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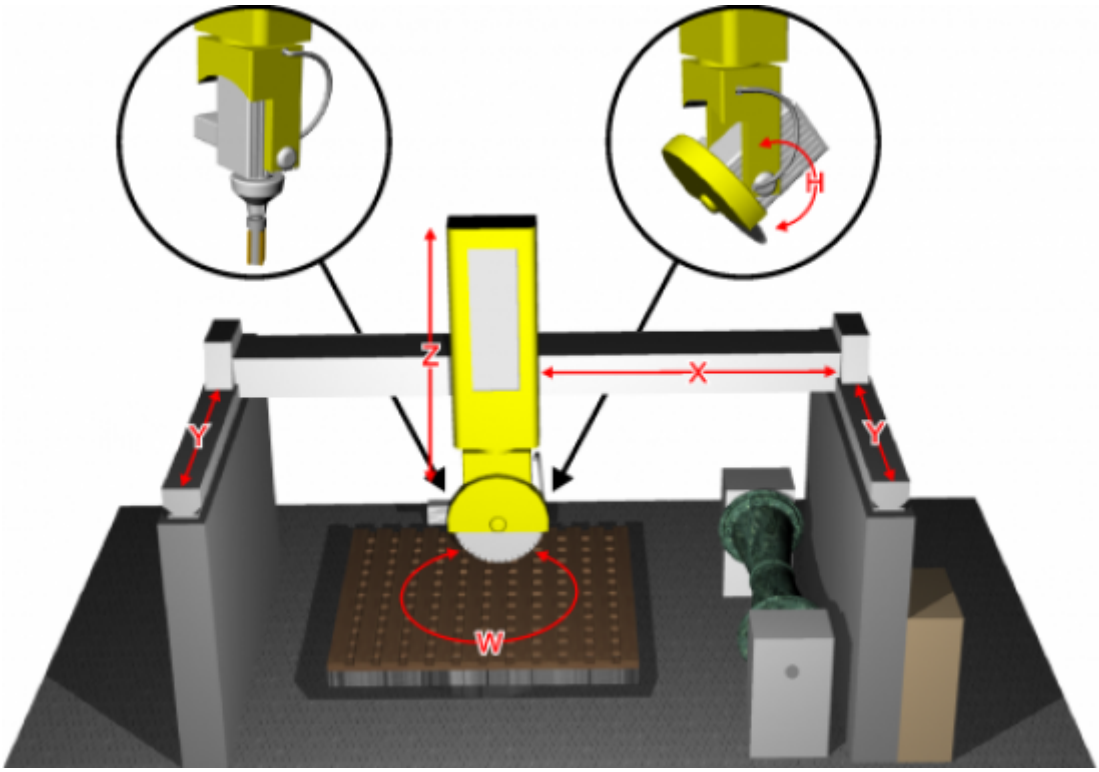
PS Bernard sistemare la tabella a “10.2.3.1.2. POCKETING - Parametri lavorazione “Tasca””

Mi manca da
- rimuovere le immagini dei zeri profili
- aggiornare elenco allarmi (ma spetto versione definitiva)
- aggiornare elenco warnings



Document	**P1K31FR30-001**
Description	User manual
Drawn up	Riccardo Furlato
Approved	Draft
Link:	http://www.qem.eu/doku/doku.php/en/strumenti/qmoveplus/j1k31/mdu_p1k31fr30-001/funzionamento
Languages	English

Release	Description	Notes	Date
01	New Manual		26/05/14

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  - 1.1 Typical work results
- 2. Hardware J1-K31-FR30
  - 2.1 Function Keys and LEDs
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1. General Characteristics

Description

The **P1K31FR30 - 001** software can be installed on the ***Qmove+ J1-K31-FR30, 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 **P1K31FR30 - 001** 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.

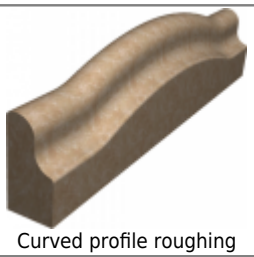
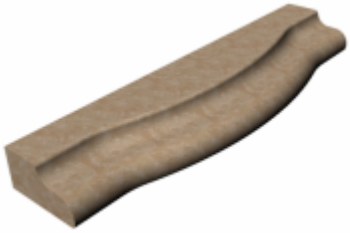
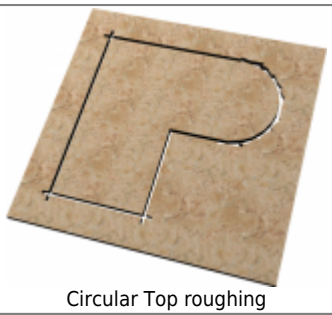
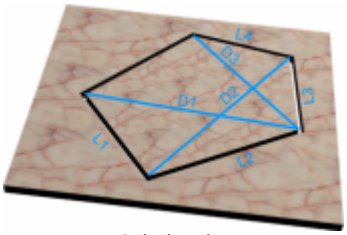
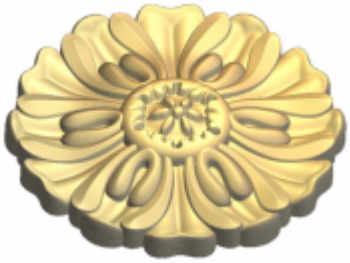
Optional Features (some not documented in this manual)

- 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. Hardware J1-K31-FR30

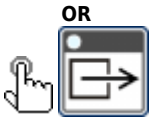
2.1 Function Keys and LEDs

Key	Icon	Function	Led	.	Key	Icon	Function	Led
F1...F3		Not Used		.	F11		**Semiautomatic = ON**	Semiautomatic status
F4		**Enclosures**	Enclosure open status	.	F12		**Table UP**	Table up
F5	-	Not used		.	F13		**Table DOWN**	Table Down
F6		**Y Laser** ON/OFF	Laser status	.	F14		**Table Rotation Anticlockwise**	-
F7		**X Laser** ON/OFF	Laser status	.	F15		**Table Rotation Clockwise**	-
F8		**Water** ON/OFF	Water status	.	F16		**Disk** ON/OFF	Blink is starting, On is started
F9		**Alarm = ON**	-	.	F17		**Mill** ON/OFF	Blink is starting, On is started
F10		**Quit** or prolonged **MAIN**	-					

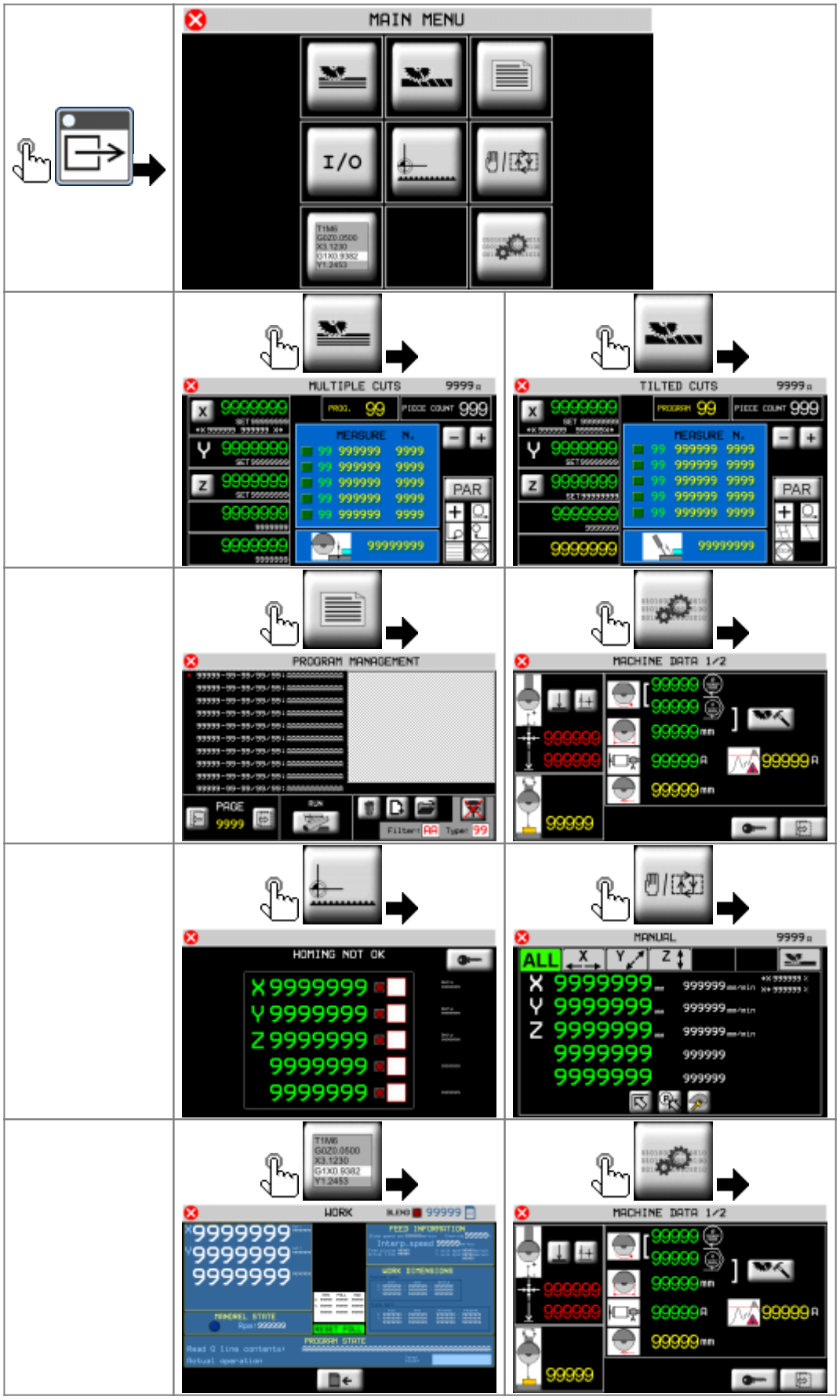
2.2 Symbols and keys

Button	Description	————————-	Top Bar Symbol	Description
	Press to confirm			Manual
	Select			Emergency
	Previous screen			Automatic
	Next screen			Function mode
	Reserved Area			Not initialized
	Open file on SD card			Setup Locked/Unlocked
	Save			
	Work preview			
	Yellow settings can be changed			

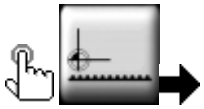
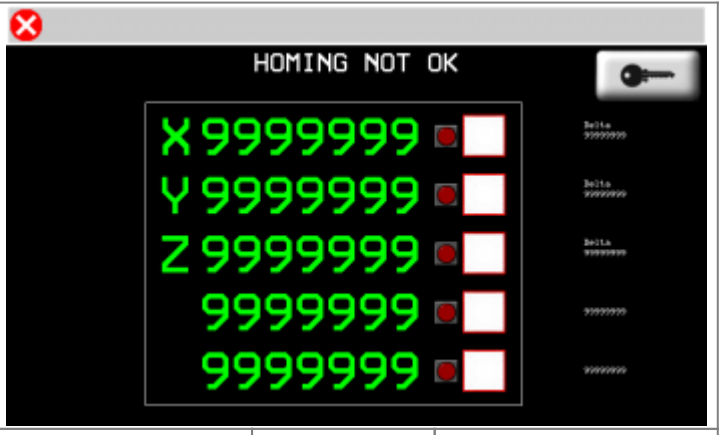
3. STARTUP

START		**OR**  to bypass
HOMING		**OR** to bypass
	ALWAYS run Homing before going to MANUAL. Homing not OK limits machine operation.	
MAIN MENU		

4. Main Menu


MAIN MENU
I/O
MULTIPLE CUTS
TILTED CUTS
MEASURE N.
PAR
PROGRAM MANAGEMENT
PAGE
MACHINE DATA 1/2
HOMING NOT OK
MANUAL
ALL
WORK
MACHINE DATA 1/2

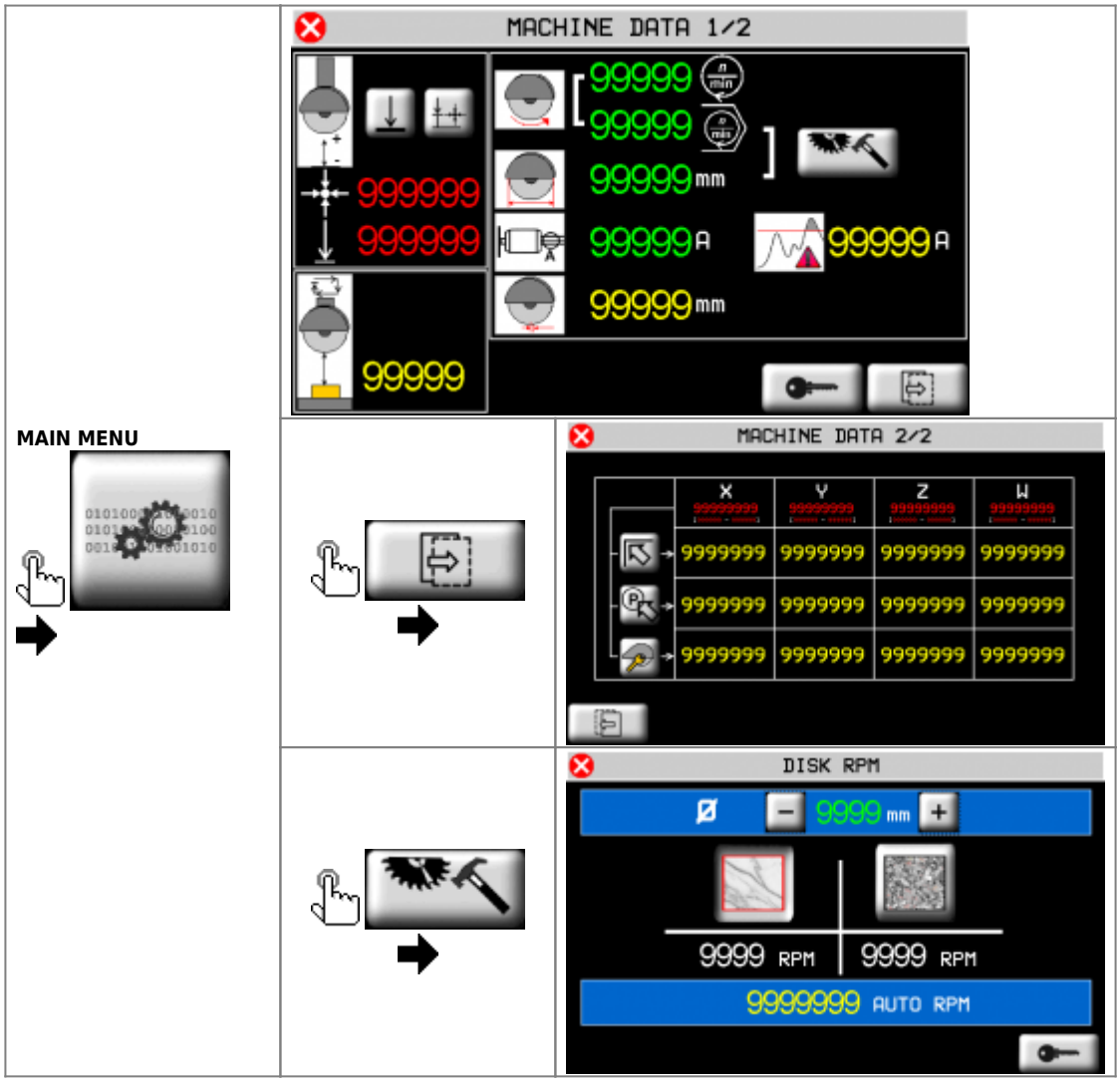
5. Homing

			
	Run Homing		Homing OK
	No Homing		Homing not OK
Delta 99999999	Delta Error		
	ALWAYS run Homing before going to MANUAL. **Homing not OK limits machine operation.**		

5.1 Homing Procedure

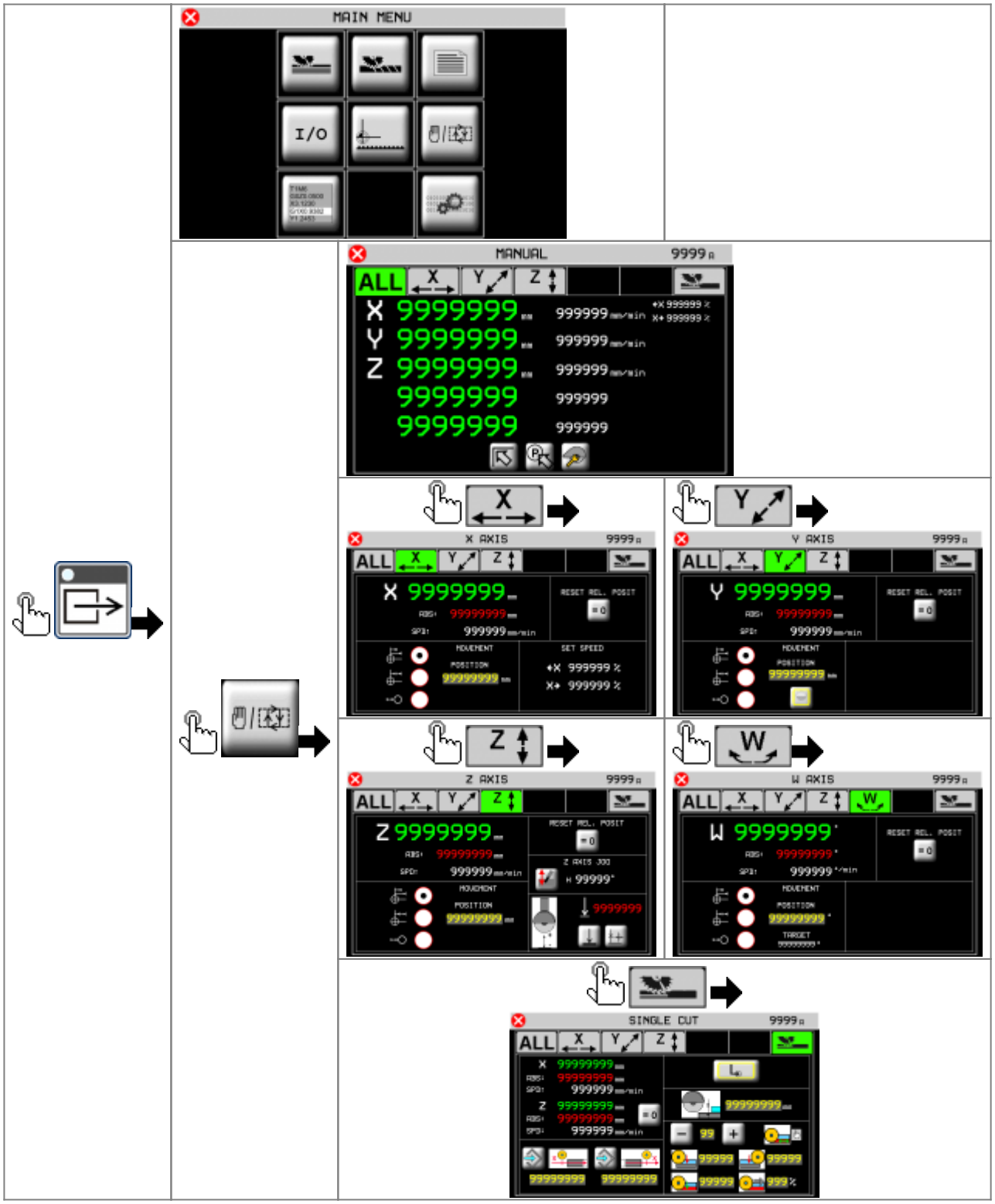
1. Select one or more Axis
2. external Machine Start button
3. Homing successful =
4. Homing not successful =
5. The Delta Error is next to each Axis

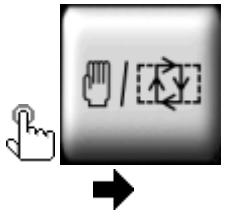
6. Machine Data



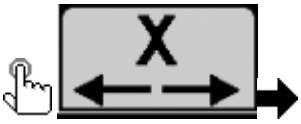
Set Default **Z min position**	Auto-set **Z min position**	Set SAFE HEIGHT
Disk RPM	Disk diameter	Set diameter and RPM
Disk absorbed current	Set Maximum current	Set Disk thickness
Start position	Park position	Change tool position
DISK DIAMETER & RPM		
9999 mm Disk diameter	Marble	Granite
9999999 AUTO RPM AUTO RPM based on diameter - Set RPM override of auto		

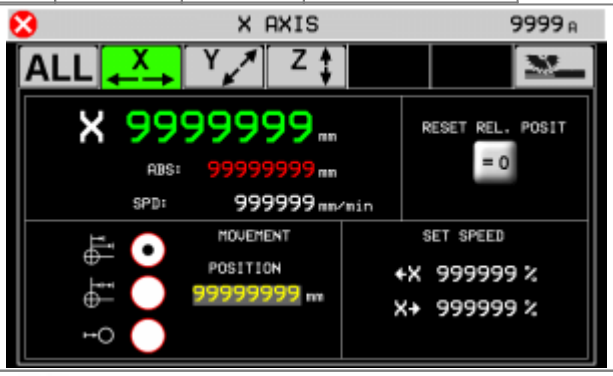
7. Manual/Semiautomatic



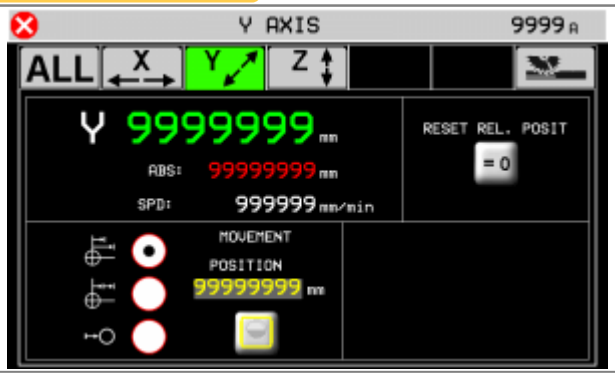


	Go to START		Go to PARK		Go to TOOL CHANGE





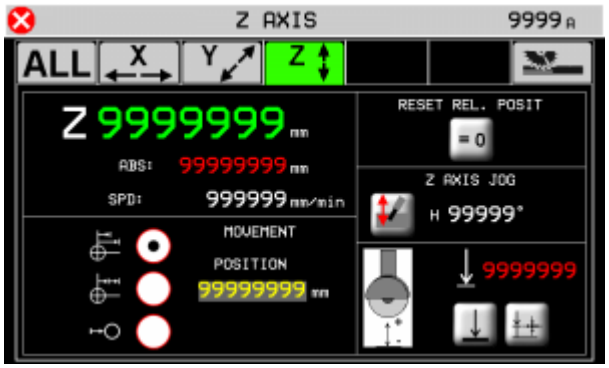
SET TARGET POSITION 9999 mm	- ABSOLUTE TARGET POSITION - **INCREMENTAL TARGET POSITION** - **AUTO-SET ZERO POSITION** Fix Me!	Auto-set ZERO position



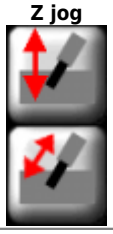
Disk Correction

OFF

ON

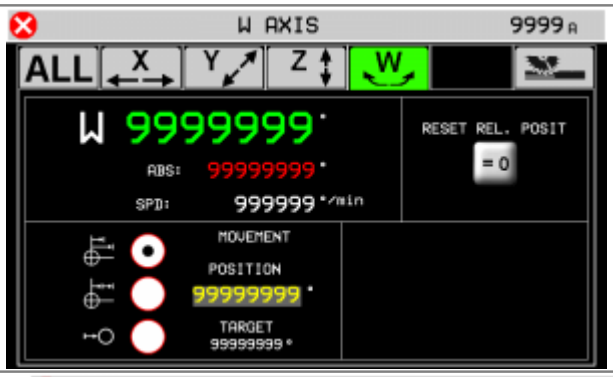


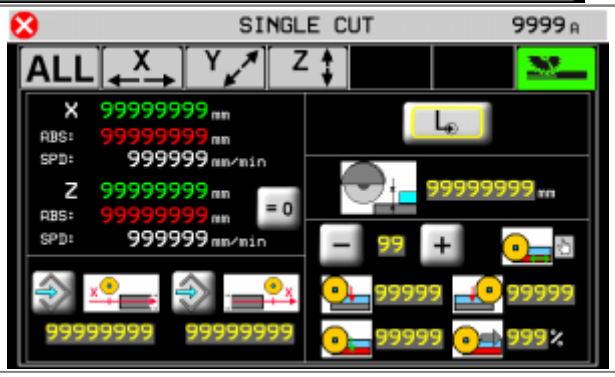
Z jog

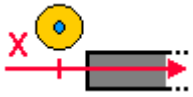
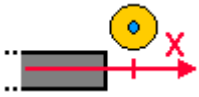
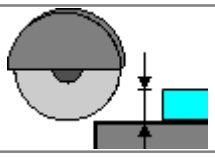
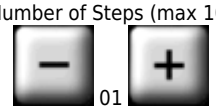
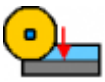
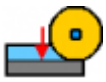


Default Z min

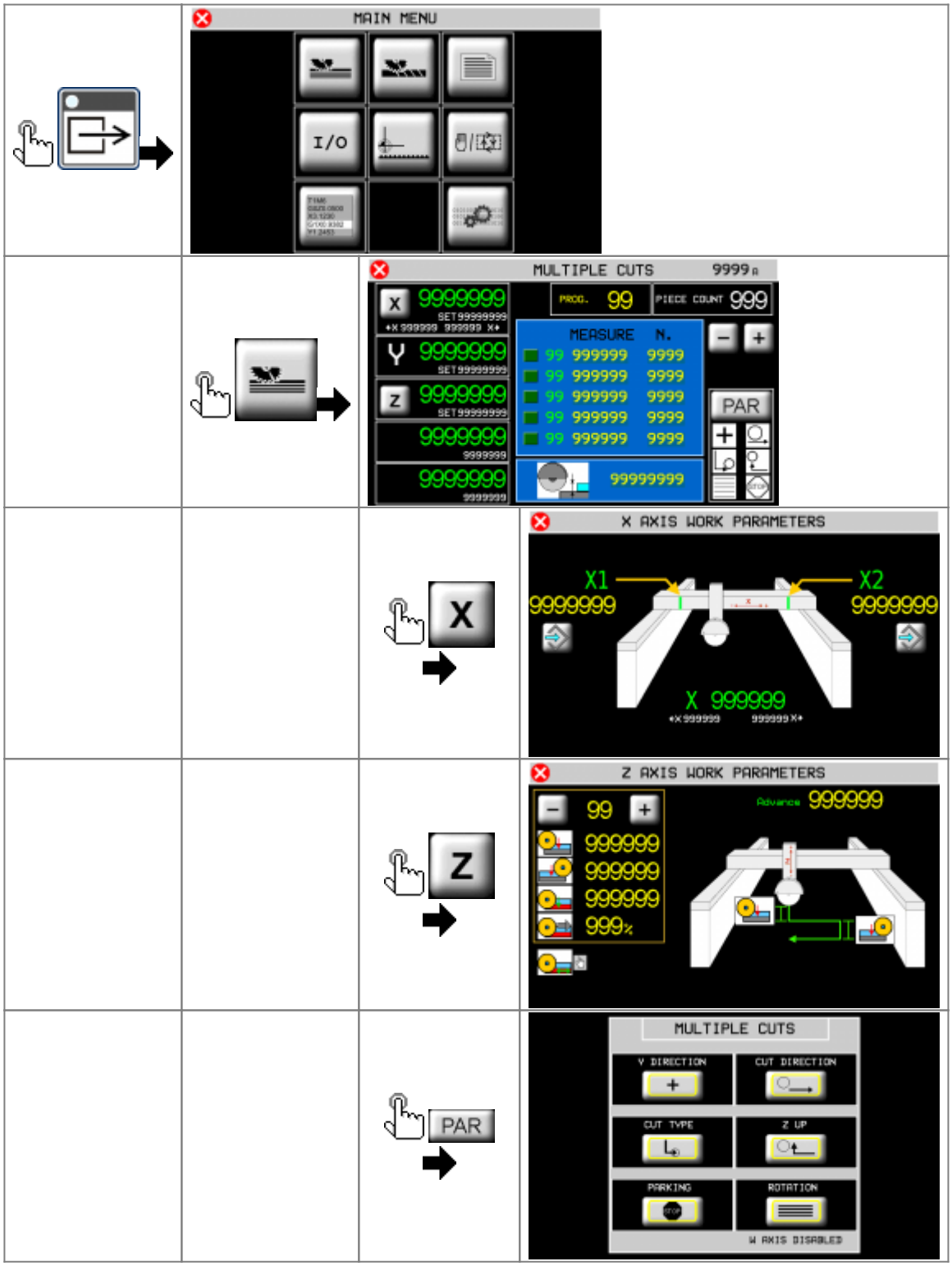
Auto-set Z min



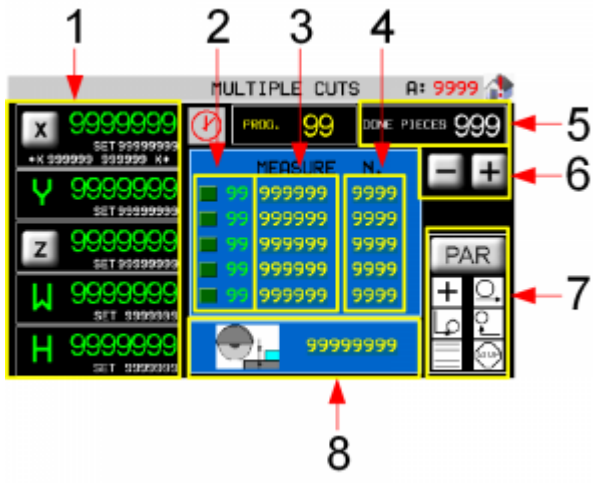


	Auto-set position		**X** Start Cut position		**X** end Cut position
	Single cut		Step cuts with multiple depth increases		Cut depth
Number of Steps (max 10)  01			Step depth for (X+)		Step depth for (X-)
Last cut direction			Last cut depth		% Speed change of Last Cut

8. Multiple Cuts

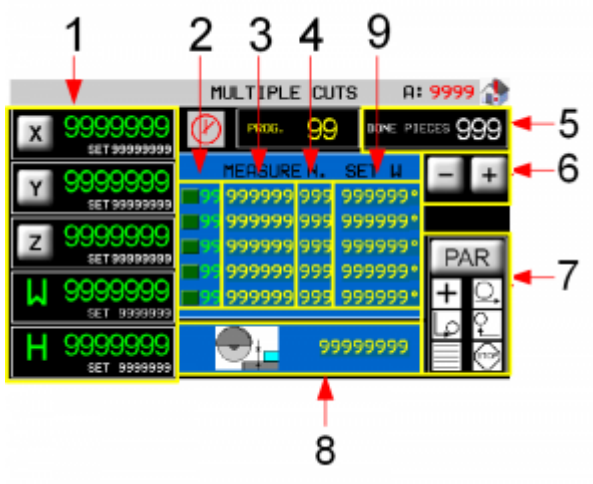


8.0.1 No Rotating Table



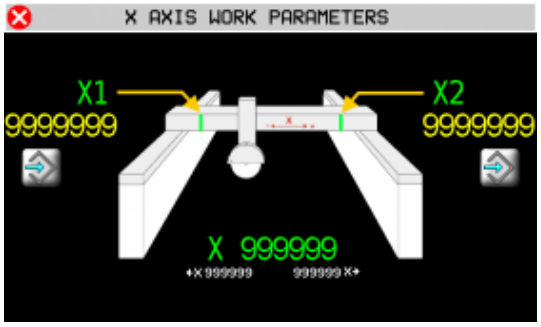
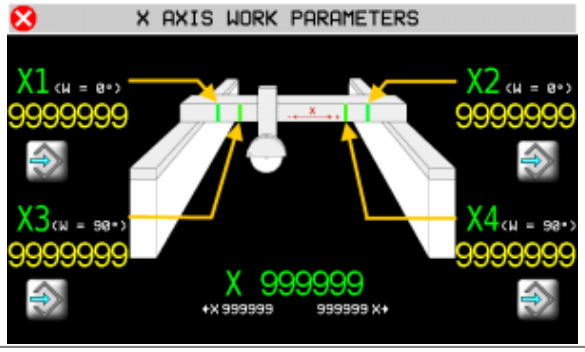
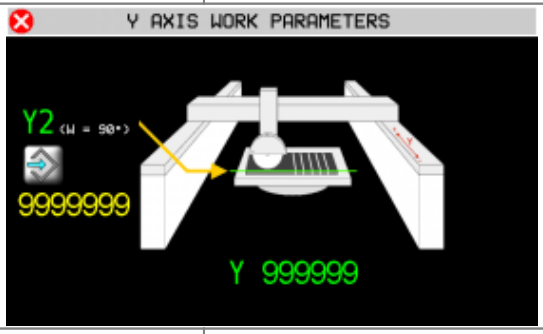
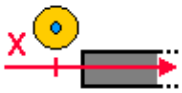
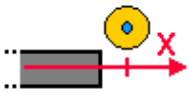
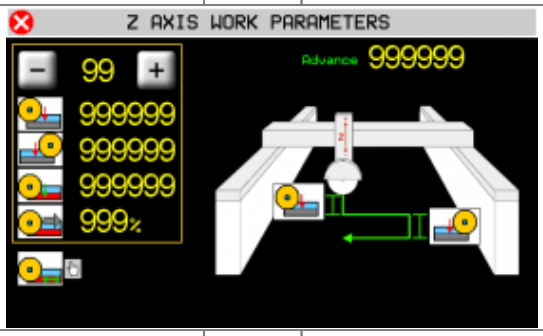
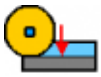
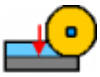
1 Target count and position
2 Work step now
3 Cut width (Y)
4 Number of cuts to make
5 Piece counter
6 Scroll work program list
7 Work Parameters
8 Cutting depth (Z)

8.0.2 Rotating Table

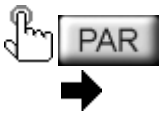
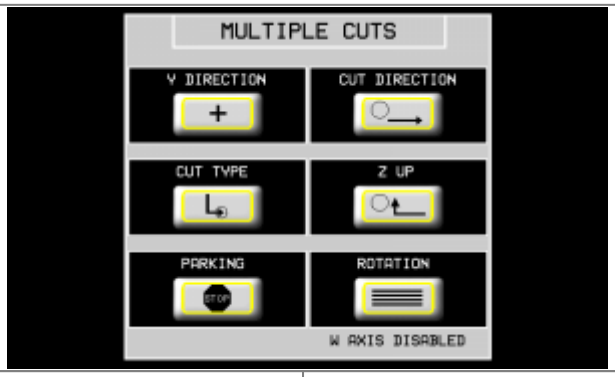
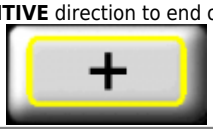
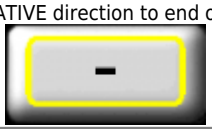
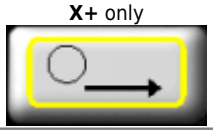
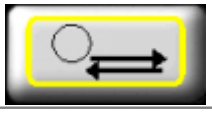
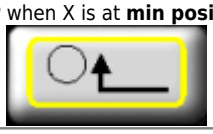
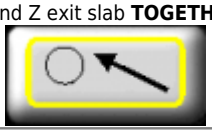
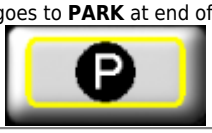
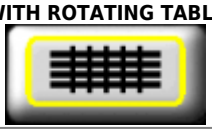


1 Target count and position
2 Work step now
3 Cut width (Y)
4 Number of cuts to make
5 Cutting depth (Z)
6 Piece counter
7 Scroll work program list
8 Work Parameters
9 Table Rotation (W)

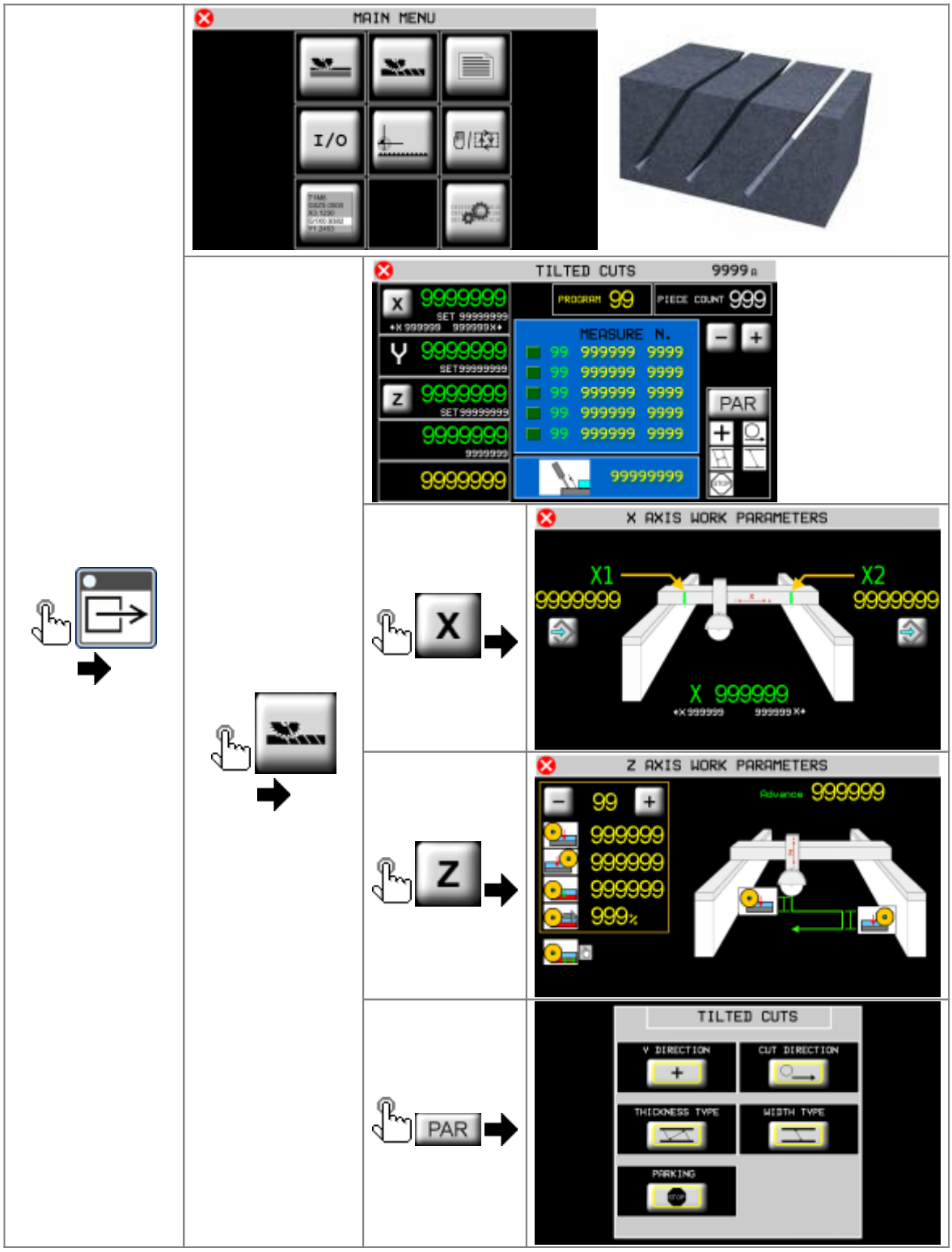
8.0.3 Axis parameters

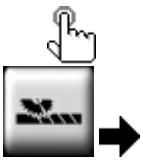
X	**NO ROTATING TABLE**  	**WITH ROTATING TABLE**  		
		Auto-set position **X1 + X2** = table (W) at 0°.....**X3 + X4** = table (W) at 90° N.B. the disk exits the slab by its radius before reaching **X1 - X2** or **X3 - X4**.		
Y	 			
		Auto-set **Y2** = start position with **table (W) at angle**		
	 	X Start position	 	X End position
Z	 			
	Advance 99999	Number of Steps 0 ~ 10 	Last cut direction 	
		Step depth for (X+) cut		Step depth for (X-) cut
		Last cut depth		Last cut % Speed change

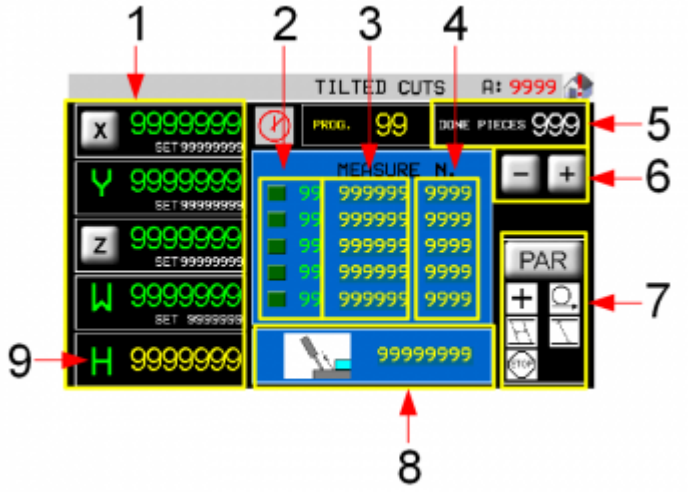
8.0.4 Work Parameters

		
Y DIRECTION	**POSITIVE** direction to end of cut 	NEGATIVE direction to end of cut 
CUT DIRECTION	**X+** only 	**TWO-WAY** Cut 
CUT TYPE	**SINGLE** cut	**STEP** cut
Z UP	Z UP when X is at **min position** 	X and Z exit slab **TOGETHER** 
END POSITION	Disk **STOPS** at end of work	Disk goes to **PARK** at end of work 
ROTATION	**NO ROTATING TABLE**	**WITH ROTATING TABLE** 

9. Tilted Cuts



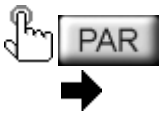


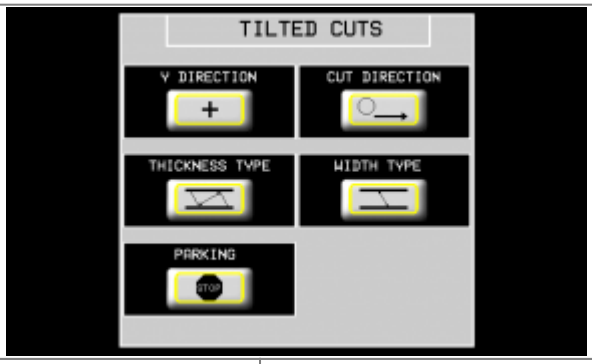


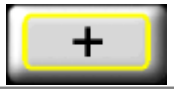
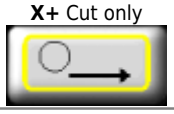
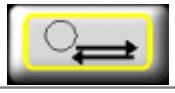
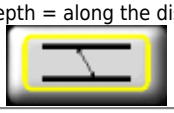
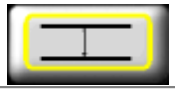
1 Axis parameters
Target count and position
2 Work step now
3 Cut width (Y)
4 Number of cuts to work
5 Piece counter
6 Scroll work program list
7 Work Parameters
8 Cutting depth (Z)
9 Set disk angle (H)

Axis parameters - see Multiple Cuts

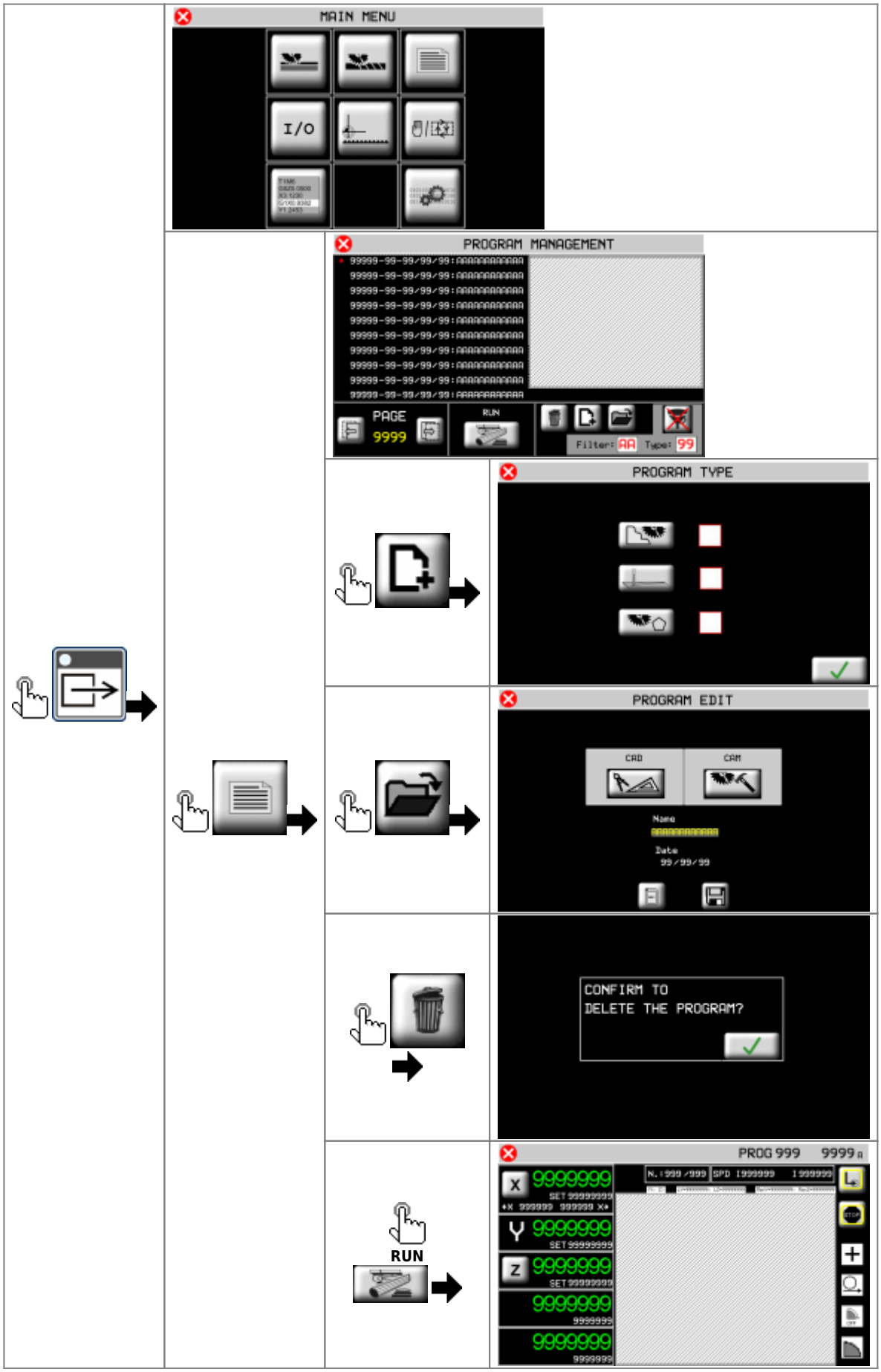
9.0.1 Work Parameters





Y DIRECTION	**POSITIVE** direction to end of cut 	**NEGATIVE** direction to end of cut
CUT DIRECTION	**X+** Cut only 	**TWO-WAY** Cut 
THICKNESS TYPE	Thickness at **90°** to the cut	Thickness **PARALLEL** to the slab surface
DEPTH TYPE	Depth = along the disk 	Depth = **90°** to the slab surface 
END POSITION	Disk stops at end of work	Disk goes to PARK at end of work

10. Programs



10.0.1 Program List Filters

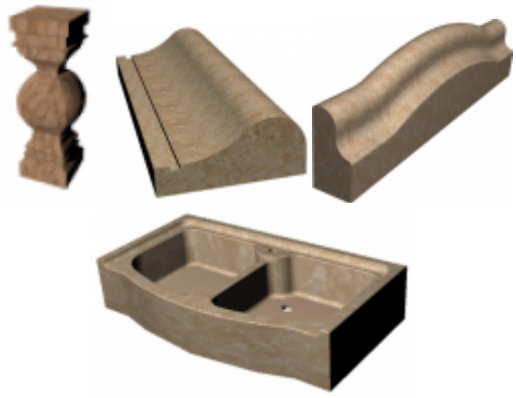
Using the program's list filters is possible to get quickly the desired program, rather than scroll entire available list. The system permit two type of filtering which can be combined each other:

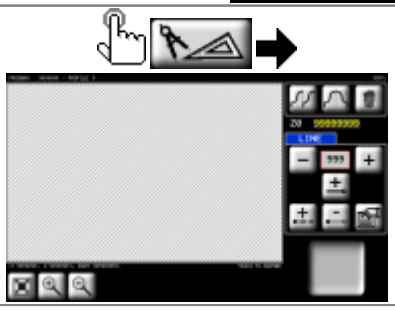
- Filter on program description
- Filter on program type

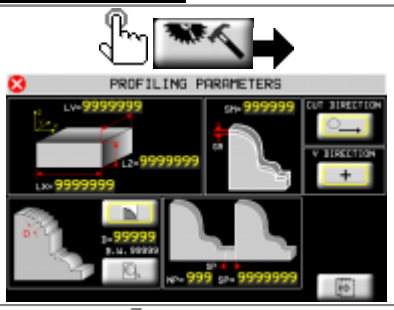
Warn that “**Type**” mean:

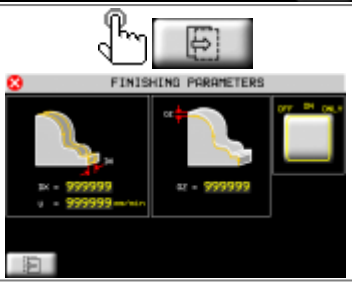
Type	Description
0	Show any program
1	Show only **tagli sagomati/profilatura** programs
2	Show only **fresatura** programs
3	Show only **taglio poligoni** programs

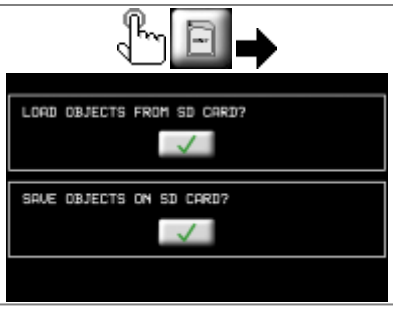
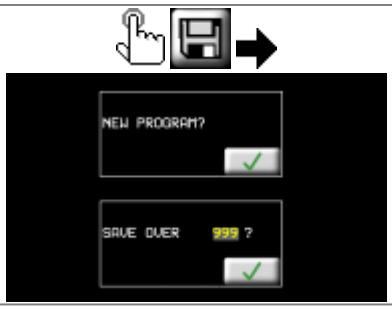
10.1 PROFILES



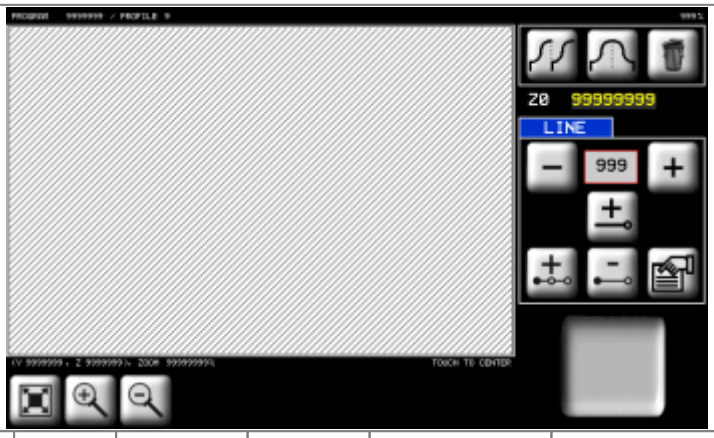






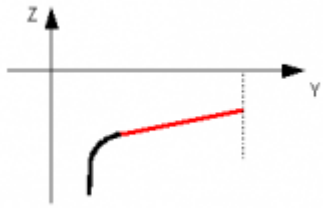
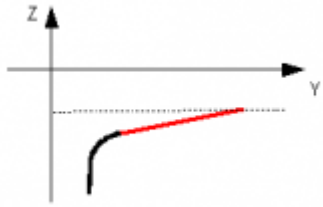
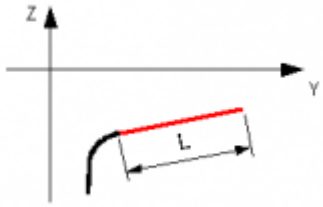
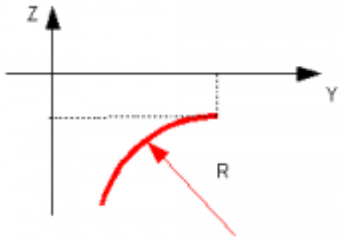
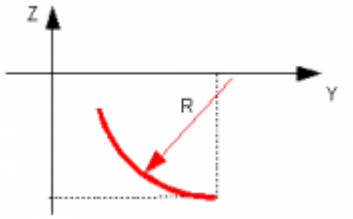
			 LOAD OBJECTS FROM SD CARD? SAVE OBJECTS ON SD CARD?	 NEW PROGRAM? SAVE OVER 999 ?

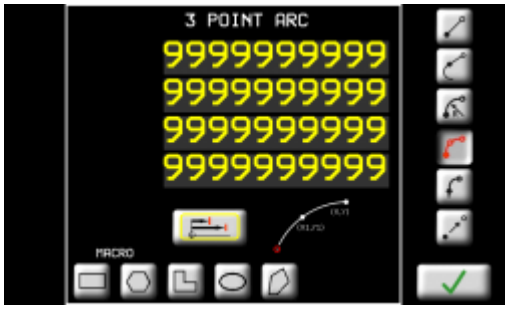
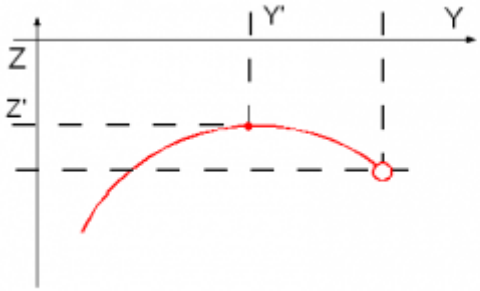
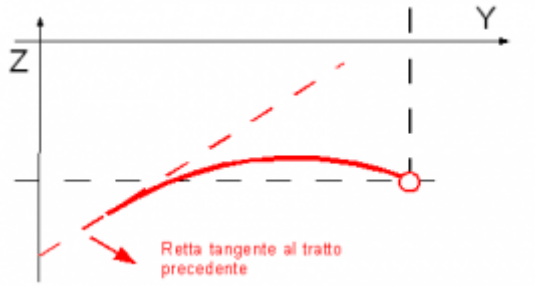
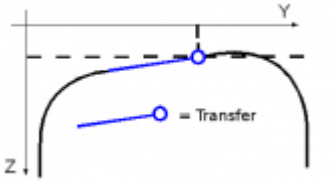
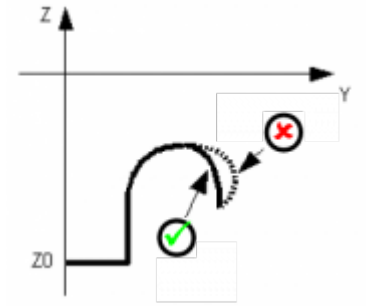
10.1.1 PROFILE - CAD



Z0 99999999		Copy		Mirror copy		Delete the object	**Z0 = origin** Y coordinate = 0
		Zoom in		Zoom-out		Fit to screen	
		YZ plane = Profile shape				XZ plane = Curved profile	
LINE 999	000			Scroll and select a line			
		Add a line		Insert a line		Delete a line	Line properties

Line Options								
	Absolute position from origin				**Incremental** position from start of line			
- - - - - - - - - - -	- - - - - - -	- - - - - - - - - -	- - - - - - -	- - - - - - - - - -	- - - - - - -	- - - - - - - - - -	- - - - - - -	- - - - - - - - - -

LINE		Enter the end point
TANGENT LINE		 **OR** enter Y (or X)  **OR** enter Z (or Y)  **OR** enter L = length
RADIUS ARC		Enter End point and Radius **MINIMUM** the minimum radius possible  clockwise  anticlockwise Also enter the curve direction clockwise OR anticlockwise small arc OR wide arc The screen shows the minimum radius possible

3 POINT ARC		Enter End point and Middle point 
TANGENT ARC		Enter End point 
TRANSFER		**Movement with no cut**. Enter target point 
		The software automatically corrects an undercut profile line see other manual

Profiles with straight cuts

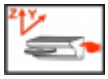
Draw a profile on the Y-Z plane

- vertical disk
- horizontal disk

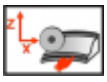
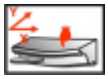
Never draw profiles on the other planes.

Profiles with curved cuts

1. Draw a profile on the usual Y-Z plane

- vertical disk
- horizontal disk 

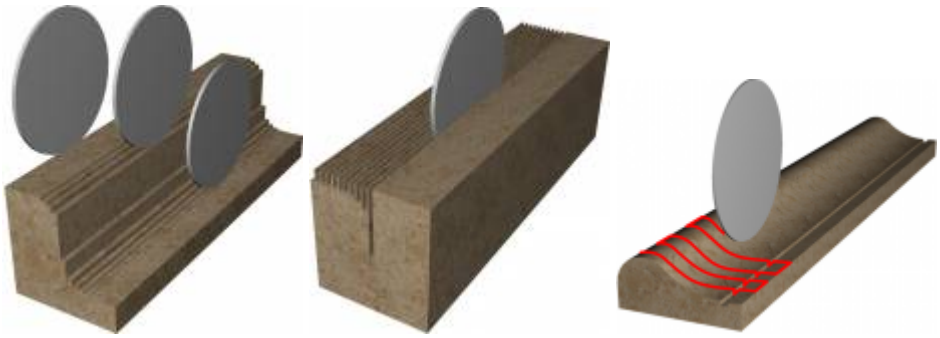
2. Draw the curved cut

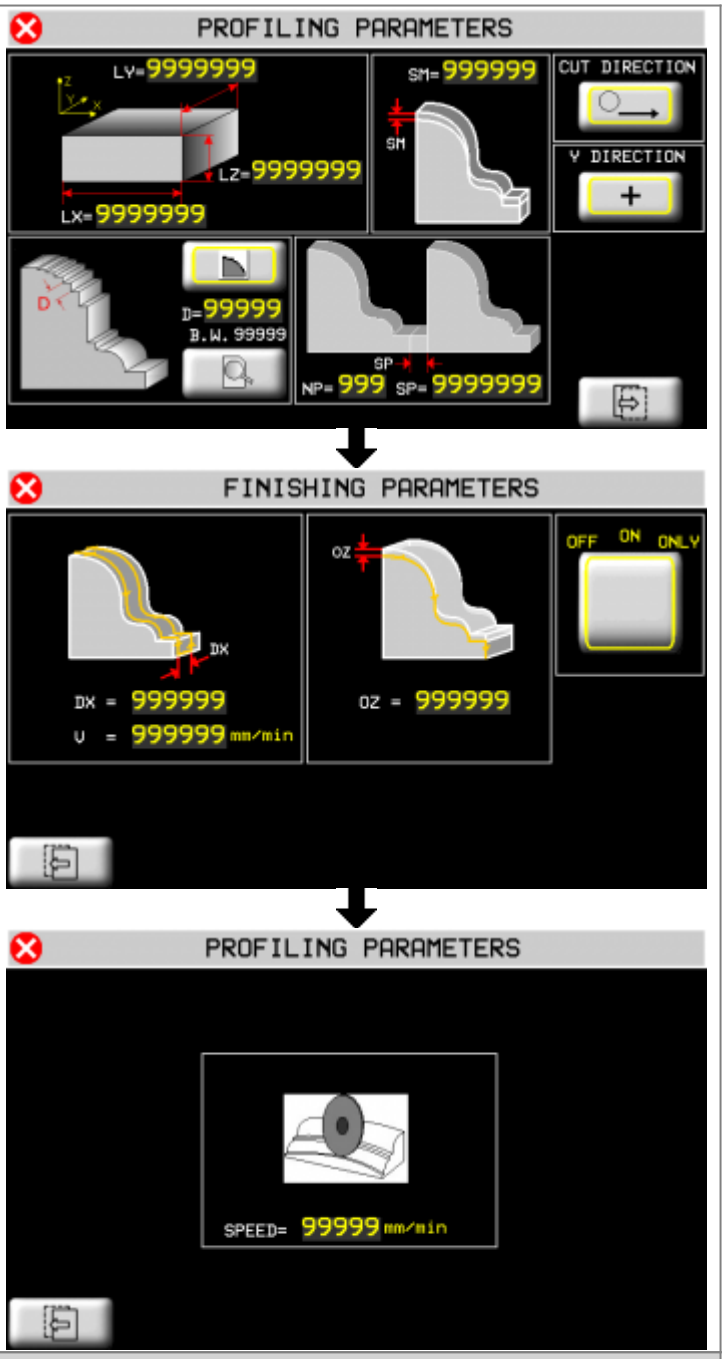
- on X-Z plane for vertical disk 
- on X-Y plane for horizontal disk 

To change plane touch the

immagine stessa.

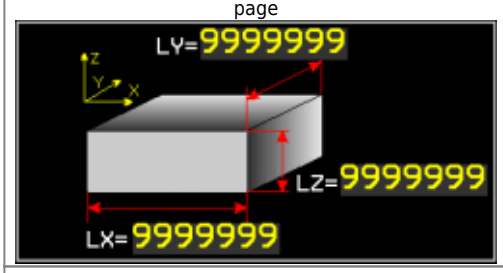
10.1.2 PROFILES - CAM





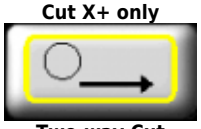
Profile Finishing is NOT possible on curved profiles.

Slab size. Optionally you can enter slab size. It will draw in gray color both in cad page and in preview page

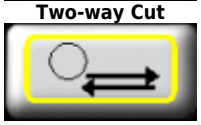


Extra Material on the profile

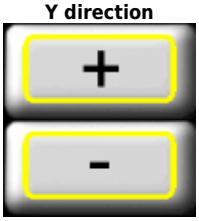
Cut X+ only



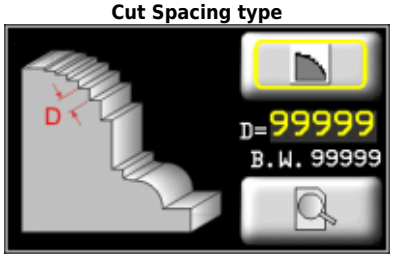
Two-way Cut



Y direction



Cut Spacing type

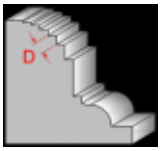


Cut spacing

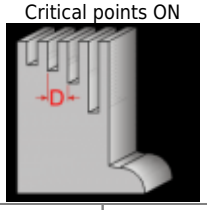
Disk diameter

Cut Preview

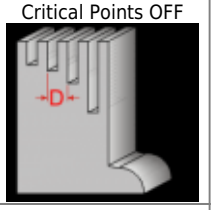
Spacing along profile



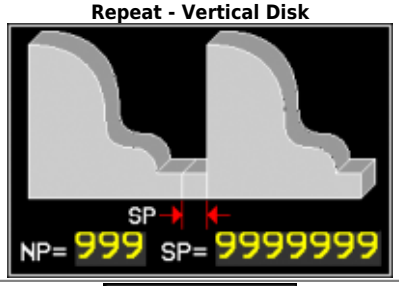
Spacing along Y
Critical points ON



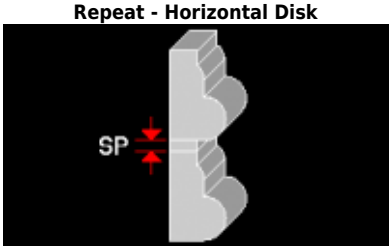
Spacing along Y
Critical Points OFF



Repeat - Vertical Disk



Repeat - Horizontal Disk



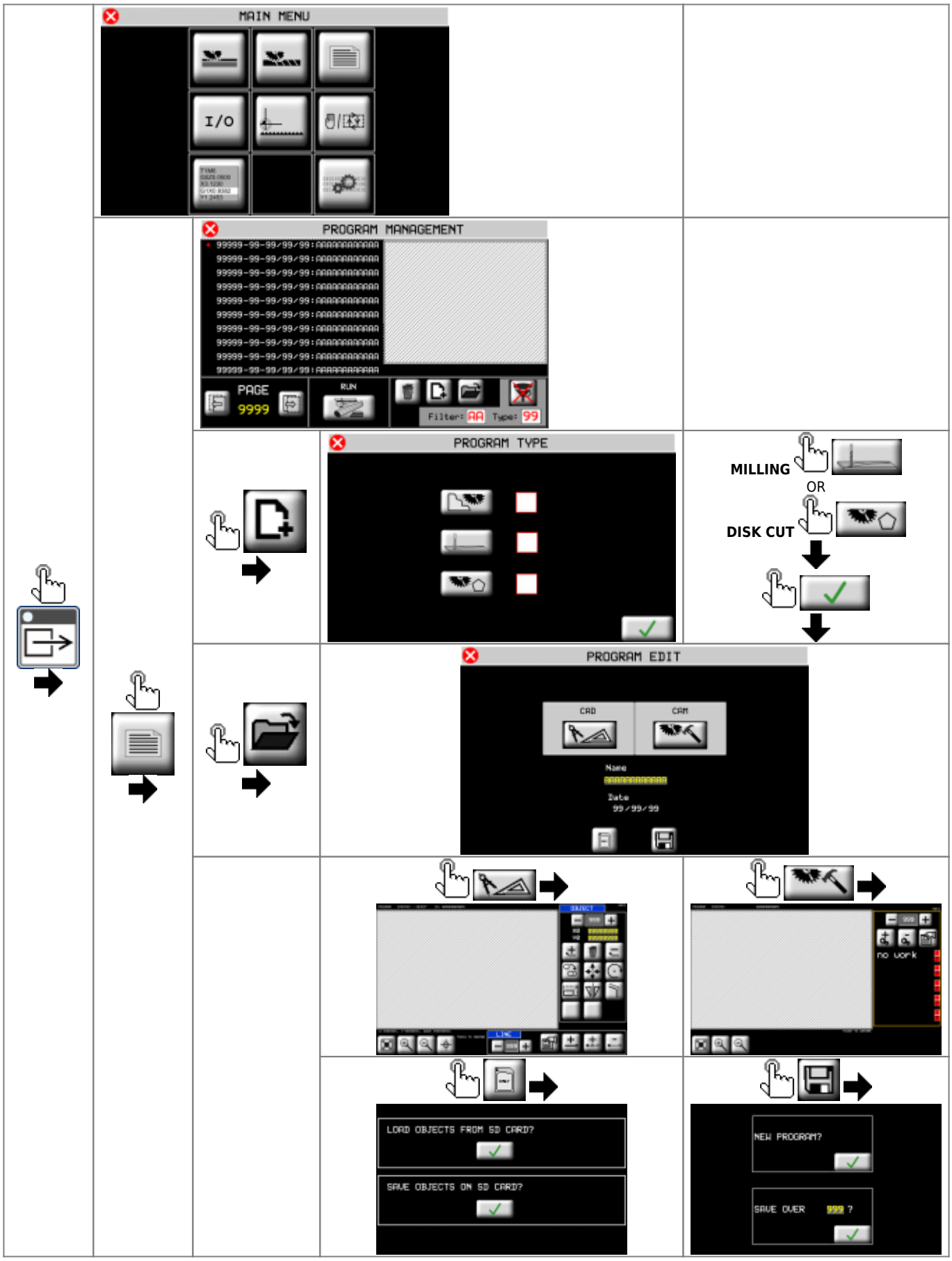
NP = Number of Repeats
SP = Space between repeats

Work sequence
OFF Profile only
ON = Profile and Finishing
ONLY = Finishing only

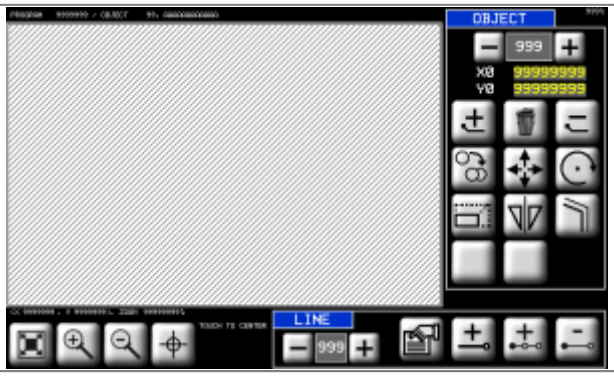
DX = Disk path spacing
V = Finishing speed
OZ = Finishing depth

Curved profiles.
Set the maximum cut speed.

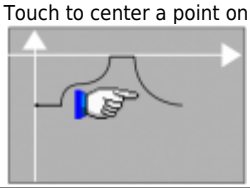
10.2 TOPS

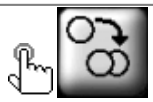
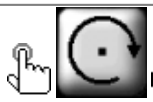
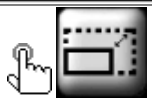
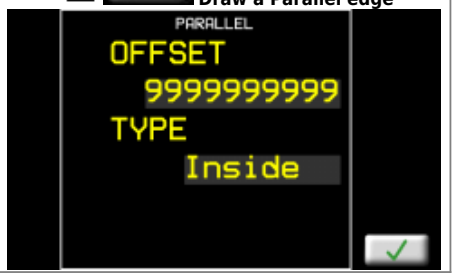

MAIN MENU
I/O
PROGRAM MANAGEMENT
PAGE
9999
RUN
Filter: AA
Type: 99
PROGRAM TYPE
MILLING
OR
DISK CUT
PROGRAM EDIT
CAD
CAM
Name
Date
99/99/99
no work
LOAD OBJECTS FROM SD CARD?
SAVE OBJECTS ON SD CARD?
NEW PROGRAM?
SAVE OVER 999 ?

10.2.1 TOPS - CAD

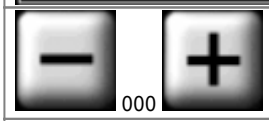


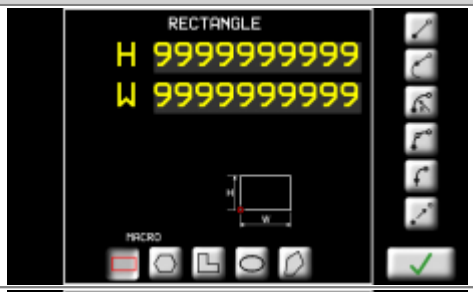
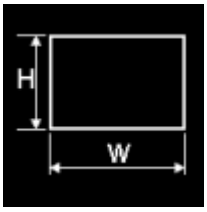
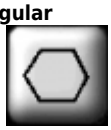
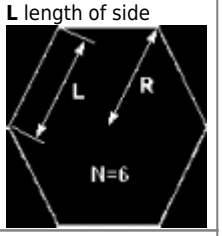
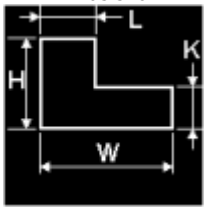
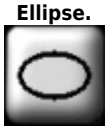
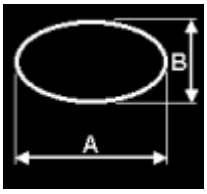
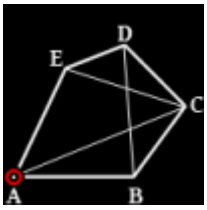
Drawings are always made with positive X and Y.

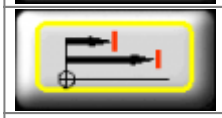
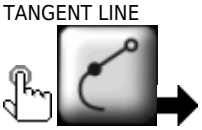
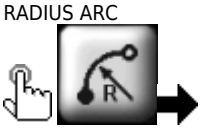
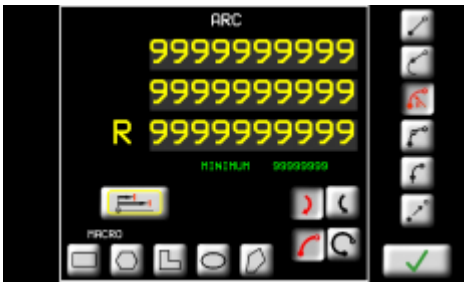
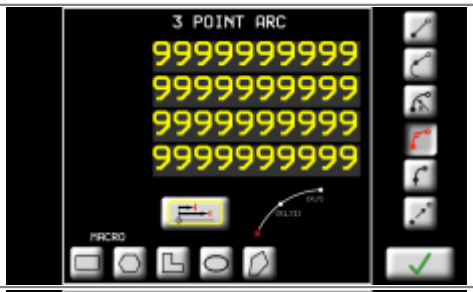
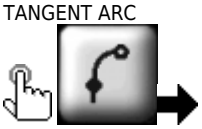
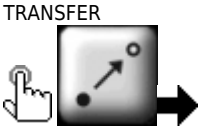
Fit to screen	Zoom in	Zoom out	Touch to center a point on	Fix Me!
				
	Scroll and Select objects. The selected object is black. Other objects are yellow.			Origin of the object.

	Object tools	
Add new object	**Delete all objects**	**Delete object**
 **Copy an object**	**Move an object**	 **Rotate an object**
 **Resize an object**	**Mirror copy an object**	**Draw a Parallel edge** 

10.2.1.1 CAD Tools

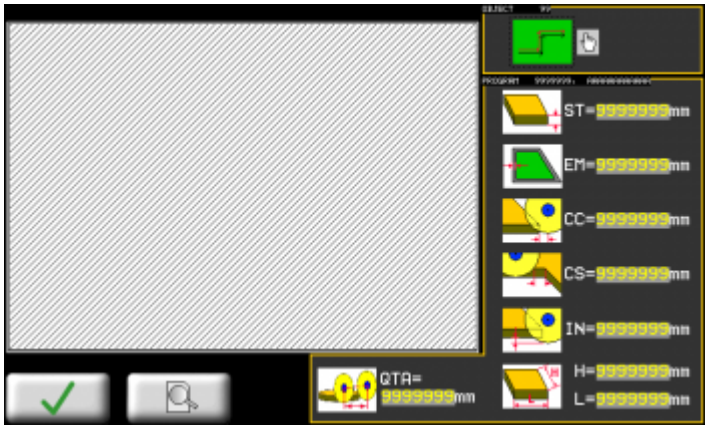
		CAD Line tools	
 000	Scroll and select a line		Line properties
Add line	**Insert line**	**Delete line**	

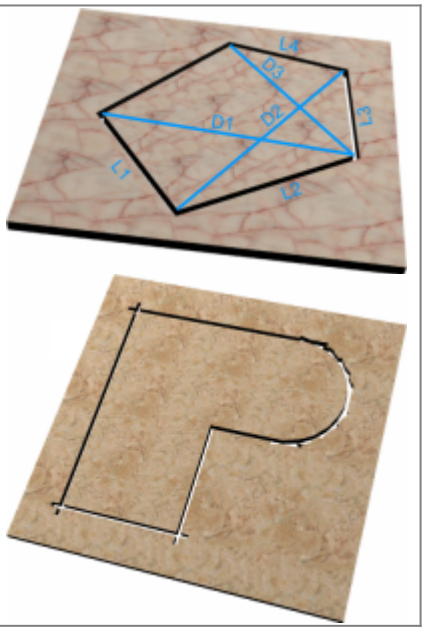
MACROS	Automatic CAD functions	
Rettangle.		**H** = height **W** = width. 
Regular Polygon 		**N** = number of sides **R** radius **OR** **L** length of side 
L Shape		**H W L K** as shown 
Ellipse. 		**A** = diameter 1 **B** = diameter 2 
Irregular Polygon		As shown 

LINES	Line drawing tools	
	Absolute positions = from origin	
	Incremental positions = from end of last line	
LINE		Enter the end point
TANGENT LINE 		Y (or X) axis Z axis **OR** Length
RADIUS ARC 		**Radius Arc** Enter the end point and radius Also enter the curve direction clockwise OR anticlockwise small arc OR wide arc The screen shows the minimum radius possible
3 POINT ARC		**Arc through 3 points** Enter the middle point and end point
TANGENT ARC 		**Arc at a tangent** to the previous line Enter the end point (the others are automatic)
TRANSFER 		**Transfer with no cut** Enter the point to start work again. The transfer line is not cut

10.2.2 DISK CUT - CAM

Fix Me!

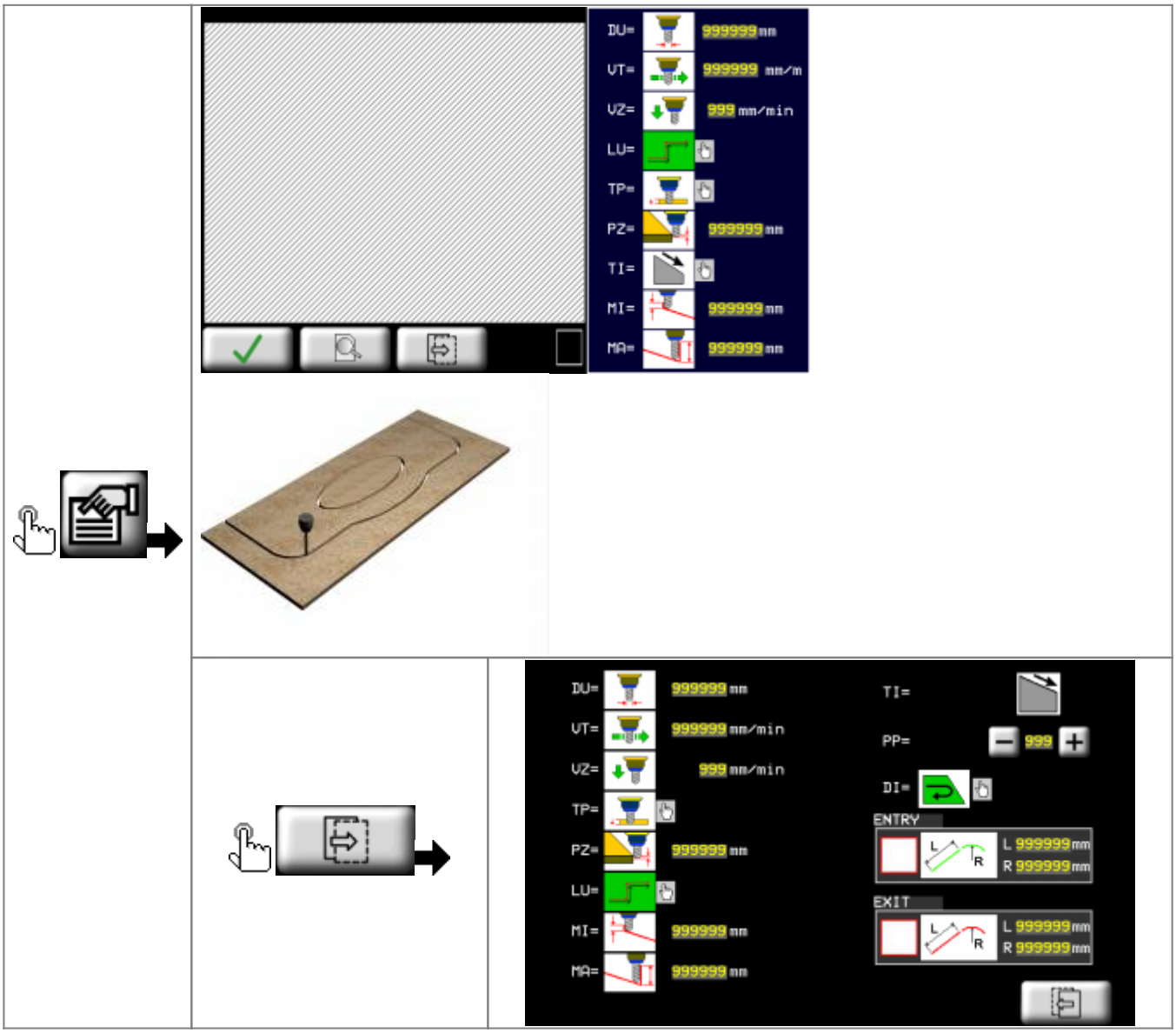




Fix Me! Mettere il numero di tipo PROFILE-TOP-DISKCUT in ogni sezione

	Tool on left or outside		Tool on right or inside		Extra material on edge
	Slab thickness		Extra Corner Cut		Shorter Corner Cut
	Extra depth into table		**H** = Slab length **L** = Slab width Fix Me!		Tangent retta Disk Segment of Arc Cut
- - - - - - -	- -	- - - - - - -	- -	- - - - - - -	- -

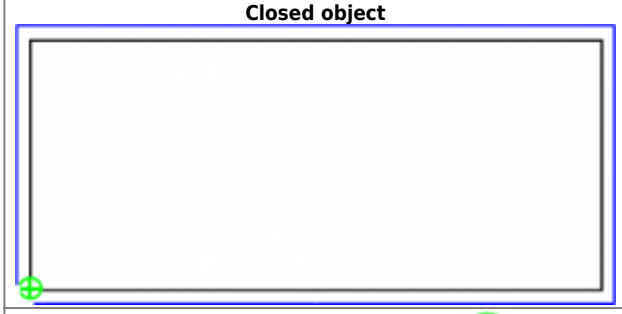
10.2.3 MILL CUT - CAM



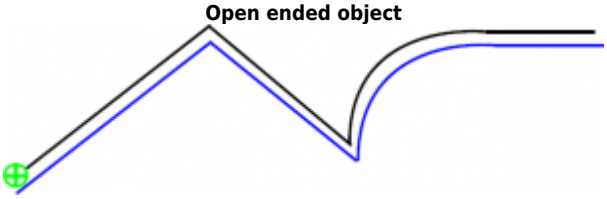
---	---	---	---	---	---
	Set Tool Diameter		Set Cutting Speed		Set Z- Down Speed
	Cut on left			Cut on right	
	SINGLE cut to full depth		**STEP** cuts with increasing depth		Step depth
Sloping cut function - Direction of slope					
	Depth increase = X increase			Depth increase = X decrease	
	Depth increase = Y decrease			Depth increase = Y increase	
	Start depth		Final depth		Cut order, normal (from start point to endpoint) or reverse (from end point to start point).

PP = Start point
Set the start point of the work

Closed object



Open ended object



Start point

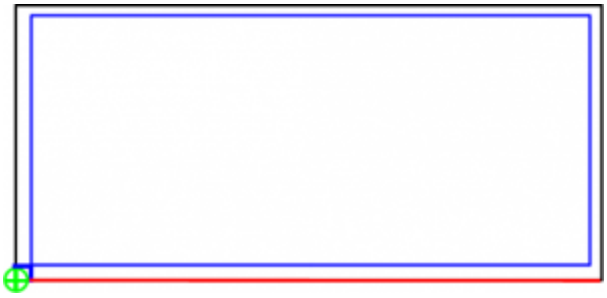
Object

Percorso utensile

Open ended objects must start at an end

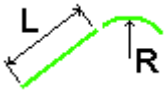
CLOCKWISE

ANTICLOCKWISE

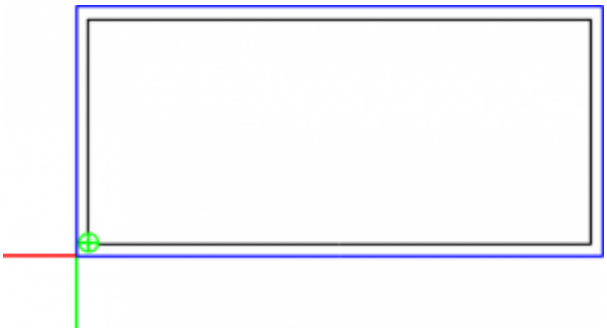


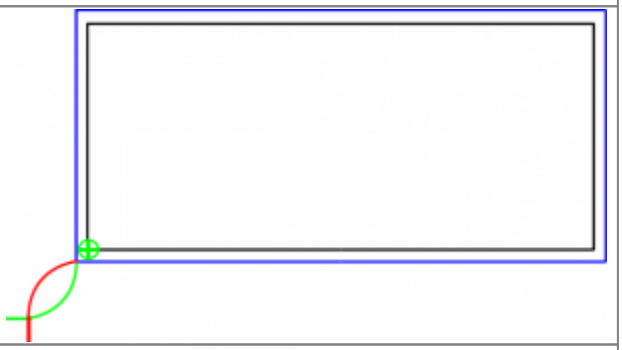
Direction of First Cut

Not valid for open ended objects



ENTRY/EXIT
Set an approach path for the tool.
L = straight section
R = radius of a curved section.

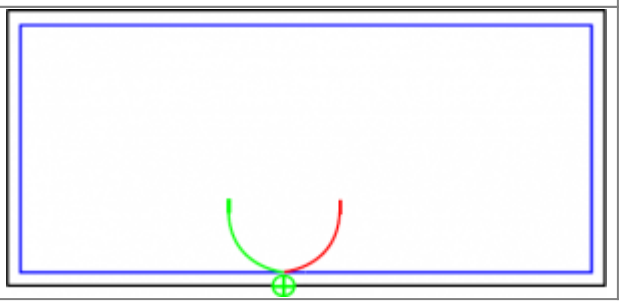




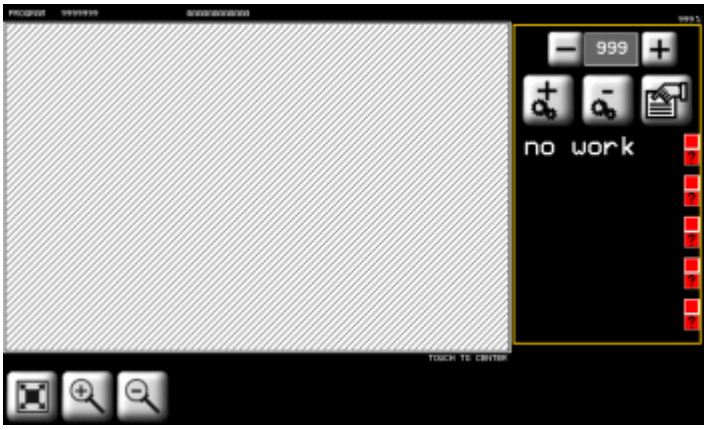
ENTRY PATH

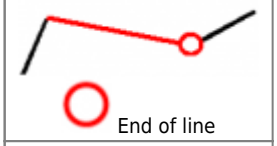
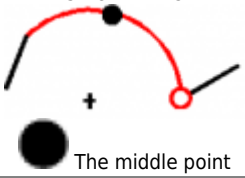
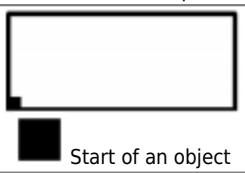
EXIT PATH

Closed objects and inside cuts do not ENTER/EXIT on corners

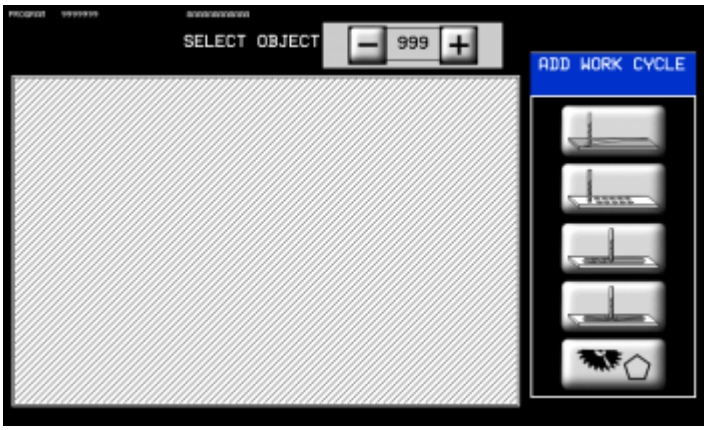
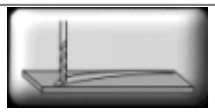
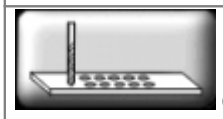


10.2.3.1 TOPS - CAM Program

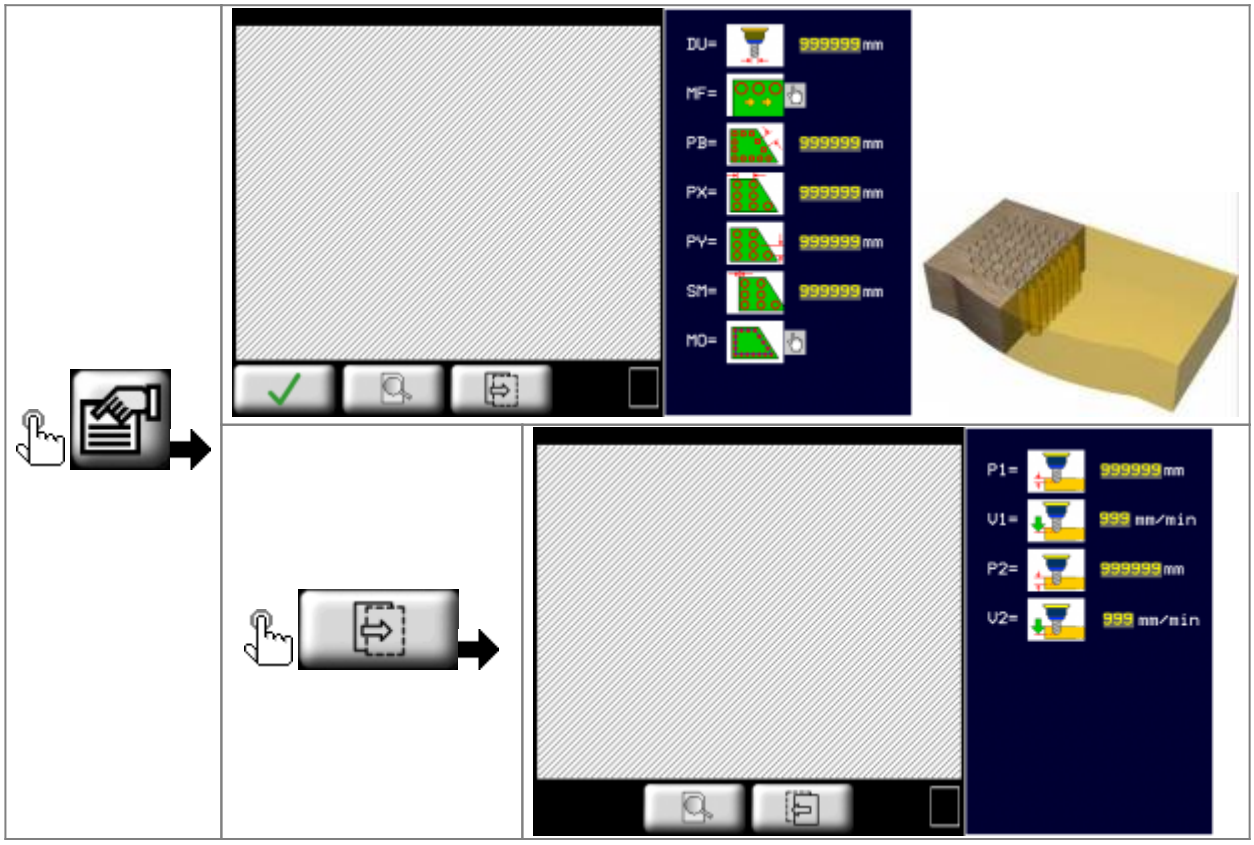


Symbols on Objects
The selected line is red
 End of line
3 POINT ARC
 The middle point
 Start of an object

Scroll and Select from CAM list						
		Add a CAM		Delete a CAM		CAM properties
		Fit to screen	Zoom in		Zoom out	
Set the CAM						
		Work OK CAM In Program		Work OFF CAM Not in Program		CAD object modified

	Select object	
	 	 Mill Cut  Core Drill Recess Mill Recess 3D Recess Disk Cut

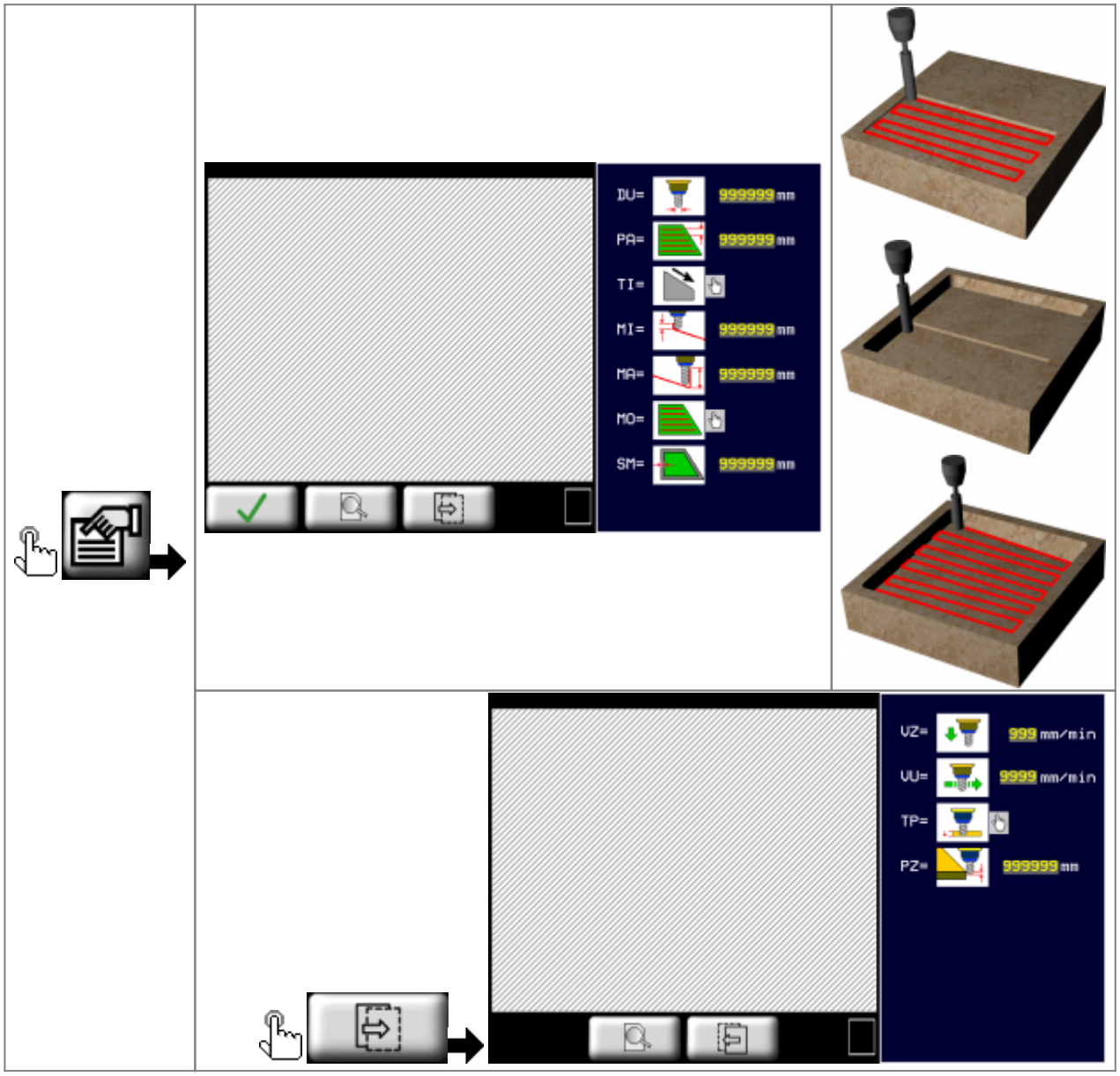
10.2.3.1.1 CORE DRILL RECESSING



L'area interna di una geometria chiusa viene svuotata tramite foratura. Tale lavorazione calcola la posizione dei fori secondo una modalità impostata con i seguenti parametri.

	Set Tool Diameter		AUTOMATIC drilling		Press START to drill each hole
	Edge hole spacing		**Extra** space between holes and inside edge		
	X hole spacing		**Y** hole spacing		
Hole Path Layout					
	EDGE holes along inside edge		**HOR** horizontal path		**VER** vertical path
	EDGE+HOR inside edge + horizontal		**EDGE + VER** inside edge + vertical		
P1	First depth of drilling	**V1**	First drilling speed		
P2	Final drilling depth P1 must be less than P2	**V2**	Final drilling speed V1 is normally less than V2		

10.2.3.1.2 MILL RECESSING

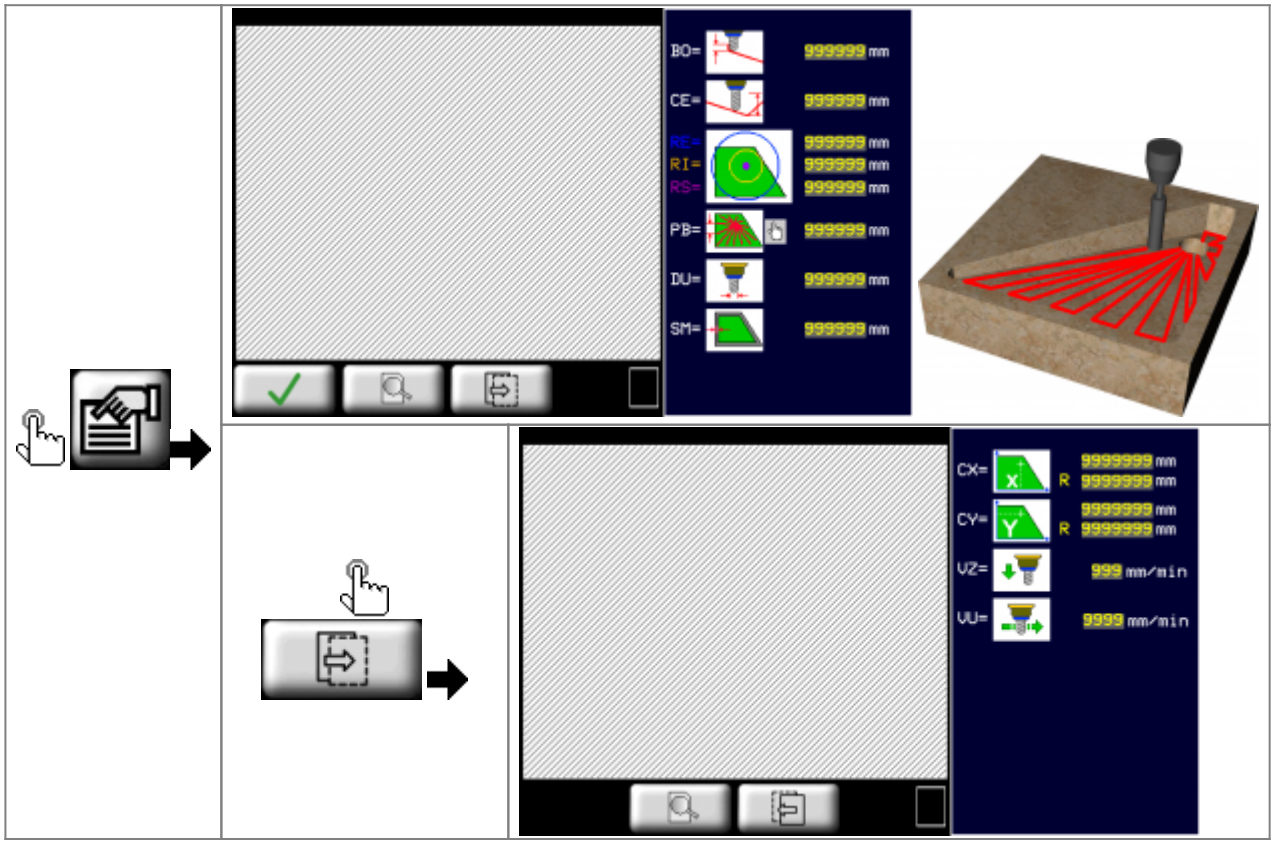


	Set drill diameter		Space between tool paths		extra material along inside edge
	TI: Direction of slope				
	Depth increase = X increase		Depth increase = X decrease		Start depth of slope
	Depth increase = Y decrease		Depth increase = Y increase		Final depth of slope
	If Start depth and Final depth are equal = no slope				
	HORIZONTAL tool paths along X		**VERTICAL** tool paths along Y		**SPIRAL** tool paths in concentric circles.
	VZ = Z- down speed		**VT** = Cutting speed		

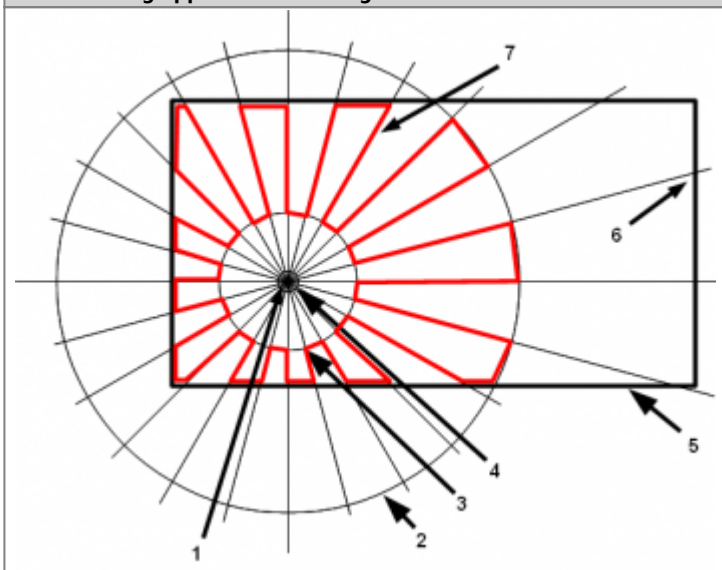
Fix Me!

	SINGLE Depth cut in one stroke.		STEP Depth cut in several steps.		Depth increase at each STEP

10.2.3.1.3 3D RECESSING



3D Recessing applied to a rectangle

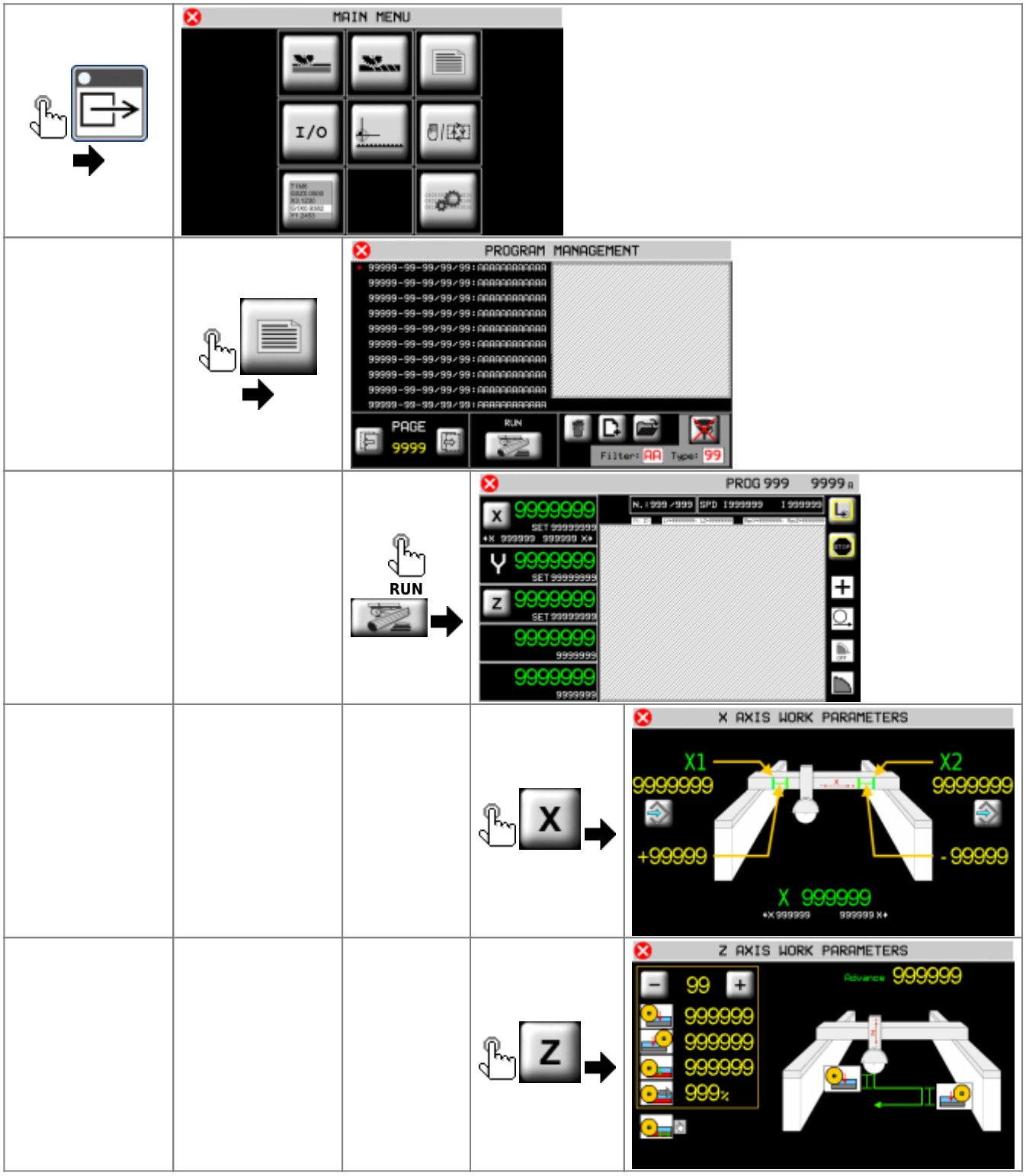


1	Depth at center
2	Outside radius
3	Inside radius
4	Drain radius
5	Closed object
6	Depth at edge
7	Tool path

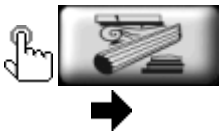
	Set tool diameter		Depth at edge		Depth at drain center
	- **RE** = Outside radius - **RI** = Inside radius - **RS** = Drain radius (all at center depth)		**PB** = Cut spacing on edge of slab		**PR** = Cut spacing on outside radius
	X position of drain center		Y position of drain center		Extra material along inside edge
	Z- down speed		Cutting speed		

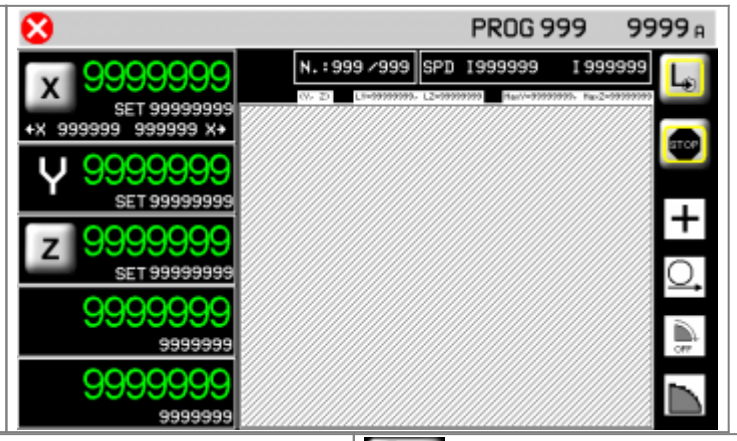
11. WORK PROGRAMS

11.1 Run a Program

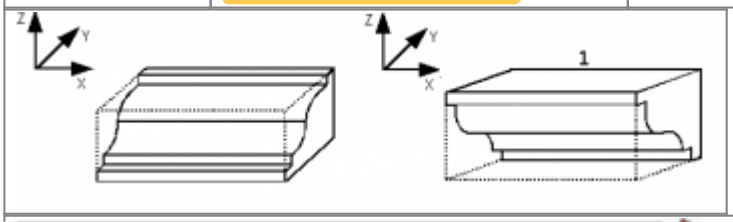


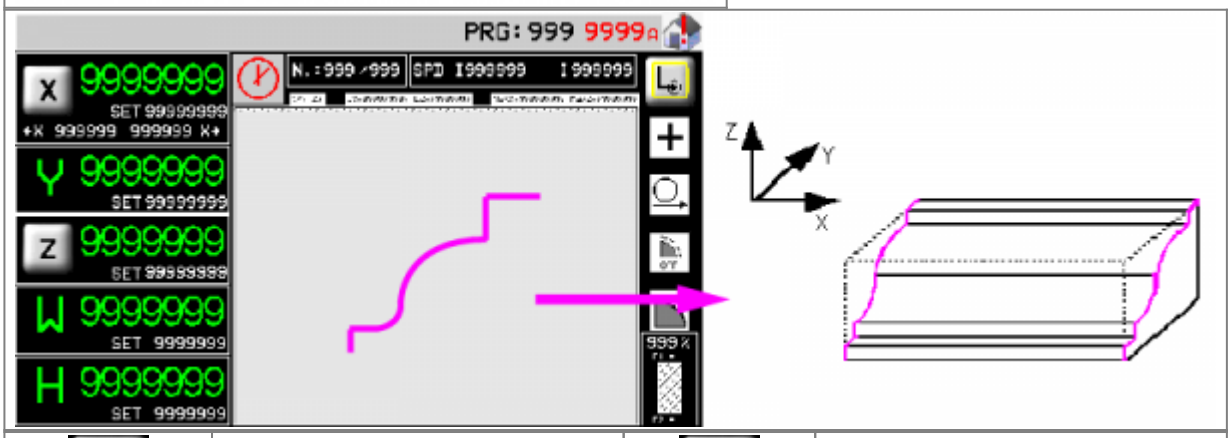
11.1.1 Work Program type 0 (Profili dritti)



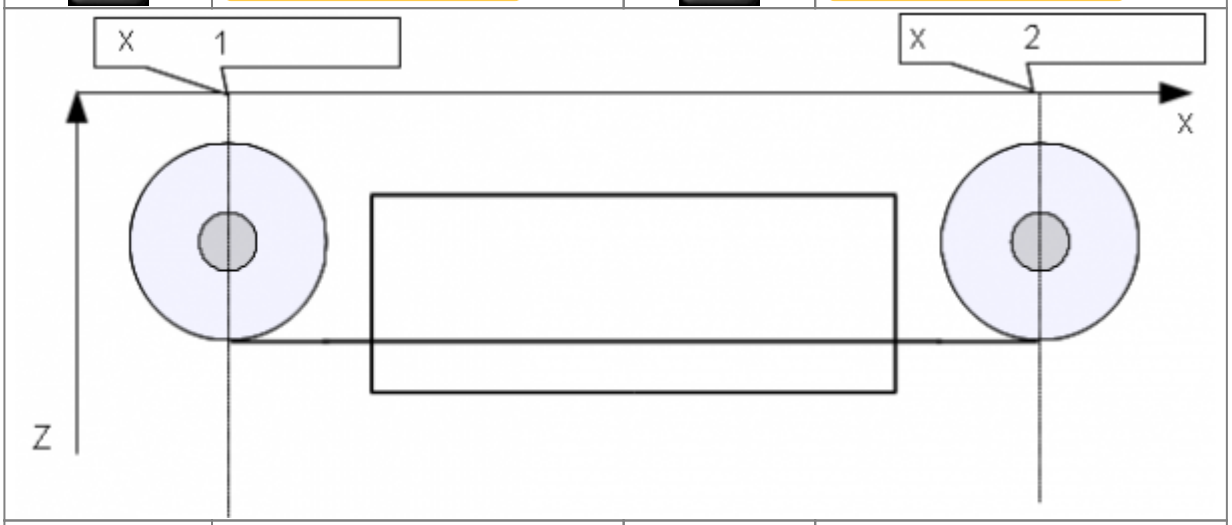


tasto marmo/granito	Fix Me!	STOP Fix Me! Fix Me!	Fix Me!
Work Parameters	see Work Program Fix Me!		





X	Fix Me!	Z	Fix Me!



1	Auto-set minimum	2	Auto-set maximum

	The minimum and maximum limits = slab size + disk radius

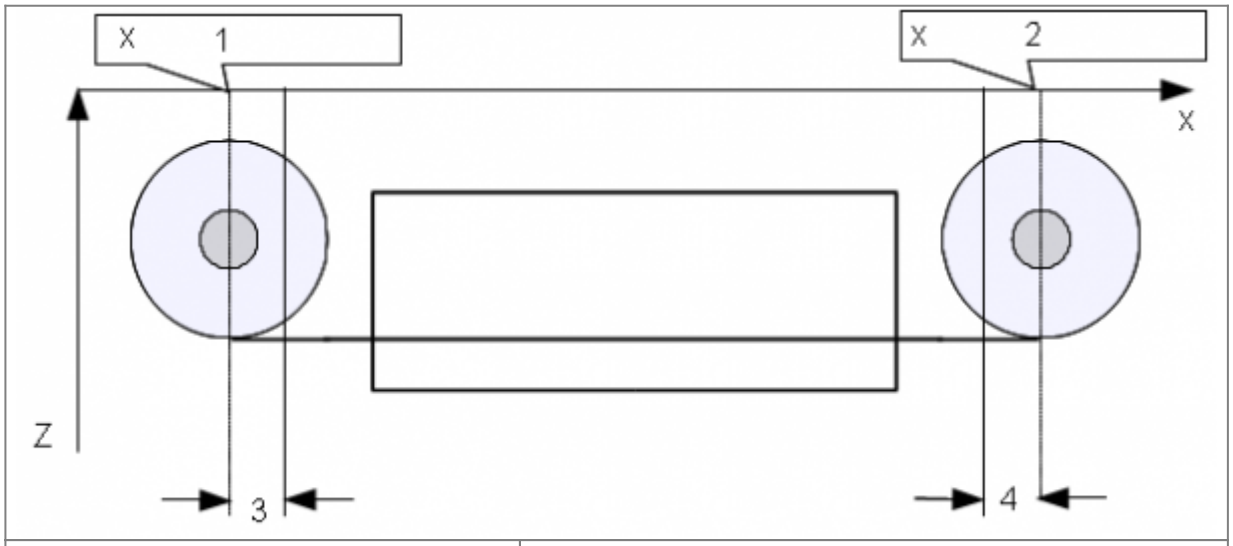
Fix Me! dimensione blocco??

Fix Me! quota di correzione???

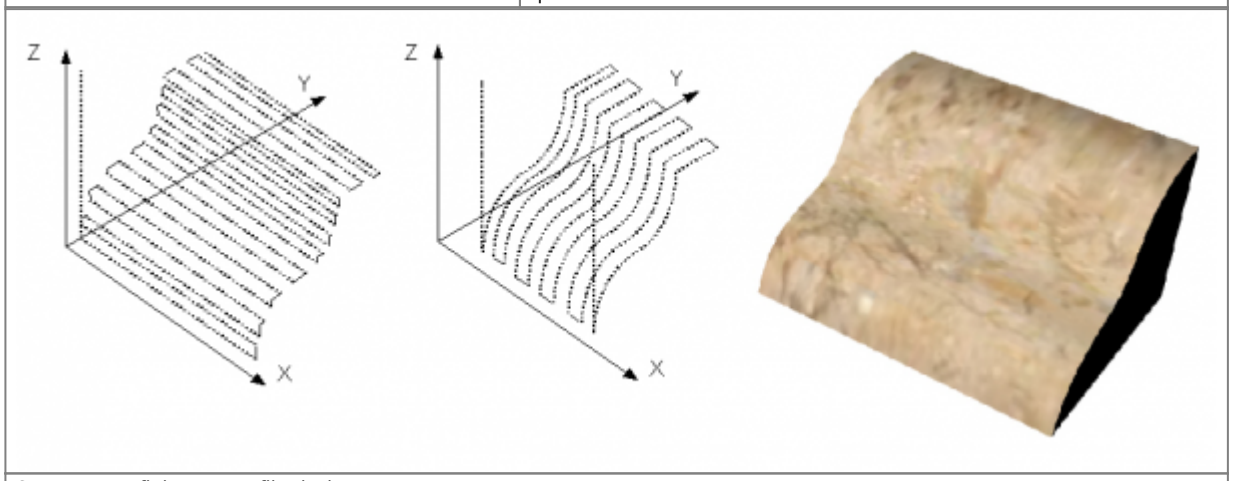
MACHINE START. Fix Me! La successione dei tagli compone la sgrossatura del profilo. L'asse X si muoverà sempre tra le due quote autoapprese che dovranno essere esterne al blocco da lavorare.

Fix Me! A questo punto può essere eseguita la finitura se il selettore della finitura è stato impostato su **CONTINUA** (se impostato su **OFF** la finitura verrà saltata, se impostato su **SOLO** la finitura verrà eseguita subito, senza eseguire la sgrossatura).

Fix Me! Per eseguire l'operazione di finitura la lama si porta sulla quota di **X autoappresa minima + quota di correzione** e quindi esegue una serie di passate in interpolazione YZ in accordo con i parametri per la finitura impostati. La finitura finisce quando si arriva alla quota **X autoappresa massima - quota di correzione** (vedi esempio).



1	minima autoappresa
2	massima autoappresa
3	quota di correzione +
4	quota di correzione -

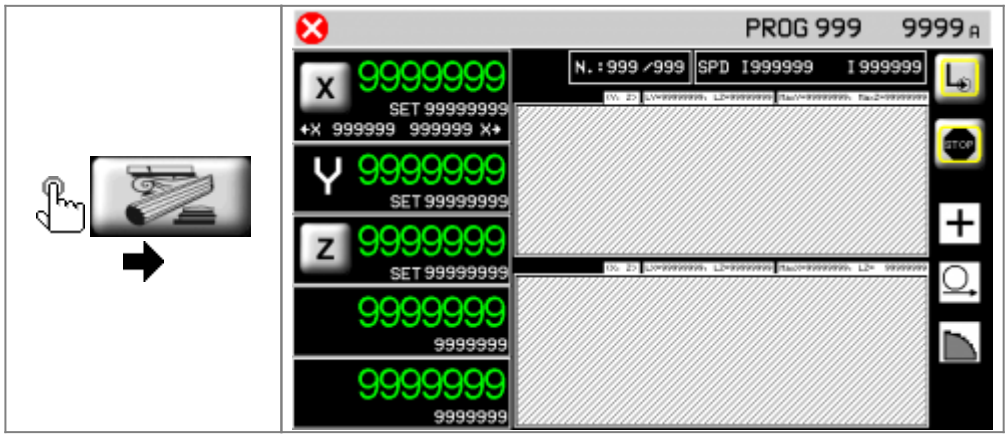


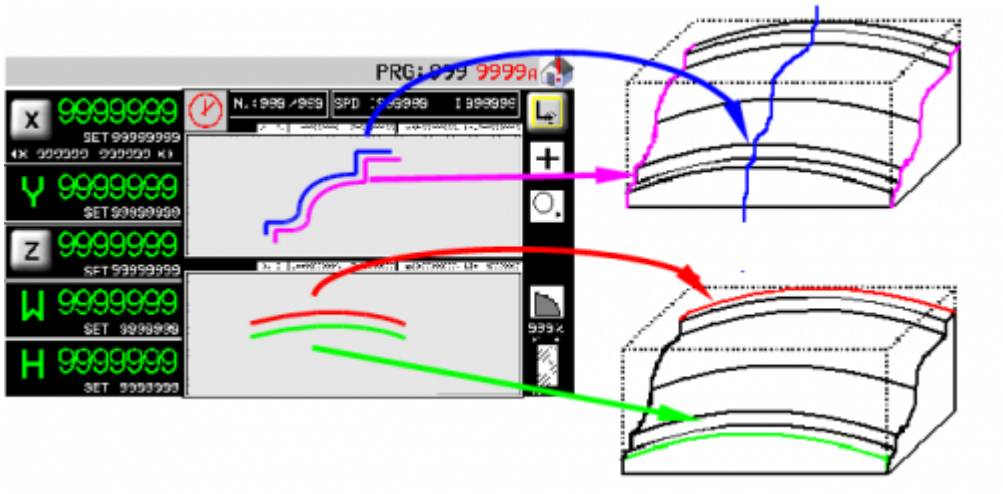
Sgrossatura, finitura e profilo risultante

	Nel dare start al ciclo automatico verrà richiesta un'operazione di azzeramento delle quote degli assi.

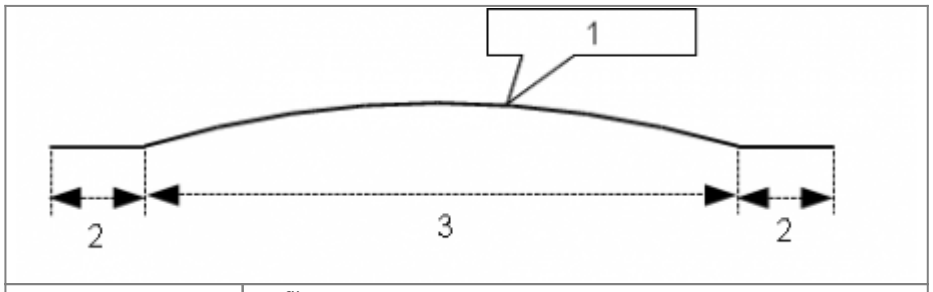
GRANDE Fix Me! Fix Me! Fix Me!

11.1.2 Work Program type 0 (Profili sagomati)



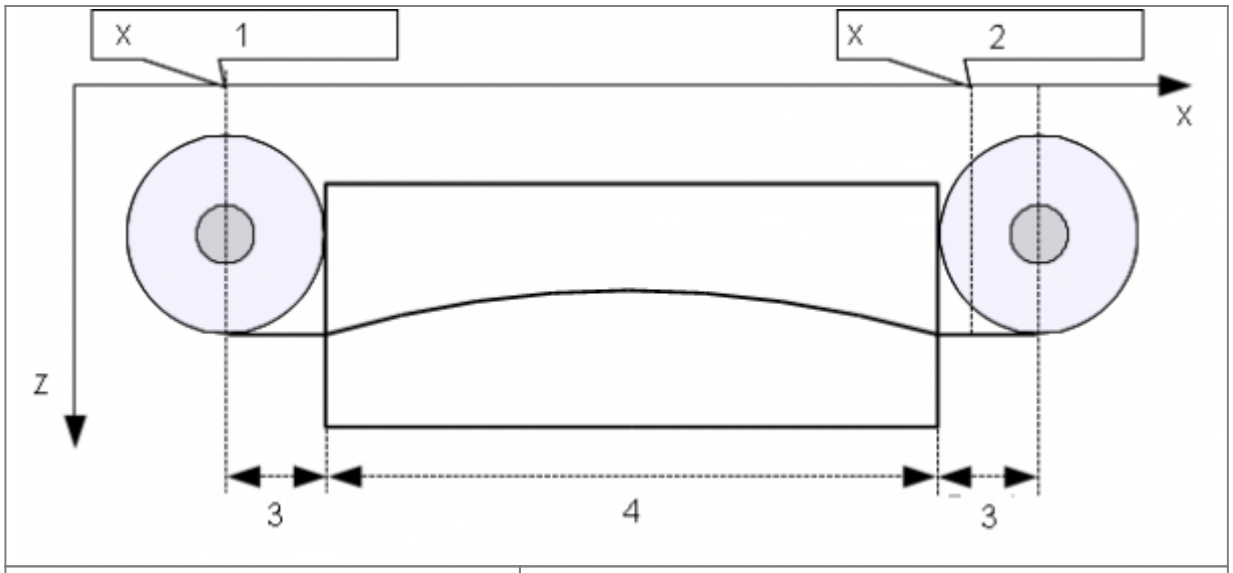


I tagli vengono realizzati in successione con un'unica passata (marmo) oppure ad incrementi successivi (granito) in accordo con i parametri impostati in precedenza. La successione dei tagli compone la sgrossatura del profilo. I tagli vengono eseguiti partendo dalla quota X autoappresa minima aggiungendo due tratti orizzontali lunghi come il raggio della lama, prima e dopo il profilo disegnato.



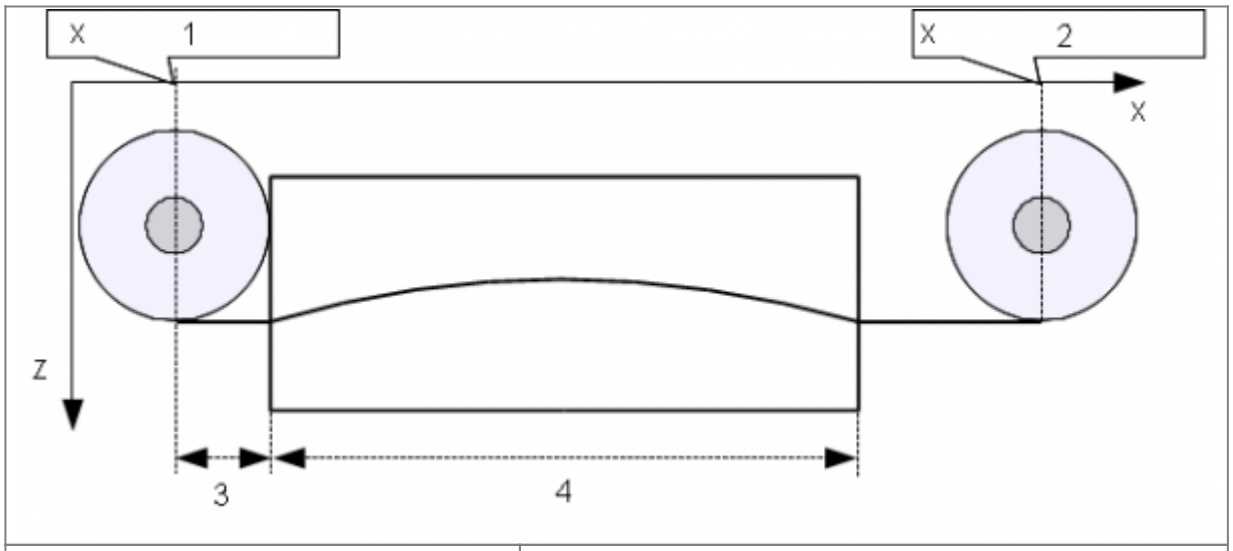
1	Profile
2	Disk radius
3	Profile larghezza

Si potranno presentare quindi due casi:



1	minima autoappresa
2	massima autoappresa
3	raggio lama
4	larghezza del profilo

In questo caso la larghezza del profilo sommato al diametro della lama è maggiore della distanza tra le due quote di X autoapprese. Come si vede dalla figura, il taglio parte alla quota minima autoappresa e viene eseguito completamente fino a superare la quota X massima autoappresa.

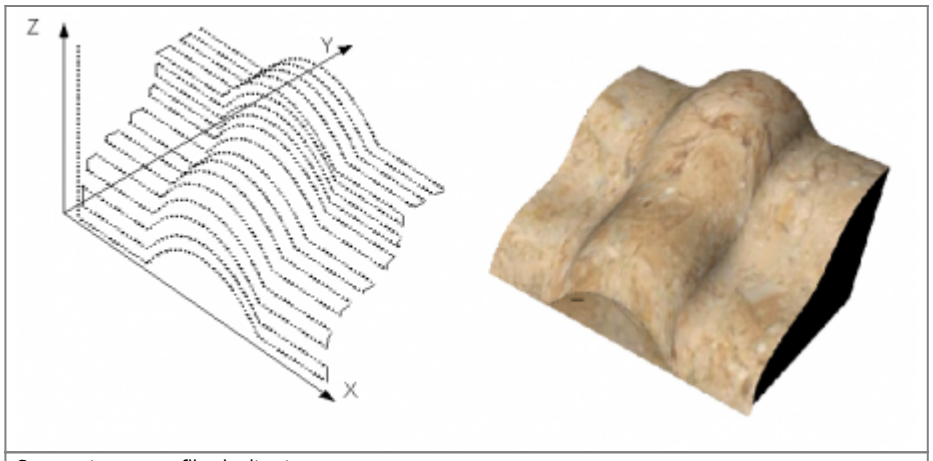


1	minima autoappresa
2	massima autoappresa
3	raggio lama
4	larghezza del profilo

In questo caso la larghezza del profilo sommato al diametro della lama è minore della distanza tra le due quote di X autoapprese. Come si vede dalla figura, il taglio parte alla quota minima autoappresa ,mentre il tratto orizzontale finale viene prolungato fino a portare il centro della lama sulla quota X autoappresa massima.

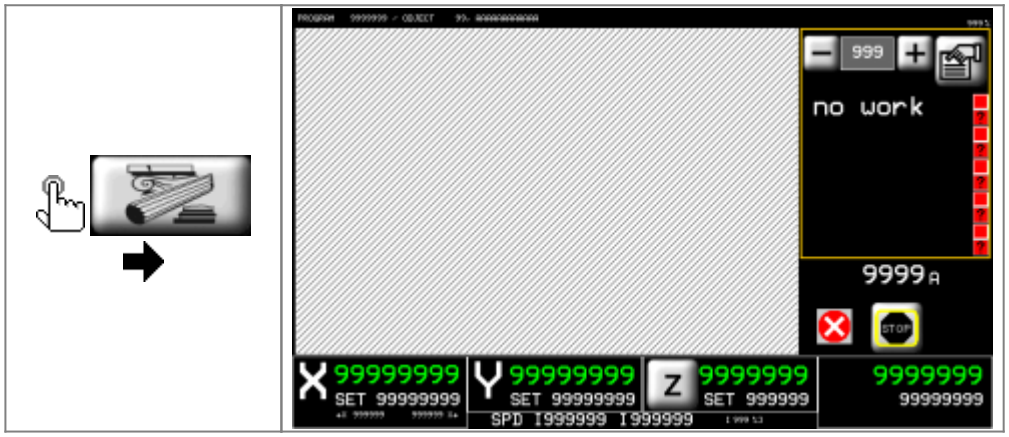
Il processo di finitura non è previsto per le lavorazioni di taglio curvilineo.

Questa schermata spiega che la lama deve essere portata a sfioro del blocco (come rappresentato), prima di dare l' OK per l'azzeramento delle quote degli assi.



Sgrossatura e profilo risultante

11.1.3 Work Program type 1 or 2 (Profili sagomati)



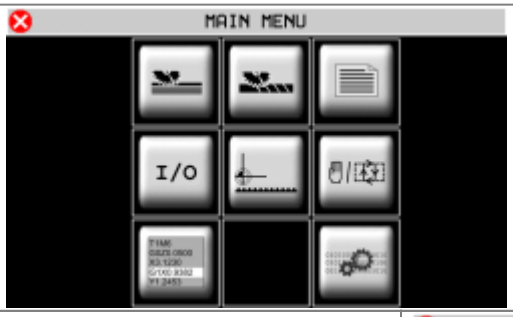
Nella pagina di esecuzione 2D è possibile lanciare l'esecuzione di un programma 2D. Nella lista di lavorazioni sono evidenziate a gruppi di 5 in un menu scorrevole le singole operazioni che compongono il programma. Durante l'esecuzione verrò visualizzata l'esecuzione della lavorazione in maniera simile a quanto ottenuto in fase di programmazione.

	Nel dare start al ciclo automatico verrà richiesta un'operazione di azzeramento delle quote degli assi.

11.1.4 TOPS Work Program

Fix Me!

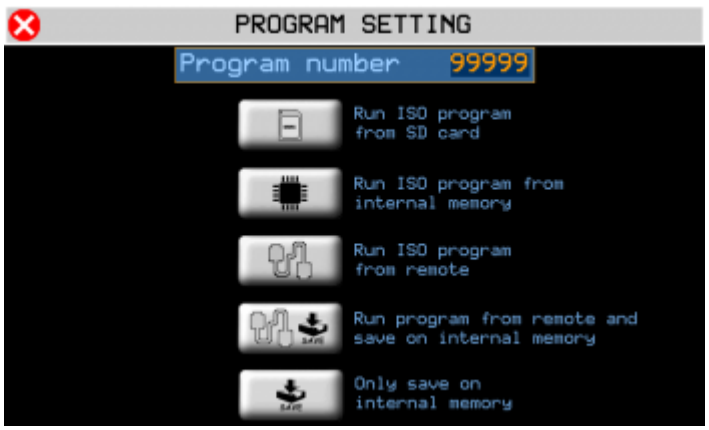
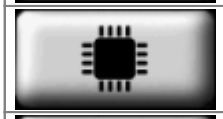
12. ISO G codes

	
	Optional accessory requiring QEM Isomanager (see specific manual Fix Me! insert link)
	When using an SD card rename the .hex file with a number (0 ~ 999999). (file name: 1.hex, 2.hex...)

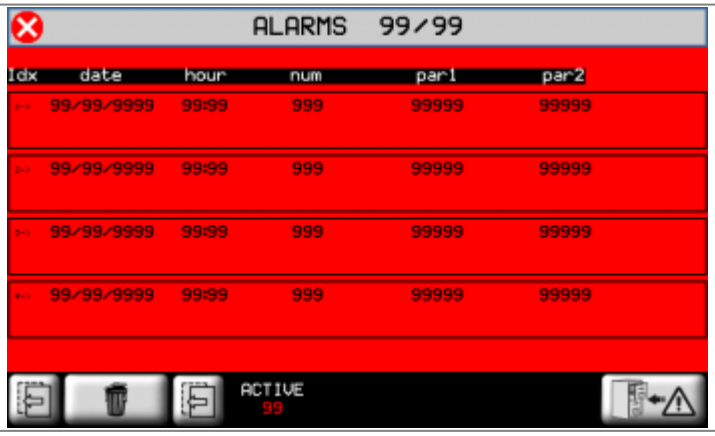
Program State

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

Program settings

			Run ISO from SD card
			Run ISO from internal memory
			Run ISO from remote
			Run ISO from remote and save on internal memory
			Only save ISO on internal memory

13. Alarms



cancel all alarms

Alarms block the machine operation.

Alarm	Cause	Solution
Emergency	Manual emergency stop	-
Y limit switch backward	Y-axis at minimum LS	-
Y limit switch forward	Y-axis at maximum LS	-
Z limit switch backward	Z-axis at minimum LS	-
Z limit switch forward	Z-axis at maximum LS	-
X limit switch backward	X-axis at minimum LS	-
X limit switch forward	X-axis at maximum LS	-
H limit switch backward	H-axis at minimum LS	-
H limit switch forward	H-axis at maximum LS	-
Disk not running	Disk must be running in automatic cyle	-
Water pressure	No cooling water	The water valve shut
Disk motor overcurrent	The disk motor current absorption is over the threshold	-
Z Following error	The axis follow error is over the maximum threshold	-
Y Following error		-
X Following error		-
Interpolation fault	Error during axis interpolation	One axis over the maximum position
Thermic fault	Overload of drivers tripped	-
Driver is fault	Fault in one of the axis drivers	-
X encoder fault	Axis encoder malfunctioning	-
Y encoder fault		-
Z encoder fault		-
W sensor missing	Low table sensor may be disconnected	-
Y Axis out of tolerance	Axis positioning out of tolerance	Check axis setup parameters
Z Axis out of tolerance		
W Axis out of tolerance		
H Axis out of tolerance		
CAN module - data error	CAN module error	Check CAN comunication or cable
CAN module - no comunication	CAN module not responding	
SD CARD not present	Error in SD card upload/download	Check the MMC/SD support, check the correct procedure
MMC/SD error update		
MMC/SD file not open		
MMC/SD file not create		
MMC/SD error write		
MMC/SD error seek		
MMC/SD error read		
MMC/SD error read seek		
MMC/SD error read format		
MMC/SD error record		
MMC/SD error delete		
MMC/SD error max retry		
MMC/SD undefined error		

Alarm	Cause	Solution
INT: motion mode not defined	Interpolation interpreter error	-
INT: exact path mode not supported		
INT: invalid istruction		
INT: invalid version		
INT: invalid release		
INT: spindle management		
INT: change tool management		
Mechanical components activation error	Interpolation execution error	
INTERP writing error		
INTERP starting error		

13.1 Alarm History

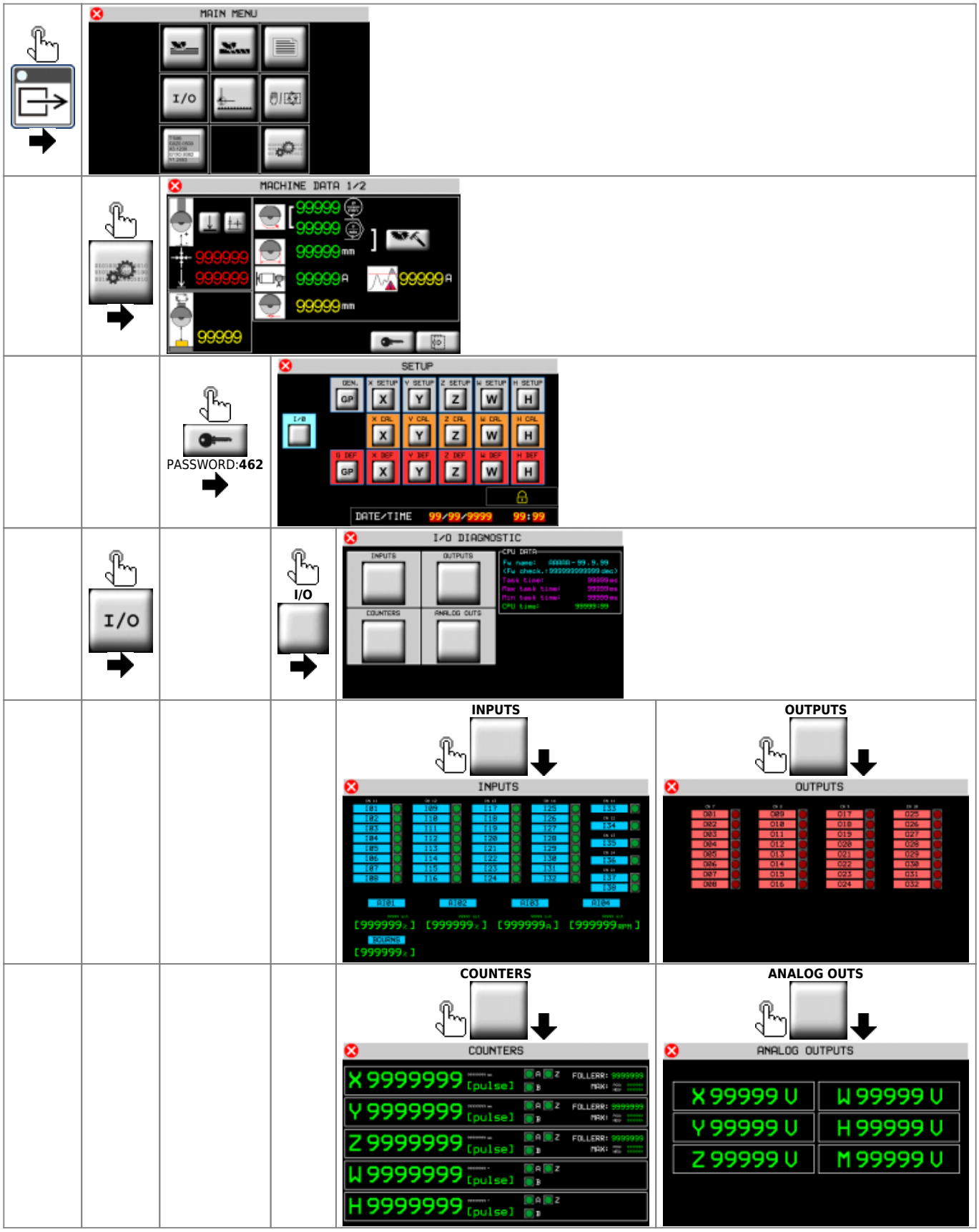
to cancel Alarm History

13.2 Warning Messages

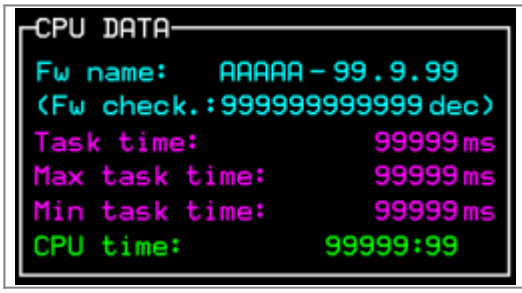
Messages do not block the machine operation. Fix Me! controllare con qpaint

Messagge	Cause	Solution
PLEASE WAIT... Fix Me!	Data being processed	-
WAITING FOR POWER SYSTEM	Fix Me!	Check the emergency button is not pressed
PATH Fix Me! ERROR	There is an error in the path settings, Fix Me! before the process.	The path may be too long
DISK TILT ERROR	The disk or tool tilt is not correct for the work cycle	Correct the disk or tool tilt
WORK DONE	Automatic cycle is completed successfully	-
X POSITION NOT OK	X position is incorrent	X position is outside the auto-set min-max positions
RUN HOMING	The Homing is not OK	Run the homing procedure

14. Diagnostics

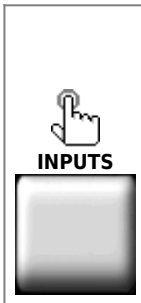


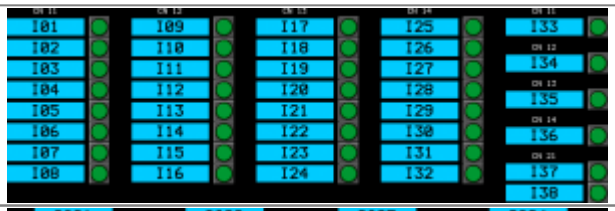
14.1 CPU DATA



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

14.2 Inputs





State of digital inputs

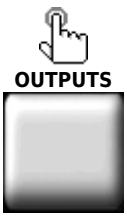
= OFF

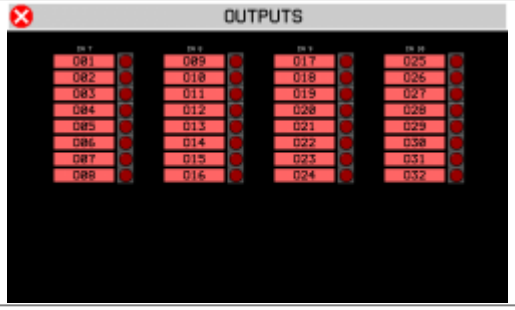
= ON

Analog input readings

BOURNS input reading

14.3 Outputs



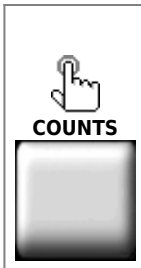


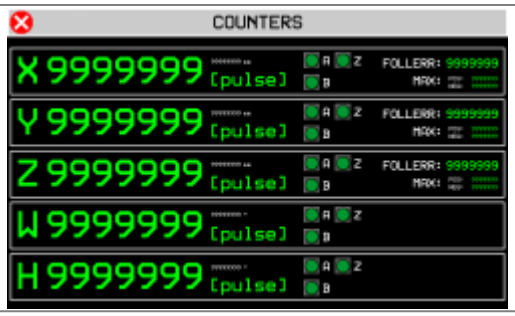
State of the digital outputs.

= OFF

= ON

14.4 Encoder Counts





Axis position

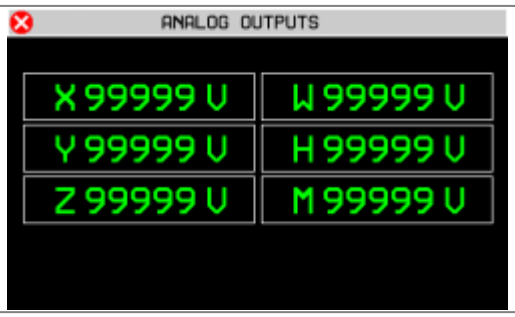
State of encoder channels.

= OFF

= ON

FOLLERR: = realtime following error
MAX: POS:/NEG: = min - max follow errors

14.5 Analog outputs



Analog output voltage

14.6 Controllo dei finecorsa

Controllo dei finecorsa hardware

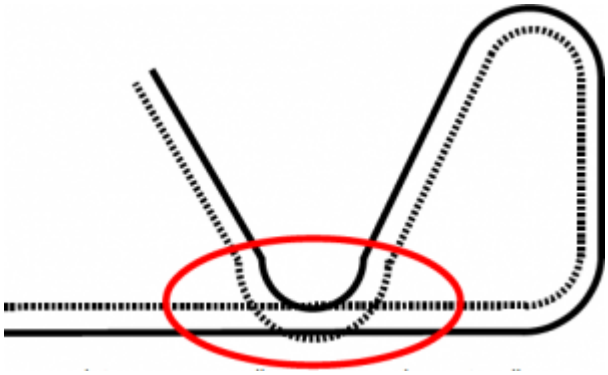
Controllo dei finecorsa 0° - 90° del disco

	Disk auto speed table (password) Fix Me! Va su installazione non qui

Tool compensation limits

Fix Me! The compensazione del tool diameter nelle lavorazioni 2D consente di determinare il percorso che l'utensile di un certo diametro deve compiere per ottenere le dimensioni del pezzo inserite.
Una volta impostato il diametro dell'utensile nella apposita pagina della lavorazione 2D, viene proposto all'operatore il percorso utensile disegnato con un tratto blu. L'operatore deve eseguire un controllo visivo della correttezza del percorso utensile.
Tale controllo è necessario per verificare la correttezza del percorso nel caso in cui si siano verificati i casi limite di seguito elencati:

Percorso utensile che si chiude su se stesso:



This does not cause a tool compensation error.

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