Sommario

P17.042

Description

The **P17.042** application, installed on Qmove+ hardware is designed to control a 4 axis marble & granite bridge saw (with two axis viewing). The main characteristics of the **P17.042** software:

Work programs:

- The Multiple cutting of blocks and slabs (Fig. 2).
- Profiling of programmed drawings with horizontal or vertical disk (Fig.'s 3, 5).
- Blade face finishing of profile (i.e. YZ interpolation) (Fig.'s 4, 6).
- Profiling with horizontal or vertical disk and with curved lengths (i.e. XZ or XY interpolation) (Fig.'s 8, 9).
- 2D slab cutting.

Drawing(Fig. 10):

- Programming of profile by built-in Qem miniCAD software
- Import of CAD dxf files

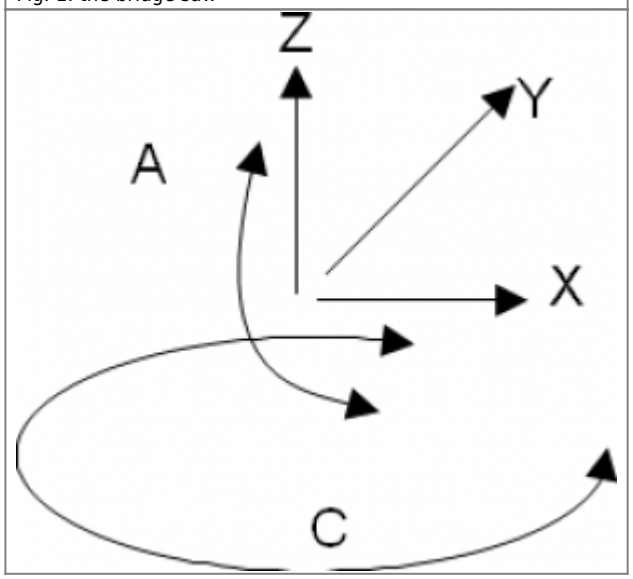
Work options:

- Repetition of programmed profile (Fig. 7).
- Precision settings for finishing
- Disk speed adjustment during the processing
- Compensation of disk diameter and thickness
- Lubrification programs

Utility, signals and alarms:

- Language select
- Viewing of profile and disk position during processing.
- Input and output diagnostics
- Data backup and restore on Flash Eprom memory
- Alarm and warning messages for easy troubleshooting
- Help messages for operator

Fig. 1: the bridge saw

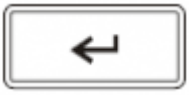


Operation

The Standard Indicators

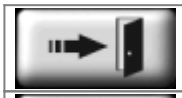
The standard indicators found in the screens

- Yellow and red settings can be modified by the operator. To modify a setting, touch the setting and this will open the number pad to enter a new setting.
- Some parameters have option settings . Use the three button panel 

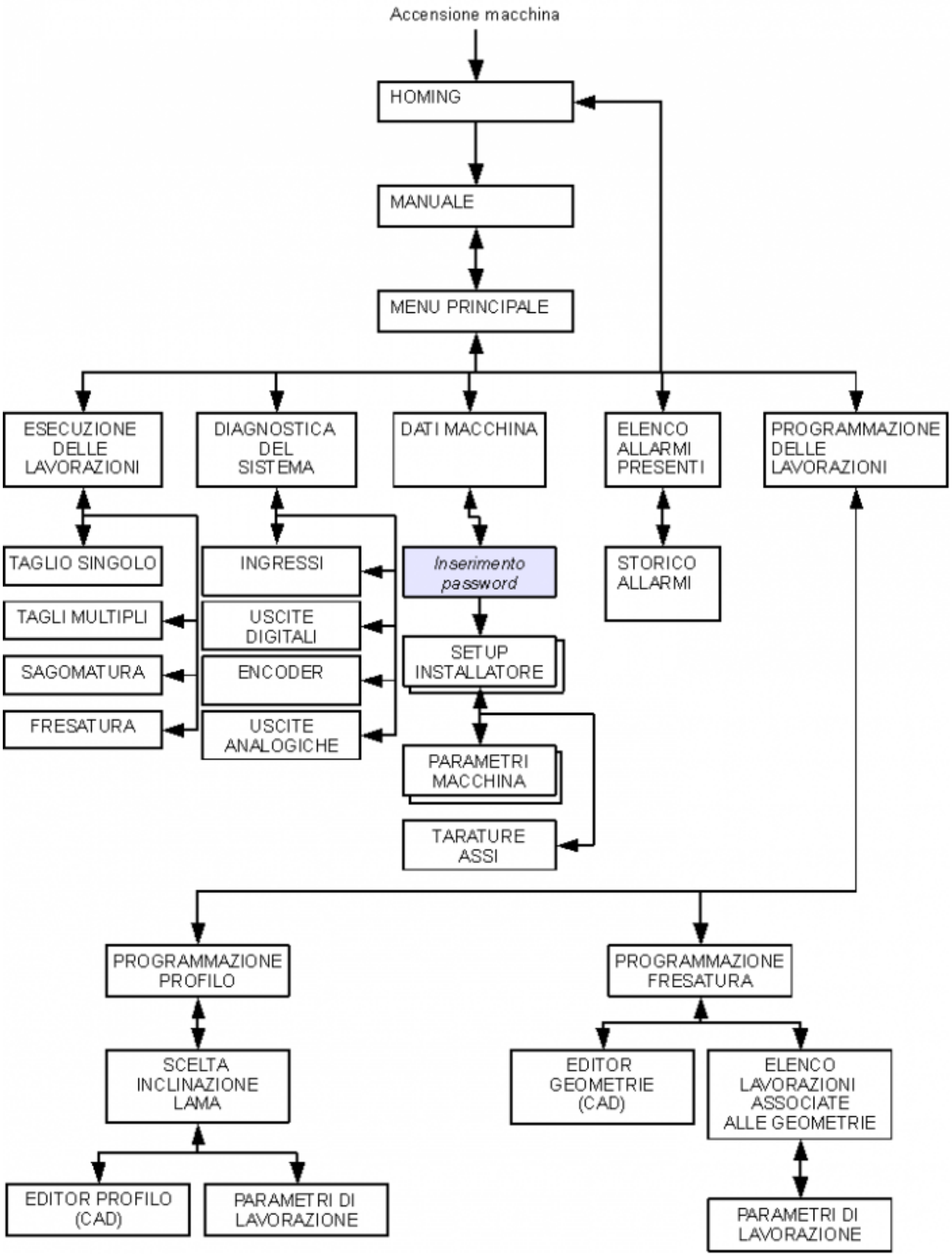
,  , and  . To select a parameter press  .

In the rest of the manual the touch boxes on the screen will be called “buttons”.

Buttons in the various screens:

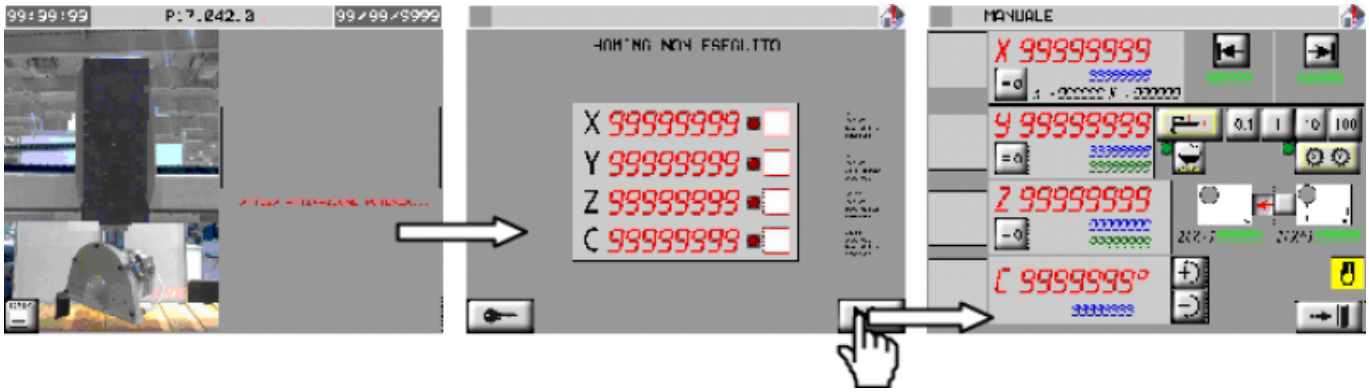
	Exit and return to previous screen
	View list of alarms currently tripped.

Screen map



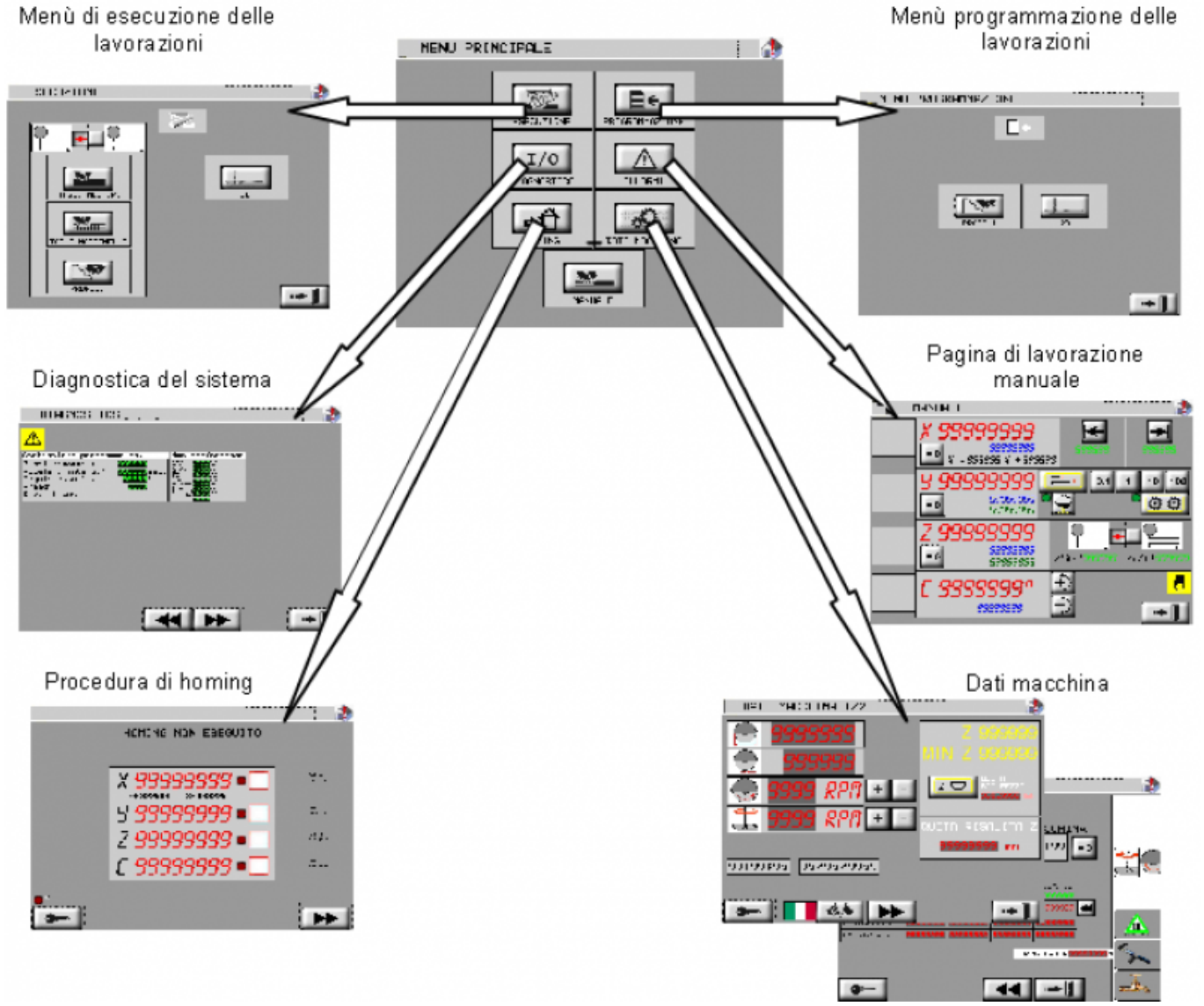
Start screen

Screens shown when the machine is started:

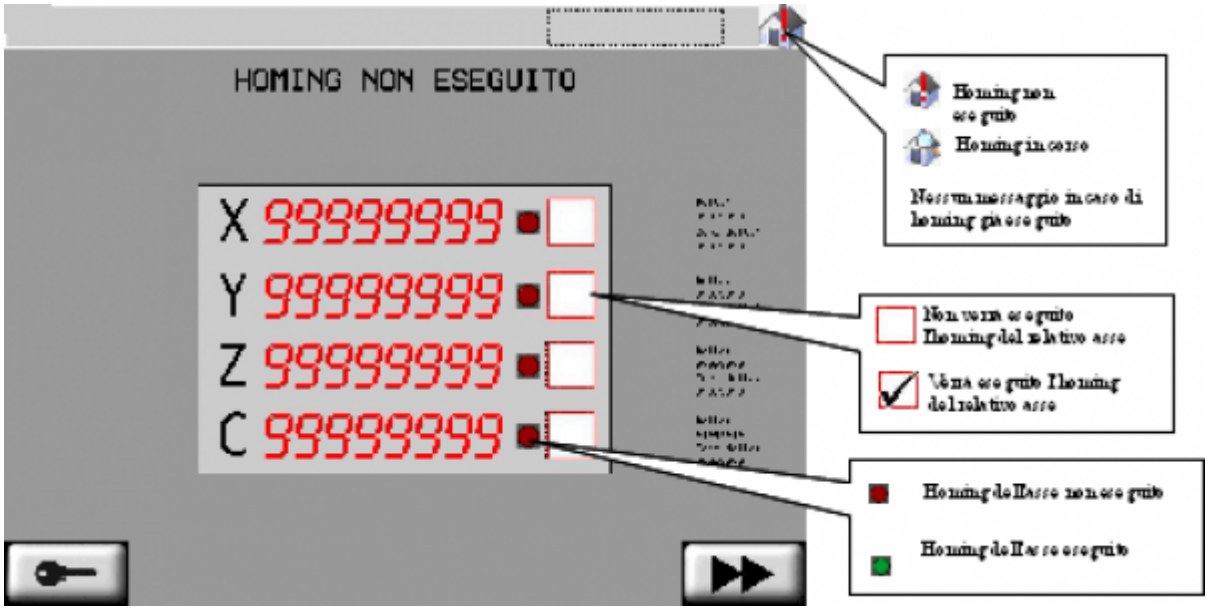


Pass from **HOMING** to **MANUAL** only after completing the Homing procedure. If HOMING is not carried out, the machine operation may have limitations. These limits are set in the setup area, protected by password.

Button	*Description*
	**BACKUP/RESTORE** of application data

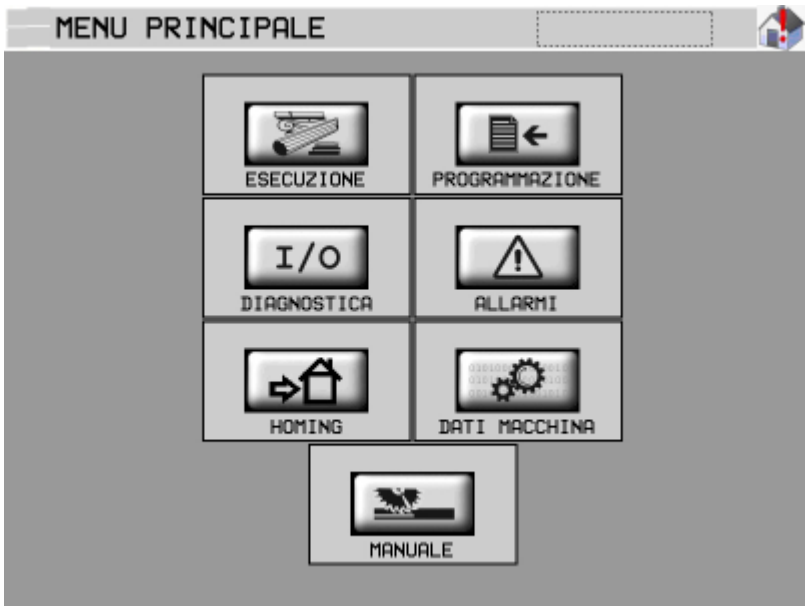


Homing



Input	*Description*
START	**START HOMING.**
STOP	**STOP HOMING.**

Main Menu



This screen accesses:

 Programming menu  The Work Program menu

 Diagnostics

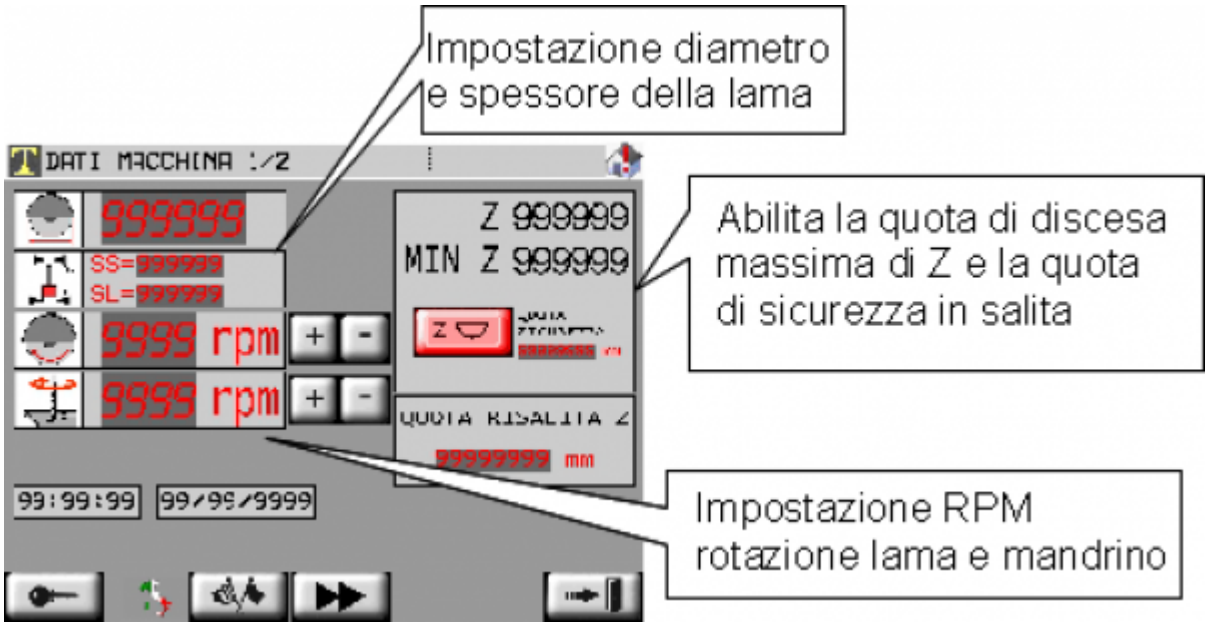
 Alarms

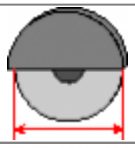
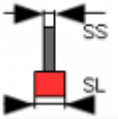
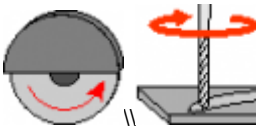
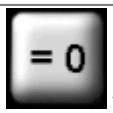
 Homing

 Machine setup

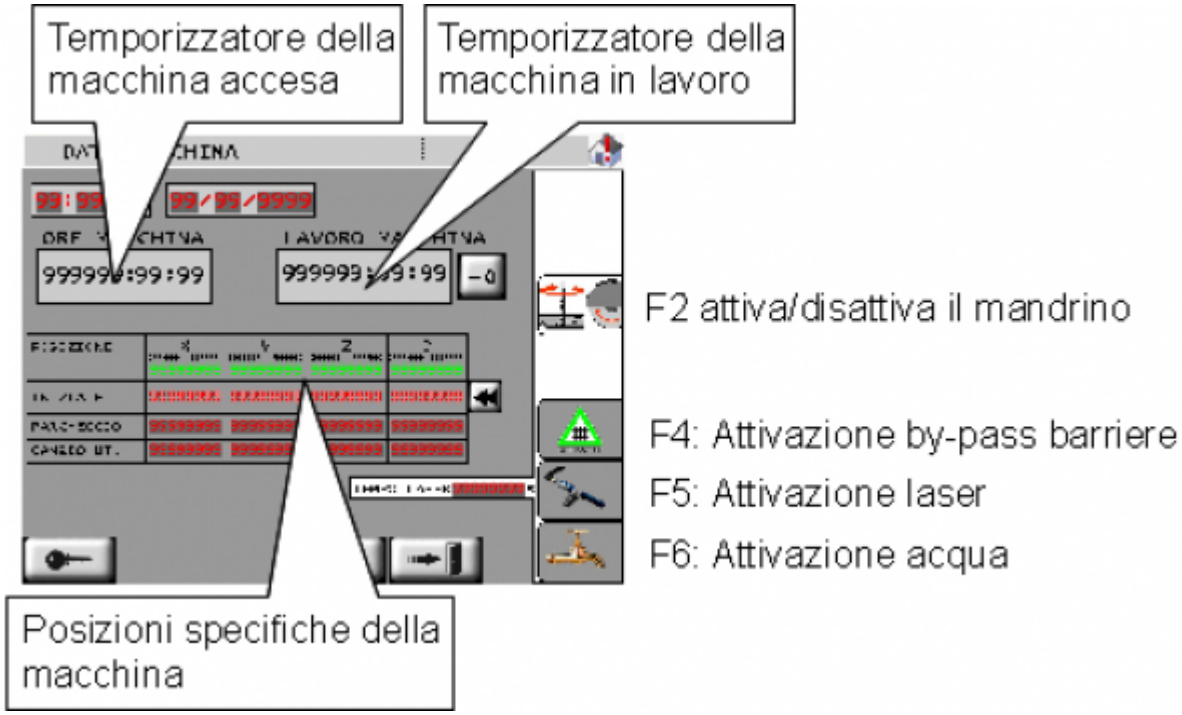
 Operation in manual/semi-automatic

Machine Setup



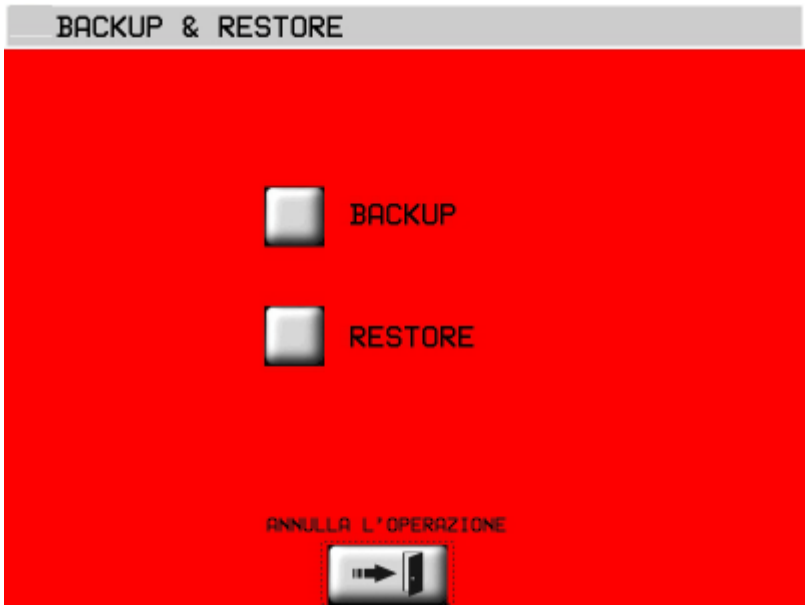
	Disk diameter
	Disk thickness (SL) and Hub thickness (SP).
	Disk/tool RPM: Press  &  to change. Press  to zero-set. The RPM setting can be entered directly. If the disk is rotating, the new RPM setting is applied IMMEDIATELY
Z	Realtime absolute Z axis position
MIN Z	Minimum software position set as safety height
SAFETY HEIGHT	Safety height can be set or self-learned by a button input at the minimum position allowed for the Z axis
	The Z axis safety height is not set
	The Z axis safety height is set after presetting the Z axis, to set this function - move the axis to the minimum height - press this button to view the set status.
	Access to reserved data (See specific manual)
	Change language Languages available: ITALIANO, ENGLISH
	Go to machine setup screen 2
	Return to machine setup screen 1

	Access to reserved data (See specific manual)



Backup / Restore

N.B.: password **264**



BACKUP	Start save data procedure
RESTORE	Start restore data procedure

Save data (backup)

This procedure saves all machine data and parameters on the controller's internal memory.

Reload data (restore)

This procedure restores the machine data and parameters saved on the controller's internal memory.
The Backup procedure must have been performed before using Restore.

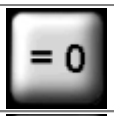
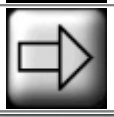
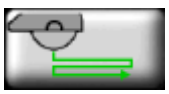
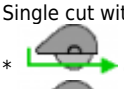
Manual/semi-automatic operation

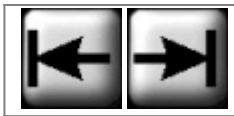
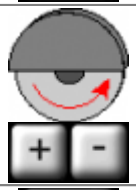
Power the HMI and complete the Homing procedure to open the screen:

There are three windows offering three oeprating modes:

-  Semi-automatic cuts on X axis
-  Semi-automatic cuts on Y axis
-  Semi-automatic cuts on diagonal XY

The buttons:

	Press for 1 second, to zero the axis position
	Start immediate axis movement to set position
	Immediate absolute positioning, referred to last zero position
	Immediate incremental positioning, referred to the current zero set position
 / 	Immediate positioning increased by disk thickness compensation [no] / [yes]
	Fine movement of joystick
	Single cut with multiple strokes: *  depth increase in cut direction *  depth increase in opposite cut direction *  final cut increase always in opposite cut direction Press and it changes to  Press START to begin a single cut

	Self-learn start and end cut positions
	Free joystick movement in cut direction
	End to end joystick movement in cut direction
	Raise Z axis to safety height
	Single cuts with disk in diagonal direciton
	Disk rpm adjustment
	Move disk to start position
	Move disk to parking position
	Move disk to tool change position

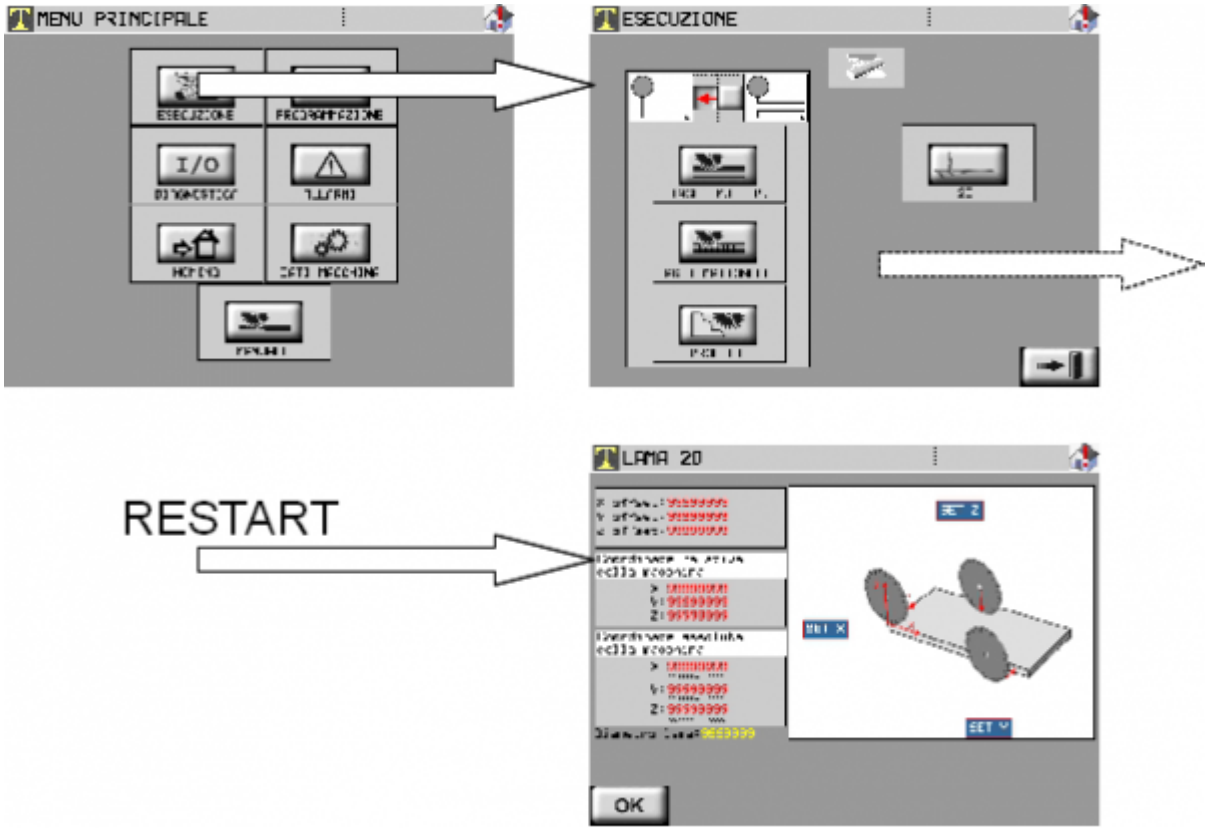
Automatic operation

N.B.: Always follow the order of operations illustrated in the diagram below:

HOMING (after startup) ⇒ PROGRAMMING ⇒ OPERATION

First complete a correct axis **homing** procedure (the first screen after startup). Select a work program, that must have been programmed in the work cycle menu. Infine the work program must be **performed** from its specific work program menu.

Work Program: Axis zero-setting and RESTART operations

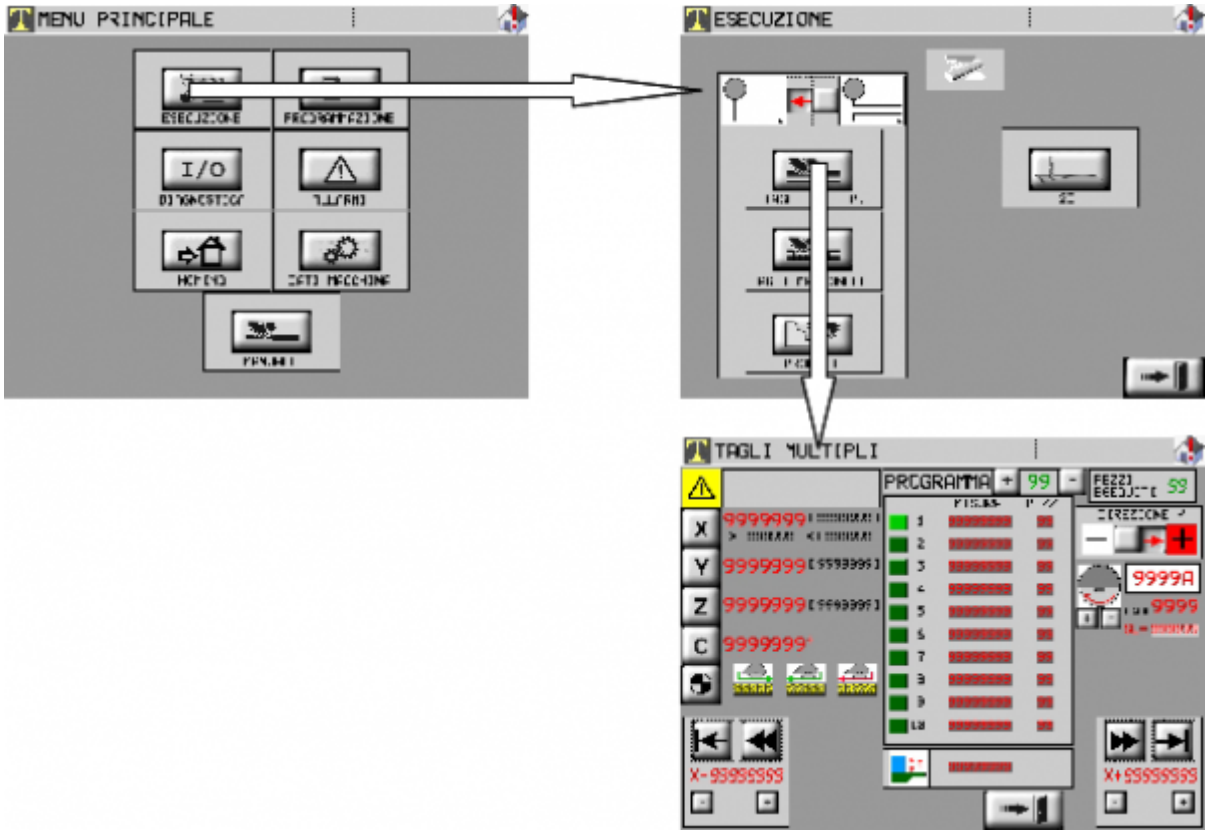


The screen can be opened from any work program page, to carry out **two important functions**:

1. OK : confirm a RESTART and then an automatic cycle that was stopped by an operator input or an emergency stop. It is zeroed and at the next cycle start it starts from the beginning.
2. Press SET X, SET Y, SET Z to zero the axis in the current position.

Screen to help the operator understand where to zero the axes for each specific work cycle.
The operator can select one or both of the above operations.

Work program: Multiple cuts



MULTIPLE CUTS makes a series of cuts to obtain pieces of a set size.
10 programs are available.
For each of the two programs can memorise

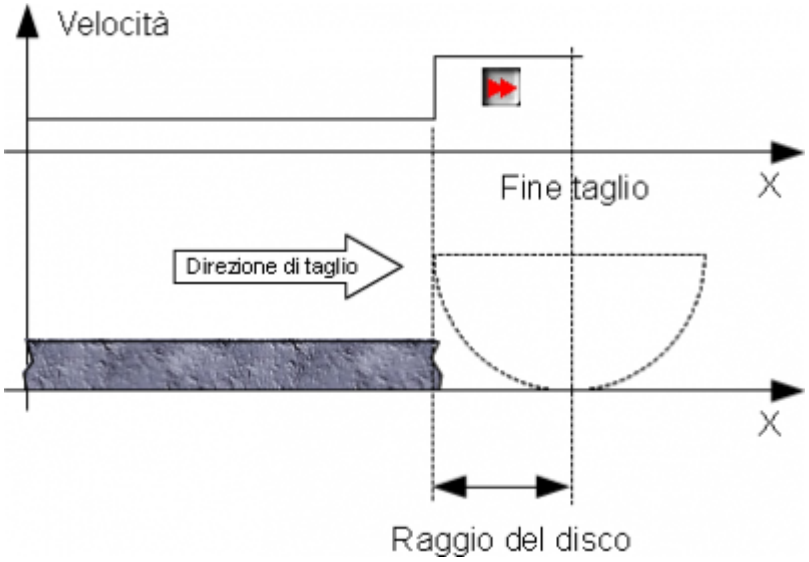
- up to 10 different sizes(SIZE).
- each size can be repeated several times (PIECES).
- Tile thickness.

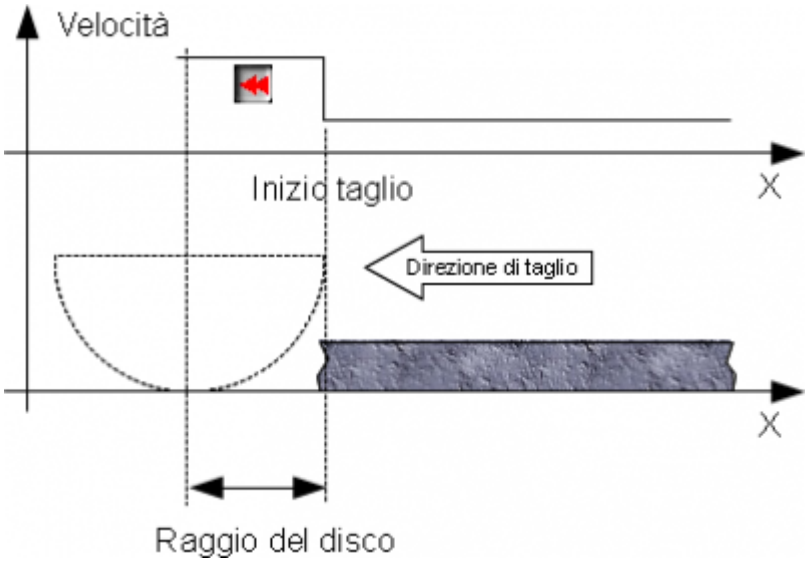
The screen:

X axis speeds in cut direction and opposite cut direction|

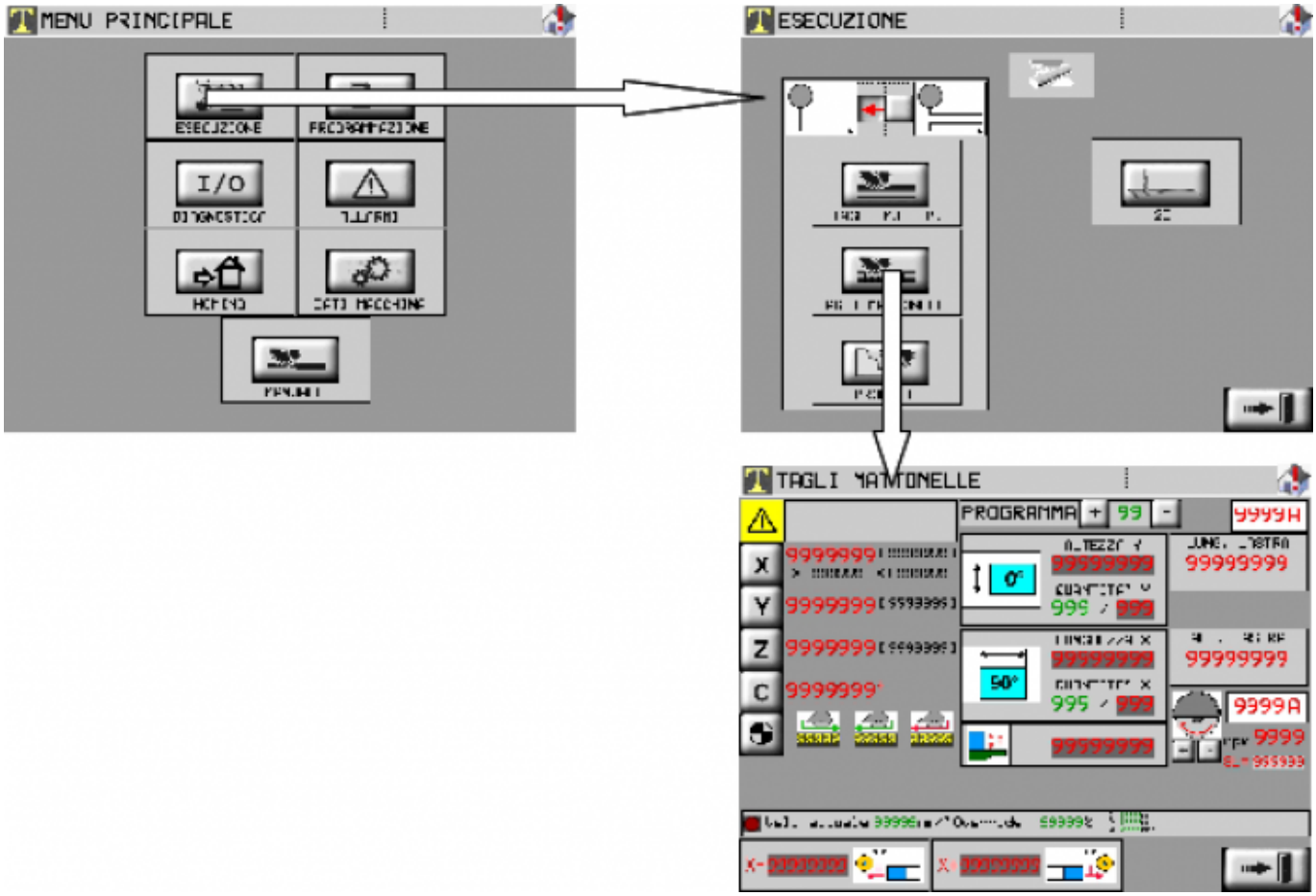
	Open axis zero-setting screen
	Z depth increase for multiple stroke cutting in cut direction
	Z depth increase for multiple stroke cutting in opposite cut direction
	Final Z increase for full slab depth. The final cut is in opposite cut direction
	Y direction in this automatic cycle

	 Cut only in cut direction and empty return  Cut in both directions. Y axis advances in both X directions
	Disk motor absorbed current, disk rpm with adjustment buttons, SL disk thickness setting
	Slab thickness
	Start cut point  Start cut, self-learn button for X axis.  Rapid exit button, to overshoot the piece on the left by the disk radius, before returning to the start cut point.
	Quota di fine taglio.  End cut, self-learn button for X axis.  Rapid exit button, to overshoot the piece on the right by the disk radius, before returning to the start cut point.





Work program: Tile cutting

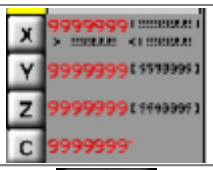
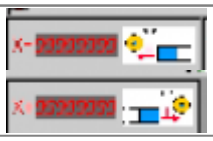


GRID CUTS are used to cut a slab into rectangular tiles. 10 programs can be saved.
Each program memorises:

- Tile length(Y axis)
- Tile width (X axis)
- Slab thickness

Zero-set the axis positions on the bottom lefthand corner of the slab. The cut start and end are calculated automatically, according to the number of tiles and their dimensions.
Always set the correct disk diameter in Machine Setup, to obtain precise calculations.

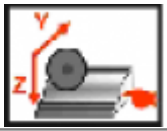
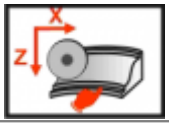
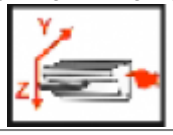
The boxes in the screen:

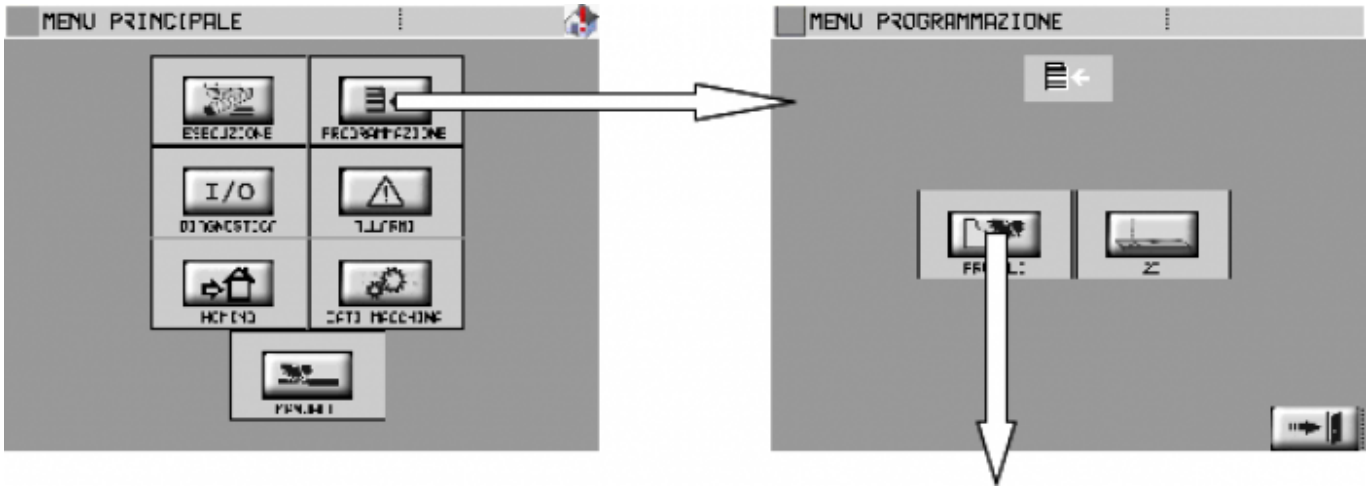
	Axes target positions and points. The X axis has the speeds in the cut direction and opposite cut direction		
	Open axis zero-setting screen		
	Z depth increase for multiple stroke cuts in the cut direction		Z depth increase for multiple stroke cuts in the opposite cut direction
	Final Z increase to reach full depth. The final cut is in the opposite cut direction		
	Y direction during this automatic cycle		
	 Cut only in cut direction and empty return  Cut in both directions. The Y axis advances in both X cut directions		
	Disk motor absorbed current, disk rpm with adjustment buttons, SL blade thickness setting.		
	Slab thickness		
	Slab length and width required for tile quantity setting, including disk thickness calculation		
	Cut start and end points are calculated automatically, according to tile quantity and size settings. The cut start and end can be extended, by entering a length in the two boxes		

Profiling: programming and work cycles

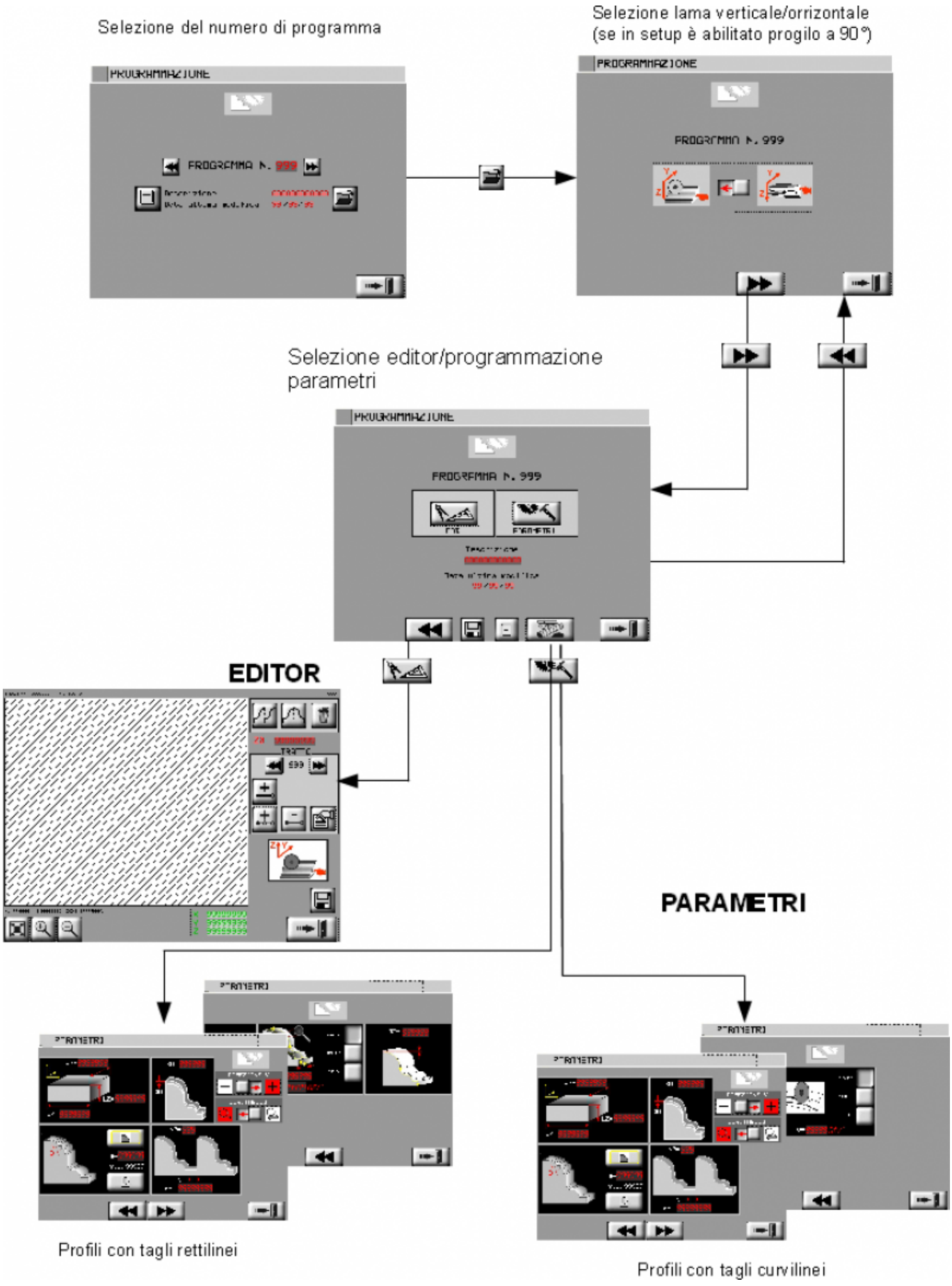
Profiling: programming

Vertical and horizontal profile cutting with straight and curved lengths between two X axis positions.

VERTICAL DISK	STRAIGHT LENGTHS  CURVED LENGTHS 
HORIZONTAL DISK (only if “enable 90° profile” parameter is set to “enable”	STRAIGHT LENGTHS  CURVED LENGTHS

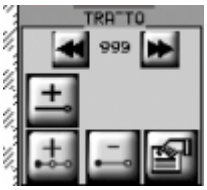
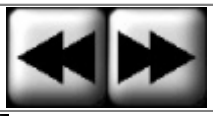
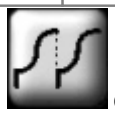
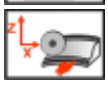


PROFILE work programming uses the profile drawing and work cycle parameter settings.
First open one of the programs listed.

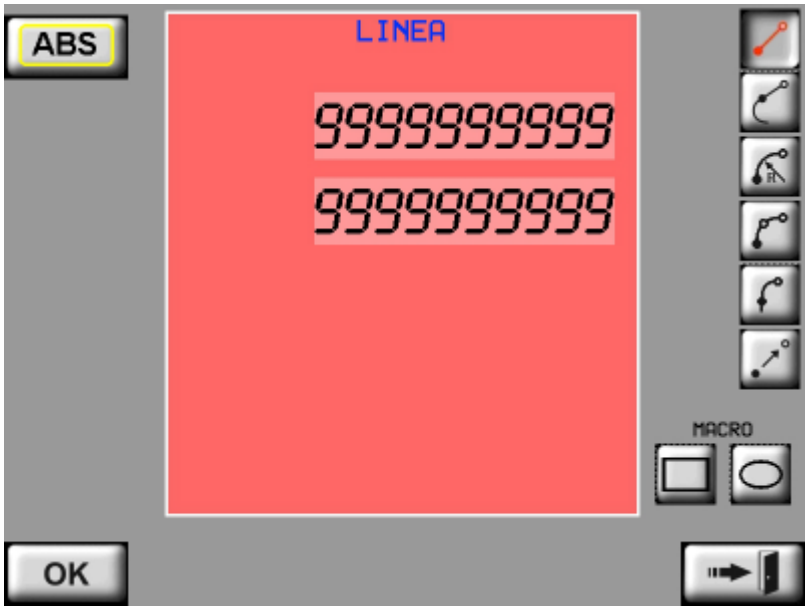


Profile Editor

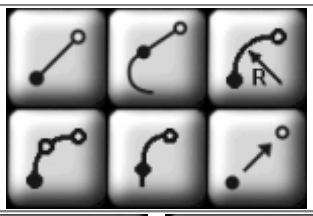
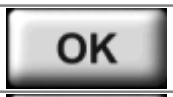
A profile is made up of a series of sections. Press  to open the profile editor to draw Y-Z profiles and X-Z length cuts.

	Z0 is the Z start co-ordinate of the first section. The Y co-ordinate is always 0.
	Section management tools. A section is a segment or an arc.
	Section scroll and select buttons.
 Add another section.	
	Insert a section.
	Delete a section.
 Open the section properties screen and change properties.	
 Copy all sections from selected section to end.	
	Mirror copy all sections from selected section to end.
 Delete profile. The profile and all sections are eliminated.	
	Adapt whole profile to the drawing box.
	Zoom-in and Zoom-out
	Viewpoint and change plane  YZ plane: profile shape.  XZ plane. length cut.

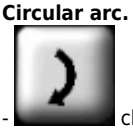
A profile is made up of a series of sections. Add a section by pressing  and open the screen:



Section parameter buttons:

	Add a section or change properties. Each section type is described below.
	Select**absolute** or **incremental** co-ordinates.
	Confirm new section or changes.
	Exit without confirming changes.

Section types and property parameters:

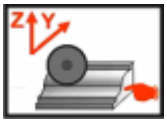
BUTTON	SECTION TYPE	PARAMETERS
	LINEA	**Straight section**. Enter the end point co-ordinates
	TANGENT LINE	**Straight section at a tangent**. Enter one of the following: - X point - Y point - Section length
	ARCO	**Circular arc.** Enter end point and radius, then select arc rotation: -  clockwise -  anticlockwise The minimum radius for the machine is also shown
	ARCO 3 PUNTI	**3 Point circular arc.** Enter intermediary and end points.
	TANGENT ARC	**Tangent circular arc.** The arc radius and curve are automatically calculated to give a tangent.

	TRANSFER	**Movement with raised head.** Enter a destination where cutting is restarted. The section drawn for transfer is not cut.

If an undersquare is entered by mistake, it is automatically corrected.

Profiling with straight lengths

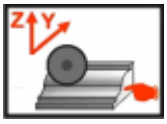
Use only the Y-Z plane to draw and program profiles with straight lengths

- with a vertical disk 
- with a horizontal disk 

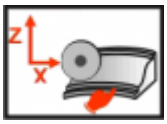
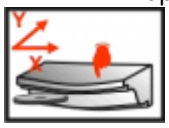
Never draw profiles on other planes.

Profiles with curved lengths

First draw and program the profile with a straight length on Y-Z plane

- with a vertical disk 
- with a horizontal disk 

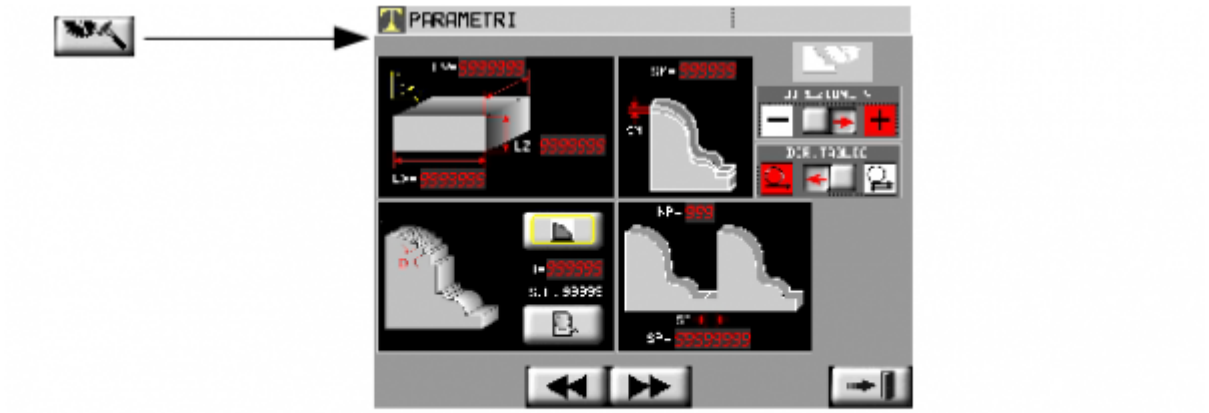
Then draw the length cutting:

- on X-Z plane for a vertical disk  oppure
- on X-Y plane for a horizontal disk 

To change plane just touch the drawing.

Parameter programming

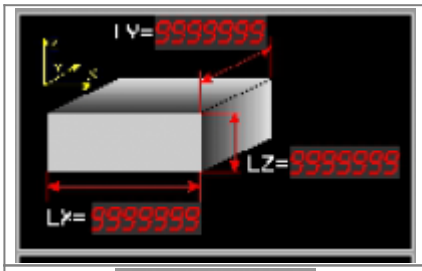
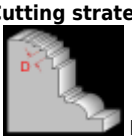
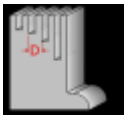
Open the Parameters Menu by pressing  in the Profile work cycle programming menu.

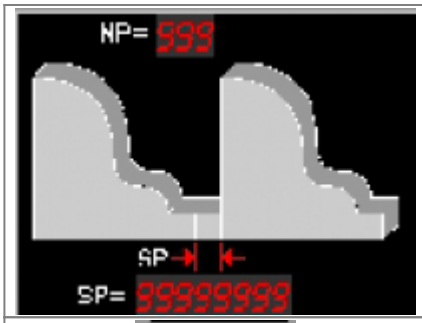
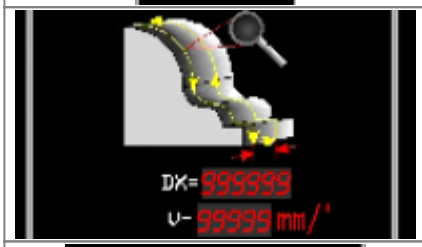
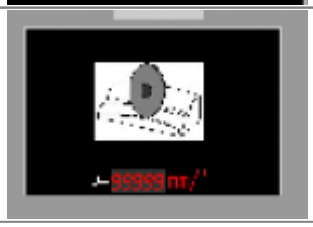


Parametri di spatolatura dei profili con tagli rettilinei

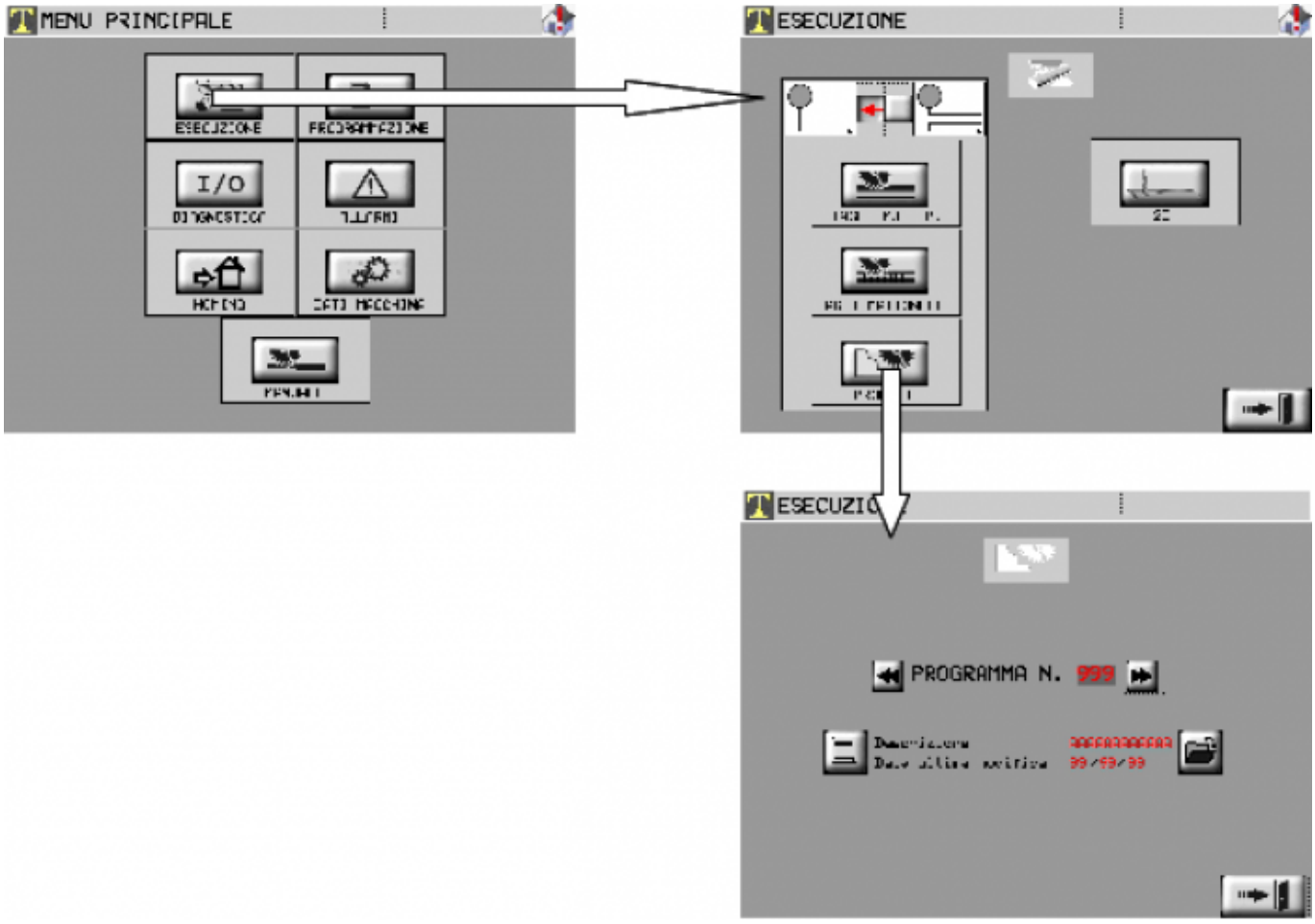
Parametri con tagli curvi

Smoothing is NOT possible on curved lengths

	Block dimensions. The block is shown as a rectangle in the drawing window to check the block size.
	**Offset**. Cuts leave an extra layer for finishing.
	**Cutting strategy.** Cut spacing options: *  D spacing along profile perimeter *  D spacing along Y axis.
	**Preview.** Press to see cut preview .

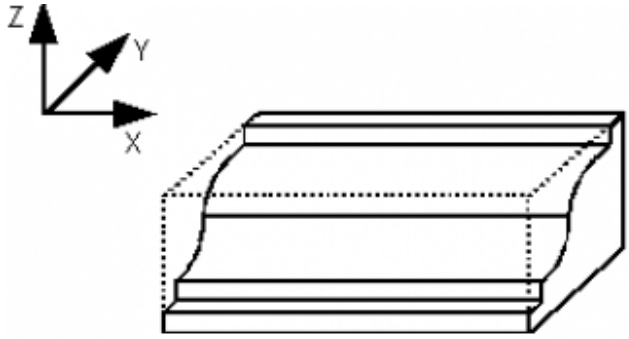
	**Repeat.** The profile is repeated NP times at SP gap between one another.
	Y axis direction in automatic cycle.
	 Cutting only in cut direction with empty return stroke  Cutting in both directions. Y axis advances in both direcitons.
	Smoothing mode selector: OFF : smoothing off CONTINUOUS: automatic smoothing after profiling. ONLY: smoothing only, without profiling.
	DX: spacing between two smoothing strokes. V: maximum interpolation speed between Y and Z axes, during smoothing.
	Vertical offset of smoothing stroke. A negative setting lowers the strokes.
	Curved lengths: enter the maximum cutting speed.

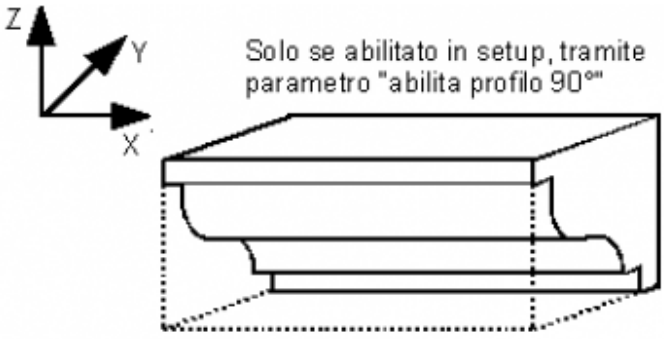
Profiling work programs

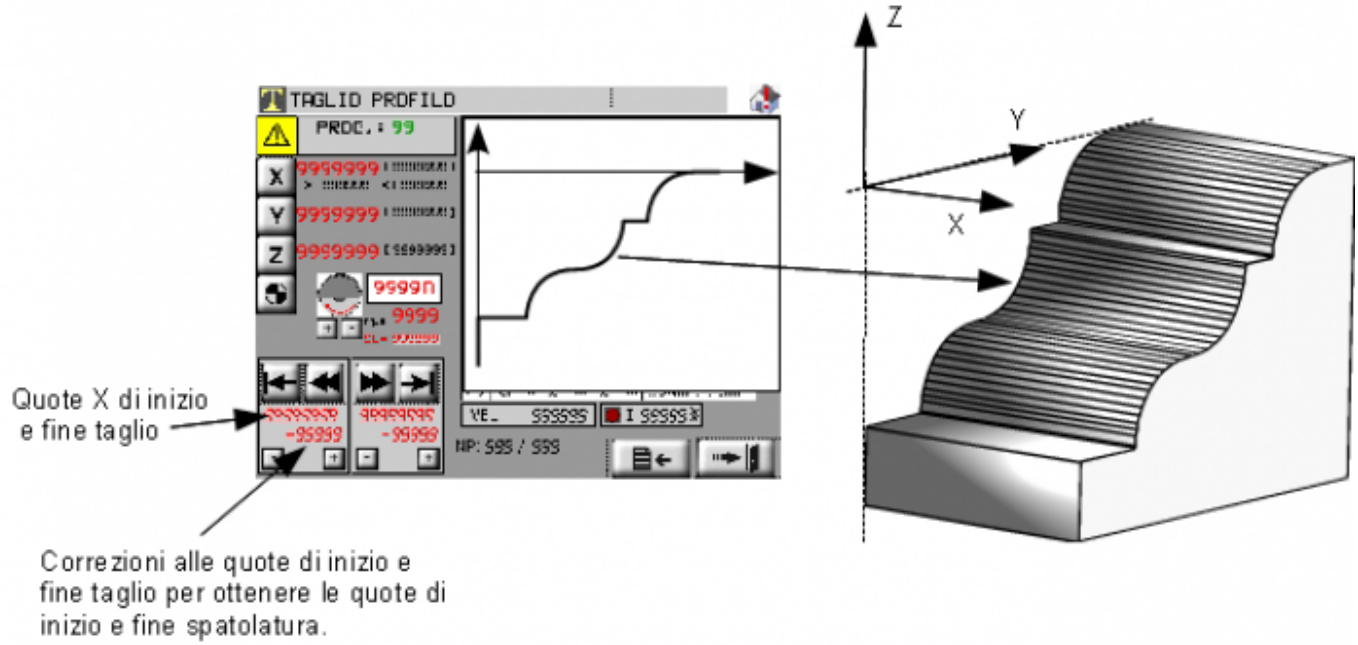


Open a work program to access one of the following screens.

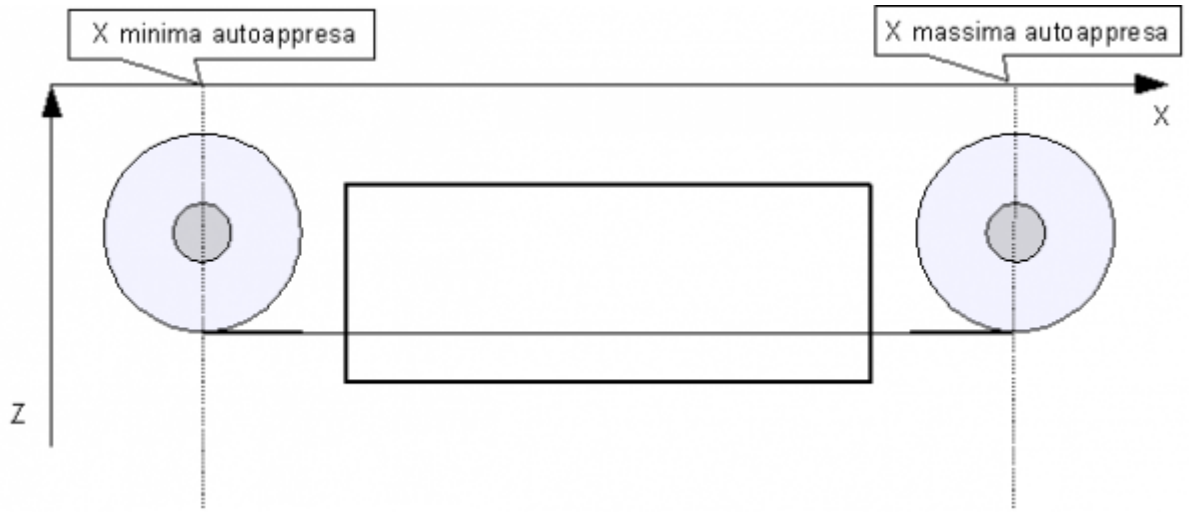
Profiling with straight lengths





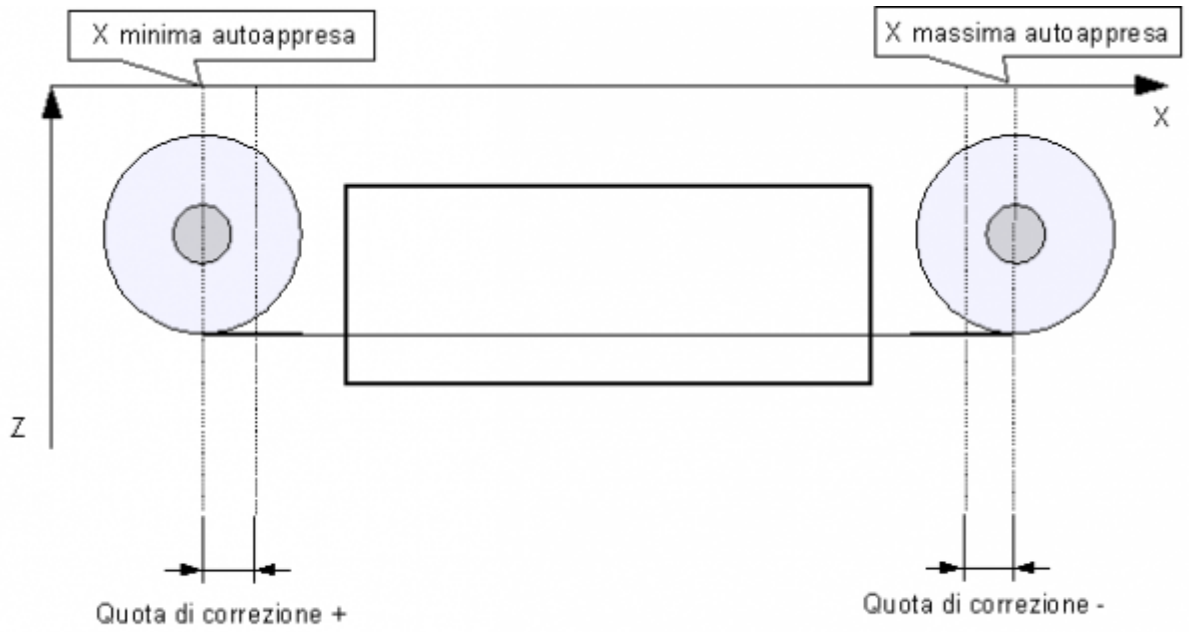


Press Start and the profile roughing cycle begins the sequence of single cuts or series of multiple cuts. The X axis always moves between the two self-learned points (outside the block size).

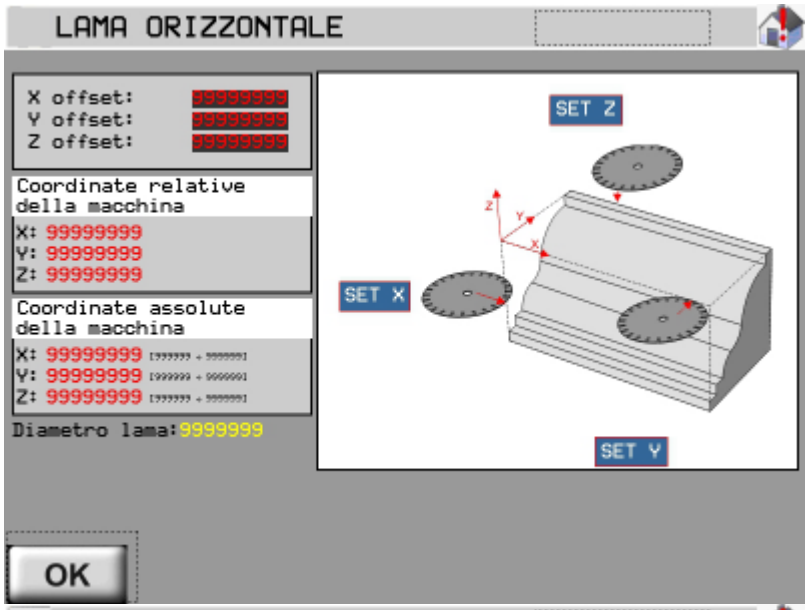


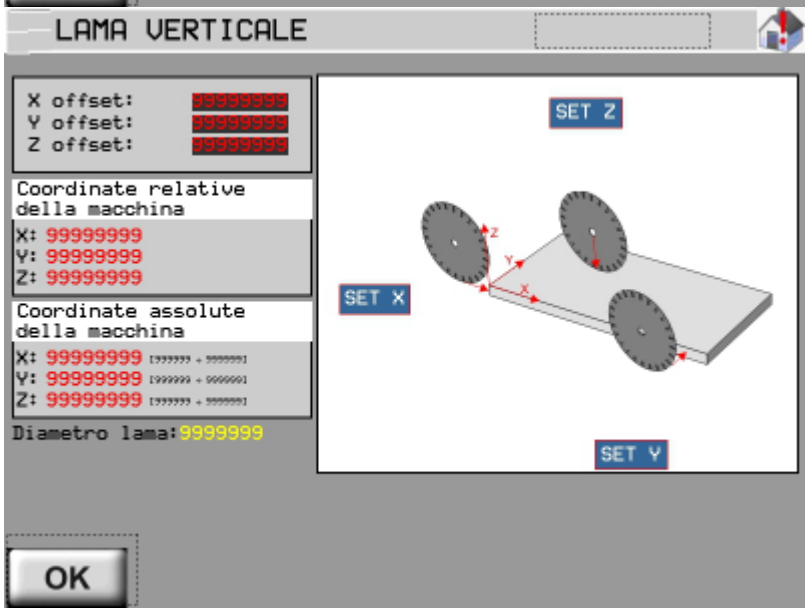
If set to CONTINUOUS the smoothing now starts (or OFF = no finishing, ONLY = direct finishing, no roughing).

In Finishing the disk goes to **self-learned minimum X point + correction** and makes a series of YZ interpolated cut strokes. Finishing ends when it reaches the **self-learned maximum X point - correction**:

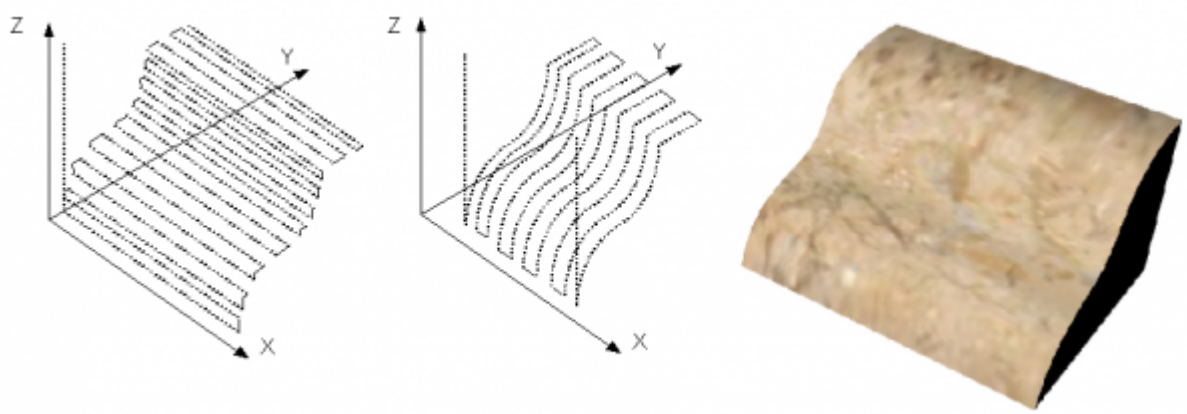


N.B. Press Start and the automatic cycle will enter the Axis zero-setting procedure on the block.

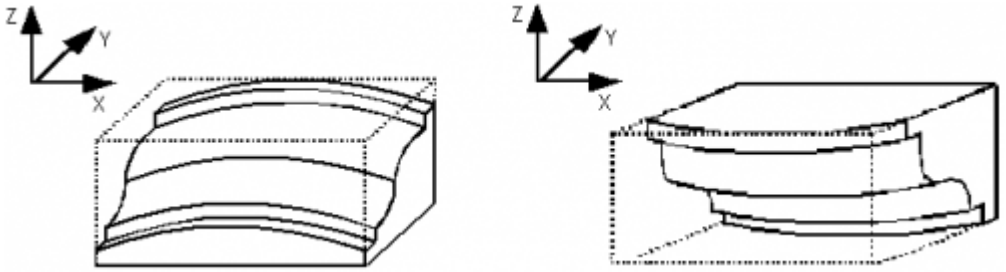


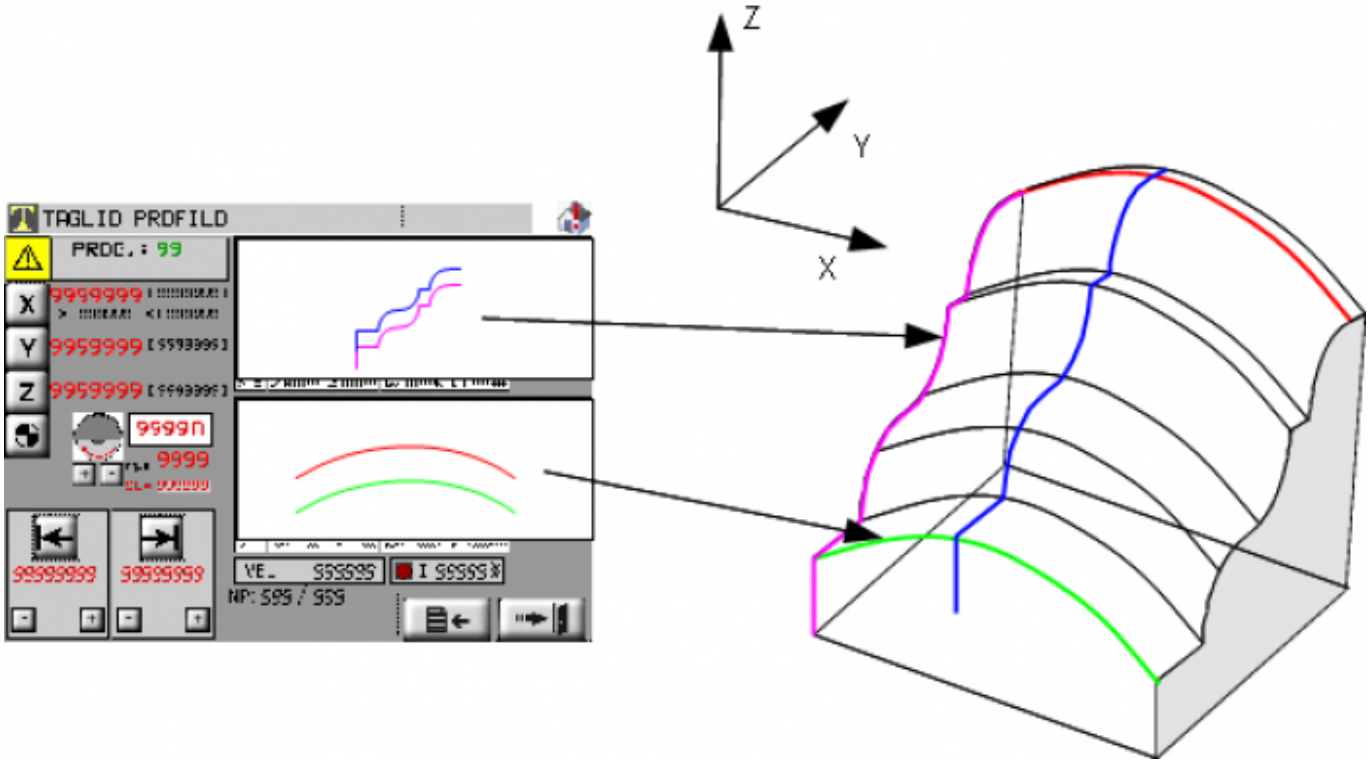


Screen showing how to position the blade **flush against the block** before the Z and Y axis zero-setting.

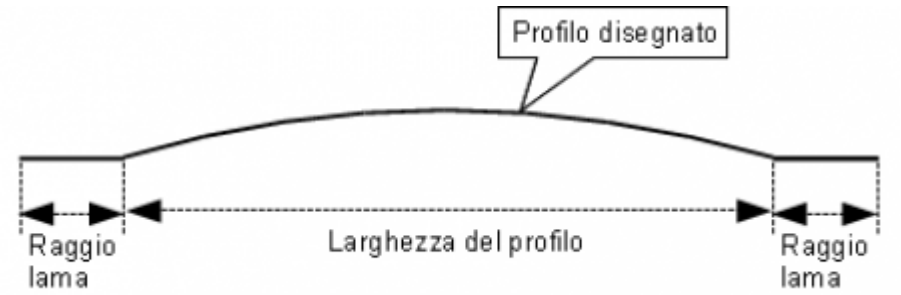


Profiling with curved lengths

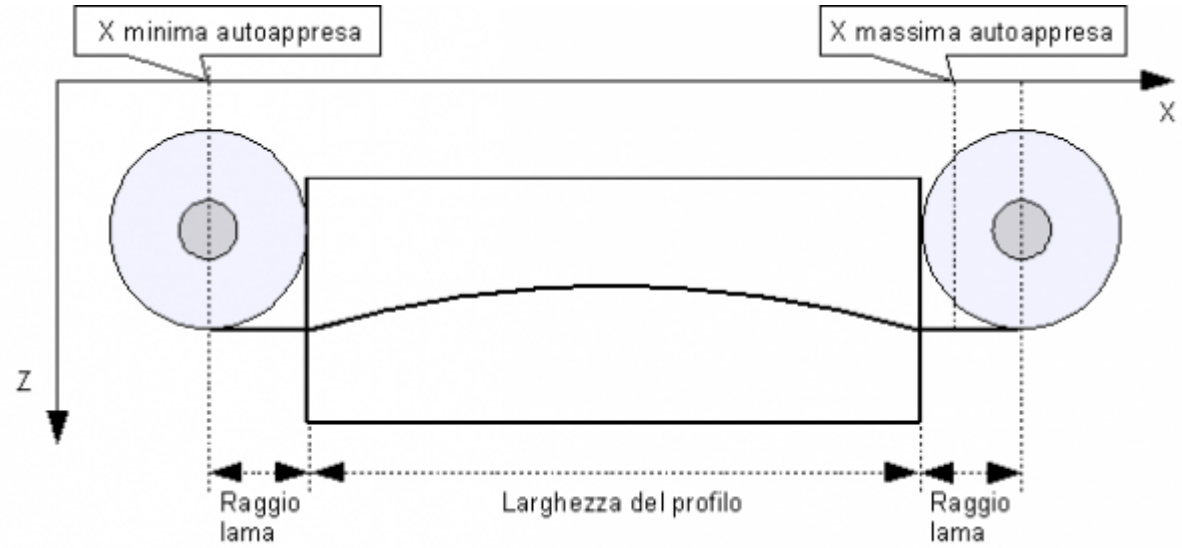




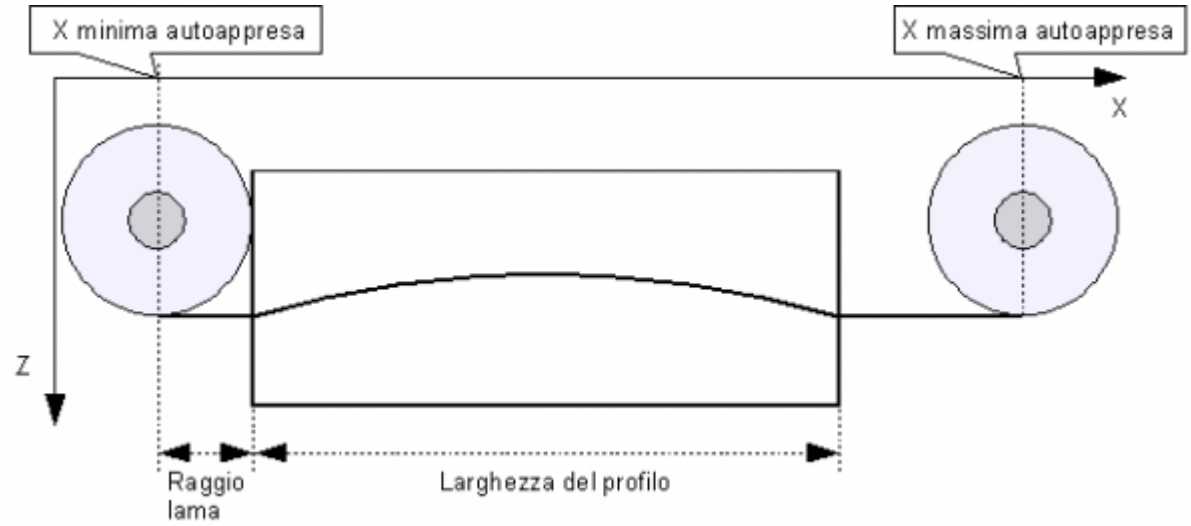
The profiling roughing is obtained by the pre-set single strokes or series of multiple strokes. The X axis moves between the two self-learned points (outside the block size) adding two horizontal sections equal to the disk radius before and after the profile drawing.



Two cases are possible:



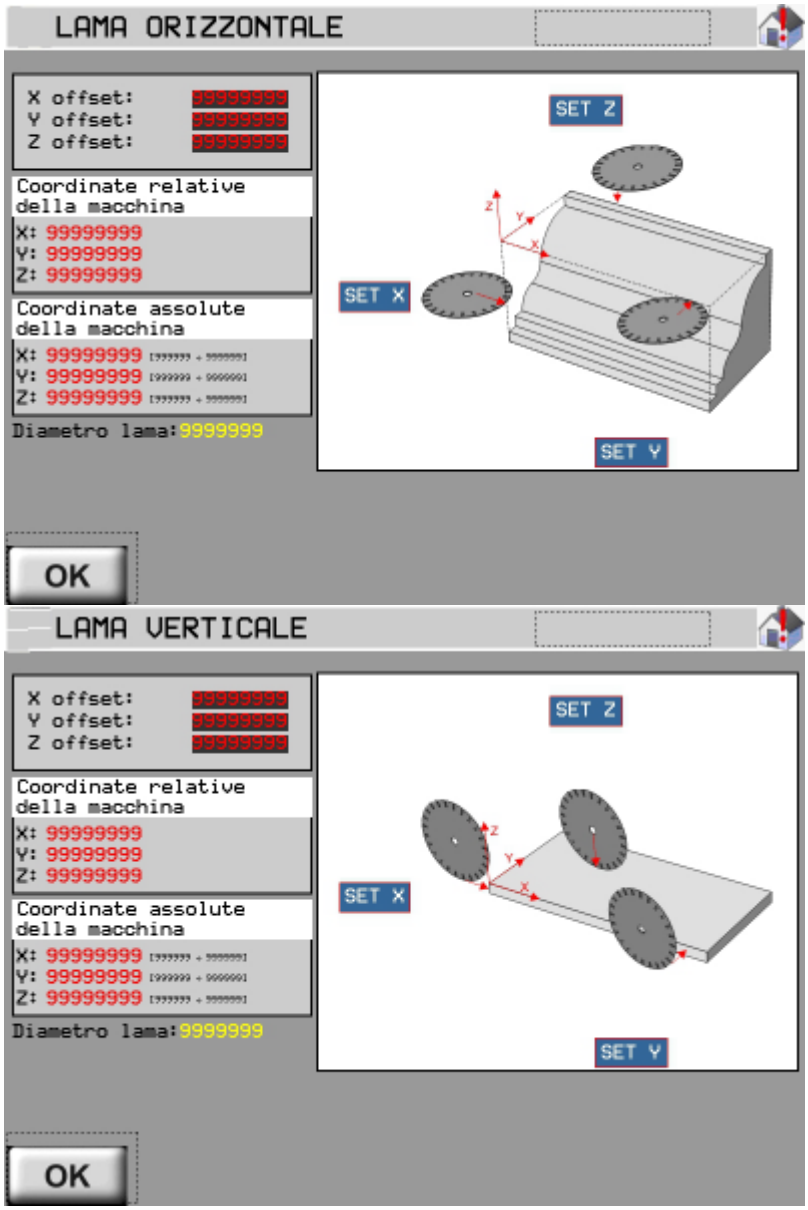
Profile width + disk diameter is greater than the two self-learned X points. As shown, the cut starts at the self-learned minimum point and is completed when it passes the self-learned maximum X point.



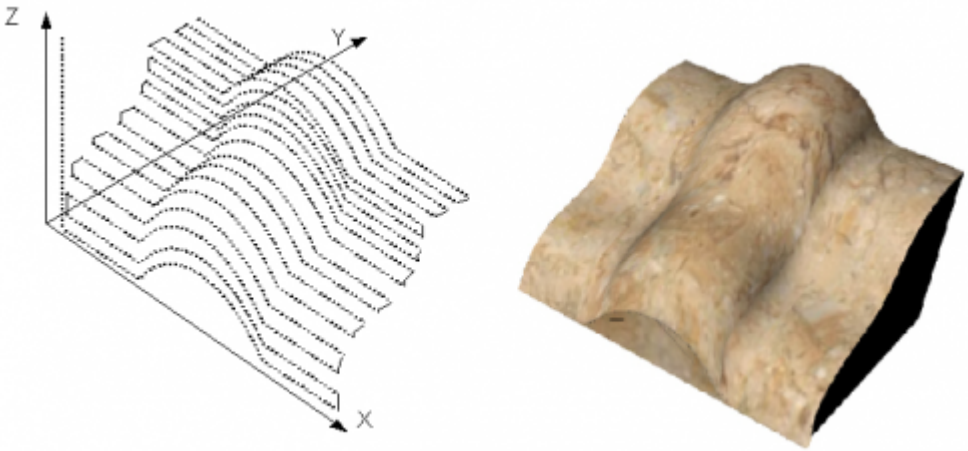
Profile width + blade diameter is less than the two self-learned X points. The cut starts at self-learned minimum point. The end point is extended and adjusted to the self-learned maximum X point.

N.B. the smoothing program cycle is not available for curved length profile work cycles.

N.B. At the start of the automatic cycle, the axis zero-set procedure is entered.

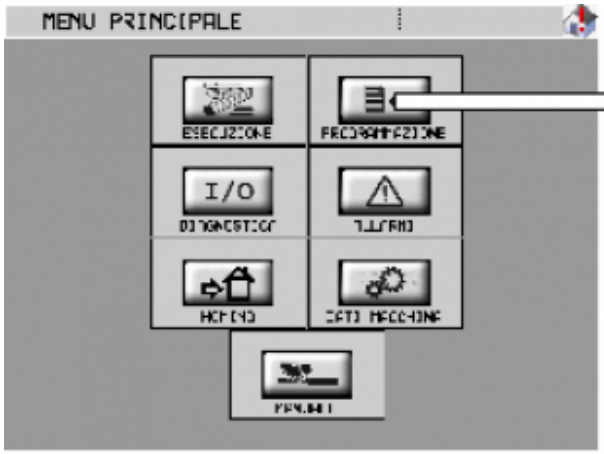


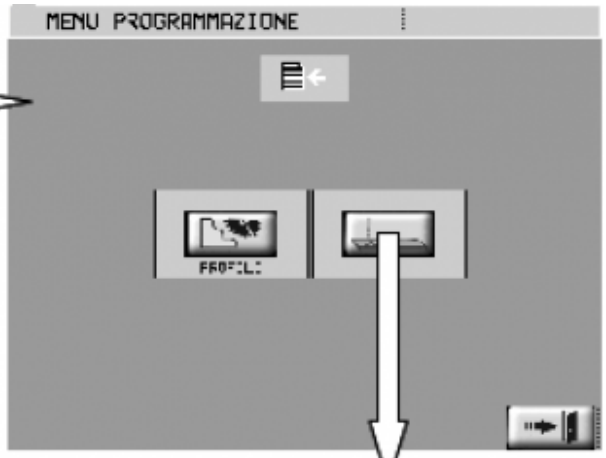
How to position the blade flush against the block before the Z and Y axis zero-setting.



2D geometries: programming and work cycles

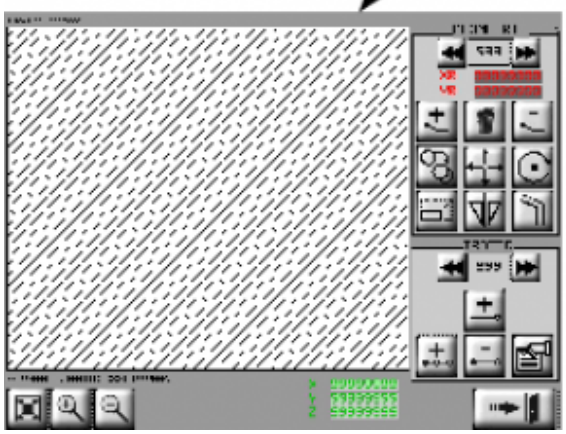
Programming: 2D geometries



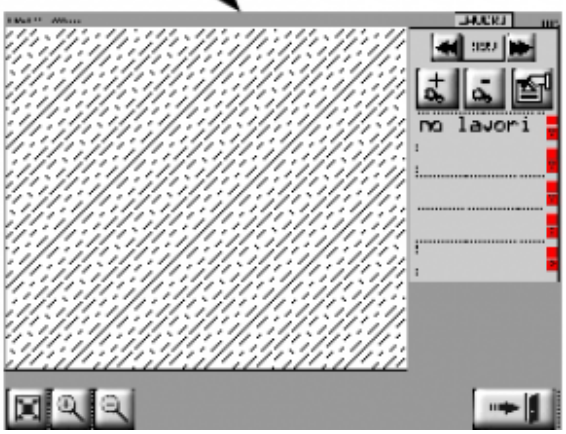


Selezione del programma da aprire

Editor geometrie

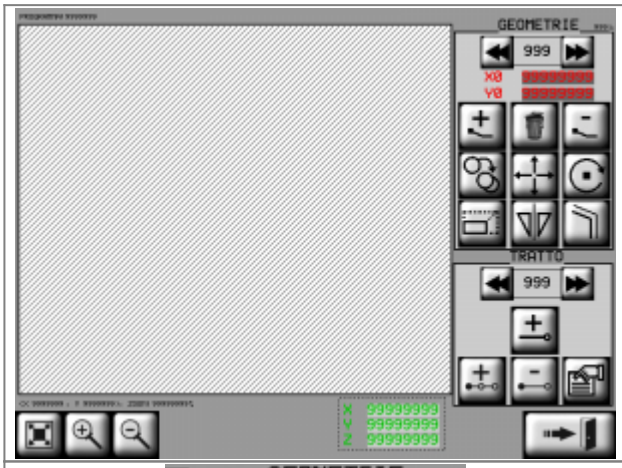


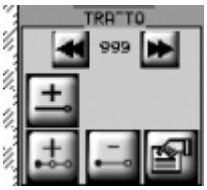
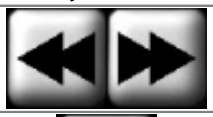
Lista lavorazioni



2D geometry Editor

2D geometry: A sequence of sections that create open or closed geometries. Several geometries can be included in a 2D drawing.

	2D geometry drawing window. The drawing must be in the positive X and Y area (see figure). The 2D geometry editor description will often refer to the Profile Editor section, since many functions are similar.
	Select existing geometry, with scroll arrows. The current geometry is black. The other geometries are yellow.
	geometry start co-ordinates, marked by a black square on the drawing.
	2D geometry tools
	**Create a new geometry.** Enter the start point of a geometry at (0, 0) co-ordinates.
	**Delete the selected geometry.** The associated work cycle is also deleted.
	**Delete all geometries.** The associated work cycles are also deleted.
	**Copy geometry.** The geometry is copied to the position settings.
	**Move geometry.** The geometry is moved to the position settings.
	**Turn geometry.** The geometry is turned by the angle setting. The geometry turns around its start point.
	**Scale geometry.** The geometry size is changed by the multiplier setting.
	**Mirror.** The geometry is mirrored on a vertical or horizontal axis.
	**Parallel.** A new geometry is created in parallel to the original geometry, inside or outside, with the set offset.

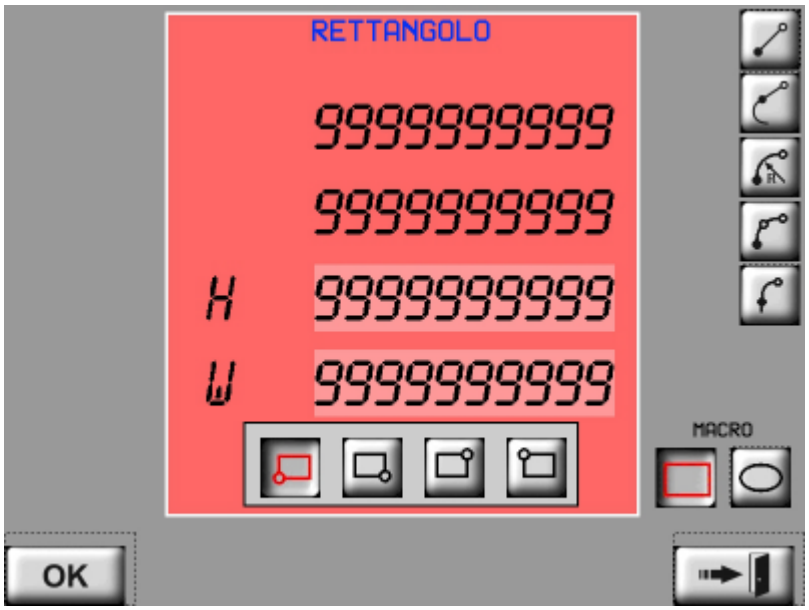
<table>
<tr><td rowspan="6"> 
</td><td colspan="2">geometry section tools.</td></tr>
<tr><td>  </td><td>Section scroll and select.</td></tr>
<tr><td>  </td><td>Add a new section to end.</td></tr>
<tr><td>  </td><td>Insert a new section.</td></tr>
<tr><td>  </td><td>Delete the section.</td></tr>
<tr><td>  </td><td>Open the section properties and change properties.</td></tr>
<tr><td>  </td><td colspan="2">Adapt whole profile to the drawing box.</td></tr>
<tr><td>  </td><td colspan="2">Zoom-in and e Zoom-out.</td></tr>
</table>

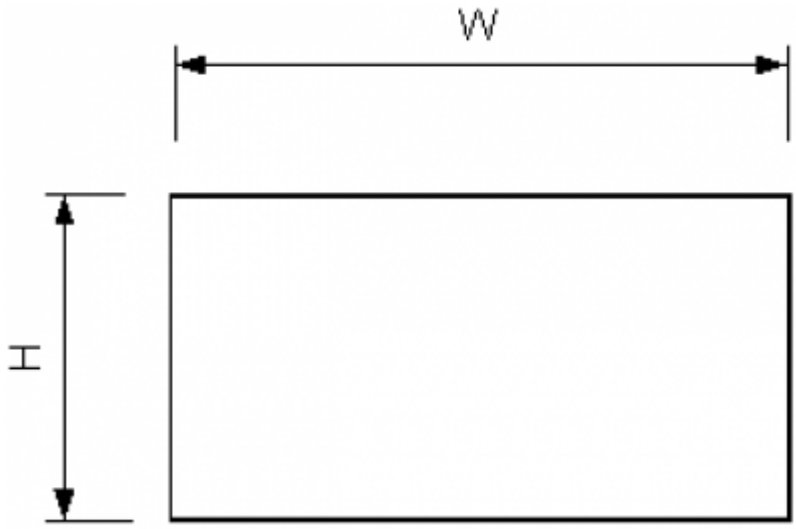
To draw a geometry, create a series of sections, by pressing  .

See Profile Editor for the section types.

The 2D geometry Editor has all the tools in Profile Editor (except Transfer), plus the following:

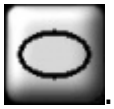
Rectangle macro tool  **.**

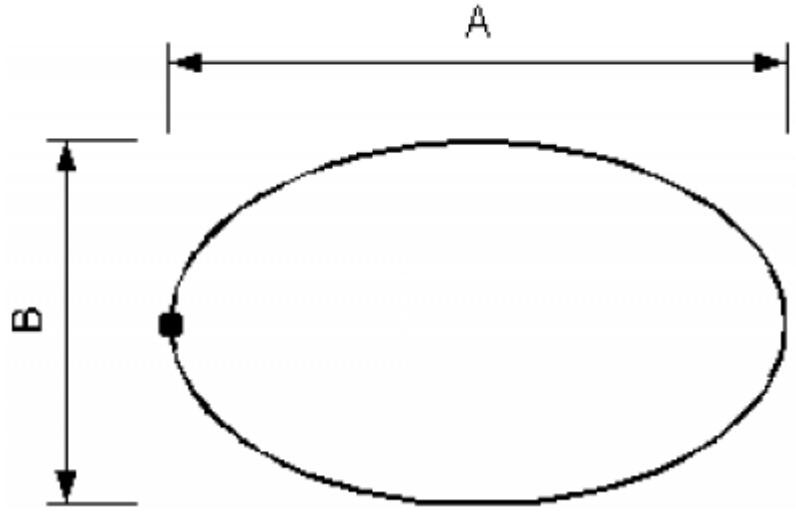




The rectangle macro: enter length (H) and width (W) and view the start point co-ordinates of the rectangle.

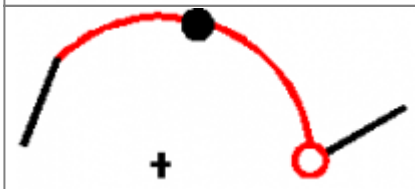
Use  ,  ,  e  to set where the rectangle drawing starts (X,Y).

Elipse macro tool  **.**



The elipse macro: enter the width (A) and length (B), view the start point co-ordinates of the elipse.

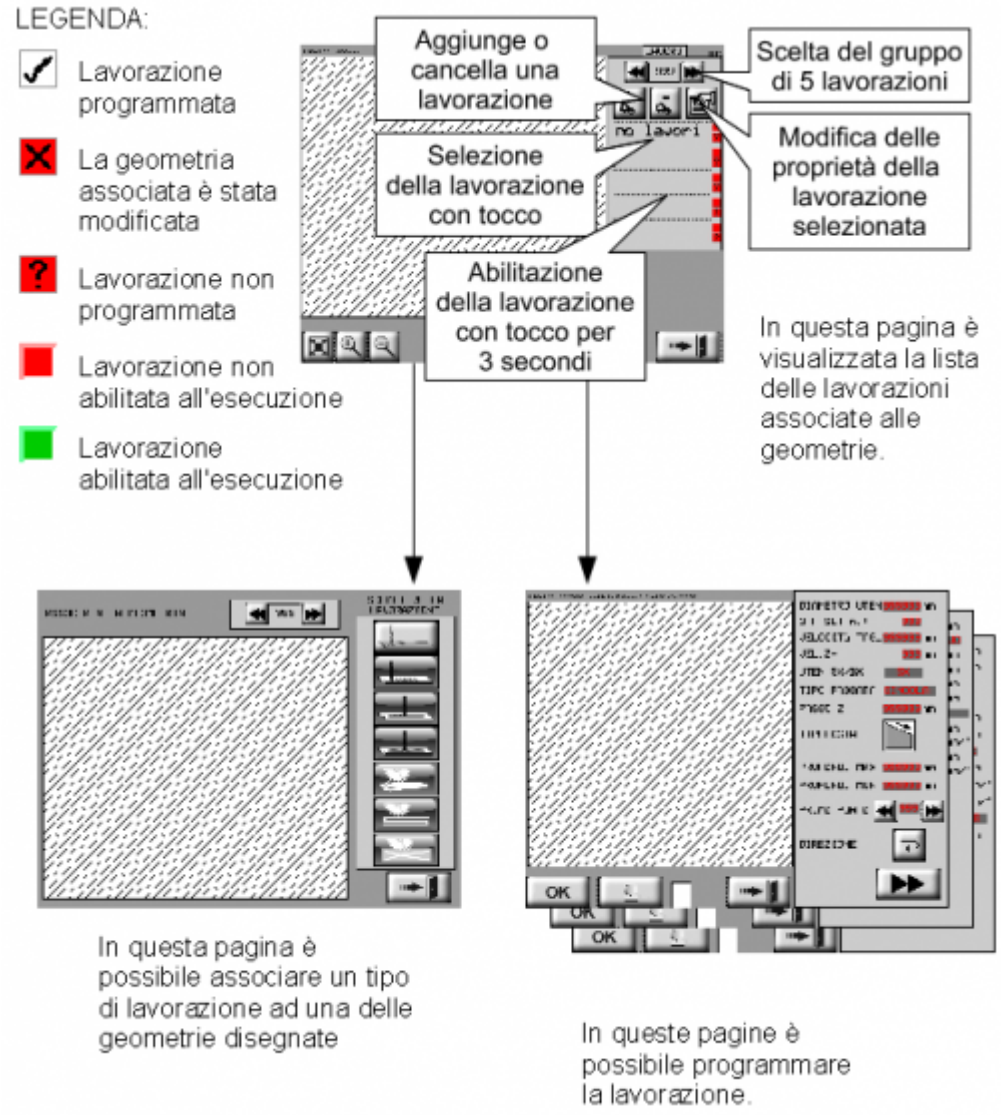
Drawing Symbols

Symbol	Meaning
	: section end the selected section is red
	: section end in a 3 point arc the intermediary point is also marked :intermediary point
	: 2D geometry start point

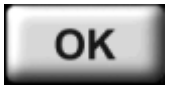
Work Cycle menu

Draw the 2D geometries and attribute one or more work cycles to each of them. The sequence of work cycles make up the work program. The work cycles are carried out in the order on the list.

Press  to open the 2D geometry work cycle menu screen.



In ogni pagina di programmazione delle lavorazioni sono presenti i seguenti tasti:

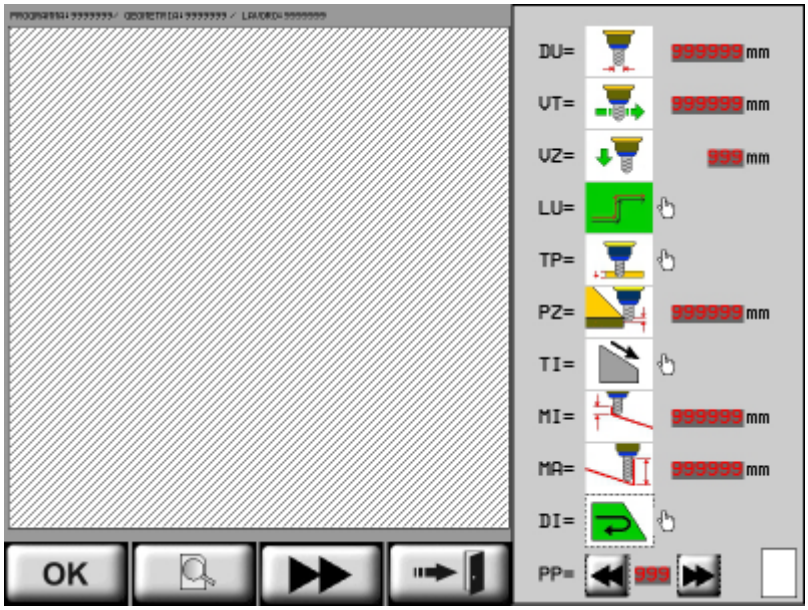


confirm settings and changes.


preview of work cycle.


exit without confirming changes (all changes are lost).

Cut work cycle parameters

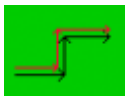


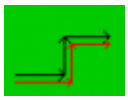
DU (Tool Diameter): Set the tool diameter for the work cycle.

VT (Cutting Speed): Set a speed for the work cycle.

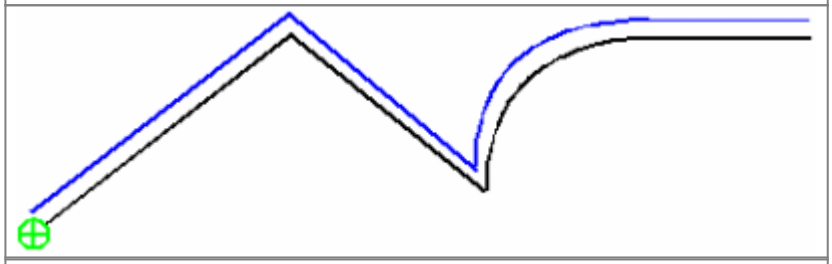
VZ (Z- Speed): Set a Z- direction, tool downstroke speed.

LU (Rh/Lh Tool): The tool position on the geometry.

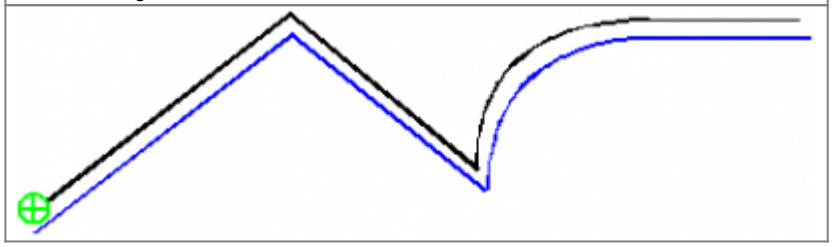

= tool to the left of geometry


= tool to the right of geometry.

Tool to the left



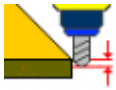
Tool to the right



TP(Cut Type):

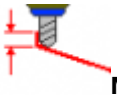
 SINGLE: the Z depth is cut in a single tool stroke.

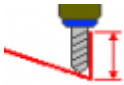
 MULTIPLE: the Z depth is cut in a series of multiple strokes with increasing depths.

 }**PZ(Z Step):** Z depth increase between two cut strokes when Cut Type = Multiple.

TI (Cut Angle): Inclined cutting depth

-  depth increases with increasing X.
-  depth increases with decreasing X.
-  depth increases with decreasing Y.
-  depth increases with increasing Y.

 **MI(Min Depth):** minimum depth of the recess.

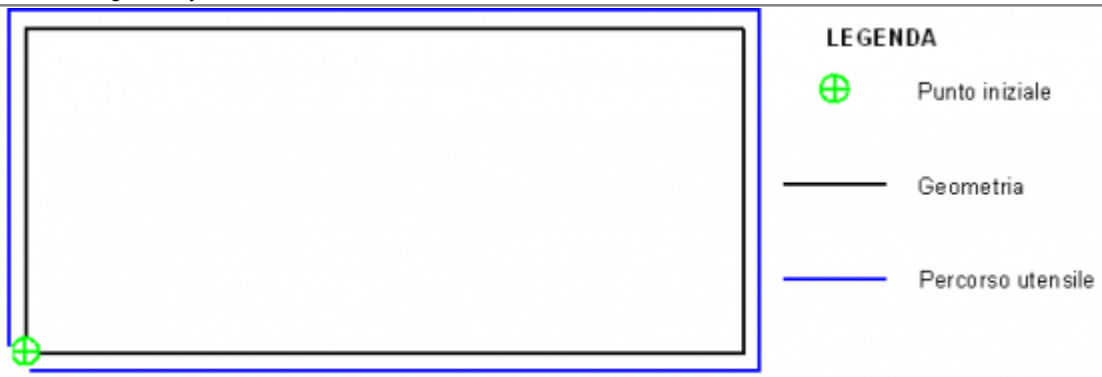
 **MA(Max Depth):** maximum depth of the recess.

If MI and MA are the same, the recess is cut with a level bottom. In all cases cutting can be Single or Multiple as set in TP.

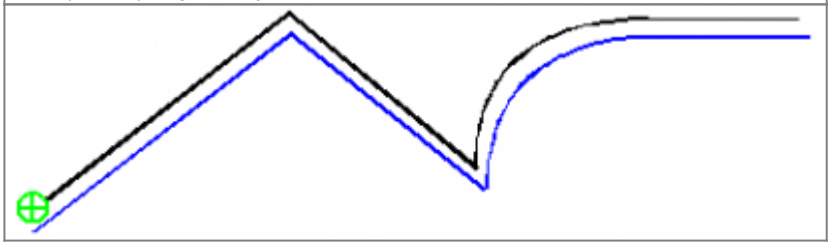
 **DI(Direction):** Tool direction for closed geometries. This gives a real direction change (clockwise/anticlockwise).

PP(Start Point): Entry point of work cycle start.

Example of closed geometry



Example of open geometry



N.B. The start point of open geometries can only be one of the two ends of the geometry.

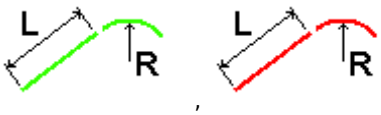
ORARIO

LEGENDA

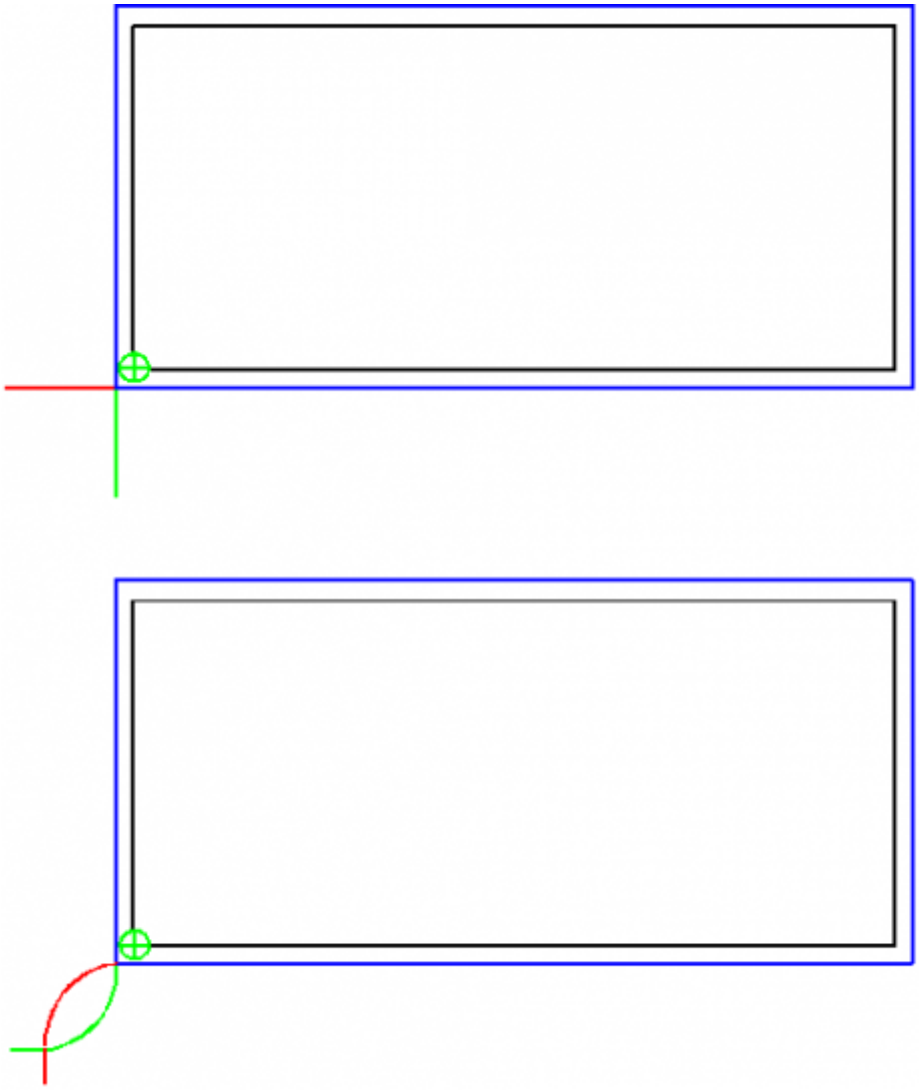
Direzione

ANTIORARIO

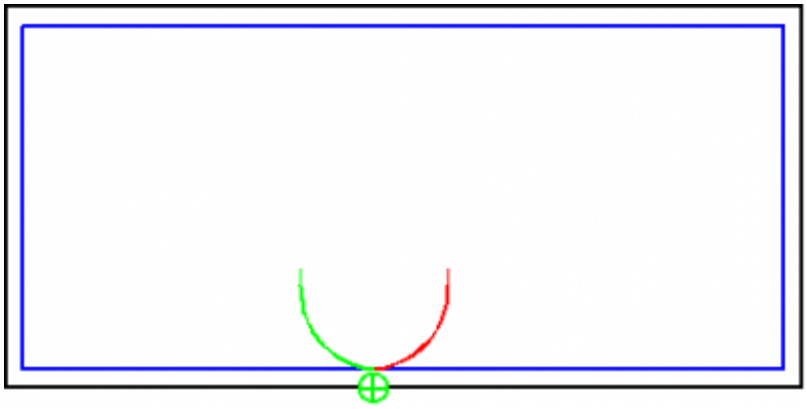
Function not used for open geometries.



Entry/Exit: Extra entry/exit sections to best couple the work cycle to the tool path. Straight sections (L), can have a radius arc (R). (e.g. 1 shows only straights, e.g. 2 shows straights and arcs).



N.B.: A closed geometry and inside tool cutting cannot have the start point on the corners (see diagram).



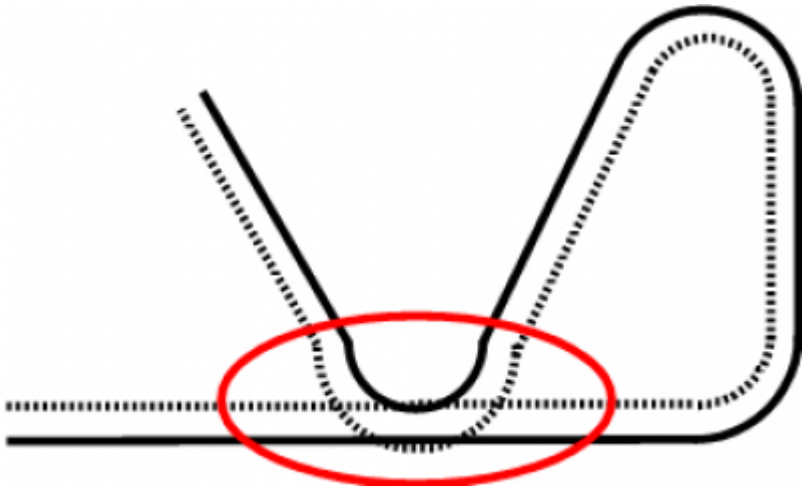
Tool compensation limits

The tool diameter compensation in 2D geometry work cycles determines the path a tool of a given diameter has to follow to obtain the set piece.

When the tool diameter has been set in the 2D work cycle, a preview of the tool path is drawn in blue. The operater must check the tool path is correct.

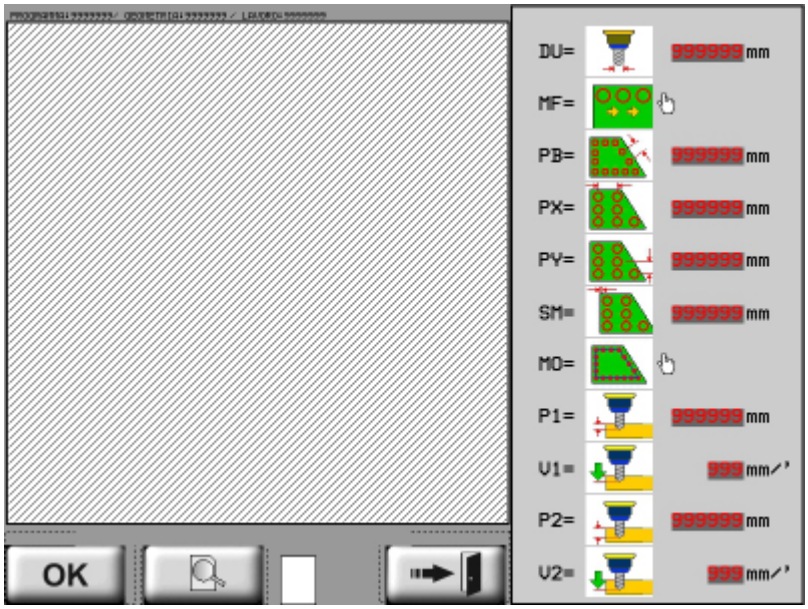
This check must verify the feasibility of paths in the following extreme cases:

Tool path completes on itself:



In this case a tool compensation is NOT signalled. These extreme cases will be solved in future software developments.

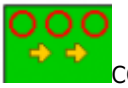
Router work cycle parameters

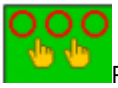


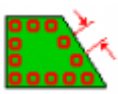
The inside area of a closed geometry is emptied by drilling. This work cycle calculates the hole positions by the following parameters:

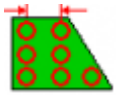
 **DU(Tool Diameter):** Tool diameter for the work cycle.

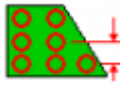
MF(Drill Mode):

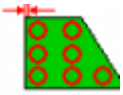
 CONTINUOUS: all holes are drilled without waiting for an operator input

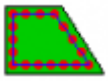
 PAUSE: the operator gives a START input before each hole is drilled

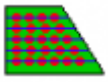
 **PB(Edge Spacing):** hole spacing around the edge for EDGE, EDGE+IN HOR or EDGE+IN VER.

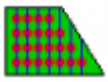
 **PX(X Spacing):** hole spacing on X axis for IN HOR, IN VER, EDGE+IN HOR or EDGE+IN VER

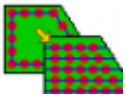
 **PY(Passo Y):** hole spacing on Y axis for IN HOR, IN VER, EDGE+IN HOR or EDGE+IN VER

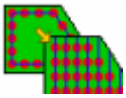
 **SM(Edge Offset):** hole to geometry edge space **MO(Mode):**

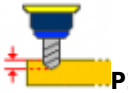
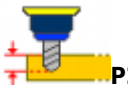
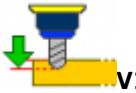
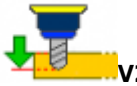
 EDGE: a series of holes on inside edge of geometry

 IN HOR: horizontal rows of holes inside the geometry

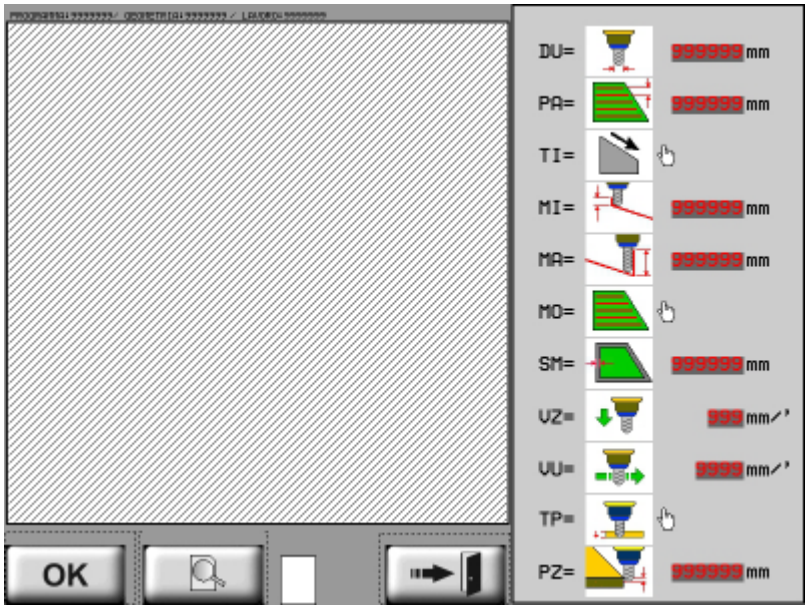
 IN VER: vertical columns of holes inside the geometry

 EDGE+IN HOR:holes on inside edge and then horizontal rows inside the geometry

 EDGE+IN VER: holes on inside edge and then horizontal rows inside the geometry

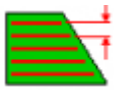
 **P1(Depth 1)**,  **P2(Depth 2)**,  **V1(Drilling Speed 1)**,  **V2(Drilling Speed 2)**\\the hole is first drilled to depth 1 at speed 1, then to depth 2 with a gradual increase to speed 2

Recess work cycle parameters



The inside area of a frame is milled to produce a recess. The recess bottom can be inclined in a set direction.

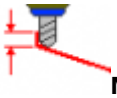
 **DU(Tool Diameter):** tool diameter for the work cycle

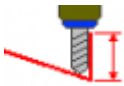
 **PA(Mill Spacing):** spacing between two milling strokes. In MO (Mode) settings:

- HORIZONTAL: spacing on Y axis
- VERTICAL: spacing on X axis
- SPIRAL: spacing on concentric spirals.

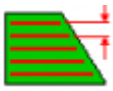
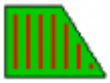
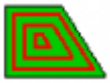
TI(Type): type of incline for the recess bottom.

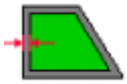
-  depth increases with increasing X.
-  depth increases with decreasing X.
-  depth increases with decreasing Y.
-  depth increases with increasing Y.

 **MI(Min Depth):** the minimum recess depth

 **MA(Max Depth):** the maximum recess depth

MO(Mode):

-  HORIZONTAL: Milling along X axis
-  VERTICAL: Milling along Y axis
-  SPIRAL: Milling in concentric spirals.

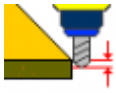
 **SM(Offset):** extra material on inside edge of geometry

 **VZ(Z- Speed):** Tool speed in Z- direction (downward).

 **VU(Tool Speed):**Speed for work cycle. **TP(Mill Type):**

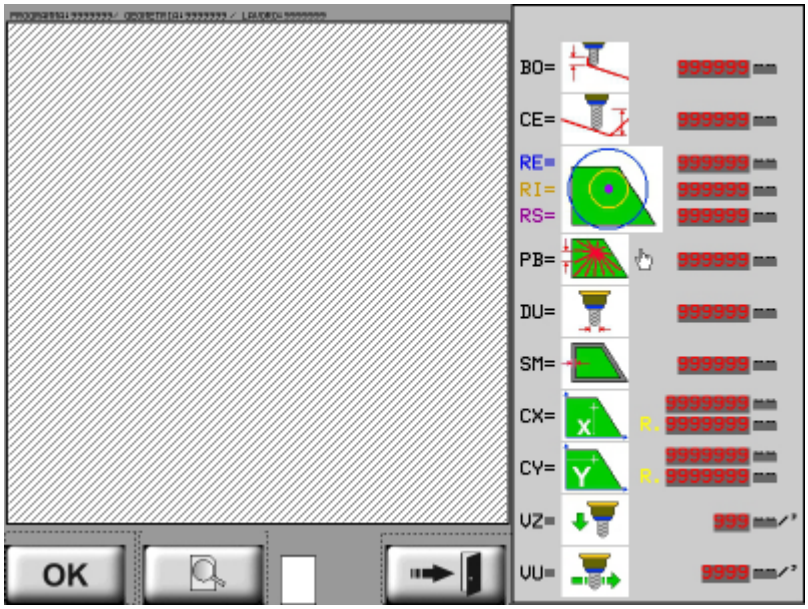
-  SINGLE: depth obtained in single tool stroke
-  MULTIPLE: depth obtained by a series of multiple strokes at increasing depths.

The bottom incline is obtained with both mill types.



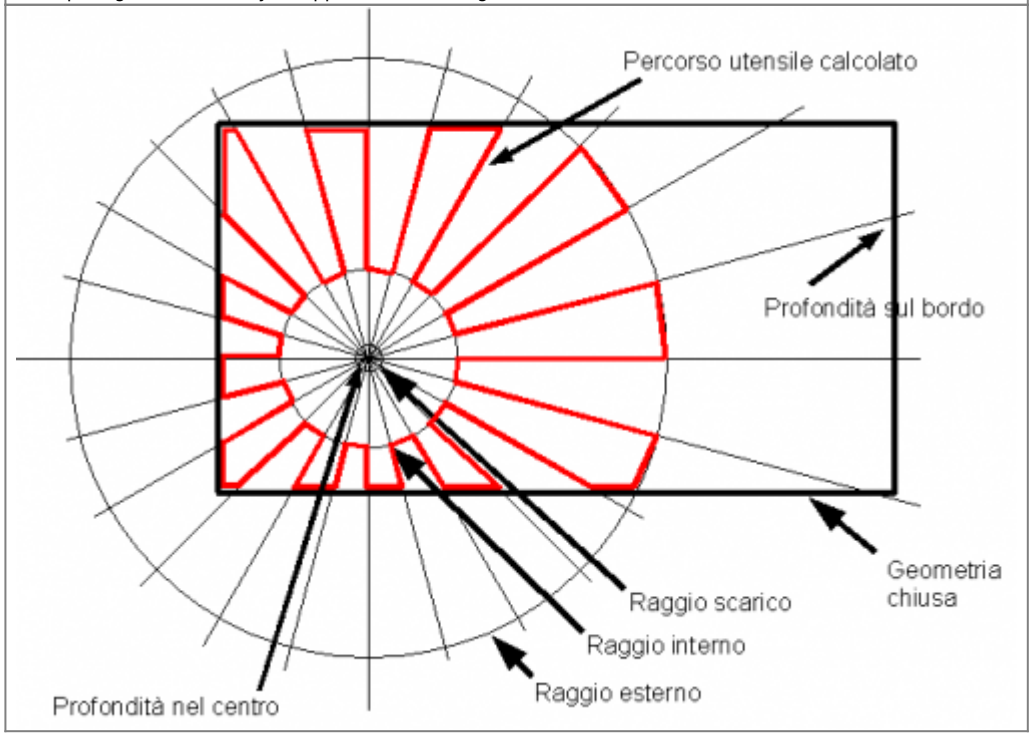
Z Step: Z depth increase for each stroke in MULTIPLE.

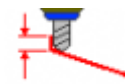
Tapering recess work cycle parameters



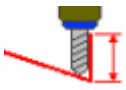
The inside of a 2D geometry is milled to incline the recess bottom towards a specific point, such as a drain hole.

3D tapering recess work cycle applied to a rectangle





BO(Edge Depth): depth of recess inside edge of geometry



CE(Centre Depth): theoretical depth of recess at centre.

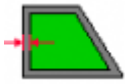
The edge and centre depths determine the incline of each radial milling stroke.

- **RE(Rag. esterno):** outside radius of reference circumference
- **RI(Rag. interno):** inside radius of reference circumference
- **RS(Rag. scarico):** central (drain) radius. Circumference of central depth.

Mode:

-  **PB** = EDGE SPACING. Radial milling is calculated for equal spacing along the edge
-  **PR** = OUR R. SPACING. Radial milling is calculated for equal spacing along the reference circumference .

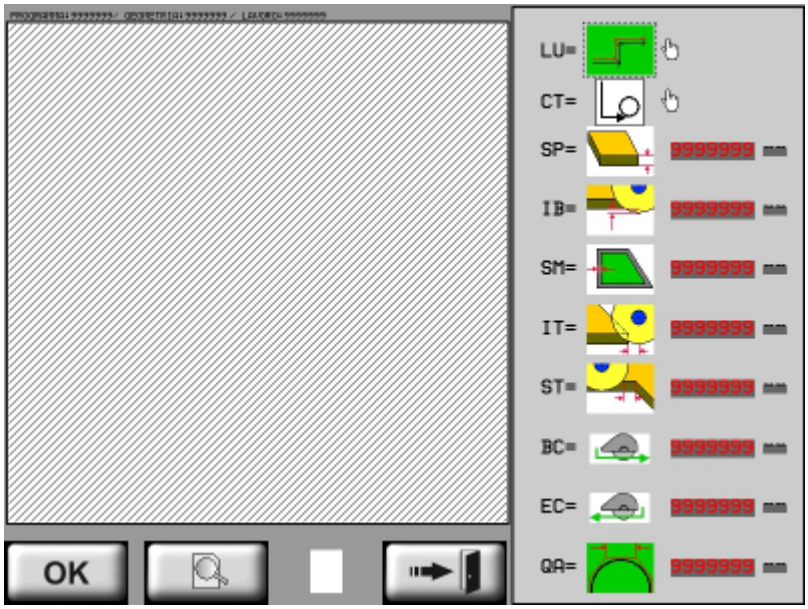
 **DU(Tool Diameter):** Set the tool diameter for the work cycle

 **SM(Offset):** extra material on inside edge of the geometry

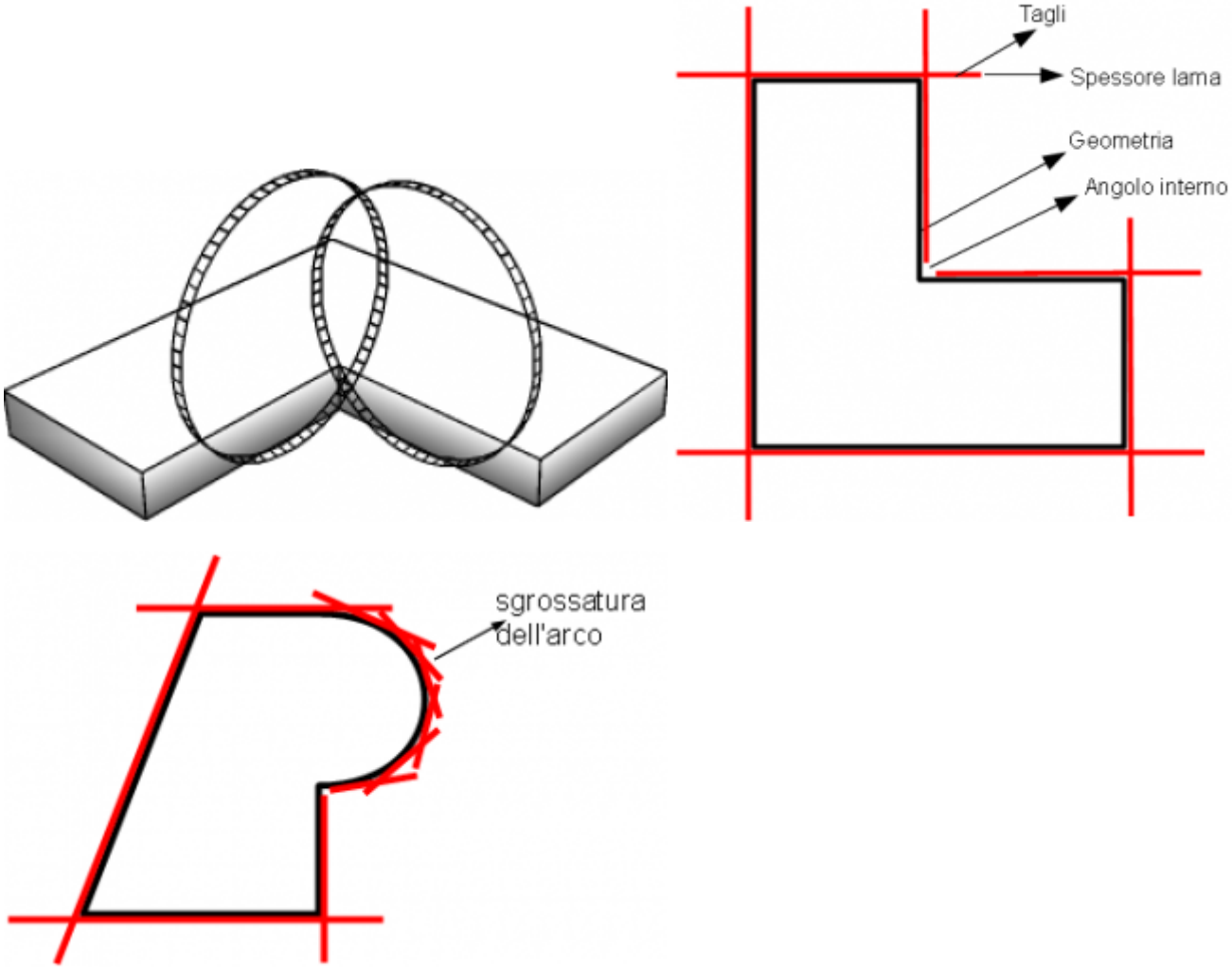
 **CX and CY (Centre (X, Y)):** X, Y co-ordinates of the incline centre referred to the block zero-setting or to the actual geometry

 **VZ(Z- Speed):** The Z- direction, tool downstroke speed  **VU(Tool Speed):** Set the tool speed for the work cycle

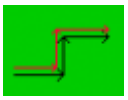
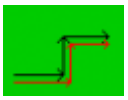
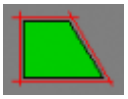
Disk profiling work cycle parameters

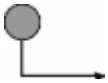


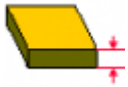
The Disk Profiling work cycle uses a disk to cut a 2D geometry in a slab. The geometry has no limits, can be open or closed, contain straight and arced sections.

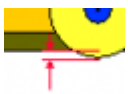


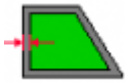
LU(Tool Side) : Disk position on the frame: right or left for open frames, inside or outside for closed frames

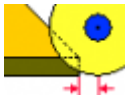
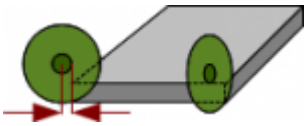
-  /  : left / right
-  /  : outside / inside

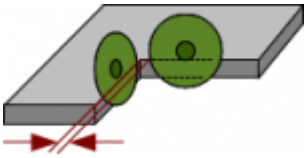
CT(Cut Type):single stroke to obtain the cut depth  a series of multiple strokes, wqith increasing Z depths: 
specified by the parameters *Increase Cut Dir. +* and *Increase Cut Dir. -*

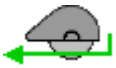
 **SP(Slab Thickness):** Thickness of the slab

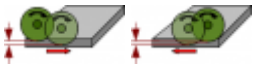
 **IB(Extra Depth):** Extra cut added to slab thickness on underside

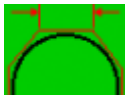
 **SM(Offset):** Extra material left by the tool on inside edge of the geometry

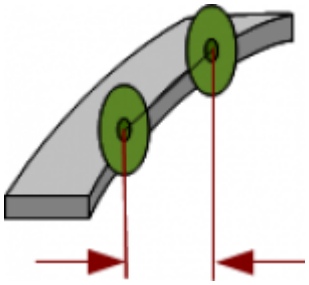
 **IT(Cross Cut):** Extension of angle cuts to ensure separation of the material 

 **ST(Short Cut):**Retraction of angle cuts to avoid cutting the piece 

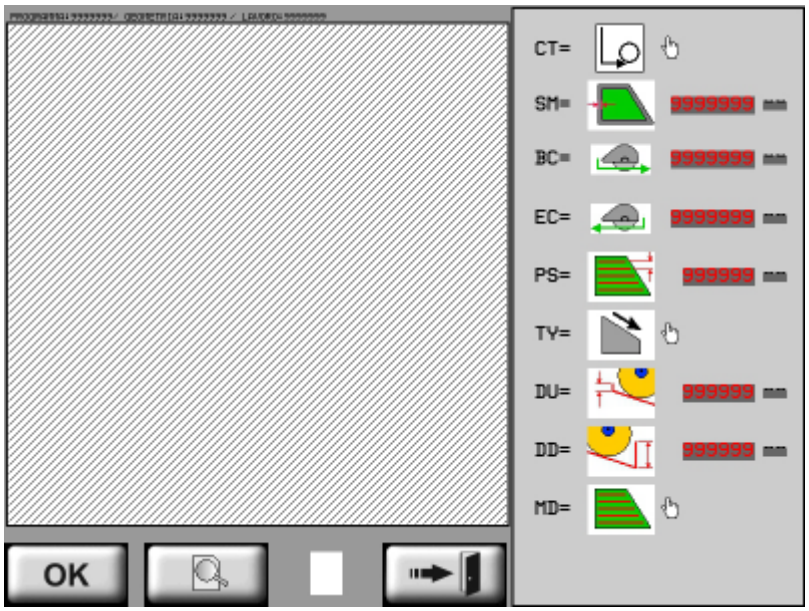
 **BC(Increase Cut Dir. +)**,  **EC(Increase Cut Dir. -)**: Two parameters to set the Z axis increases, BC in the positive cut direction and the same as C axis orientation. EC in the negative cut direction and different to C axis orientation. Only use for *Multiple Cut Type*



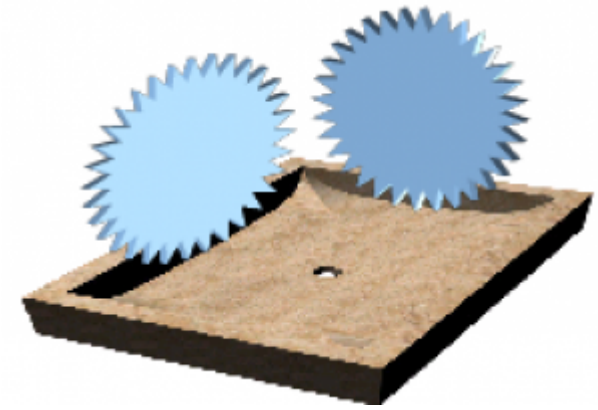
 **QA(Arc Cut Sections)**: Arc cutting parameters. The length of disk movement for each arc section cut. A low setting has more cuts and greater precision.



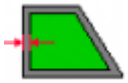
Disk Recess work cycle parameters

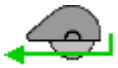


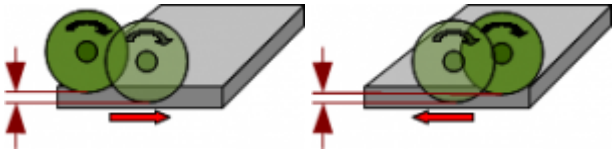
The 2D geometry is emptied by a series of parallel cuts along the X or Y axis. There are no limits on the frame and the bottom can be inclined in a direction parallel to the X or Y axis.

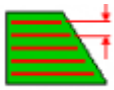


Cut Type:  / single cut or multiple cuts with Z increases set by parameters:*Increase Cut Dir. +* and *Increase Cut Dir. -*.

 **SM(Offset)**: Extra material left by the tool on edge of geometry.

 **BC(Increase Cut Dir. +)**,  **EC(Increase Cut Dir. -)**: Two parameters to set the Z axis increases. BC in the positive cut direciton and the same as C axis orientation. EC in the negative cut direction and different to C axis orientation. Use only for *Multiple Cut Type*.



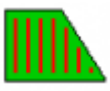
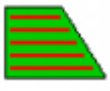
 **PS(Spacing):** Vertical/horizontal spacing between cuts. **TI(Incline Type):** how the recess bottom is inclined.

-  depth increases with increasing X.
-  depth increases with decreasing X.
-  depth increases with decreasing Y.
-  depth increases with increasing Y.

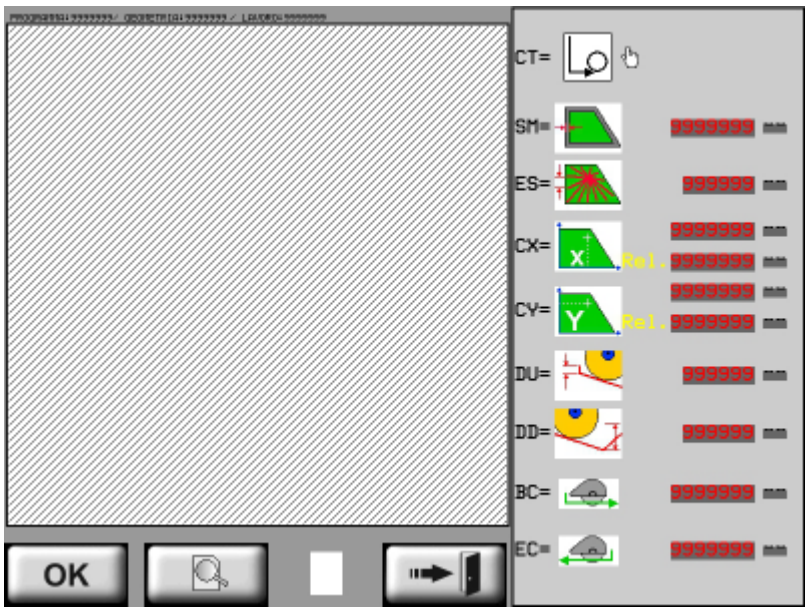
 **DD(Max Depth):** maximum depth of the recess.

 **DU(Min Depth):** minimum depth of the recess.

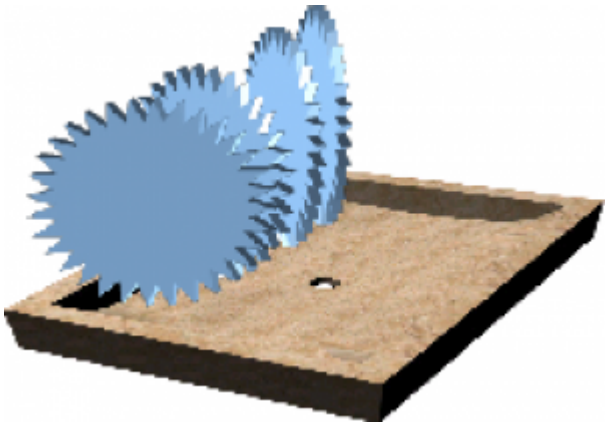
MD(Mode): Cut stroke direction

-  Vertical
-  Horizontal.

Disk Tapering Recess work cycle parameters



The bottom of the 2D geometry is The bottom of a frame is inclined towards a set point (e.g. sink drain). Radial cuts are directed from the edge to a selected central point.



Cut Type: / Selection of single cut or multiple cut with Z increases set by the parameters *Increase Cut Dir.* + and *Increase Cut Dir.* -

SM(Offset): extra material left on inside edge of the geometry.

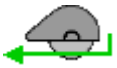
ES(Edge Spacing): The spacing on the edge of radial cuts directed towards the centre. A lower spacing obtains a more precise finish.

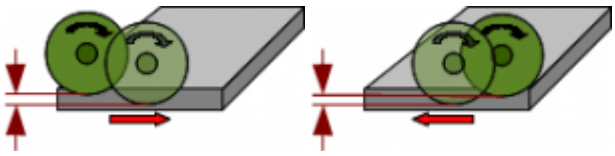
, **CX, CY(Centre):** Centre of incline in absolute or relative co-ordinates.

DU(Min Depth): minimum depth of the recess at edge.

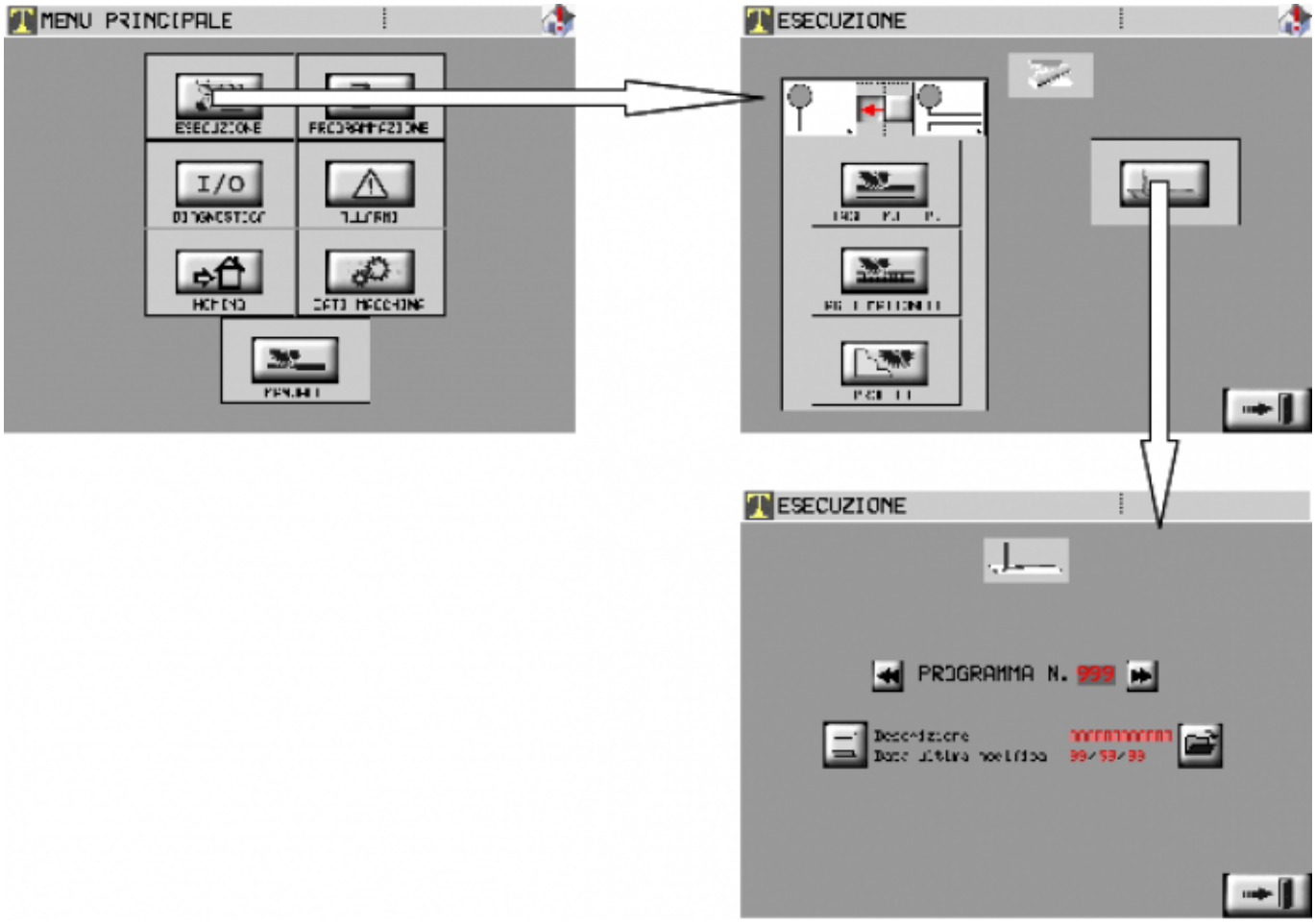
DD(Centre Depth): theoretical depth of tool at centre.

The edge and centre depths determine the incline of each radial milling stroke.

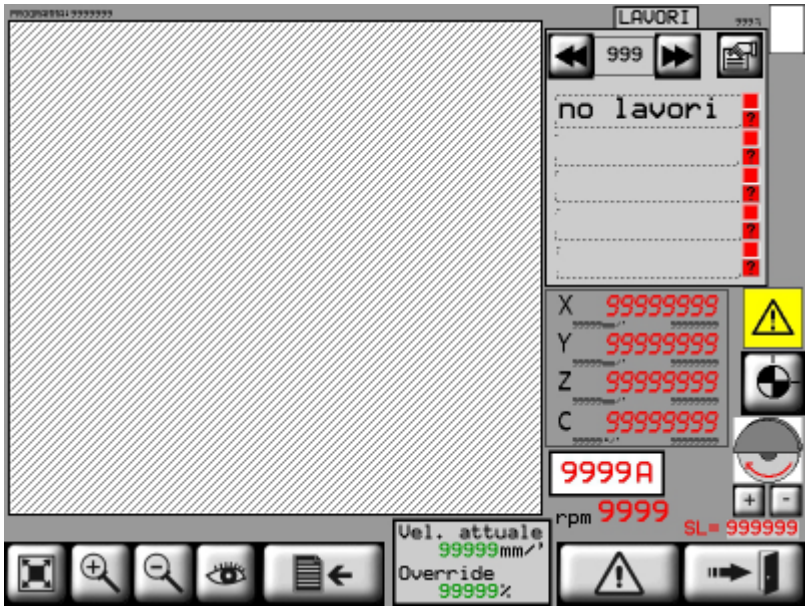
 **BC(Increase Cut Dir. +)**,  **EC(Increase Cut Dir. -)**: Two parameters to set the Z axis increases. BC in the positive cut direciton and the same as C axis orientation. EC in the negative cut direction and different to C axis orientation. Use only for *Multiple Cut Type*.



2D geometry: work programs



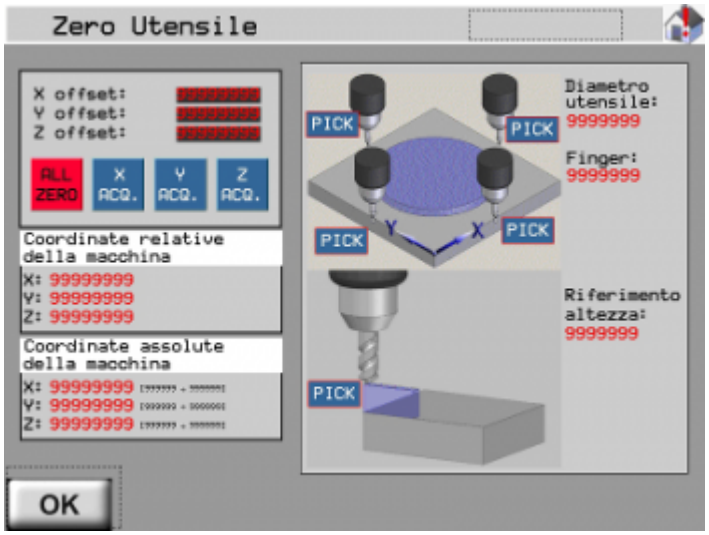
Press  to open the selected program. The following screen is shown with the various geometrias and related list of programmed work cycles.

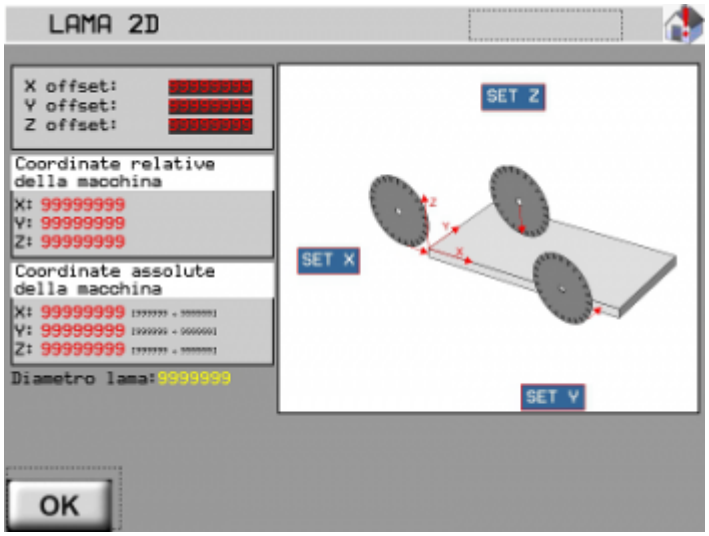


In the 2D work program screen, a 2D work program can be started. The work program lists the individual operations of a program in groups of 5 in a scroll menu . During the work program the work cycle will be carried out as shown in the work cycle programming.

Press  to view the work parameters and interrupt the program to access and change the 2D geometries, work cycles and parameters.

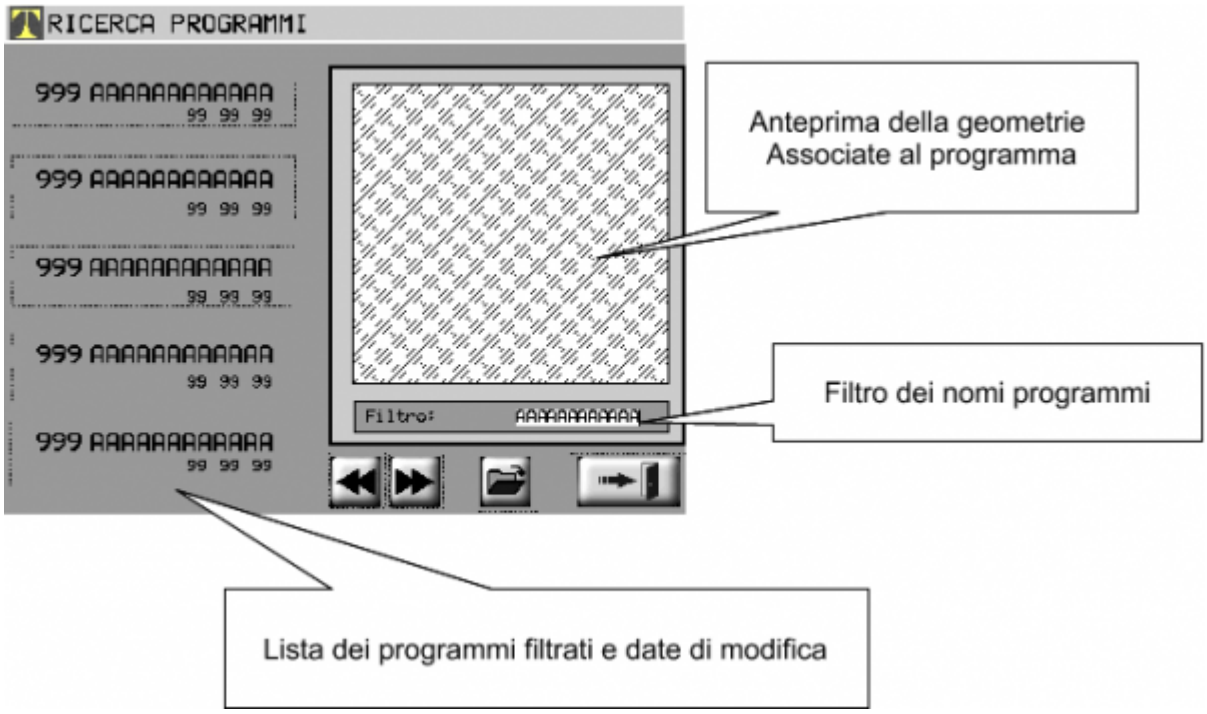
N.B. Press Start and the automatic cycle will enter the Axes zero-setting procedure.





Work Program Search

Press  to open a work program library.



A name can be given to any 2D geometry or profile work program. The search can find all work programs that have a name starting with the search criteria.
(e.g. all programs with a name starting with 'A'..)
The search screen can be opened from the open work program screens, by pressing on the current work program description.