td></tr>
<tr><td>  </td><td colspan="2">Press to Auto-learn points by laser</td></tr>
<tr><td></td><td>Slab Sizing by Laser.</td><td>Move the laser to points on the slab and acquire the shape. The shape is shown on the screen, check the drawing with slab size</td></tr>
<tr><td>Line
  </td><td> 
</td><td>Enter two end point coordinates
(incremental or absolute)</td></tr>
<tr><td rowspan="3">Tangent line
  </td><td rowspan="3"> 
</td><td> 

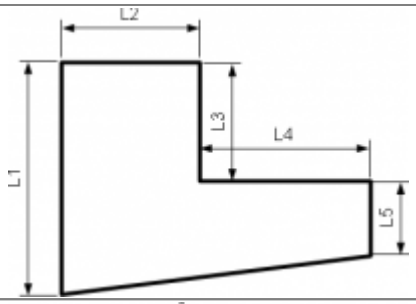
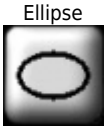
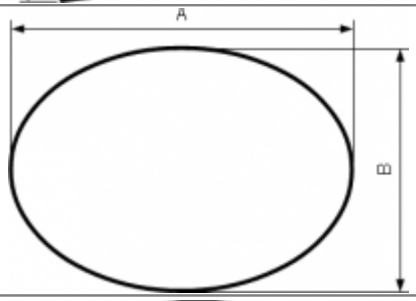
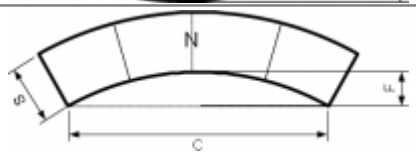
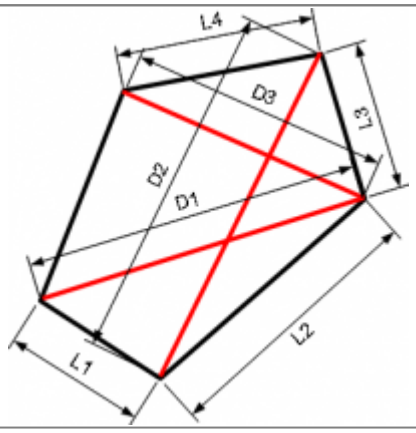
Enter coordinate 1</td></tr>
<tr><td> 

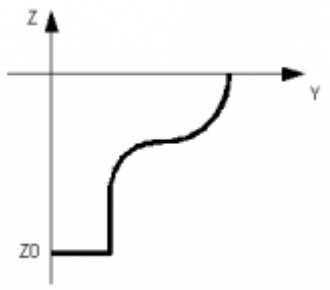
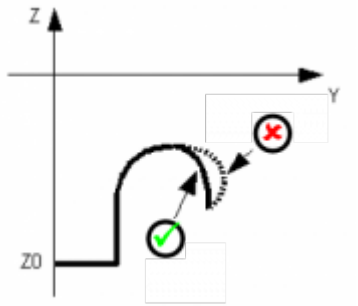
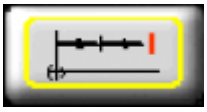
Enter coordinate 2</td></tr>
<tr><td> 

Enter L = length</td></tr>
<tr><td rowspan="3">Arc
  </td><td rowspan="3"> 
</td><td>Enter two end point coordinates, and radius
MINIMUM: the minimum radius</td></tr>
<tr><td> 
clockwise arc
 
</td></tr>
<tr><td> 
anticlockwise arc
 
</td></tr>
</table>

<table>
<tr>
<td>3-point Arc
  </td>
<td> 
</td>
<td>Enter two end point coordinates, and middle point
 
</td>
</tr>
<tr>
<td>Tangent Arc
  </td>
<td> 
</td>
<td>Enter two end point coordinates
 
</td>
</tr>
<tr>
<td rowspan="2">Transfer
  </td>
<td>Transfer = section with no cut
 
</td>
<td>Enter two end point coordinates
 
</td>
</tr>
<tr>
<td><u>IMPORTANT</u>:
Transfers must always be downward, before a cut</td>
<td> 

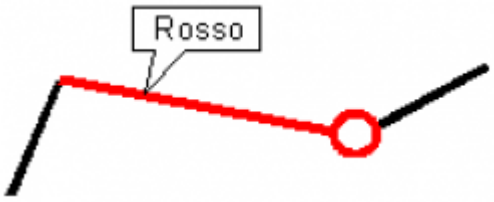
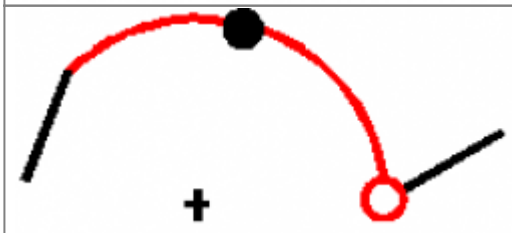
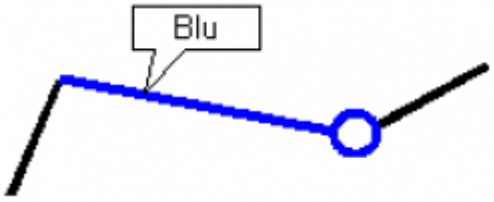
...</td>
</tr>
<tr>
<td colspan="3">Drawing macros. Easy drawing tools. Enter the drawing dimensions.</td>
</tr>
<tr>
<td>Rectangle
  </td>
<td colspan="2"> 
</td>
</tr>
<tr>
<td>Regular poligon
  </td>
<td colspan="2"> 
</td>
</tr>
</table>

Kitchen top 	
Ellipse 	
Arc sectors 	
Spiral staircase 	

Start of drawing	Start point is at zero. To change, enter a point (negative) in the parameter **Z0** (main editor screen)	
Undercut on profile	**PROFILE ONLY** Automatic correction of an undercut	
Absolute or Incremental quota	The co-ordinates can be absolute or incremental	 Absolute = co-ordinates from origin  Incremental = co-ordinates from end of drawing

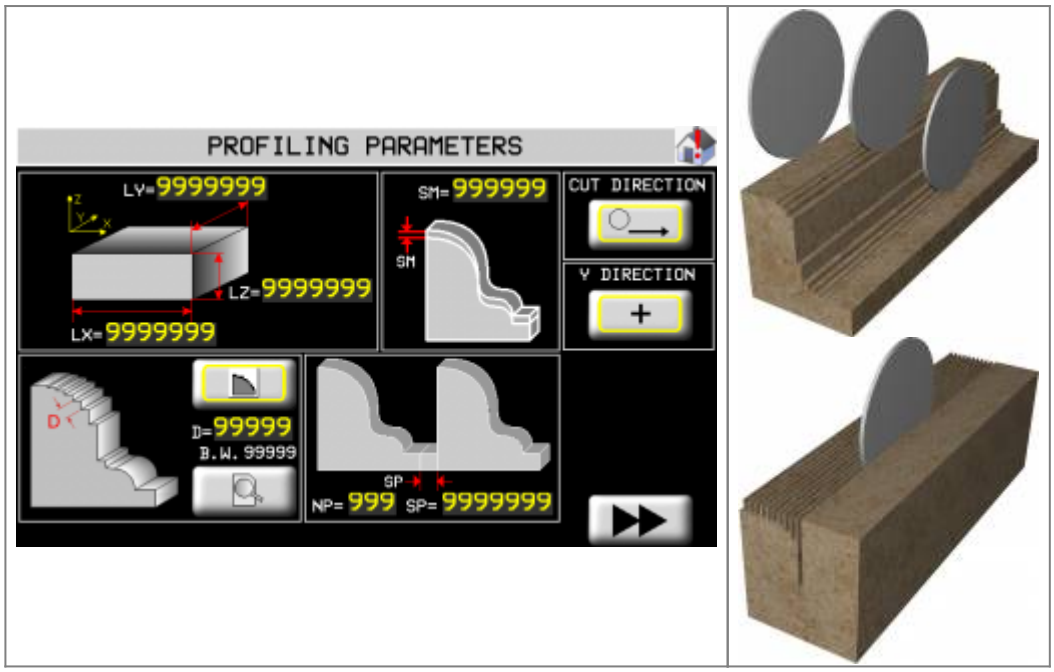
4.1.2 Symbols on the drawing

The following symbols are used on the drawing.

Symbol	Meaning
	: end of section. The selected section is shown in red.
	:end of section. If the selected section is a 3-point arc, the intermediary point is shown. : intermediary point.
	: end of transfer section The transfer section is always blue.
No symbol	If the drawing does not have any symbols, the section is the last.

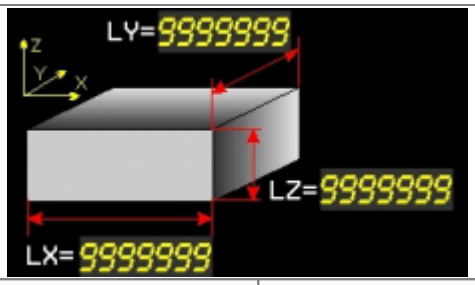
4.2 Work cycle - Profiles

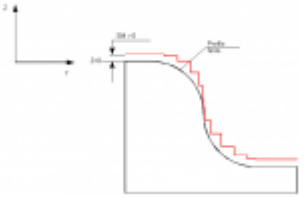
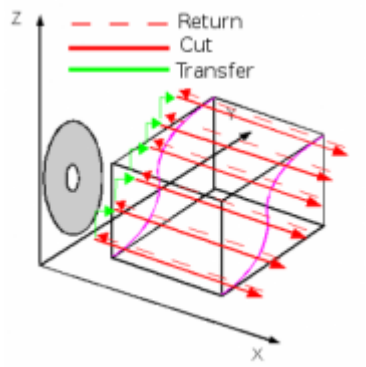
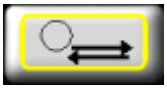
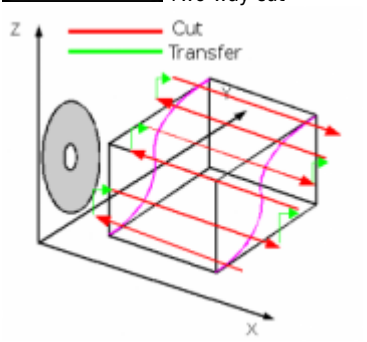
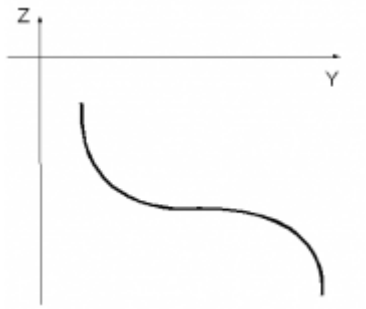
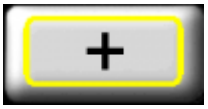
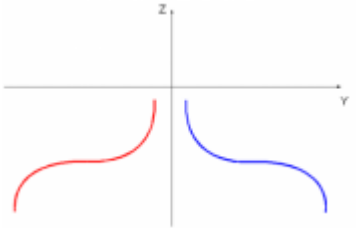
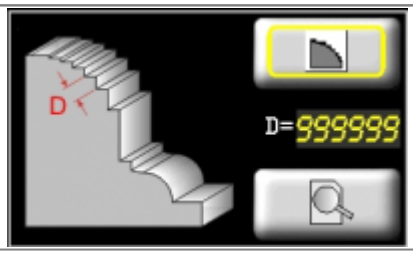
Press 

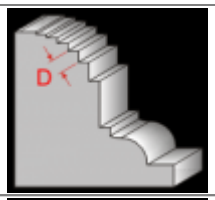
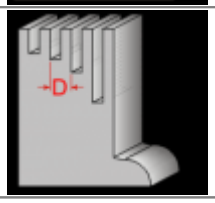
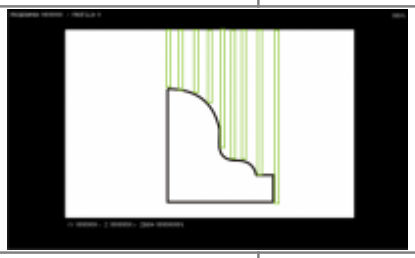
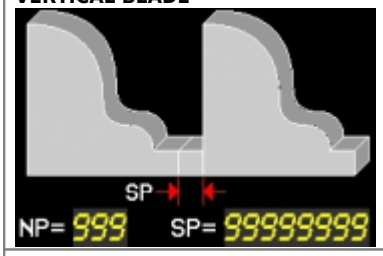
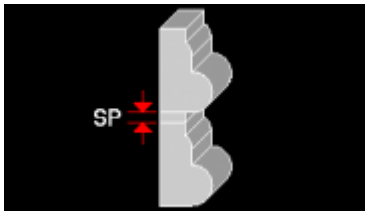


 Finishing screen or 

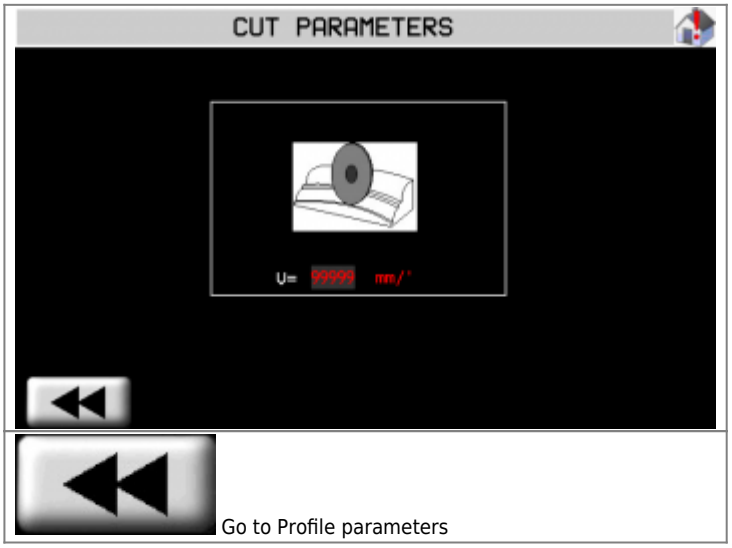
Cut parameters.**Only available on straight profiles.**

<table>
<tr><td>BLOCK DIMENSIONS</td><td> 
</td><td>Check the profile enters the block
(grey = stone block)</td></tr>
<tr><td>SURPLUS MATERIAL</td><td>VERTICAL BLADE
 

HORIZONTAL BLADE
 
</td><td>SM = extra material on the profile
  </td></tr>
<tr><td>CUT DIRECTION</td><td>  Simple cut
 
</td><td>  Two-way cut
 
</td></tr>
<tr><td>Y-AXIS DIRECTION</td><td>A profile drawing:
 
</td><td>  Y = Negative direction ? blue profile
  Y = Positive direction ? red profile
 
</td></tr>
<tr><td>CUT MODE</td><td> 
</td><td>Press 
 to set</td></tr>
</table>

<table>
<tr><td rowspan="2">CUT MODE</td><td> 
</td><td>  </td><td>Cut mode 0
D = Cut spacing on the profile contour
Low speed - High precision</td></tr>
<tr><td> 
</td><td>  </td><td>Cut mode 1
D = Cut spacing on the Y-Axis
High speed - Low precision</td></tr>
<tr><td>CUT PREVIEW</td><td>  </td><td colspan="2">  </td></tr>
<tr><td rowspan="2">REPEAT PROFILE</td><td colspan="2">VERTICAL BLADE
 
</td><td>HORIZONTAL BLADE
 
</td></tr>
<tr><td colspan="2">NP = Number of profiles to cut</td><td>SP = Space between profiles.
Blade thickness is calculated</td></tr>
</table>

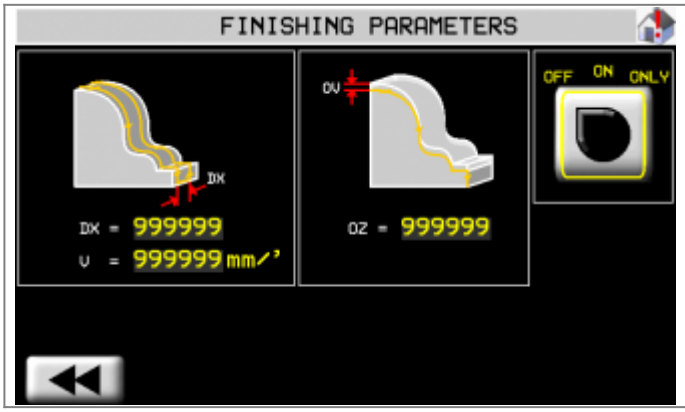
4.2.1 Work Cycle - Curved Profiles

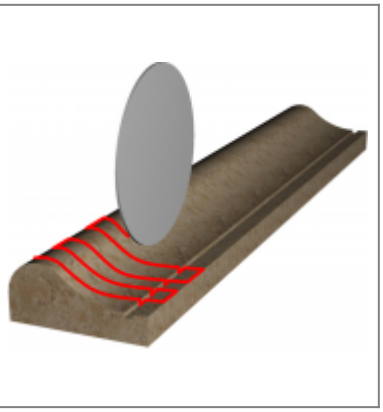


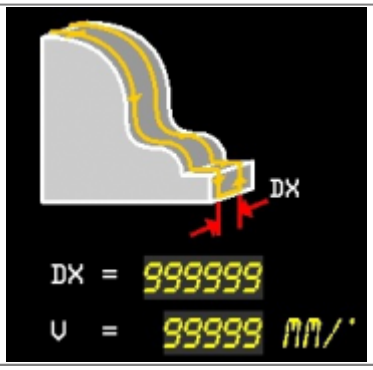
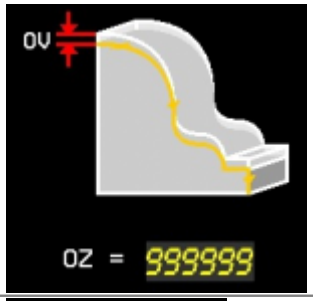
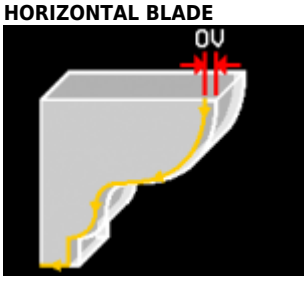
Go to Profile parameters

Set the maximum interpolation speed. This setting can be adjusted during the work.

4.2.2 Work Cycle - Profile Finishing

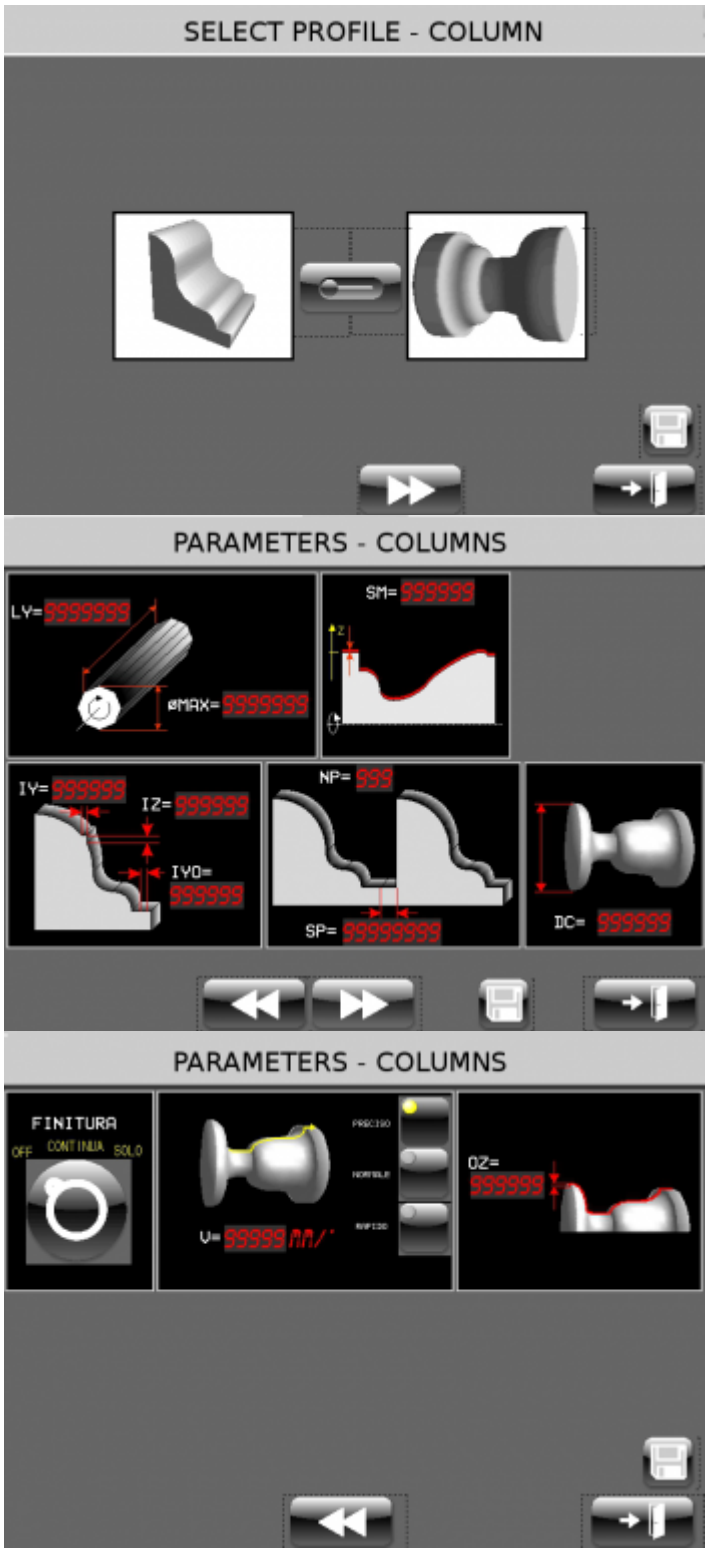




GENERAL PARAMETERS		**RH** = X-Axis steps **V** = Max speed for interpolation **OZ** = extra material for removal
OFFSET	**VERTICAL BLADE** 	**HORIZONTAL BLADE** 
STRATEGY		**OFF** = No finishing **ON** = Finishing after profiling **ONLY** = Only finishing and no profiling

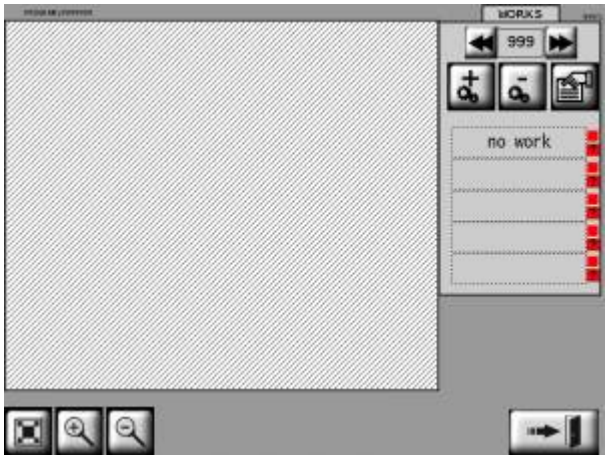
4.3 Work Cycle - Columns

N.B. Column work is only available if the lathe mechanics are installed



4.4 Work Cycle - Tops

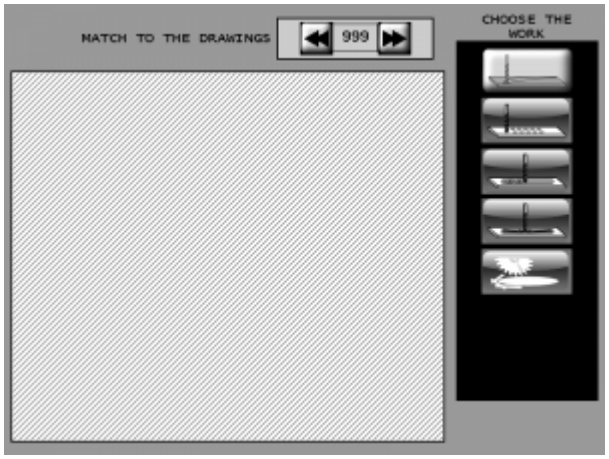
Press  **>**



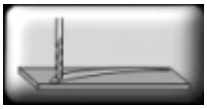
Match adrawing to a work cycle. The righthand box lists the work cycles in a work program.
Touch a Work Cycle to select it and see its related drawing.

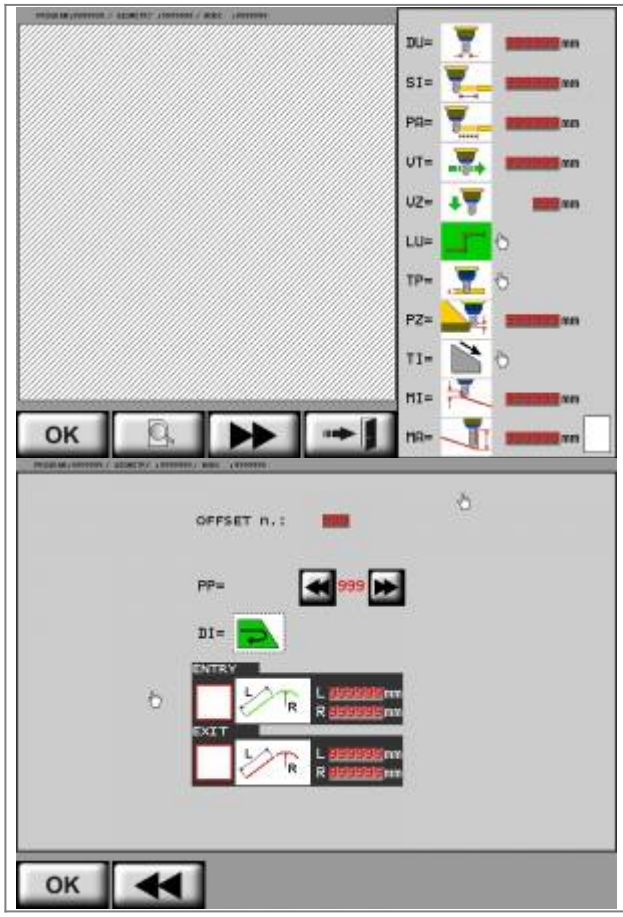
First icon	
work cycle not included	The work cycle is not in work program, or not programmed
work cycle in work program	The work cycle is included in work program
Second icon	
work cycle not programmed	The work settings must be entered
programmed work cycle	
work cycle changed	The drawing has been changed, check the data!

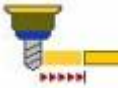
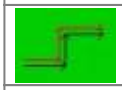
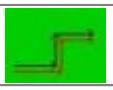
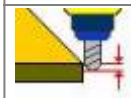
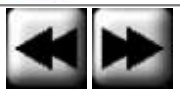
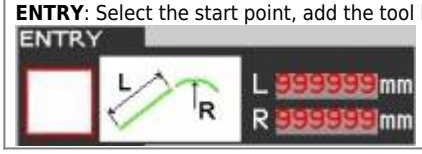
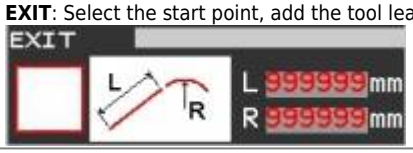
999	Open the previous or next 5 work cycles.		
	Add a new work cycle.		Delete the work cycle. (Not the drawing)
	Work cycle properties. A page is opened for each work cycle, to enter the settings.		



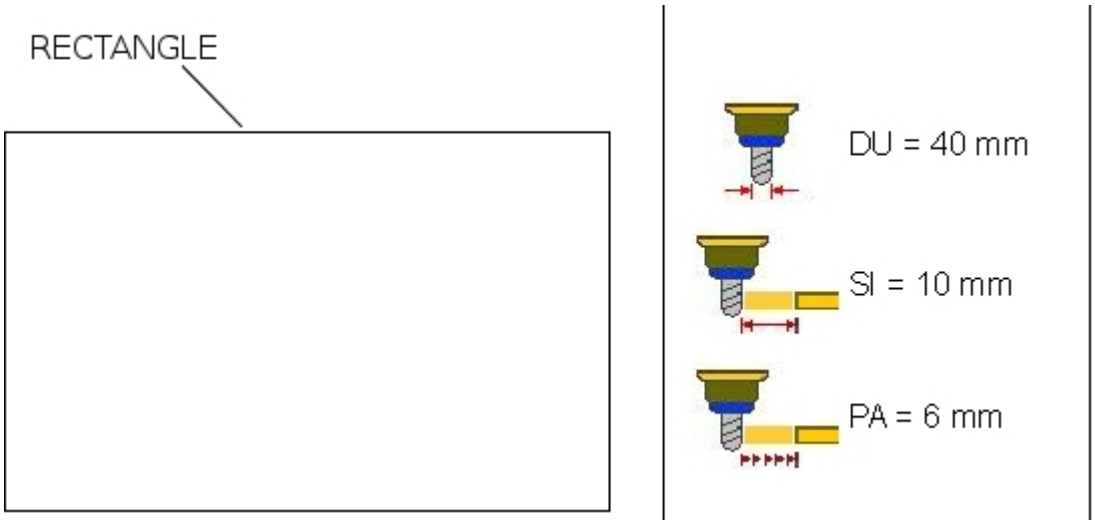
4.4.0.1 Work Cycle - Tops > Milling

Press 



Symbol	Description	Symbol	Description
	Preview of work cycle on drawing		**DU (Tool diameter)**
	**SI (Initial Surplus)**: Distance of first cut from real cut		**PA (Approach Cut)**: Distance of next cuts to reach the real cut
	**VT (Cutting Speed)**		**VZ (Z- Speed)**: Down speed
LU (Lh/Rh Tool)			
	tool cuts on left side		tool cuts on right side
TP (Type of cut)			
	**SINGLE:** Cut made in a single stroke		**MULTI:** Cut made in several steps
	**PZ(Z Step)**: Multi type of cut = the depth of the Z axis each step.		
TI (Cut Slope): the cutting depth has a slope direction			
	depth increase = X axis decrease		depth increases = X axis increase
	depth increase = Y axis decrease		depth increase = Y axis increase
	**MI(Minimum Depth)**: minimum depth of the slope		**MA(Maximum Depth)**: maximum depth of the slope
If **MI = MA**, the cut is level. The cut can be obtained by single or multi cut, set in parameter, TP			
	**DI (Direction)**: Select the tool direction (clockwise/anticlockwise) Only for closed shapes		
PP = 	**PP (Start Point)**: Select the start point	**Closed shape**: any point	**Open line**: only an end
ENTRY: Select the start point, add the tool lead in 		**EXIT**: Select the start point, add the tool lead out 	

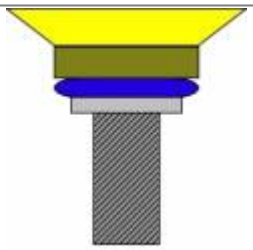
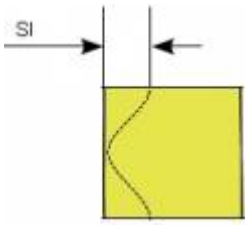
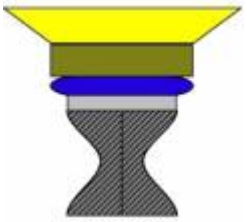
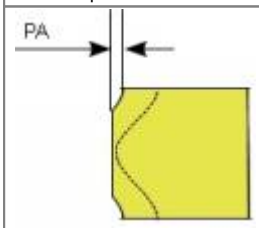
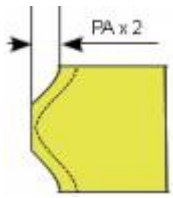
A typical tool path for a rectangular recess:



Set **SI (Initial Surplus)** and **PA (Approach Path)**. The tool follows the paths and approach the final path for the final size.

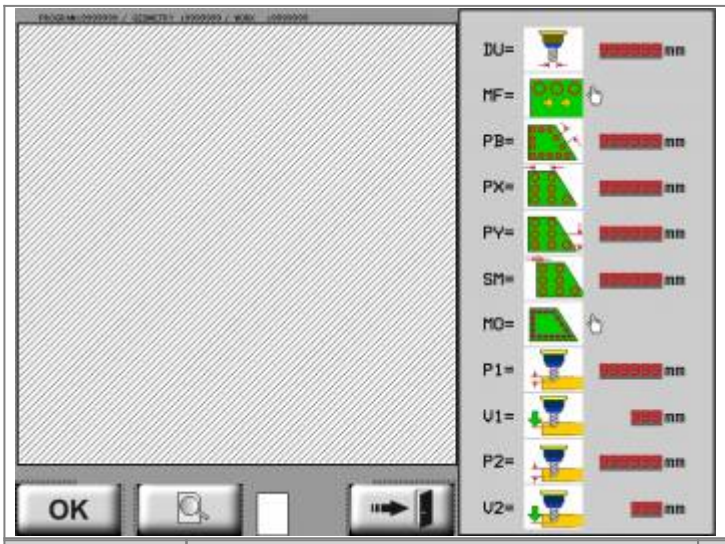
PA (Approach Path) is the material removed during each path.

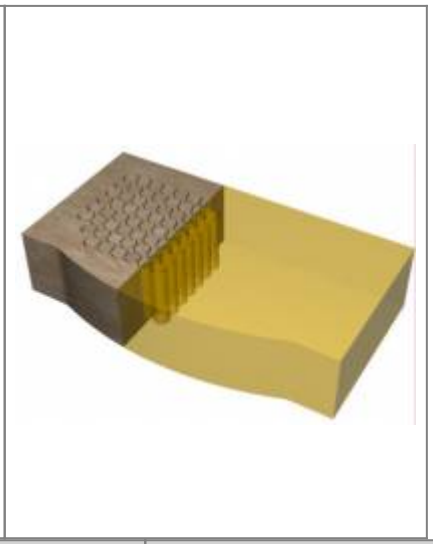
Try with shaped tools. First cut a rough geometry with a simple bit, leaving extra material (**SI**). Change the tool and add **PA**. Repeat the work cycle with **PA**.

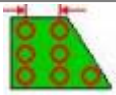
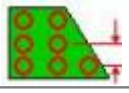
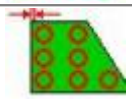
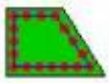
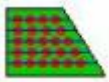
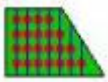
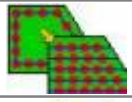
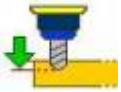
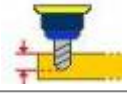
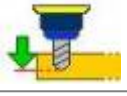
<table>
<tr><td rowspan="2">Milling bit</td><td rowspan="2">  </td><td>Roughing step</td><td colspan="2"> 
</td></tr>
<tr><td>First step</td><td>Second step</td><td>Final step</td></tr>
<tr><td>Shaped bit</td><td>  </td><td> 
</td><td> 
</td><td>  </td></tr>
</table>

4.4.0.2 Work Cycle - Tops > Pocketing

Press 

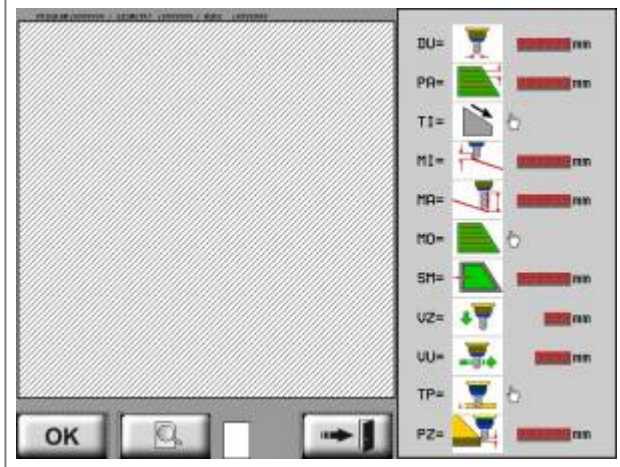


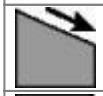
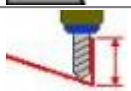
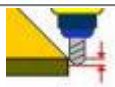


Symbol	Description	Symbol	Description
	Preview of work cycle on drawing		**DU (Tool diameter)**: set the diameter of the bit.
MF(Drill Mode)			
	CONTINUOUS: no operator confirmation to drill holes.		PAUSE: press START to drill the next holes.
	**PB(Edge)**: hole spacing along the edge.		**PX(X-Axis)**: hole spacing along the X-axis.
	**PY(Y-Axis)**: hole spacing along the Y-axis.		**SM(Space)**: distance between holes and edge of the drawing.
MO(Mode)			
	EDGE: holes along inside edge.		
	HOR.IN.: horizontal layout of holes.		VER.IN: vertical layout of holes.
	EDGE+HOR.IN.: inside edge and then horizontal layout.		EDGE+VER.IN: inside edge and then vertical layout.
 **P1**	the first depth of drilling	 **V1**	the first drilling speed
 **P2**	Final drilling depth The depth, P1, must be less than P2	 **V2**	Final drilling speed Speed, V1, is normally less than V2

4.4.0.3 Work Cycle - Tops > Tapered Recess

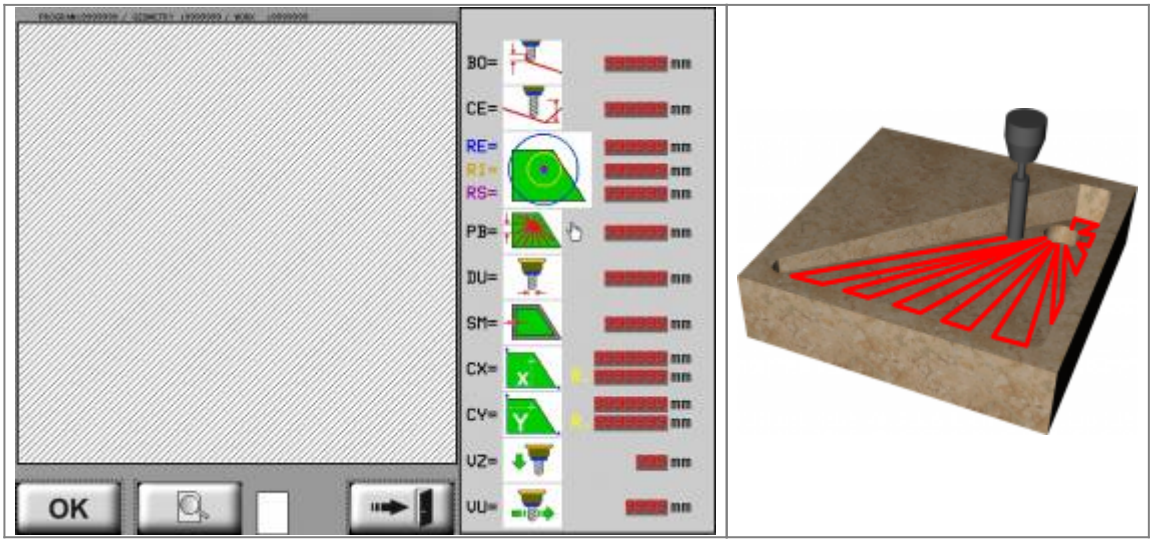
Press 

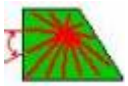


Symbol	Description	Symbol	Description
	Preview of work cycle on drawing		**DU (Tool diameter)**: set the diameter of the bit.
	**PA(Spacing)**: hole spacing	**MO** (Mode)	HORIZONTAL: spacing on Y-axis VERTICAL: spacing on X-axis SPIRAL: concentric spacing
TI (Cut Slope): the cutting depth has a slope direction			
	depth increase = X axis decrease		depth increase = X axis increase
	depth increase = Y axis decrease		depth increase = Y axis increase
	**MI(Minimum Depth)**: minimum depth of the slope		**MA(Maximum Depth)**: maximum depth of the slope
If **MI = MA**, the cut is level. The cut can be obtained by single or multi cut, set in parameter, TP			
MO(Mode)			
	HORIZONTAL: tool paths along the X-axis.		VERTICAL: tool paths along the Y-axis.
	SPIRAL: tool paths in concentric circles.		**SM(Surplus Material)**: extra material along inside edge.
	**VZ (Z- Speed)**: downward speed		**VT (Cutting speed)**: cutting speed
TP(Cut Mode)			
	SINGLE: cut made in one stroke.		MULTIPLE: cut made in several steps.
	**PZ(Z Step)**: if the Z Step = Multiple, depth increases of the Z-axis from one cut to another		

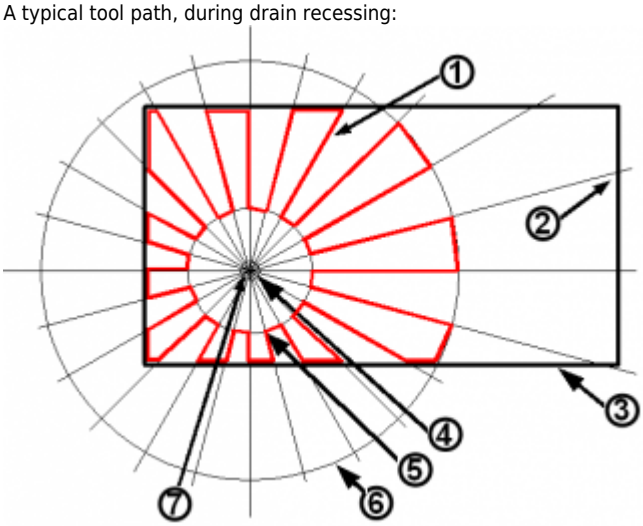
4.4.0.4 Work Cycle - Tops > Milling Drain slopes

Press 



Symbol	Description	Symbol	Descrption
	**BO(Edge Depth)**: the depth along the edge.		**CE(Centre Depth)**: the depth at the drain centre.
	**RE(Outside Radius)**: radius of the external reference circumference.		
	RI(Inside Radius): radius of the internal reference circumference.		
	RS(Drain Radius): radius of the drain. This circumference has the depth at the centre.		
	**PB(SPACING AT EDGE)**: Equal path spacing on the edge.		**PR(OUTSIDE SPACING)**: Equal path spacing on outside reference circle
	**DU (Tool Diameter)**: diameter of the drill bit.		**SM(Surplus Material)**: extra material left along the inside edge.
		**CX e CY (Centre (X, Y))**: drain centre coordinates Reference to piece or to drawing.	
	**VZ (Z- Speed)**: Tool DOWN speed		**VT (Cut Speed)**: Work speed.

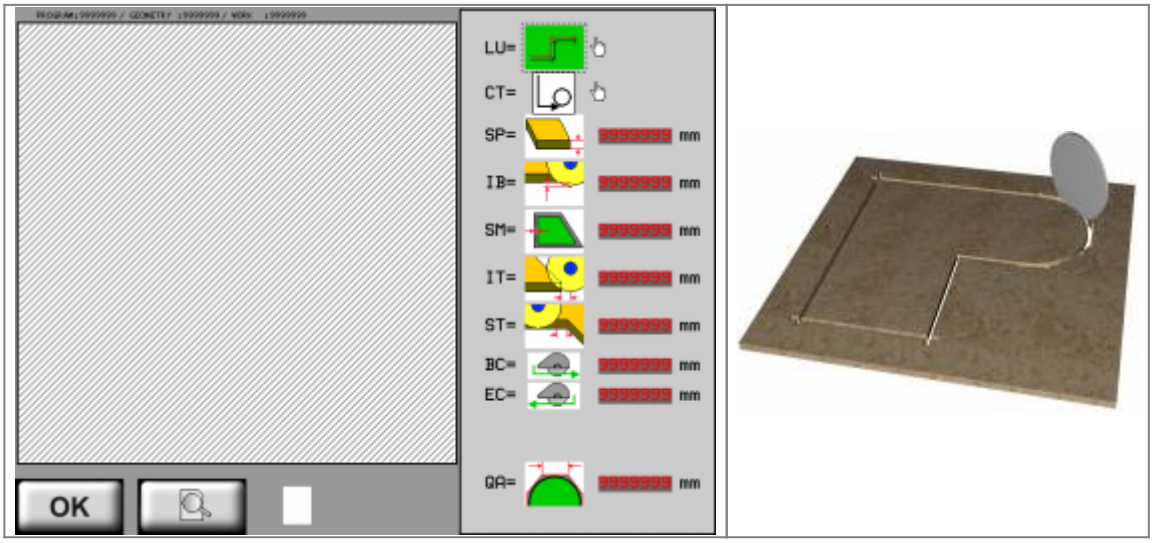
A typical tool path, during drain recessing:

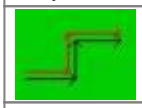
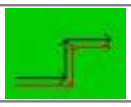
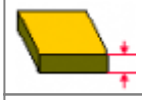
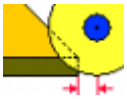
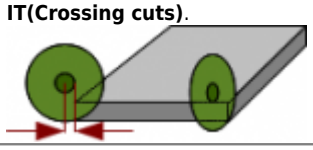
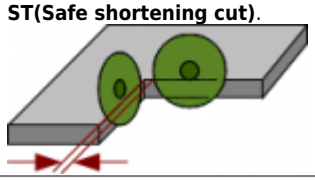
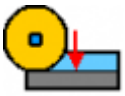
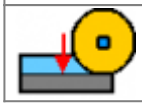
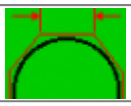


1	Tool path
2	Depth at edge
3	Solid shape
4	Drain radius
5	Inside radius
6	Outside radius
7	Depth at center

4.4.0.5 Work Cycle - Tops > Disk cutting

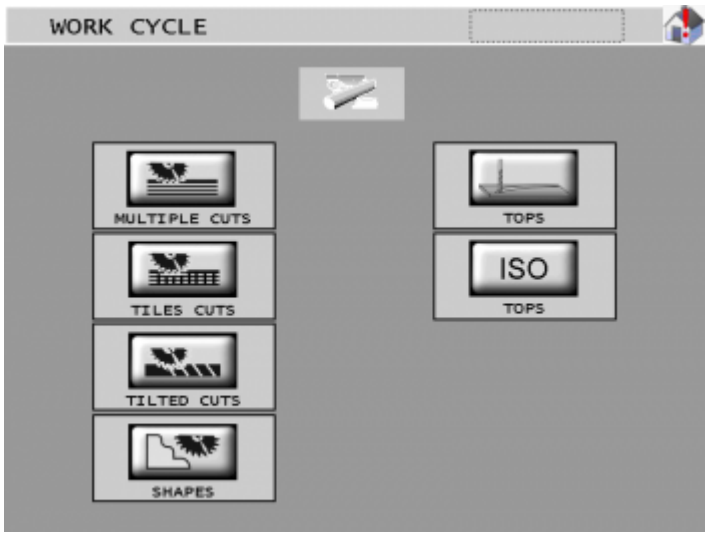
Press 

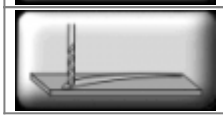


Symbol	Description	Symbol	Description
LU (Lh/Rh Tool)			
	tool cuts on left side		tool cuts on right side
CT(Cut Type)			
	Cuts with only one pass.		Cuts with multi passes.
	**SL(Slab thickness)**.		**IB(Engraving desk)**.
	**SM(Surplus Material)**: extra material along inside edge.		**IT(Crossing cuts)**. 
	**ST(Safe shortening cut)**. 		**BC(Begin cut deepness increment)**.
	**EC(End cut deepness increment)**.		**QA (Arc Quota)**. Value to cut the arc with a rough mode.

4.5 Work Menu

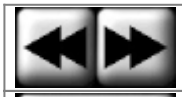
MAIN MENU > Press 



	Work menu for **MULTIPLE CUTS**
	Work menu for **TILES**.
	Work menu for **TILTED CUTS**
	Work menu for **PROFILES**
	Work menu for **TOPS**

4.6 Work - Multiple cuts

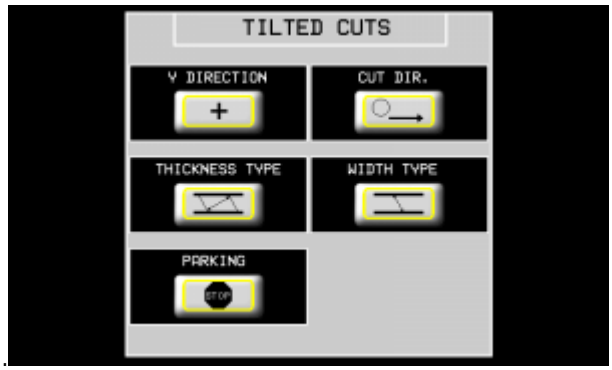
MAIN MENU > WORK CYCLE > Press 

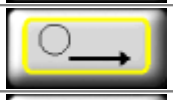
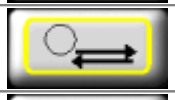
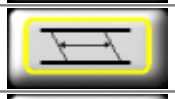
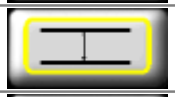
	Measures page selector.		
	Press to change the work cycle parameters		
			Y-Axis direction at end of cut
			Cut only in **X+** direction or Cut **BOTH WAYS**
			**SINGLE** cut or **STEP** cut
			Disk goes back and then up or Disk goes up while it goes back
			At the end of the work cycle: stop the axes or move axes to park position.

4.7 Work - Tilted Cuts

MAIN MENU > WORK > Press 

Press  …



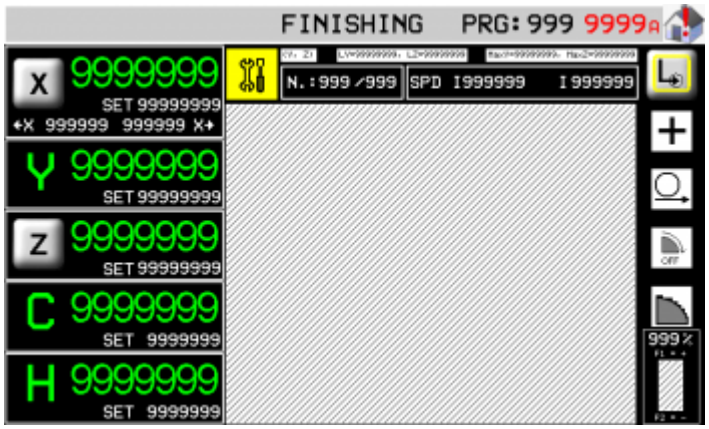
Y-AXIS DIRECTION		Y-xis moves in **POSITIVE** to the end of cut		Y-axis moves in **NEGATIVE** to the end of cut
CUT DIRECTION		Cut only in **X+** direction		**TWO-WAY** cut
SPACING		**DISTANCE** = perpendicular to the cuts.		**DISTANCE** = on edge of the block.
DEPTH		Depth the blade enters the block.		The Depth is the block thickness
PARKING		At the end, the disk stops		At the end, the disk goes to the **PARKING** position

4.8 Work - Profiles

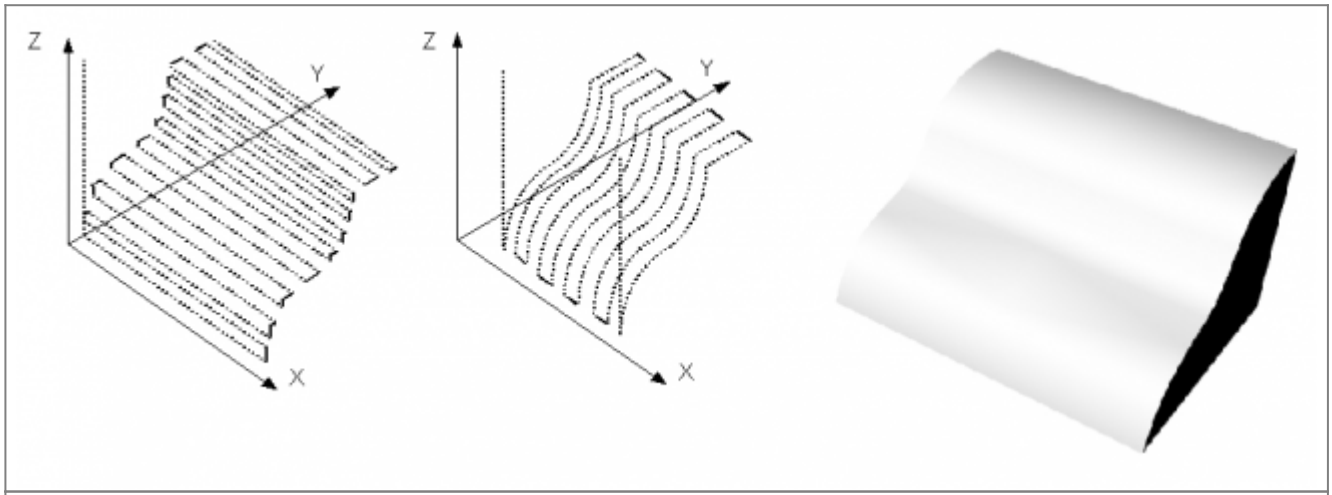
MAIN MENU > WORK > Press 

CUT TYPE	 **SINGLE** Cut
	 **STEP** Cut

4.8.1 Profile with straight cuts

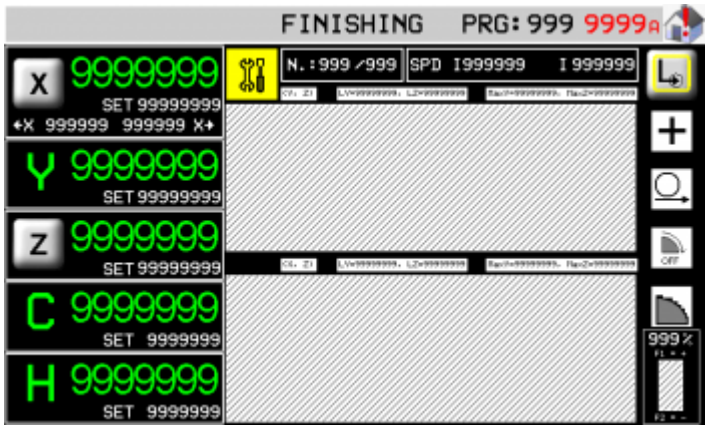


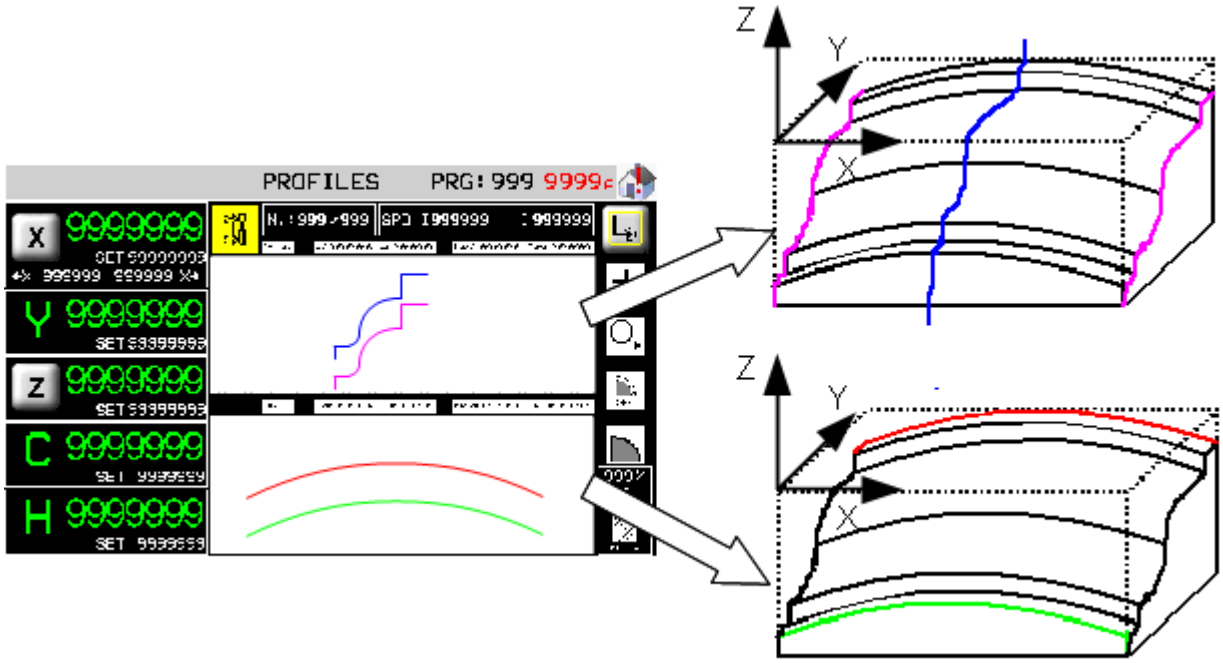
Profiling and finishing



Roughing, finishing and final result

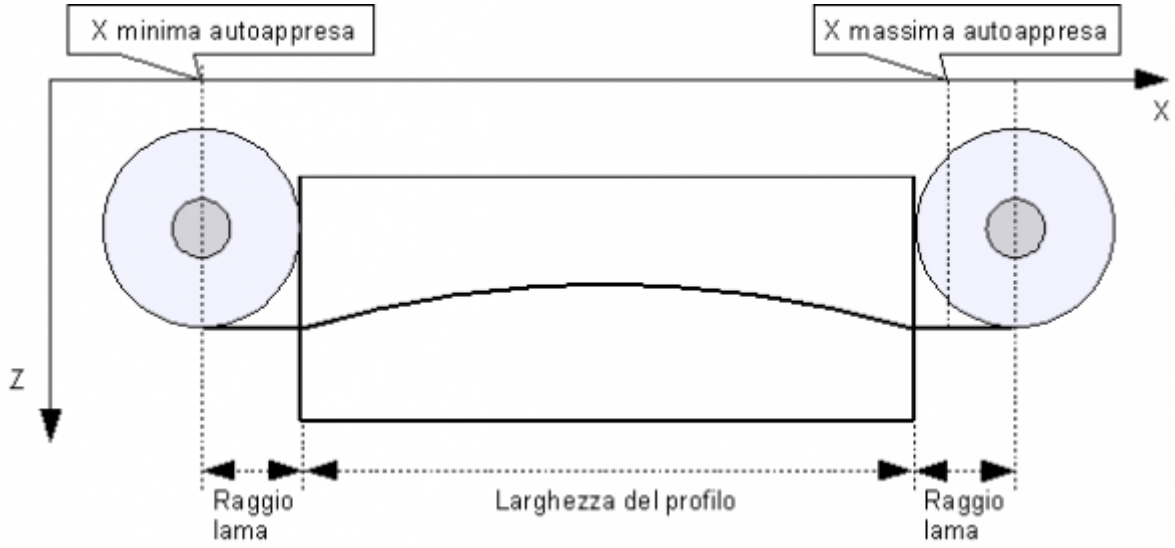
4.8.2 Profile with curved cuts





Cuts on the X-axis produce a rough profile. The cuts are made from the self-learn, minimum position on the X axis, plus two lengths the same as the disk radius, one before the profile and one after the profile.

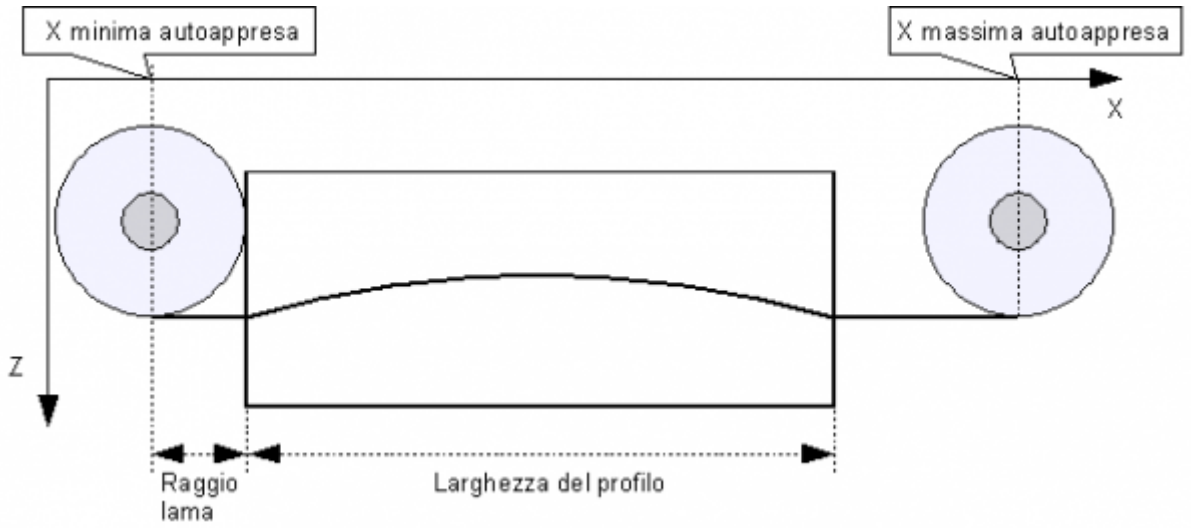
Therefore, two situations are possible:



Situation 1:

The width of the profile, plus the disk diameter, is greater than the two self-learn quotas of the X axis. The figure showns that

the cut starts at the self-learn minimum, and its end overshoots the self-learn maximum.

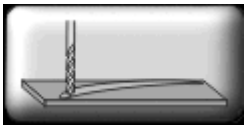


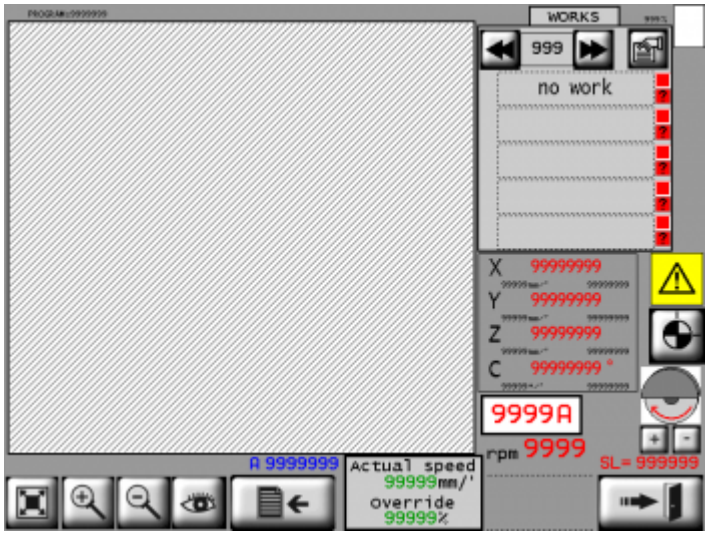
Situation 2:

The width of the profile, plus the disk diameter, is less than the two self-learn quotas of the X axis. The figure showns that the cut starts at the self-learn minimum, and its end is extended to until the centre of the disk is on the self-learn maximum.

Important: The finishing process is not available for Curved Profiles.

4.9 Work - Tops

MAIN MENU > WORK CYCLE > Press 



4.10 Work - ISO G codes

N.B. Optional accessory requiring QEM Isomanager (see specific manual Fix Me! insert link)

The ISO code is processed by performing a tool path created on a CAD/CAM, which creates a list of G code instructions that are then converted into a .hex file by the Qem Isomanager software.

The .hex file is then downloaded onto the controller by Ethernet, Modem or SD card.

If an SD card is used, the .hex file must be renamed with a number from 0 to 999999. (file name: 1.hex, 2.hex...)

The Program State box:

Execution Mode	set one of the following modes: **1: read from MMC** read file from a Memory card **2: read from remote** read file from the PC connection **3: store in MMC** only save file from PC to Memory card
MMC program number	the .hex file number in the MMC/SD card.
Read status	the percentage progress of reading the file on MMC/SD card.
Block Executed	ISO instructions executed.
G code actual line num.	the actual ISO instruction number.
G code actual line	the actual ISO instruction.

Program uploaded from MMC/SD card: **Execution mode** ? **1: read from MMC**
Controller Power OFF and ON, then zero-set the axes on the piece to the zero-set on the CAD/CAM software.
Select Automatatic mode and start an automatic cycle.
Grey box message: **Operation: start job**.
Press **START**
After start, increase the interpolation speed to startup the axis movements.
At the end of the work process, read the message **Operation: End of program execution**.

4.11 Start Cycle

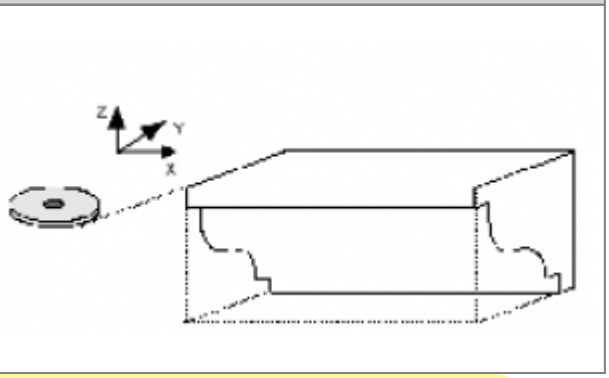
The work cycle has the following three steps :

1. Zero-set the axis positions
2. Self-learn the start of cut and end of cut
3. Start the work program

IMPORTANT NOTE
To start a work program always zero-set the axis Select manual mode. Press the zero-set button on the control panel, to open the following screens of the work program.

MULTIPLE CUTS, TILTED CUTS and TOPS

PROFILING

Vertical Disk	Horizontal Disk
	

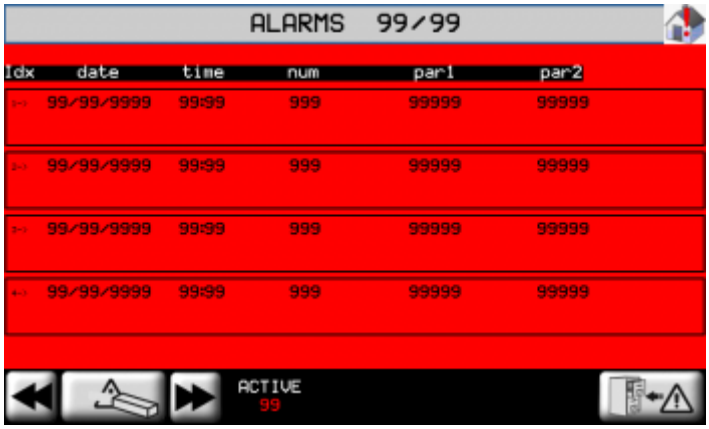
See that the disk/tool is taken to touch the block, before OK to zero-set the axes.

Press function key  to **START**, or press  to **STOP** the work.

5. Alarms

Press 

in any screen



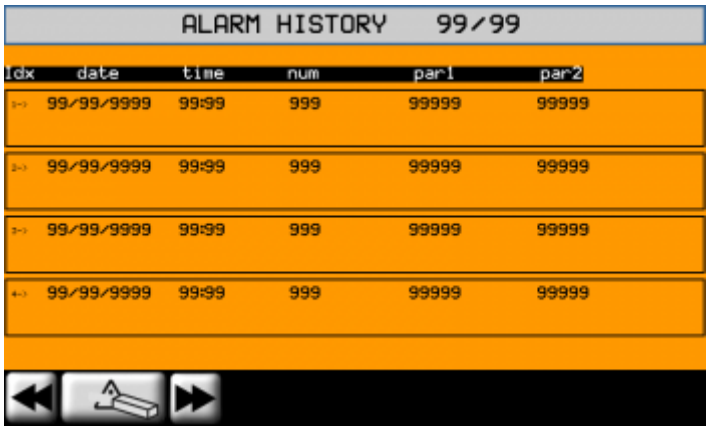
Press  to cancel the alarms.

Alarms block the machine operation.

Alarm	Cause	Solution
Emergency	Manual emergency stop	-
LS Y-axis backward	Y-axis at minium LS	-
LS Y-axis forward	Y-axis at maximum LS	-
LS Z-axis backward	Z-axis at minium LS	-
LS Z-axis forward	Z-axis at maximum LS	-
LS X-axis backward	X-axis at minium LS	-
LS X-axis forward	X-axis at maximum LS	-
LS H-axis backward	H-axis minium LS	-
LS H-axis forward	H-axis at maximum LS	-
LS C-axis backward	C-axis at minium LS	-
LS C-axis forward	C-axis at maximum LS	-
Disk not rotating	Disk must be running in automatic cyle	-
Water pressure	No cooling water	The water valve shut
Overcurrent blade motor	The disk motor current absorption is over the threshold	-
Follow Error Z	The axis follow error is over the maximum threshold	-
Follow Error Y		-
Follow Error X		-
Fault interpolation	There is an error during the interpolation of the axes.	One of the axes has gone over the maximum position.
Fault driver	Fault in one of the axis drivers	-
Cutout driver X	Overload cutout of driver X tripped	-
Cutout driver Y	Overload cutout of driver Y tripped	-
Cutout driver Z	Overload cutout of driver Z tripped	-
Cutout driver H	Overload cutout of driver H tripped	-
Cutout driver W	Overload cutout of driver W tripped	-
Cabinet Ventilation	Emergency of cabinet ventilation	-
Disk overload	Overload cutout of disk motor tripped	-
No auxiliaries	No power supply to auxiliaries	-
Phases not OK	Motor supply power phases could be inverted.	-
Fault encoder X	The encoder of the axis does not work properly	-
Fault encoder Y		-
Fault encoder Z		-
No table sensor	The low table sensor could be disconnected.	-
Y-axis off tolerance	The axis Y positioning out of set tolerance .	Control the Y-axis setup parameters

5.1 Alarm history

Press 



To cancel the history, press 

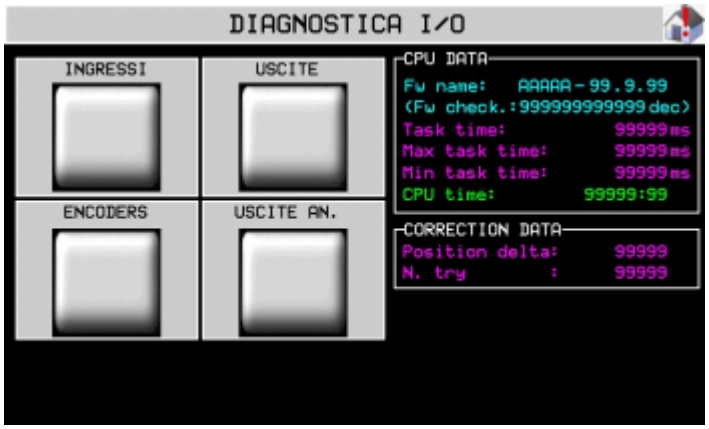
5.2 Warning Messages

Messages do not block the machine operation.

Messagge	Cause	Solution
WAIT...	A calculation is in course.	-
PATH ERROR	An error has been found in the path settings, before the process.	Control that the path is not too long
ERR: INCLINED BLADE	The inclination of the blade and the tool is not correct for the work cycle.	The blade or the tool inclination must be corrected
WORK COMPLETE	The automatic cycle is completed without problems.	-
X OFF POSITION	The position of X is not correct.	It is external to the self-learn positions of the LS.
FLAT BATTERY	The battery of the controller is flat or has a low charge.	See the installation and maintenance manual for the battery change instructions.
RUN HOMING	The Homing procedure has not be performed.	Perform the homing procedure.
ERROR ARC CALCULATION	Error in the calculation of the points for the arcs	Control the Setup parameters.
SHAPE TOO LARGE	the shape has more than the maximum number of sections.	Use the editor to control the shape.

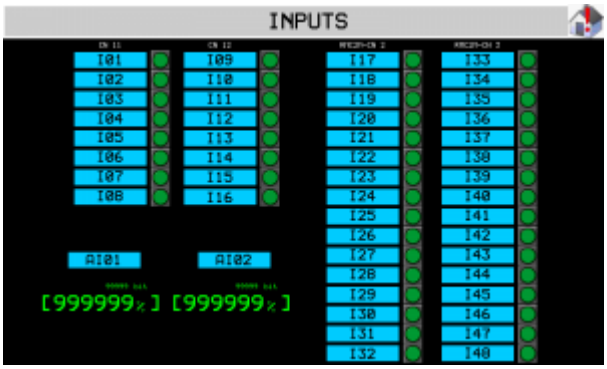
6. Diagnostics

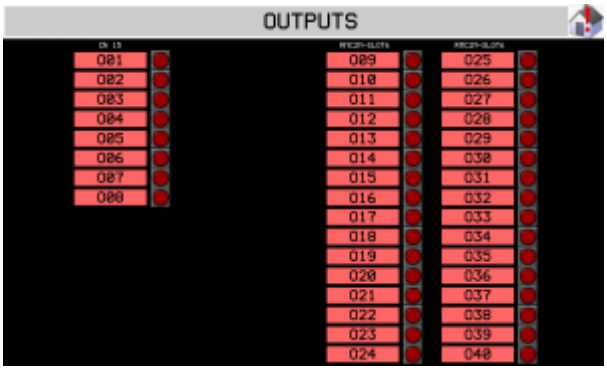
MAIN MENU > Press 

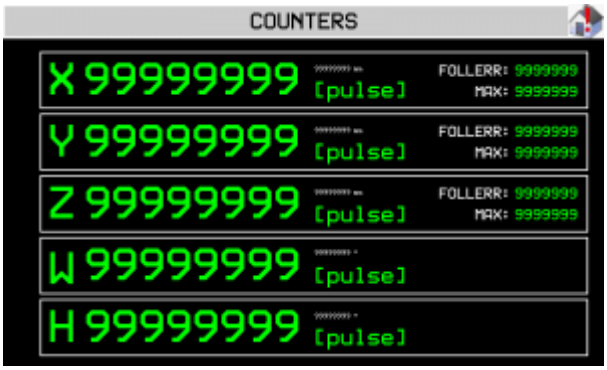


Fw name : firmware in the controller and relative checksum
Task time : the average cycle time of the CPU with indexing of the **Maximum Time** and the **Minimum Time** for the scan
CPU time : total time from when the CPU is in the RUN state (hh:mm)

Only for the axis Y and in particular for the positioning function, with the magnetic rule:
Position delta : position error between resolver feedback and magnetic rule to be recovered;
N. try : number of attempts made to recover the delta.

Press **INPUTS** 

Press **OUTPUTS** 

Press **ENCODERS** 

Press **AN OUTPUTS**