



Getting Started Guide

Horizontal Press Software Simulator



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Notes

General Information

The information contained in this document is only applicable to the software versions indicated on the cover page.

It may happen that not all the functions that can be performed by the product are described in this document; in this case Esautomotion is not obliged to guarantee these functions or conserve them in future versions.

Scope

The scope of this document is to help the operator if the product described on the cover page and in the installation / use of the office software.

Users

This document contains information for the:

- Machine operator with no basic computer knowledge
- Operator/technical installer with knowledge of Windows ®

Use

The document is divided into chapters that describe the most common control functions and procedures for installing the Office Software.

Reporting problems

Should any problems arise during consultation of this document please contact Esautomotion.

Explanation of the symbols

There may be graphic symbols alongside the text. These are used to highlight particularly relevant information.



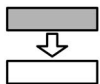
Attention: This symbol is used when failure to observe the appropriate precautions could cause slight damage to property or injury to persons.



Danger: This symbol is used when failure to observe the appropriate precautions or the performing of incorrect manoeuvres could cause serious damage to property or injury to persons.



Important: This symbol is used in the document to indicate the presence of particularly important information. It means that it is essential to read and fully understand this section of the document.



Optional: This symbol is used to indicate sections of the document that describe functions or components that are only optional. The use of optional functions must be agreed upon with the machine manufacturer



Manufacturer: This symbol is used to indicate sections of the document reserved for the machine manufacturer.



Passwords: This symbol is used to indicate sections of the document that describe functions with access controlled by software access passwords.



CN: This symbol is used to indicate sections of the document that describe functions that are only available with NC and not on the PC.



PC: This symbol is used to indicate sections of the document that describe functions that are only available on the PC and not with NC.

Printing conventions

To facilitate the identification of the information in this document, use is made of special printing conventions as illustrated below.

Keypad and video

The following are used:

- The names of the screen-printed keys are highlighted in **bold print** and enclosed in square brackets. If the name of the key is preceded by "Pushbutton" it refers to a pushbutton on the pushbutton panel.
- **[ENTER]**. Identifies the pushbutton bearing the word **ENTER**.
- **[+]** indicates a key + of the keypad whereas pushbutton **[+]** indicates a pushbutton + of the pushbutton panel.
- The names of the function keys are highlighted in **bold print italics** and enclosed in square brackets.
- **[Menu Plc]**. Identifies the function key with the word Menu Plc.
- References to the fields and/or messages on the video are displayed in **bold print italics**.
- The specific text that has to be entered by the user is underscored.
- If the manual indicates "enter ok" the word "ok" must be entered.
- DIRECTION or DIRECTIONAL keys is the collective name of the UP, DOWN, LEFT and RIGHT arrows.
- The pressing in sequence of sets of keys is indicated by separating the identifiers of the key to press with the character ">".
- **[Manual] > [START]**. Describes the pressing in sequence of the keys **[Manual]** and **[START]**.
- The simultaneous pressing of several keys together is indicated by separating the identifiers of the keys themselves with the character "+".
- **[SHIFT] + [à]** Describes the simultaneous pressing of the keys **[SHIFT]** and **[à]**.

Text

The following agreements are used:

- **Italics** are used to highlight specialist terms.
- **Bold print** is used to highlight particularly important words.

Glossary

CNC: The abbreviation of Computerised Numerical Control which indicates the apparatus governing the machine, that is, the electronic device via which the work cycles are programmed, the axes are moved, etc...

It corresponds to one of the devices, the operation of which is described in this manual.

SSD: Solid State Disk, also known as Flash Hard Disk, is a data saving device without any components in movement, therefore particularly suited to industrial environments.

Menu selection: To select the menu that interest you must press the button and then select the desired menu using the number:

Setting Menu programs and tools (0)

Parameter Menu Axes

Menu Configure the Machine

Diagnostics Menu

Menu User Parameter

Menu Turn Off

Menu Esc

Version Menu

Logo Menu

Monitor Menu Memory



Home



Main Menu



Black arrow Main Menu



Sub Menu



Settings



List



Program List



Punches and dies List



Save / Usb programs or tools list



Previous



Next



Hamming or Flattening or Dutch Folding bend



New bending program



Parameters selection



Manual



Automatic



Semiautomatic



Corrections



Save / Load from disk



Delete



Minimize



Exit



Off



Start



Stop



Restart



Light



Rear Door Open



Laser



Laser Mode 1



Laser Mode 2



Laser Reset



Keys for manual handling operations; on some



versions replaced by a wheel on the front panel

Touch enviroment

The new interface of the NC Kvara S 560 and S 660W born with a new interactive graphics on which every function is achieved at the touch of your finger, not only because Esautomation Ltd. aligns well to the features most current PC environment but also want to speed up and facilitate the work of its end user.

Soft Keyboard:

Whenever you have to set programs to move data in the input fields, enter and correct data or units or to access to the drawing musk just type on the screen to edit the data directly with your finger and immediately you will see the Soft Keyboard as shown in the Figure.

The Soft Keyboard is a virtual keyboard and interactive that has all the functionality of a PC keyboard but with the advantage that being in touch environment, allows the user to have the keyboard directly on the screen so without losing the visual changes and / or entries made to their work, thus speeding up all the useful operations.

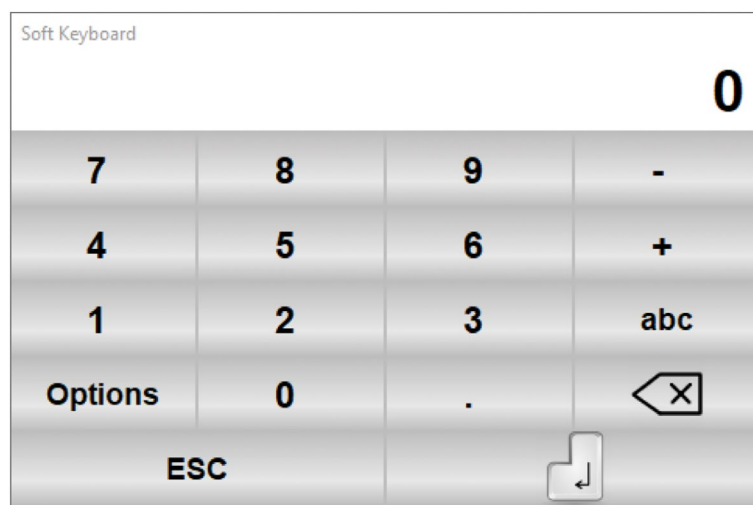


Figure a - Soft Keyboard Numbers

The  key means Delete

The  key means Confirm - ENTER

When you confirm a given inserted, the Soft Keyboard normally closes.

- By pressing "Option" you can select the "pincushion" to keep the keyboard always on in the foreground, even after confirming the entered data:

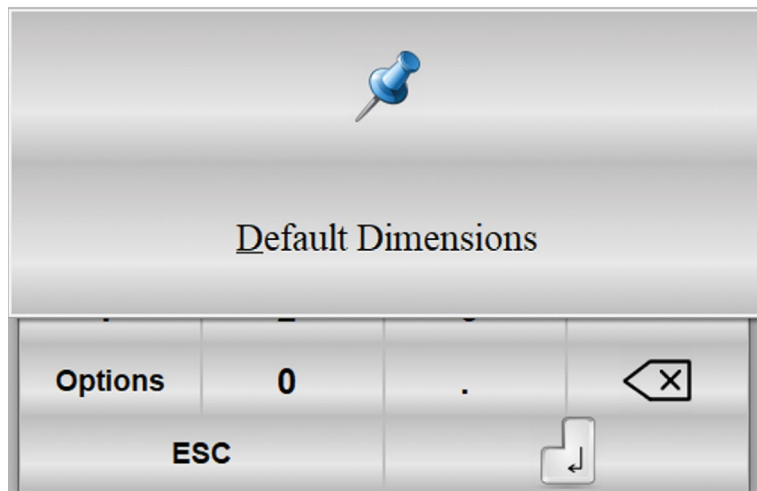


Figure b - Soft Keyboard the "pincushion"

- pressing "Default Dimensions" the keyboard is resized to a standard size.
- pressing "abc" will appear in the literary characters to nominate programs and tools chosen:

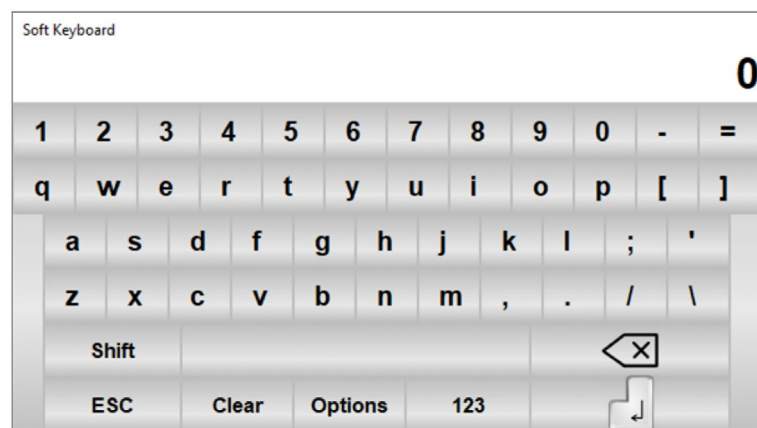


Figure c - Soft Keyboard the literary characters

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Any changes to this document (in either electronic or printed form), even if authorised, shall invalidate the warranties specified hereunder.

Warranties

It is possible for the product to offer types of performance not described in this document. Esautomotion does not undertake to conserve these functions in the new versions of the product or to guarantee assistance for the same. It has been verified that the contents of this document comply with the product described. Nevertheless, there may be some discrepancies. As a result, Esautomotion cannot guarantee full compliance and completeness of the contents.

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This document has been drafted in partial compliance with the ANSI/IEEE standard 1063-1987 "IEEE Standard for software User Documentation".

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This document is subject to changes without notice. The changes may entail a re-edition or a revision of the document.

The re-edition implies complete replacement of the document.

The revision entails the replacement/addition/elimination of pages of the document.

The bottom of every page is identified by the document code.

Notes

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1. NC Powering

1.1. Home Page

After turning on the Numerical Control, the first available page is the Home page.



Figure 1 - Home Page

From any other page, pressing the  icon, you can enter on the Home page.
From this page it's possible to:

- Enter in Settings pressing 
- Enter enter in Manual, pressing 
- to enter in Semiautomatic, pressing 
- to enter in Automatic pressing 
- to minimize the application, pressing 
- to exit from the application, pressing 
- to realize a new program of bend, pressing 
- to select one of the lists (Program, Punches, Dies), pressing 
- to select one of the parameters pages, pressing 
- to turn off the Numerical Control, pressing 

2. MACHINE SETUP

Operations to carry out after powering



It's **obligatory** to size the Ram to access the automatic phase and execute a work program.

Sizing of the stop axes is **optional**. It is advisable to size them if there are doubts about the correctness of the current stop axes targets. The current targets may not be correct if an axis is moved manually when the numeric control is off.

2.1. Ram Sizing

Comply with the following procedure to size the ram:

- Press 

- If the ram is up, press the **down pedal** to move it down below the zero marks

- Press the **up pedal**; this operation will activate manual re-ascent if the machine has been reset.

The ram will move upwards until it meets both the zero marks of the optic lines of the two cylinders where sizing takes place. It will now be possible to execute a program in automatic mode.

To repeat the resetting procedure without turning off the NC:

- Press **[Repeat Sizing]**;

- Press the re-ascent pedal.

2.2. Sizing the stop axes

To calibrate the axes of the stop it is necessary to follow the steps below:

- Press 

- Press 

The stop axes move towards the sizing limit switch. Once the limit switch has been touched, they will reverse their direction and, after having released the limit switch, they will size to the first zero mark of the encoder.

3. PUNCHES AND DIES SETUP

3.1. Punches and Dies List

Comply with the following procedure to access the tools list:

- Press  to display the list of punches or list of dies

- If the list of dies appears, press again  to display the punches, or vice versa.

The following window will appear in the case of punches:

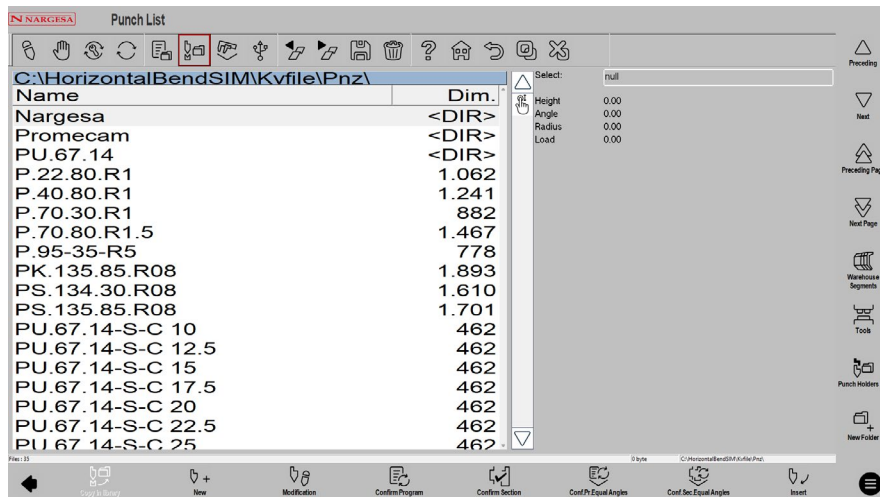


Figure 2. Punches List

The window on the left is the list window.

In the center there are the data of the punch to which the cursor has set (in the list).

The window on the right gives a preview of the punch to which the cursor has set.

The following window will appear in the case of dies:

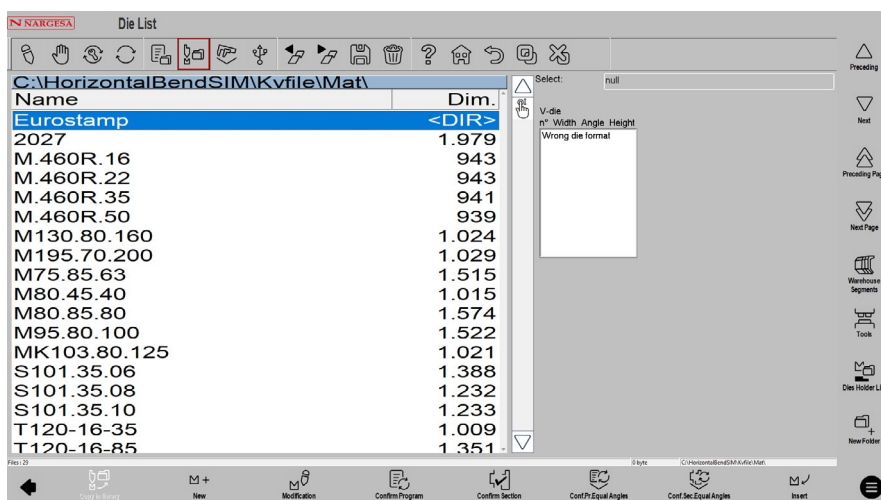


Figure 3. Dies List

The window on the left is the list window.

The central boxes give the data of the die to which the cursor has set (in the list).

The window on the right gives a preview of the die to which the cursor has set.

When the available tools are many, for fast choice, is enough to flow the wheel visualized on the panel, with own touch.

The function keys have the following meanings:

-  + to completely draw the punch or  + to completely draw the die
-  + to use a type 1 preset punch or  + to draw a preset die
-  + to use a type 2 preset punch
-  + to use a type 3 preset punch
-  + to use a type 4 preset punch (round punch).
-  ↶ to insert the punch or  ↶ to insert the die in the work program or in the selected bend

How to display the preview

Allows you to display the tool preview (to make it easier to identify). The preview function is normally enabled, but can be disabled if not required. Comply with the procedure below:

- Press the  to display the list of punches or list of dies
- Select the **Preview**  item
- Select the preview item is disabled

Repeat the operation to re-enable the item again.

How to copy a punch or die

This allows you to create a copy of a tool with another name so that it can then be modified. Move to the tool you wish to copy and then comply with the procedure below:

- Press the  key to access the menu
- Select the **Copy**  item
- This accesses a window where the tool name must be entered.

After the name has been entered, move to the **[Confirm]** button and press **[OK]**

How to rename a punch or die

Allows you to change the name of a tool. Move to the tool you wish to rename and comply with the procedure below:

- Press the  key to access the menu
- Select the **Rename**  item
- This accesses a window where the new tool name must be entered.

After the name has been entered, move to the **[Confirm]** button and press **[OK]**

How to erase a punch or die

Allows you to eliminate a tool. Move to the tool you wish to eliminate and comply with the procedure below:

- Press the  key
- Press **[Yes]**
- the selected tool will be erased.

Save all tools on USB

Allows you to save all the tools on USB so that they can then be transferred to another numeric control (useful when backup copies must be created). Comply with the procedure below:

- Insert into the USB port a USB device formatted with enough space to hold the tools.
- Press the  key to access the menu
- Select the **Save Tools**  item
- All the tools (dies and punches) will be saved on USB.

Erase all tools

Used to erase all the tools. Comply with the procedure below:

- Press the  key to access the menu
- Select the **Delete Tools**  item

All the tools will be Deleted (confirmation is requested for each tool).

Tools list on USB device

Used to display the list of tools USB device. The possible operations are the same as the tool list, then you can copy, rename, delete all tools present on the USB device. Select the list punches and dies and perform the following steps:

- Insert into the USB port a device containing tools (created by VIS 600 or VIS 800 cnc's series)

- Press the  key

- The list of punches or dies on USB will be displayed

- Proceed with the required operation.

How to save all tools from USB to NC

Allows you to save the tools from floppy disk to NC, so that they can be downloaded from another numeric control. Comply with the following procedure:

- insert into the USB port a device containing tools (created by VIS 600 or VIS 800 cnc's series)

- Press the  key

- Press the  key to access the menu

- Select the **Save Tools**  menu

- All the tools (dies and punches) will be saved from USB to NC.

3.1.1. How to enter a new punch

Comply with the following procedure to enter a new punch:

- Press the   key ; the list of punches or list of dies will appear

- If you see the list dies press again the   key;

Select the desired type of punch. The punch can either be completely drawn or three types of preset punches with fixed measurements can be used. These measurements are varied in order to rescale and re-design the punch.

The following types of preset punch are available:

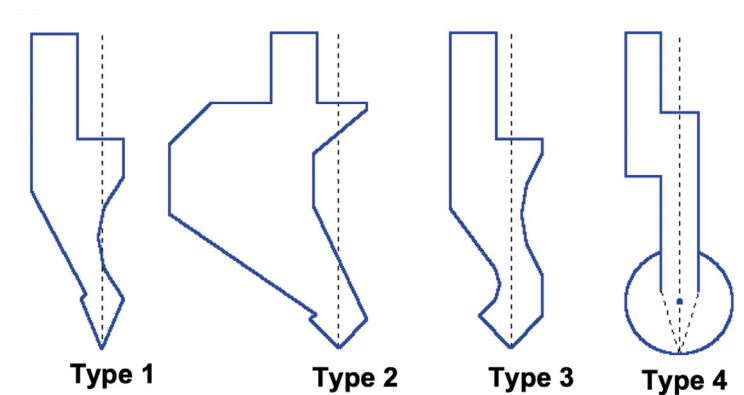


Figure 4. Types of preset punch

It is advisable to use preset punches if the punch to be entered is similar to one of the proposed types (taken from the catalogues), since the drawing will be less difficult.

The punch must be completely drawn if it is not within the preset punch categories.

Note

Remember that the punch drawing is used to make anti-collision checks for the graphically designed work pieces, while the bending depth calculation is developed according to the punch dimension data. If there are difficulties in completely drawing a punch, the problem can be obviated by using a type of preset punch and attempting to adapt it to the real shape as much as possible by means of the pre-defined data.

Press:

-  + to completely design the punch
-  + to use a preset punch type 1;
-  + to use a preset punch type 2;
-  + to use a preset punch type 3.
-  + to use a type 4 preset punch (round punch).

A window will be opened requesting entry of the punch dimensions:

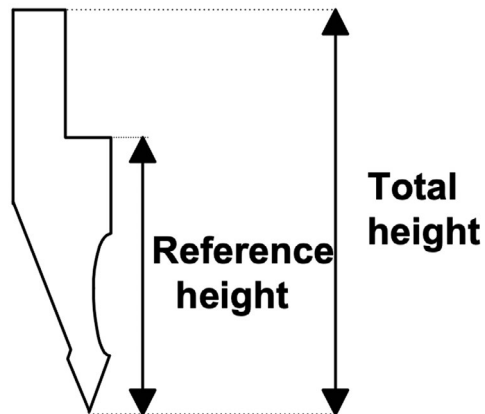


Figure 5. Punch dimensions

Enter the Total Height and the Reference Height as indicated in the figure and select **OK**.

Access to the drawing page

Access the drawing page once the punch dimensions have been entered and the type of punch selected. The drawing page changes, depending on the type of punch selected.

3.1.2. Punches to draw

The punches to draw page is obtained by means of the drawing function (see relative chapter in the operator manual)

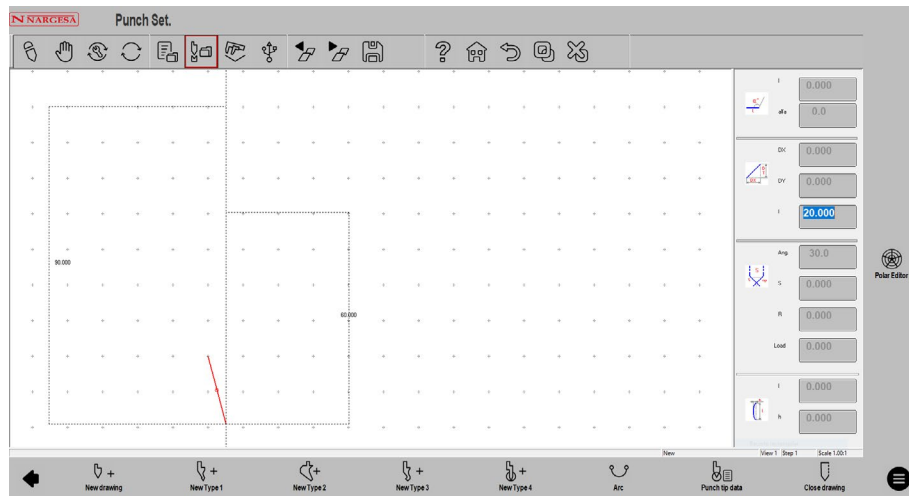


Figure 6. Punch drawing page

The left-hand window is the drawing window.

The four right-hand windows are drawing data entry windows and respectively represent:

- The polar drawing data
- The Cartesian drawing data
- The vertex drawing data
- The arc drawing data

Drawing conventions

The punch must be drawn in an anticlockwise direction, remembering that the stop is on the right-hand side of the punch itself.

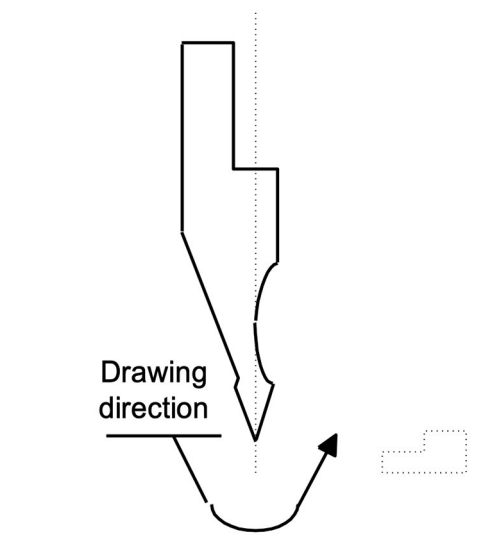


Figure 7. Punch drawing direction

Vertex entry

The tip must be defined in order to use the punch drawing. When the drawing is commenced, the marked line represents one of the two sides of the tip. Proceed in the following way to define the tip:

- Enter the length l (section l);
- Press **[ENTER]**;
- Enter the tip angle (ang. angle);
- Press **[ENTER]**;
- Enter the chamfer, if present (S data item)
- Press **[ENTER]**;
- Enter the tip radius (R data item);
- Press **[ENTER]**;
- Enter the punch load (maximum tons for meter);
- Press **[ENTER]**.

The tip will be drawn and the next section will be automatically drawn with the same length as entered in section "l".

How to do the drawing

Supposing that the following punch must be drawn:

The cursor is in section l of the data entry window of the drawn tip data:

- Enter the tip data as previously described
- Enter the length of the second side of the tip (section l1)
- Press **[ENTER]**; the cursor will set to the **alfa** Field where the angle is entered in relation to the next section
- Press on the display to move to the design, using own touch (touch environment)
- Press **[ENTER]**; the next section will be drawn in automatic mode. The section to which the data refer will be marked, the cursor will move to Field 1 where the length of the section is entered
- Press **[Arc]**;
- Enter the length corresponding to section l2 in Field 1
- Enter the depth corresponding to section p1 in Field h
- Press **[ENTER]**.
- Enter the length corresponding to section l3 in Field 1
- Press **[ENTER]**. The cursor will move to the **alfa** Field where the angle is entered in relation to the next section
- Enter value 90.0 in the **alfa** field
- Press **[ENTER]**: the next section will be drawn in automatic mode. The section to which the data refer will be marked, the cursor will move to Field 1 where the section length can be entered. The punch drawing will form by continuing to alternatively enter the lengths and angles. The more the entered measurements and angles correspond to reality, the more the drawing will be correct. Figure 8 Example of a punch to be drawn.

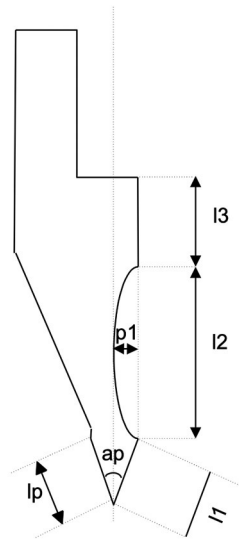


Figure 8. Punch drawing example

Graphic helps

In relation to sections whose measurements may cause difficulties, the operator can use graphic helps allowing the angle value to be varied by $\pm 1^\circ$ and the length to be varied by $\pm 1\text{mm}$ each time. This achieves a visual correspondence between the drawing and the real punch. To enable this feature, only valid for settings punches:

- Press the  key to access the menu

- Select the **Dynamic**  item

The angle value is increased by 1° by pressing the down arrow of an external keyboard and is diminished by one degree at a time by pressing the up arrow. The length value is increased by pressing the right arrow and decreased by pressing the left arrow.

Drawing curved sections

As shown in the example, the drawing function can be used to draw curved sections. Press the  item and the cursor will move to the arc data entry window.

Enter length l and depth h of the arc and the curve corresponding to the entered data will be automatically plotted.

Entered data correction

Incorrect entries may be made during drawing entry. Correct these entries and move amongst the various drawn

- Sections by means of the  and  keys and by modifying the values of the fields.
- Use the  key to switch to the immediately previous entry Field and then alternatively pass to a section entry Field and an angle entry Field (alfa)
- The  key immediately passes to the next section and, thus, always to the section entry Field (l)
- Press **[ENTER]** to pass to the immediately following entry Field and to then alternatively pass to a section entry Field (l) and an angle entry Field (alfa), or tap on the desired field.

Error correction

A very frequent error (particularly if the arrows are used to enter the angles) is that of forgetting to press [ENTER] after having entered an angle. At this point, the length of the section will be entered in the angle entry field, thus creating an error in the drawing.

- Use the  key to move back to the angle entry Field and re-enter the correct value.

Saving the drawing

At the end of the drawing, press the  key to memorize it. Enter the name of the punch in the window that appears. After the name has been entered, move to the **[Confirm]** button and press **[OK]**.

Tolerated name characters

The entered name can be formed by a combination of numbers and letters (e.g. the code of the punch in the catalogue can be used).

3.1.3. Preset punches

The preset punch page is presented in the form of a pre-drawn punch along with a series of data that characterize the shape of that punch

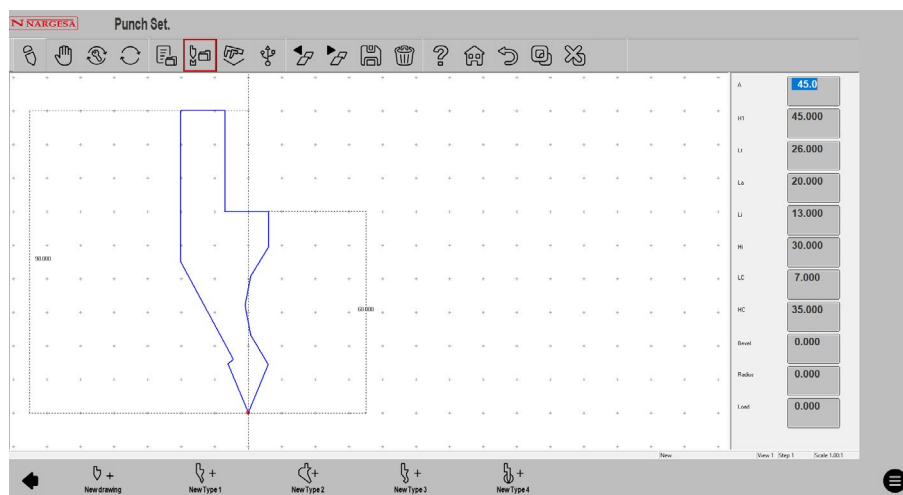


Figure 9. Preset Punch

When the data are scrolled with the **[ENTER]** key or selected with a touch, an indication will appear on the drawing as to which measurement corresponds to the selected data item.

By modifying any one of the values and pressing **[ENTER]**, the drawing will be re-plotted by taking the modified value into account.

Saving the drawing

At the end of the drawing, press the  key to memorize it. Enter the name of the punch in the window that appears. After the name has been entered, move to the **[Confirm]** button and press **[OK]**.

Tolerated name characters

The entered name can be formed by a combination of numbers and letters (e.g. the code of the punch in the catalogue can be used).

3.2. How to enter a new die

Comply with the following procedure to enter a new die:

- Press  to display the list of punches or list of dies
- If the list of punches appears, press the  key again.
- Select the required type of die. The die can be completely drawn or the default die with fixed dimensions can be used. These measurements can be varied in order to rescale and de-design the die:

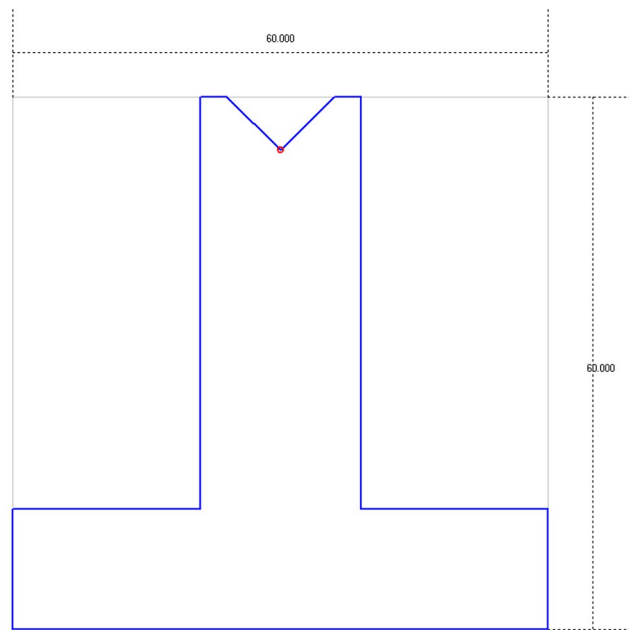


Figure 10. Available types of preset die

It is advisable to use preset dies if the die to be entered is similar to one of the proposed types (both square and overturned T dies can be drawn), since the drawing will be less difficult.

The die must be completely drawn if it is not within the preset die categories, if a die with several V-dies must be drawn or if square or pressing V-die must be used.

Note:

Remember that the die drawing is used to make anti-collision checks for the graphically designed work pieces, while the bending depth calculation is developed according to the die dimension data. If there are difficulties in completely drawing a die, the problem can be obviated by using a type of preset die and attempting to adapt it to the real shape as much as possible by means of the pre-defined data:

Press:

-  + to completely design the die;
-  + to use the data of the preset die.

A window will be opened requesting entry of the die dimensions:

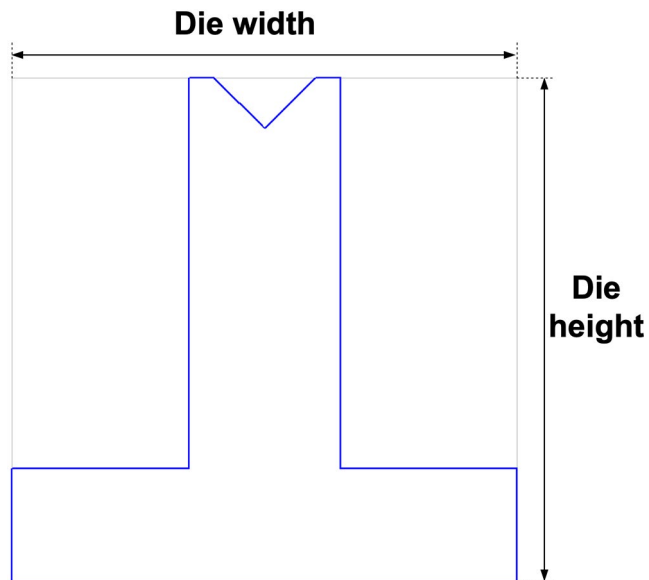


Figure 11. Die dimensions

Enter the die height and width as indicated in Figure 11

Access to the drawing page

Access the drawing page once the die dimensions have been entered and the type of die selected. The drawing page changes, depending on the type of die selected:

Tap on the **[OK]** button.

3.2.1. Dies to draw

The dies to draw page is obtained by means of the drawing function (see relative chapter in the operator manual).

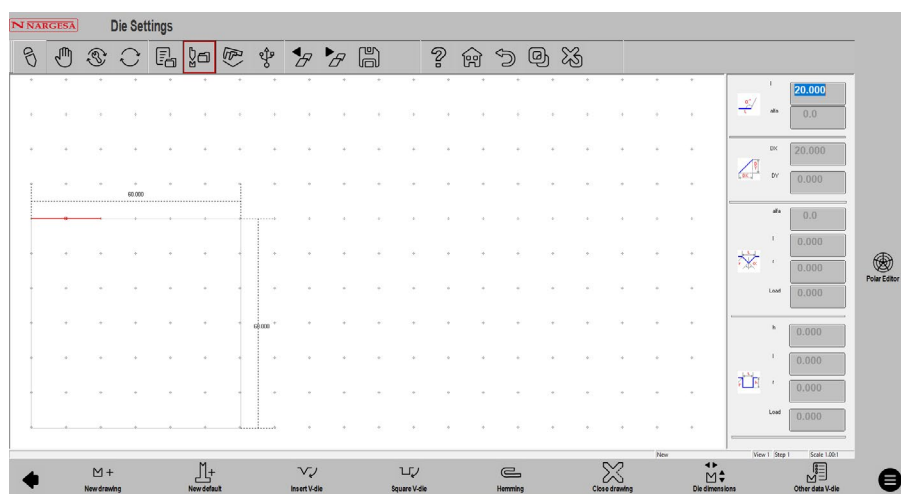


Figure 12. Die drawing page

◦The left-hand window is the drawing window. The four right-hand windows are drawing data entry windows and respectively represent: 1/The polar drawing data; 2/The Cartesian drawing data; 3/The v die drawing data; 4/The square V-die drawing data.

Drawing conventions

The die must be drawn in a clockwise direction, remembering that the stop is on the right-hand side of the die itself.

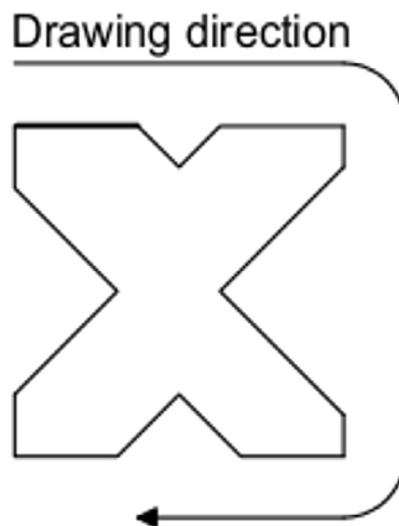


Figure 13. Die drawing direction

The marked line represents the line initially proposed in the drawing page.

How to do the drawing

Supposing that the following die must be drawn:

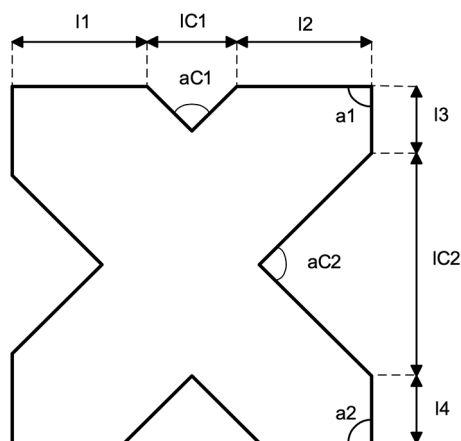


Figure 14. Example of a die to be drawn

The cursor is in Field 1 of the polar drawing data entry window:

- enter the length corresponding to section l1 in Field 1;
- press **[ENTER]**: the cursor will set to the a Field where the angle is entered in relation to the next section. Now define the first V-die of the die.

V-die entry

Comply with the following procedure:

- Press  ; the data entry window will automatically switch to the V-die data where it is necessary to:
- Enter the V-die angle (angle aC1);
- Press **[ENTER]**;
- Enter width I of the V-die (section IC1);
- Press **[ENTER]**;
- Enter radius R of the V-die.
- Press **[ENTER]**;
- Enter the V-die load (maximum tons for meter);
- Press **[ENTER]**; the V-die will be drawn and the next section automatically entered. The cursor will return to the polar data entry window;
- Enter the length corresponding to section I2 in Field I;
- Press **[ENTER]**;
- Enter the value of angle a1;
- Press **[ENTER]**; the next section will be drawn in automatic mode. The section to which the data refer will be marked, the cursor will move to Field I where the length of the section is entered;
- Enter the length corresponding to section I3 in Field I;
- Press **[ENTER]**; the cursor will move to the α Field where the angle is entered in relation to the next section.

The second V-die must now be defined:

- Press  ; the data entry window will automatically switch to the V-die data where it is necessary to:
- Enter the V-die angle (angle aC2);
- Press **[ENTER]**;
- Enter length I of the V-die (section IC2);
- Press **[ENTER]**;
- Enter V-die radius R;
- Press **[ENTER]**;
- Enter the V-die load (maximum tons for meter);
- Press **[ENTER]**; the V-die will be drawn and the next section automatically entered. The cursor will return to the polar data entry window;
- Enter the length corresponding to section I4 in Field I;
- Press **[ENTER]**;
- Enter the value of angle a2;
- Press **[ENTER]**.

The die drawing will form by continuing to alternatively enter the lengths and angles. The more the entered measurements and angles correspond to reality, the more the drawing will be correct.

Entered data correction

Incorrect entries may be made during drawing entry. Correct these entries and move amongst the various drawn

- Sections by means of the  and  keys and by modifying the values of the fields.
- Use the  key to switch to the immediately previous entry Field and then alternatively pass to a section entry Field and an angle entry Field (alfa)
- The  key immediately passes to the next section and, thus, always to the section entry Field (l)
- Press **[ENTER]** to pass to the immediately following entry Field and to then alternatively pass to a section entry Field (l) and an angle entry Field (alfa), or tap on the desired field.

Error correction

A very frequent error (particularly if the arrows are used to enter the angles) is that of forgetting to press **[ENTER]** after having entered an angle. At this point, the length of the section will be entered in the angle entry field, thus creating an error in the drawing.

- Use the  key to move back to the angle entry Field and re-enter the correct value.

Square V-die entry

The die drawing page can be used to enter square V-die. To enter one of these, carry out the following operations when on angle entry Field α of the section prior to the square V-die itself:

- Press .

This accesses the square V-die data entry window.

- Enter the depth of the square V-die;
- Press **[ENTER]**;
- Enter width l of the square V-die;
- Press **[ENTER]**;
- Enter radius R of the square V-die;
- Press **[ENTER]**;
- Enter the square V-die load (maximum tons for meter);
- Press **[ENTER]**; the square V-die will be drawn with the newly entered data. The cursor will return to the polar data description window in order to describe the next die section.

Square V-die conventions

If a square V-die has been entered, the minimum bend angle that can be made is the angle corresponding to a square V-die of the entered width and depth.

Hemming V-die entry

The die drawing page can be used to enter an Hemming V-die. To define one of these, it is necessary to indicate which are the sections that determine die closing by their movement and then draw a section squashed on both sides.

- Draw the profile of the open die with the nook of the part to be squashed;
- Draw the profile of the open die with the recess of the flattening part;
- Set the cursor to the section to be defined (vertical section);
- Press .

- The section defined as the flattening part will appear hatched on the drawing.

The following figure shows an example of an hemming die.

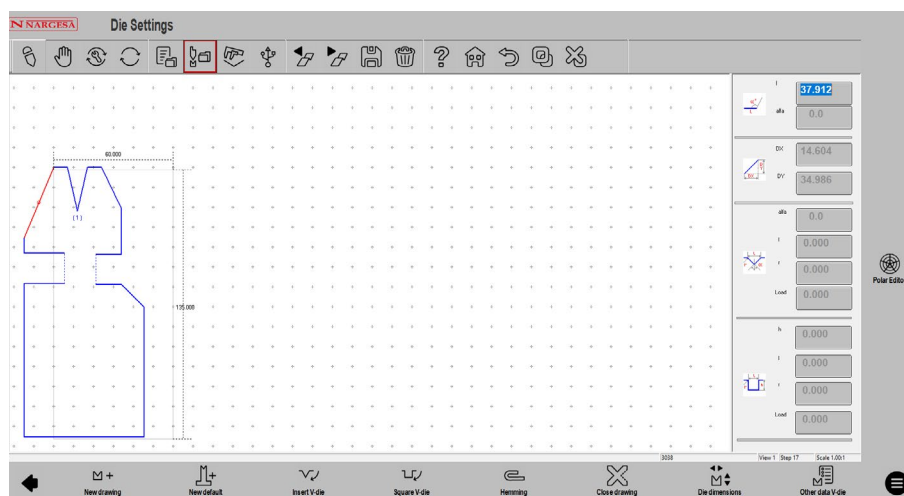


Figure 15. Drawing of the flattening die

How to enter hemming pneumatic V-die

The die drawing page can be used to enter hemming pneumatic V-dies.

To define one, two squash 0.001 mm length sections must be indicated on both sides of the die.

- Draw the profile of the open die with the recess of the flattening part, but enter 0.001 mm for this section (as though the die were closed);
- Move the cursor to the section to be defined for hemming;
- Press ;
- The section defined as the flattening part will appear hatched in the drawing (even though it will be difficult to see);
- Once the die has been drawn, press  and digitize 1 in the **Pneumatic** field;
- Tap on the **[OK]** button;
- From this moment onwards, function 2 will be automatically enabled on the hamming bends.

When the bend is hamming with the pneumatic die, this latter will open and will then drop in the fast mode with the ram. The tools could touch each other in the fast mode (something to be avoided). The flattening opening target must be set in the general parameters if, during bend flattening, the ram must change speed (switch to the slow mode) first (at a higher target) (consult the machine parameters manual).

Entry of the pneumatic flattening die support

A new method for handling the pneumatic die support is available from version 13.2 onwards. If the press has a pneumatic flattening die support in his basement, the relative data can be entered in the General Parameters Configuration page (refer to the machine parameters manual). Once the data have been entered, flattened bends can also be obtained in the graphic mode using standard dies without having to draw particular dies with bending-flattening functions.

Saving the drawing

At the end of the drawing, press the  key to memorize it. Enter the name of the punch in the window that appears. After the name has been entered, move to the **[Confirm]** button and press **[OK]**.

Tolerated name characters

The entered name can be formed by a combination of numbers and letters (e.g. the code of the punch in the catalogue can be used).

3.2.2. Default dies

The default die page is presented in the form of a pre-drawn die along with a series of data that characterize the shape of that die.

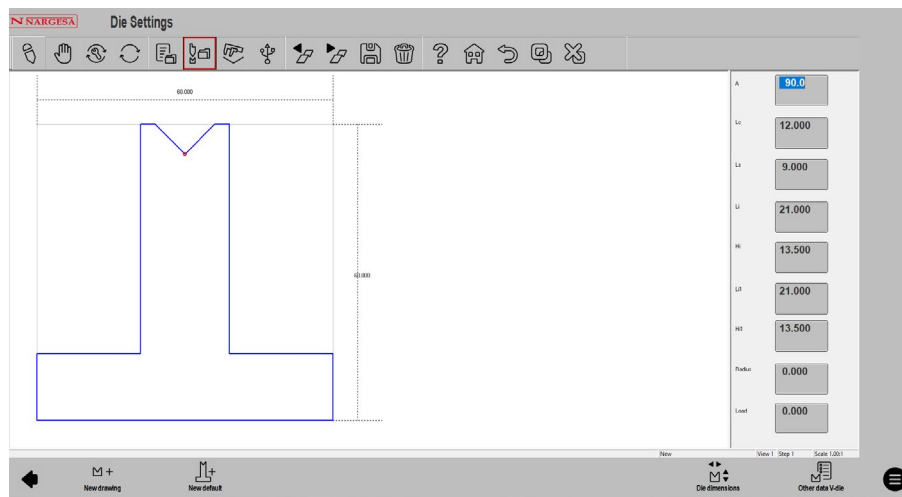


Figure 16. Preset die

When the data are scrolled with the [ENTER] key or selected with a tap, an indication will appear on the drawing as to which measurement corresponds to the selected data item.

By modifying any one of the values and pressing [ENTER], the drawing will be re-plotted by taking the modified value into account.

Saving the drawing

At the end of the drawing, press the  key to memorize it.

Enter the name of the die in the window that appears.

After the name has been entered, move or tap to [OK].

4. PROGRAMMING

4.1. List of programs

To enter the list of programs it is necessary to follow the steps below:



- Press
- The following window will appear:

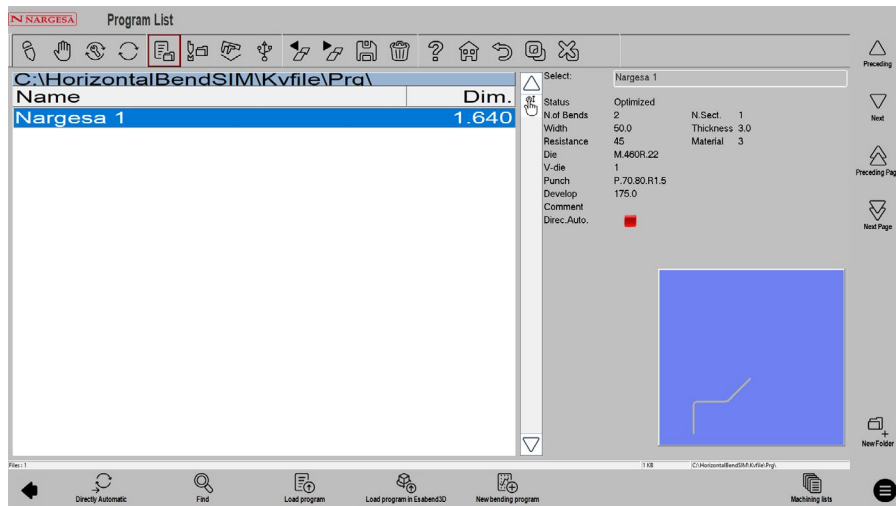


Figure 17. List of programs

The window on the left is the list window.

The top center part of the window contain the program data on which the cursor is positioned (on the list).

The window on the right down shows a preview of the drawing if the program selected is graphic.

To scroll down the programs available on the list just use your finger on the scrollbar. Are also available the following functions to move in the list:

- to select the preceding program
- to select the next program
- to select the preceding page
- to select the next page

The others function keys displayed have the following meanings:

by pressing and enabling this function, a symbol (small red square) will appear on the right of the words **DirectAuto** to remind the use of the type of selection and method if entering in automatic.

In fact, with this selection, when choosing a program on the list instead of going to the [Editor] page, it is possible to carry out the program by going directly into Automatic mode.

-  to find a program in the list window
-  to load the program in Automatic mode
-  to load the program in Esabend3D.
-  to set a new numeric or graphic program
-  to select a machining list
-  to select a machining list

How to view the Preview

This allows you to see the preview of the program (if the program is graphic). The preview is normally enabled but if desired you can also disable it by following the steps below:

- press the  key to open the menu.
- select the item **Preview** 
- the window preview window will be disabled.
- to re-enable it just repeat the steps above.

How to copy a program

This allows you to create a copy of a program with another name so that you can change it. Move onto the program you wish to copy and follow the steps below:

- press the  key to open the menu.
- select the item **Copy** 
- a window will open in which it will be necessary to enter the name of the program.
- after entering the name press [OK].

Renaming a program

This allows you to change the name of program. Move onto the program you wish to rename and follow the steps below:

- press the  key to open the menu.
- select the item **Rename** 
- a window will open in which it will be necessary to enter the new name of the program.
- after entering the name press [OK].

Saving a program

This allows you to save a program on the USB device in order to then transfer it to another control (also useful for creating backup copies). Move onto the program you wish to save and follow the steps below:

- press the  key.
- the program selected will be saved on the USB device.

Deleting a program

This allows you to delete a program. Move onto the device you wish to delete and follow the steps below:

- Press the  key .
- after press the [YES] key.
- the selected program will be deleted.

Saving all the programs on the USB device

This allows you to save the programs on the USB device in order to then transfer them to another control (this also allows you to create backup copies). Follow the steps below:

Insert the formatted USB device with sufficient space for containing the programs into the USB port:

- press the  key to open the menu.
- select the item **Save Programs** 
- All the programs will be saved on the USB device

Deleting all the programs

This allows you to delete all the programs. Follow the steps below:

- press the  key to open the menu.
- select the item **Delete Programs** 
- All the programs will be deleted (you will be asked to confirm).

Program list on the USB device

This allows you to view the program list on the USB device. The possible operations are the same as for the tool list therefore it is possible to copy, rename and delete all the tools present on the USB device. Select the program list and follow the steps below:

Insert the USB device containing the programs (generated for example by kvara S 560 Touch or S 660W) into the USB port.

- press the  key
- the program list on the USB device will be displayed.
- carry out the desired operation.

Saving a program from a USB device to NC

This allows you to save a program on NC from a USB device in order to be able to download it from another control. Move onto the program you wish to save and follow the steps below:

- press the  key.
- the program selected will be saved from the USB device to NC.

Saving a program from a USB device to NC

This allows you to save the programs on NC from a USB device in order to be able to download them from another control. Follow the steps below:

- insert a USB device containing the programs (generated for example by kvara S 560 Touch or S 660W) into the USB port.
- press the  key
- the program list on the USB device will be displayed.
- press the  key to open the menu.
- select the item **Save Programs** 
- all the programs will be saved from the USB device to NC.

Changing the work unit

This operation can be performed in the following sequence:

- press  to open the Program List
- press the  key to open the menu.
- press Backup unit  and [OK] after have select it:

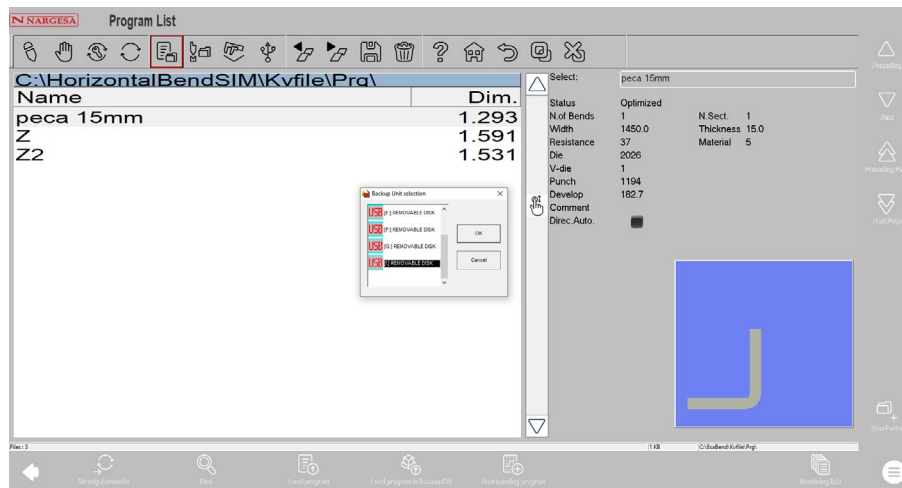


Figure 18. View of the operation for changing the work unit.

4.2. Entering a numeric program

To enter a new numeric program it's necessary to:

- press  and the Home page will open:



Figure 19. Home page

On this page it's chosen **New bending program** pressing .

Setting the piece data

A window will open for entering the program data. Please note that the touch mode provides the scroll :

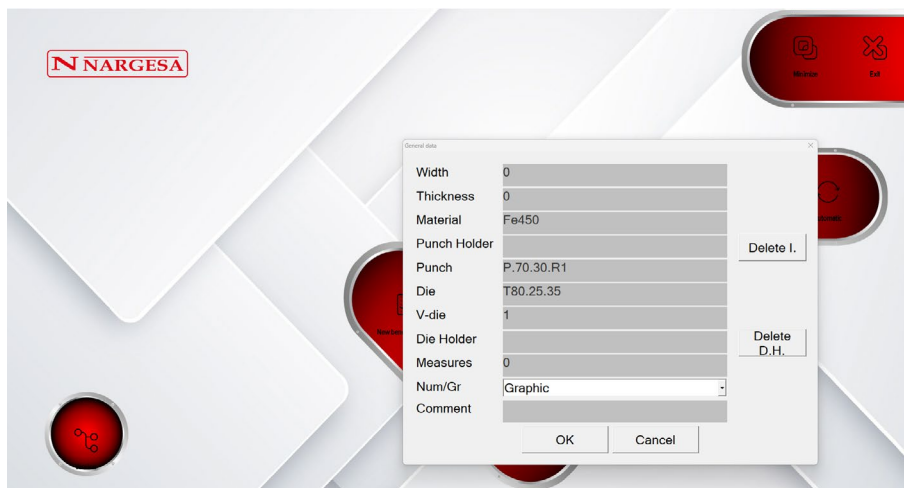


Figure 20. Page for setting the program data

- enter the punch that will be used for the bend (the punch must already have been drawn) in mind that, thanks to the new product functions this is a rapid operation. In fact, by clicking or touching the parameter to be entered, the Punch List will immediately open, afterwards , select the desired row with a double touch.
- enter the die that will be used for the bend (the die must already have been drawn).

After selecting in the editor program, the punch and die selected from the lists will appear.

- enter the **V-die** of the die that will be used for the bend (a die may have several V-dies; in the case in which it only has one, enter 1).
- enter the **width** of the metal sheet to be bent.
- enter the **thickness** of the metal sheet to be bent.
- enter the **material** (resistance) to be bent bearing in mind that, thanks to the new product functions this is a rapid operation. In fact, by clicking or touching the parameter to be entered, the Materials Table will immediately open containing all the values entered; afterwards, select the desired row with a double touch:

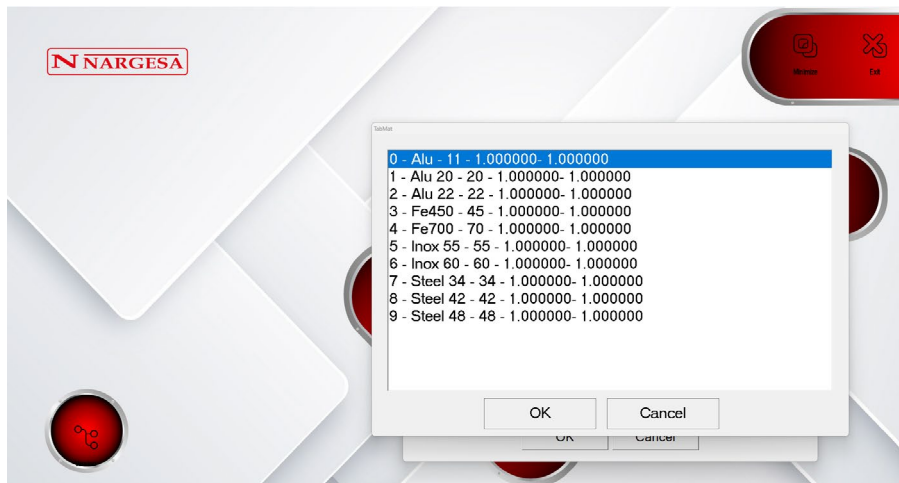


Figure 21. Page for setting the material

After selecting material appears in what is described in the NAME field of the table material.

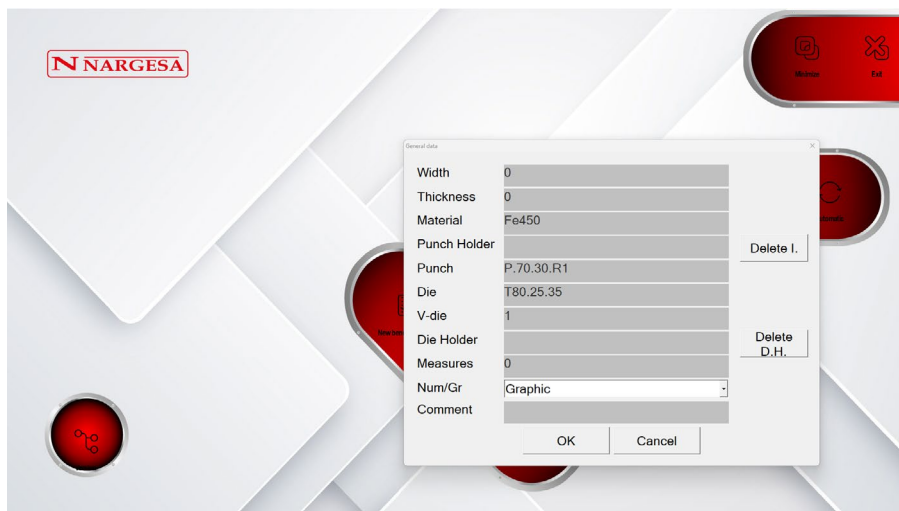


Figure 22. Page with added material

- Set specifying that the program is numeric in the field Num/Gr

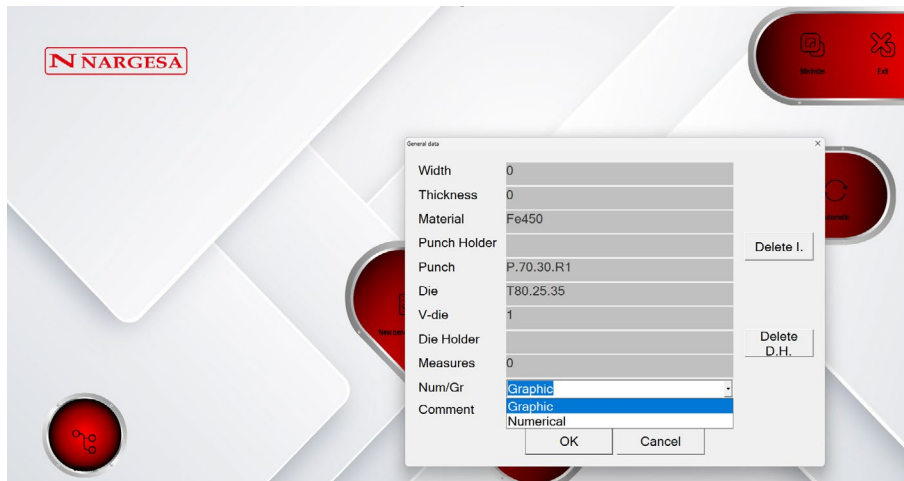


Figure 23. Numeric program setting

To accept the data, to press [OK], allowing the direct access the Settings page.

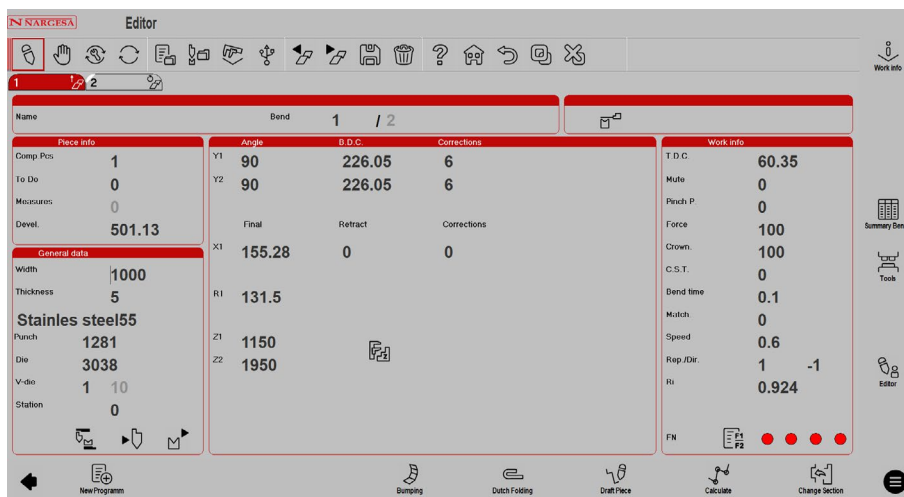


Figure 24. Numeric program Settings page

Setting the bends

The cursor now moves into the fields for setting the bend.

Set for each bend:

- The desired bend angle in the **Y1 angle** field.
- The desired bend length in the **Field Final X1** field.

All the other data relating to the bend will be calculated automatically but they can still be changed by the user.

Work info

This allows you to view the data relating to the absolute **T.D.C**, **Mute** and **Pinch point** of that bend, move onto the desired bend and follow the steps below:

- press  **Work info**
- a window will appear which contains the work info datas.
- for exit just press [OK].

Copying a bend

To copy a bend, move onto the bend you wish to copy and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **Copy step**; the bend will be copied in the cnc memory waiting to be pasted.

Cutting a bend

To cut a bend, move onto the bend you wish to cut and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **Cut step**; the bend will be cutted and copied in the cnc memory waiting to be pasted.

Entering a bend

To enter a new bend in a section, move onto the bend after the one you wish to enter and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **insert step**; the bend will be inserted before the one you moved onto.

Entering a copied or cutted bend

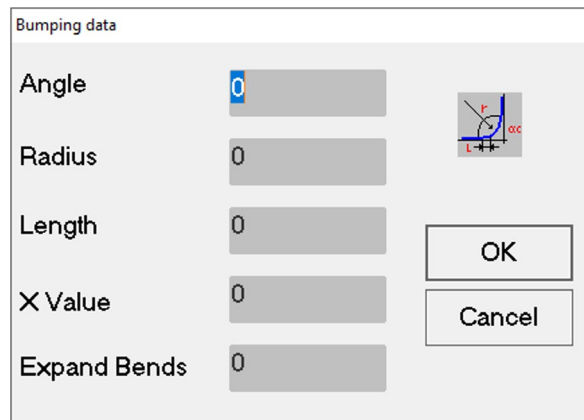
To enter a bend instead of one already present in the section or of one just entered using the  **insert step** function, move onto the bend and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **Paste step**; the bend before copied with the item  **Copy step** or  **Cut step** will be entered instead you were positioned on.

Defining a bumping radius

For entering the datas to define a bumping a radius bend follow this steps:

- from the  [Editor] page select the item  [Bumping]; a window will open to enter the bumping data:



The dialog box titled "Bumping data" contains the following fields and controls:

- Angle:** Input field with the value "0".
- Radius:** Input field with the value "0".
- Length:** Input field with the value "0".
- X Value:** Input field with the value "0".
- Expand Bends:** Input field with the value "0".
- OK** and **Cancel** buttons.
- Diagram:** A small schematic diagram showing a bend with radius 'R', angle 'α', and length 'L'.

Figure 25. Defining a bumping radius

- enter the desired bumping angle in the **Angle** field.
- enter the bumping radius in the **Radius** field.
- enter the length of the bumping pitch in the **Length** field.
- enter the initial position of the X back gauges in the **X Value** field.
- enter 1 in the **Expand Bends** field in order to create all the program with singles bends, it means without repeat the same bend more than one time. 
- press [OK], the bumping pitch calculated will be automatically entered on the Bend program.
- the bends created will assume the following tab :

Correcting a bumping a radius

Whenever a bumping is carried out it is unlikely that you will obtain a correct bend at first try: this imprecision depends on the fact that the angles that have to be bent to create the bumping a radius are opened (e.g.: 170°) and it is difficult to obtain bends with these angles. In order to obtain a correct bumping it is necessary to measure the difference between the angle of the bumping obtained and the desired angle: the difference calculated must be divided equally on all the bends.

Example

Let's suppose we have to create a bumping a radius with an angle of 90° in which is it necessary to make 15 bends equal to 170°; if the angle obtained is 112.5° we must carry out the following:

$112.5 - 90 = 22.5^\circ$ (difference between the real and the theoretical angles)

$22.5 / 15 = 1.5^\circ$ (correction to be applied for each bend)

We must apply a correction of 1.5° in the bumping pitch which will be repeated 15 times.

Defining a Dutch folding bend

In the  [Editor] page of a numerical program select the item  [Dutch Folding]:

- the Dutch folding will be created setting 0 in the program angles fields.
- the bend created will assume the following tab:  

Correcting a Dutch Folding

To correct a dutch folding it is not possible to change the value of the angle, but it is necessary to change the numeric value present in the Field **B.D.C.** of the Y axis. Normally this sort of bend results opened, than will be necessary to decrease this value.

If it is needed a definitively solution will be necessary to:

- Select the  item [Corrections]
- press the item  [Coefficient corrections]
- the height entered in the field **Hemming** will be directly added to, or subtracted from the B.D.C. of the Y axis. This value will be linked to the machine and not to the program. To cancel the correction press the item  [Undo correct.].

Defining a coining bend

For entering the datas to define a coining bend follow this steps:

- From the  [Editor] page press the sub menu button  and select the item 
- the bend created will assume the following tab:  

Correcting a coining

To correct a coining it is necessary to change the lower dead point of the Y axis.

If the coining is too shallow it will be necessary to reduce the B.D.C.

If the coining is too deep it will be necessary to increase the B.D.C.

If it is needed a definitively solution will be necessary to:

- Select the  item [Corrections]
- press the item  [Coefficient corrections]
- the height entered in the field **Coining** will be directly added to, or subtracted from the B.D.C. of the Y axis. This value will be linked to the machine and not to the program. To cancel the correction press the item  [Undo correct.].

Saving the program

At the end of the setting, press ; a window will open in which it is necessary to enter the name of the program. After having entered the name press [OK].

Save with name

It is possible save a program with a different name to the one you started off with. This may be useful if the changes made to a program must not be lost, but you wish to change the program uploaded (possibility of having various program with different corrections). Follow the steps below:

- press the  key to open the menu.
- select the item  [Save as]
- a window will open in which it is necessary to enter the name of the new program.
- After having entered the new name press [OK].

Updating a program

If you change a tool already used in a program, it will be necessary to update the program because the heights calculated will no longer match.

To update the program, load the program from the list and follow the steps below:

- From the  [Editor] page press the  key to open the menu.
- Select the item  [Program update]; the following window will appear on the display.

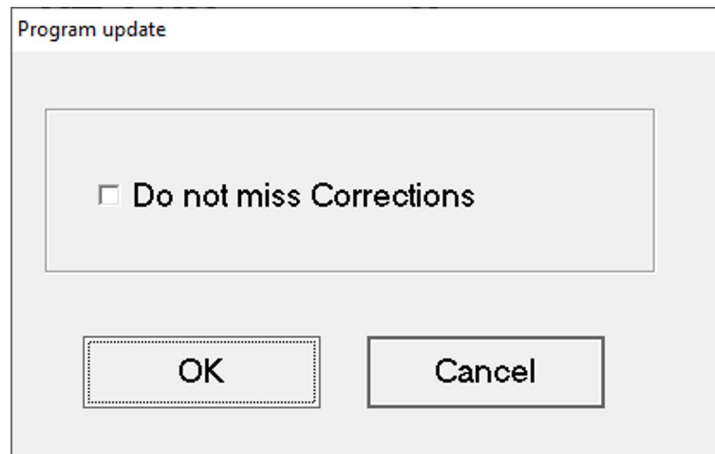


Figure 26. Updating a program

- Select OK (without check the boxes **Do not miss Corrections**).
- All the program data will be calculated.
- Save the program if necessary.

4.3. Entering a graphic program



To set a new graphic program it is necessary to follow the same procedure of setting up a numeric program of bend, but at the page for setting the program data, select "Graph" in the field Num\Gr :

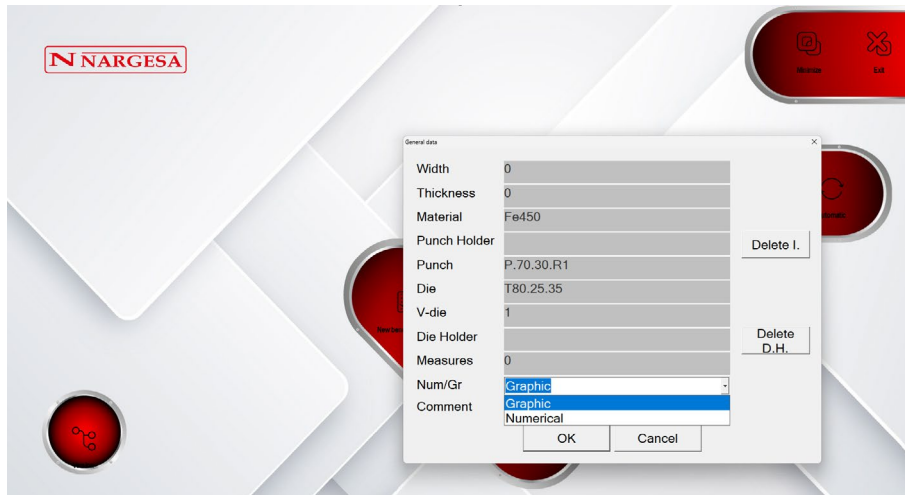


Figure 27. Graphic program setting

Setting of the general data

A window will open of entering the general data of the program.

If these data are not entered, access will not be permitted to the drawing function:

- enter the **width** of the metal sheet to be bent.
- enter the **thickness** of the metal sheet to be bent.
- enter the **Measures**: it indicates whether the user describes the piece by means of external, neutral fibre or internal measurements.
- enter the **material** (resistance) to be bent bearing in mind that, this is a rapid operation. In fact, by moving onto the parameter to be entered, the Material Table will immediately open containing all the values already entered: you can then select the desired row with a double touch.

After selecting in the editor program, besides the number, what will be described in the NAME Field of the materials table will also be displayed. See Figures 20-21 p.44/45.

- the material is calculated automatically depending on its resistance.
- enter the **punch holder** that will be used for the bend (if present)
- enter the **punch** that will be used for the bend (the punch must already have been drawn).
- enter the **die** that will be used for the bend (the die must already have been drawn).
- enter the **V-die** of the die that will be used for the bend (a die may have several V-dies; in the case in which it only has one, enter 1).
- enter the **die Holder** that will be used for the bend (if present)
- enter a **Comment** if desired.
- select [OK].

Drawing window

The drawing window will be opened:

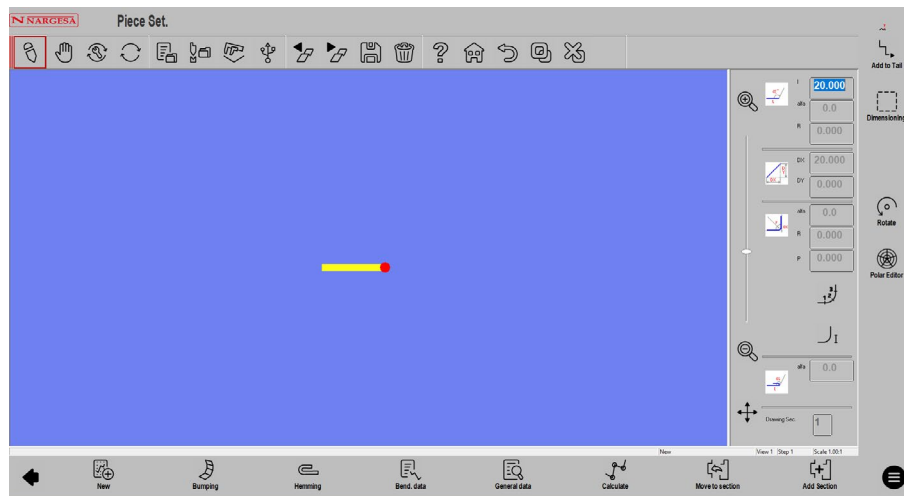


Figure 28. Drawing windows of the piece

The window on the left is the drawing window.

The four windows on the right are for entering the drawing data and they respectively represent:

- 1) the polar drawing data.
- 2) the Cartesian drawing data.
- 3) the drawing data of a bumping.
- 4) the drawing data of a dutch folding bend.

After having entered the general data and accessed the SET PIECE page, the first segment will appear in red with a length of 20.0 mm. Touch the centre of the segment with your finger and the “Soft Keyboard” will open, as in Figure 29.

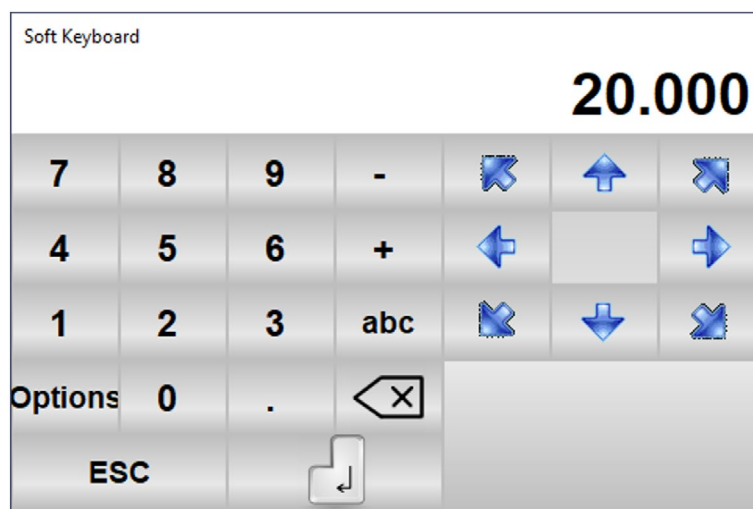


Figure 29. Soft Keyboard for setting the piece

with which you can:

- change the length of the first segment by entering a height differing from 20, and after having pressed “Confirm” (with the option enabled for always having the keyboard active in the foreground) and selecting one of the BLUE arrows on

the virtual keyboard, the angles to be entered in the next bend will automatically be displayed.

- by touching one of the seven arrows starting from the right  in a clockwise direction, the next segment will be taken to 45, 90, 135, 180, -135, -90, -45.
- If the "pincushion" option of the keyboard has not been enabled, by touching the ALFA angle Field (as illustrated in Figure 32) the Soft Keyboard will reappear and allow you to enter the angle:

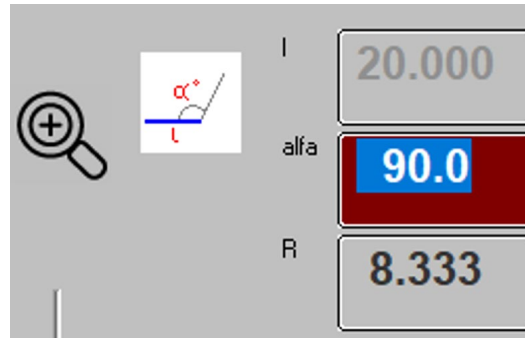


Figure 30. Portion of the part described above, viewed on the "ALFA angle field" display

- The next segment can only be entered by simply tapping the screen with your finger in the desired direction.
- Once the segment has been entered, by tapping the screen with your finger in the center of the line drawn it will be possible to enter the measurement of the desired length on the virtual keyboard.
- Also to change the angle, with your finger just press the intersection between the previous segment with the following one to make the virtual keyboard appear with the 8 blue direction arrows of the angles (obviously you can also directly write in the editing field of the virtual keyboard if preferred, or if the angle differs from one of the 8 specific angles)

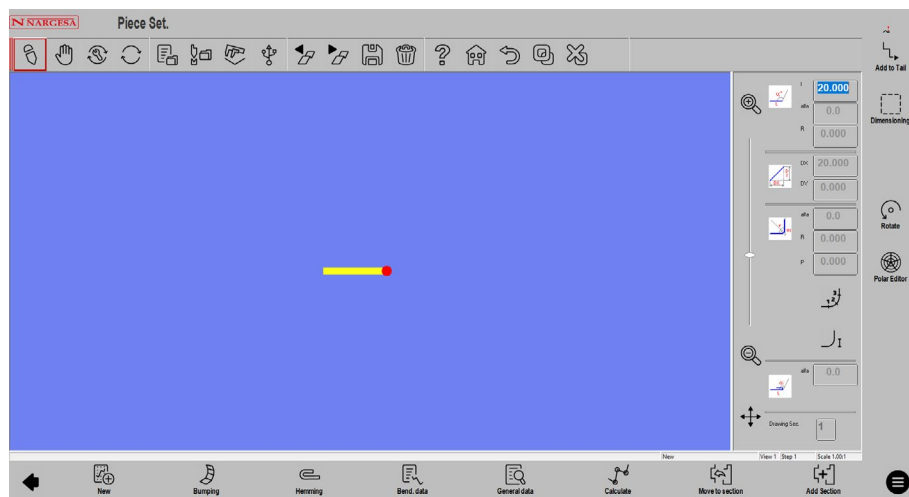


Figure 31. Intersection of the segment

The intersection between the previous segment and the next one, indicated in red, is the point to touch to change its direction and consequently also the value of the angle.

Also on the PIECE SET page:

- by touching the ZOOM bar and sliding it up and down you can intervene on the display either enlarging or reducing the view of the piece. In addition, you can hook onto it with your finger to move it to the right or left and up or down.

By pressing  [Calculate] and touching the machine drawing with your finger, you can move it to the right or left and up or down.

These two functions can also be used in the graphic viewing of the piece on the SEMIAUTOMATIC and AUTOMATIC page.

Changing the colour

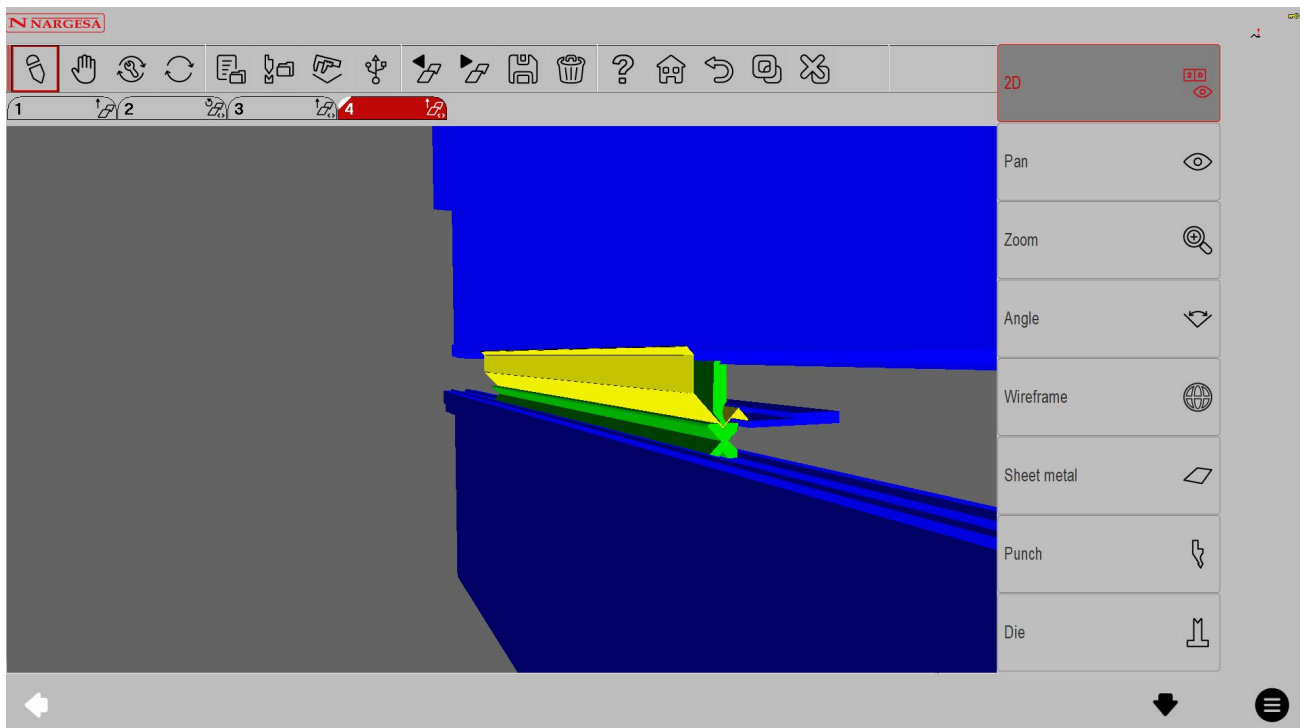
This allows you to change the colour of the background and of the piece to be bent. Follow the steps below:

- press the  key to open the menu.
- select the item  [Change color].

3D vision

This allows you to view the drawing in 3D. Follow the steps below:

- press the  key to open the menu.
- select the item  [Extrusion viewer]
- pressing the  key you can select from the following 3D views options:



- to return to the 2D view press the  key to open the menu and select [2D].

How to carry out the drawing of a piece

Let's suppose we have to draw the piece illustrated in the figure below:

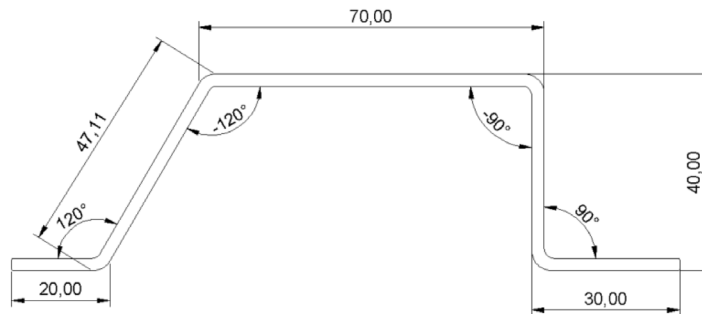


Figure 32. Example of piece to be drawn

The cursor is located in Field I of the window for the polar setting of the drawing data:

- Enter in Field I, the length corresponding to the first section of the piece to be drawn (20.0) in Field I.
- Press [ENTER] in the virtual keyboard.
- Enter the value of the first angle (120.0°) in Field α (value of the angle compared to the following section).
- Press [ENTER] the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the second section of the piece to be drawn (45.0) in Field I (length of the section).
- Press [ENTER].
- Enter the value of the second angle (-120.0°) in Field α (value of the angle compared to the following section).
- Press [ENTER], the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the third section of the piece to be drawn (70.0) in Field I (length of the section).
- Press [ENTER].
- Enter the value of the third angle (-90.0°) in the Field α (value of the angle compared to the following section).
- Press [ENTER], the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the fourth section of the piece to be drawn (20.0) in Field I.
- Press [ENTER].
- Enter the value of the fourth angle (90.0°) in Field α (value of the angle compared to the following section).
- Press [ENTER], the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the fifth section of the piece to be drawn (30.0) in Field I (length of the section).
- Press [ENTER], the drawing has now been completed.

You could even draw the piece by touching the screen 4 times following the directions of the 3 vertices and of the last tract of the drawing:

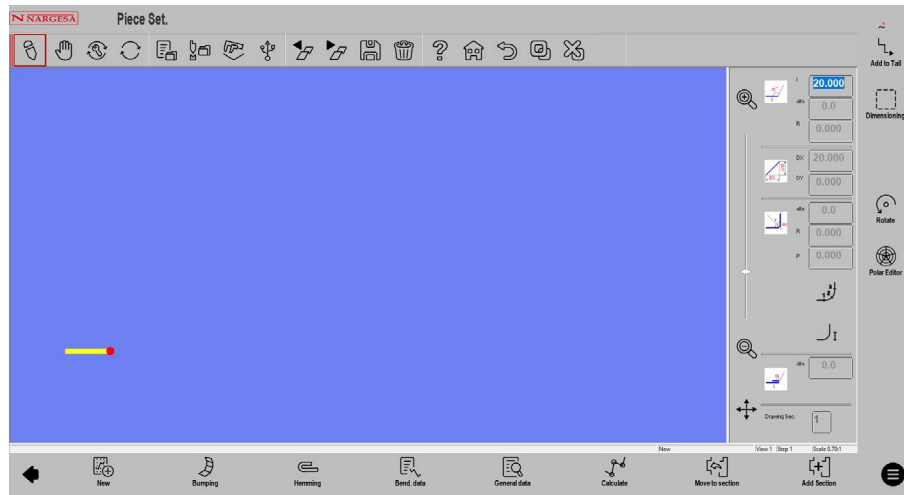


Figure 33. Drawing of the first segment

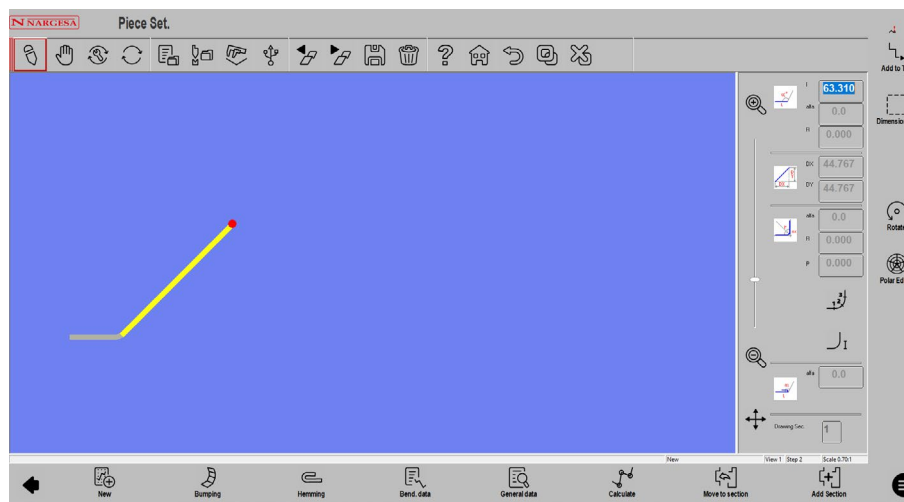


Figure 34. Drawing of the second segment

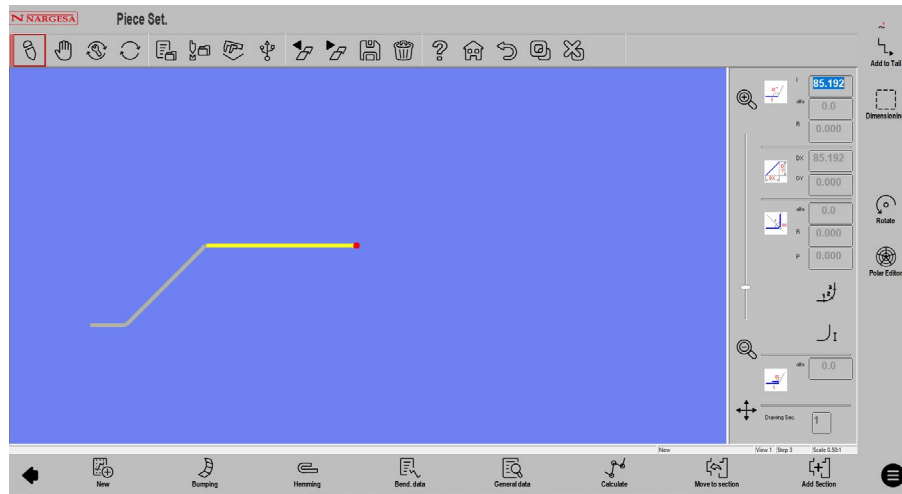


Figure 35. Drawing of the third segment

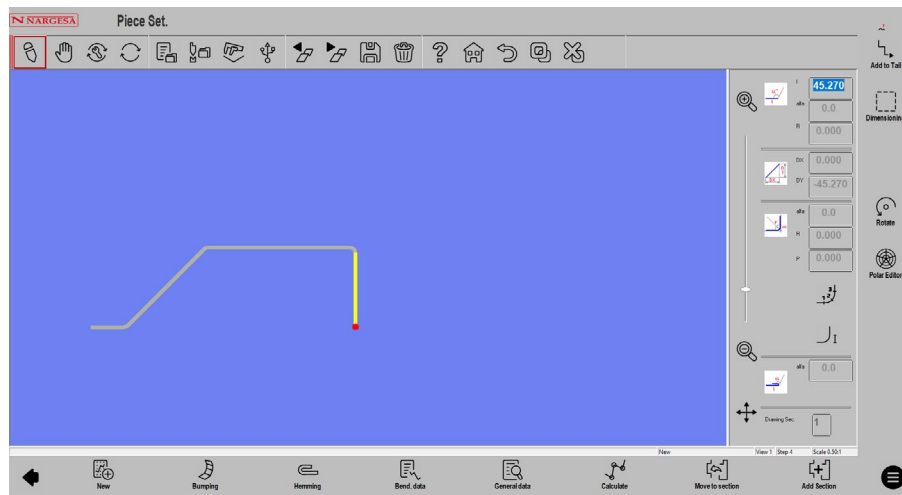


Figure 36. Drawing of the fourth segment

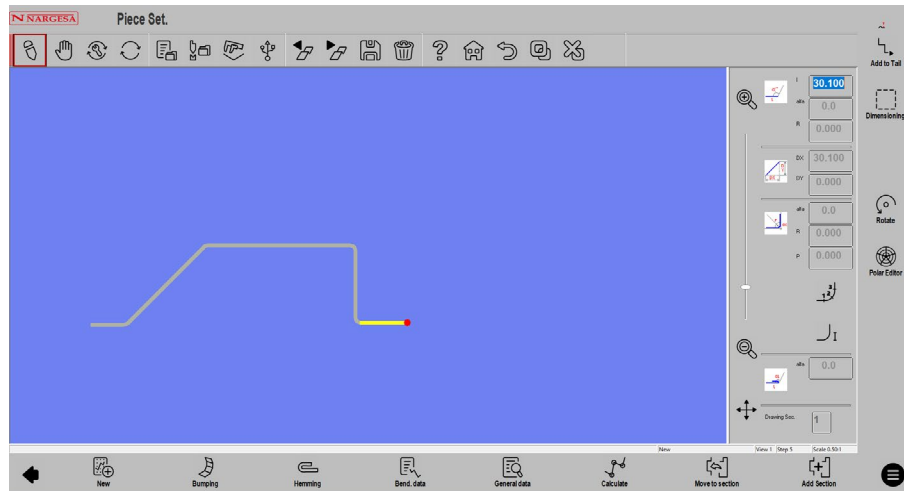


Figure 37. Drawing of the fifth segment

After have done the drawing, like explained before, you can insert the corrects measures and angles by touching the screen with your finger in the center of the lines drawn and of the vertices.

How to carry out bumping

In order to carry out a bumping it is necessary to bear in mind that as per the convention, there must be a section of metal sheet before and after the bumping.

Let's suppose we have to draw the piece illustrated in the figure below:

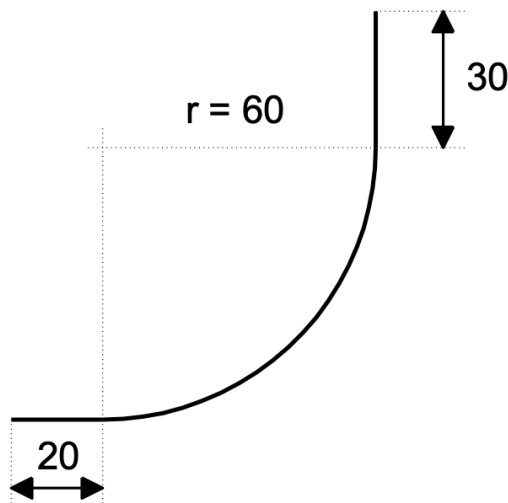


Figure 38. Example of bumping to be drawn

The cursor is located in Field I of the window for the polar setting of the drawing data:

- Enter the length corresponding to the first section of the piece to be drawn (20.0) in Field I.
- Press **[ENTER]** in the virtual keyboard.
- Press  **[Bumping]**; the window of the bumping data will open.
- Enter the desired bumping angle (90.0°) in Field "alfa".
- Press **[ENTER]**.

- Enter the radius of the bumping (60.0) in Field "R".
- Press [ENTER].
- Enter the length of the bumping pitch you want to obtain in Field "P".
- Press [ENTER], the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the last section to be drawn (30.0) in Field I (length of the section).
- Press [ENTER], the drawing has now been completed.

How to carry out a hemming

Let's suppose we have to draw the piece illustrated in the figure:

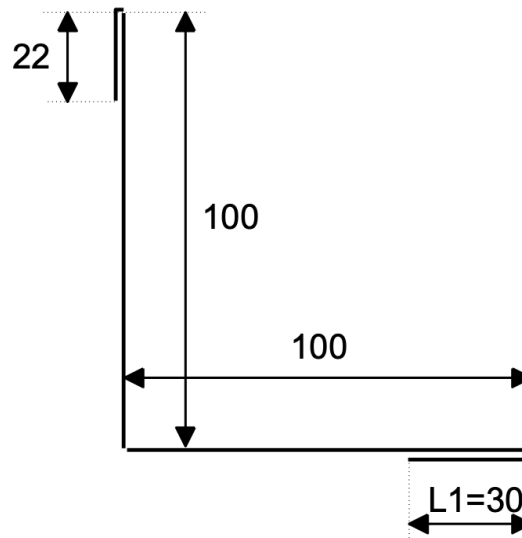


Figure 39. Example of hemming bend to be drawn

The cursor is located in Field I of the window of polar setting of the drawing data.

- Enter the length of side L1 to be hemmed (30.0) in Field I.
- Press [ENTER] on the virtual keyboard
- Press  [Hemming].
- Enter the intermediate hamming angle (e.g.: 45.0°) in the "alfa" field.
- Press [ENTER], the next section will be drawn in automatic mode; the section the data refer to will be highlighted.
- Enter the length of the current section (100.0) in Field I.
- Press [ENTER], the cursor will move onto Field α for setting the angle compared to the following section.
- Enter the value of the angle (-90.0°).
- Press [ENTER], the cursor will move onto Field α for setting the length of the section.
- Enter the length of the side (100.0) in Field I.
- Press [ENTER].
- Press  [Hemming].
- Enter the intermediate hamming angle (e.g.: 45.0°) in the "alfa" field.
- Press [ENTER], the next section will be drawn in automatic mode; the section the data refer to will be highlighted.
- Enter the length of the last section (22.0) in Field I. The drawing has now been completed.

Saving the drawing

At the end of the setting, press the  key; a window will open in which it is necessary to enter the name of the program.

After having entered the name press [OK].

4.4. Automatic calculation of the bending sequence

It is possible to access the automatic calculation procedure from the drawing page of the piece by following the steps below:

- Press  [Calculate]

Calculation window

A window will open that shows the simulation of the piece to be bent, including the lower and upper part of the bender press, the punch, the die, the stop and the piece prior to being bent.

On the right hand side of the Automatic Sequence page there are some boxes that respectively indicate the development of the piece, the retract calculated for the bend selected, the upsettings and the rotations of the piece relating to the bending sequence found, and the enabling of the search for the bending sequence with all the solutions. The numeric control searches for the solution by always trying to leave the greatest part of the metal sheet in the operator's hands; if you change the calculation criteria pressing  it is possible to search for the sequence among all the possible solutions.

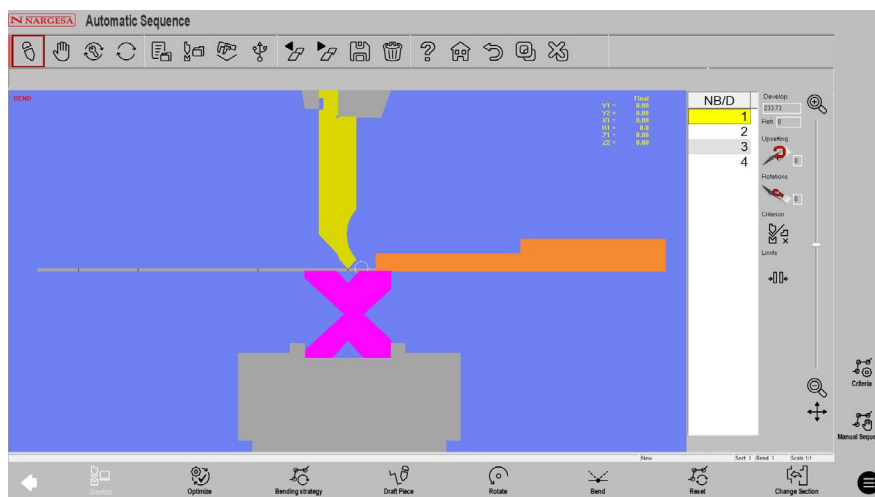


Figure 40. Calculation page of the bending sequence

It is possible to make the calculation of the bending sequence in two modes: automatic or manual.

Automatic search for the bend sequence

In the automatic search, the optimal bending sequence is established by the numeric control; by pressing  [Optimize].

Manual search for the bend sequence

In the manual search, the bending sequence is established by the operator who forces the bends.

The bending sequence can be completely or partially forced by the operator: in the case of the sequence only being partially entered, the remaining bends will be calculated automatically by the numeric control.

The operator has the possibility of shifting between the various bends by pressing the  and  keys. To force the bends it is necessary to press the  [Bend] key next to the selected bend; if you press the key next to a bend that has already been forced, that bend will be straightened.

The operator has the possibility of rotating the piece by pressing the  [Rotate] key;
 Press  [Optimize] when you want to force the desired bends.
 The numeric control finds the solution while keeping in mind the sequence forced by the operator.

Results of the optimisation

If the piece is not feasible, the control will warn the operator with a **No Solution !!** message.

In this case the operator can try to make the calculation using the criterion that carries out the search for all the solutions pressing this button  that will change in . In this way the solution found will be also the solutions which have the most part of the piece inside the machine (the solutions most dangerous for the operator fingers).

In the event that there is no possible solution, the operator can try to identify which bend makes it impossible to bend the piece from the manual search of the bend sequence; any collision of the piece with the various parts of the machine is notified by a colour change on the side of the piece that enters into collision.

In order to bend a piece even if it enters into collision (for example in the case in which the collision does not damage the sheet metal) the operator must force the entire bend sequence.

If the piece is feasible the control advises the operator with a **Solution Found** message; the operator can select the following functions in this window:

- [0 STOP]: the optimisation is stopped in order to make changes.
- [1 Continue]: a different solution to the one just found is used; if you continue to refuse to accept the solutions proposed, the numeric control will search until it comes to the end of the different solutions, and then it will display the message:
No Solution !!.
- [2 Simulate]: the simulation of the bending of the piece is displayed; the user can continue with the bending sequence by pressing [1 Continue] or stop the simulations by pressing [0 STOP].
- [3 Confirm]: the values calculated in the solution found will be entered in the program.

Limits button

Pressing the button  [Limits] it will change in : it means that during the optimisation of the program the minimum and maximum limits of the X and R axes are not taken into account.

Bending sequence search criteria button

Pressing the button  [Criteria] a collision tolerance edit will open: will be possible insert how many mm of piece can penetrate the tools or the machine without generating a message of **No Solution !!** during the optimisation of the program.

Simulation

Once the solution has been accepted, it will be possible to simulate the bending sequence obtained in the optimisation window of the graphic program:

- Press the function key  [Simulate], the piece without bends, set up and ready for the first bend will be displayed.
- Press the function key  [Rest/ Support], as many times as necessary, to select the first support or the second support (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.

- Press the function key  [Continue], the piece will be displayed with the first bend already made.
- Press the function key  [Continue], the piece will be displayed with the first bend already made and in position for the second bend.
- To stop the simulation press the function key  [Stop], to return to the previous step in the simulation press the function key  [Previous].
- Press the function key  [Continue], until the end of the simulation (the function key   [Simulate] will reappear)

Rest/ Support mode

Once the solution has been accepted, it will be possible so select whether to carry out a resting-against bend In the optimisation window of the graphic program:

- Press the function key   [Simulate], the piece without bends, set up and ready for the first bend will be displayed.
- Press the function key  [Rest/ Support], as many times as necessary, to select the first or second resting-against position (if available) or the supporting of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  [Continue], the piece will be displayed with the first bend already made.
- Press the function key  [Continue], the piece will be displayed with the first bend already made and in position for the second bend.
- Press the function key  [Rest/ Support], as many times as necessary, to select the first supported or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- To stop the simulation press the function key  [Stop], to return to the previous step in the simulation press the function key  [Previous].
- Press the function key  [Continue], until the end of the simulation (the function key   [Simulate] will reappear)
- The function is displayed in the numeric program at the top, on the right hand side of the type of bend (see the meaning of the icon). The control automatically calculates the corrections necessary on the X and the R. The function key  [Rest/ Support], in numeric mode will not work if the program is graphic. To change the resting against/supported it is necessary to enter the simulation page.

4.5. Manual calculation of the bending sequence

It is possible access the manual calculation procedure from the drawing page of the piece by following the steps below:

- Press  [Calculate]

Calculation window

A window will open that displays the simulation of the piece to be bent, including the lower and upper parts of the bender press, the punch, the die, the stop and the piece before being bent.

On the right hand side of the Automatic Sequence page there are some boxes that respectively indicate the development of the piece, the retract calculated for the bend selected, the upsettings and the rotations of the piece relating to the bending sequence found (refer to the figure in the paragraph on the Automatic calculation of the bend sequence).

Manual searching for the bend sequence

In the manual search the bending sequence is established by the 'operator by forcing the bends.

The operator has the possibility of shifting between the various bends by pressing the  and  keys.

To force the bends it is necessary to press the  [Bend] key next to the selected bend; if you press the key next to a bend that has already been forced, that bend will be straightened.

The operator has the possibility of rotating the piece by pressing the  [Rotate] key;

Press  [Optimize] when all the desired bends have been forced. The control will warn the operator with a Forced Solution message: the operator can select the following functions in this window:

- [0 STOP]: the optimisation is stopped in order to make changes.
- [1 Continue]: the bend sequence forced is rejected.
- [2 Simulate]: the simulation of the bending sequence is displayed; the user can continue with the bending sequence by pressing [1 Continue] or stop the simulations by pressing [0 STOP].
- [3 Confirm]: the values calculated in the forced solution will be entered in the program.

Simulation

In the optimisation window of the graphic program, once the solution has been accepted, it will be possible so simulate the bending sequence obtained:

- Press the function key  [Simulate], the piece without bends will be displayed, set up and ready for carrying out the first bend.

- Press the function key  [Rest/Support], as many times as necessary, to select the first or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.

- Press the function key  [Continue], the piece will be displayed with the first bend already made.
- Press the function key  [Continue], the piece will be displayed with the first bend already made and in position for the second bend.
- To stop the simulation press the function key  [Stop], to return to the previous step in the simulation press the function key  [Previous].
- Press the function key  [Continue], until the end of the simulation (the function key   [Simulate] will reappear)

Resting against/supported

In the optimisation window of the graphic program, once the solution has been accepted, it will be possible so select the whether to carry out a supported bend:

- Press the function key   [Simulate], the piece without bends will be displayed, set up and ready for carrying out the first bend.
- Press the function key   [Rest/ Support], as many times as necessary, to select the first or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  [Continue], the piece will be displayed with the first bend already made.
- Press the function key  [Continue], the piece will be displayed with the first bend already made and in position for the second bend.
- Press the function key   [Rest/ Support], as many times as necessary, to select the first or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  [Continue], until the end of the simulation (the function key   [Simulate] will reappear)
- To stop the simulation press the function key  [Stop], to return to the previous step in the simulation press the function key  [Previous].
- Press the function key  [Continue], until the end of the simulation (the function key   [Simulate] will reappear)
- The function is displayed in the numeric program at the top, on the right hand side of the type of bend (see the meaning of the icon). The control automatically calculates the corrections necessary on the X and the R. The function key   [Rest/ Support] in numeric mode will not work if the program is graphic. To change the resting against/supported mode it is necessary to enter the simulation page.

Changing the bend sequence

Once the bend sequence has been optimised, it will still be possible to change the bending sequence obtained:

The operator has the possibility of moving among the various bends by pressing the  and  keys.

To remove the bends it is necessary to press the  [Bend] key next to the bend selected, remove the other bend you wish to exchange, and press  [Bend] to select the new sequence desired on each bend removed.

4.6. How to bend a box

The numeric control does not allow to directly set the development on the flat of a box to be bent.

To be able to bend a box it is necessary to set a program with two bend sections (it doesn't matter if the program is graphic or numeric) in which to set the bends relating to the horizontal section and the bends relating to the vertical section respectively.

The two programs will be carried out one after the other, thus making it possible to create the box.

The execution of a program with several sections always starts from the section with the smallest width of the sheet metal.

How to add or delete a section

To add a section in numeric, it is necessary:

- to press the function key  [Change Section]
- the bend created will assume the following tab: 

Whereas to delete a section, move onto the desired section and follow the steps below:

- press the  key to open the menu.
- select the item  [Delete Section]; the section will be deleted and the program will move onto bend 1 of section 1.

4.7. Work data

It is possible to check the absolute TDC, Mute and Pinch point of a bend, in the following manner:

- select the item  **Work** info; a window will appear containing the absolute TDC, Mute and Pinch point.
- to exit select [OK].

4.8. Execution of a program in automatic mode

After setting a numeric program or calculating a graphic program it is possible to carry this out in automatic.

Automatic mode can be enabled by pressing the  key.

Automatic graphic page

If the program currently selected is a calculated graphic program the automatic graphic page can be viewed by pressing



 [Graphic]; this page consists of three windows:

The main window contains the drawing of the upper and lower parts of the machine, the drawing of the punch and the die entered in the program, the drawing of the piece before and after the bend, and the drawing of the stop.

The second window shows how to orient the piece for each bend (tilting or rotation of the metal sheet compared to the previous bend).

The third window contains the data of the bend in progress and the piece counter.
The final and actual axes positions are shown in yellow.

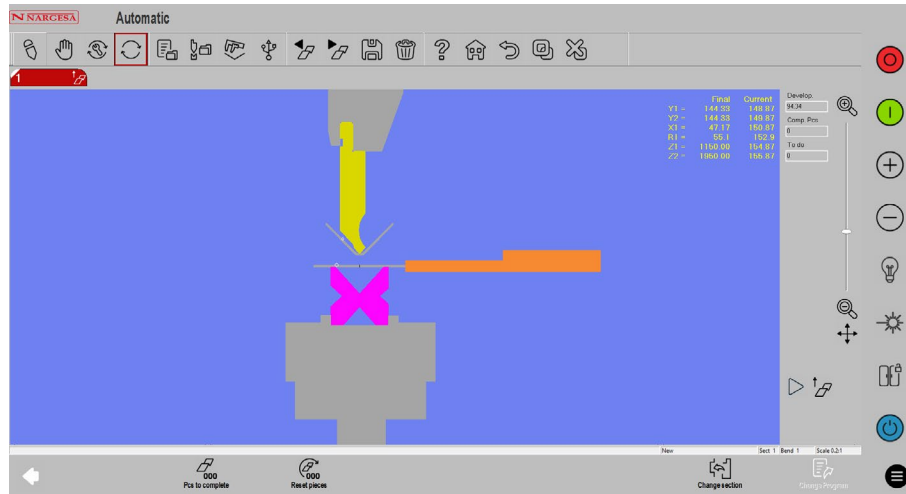


Figure 41. Automatic graphic page

Automatic graphic page

If the program currently selected is numeric, added to the numeric setting data there will also be the actual positions of the axes; it is not possible to change the program data in automatic mode.

The page also shows how to orient the piece for each bend (tilting or rotation of the metal sheet compared to the previous bend).

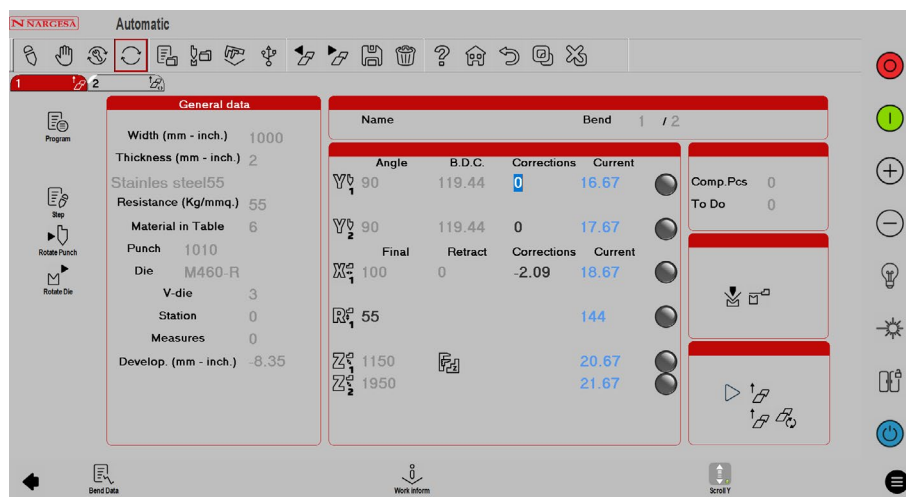


Figure 42. Automatic numeric page

- To see this visualization press  for more than 3 seconds.
- To return to the standard page press another time  for more than 3 seconds.

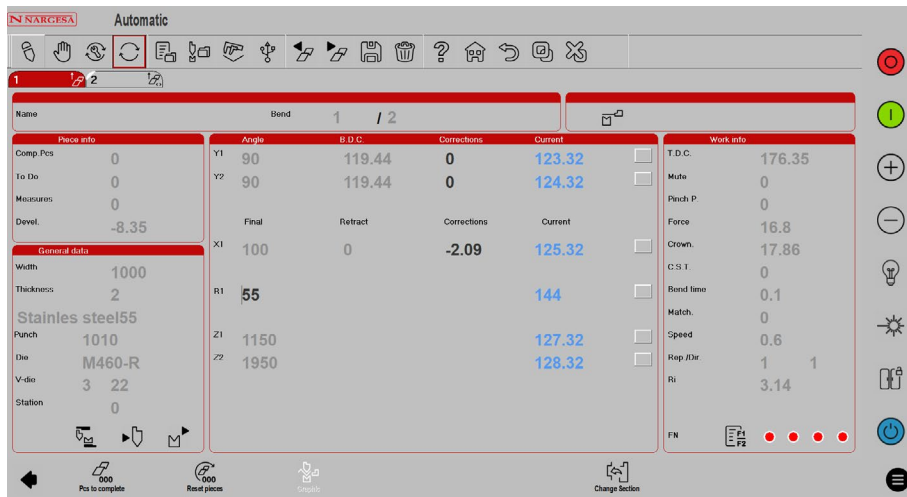


Figure 43. Automatic standard numeric page

First bend

To select the first bend select the tab



4.9. Materials Table

How to enter the Materials Table

To access the Materials Table page follow the steps below:

- enter the Corrections page by pressing the  button.
- press the  [Materials Table] button.

The table appears as illustrated in the figure:

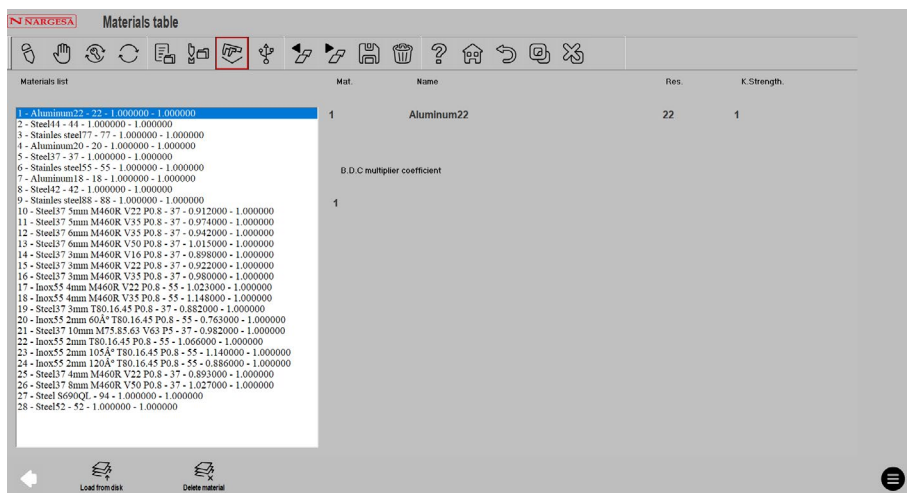


Figure 44. Material list table

How to enter a new material

After have Opened the Materials Table add a material writing a new number in the field **Mat.** After insert the other parameters in the fields **Name** (it is the name of the material) and **Res** (it is the resistance of the material).

How to use the K Strength. coefficient

This parameter will be used in the calculation of the stretch for all the bends entered after the change in the coefficients and for all the new programmes. To apply the corrections to the existing programmes it will be necessary to re-enter the angle in each bend.

The default value of the coefficients is 1, with this value the standard stretch is calculated by re-processing the DIN6935 standard formula (or of the DIN6935, it depend of the USER PARAMETER selected, see the chapter 5.2). The value entered in the coefficients will be multiplied by the stretch calculated, therefore by setting the value 2, a double stretch is calculated, while by setting the value at 0.5, half a stretch is calculated.

The tolerated values must be found between 0 and 100.

How to disable the calculation of the stretching

To disable the calculation of the stretch of the material, it is sufficient to set the K. strength. coefficients to 0. With the calculation disabled, the corrections of the X in the numeric programmes will no longer be calculated and the development of the piece in the graphic programmes will be the exact sum of all the segments.

How to use the B.D.C multiplier coefficient

This parameter will be used in the calculation of the BDC for all the bends entered after the change in the coefficients and for all the new programmes. To apply the corrections to the existing programmes it will be necessary to re-enter the angle in each bend.

The default value of the coefficients is 1: with this value the standard BDC calculation is done. If the bend will be opened instead to do an angle correction in the program you can decrease this value, writing for example 0.99. If the bend will be closed you can increase the coefficient writing for example 1.01. If the new BDC calculated is still not correct, change another time the coefficient. The order of magnitude of the variations shall be on the order of one cent, it means 0.01.

Deleting the material

To delete a material after have selected it from the list press the function button  **[Delete material]**.

Saving the materials

To save the materials coefficients entered in the backup USB memory just press the  button.

Uploading the materials

To upload the materials entered from a USB device just press the function button  **[Load from disk]**.

4.10. Hemming/Coining coefficient

How to enter the Corrections Coefficient page

The Coefficients Corrections page contains the Hamming and Coining coefficients.

In order to access to the Coefficients Corrections page it is necessary to follow the steps below:

- enter the Corrections page by pressing the  button.

- press the button  **[Coeff. corrections]**.

The following page will appear:

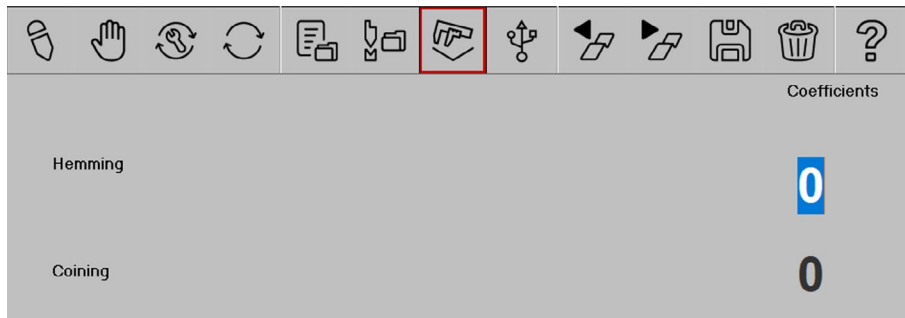
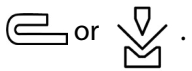


Figure 45. Correction coefficients

How to use the Hamming/Coining coefficient

Open the Coefficients correction page and enter the parameters. These parameters will be used to calculate the B.D.C.s for all the bends of the hamming/Coining type. This means that they will be algebraically added to the B.D.C.s that are calculated normally. This Coefficients become useful when we calculate the B.D.C.s too high.

In order for them to be assimilated after the setting it is necessary press another time the functions button



Saving the coefficient

The coefficients are automatically saved every time you exit from the Coefficients Correction page. They are not saved in the current work program, however they always remain linked to the machine.

To delete the changes made to the corrections press the button  [Undo correc.].

The values present on opening the page will be restored

5. Bend programming and management

5.1. Summary bend page

This page allows you to simultaneously view the data of all the bends of the current programme. This page is in table form similar to the graphic interface of TRIA.

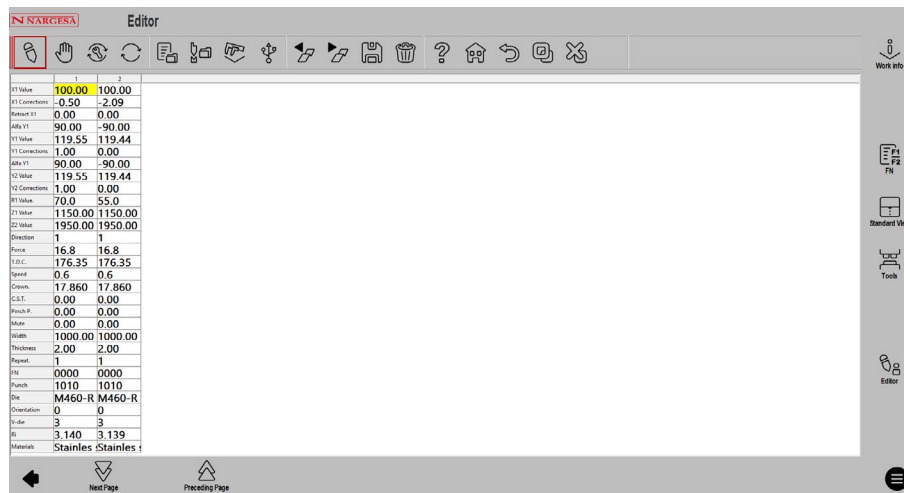
From this page it is also possible to change the programme data, using the main functions contained in the settings page. The table is organised so that a bend corresponds to each column, and the date of the bends correspond to each row.

5.1.1. How to enter the summary bend page

In order to access the Summary Bend page follow the steps below:

- from the  [Editor] page press the  [Summary Bends].
- this page contains the following information (figure 54):
- the heading of each column contains the progressive number of the bend in the program

- the first column on the left contains the description of the value associated with the row
- the value currently selected will be highlighted against a yellow background
- indications of the name of the programme selected
- indications of the bend selected from the total number of bends in the current section
- indications of the current section from the total number of sections in the program



	1	2
Z1 Value	100.00	100.00
R1 Connection	-0.50	-2.09
Radius R1	0.00	0.00
Angle Y1	90.00	-90.00
Y1 Value	119.55	119.44
Y1 Connection	1.00	0.00
Angle Y1	90.00	-90.00
Z2 Value	119.55	119.44
Z2 Connection	1.00	0.00
R2 Value	70.0	55.0
Z1 Value	1150.00	1150.00
Z2 Value	1950.00	1950.00
Direction	1	1
Radius	16.8	16.8
120.C	176.35	176.35
Speed	0.6	0.6
Crown	17.860	17.860
C.T.T.	0.00	0.00
Punch P	0.00	0.00
Width	0.00	0.00
Width	1000.00	1000.00
Thickness	2.00	2.00
Repeat	1	1
FN	0000	0000
Punch	1010	1010
Pin	M460-R	M460-R
Orientation	0	0
Value	3	3
R	3.140	3.139
Material	Stainless	Stainless

Figure 46. Bend summary Page

5.1.2. How to use the Summary Bends page

How to shift the selection

To shift the selection from one bend to another in the program:

- Press the  and  buttons. If you press the second button when the selection is on the last bend in the program, a new bend can be added to the end of the queue.

To shift the selection onto the first or last bend and from one side to the other of the selected bend, use the specific touch function of this product, as indicated above in this document.

N.B.

When there are several bends the ones in excess will not be immediately visible.

These can be viewed by pressing the  function button: to go back from the columns press .

How to change a value

In order to change a value, move onto the corresponding cell, enter the desired value and press the ENTER  key.

5.1.3. Insert step, Cut, Copy, Past Summary Bends page functions

Pressing the  function button the secondary menu view will open:

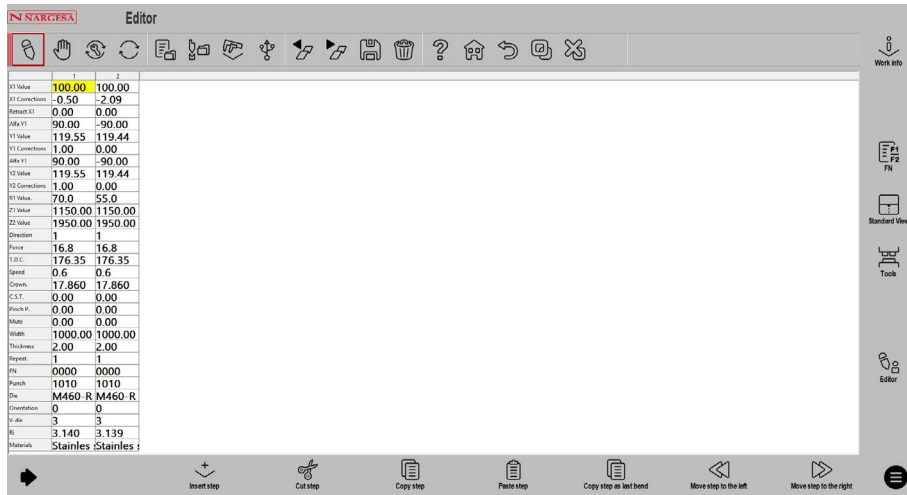


Figure 47. Insert step, Cut, Copy, Past functions

To insert a bend in a position of the program select the position desired in the program and press the  **insert step** button, an empty bend will be inserted:

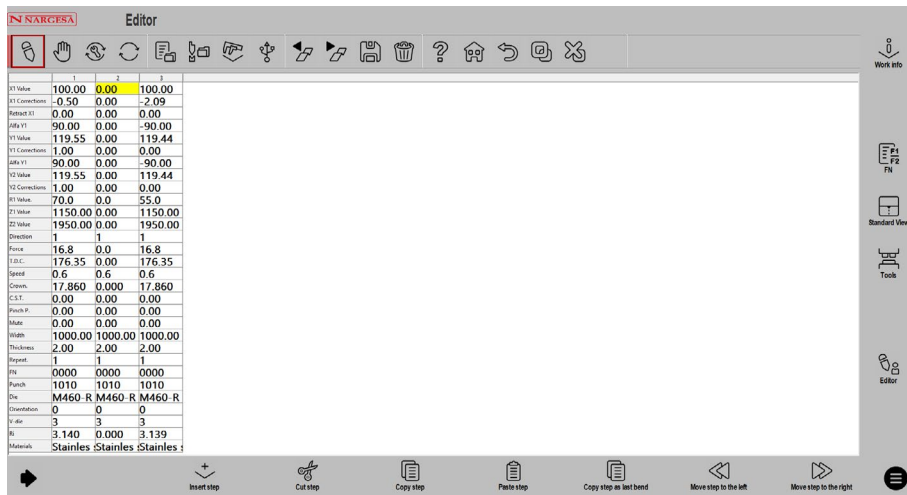


Figure 48. Insert step

If you want copy a bend in this inserted step tap on the bend to copy and select the item  **[Copy step]**. After select the bend inserted and select the item  **[Paste step]**.

If you want copy a step as last bend move to the bend to be copied and select the item  **[copy step as last bend]**.

The functions buttons  **Cut step** have the same means described before.

Saving the program

At the end of the setting press the  key; a window will open in which it is necessary to enter the name of the programme.

After having entered the name press the Enter  key and select **[OK]**.

Standard view

If you want come back to the standard view press the function button  **[Standard view]**.

5.2. "General data"

In this page it is possible to make changes to a bend in the programme and then later on, apply said changes to

- all the bends in the program
- all the bends in the section
- all the bends in the programme with the Y1 angle equal to that of the changed bend
- all the bends in the section with the Y1 angle equal to that of the changed bend.

5.2.1. How to enter the new "General data" page

In order to access to the new general data page it is necessary to follow the steps below:

- from the  **[Editor]** page press the  **[General Data]** function button; now you enter the general data page.

This page has the same set up as that of the  **[Editor]** page and contains the following information (indicated in the figure):

- the fields in which the user has changed the value are illustrated with their colours reversed **120**
- the fields in which the value has been changed due to the effect of a recalculation made by the program, will have a pink background **147.73**
- the  **[Lose Crrrect.]** button for cancelling the changes made temporarily.
- the  **[Confirm Program]** button for applying the changes made to all the bends in the programme.
- the  **[Confirm Section]** button for applying the changes made to all the bends in the current section.
- the  **[Sme. Crns. Pr. Conf.]** button for applying the changes made to all the bends in the programme that have the same Y1-Y2 angle as the one displayed on the page.
- the  **[Sm. Crns. Sec. Conf.]** button for applying the changes made to all the bends in the current section that have the same Y1-Y2 angle as the one displayed on the page.

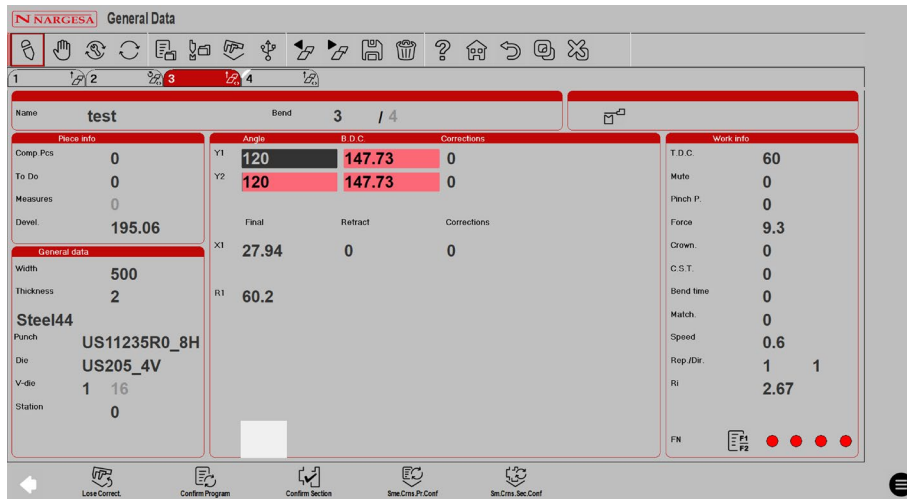


Figure 49. General data page

5.2.2. How to make corrections to the bend program

From the  [Editor] page open the general data page, which contains the same data as the currently activated bend.

Change the data of the bend displayed.

The changed or recalculated fields will turn a different colour to the one of the normal fields in order to remind the user which changes have been made.

N.B.

The bend displayed on this page is NOT actually the bend of the active programme but instead, a copy to be changed as desired.

For this reason the changes made on this page are NOT applied to any bends in the programme until such time as one of the four confirm keys are pressed.

How to apply the changes made only to the current section

To apply the changes made to all the bends of the current section press the  [Confirm Section] button.

The values highlighted with reverse colours will be copied to all the bends of the current section in the active program, and for each one, the corresponding recalculations will be carried out.

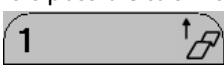
If you only wish to apply the changes to the bends in the current section, which have the same bend angle as that of the bend displayed, press the  [Sm. Crns. Sec. Conf.] button.

Upon concluding the operation all the fields of the page will return to their normal colours.

How to cancel the changes made

To cancel the changes made on the general data page press the  [Lose Crrrect.] button.

N.B.

It is possible to shift between the bends of the programme with the  and  buttons or selecting directly the  program tabs.

It is not possible to add or delete bends from this page, to carry out these operations you must return to the  [Editor] page.

5.3. "Metal-working machine" function

5.3.1. How to enable the "Metal-working machine" function

- from the  [Editor] page press the button  two times to open the menu
- select the item  [Configuration]
- select the item **6) MACHINE PARAMETERS**
- enter the password and press [OK]
- press the function button **Parameters 2**
- check the Auxiliary functions parameter **Metal-working machine** field.
- from this moment on the "New Bend" this functions will be enabled.

5.3.2. "New Bend" Function

This function, active on the  [Editor] and  [Summary Bends] pages, allows you to create new bends containing the same data as the previous bend. Normally instead, the new bends only have the General data the same as those of the previous bend.

This function is active in the following cases:

-  [Next] function: by pressing the  button when you are positioned on the last bend in the section, a new bend will be added to the bottom of the section. This new bend contains the same data as the preceding bend.
-  [Insert step] function: by selecting the  item from the  [Edit] menu you add a new bend to the current position.

This news bends contains the same data as the preceding bend.

5.4. "Machine Functions" Page

This news bends contains the same data as the preceding bend.

- from the  [Editor] page press the  [Machine functions] button; the following window will be displayed:

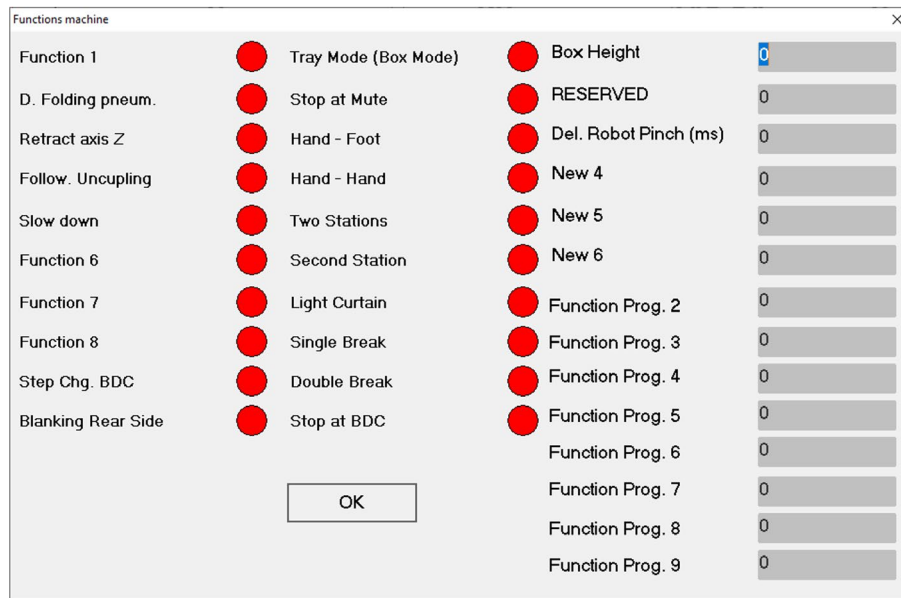


Figure 50. Machine functions

- To enable or activate a function tap on the red check box that will become green:

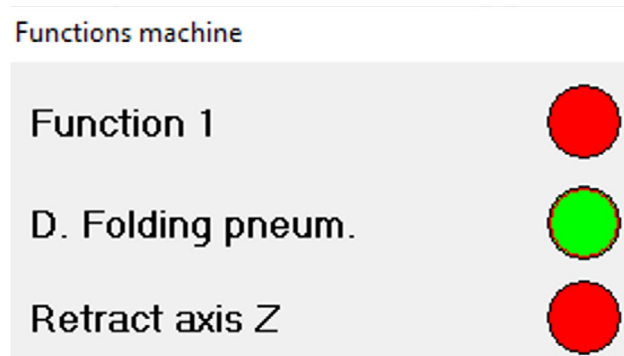


Figure 51. D. Folding pneum. Function enabled

The Machine functions are as follows:

D folding pneum.

If this function is active in a bend with a dutch folding bend, the pneumatic dutch folding die will be raised.

Z axes recoil Function

If this function is active, the Z1 and Z2 axes will carry out a recoil set in the  [User Parameters] page “Z deviation value” during the movement cycle.

Follow. Uncupling

If this function is active, during its movement cycle, the followers will also carry out the unhooking cycle. To learn about the functioning of the followers axes, consult the relative user manual.

Slow down

If this function is active, during the Semiautomatic and Automatic cycle, the ram will always be descend at slow speed.

Step chg. BDC

If this function is active, the bend step change will be made once the ram reaches the Bottom Dead Center (that is, the end of the bend).

Blanking Rear Side

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. If this function is active, the rear beam of the photocells is turned OFF to prevent the stop of the machine in case the back gauges are near the die.

Tray mode (box mode)

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. If you are bending a box the *MCS* system exclude the front and the back photocell beam, going down in high speed to the mute point calculated. If the parameter “Box height” is set to 0 The *laser safe* system stop the RAM when encounter the flange: by pressing again the down pedal the RAM proceed in high speed till the mute point calculated in the program. If the parameter “Box height” is set according to the height of the flange encountered, the RAM going down in high speed to the mute point calculated.

BOX Height

This function is used only when the *laser safe* safety system is present on the machine and the function “Tray mode” is enabled. It indicates the height of the box flange to be entered, in mm.

Stop at Mute

By enabling this function the ram stop at the mute point. It is possible to continue the bend of the piece by releasing and pressing again the down pedal.

Hand - Foot

This function is used only when the *laser safe* safety system is present on the machine. By enabling this function you are able to stop at the mute point with the hand control (if installed), and then continue again by pressing the down pedal.

Hand – Hand

This function is used only when the *laser safe* safety system is present on the machine. By enabling this function you are able to stop at the mute point with the hand control (if installed), and then continue with the same.

Two stations

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. By enabling this function you must use both pedals to bend (if installed).

Second station

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. By enabling this function you are able to use only the second pedal (if installed).

Light Curtain

This function is used only when the *laser safe* safety system is present on the machine. If installed, the function enable the working of the front light curtain.

Single Break

This function is used only when the *laser safe* safety system is present on the machine. When the function “**Light curtain**” is enabled, after have inserted the piece to bend in the machine and have removed the hands and the arms from the light curtain intervention zone, the RAM goes down to bend, without press the down pedal.

Double Break

This function is used only when the *laser safe* safety system is present on the machine. When the function “**Light curtain**” is enabled, after have inserted the piece to bend in the machine and have removed the hands and the arms from the light curtain intervention zone, the RAM goes down to bend, without press the down pedal, but only if with one hand you enter and exit from the light curtain intervention zone another time.

Stop at BDC

With this function activated, during the Semiautomatic and Automatic cycle the ram will always go down till the BDC and will remain stopped: to finish the cycle must be pressed the up pedal.

Del. Robot Pinch (ms)

Reserved

5.5. Other Menu Pages

Turning off the NC

This allows you to turn off the NC machine. Follow the steps below:

- press the  [*Home*] button to open the *Home* menu.
- select the item  [*Shut down*].

Viewing the software version

This allows you to view the information relating to the software version currently in use, the number of axes enabled, and the software options installed. Follow the steps below:

- press the  [*Home*] button to open the *Home* menu.
- select the item  [*Version*].

6. Integrated CAD

Introduction

The Esautomotion numeric controls for the bender are also equipped with a function that allows for drawing all the necessary graphic elements for checking the feasibility of the sequences of a bend; these graphic elements are as follows:

- lower part of the machine.
- upper part of the machine.
- punch.
- die.
- piece to be bent.

Access to the drawing of the elements listed above is described in the brief handbook.

6.1. Drawing function

The drawing function works by tracing the straight line segments in accordance with the data entered by the operator. The data can be entered in either polar format or Cartesian format, however use of the polar format is recommended to make the settings more user-friendly.

6.2. Polar setting of the drawing data

This function allows for defining the sections that will make up the drawing by mean of setting a pair of data:

- length of the section.
- angle compared to the following section.



the angles entered must be found within $\pm 180.0^\circ$.

The conventions via which these angles must be entered is as follows:

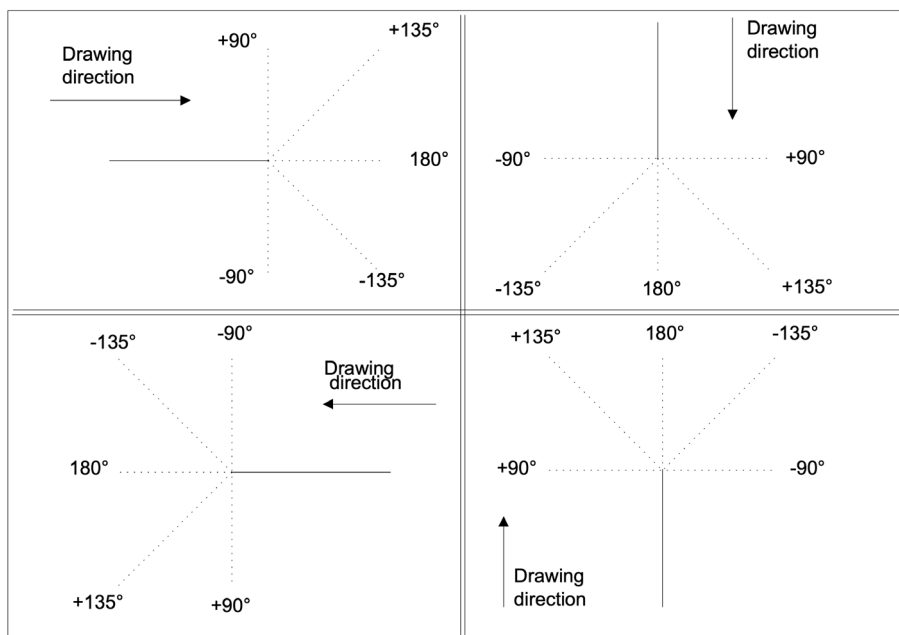


Figure 52. Conventions for setting the VSD angles

6.2.1. Cartesian setting of the drawing data

This function allows for defining the sections that will make up the drawing by means of a pair of coordinates that identify the difference between the beginning and end of the segment.

The Cartesian coordinates are not absolute but instead relate to the beginning of the segment and they must be entered as described in Figure 68.

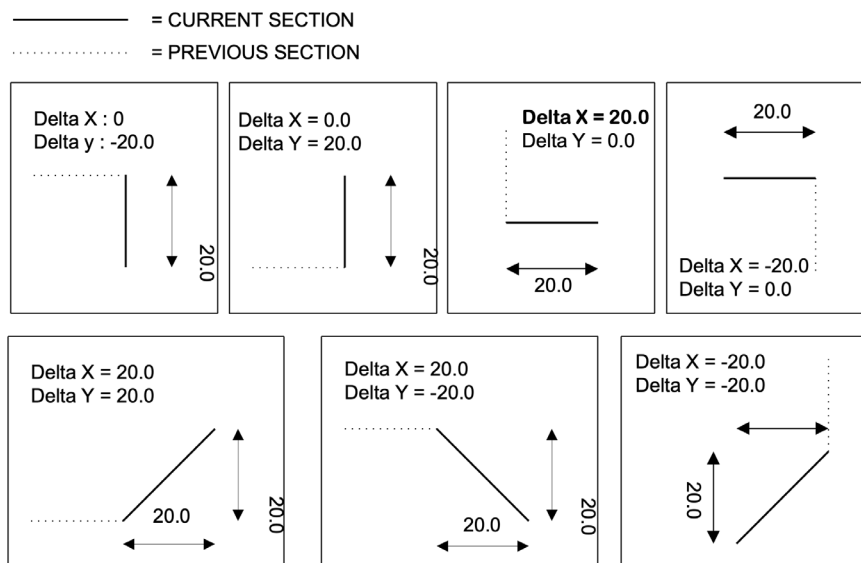


Figure 53. Conventions for setting the VSD angles

6.2.2 General data

Before starting the drawing of a graphic element it is necessary to enter some general data that will vary according to the object you wish to draw.

The data to be introduced in this phase are described in the specific chapters for each object.

6.3. Piece Setting page

- **Area 1** window of the drawing information or the status bar contains:

the name of the file that you are drawing.

the number of the step of the current drawing.

the scale factor of the drawing.

- **Area 2** window of the graphic tracing of the drawing in which:

the drawing corresponding to the data entered will be displayed.

- **Area 3** window of the polar setting of the drawing in which:

it is possible to enter the data relating to the length of the section to be drawn "**L**" and the angle compared to the following section "**Alfa**". Is it visible also the "**Ri**" data, it means the radius of the bend

- **Area 4** window of the Cartesian setting of the drawing in which:

it is possible to enter the Cartesian coordinates "**DX**" and "**DY**" which represent the difference between the initial coordinates and the final ones of the section to be drawn.

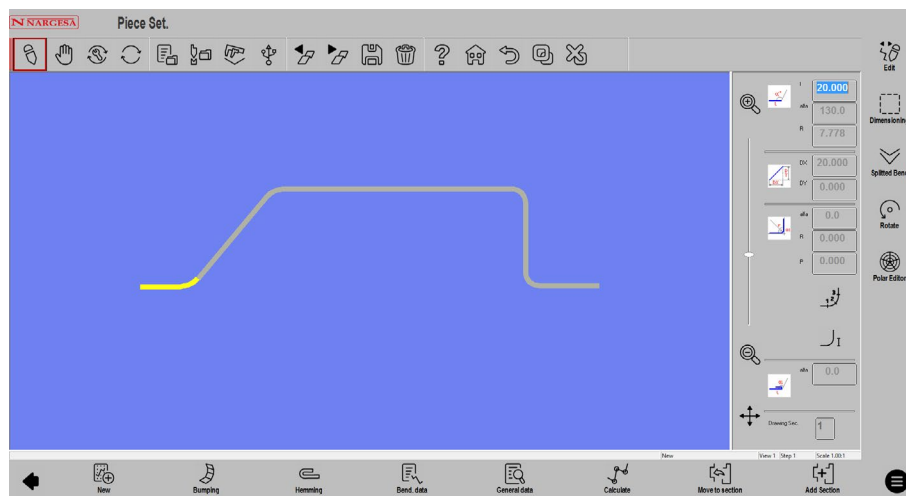


Figure 54. Drawing window

6.4. Entering of the data of the drawing

When you access the drawing of a new program, in Area 2 the first section standard length is automatically drawn.



Figure 55. first section standard length

The initial direction of the drawing, indicated by a red circle, can be changed by pressing the  [Rotate] button. The cursor is located in Field "I" in Area 3; there is a standard value in this Field, 20 mm.

N.B.

Each value entered using the virtual keyboard must be confirmed by pressing the ENTER  key.

6.4.1. How to enter a drawing in polar mode

If the cursor is not located in Field "I" of Area 3 it will be necessary to press the button  [Cartesian Editor] to activate the polar type setting. As described in the Polar Setting chapter of the in drawing data, the values to be entered are as follows:

- 1) the length of the section; the section will be rescaled depending on the length entered and the cursor will move onto the "alfa" Field for setting of the angle.
- 2) the "alfa" angle compared to the following section.

The section described above will turn grey; the following section will be drawn that then becomes the current section, and it will be shown in yellow.

After completing the entering of the data the cursor moves into Field "I" for setting of the length of the **new section**.

The entering of this data pair must be repeated until the drawing has been completed.

6.4.2. How to enter a drawing by tapping on the screen

When you access the drawing of a new program the next segment can be entered by simply tapping the screen with your finger in the desired direction like described in the chapter 4.3 of this guide. Once the segment has been entered, by tapping the screen with your finger in the center of the line drawn it will be possible to enter the measurement of the desired length on the virtual keyboard.

How to finish the drawing

In order to indicate that the drawing is finished you must set the angle of the last section to zero.

How to select the drawing data

To select the drawing data it is necessary to scroll through them with the  [Next] and  keys or tapping on the center of the section.

The  key scrolls backwards through the data forming the drawing in a sequential manner, passing step-by-step between the "alfa" Field and the "I" Field. The  scrolls backwards through the data in a sequential manner, passing step-by-step in the "I" Field. Whenever you scroll through the data of a drawing the section relating to the data displayed will be highlighted and the number of the section of current drawing will be displayed in Area 1.

How to change the drawing data

To change the drawing data it is necessary to:

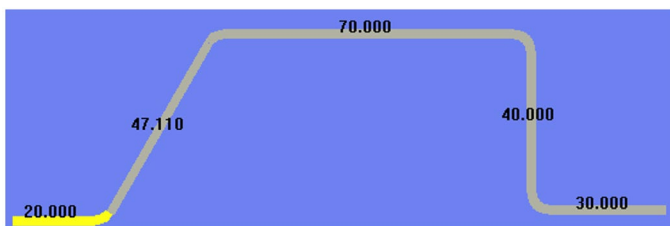
- select the value.
- enter the new value.
- press **[ENTER]** to accept the new value.
- the drawing will be traced depending on the new value entered.

How to visualize the drawing dimensions

Selecting the function button  **[Dimensioning]** will be possible to visualize some drawing dimensioning:

-  **[Show None]** no dimensioning are visualized

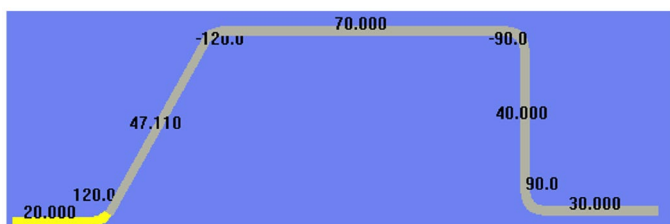
-  **[Show Height]** it show the lengths of the sections in the drawing:



-  **[Show Angle]** it show the angles of the drawing:



-  **[Show Height Angle]** it show the angles of the drawing:



Use the directional arrows

To automatically enter the angle of a section with respect to the following one, you can use the directional arrows. When you press one of these directional keys, a new segment will be traced in the direction indicated on the key you have pressed.

Using the directional arrows

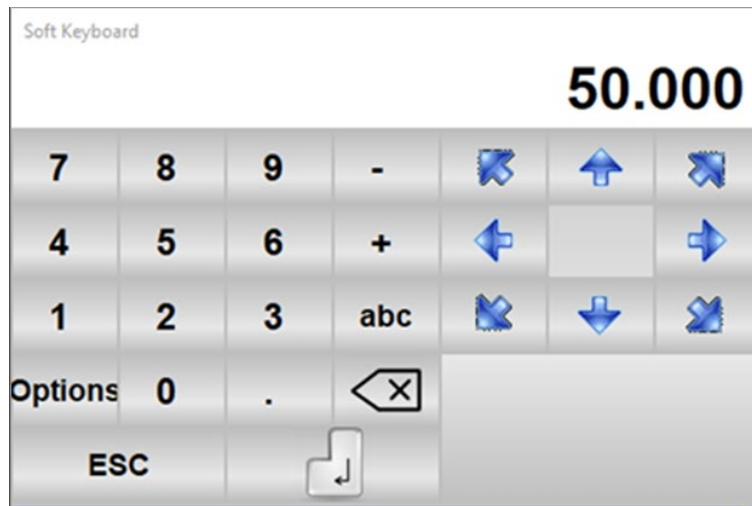


Figure 56. Position of the direction arrows keys

The directional vertical and horizontal arrows move both horizontally or vertically through the segments.

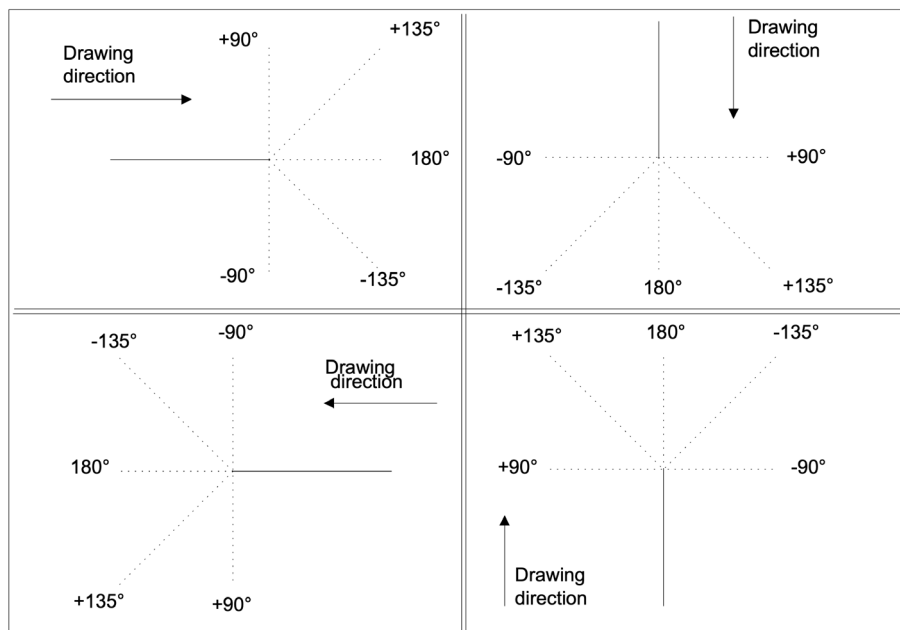


Figure 57. Using the arrows

The directional diagonals arrows move diagonally through the segments.

Use of the directional arrows

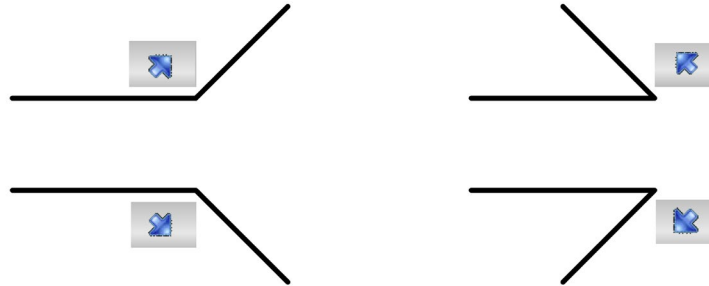


Figure 58. Using the directional diagonals arrows

The existing angle is automatically entered in the “**alfa**” Field between the current section and the segment traced depending on the directional key that has been pressed.

This angle must be confirmed with the **[ENTER]** key if you want to move on and enter the length of the new section.

How to delete a section of the drawing

To delete a section of the drawing it is necessary to select the data of the section that you want to delete and press the  button.

The current section will be deleted; the following sections will be orientated depending on the angle entered in the previous section previous to the one deleted.

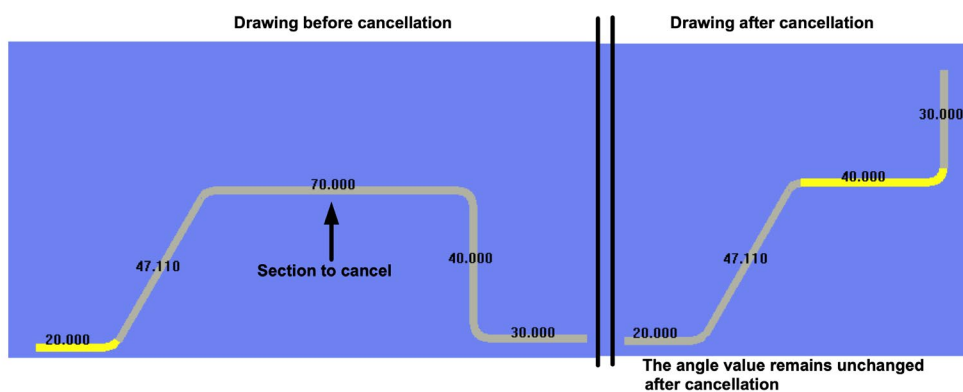


Figure 59. Deletion of a section

How to enter a section in the drawing

- Press the button  and select  **[Insert]** - in this way a section will be inserted before the one selected.

The data of the section that is inserted will be standard and they cause the extending of the currently selected side by 20 mm.

At this point it is necessary to enter the values of the new section to obtain the desired the drawing.

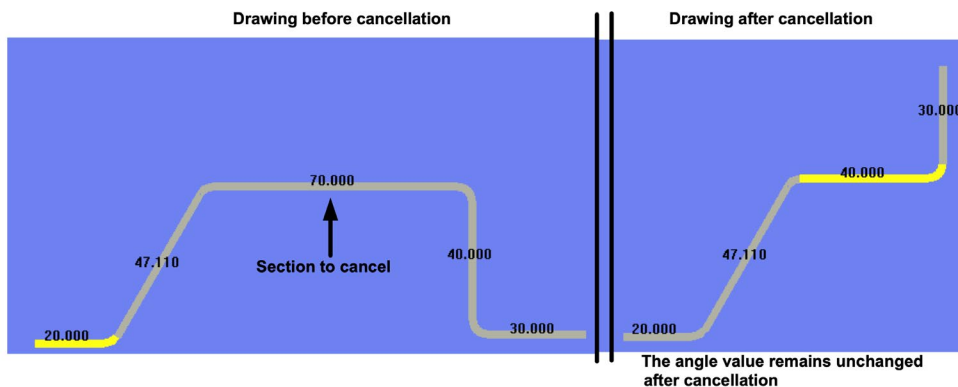


Figure 60. Inserting a section

There are some other method to enter a section in the drawing selecting the function button  **[Add to Tail]**:

-  **[Add]** selecting this function tapping near the end or of the beginning of the drawing you can add a new section.
-  **[Add to Tail]** selecting this function tapping near the end of the drawing (right side) you can add a new section.
-  **[Add to Head]** selecting this function tapping near the beginning of the drawing (left side) you can add a new section.
-  **[Edit]** selecting this function you can add a new section only using the Polar or the Cartesian Editor moving between the bends only using the function buttons  and 

6.4.3. How to use the Cartesian Editor

If it is not possible to define a segment in polar Editor, the function of drawing allows you to define it in Cartesian Editor.

Activation

From the Piece Setting page press the function button  [Polar Editor] in order to enable the Cartesian Editor function.

The cursor will move onto Area 4.

1) you must enter the difference between the beginning and the end of the segment along the horizontal axis in the **DX Field**.

2) you must enter the difference between the beginning and the end of the segment along the vertical axis in the **DY Field**.

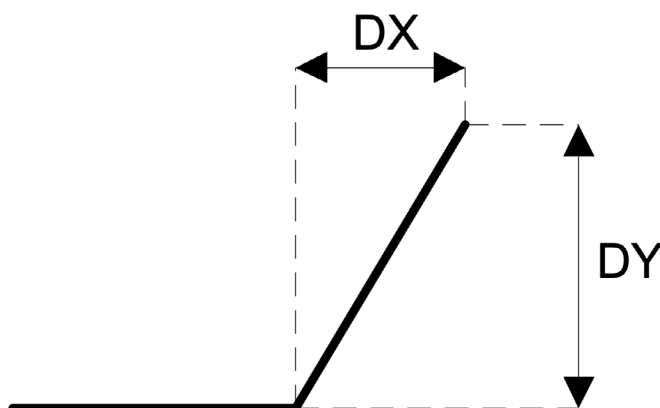


Figure 61. Cartesian data setting

By confirming the data with the key [ENTER] the new segment will be traced.

To return to the polar editor it is necessary to press the  [Cartesian Editor] button.

7. Managing the backup of the data's

7.1. Memory devices

7.1.1. USB device

This is a normal USB 1.1 or USB 2.0 or USB 3.0 device (pen drive). It must be fat 32 formatted.

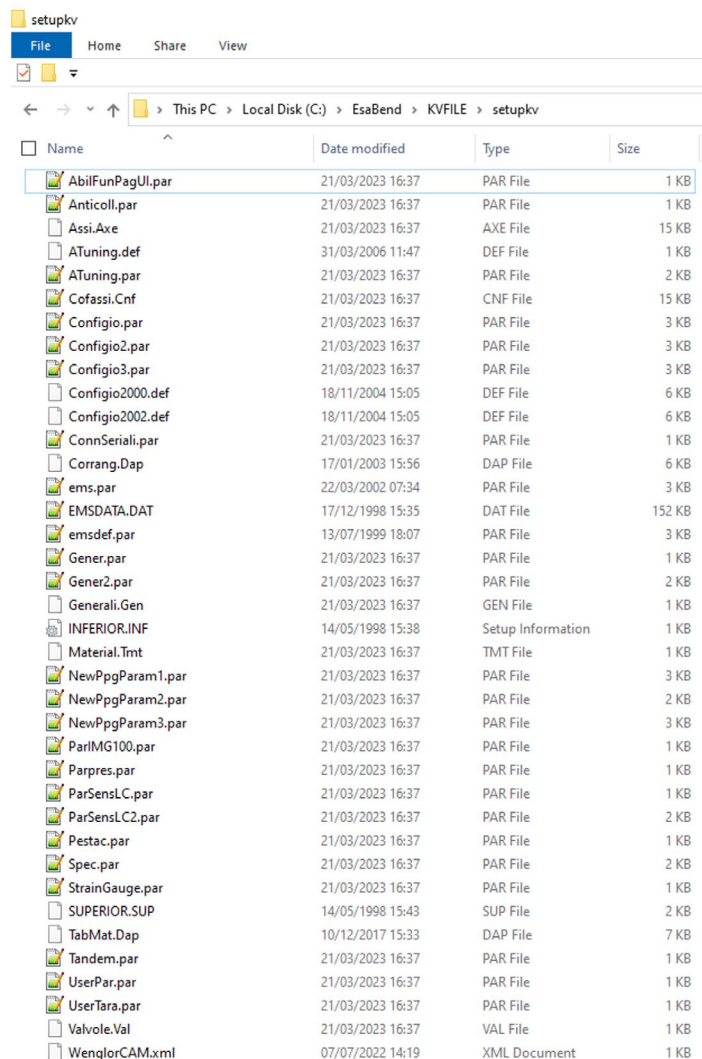
It is used to save the configuration parameters of the machine and the parameters of the axes; it is also used for the saving the security copy of the programmes, punches and dies. It is possible to view the contents of the device from any compatible IBM Personal Computer.

7.2. Exchanging the data between the memory devices

Data exchanging is understood as the transferral of the data from the internal CNC memory devices to the USB device (SAVE ALL-COMPLETE BACKUP) or from the USB device to the internal CNC memory devices (LOAD ALL- RESTORE BACKUP).

7.2.1 Save / Load the machine Parameters

The machine parameters are present in the VIS PC folder C:\HorizontalBendSIM\KVFILE\setupkv:

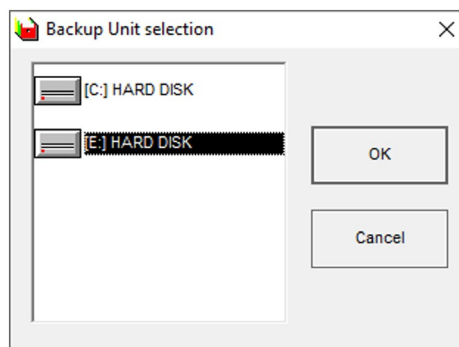


Name	Date modified	Type	Size
AbilFunPagUI.par	21/03/2023 16:37	PAR File	1 KB
Anticoll.par	21/03/2023 16:37	PAR File	1 KB
Assi.Axe	21/03/2023 16:37	AXE File	15 KB
ATuning.def	31/03/2006 11:47	DEF File	1 KB
ATuning.par	21/03/2023 16:37	PAR File	2 KB
Cofassi.Cnf	21/03/2023 16:37	CNF File	15 KB
Configio.par	21/03/2023 16:37	PAR File	3 KB
Configio2.par	21/03/2023 16:37	PAR File	3 KB
Configio3.par	21/03/2023 16:37	PAR File	3 KB
Configio2000.def	18/11/2004 15:05	DEF File	6 KB
Configio2002.def	18/11/2004 15:05	DEF File	6 KB
ConnSeriali.par	21/03/2023 16:37	PAR File	1 KB
Corrang.Dap	17/01/2003 15:56	DAP File	6 KB
ems.par	22/03/2002 07:34	PAR File	3 KB
EMSDATA.DAT	17/12/1998 15:35	DAT File	152 KB
emsdef.par	13/07/1999 18:07	PAR File	3 KB
Gener.par	21/03/2023 16:37	PAR File	1 KB
Gener2.par	21/03/2023 16:37	PAR File	2 KB
Generali.Gen	21/03/2023 16:37	GEN File	1 KB
INFERIOR.INF	14/05/1998 15:38	Setup Information	1 KB
Material.Tmt	21/03/2023 16:37	TMT File	1 KB
NewPpgParam1.par	21/03/2023 16:37	PAR File	3 KB
NewPpgParam2.par	21/03/2023 16:37	PAR File	2 KB
NewPpgParam3.par	21/03/2023 16:37	PAR File	3 KB
ParIMG100.par	21/03/2023 16:37	PAR File	1 KB
Parpres.par	21/03/2023 16:37	PAR File	1 KB
ParSensLC.par	21/03/2023 16:37	PAR File	1 KB
ParSensLC2.par	21/03/2023 16:37	PAR File	2 KB
Pestac.par	21/03/2023 16:37	PAR File	1 KB
Spec.par	21/03/2023 16:37	PAR File	2 KB
StrainGauge.par	21/03/2023 16:37	PAR File	1 KB
SUPERIOR.SUP	14/05/1998 15:43	SUP File	2 KB
TabMat.Dap	10/12/2017 15:33	DAP File	7 KB
Tandem.par	21/03/2023 16:37	PAR File	1 KB
UserPar.par	21/03/2023 16:37	PAR File	1 KB
UserTara.par	21/03/2023 16:37	PAR File	1 KB
Valvole.Val	21/03/2023 16:37	VAL File	1 KB
WenglorCAM.xml	07/07/2022 14:19	XML Document	1 KB

Parameters saving

To save all the machine parameters including the ioredir on the USB device it is necessary to:

- 1) Insert the **USB** device in the VIS PC.
- 2) Press the button  two times to open the menu.
- 3) Select the item  [**Configuration**].
- 4) Press the button .
- 5) Select [**Backup Unit**]:



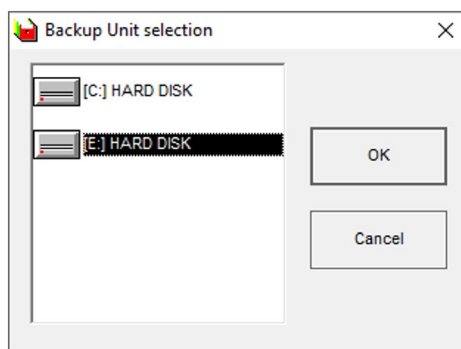
Select the backup unit from the list and select [**OK**]

- 6) Press the function button [**Save ALL**] and select [**Yes**]: after some seconds all the machine parameters will be saved on the USB device.

Parameters loading

To load all the machine parameters on the CNC device it is necessary to:

- 1) Insert the **USB** device in the VIS PC.
- 2) Press the button  two times to open the menu.
- 3) Select the item  [**Configuration**].
- 4) Press the button .
- 5) Select [**Backup Unit**]:



Select the backup unit from the list and select **[OK]**

6) press the function button **[Load ALL]** and select **[Yes]**: after some seconds all the machine parameters will be loaded on the CNC device.

At this point if you want load also the ioredir file press the function button **[Load I/O]**

Complete backup

To save all the machine parameters, the ioredir file, the punches, the dies and all the user data's files (plc, iso cycles, defcn.usr etc...) of the machine on the USB device it is necessary to:

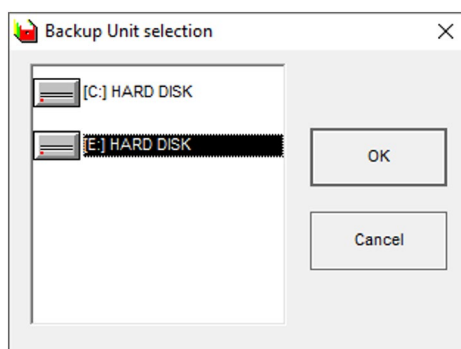
1) Insert the **USB** device in the VIS PC.

2) Press the button  two times to open the menu.

3) Select the item  **[Configuration]**.

4) Press the button .

5) Select **[Backup Unit]**:



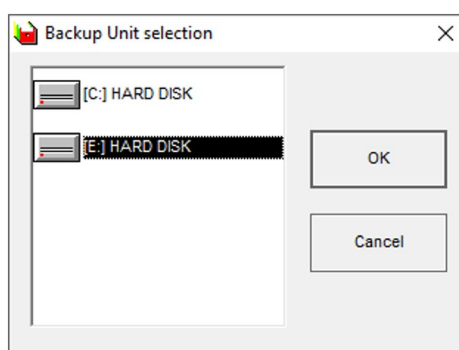
6) Select the backup unit from the list and select **[OK]**

press the function button **[Complete backup]** and select **[Yes]**: after some seconds all the machine parameters, the ioredir file, the punches, the dies and all the user data's files will be saved on the USB device.

Restore backup

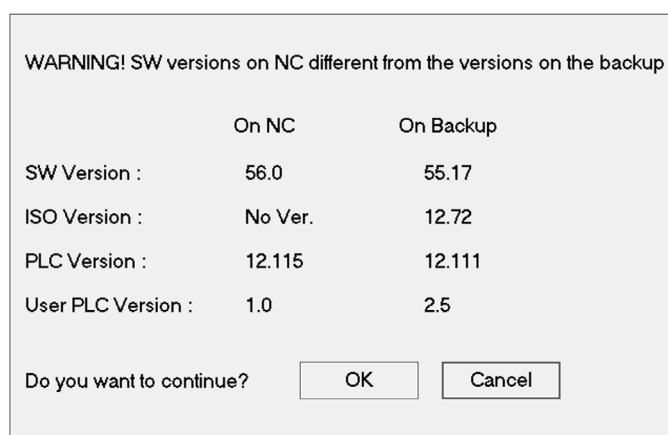
To load all the machine parameters, the punches, the dies and all the user data's files (plc, iso cycles, defcn.usr etc...) on the CNC device it is necessary to:

- 1) Insert the **USB** device in the VIS PC.
- 2) Press the button  two times to open the menu.
- 3) Select the item  [Configuration].
- 4) Press the button .
- 5) Select [Backup Unit]:



Select the backup unit from the list and select **[OK]**

- 6) press the function button **[Restore Backup]** and select **[Yes]**: after some seconds all the machine parameters, the punches, the dies and all the user data's files will be loaded on the CNC device.
 - 7) At this point if you want load also the ioredir file press the function button **[Load I/O]**
- If during this operation this screen will appears:



It means that the software version on the CNC is different from the version on the backup: in this case is not recommended to do the restore backup, select **[Cancel]** in order to cancel the operation.

Single parameters group loading

If you want load a single parameters group enter in the parameters page and select *[Load from Disk]*.

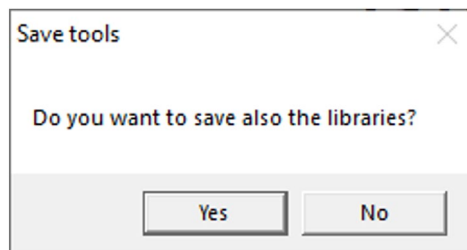
7.2.2. Saving/Loading the Tools

1) Press the top bar menu button .

2) Press the button .

3) Select the *[Save tools]*  item.

If the windows:



Select *[Yes]* or *[No]*, it is up to you.

All the tools (dies and punches) will be saved on USB.

If you want save only one tool on the USB device, from the die or punch list select the tool you need to save and press .

Loading the tools from the USB device

To load all the tools from the usb device it is necessary to:

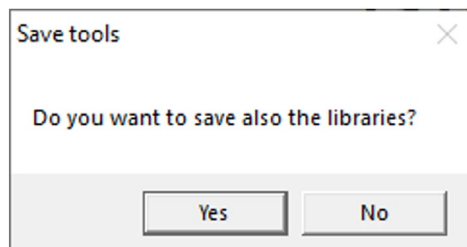
1) Press the top bar menu button .

2) Press the top bar menu button  to view the list of the dies or of the punches of the USB device.

3) Press the button .

4) Select the *[Save tools]*  item.

If the windows:



Select *[Yes]* or *[No]*, it is up to you.

All the tools (dies and punches) will be saved on the CNC device.

If you want save only one tool on the device, select the tool on the die/punch list and press .

7.2.3. Saving/Loading the programs

Saving the programs on the USB device

To save all the programs on the usb device it is necessary to:

- 1) Press the top bar menu button 
- 3) Press the button  .
- 3) Select the **[Save programs]**  items .
- 4) If you want save only one program on the USB device, from the program list select the program you need to save and press  .

Loading the programs from the USB device

To load all the tools from the usb device it is necessary to:

- 1) Press the top bar menu button 
- 2) Press the top bar menu button  to view the list of the programs of the USB device.
- 3) Press the button  .
- 3) Select the **[Save programs]**  items .
- 5) If you want load only one program from the USB device, from the program list select the program you need to save and press  .

7.2.4. Recommendations for the manufacturer and for the end user of the press brake

It is recommended to keep:

- USB device containing the machine parameters for each bender press sold (in double copy or a backup copy on the hard disk of a personal computer);
- A copy of the environment of the press brake that from the software version 73.55.0 is in the folder **C:\HorizontalBendSIM**. In the previous versions take a copy of the folders **DATI-DATIPPG-KVARA-KVFILE** that are present in the **C:\CNC** disk.

8. Description of the program data

8.1. Header section

This section contains a description of the header information contained in the upper part of the EDITOR page:

Name	
Minimum value:	Maximum value:
Default value:	Measuring unit: Alphanumeric characters
Present in SW version 1.0	Change activated
Description:	This is the name of the programme currently in progress; if nothing is entered in the field the programme will be the temporary type which has still not been saved. As many as 16 characters are managed in the header.
Bend:  1	
Minimum value: 1	Maximum value: 80
Default value:	Measuring unit: pure number
Present in SW version 1.0	Change activated
Description:	This is the bend currently in progress.
Section:  S2 - 1	
Minimum value: 1	Maximum value: 8
Default value:	Measuring unit: pure number
Present in SW version 1.0	Change activated
Description:	This is the section currently in the bending phase; the term section is understood as the side of the metal sheet on which you are carrying out the bends.

8.2. Supplementary information that cannot be changed

In the pages "Settings", "Automatic" also contain some information that cannot be changed:

- type of bend; the following values may be assumed:

 **1** normal bend in the air

 **1** calendered bend

 **1** Dutch folding bend

 **1** coining bend

 **1** conical bend

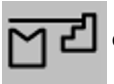
- bearing support; the following values may be assumed:



resting-against bend, the metal sheet must be pushed against the stop



supported bend, the metal sheet must be resting on top the first step of the stop



double supported bend; the metal sheet must be resting on top the second step of the stop

- Default Page:  the default page is enabled.

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