CNC control

HPC DIGITAL PROCESS III

SAFETY INSTRUCTIONS FOR OPERATING AND MAINTENANCE

ISSUE : EN
REVISION : H
DATE : 03 - 2024

Instruction manual

REF : 8695 4995

Original instructions

LINCOLN ELECTRIC

Thank you very much for the trust you have shown by choosing this piece of equipment. It will give you trouble-free service if it is used and maintained as recommended.

Its design, component specifications and manufacturing are in accordance with applicable European directives.

Please refer to the CE declaration enclosed to identify the directives applicable to it.

The manufacturer shall not be liable for any combination of parts not recommended by it.

For your safety, please follow the non-limitative list of recommendations and obligations, a large part of which are included in the Labour Code.

Please inform your supplier if you find any error in this instruction manual.

Table of contents

A - IDENTIFICATION 1
B - SAFETY INSTRUCTIONS 2
1 - Particular safety instructions ---------- 2
C - DESCRIPTION 3
1 - DESCRIPTION OF HPC DIGITAL PROCESS III ---------- 3
D - ASSEMBLY AND INSTALLATION 4
1 - Assembly and installation instructions ---------- 4
2 - Handling ---------- 4
E - OPERATING MANUAL 5
1 - Overview ---------- 5
1.1 Description of HMI structure ---------- 5
1.2 Management of alarms ---------- 6
1.3 Changing user levels ---------- 7
1.4 Shutting down the machine ---------- 8
1.5 Removing a USB stick ---------- 9
1.6 Opening the documentation of the Human Machine Interface (HMI) ---------- 10
2 - Program management ---------- 11
2.1 Importing a program from the network ---------- 11
2.2 Importing a program from a USB stick ---------- 13
2.3 Selecting a job (program + specific associated process) ---------- 14
2.4 Exporting a program ---------- 15
2.5 Deleting a program ---------- 17
2.6 Extracting a part from a complete program ---------- 18
2.7 Making a program from a standard shape ---------- 21
2.8 Manual program editing ---------- 24
2.9 Viewing important program values ---------- 26
3 - Adaptation of the program to the plate to cut ---------- 27
3.1 Transforming the program (rotation, change of scale) ---------- 27
3.2 Changing plate dimensions and materials ---------- 30
3.3 Aligning the plate ---------- 31
3.4 Adjusting the space between parts or from the edge of the plate ---------- 32
3.5 Multiplying the program on the plate ---------- 33
3.6 Setting and always finding the same position (project offset) ---------- 34
3.7 Positioning the plate with the laser ---------- 35
3.8 Positioning the plate in dry running ---------- 37
3.9 Saving the program with the selected process for reuse (job) ---------- 38
3.10 Using the optional camera ---------- 39
3.11 Using the optional pipe cutting feature ---------- 39
3.12 Setting a risk area ---------- 40
4 - Assignment of cutting parameters ---------- 41
4.1 Description of cutting parameters (process, quality) ---------- 41
4.2 Viewing parameters included in the program ---------- 42
4.3 Selecting the desired cutting parameters ---------- 42
4.4 Editing the cutting parameters ---------- 45
4.5 Verifying and validating parameters: ready to cut program ---------- 47

4.6 Description of **HPi** *plasma parameters*---48
4.7 Description of **Essential** *plasma parameters*---50
4.8 Description of **HPi²** *oxy-fuel parameters*---52
4.9 Description of **Essential** *oxy-fuel cutting parameters*---54
4.10 Description of Essential marker parameters---56
4.11 Description of **FINELINE** *plasma parameters*---57
5 - Manual controls---60
5.1 Description of controls on the console---60
5.2 Moving the different axes---63
5.3 Selecting and changing consumables---67
*5.4 Preparing the plasma process (switching on the power source, extraction gas test etc.)*68
5.5 Manual detection with plasma (for a detection test or program zero point)---77
5.6 Preparing the oxy-fuel cutting process---79
5.7 Manual control of an **Essential** *marker*---83
5.8 Selecting the execution mode (cutting, dry running etc.)---84
5.9 Skeleton or scrap cutting---85
6 - Monitoring of cutting---87
6.1 Viewing the cycle in progress (cut preparation window)---87
6.2 Viewing the parameters in progress (parameters + cycle page)---90
6.3 Following the cut in progress (path display)---93
6.4 Editing process parameters: cutting speed and sensing---94
6.5 Modifying the overheating time---96
6.6 Managing sensing during oxy-fuel cutting---97
6.7 Managing a cutting incident (offset, path) etc.---99
6.8 Carrying out a graphics-based restart---99
6.9 Exiting a program (reset)---100
6.10 Saving a rush and resuming a rush---100
6.11 Saving a job---101
7 - Process maintenance---102
7.1 Consumable maintenance: number of strikes/alerts---102
*7.2 Testing the solenoid valves (***HPi** *plasma)*---104
7.3 Carrying out an HF test (level 2)---106
7.4 Adjusting the process offsets (level 2)---107
7.5 Viewing the return from the **FINELINE** *installation*---111
7.6 Viewing the cycle times (level 2)---112
7.7 Retrieving production reports (level 2)---113
7.8 Loading/saving a process database (level 2)---114
7.9 Editing the setup parameters relating to Hpi plasma (level 2)---116
7.10 Changing cyan qualities into blue qualities---118
7.11 Adjusting the tool holder (level 2)---119
7.12 Editing the setup parameters relating to Essential plasma (level 2)---123
7.13 Adjusting motor torque plate detection (level 2)---124
7.14 Editing the setup parameters relating to **HPi²** *or* **Essential** *oxy-fuel (level 2)*---125
7.15 Adjusting the HPi² oxy-fuel cutting sensors---127
7.16 Adjusting the Essential oxy-fuel cutting sensors---129
8 - User adjustments---131
8.1 Modifying the HMI language (level 2)---131
8.2 Permitting access to documentation by users---132
8.3 Modifying the touch screen adjustments (level 2)---133

F - MAINTENANCE 135
1 - Touch screen ----- 135
2 - Care ----- 135
3 - Spare parts ----- 136
PERSONAL NOTES 138

INFORMATION

DISPLAYS AND PRESSURE GAUGES

Measurement instruments or displays of voltage, intensity, speed, accuracy etc. are to be considered as indicators, whether they are analogue or digital.

For operating instructions, adjustments, troubleshooting and spare parts, please refer to the special instructions for safe operating and maintenance.

REVISIONS

REVISION : B DATE : 08/21

DESCRIPTION	PAGE
Update	

REVISION : C DATE : 10/21

DESCRIPTION	PAGE
FINELINEadded	

REVISION : D DATE : 09/22

DESCRIPTION	PAGE
Addition: • Technologies for standard shapes, • Optional camera • Skeleton cutting • Pipe cutting	

REVISION : E DATE : 12/22

DESCRIPTION	PAGE
Update	

REVISION : F DATE : 03/23

DESCRIPTION	PAGE
Update	

REVISION : G DATE : 09/23

DESCRIPTION	PAGE
Update	

REVISION : H DATE : 03/24

DESCRIPTION	PAGE
Update	

A - IDENTIFICATION

Refer to the identification plate of the machine.

B - SAFETY INSTRUCTIONS

For general safety instructions, please refer to the specific manual supplied with the equipment.

AIRBORNE NOISE:

Refer to the special instructions 8695 7050 supplied with the equipment.

1 - Particular safety instructions

Caution! The **HPC DIGITAL PROCESS III** controls a machine.

Refer to machine documentation.

The machine may only be operated by a single operator trained in safe use.

Before use, the operator must make sure that there is no risk of collision with personnel.

Clean the working area from time to time.

The use of Personal Protective Equipment (PPE) and work clothing covering the body is **mandatory**.

Caution! The numerical control system and power supply modules of the inputs and outputs are supplied with 230V. **Switch off the power at the electrical cabinet before any work** on these devices.

Machine maintenance must be carried out **with all the energy supplies switched off**.
The disconnection and padlocking of all energy sources is **mandatory**.

1 - DESCRIPTION OF HPC DIGITAL PROCESS III

The **HPC DIGITAL PROCESS III** automatically manages cutting parameters depending on the equipment and the material to cut, associated with part programs.

OXYTOME²/PLASMATOME²

EUROTOME²

OPTITOME²

ALPHATOME²

The part programs are derived from standard shapes or imported from a CAD system.
The association of a part program and cutting parameters constitutes a job, which can be saved.
Each program and each job may be copied, edited or exported.
There are several ways to cut a part:

- Select a job to make a part that has already been made
- Select a program, then the material and cutting performance
- Select a standard shape, enter its dimensions and then the material

D - ASSEMBLY AND INSTALLATION

1 - Assembly and installation instructions

The **HPC DIGITAL PROCESS III** is supplied assembled with the software installed.

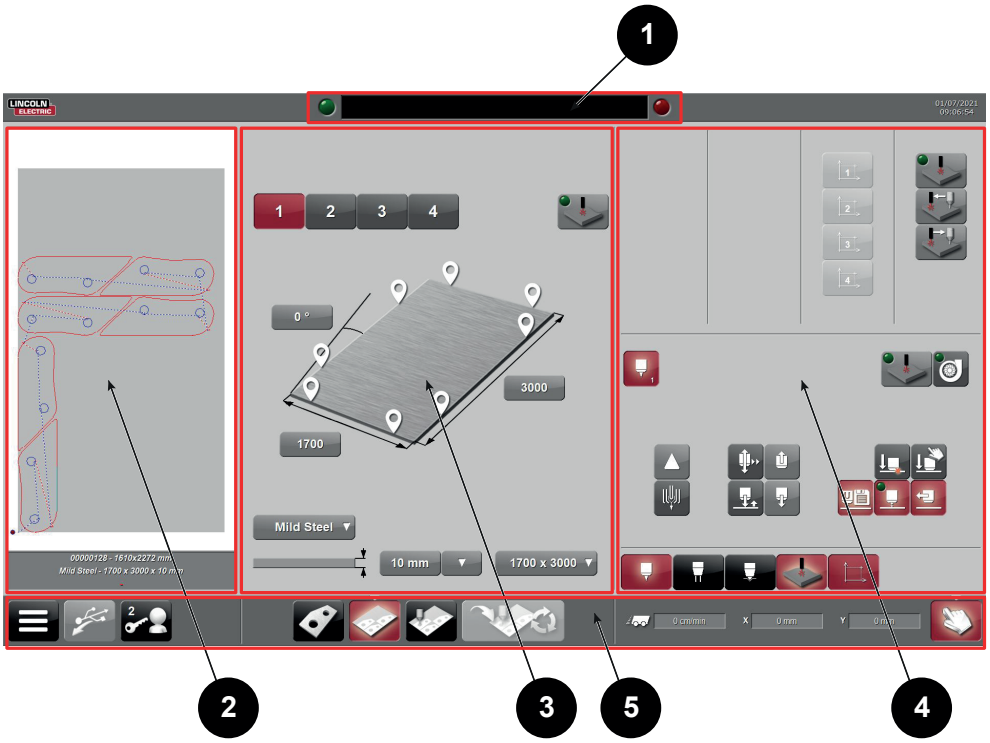
Refer to machine documentation.

2 - Handling

Caution! The **HPC DIGITAL PROCESS III** contains a touch screen. This component is fragile and must absolutely be protected during handling.

1 - Overview

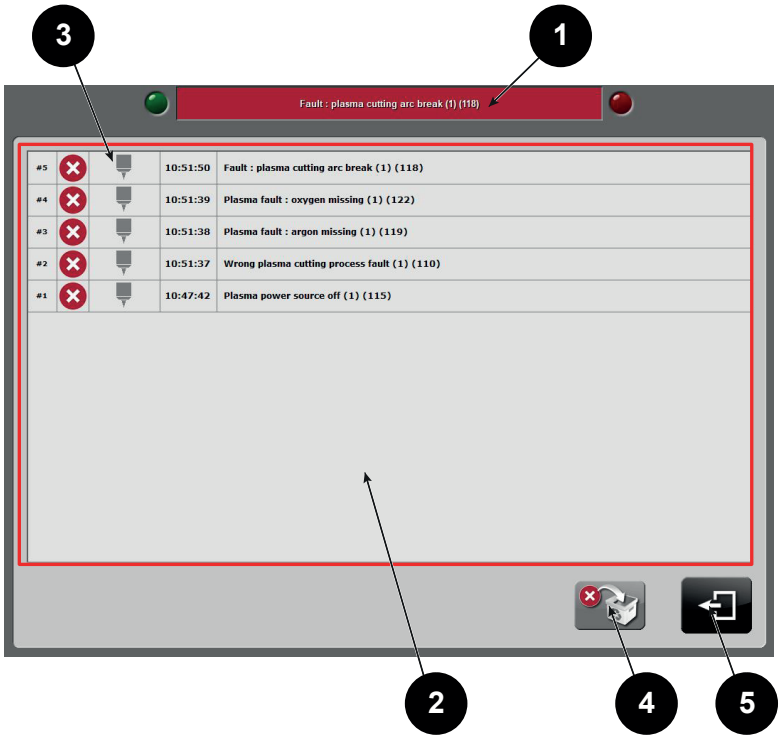
1.1 Description of HMI structure



Alarms are displayed in **area (1)**.
Programmed paths are displayed in **area (2)** (left of the screen).
A wide variety of functions can be found in **area (3)** (centre of the screen).
Area (4) (right of the screen) is devoted mostly to manual functions.
Area (5) is always displayed. It provides access to the main menus.

1.2 Management of alarms

When an alarm occurs, the number and text are displayed in **area (1)**. When you press it, **area (2)** is displayed.



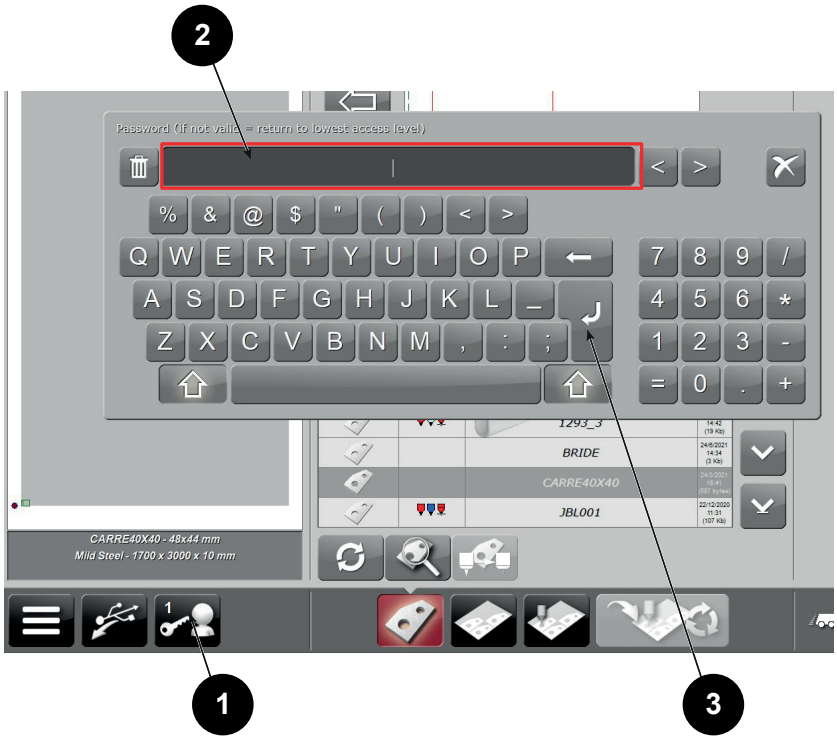
All active alarms are displayed in **area (3)**, from the most recent to the oldest. From left to right:
Order of occurrence

- Shows if the fault blocks operation or not
- Origin of the fault (plasma, oxy-fuel, machine)
- Time of occurrence
- Full description, including alarm number

To acknowledge, press **button (4)**. Only alarms that have ceased and been acknowledged will disappear.
Press **button (5)** to close the window.

1.3 Changing user levels

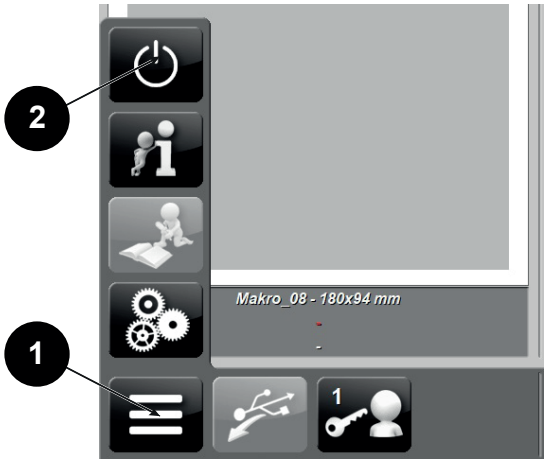
First press **button (1)**, then enter the password for the desired user level in **area (2)**. Confirm with **button (3)**. If the password is correct, the number on **button (1)** is changed.



To go back to user level 1, the password is 1

1.4 Shutting down the machine

First press the emergency stop.



Press **button (1)** then **button (2)**.

The window below opens

Press **button (3)** to confirm.

Wait for the NC system to shut down (black screen).

Switch off the disconnector on the side of the electrical cabinet.

Switch off the main machine disconnector.

1.5 Removing a USB stick

Press the button (bottom left of the screen) to take off the USB stick safely

Press **button (1)** to make the window disappear.

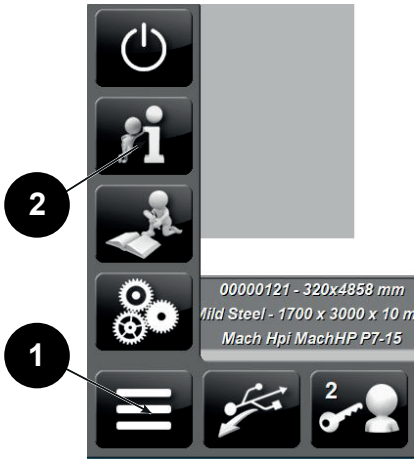
Take the stick off its connector on the console.

Caution! Do not remove the stick located on the numerical control system, as this is the dongle of the NC and is indispensable for operation

If the button is greyed out, either the stick is absent or the USB port has already been deactivated and the stick can be removed safely.

1.6 Opening the documentation of the Human Machine Interface (HMI)

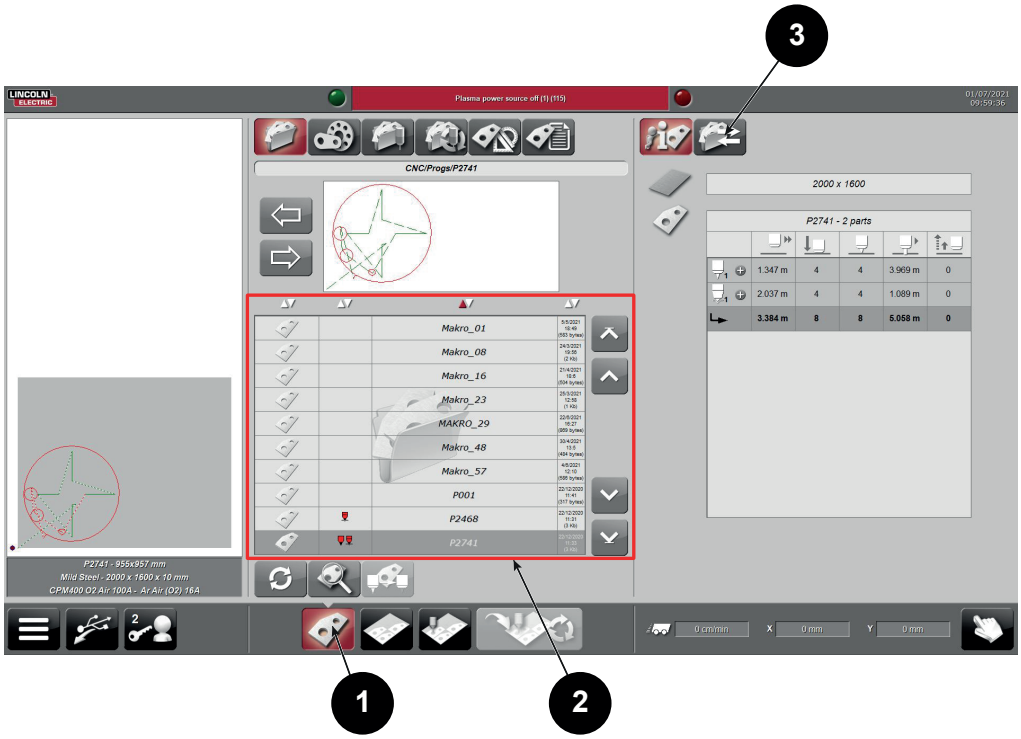
The documentation is accessible on level 2 and level 1 depending on the settings.



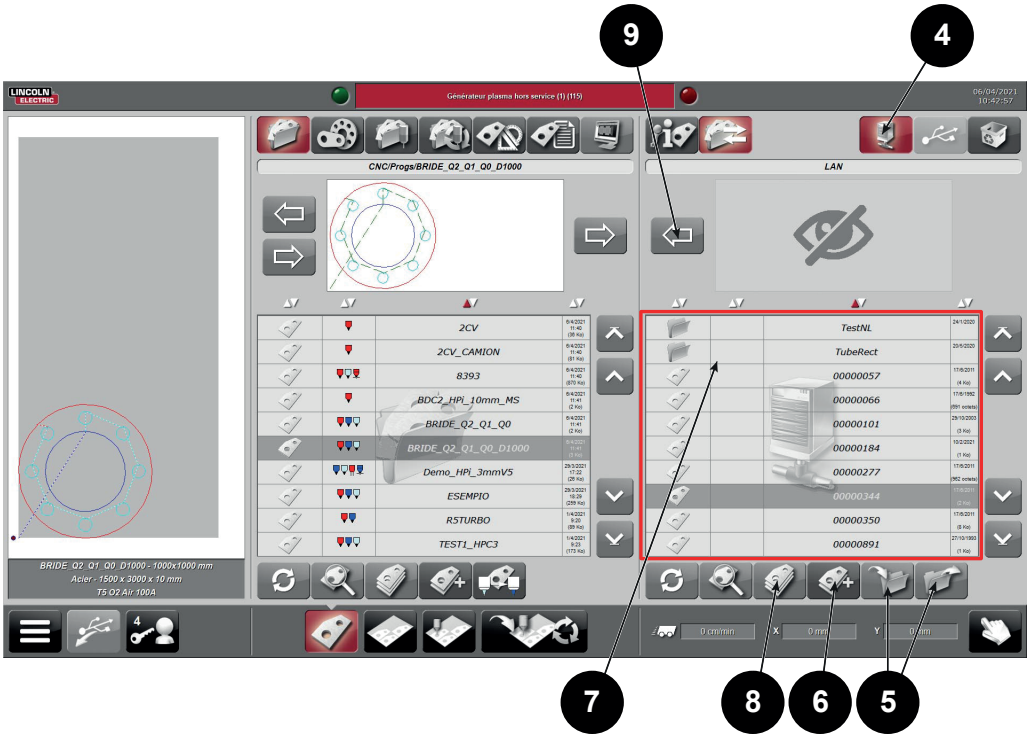
To access the documentation, press **button (1)**, then **button (2)**. Close the PDF file to go back to the HMI screen.

2.1 Importing a program from the network

First of all, the machine must be connected to the network and the server containing the files must be operating.



Press **button (1)** to display the list of NC programs **(area 2)**, then **button (3)** to see the possible drives.



Then select the network drive (**button (4)**) on which the files to import are located.

The directory to which the program is to be copied can be identified using the **buttons (5)**.

Then, on the right-hand side of the screen, press **button (6)** (for multiple selection), and select one or more programs **(area 7)**.

You can also select all the files in the network folder. To do so, press **button (8)**

Lastly, press **button (9)** to start the import.

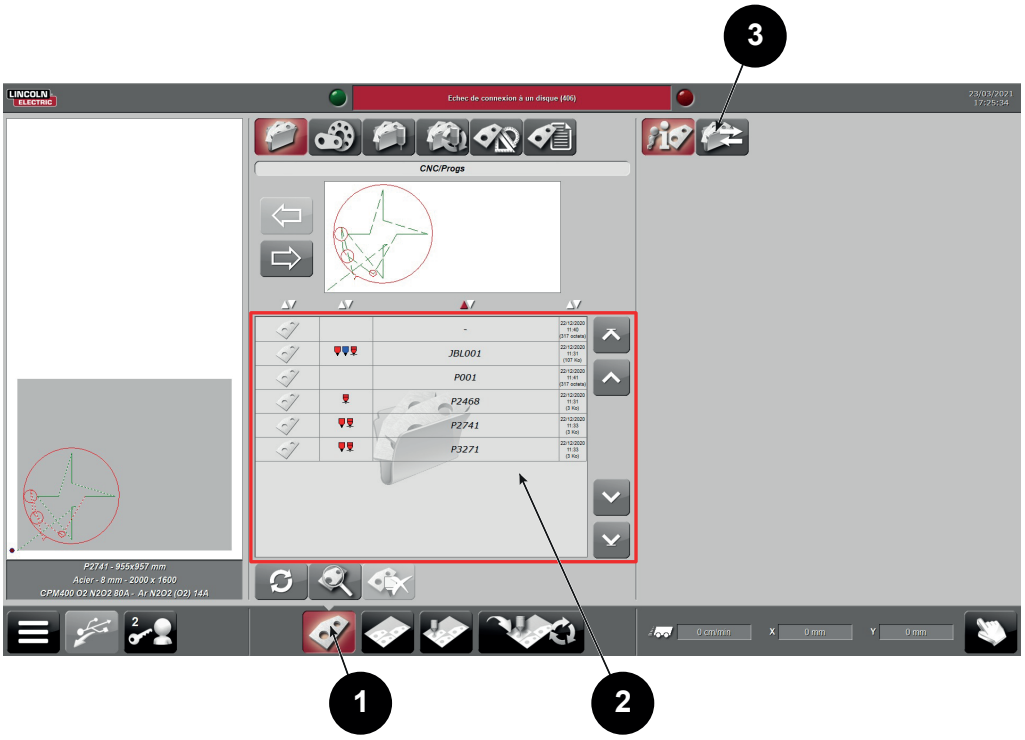
In each area,

This button is used to refresh the list of files present.

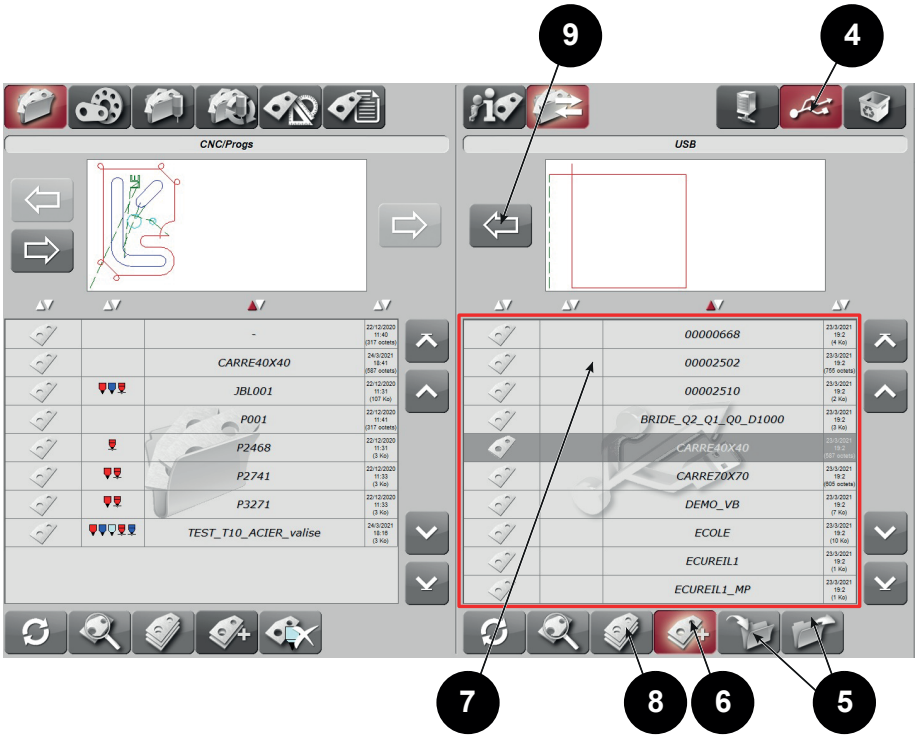
This button opens a window to search a file by name

2.2 Importing a program from a USB stick

First of all, insert a USB stick with the desired program into the USB connector on the console. Then, in the HMI:



Press **button (1)** to display the list of NC programs **(area 2)**, then **button (3)** to see the possible drives.



Then select the USB drive (**button (4)**) on which the files to import are located.

The directory to which the program is to be copied can be identified using the **buttons (5)**.

Then, in the central area of the screen, press **button (6)** (for multiple selection), and select one or more programs **(area 7)**.

You can also select all the files in the directory of the NC system. To do so, press **button (8)**

Lastly, press **button (9)** to start the import.

In each area,

This button is used to refresh the list of files present.

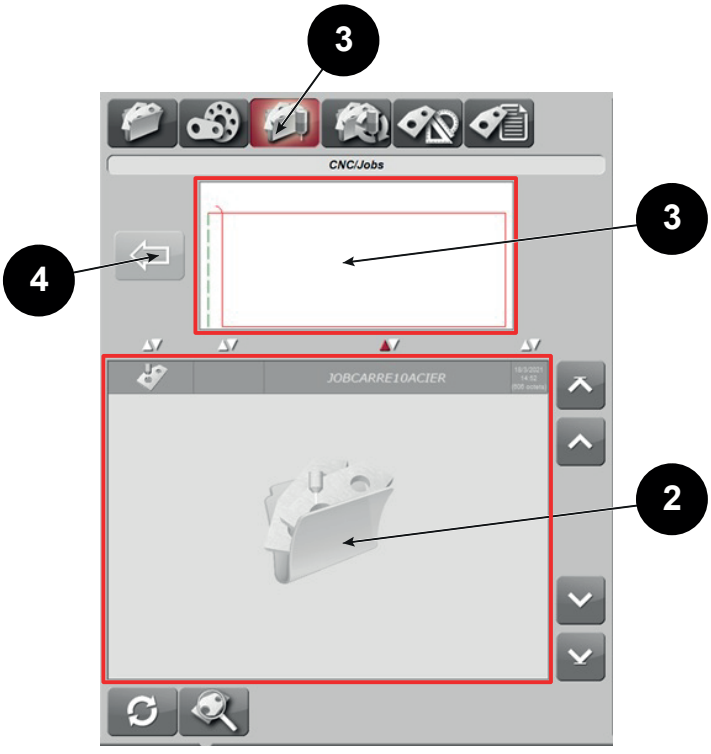
This button opens a window to search a file by name

2.3 Selecting a job (program + specific associated process)

To load a job program

Select the Program menu (at the bottom of the central page).

The window below will be displayed.



First of all, press **button (1)** to display the list of jobs

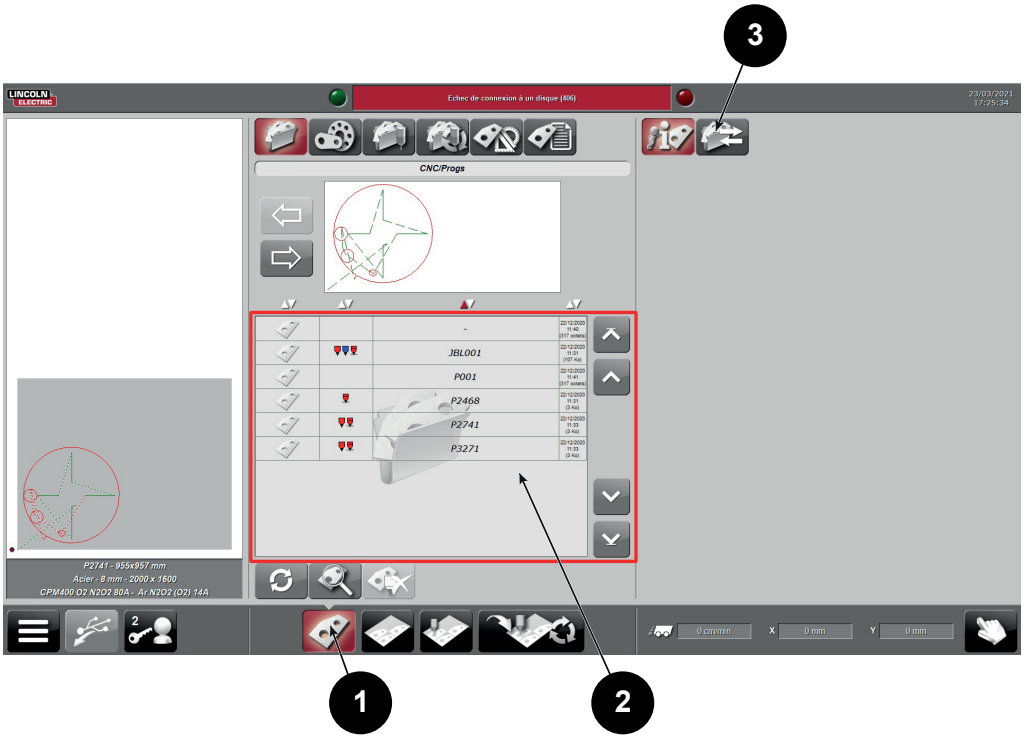
Then select the desired job in **area (2)**.

When the job is selected, the path is displayed in **area (3)**

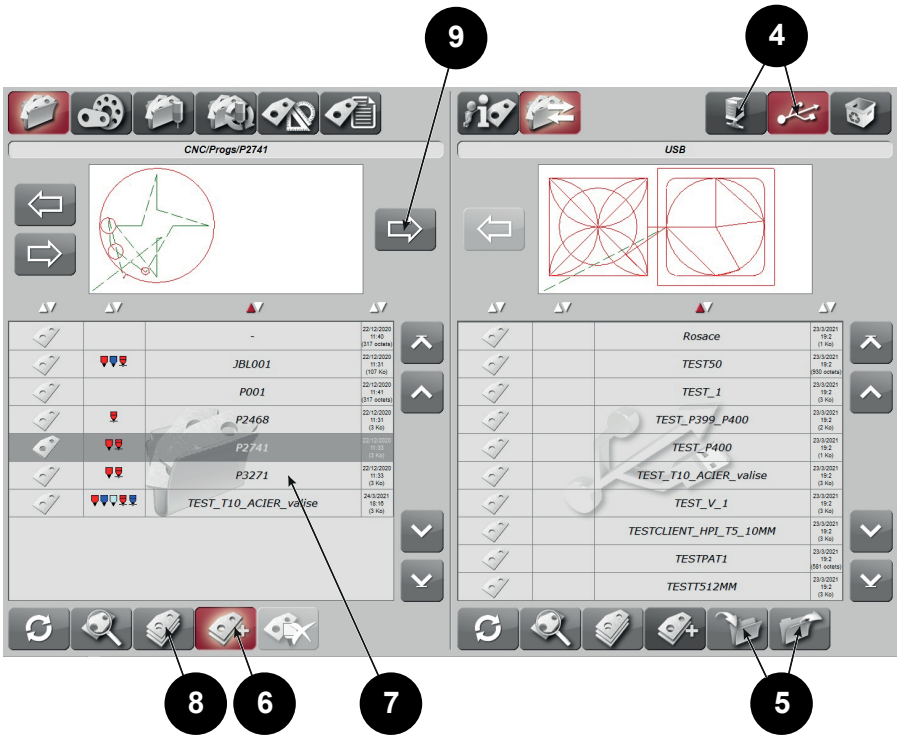
You can then load the program by pressing **button (4)**

2.4 Exporting a program

You need be on level 2 to export a program.



Press **button (1)** to display the list of NC programs **(area 2)**, then **button (3)** to see the possible drives.



Then select the drive to which the program is to be exported from the NC (network folder or USB drive),with one of **buttons (4)**.

The directory to which the program is to be copied can be identified using the **buttons (5)**.

Then, in the central area of the screen, press **button (6)** (for multiple selection), and select one or more programs **(area 7)**.

You can also select all the files in the directory of the NC system. To do so, press **button (8)**.

Lastly, press **button (9)** to start the export.

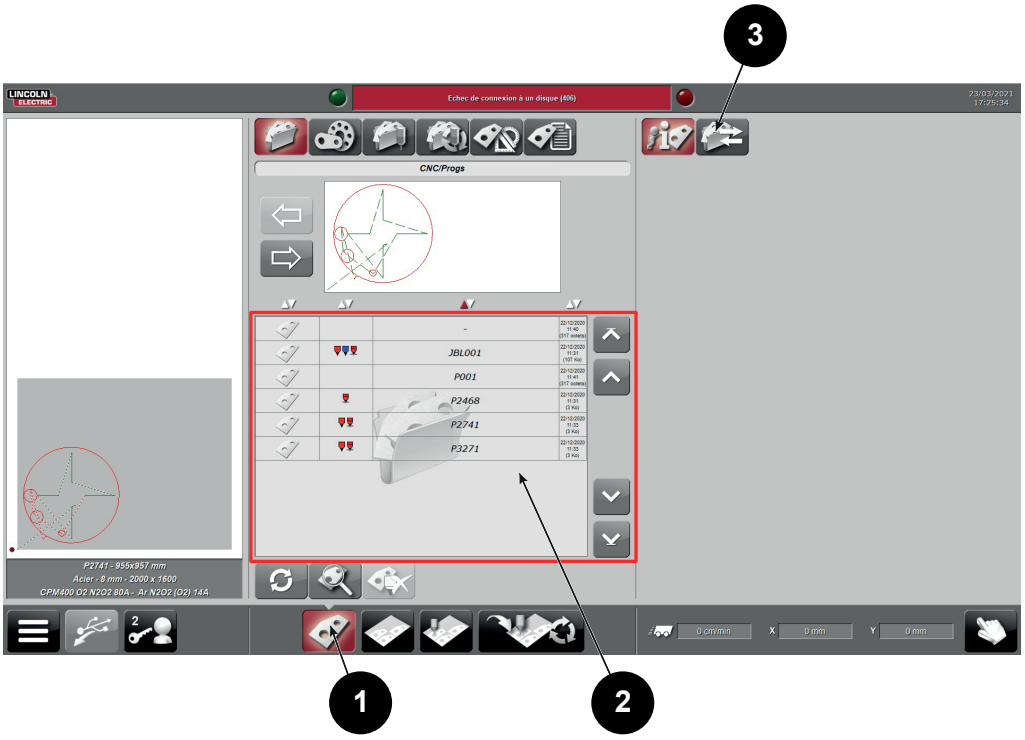
In each area:

This button is used to refresh the list of files present.

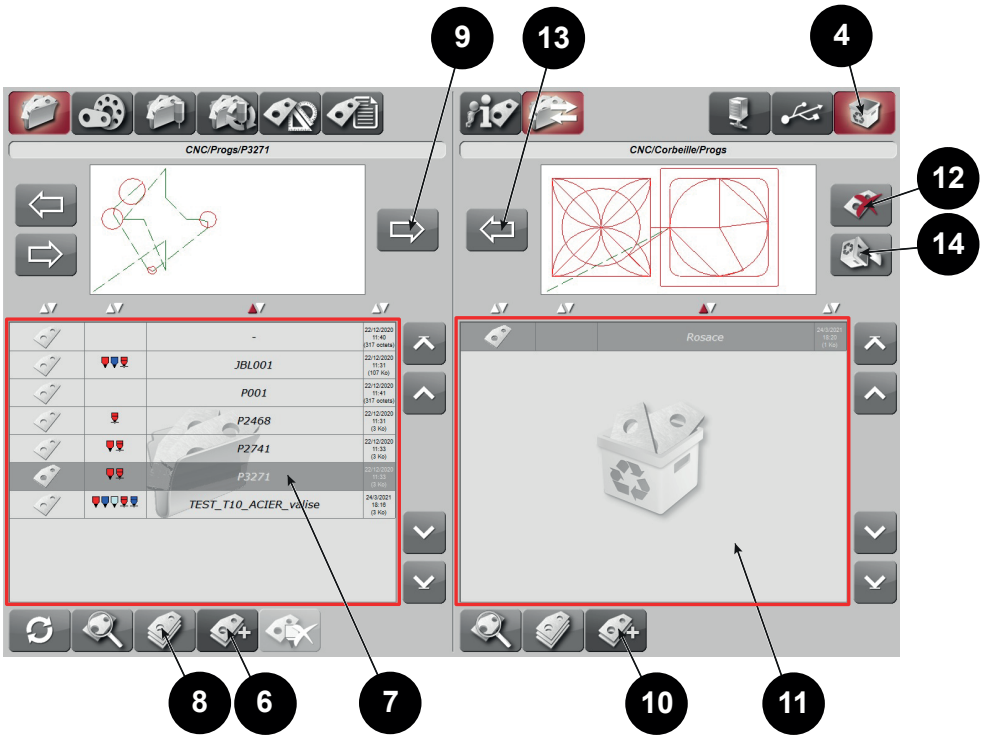
This button opens a window to search a file by name

2.5 Deleting a program

You need be on level 2 to delete a program.



Press **button (1)** to display the list of NC programs **(area 2)**, then **button (3)** to see the possible drives.



Then select the trash bin, with **button (4)**.

Then, in the central area of the screen, press **button (6)**, and select one or more programs **(area 7)**.

You can also select all the files in the directory of the NC system. To do so, press **button (6)** (multiple selection), then **button (8)**.

Lastly, press **button (9)** to start moving items to the trash bin.

To delete the files permanently:
- Press **button (10)**,
- Then select the programs to delete permanently in **area (11)**
- Lastly, press **button (12)**

Press **button (14)** to empty the trash bin (permanently delete all the files in it)

To restore files from the trash bin:
- Press **button (10)**,
- Then select the programs to restore in **area (11)**
- Lastly, press **button (13)**

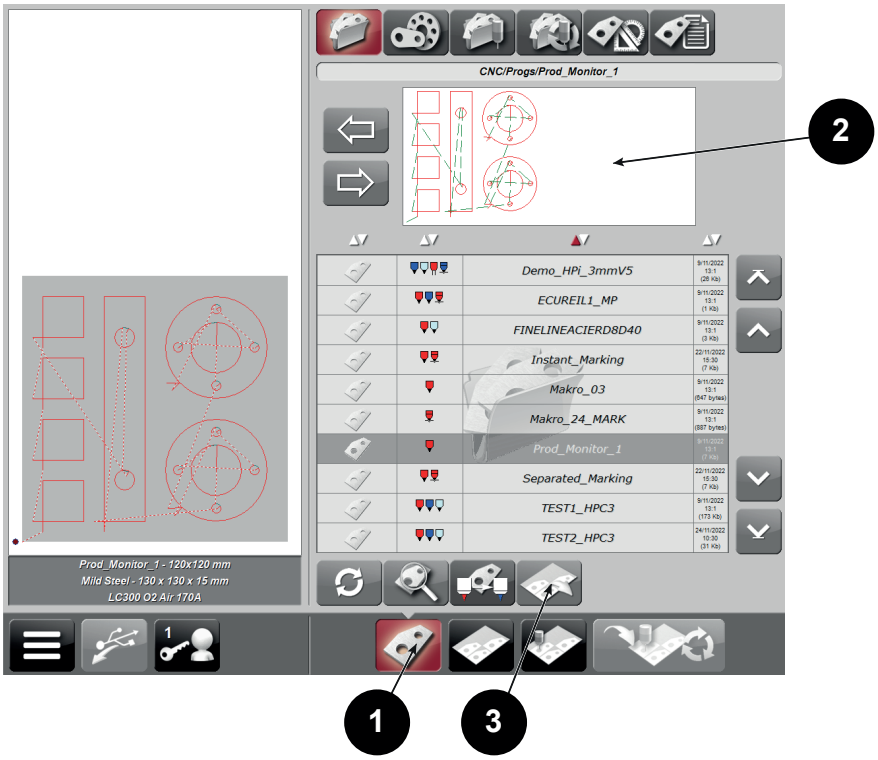
In each area:

This button is used to refresh the list of files present.

This button opens a window to search a file by name

2.6 Extracting a part from a complete program

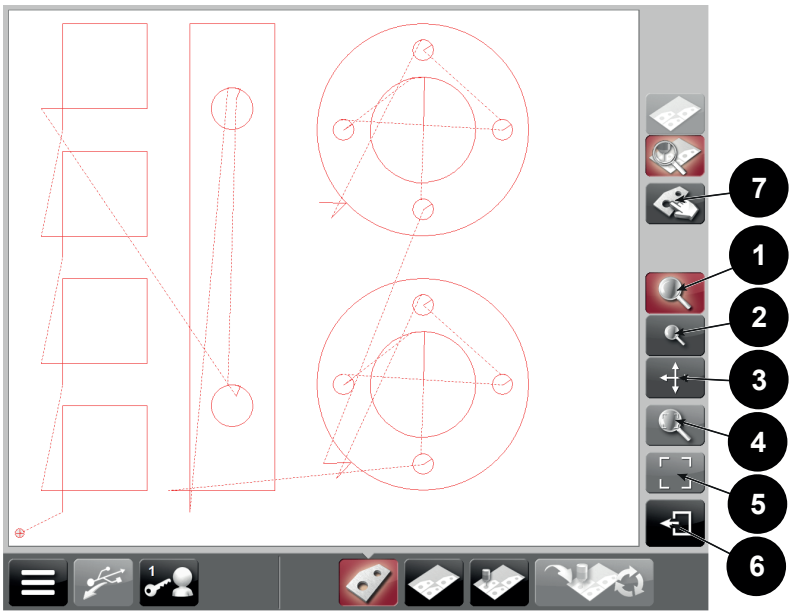
After a cutting incident in a program, it may be useful to extract a part from it.



Click on **button 1** to access the program menu.

Select the program containing the part to extract in the list; it will be displayed in **area 2**.

If the program contains several parts, you can use **button 3**. Click on it to enter the part selection screen.



Buttons 1 to **5** are used for manipulating the program display to better identify the part to extract:

- **button 1**: Zoom + mode, then click on the area affected by zooming in,
- **button 2**: Zoom– mode, then click on the area affected by zooming out
- **button 3**: movement mode, then click on the area to recentre
- **button 4**: optimum zoom (complete program display)
- **button 5**: full screen mode. You can go back to a two-thirds screen display.

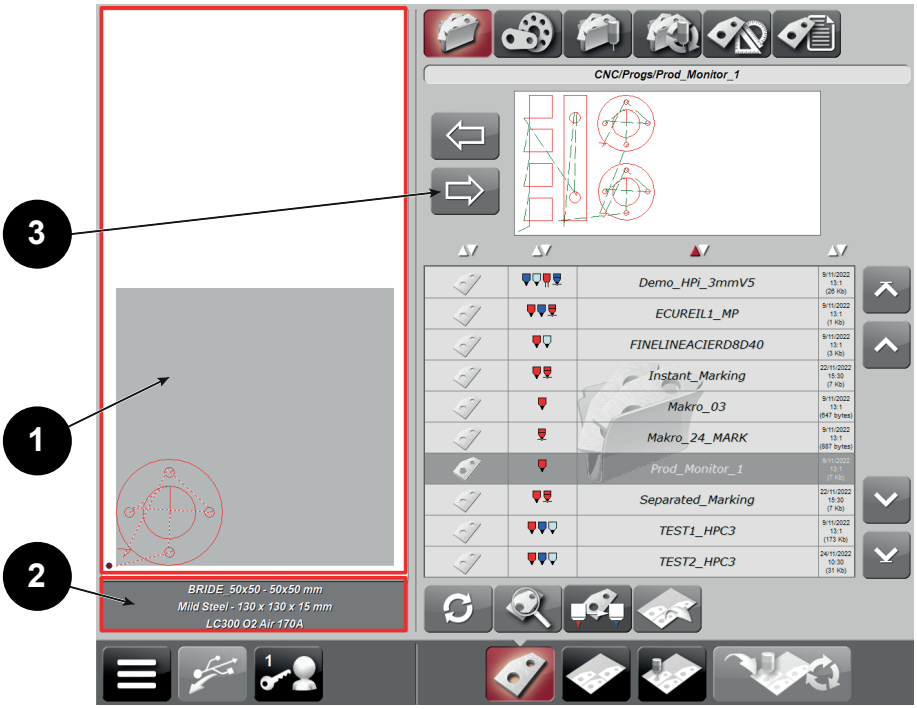
Button 6 is used for cancelling the part extraction.

Back to two-thirds display

Once the part to extract is identified, use **button 7** to access the part selection mode and click on one of the contours of the part.

Button 7 will become a confirmation button. Click on it to extract the part.
The extraction screen will close.

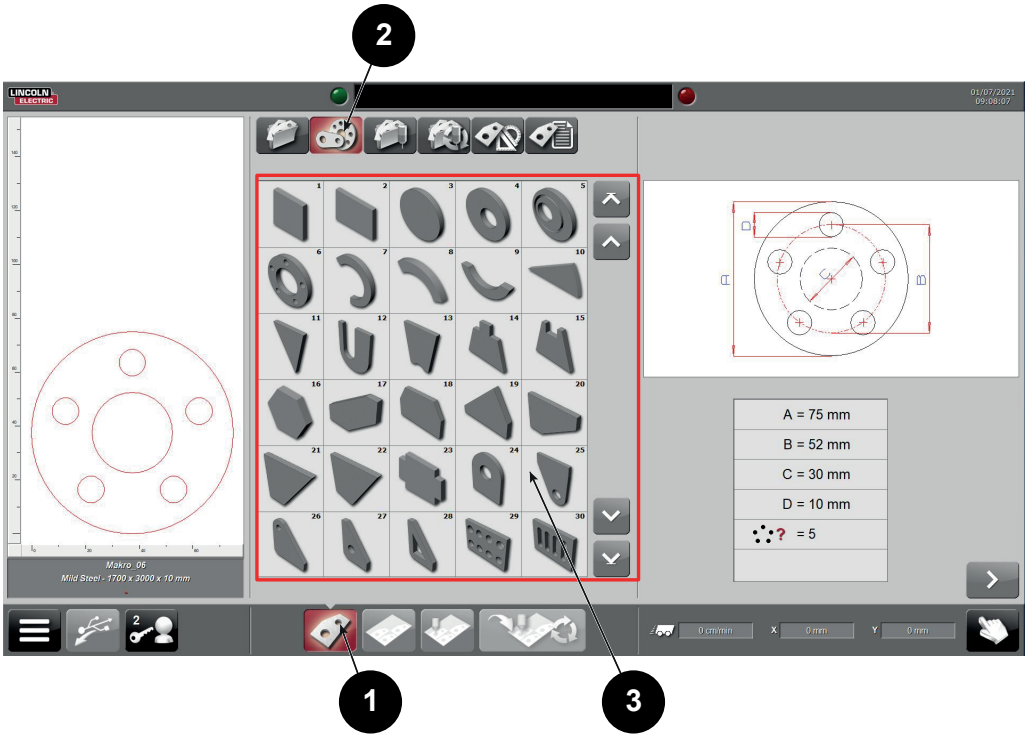
Confirmation button



The extracted part is moved to **area 1**. Its name is derived from the data of the initial program, and its dimensions are calculated (**area 2**).
It can be saved as a program (**button 3**).

2.7 Making a program from a standard shape

Standard shape functions make it possible to make simple shapes without using programs created by post-processing.
To do so:



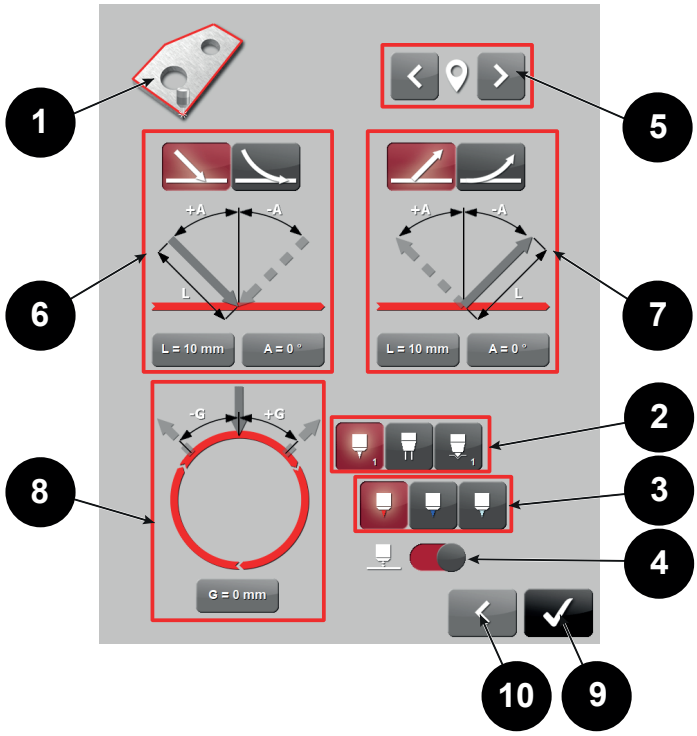
Press **button (1)** then **button (2)** to access the standard shapes

Select a standard shape from those proposed, in **area (3)**

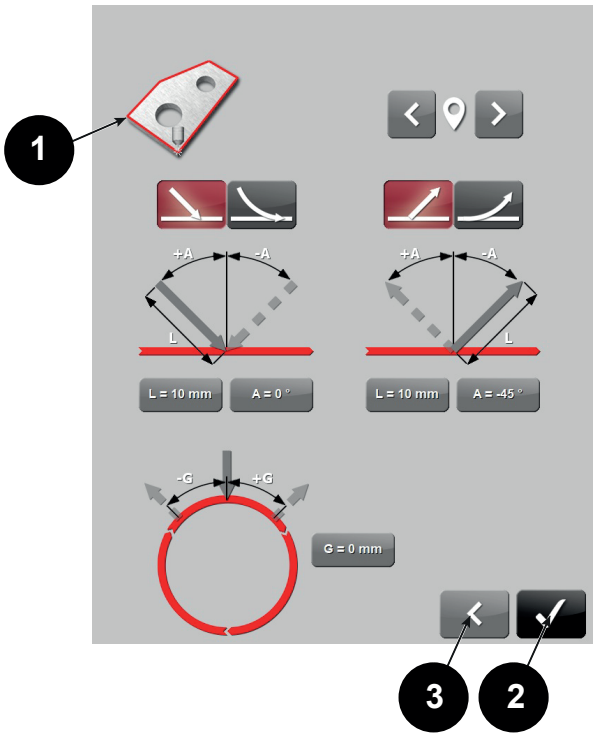
At that time, the shape is displayed in **area (5)**.

Now you can edit the various dimensions of the shape in **area (6)**.
The path in **area (5)** will change in real time.
When the dimensions are as needed, press **button (7)**.

The internal contour adjustment window will then open (symbol in **area (1)**)



In **area (2)**, select the process assigned to cutting (or marking).
In **area (3)**, select the quality of the cut to apply. If ultrasharp is used, then the entries are defined in the process parameters, and standard shape configurations **(zones 6** to **8**) are greyed out.
In **area (4)**, define whether sensing must be enabled while cutting. If ultrasharp is used, then sensing is disabled and will be managed by the process parameters.
In **area (5)**, the position of the attack point is selected using the arrows. View the changes in position on the representation of the path on the left-hand side of the screen.
In **area (6)**, the type and dimensions of attack for lead-in are selected
In **area (7)**, the type and dimensions for lead-out are selected
In **area (8)**, the overlap distance for internal contours is adjusted. It may be negative.
Lastly, press **button (9)** to continue with configuration, or **button (10)** to go back to the previous screen.
For the remainder of the configuration, the following screen is displayed, for the external contours (see **area 1**).

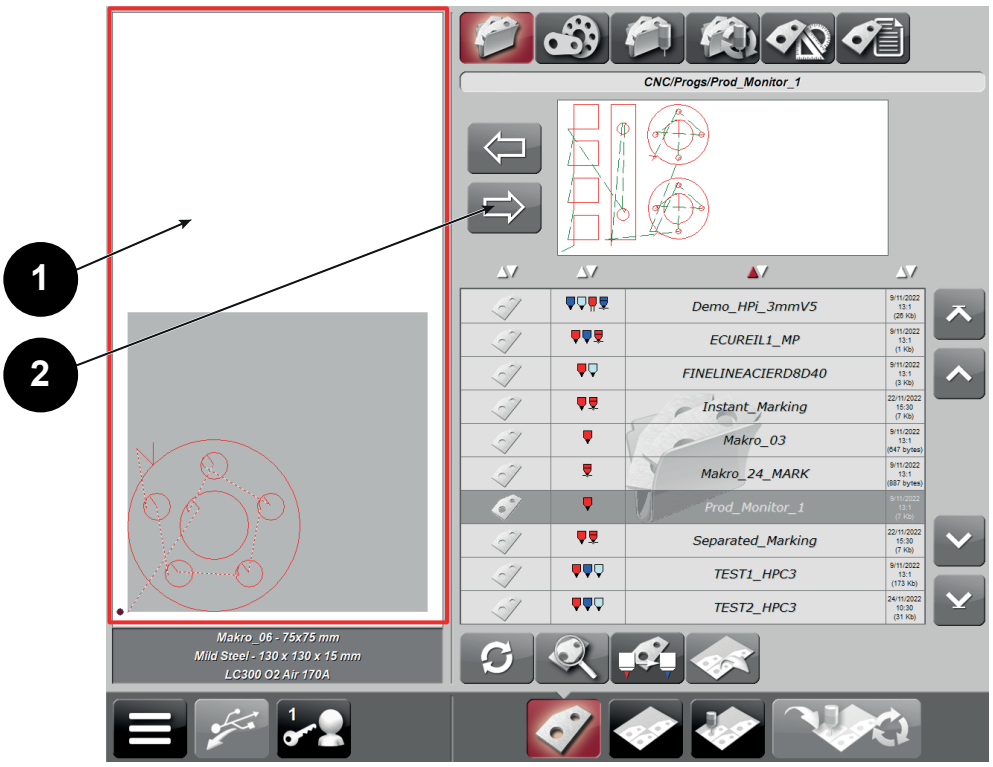


Same settings as with internal contours

When the settings are complete, press **button (2)** to confirm them, or **button (3)** to go back to the previous screen.

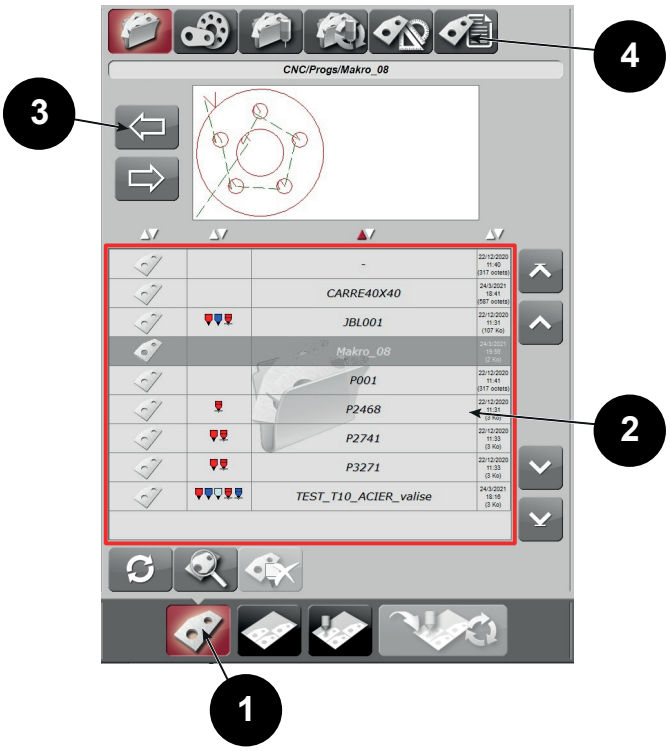
The program is then displayed on the left-hand side of the screen (see **area 1**), but not yet saved.

To save it, press **button (2)**. A window opens for defining the name of the program.

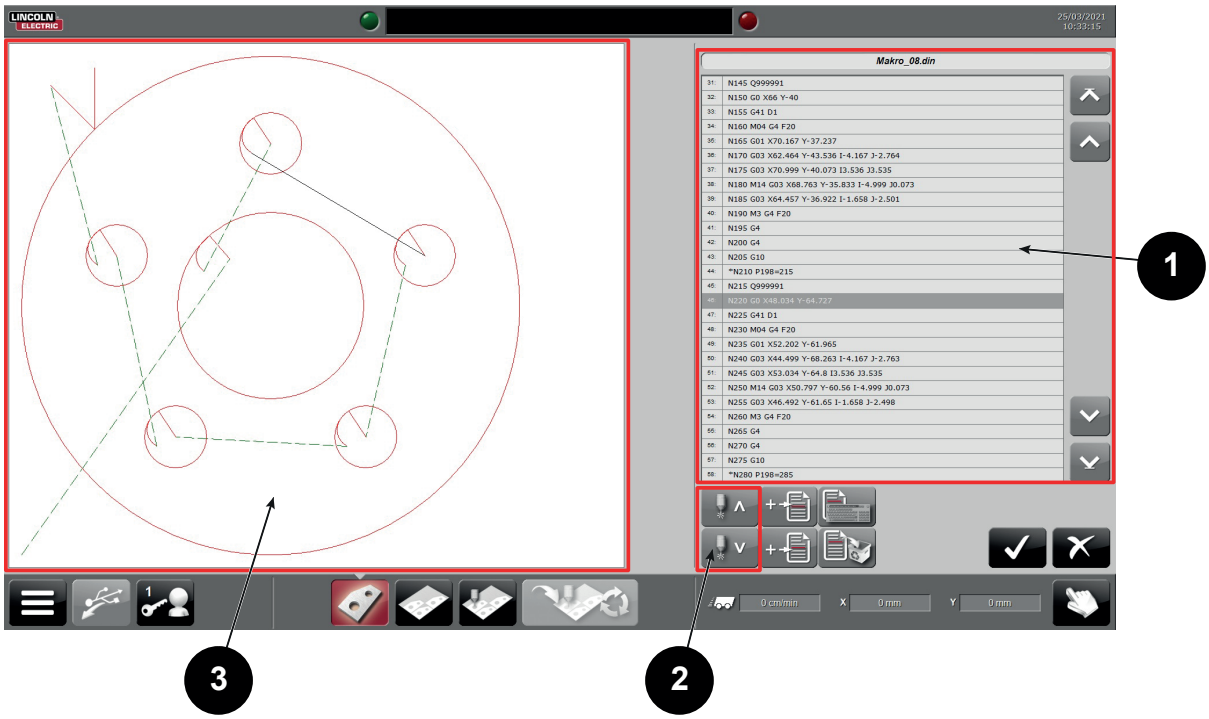


2.8 Manual program editing

In the central part of the screen, press **button (1)**, select the program to edit in **area (2)**, then press **button (3)** to nest the program (left-hand side of the screen). Then press **button (4).**



That will take you to the window for editing the program:

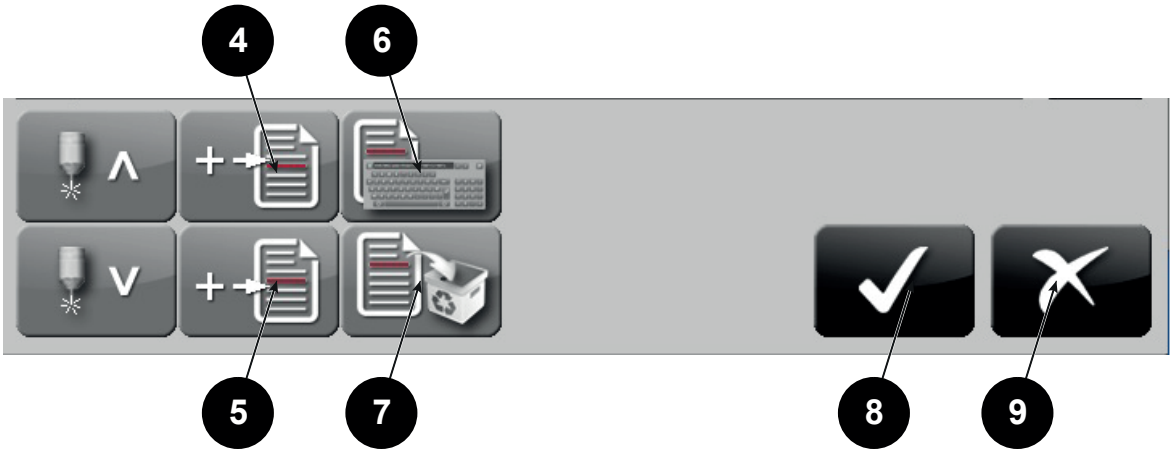


First of all, select the line to edit; to do so, select it in **area (1)**, possibly with the help of the arrows on the side.

The buttons in **area (2)** are used to deselect the first line of the previous or next lead-in.

If there is a movement on the selected line, it is displayed in black in **area (3)**.

Then make the required change:



Press **button (4)** to add a line before the selected line (a window will open to allow you to write the new line).

Press **button (5)** to add a line after the selected line (a window will open to allow you to write the new line).

Press **button (6)** to edit the selected line

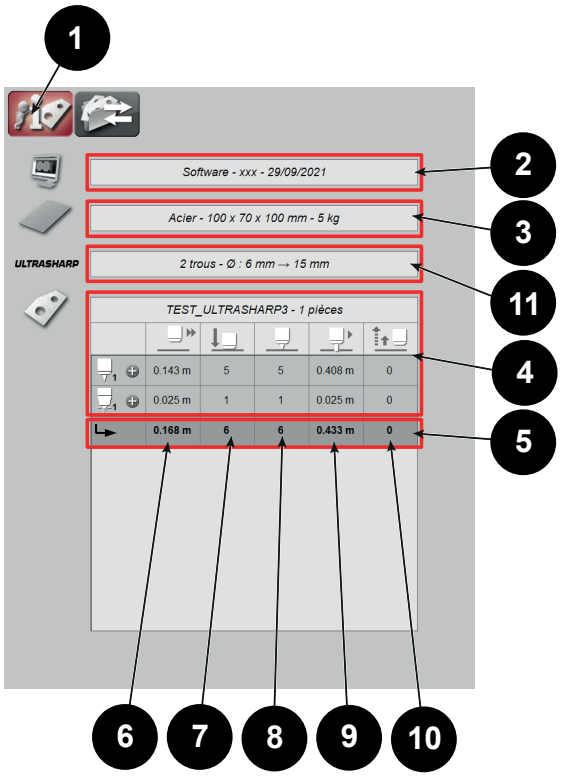
Press **button (7)** to delete the selected line.

When editing is complete, press **button (8)** to confirm (in that case, you will be asked to save the program), or **button (9)** to cancel the changes.

While adding lines or editing the program, it is important to follow the syntax of the program.

2.9 Viewing important program values

Once the program is loaded in the NC, press **button (1)** (right-hand area of the screen)



Depending on the part program programming version, the following information may be displayed:

In **area (2)**, the title of the program, version and date of creation

In **area (3)**, the material, dimensions and estimated plate mass

In **area (4)**, the different data, classified by process, then cutting quality

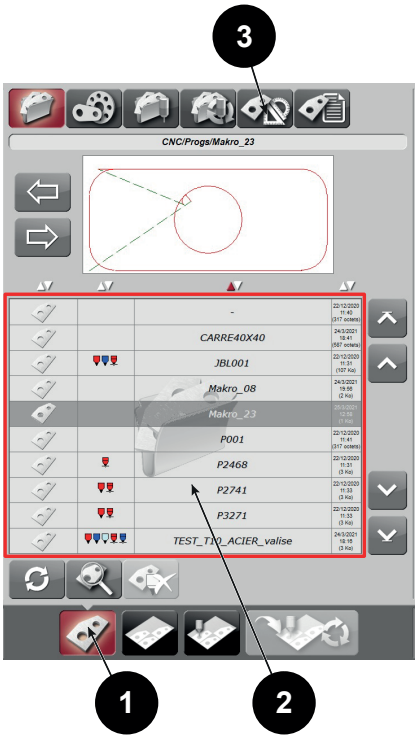
In **area (5)**, the total data of the program

Area (11) contains the **Ultrasharp** data of the program (number of holes, min and max diameter)

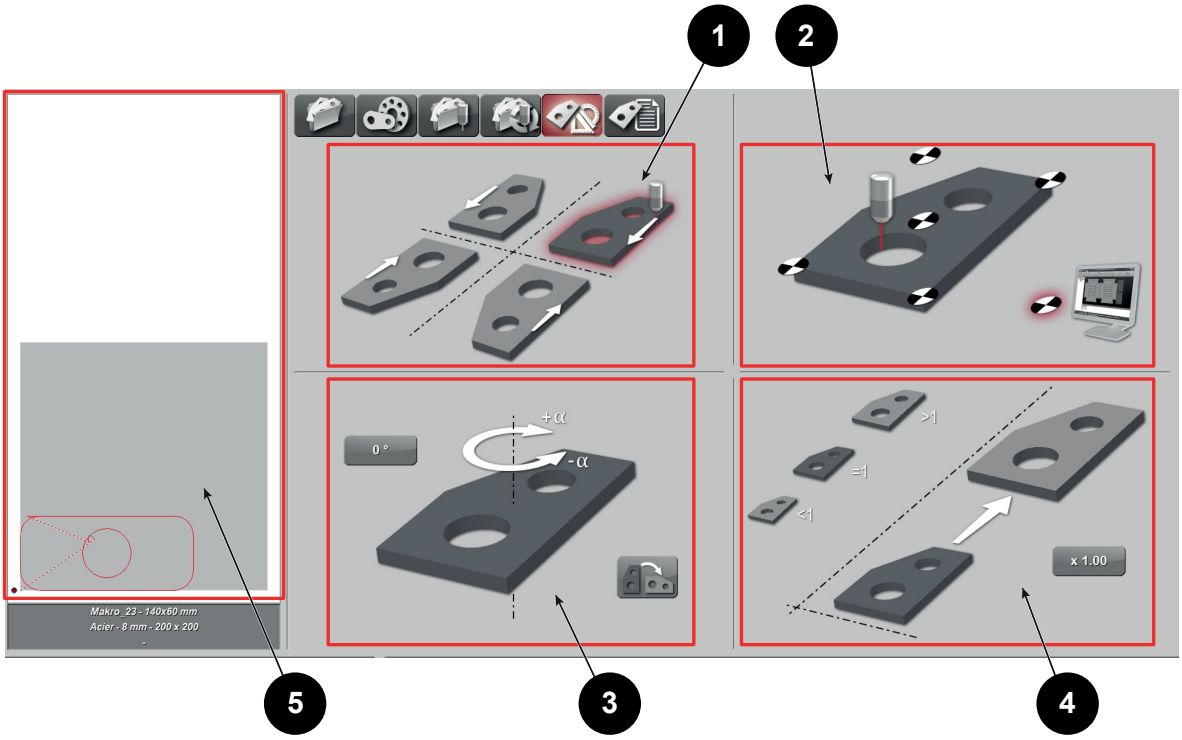
Column (6) represents empty journeys
Column (7) represents the plate detection number (P400=1 in the program)
Column (8) represents the number of strikes (M4 in the program)
Column (9) represents the total cutting length
Column (10) represents the number of high-speed journeys with the head down) (P399=1 in the program)

3.1 Transforming the program (rotation, change of scale)

In the central part of the screen, press **button (1)**, select the program to edit in **area (2)**, then press **button (3)**.



You will be taken to the screen below:



Area (1) is devoted to program transformation using symmetry

In **area (2)**, you can set the zero point of the program in relation to the plate

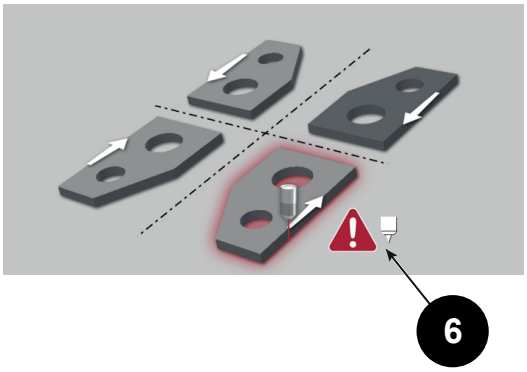
In **area (3)**, you can set program rotation in the plate

In **area (4)**, you can change the scale of the program (enlarge or reduce

All the changes can be seen in real time in **area (5)**.

Symmetry (area 1):

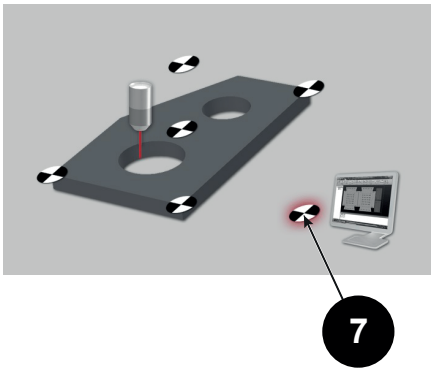
The program may be symmetrised along the horizontal or vertical or both axes. The selected symmetry is displayed on a red background (none by default)



Caution! Warnings are displayed with some positions (see **area 6**)

The warning will indicate that the required symmetry will result in inverting the cutting direction on the piece, which reduces the quality of the cut parts when plasma is used.

Change in zero point (area 2):

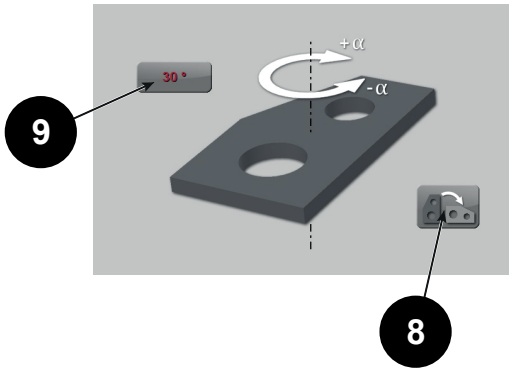


The zero point of the program may be modified (at the four ends of the program or at its centre).

The selected zero point is on a red background (see **area 7**). For the zero point located close to a computer (**area 7**), that represents a zero point set by the post processor (not the HMI).

The change in zero point also changes the position of the part in the plate.

Program rotation in the plate (area 3):

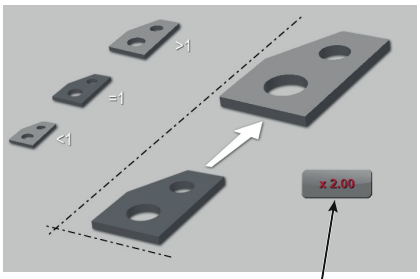


You can rotate the program, so that the centre of the program is the centre.

To do so

- Either apply 90° rotations using **button (8)**.
- Or set a specific angle using **button (9)**. (if the angle is not 0, it will be displayed in red)

Change of scale (area 4):

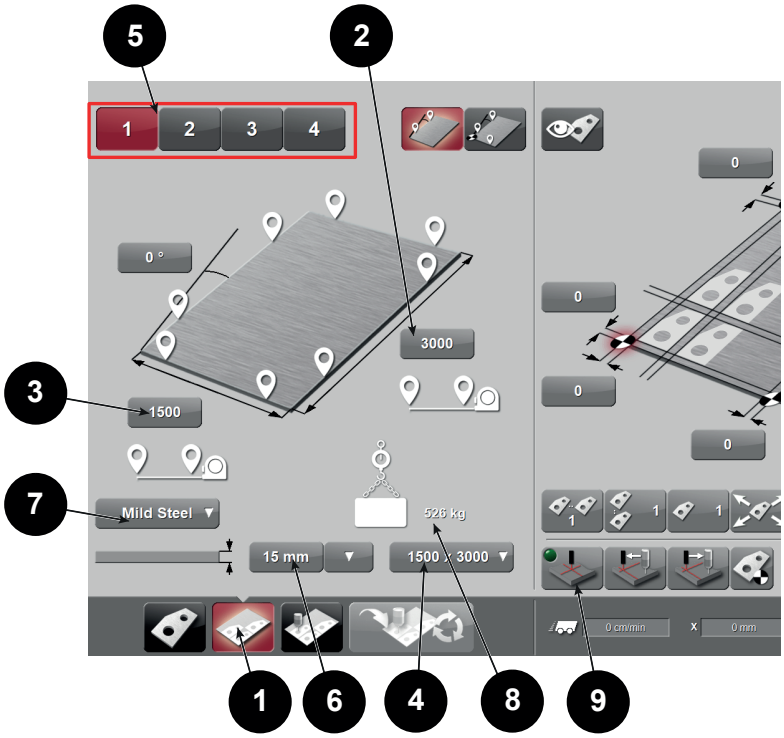


- To enlarge the program, press **button (10)** and set a value greater than 1
- To reduce the program, press **button (10)** and set a value less than 1

Caution! Cutting lead-in and end lengths are increased/reduced similarly.

3.2 Changing plate dimensions and materials

After selecting the program, you need to select the plate to cut:



To do so, in the central part of the screen, press **button (1)**,

Then set the plate dimensions:

- the plate dimension along axis X (**button 2**) and then the plate dimension along axis Y (**button 3**)
- Or a predefined plate dimension (drop-down menu accessible by pressing **button (4)**.
- Or a predefined plate (dimension, orientation), out of the four available in **area (5)**.
- Or use the measurement system:

Start the positioning laser (**button 9**), point at a corner of the plate and click on one of the positions:

Point at the second corner of the plate and click on the second position. The corresponding plate dimensions are calculated automatically.

Then set the thickness by pressing **button (6)**, or the drop-down menu immediately to the right.
The thicknesses presented in the drop-down menu are those used last.

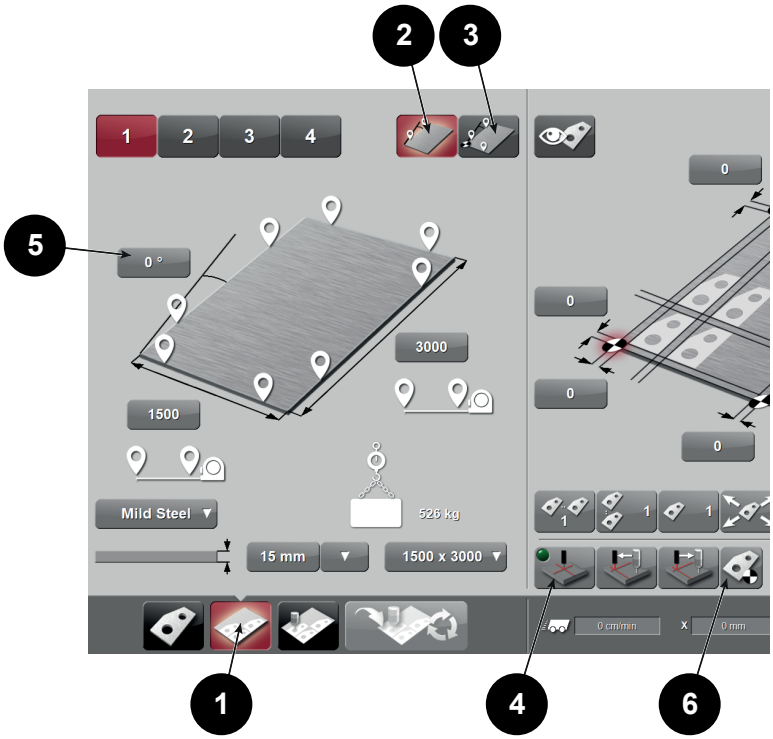
Lastly, indicate the material to cut, by selecting it from the **drop-down menu (7).**

Area 8 provides the guidance weight of the plate.

3.3 Aligning the plate

After selecting the program, it is often useful to align the plate

To do so, in the central part of the screen, click on **button (1)**.



Two possibilities:

Two-point alignment (**button 2**)

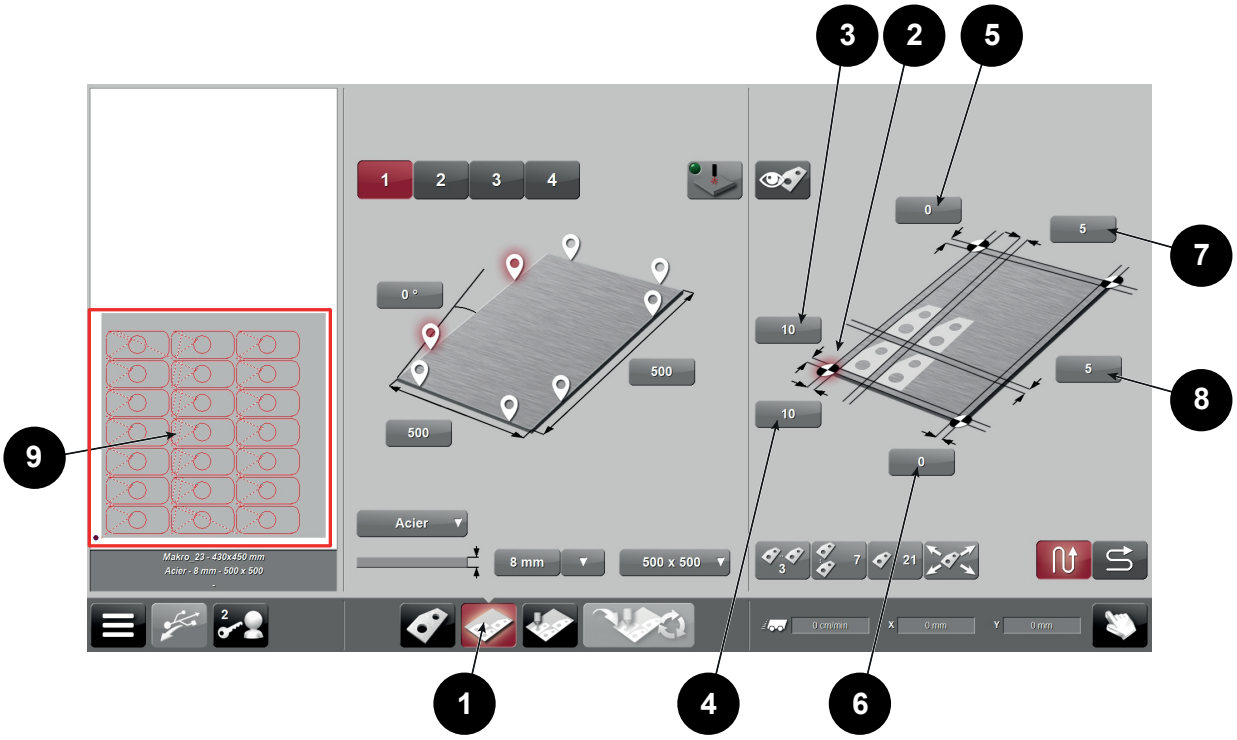
- Start the positioning laser (**button 4**).
- Move the laser to the plate edge used for alignment and click on the corresponding position.
- Move the laser to a second position on the plate edge and click on the corresponding position.
- The angular value is calculated automatically in **button 5** and the plate display is refreshed in the left-hand part of the screen.

Three-point alignment (**button 3**) with plate zero alignment

- Start the positioning laser (**button 4**)
- Move the laser to the plate edge used for alignment and click on the corresponding position.
- Move the laser to a second position on the plate edge and click on the corresponding position.
- The angular value is calculated automatically in **button 5** and the plate display is refreshed in the left-hand part of the screen.
- Move the laser to the adjacent plate edge and click on the corresponding position.
- Click on **button 6**. The **Cycle start** button of the console starts flashing, and the machine can then be moved to the corner of the plate.

Corresponding position

3.4 Adjusting the space between parts or from the edge of the plate



To adjust the space between parts, press **button (1)** (after selecting the program), then adjust the spaces in the right-hand side of the screen:

First of all, check where the zero point of the program is located. This is the area where the zero point symbol is on a red background (**area 2**).

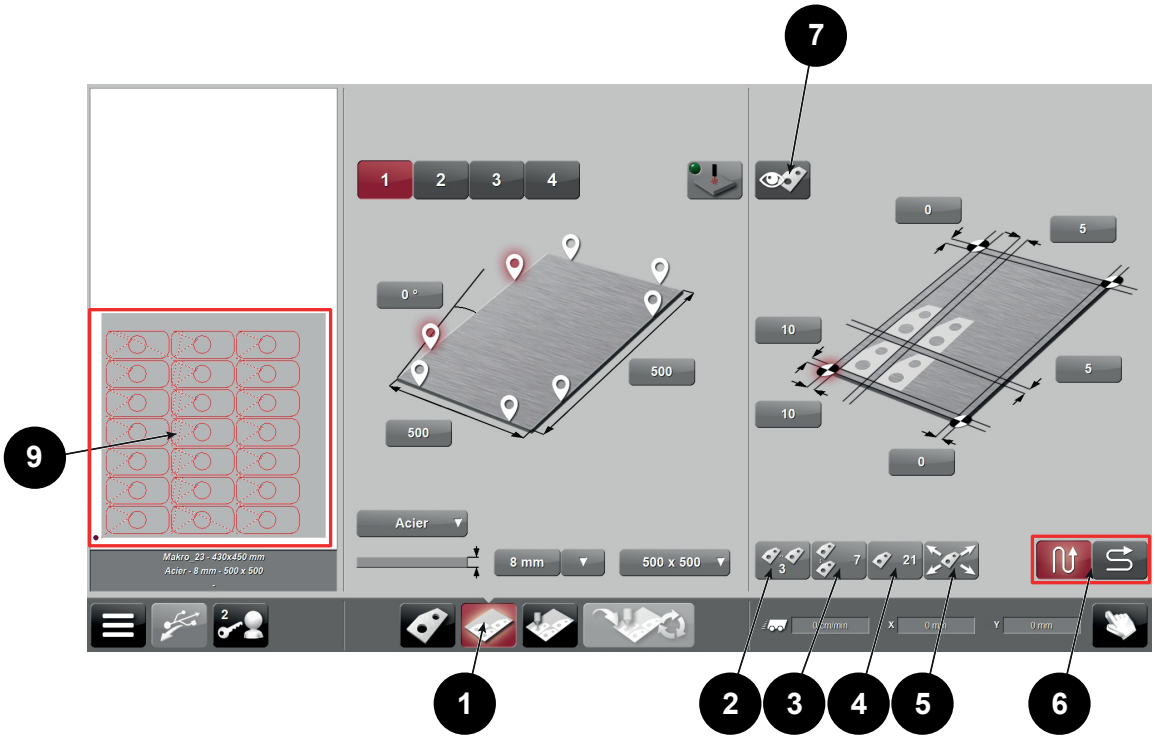
Then adjust the spaces between the program and the edge of the plate. To do so, press **buttons (3)** to **(6)** and set the required values.

Buttons (7) and **(8)** (spaces between parts) will be refreshed. However, you can press **buttons (7)** and **(8)** to make a new setting.

Negative values are not permitted for the space between the edge of the plate and the program. On the other hand, a negative value may be entered for the space between parts (if spaces are already provided in the program). In that case, the value is displayed in red, and the operator must verify that the parts will be cut correctly.

The settings made are visible in real time in the program applied to the plate in **area (9)**.

3.5 Multiplying the program on the plate



To set program multiplication on the plate, press **button (1)** (after selecting the program), then adjust the matrix in the right-hand side of the screen:

Several choices are now possible:

- Either you can individually set the program quantity horizontally and vertically by pressing **buttons (2)** and **(3)**, and indicating the quantities
- Or you can set an overall quantity of parts by pressing **button (4)** and indicating the required quantity
- Or you can press **button (5)** to put as many parts as possible on the plate (taking account of spaces between parts).

By pressing one of the buttons of **area (6)**, you select the matrix direction (vertical or horizontal).

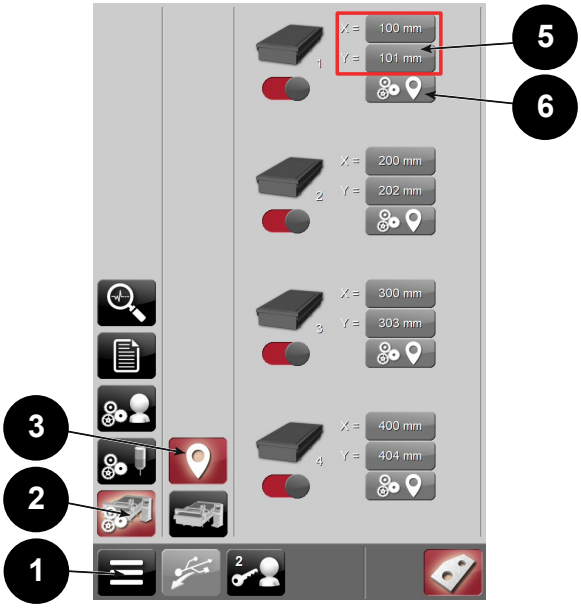
Press **button (7)** to view the single part, and press it again to view all the parts on the plate.

The settings made are visible in real time in the program applied to the plate in **area (8)**.

3.6 Setting and always finding the same position (project offset)

To define a project offset:

You need be on level 2 at least to define a project offset.



Press **button (1)**, then **button (2)**, and **button (3)**.

Activate the project offset by pressing **button (4)** (red = active)

Two setting methods:

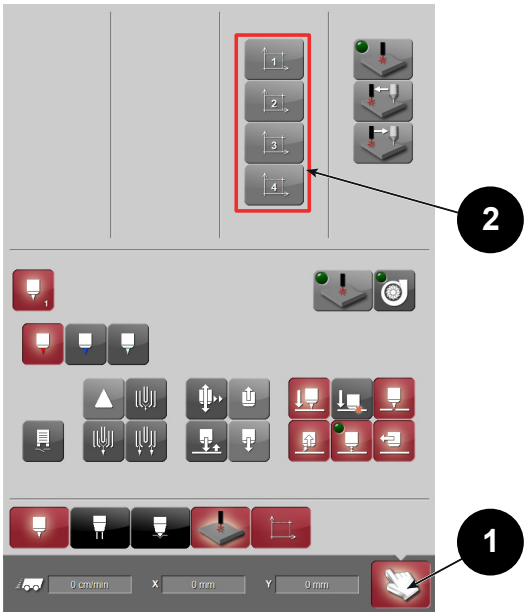
- Either set positions X and Y in **area (5)**
- Or go to the project offset position and press **button (6)**. At that point, the buttons in **area (5)** take the value of the position of the tool holder.

Then press the emergency stop button.

This button is used to confirm.

This button is used to cancel.

To select a project offset:



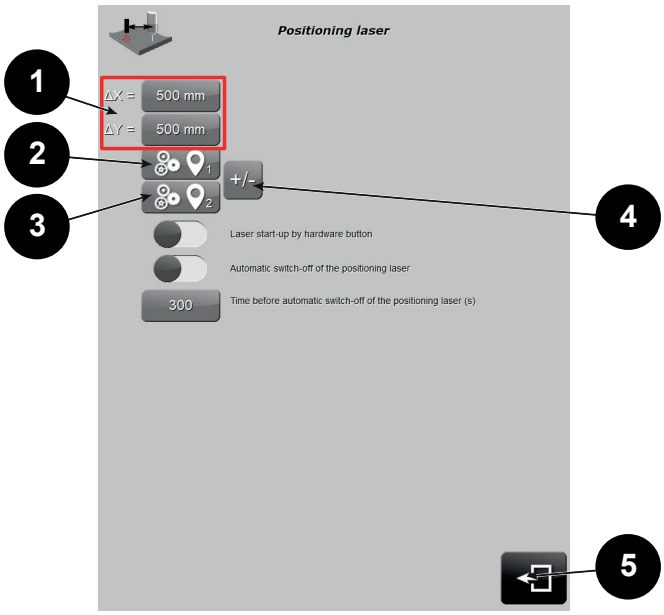
Once the program is loaded with its parameters, press **button (1)**, then one of the buttons of **area (2)**.
Button **Cycle start** starts flashing on the console.
Press button **Cycle start** so that the tool holder goes to the desired position.

3.7 Positioning the plate with the laser

To modify the positioning laser offset:

This value is factory set. To change that value (following a mechanical modification), you need to be at least on level 2.

Successively press **buttons (1) ➜ (2) ➜ (3) ➜ (4)** to access the adjustments of the positioning laser.
The window below opens:



Two solutions for adjustment

- Either in **area (1)**, set the laser offset in relation to the torch, that is the movement the tool holder must make to go from the tool position to the laser position.
- Or position the torch above a reference point, press **button (2)**, place the laser above the reference point and press **button (3)**.

If you observe an inversion of the direction in relation to that required, press **button (4)** to invert the movement direction.

Then exit the page with **(button (5)**.

Then press the emergency stop button.

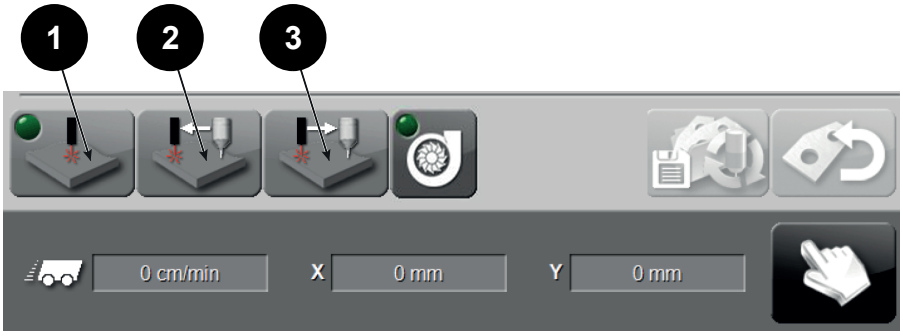
This button is used to confirm.

This button is used to cancel.

Using the positioning laser movement:

Laser offset movements are made outside the program.

Laser movements are available in the page located to the right of the screen (manual controls)



To set the zero point:

- Switch on the laser with **button (1)**.
- Press **button (3)** so that the laser takes the place of the torch.
- Press Cycle start to start the movement
- Manually position the plate zero point (or position the plate with dry running, with the laser)
- Press **button (2)** so that the torch takes the place of the laser.
- Start the program.

3.8 Positioning the plate in dry running

To position the plate in dry running:

- Set the direction of the plate
- Start the program in dry running

Dry running

- Press Cycle stop in places to check the path and move the machine manually so that the path is optimised to suit your needs.
- Wait for the end of the cycle, or after a cycle stop, ask for a program reset at the bottom right of the screen. If it is not visible, press the button that displays the manual page.

Program reset

Display manual page

- Then press the Home button on the console. The program is ready to begin with the offset.

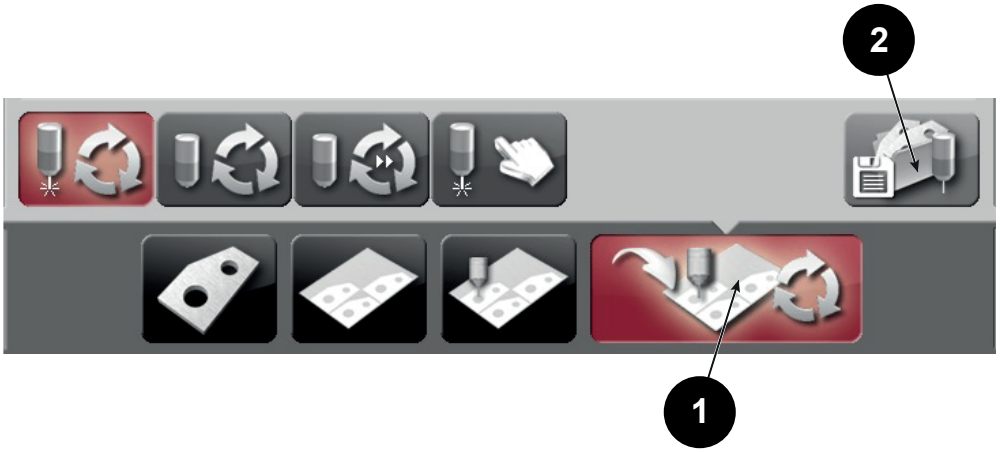
Pressing the Home button once again cancels the offset.

3.9 Saving the program with the selected process for reuse (job)

To save a job:

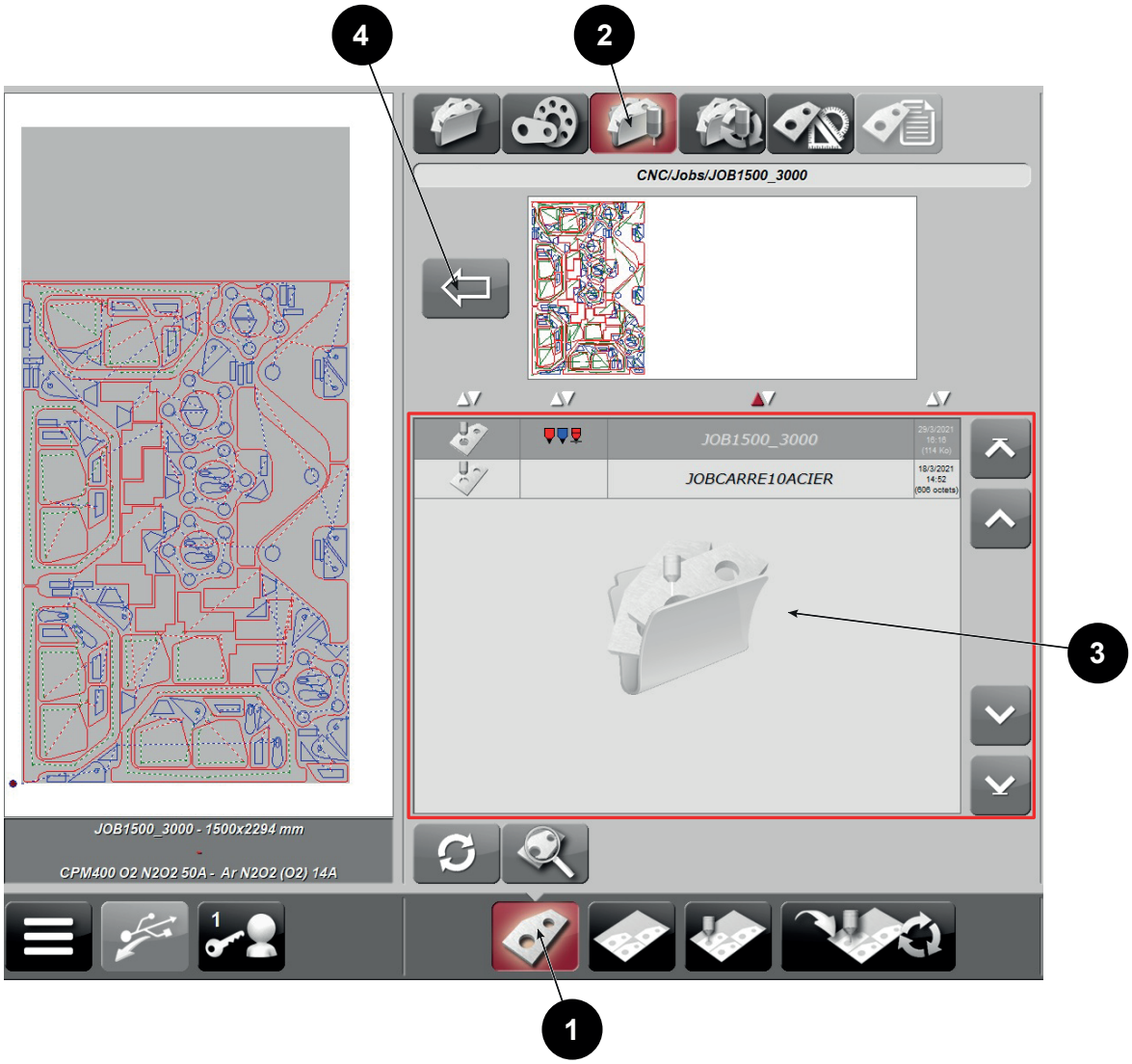
Once the program is confirmed with its parameters, it may be saved in the form of a job (part program and process parameters).

To do so, in the central part of the screen, press **button (1)**, and then **button (2)**.



Then enter the name of the job and press **button (3)** to confirm.

To reuse a job:



Press **button (1)**, then **button (2)**.

Select the job in **area (3)**.

Lastly, load it in the NC with **button (4)**. The program is ready to be cut.

3.10 Using the optional camera

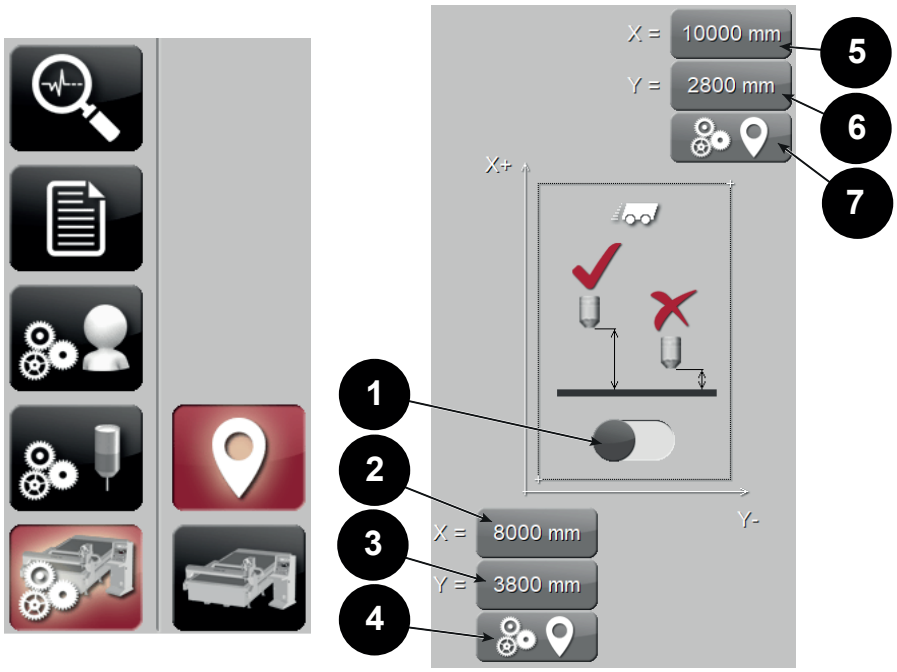
Refer to document:
- 86954968: **VISIO PROCESS HPCIII**

3.11 Using the optional pipe cutting feature

Refer to document:
- 86954622: Pipe cutting

3.12 Setting a risk area

Area where the machine can only move if the tool holders are in the high position



1	Risk area activation	**5**	X+ limit of the area
2	X- limit of the area	**6**	Y- limit of the area
3	Y+ limit of the area	**7**	Automatic reading of machine coordinates for the upper right-hand corner of the risk area
4	Automatic reading of machine coordinates for the lower left-hand corner of the risk area		

The definition of this area is useful, for instance, for a machine with several projects

Two solutions for setting a risk area:

- Either with **buttons 2**, **3**, **5**, **6** manually set the position of the risk area.
- Or position the torch above one end of the risk area, press **button (4)**, then place the torch at the other end of the risk area and press **button (7)**.

Then press the emergency stop button.

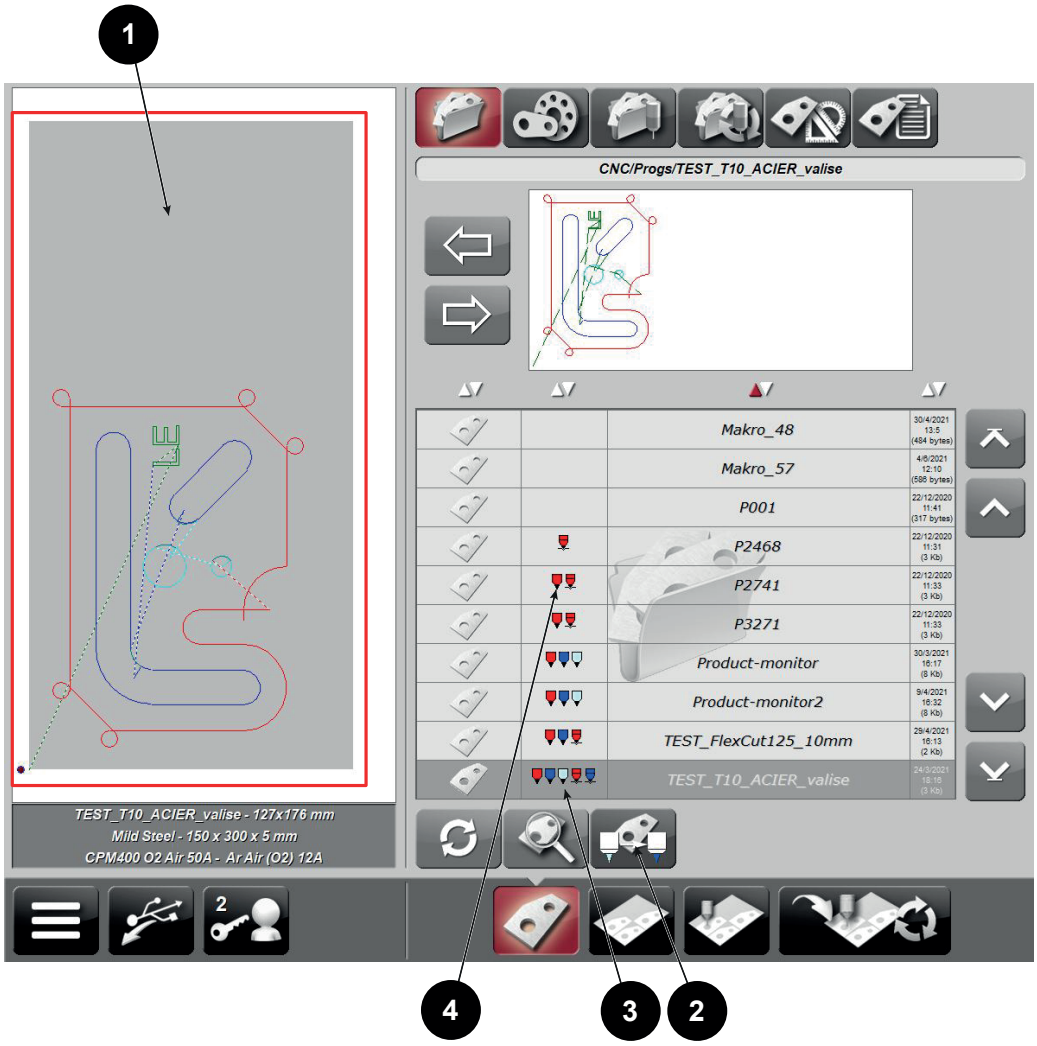
4.1 Description of cutting parameters (process, quality)

Concept of cutting quality:

Every cut (plasma or oxy-fuel cutting) may have three different qualities:

- Red, for production contours (external contours, few small movements)
- Blue for internal quality contours
- Cyan for small internal contours (master hole)
- Green represents marking

Each quality is represented by its colour while following the path.



Cutting tools and cut qualities are already entered in some programs (**area (3)** for example); the cutting tools of other programs are to be entered when the program is confirmed (**area (4)**, empty).

As all the programs do not have the Cyan quality, the Cyan qualities may be replaced by Blue qualities (by pressing **button (2)**).

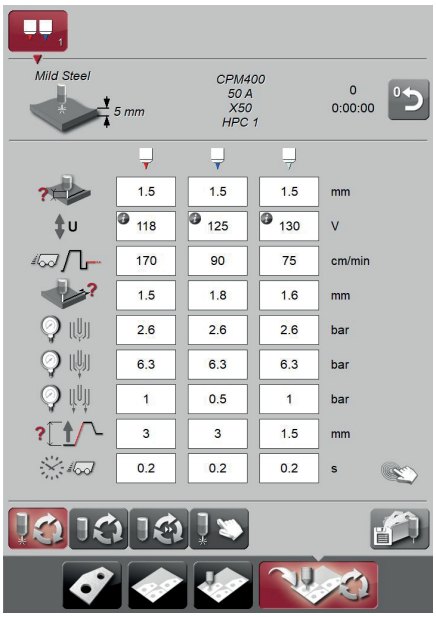
Cutting is then characterised by the following
- cutting tool,
- cutting gas,
- cutting intensity,
- set of cutting parameters.

All these data are selected in the section “Editing the cutting parameters”

4.2 Viewing parameters included in the program

If the parameters are included in the program, this is a job.

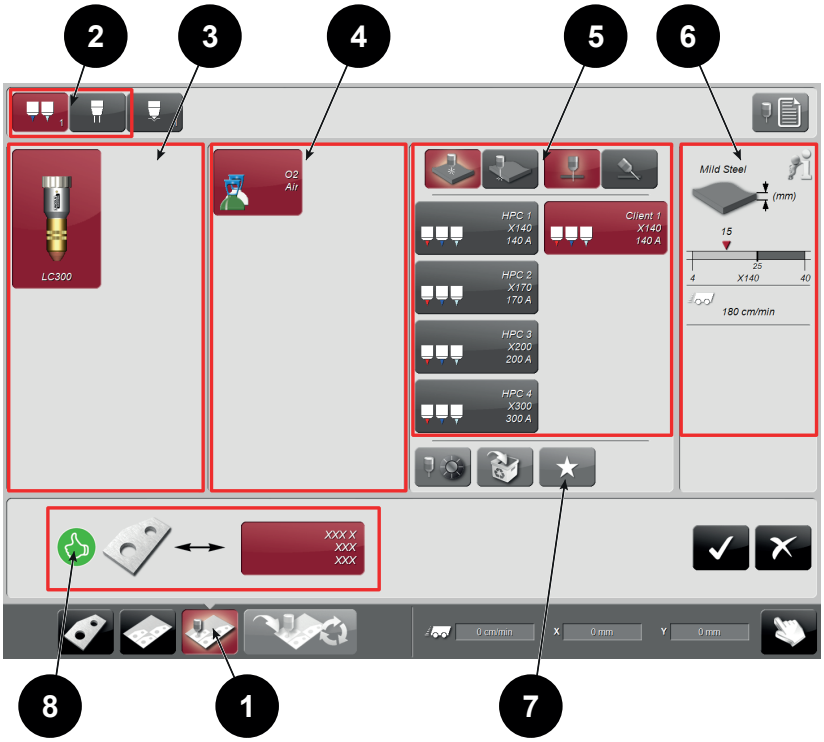
In that case, when the job is loaded, the main cutting parameters will be displayed automatically in the central area



The three qualities are represented in columns: red, blue and cyan.

4.3 Selecting the desired cutting parameters

Once the plate (material, thickness) is selected, you need to assign cutting parameters.
If the shape is a standard shape (with no assigned process), you need to select a process.
In the Plate selection window, select a material/thickness and confirm.
Then press **button (1)** at the bottom of the central area, which opens the screen below.
Press a button in **area (2)** to select the process and tool.

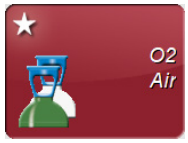


Then press **area (3)** to select which torches will be used.
Reminder: these selections may also be made with a program specific to plasma.

Then in **area (4)** to select the cutting gas

Lastly in **area (5)**, the selected intensity.
In this area, factory parameters are in the left-hand column and customer parameters in the right-hand column.
Parameter filters (mid plate/plate edge) are also available.

Selecting an operating point in **area 5** for the plasma cutting tool leads to the automatic selection of an operating point using the same set of consumables for the plasma marking tool, and the operating points using other consumables are then prohibited.
Button 7 makes it possible to identify a favourite operating point for the current material, thickness and cutting tool. Only level-2 operators can select favourites.
The benefit of the favourite status is that the operating point is selected automatically.
The favourite status of a parameter is symbolised by a white star in the upper left-hand corner of the selection buttons.

Torch	Cutting process	Operating point
		

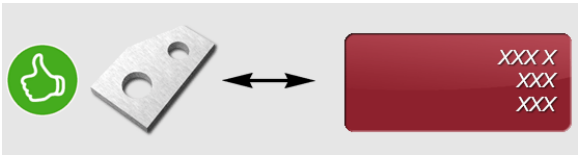
Important! There may be only one favourite operating point for the current material, thickness and cutting tool. Selecting a second one will cancel the favourite status of the first.

To cancel the favourite status of an operating point, click on **button 7** once again.

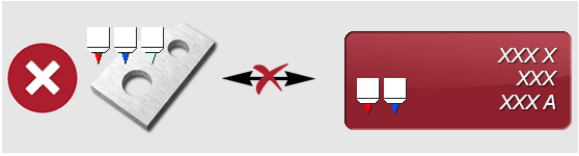
Area (6) contains a remainder of the material and thickness of the plate to cut. Also, a chart is indicated to show if the thickness to cut is at the acceptability limit of the cut or in the “comfort zone” for the given intensity.
For the **Fineline** process, the minimum diameter for **ultrasharp** holes is also indicated.
Then see the section “Editing the cutting parameters” to modify the cutting parameters or “Verifying and validating parameters: ready to cut program” to confirm the cutting parameters.

Area 8 contains information or alarms relating to the selected operating points:

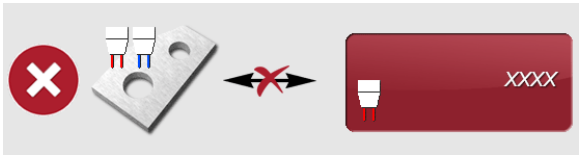
Information:
- The operating points selected for each tool allow you to cut the current program.



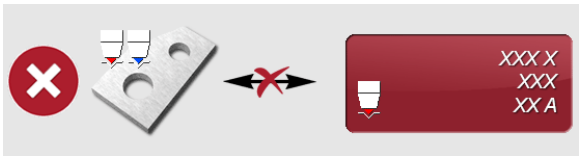
Alarms:
- The qualities of the selected plasma operating point are not sufficient for cutting the current program.



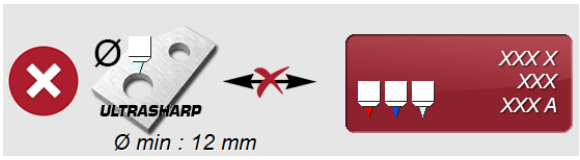
- The qualities of the selected oxy cutting operating point are not sufficient for cutting the current program.



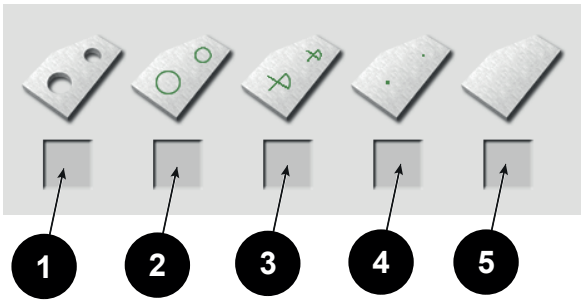
- The qualities of the selected plasma marking operating point are not sufficient for cutting the current program.



- The **Ultrasharp** settings of the selected operating point do not make it possible to cut the holes of the current program. The minimum diameter of the holes in the program is displayed (12mm here).



In that case, the operator is asked to:
- Select another operating point
- Use a fault-tolerant mode for the holes where the diameter is a problem:



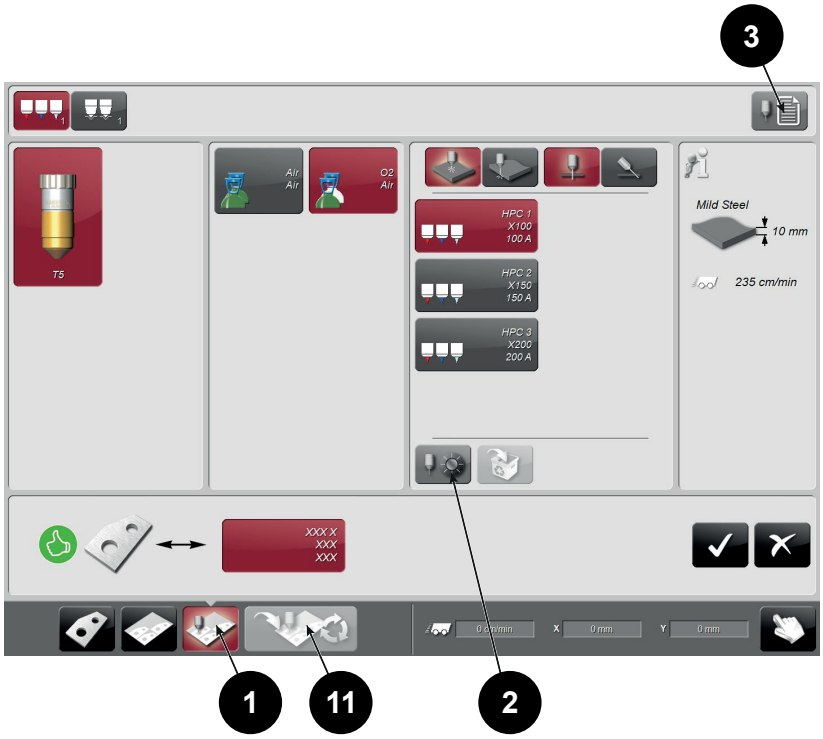
Button 1 is a cutting mode with a result with no guarantee.
Button 2 is a contour marking mode.
Button 3 is a mode for marking a cross at the centre.
Button 4 is a mode for marking a dot at the centre.
Button 5 is a cancellation mode.

Several alarms may occur at the same time.

They can be scrolled using the buttons:

4.4 Editing the cutting parameters

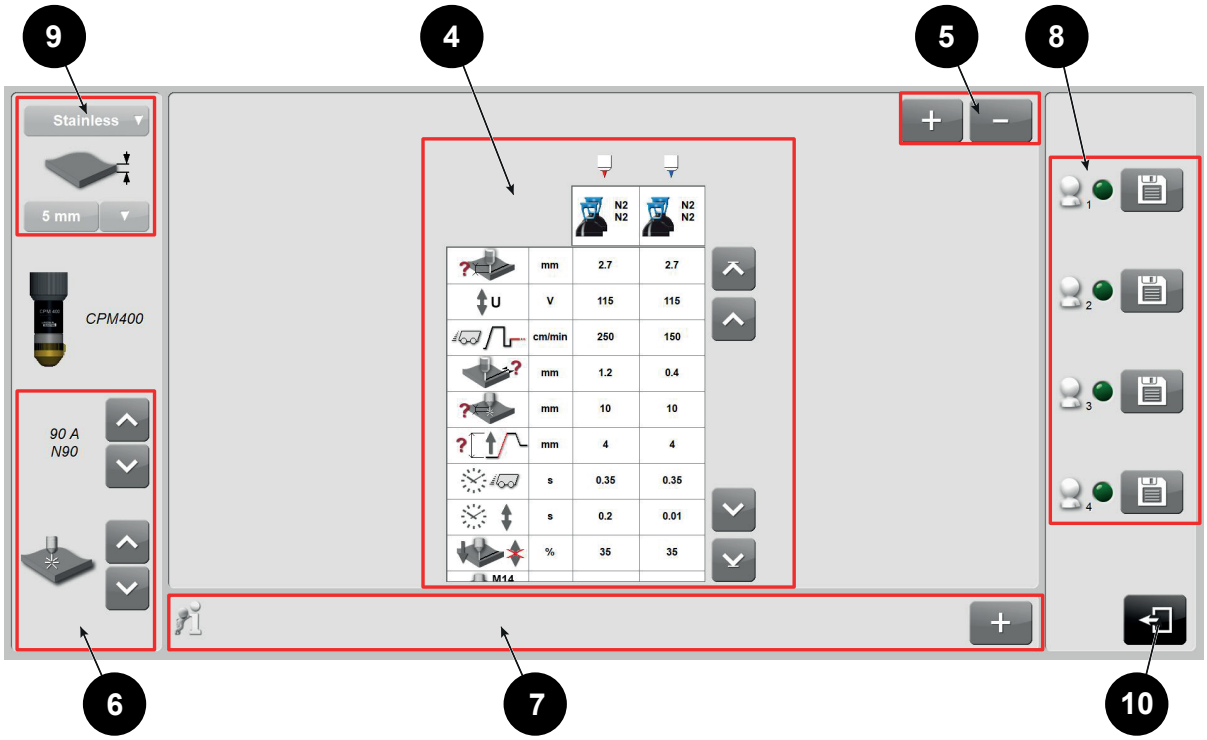
To modify the cutting parameters, first press **button (1)**, then **button (2)** (editing parameters) or **button (3)** (creating a new thickness)



Or, if you are not in a program, on the cycle page (**button 11**) then press anywhere in the process parameters display area.

Sign in the process parameters display area

The following screen is displayed:



In **area (4)**, you can edit the cutting parameters (see details in section “Description of **HPi** plasma parameters).
The buttons in **area (5)** are used to hide/show the cut qualities (red/blue/cyan)

In **area (6)**, you can edit the amperage and cut type (mid plate or edge of plate).

In **area (7)**, you can insert the comments for the edited parameter (type of plate, customer, or other)

In **area (8)**, you can save the new set of parameters, on one of the four existing customer parameters:
- If the indicator is off: the location is available, for saving
- If the indicator is on and steady: a set of parameters is already saved in this location
- If the indicator is flashing: this is the set of parameters being edited.

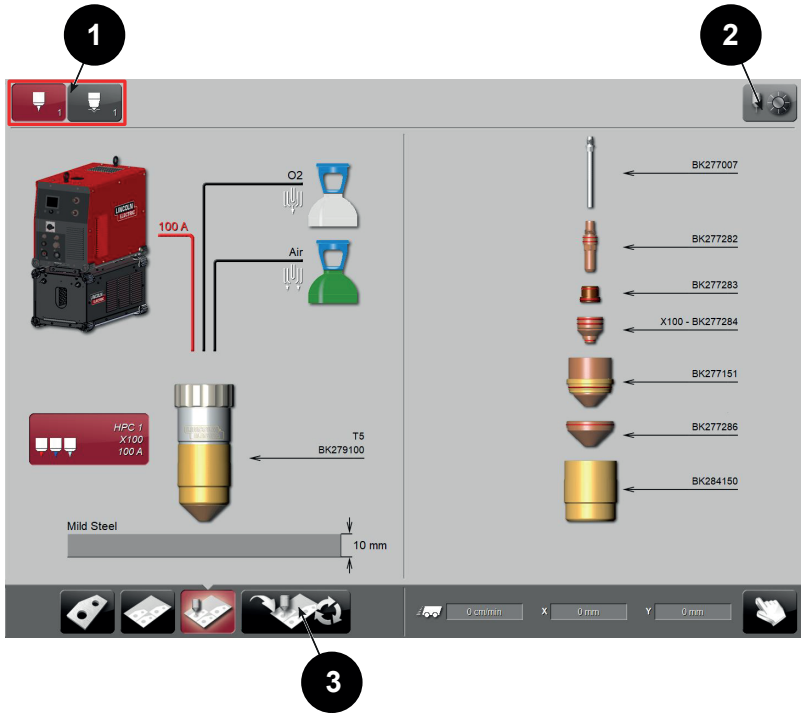
Area (9) is not greyed out if you go into the mode for creating a new thickness (**button 3**). A new material or thickness can then be set.

With **button (10)**, you can exit the page without saving the changes.

4.5 Verifying and validating parameters: ready to cut program

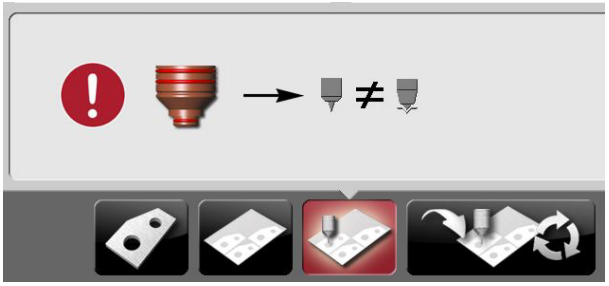
Once the parameters are selected, they need to be assigned to the program to cut.

To do so, in the central part of the screen, press **button (1)** if you had exited the window.
Check that **area (2)** shows a green thumb up (difference processes compatible).
Press **button (3)** to assign the cutting parameters to the program.
After confirmation, a window is displayed restating the main process elements and the associated consumables.



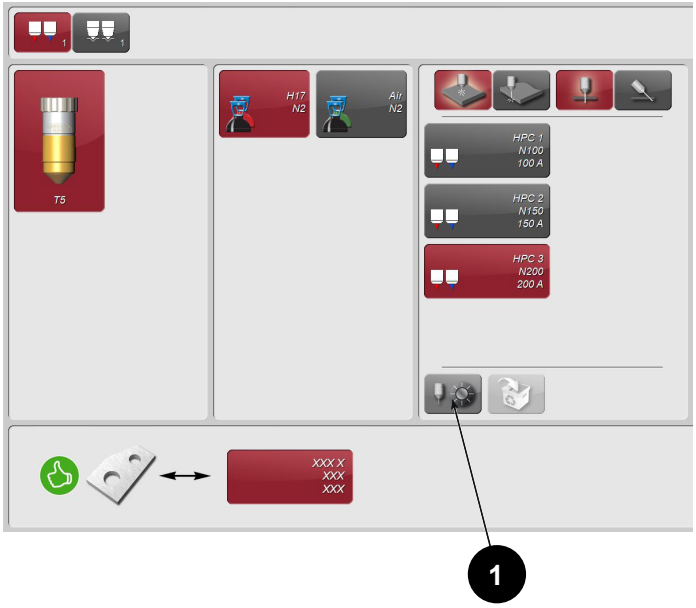
Select the different processes in **area (1)**.
Edit the selected parameters by pressing **button (2)**.
Or confirm the parameters by pressing **button (3)**.

Note that it may happen that **area (2)** does not show a green thumb up.
In that case, it is important to note the warnings shown.
Below is a warning about different cutting and marking consumables.



4.6 Description of HPi *plasma parameters*

The simplified scale window will open if you are on level 2 on the page, or if you are in a cycle and press **button (1)**.

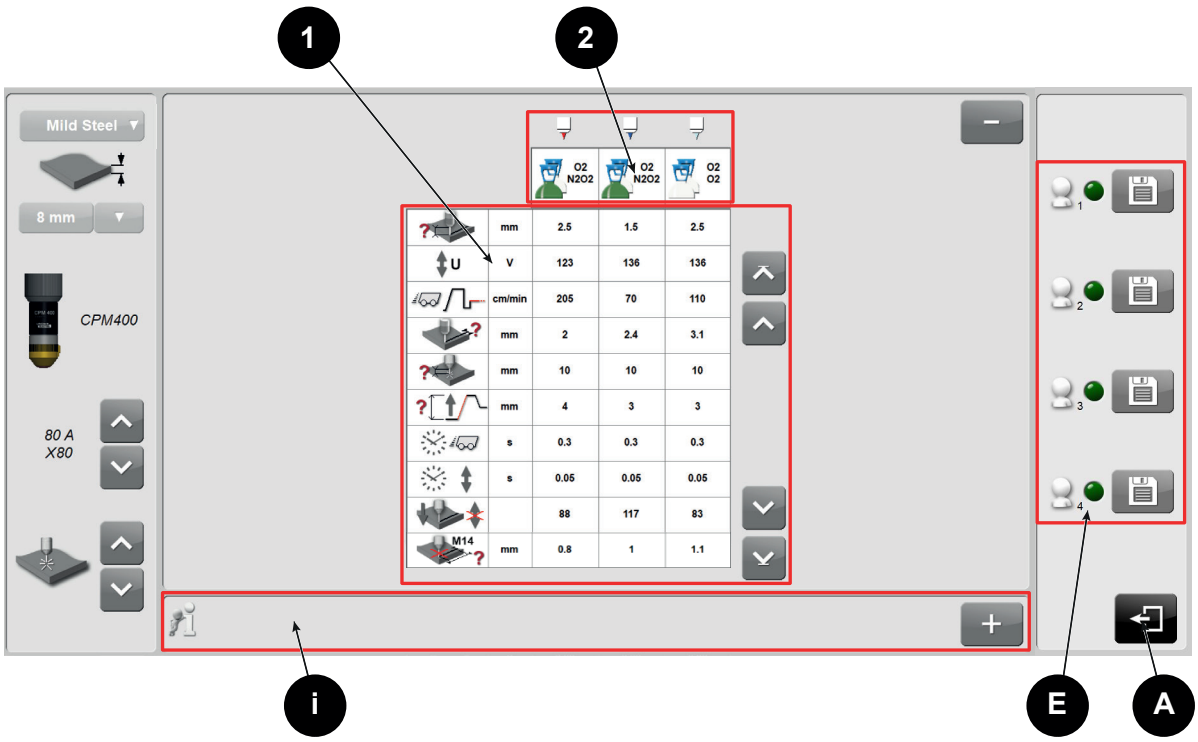


Or, if you are not in a program on the cycle page, then press anywhere in the process parameters display area.

Outside a program in a cycle page

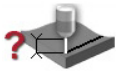
Sign in the process parameters display area

Description of parameters:



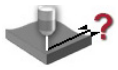
Area (1) contains the quality parameters T00 (red) , T01 (blue) or T02 (cyan)

Quality T00 Quality T01 Quality T02

 ➜ is used for setting the cutting height for sensing (in relation to the plate)

➜ is used for setting the sensing voltage while cutting

➜ is used for setting the cutting speed

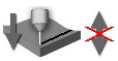
 ➜ is used for setting the kerf compensation (= kerf width = 2*compensation)

➜ is used for setting the strike height (Ha): the height of the torch in relation to the plate when the arc is established.

➜ is used for setting the piercing height (Hp): the height by which the torch is raised at the end of the shortening time.

➜ is used for setting the time for the movement start (TDM): The time starts when RIC is detected (when the arc is transferred). The end of that time triggers the start of the movement XY.

➜ Sensing start time (TMP): This time is executed after sensing is frozen during a cut. It starts when the sensing conditions are fulfilled. The end of this time triggers sensing voltage with the previously acquired voltage.

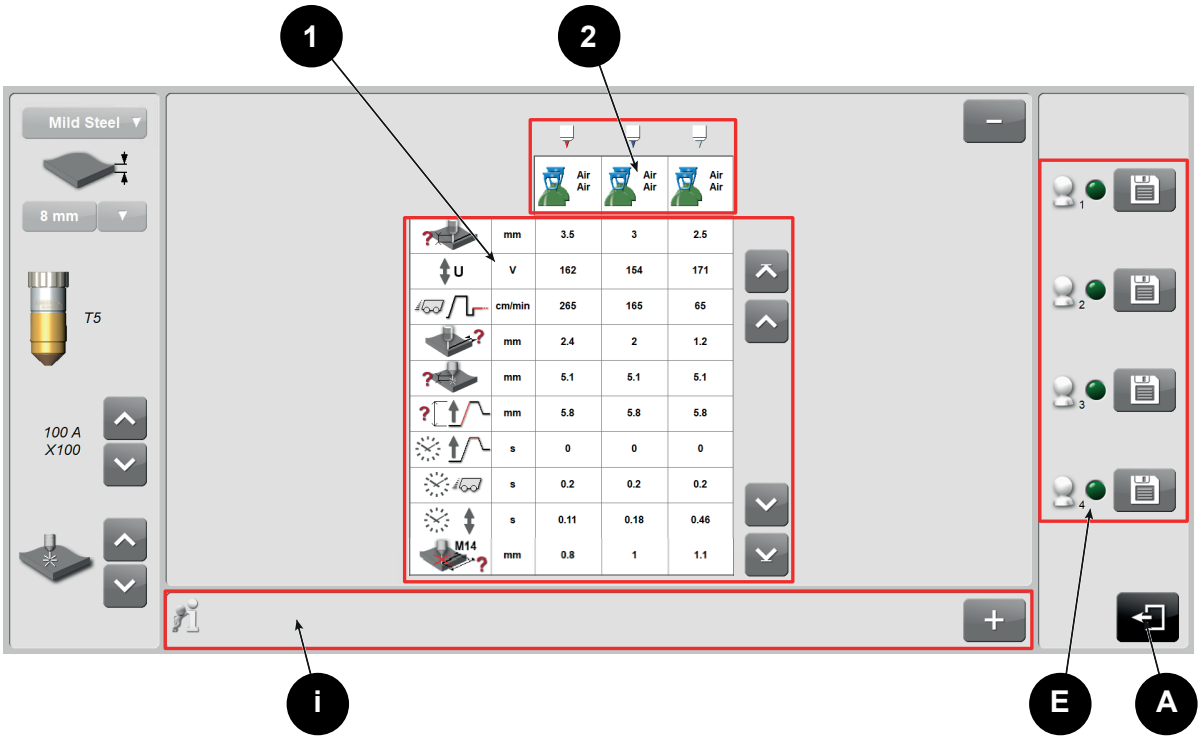
 ➜) Tool holder descent percentage after retracting, in relation to the rise (100% = to back down to the height before retracting)

➜) Arc stopping distance after M14. The M14 code is used to freeze sensing, and then to stop the arc at the end of the distance M14 set here. When the distance is covered, the machine continues its movement up to the end of the cut M3.
If the distance is greater than the cutting distance still to be covered, the arc stops on the code for the end of the cut M3.

Area (2) indicates the gas used.
Area (i) indicates the information specific to that parameter. After the values are edited, press one of the four buttons in **area (E)** to save them.
In **area (E)**, the customer scales that are already present flash in green. If the indicator is green and steady, that set of parameters is the one currently being edited.
You can press **button (A)** to cancel.

4.7 Description of Essential *plasma parameters*

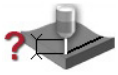
Access to **Essential** plasma parameters is identical to **HPi** plasma. (see section ***4.6 Description of* HPi *plasma parameters***)



Description of parameters:

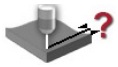
Area (1) contains the quality parameters T00 (red) , T01 (blue) or T02 (cyan)

Quality T00 Quality T01 Quality T02

 ➜ is used for setting the cutting height for sensing (in relation to the plate)

➜ is used for setting the sensing voltage while cutting

➜ is used for setting the cutting speed

 ➜ is used for setting the kerf compensation (= kerf width = 2*compensation)

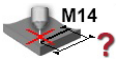
➜ is used for setting the strike height (Ha): the height of the torch in relation to the plate when the arc is established.

➜ is used for setting the piercing height (Hp): the height by which the torch is raised at the end of the shortening time.

➜is used for setting the time during which it is held at the piercing height (or retract).

➜ is used for setting the time for the movement start (TDM): The time starts when RIC is detected (when the arc is transferred). The end of that time triggers the start of the movement XY.

➜ Sensing start time (TMP): This time is executed after sensing is frozen during a cut. It starts when the sensing conditions are fulfilled. The end of this time triggers sensing voltage with the previously acquired voltage.

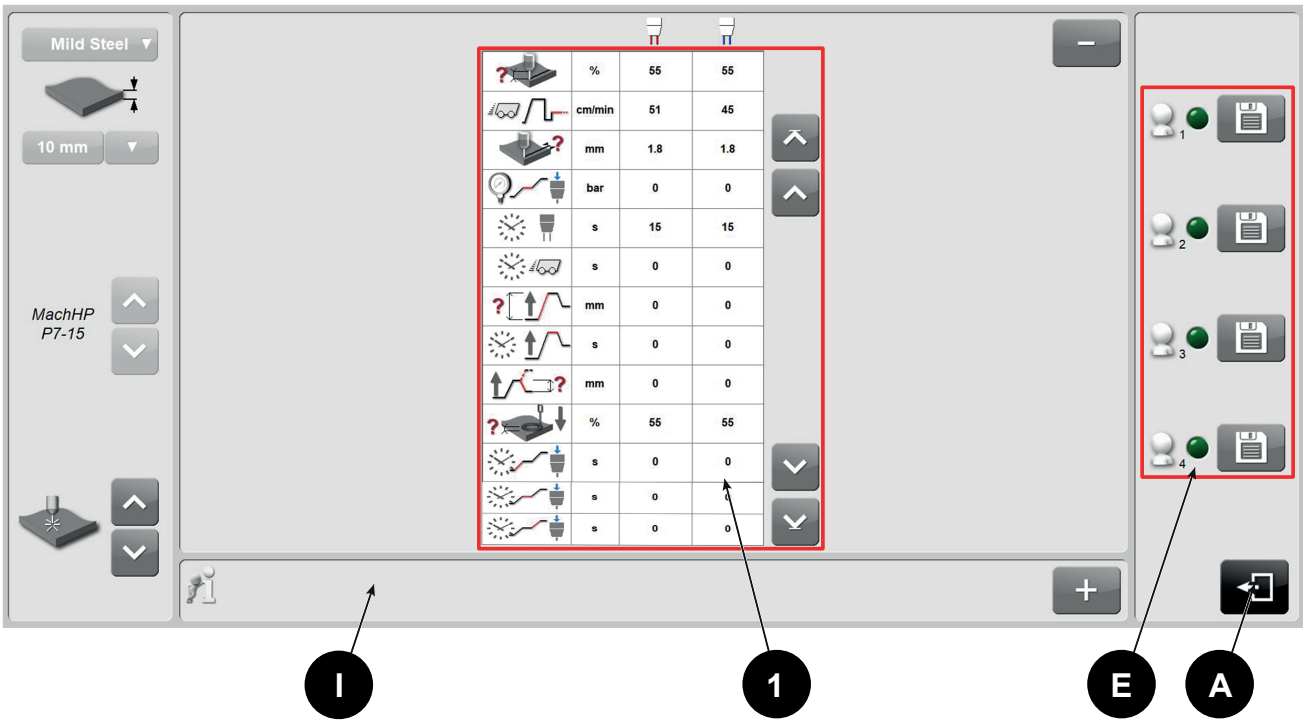
 ➜) Arc stopping distance after M14. The M14 code is used to freeze sensing, and then to stop the arc at the end of the distance M14 set here. When the distance is covered, the machine continues its movement up to the end of the cut M3.
If the distance is greater than the cutting distance still to be covered, the arc stops on the code for the end of the cut M3.

➜ Arc stopping time: Corresponds to the plasma extinguishing time before the end of the cut.

Area (2) indicates the gas used.
Area (i) indicates the information specific to that parameter. After the values are edited, press one of the four buttons in **area (E)** to save them.
In **area (E)**, the customer scales that are already present flash in green. If the indicator is green and steady, that set of parameters is the one currently being edited.
You can press **button (A)** to cancel.

4.8 Description of HPi² *oxy-fuel parameters*

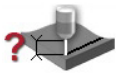
Access to **HPi²** oxy-fuel parameters is identical to **HPi** plasma. (see section 4.6 Description of **HPi** plasma parameters)



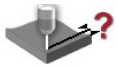
Description of parameters:

Area (1) contains the quality parameters T00 (red), T01 (blue).

Quality T00 Quality T01

 ➜ is used for setting the cutting height for sensing (50%=5mm)

➜ is used for setting the cutting speed

 ➜ is used for setting the kerf compensation (= kerf width = 2*compensation)

➜ is used for setting the cutting oxygen stage pressure

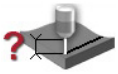
➜ is used for setting the overheating time (t5): starts when the plate is detected; the end is when cutting starts

➜ is used for setting the time for starting movement (t9): starts when the cutting stage starts; the end of this time triggers the start of movement XY.

➜ is used for setting the retract time (t12): This time starts when the cutting oxygen pressure has reached the retract pressure. The tool holder goes up during that time. The end of that time triggers the start of time t14. Retracting is used for avoiding dross during the strike phase.

➜ Retract height hold time (s): This is time t14. It starts at the end of the retract time (t12). During that time, the tool holder is kept high and stable. At the end of the time, the tool holder is moved down (time G4)

➜ Tool holder movement after retract (mm). It may be up (positive value) or down (negative value)

 ➜ used for setting the detection height; upon striking, in the down movement stage (50%=5mm), this limit is used for stopping the descent of the tool holder, stopping heating and starting overheating

➜ used for setting the time t1: first heating gradient (from 0 bar to stage pressure)

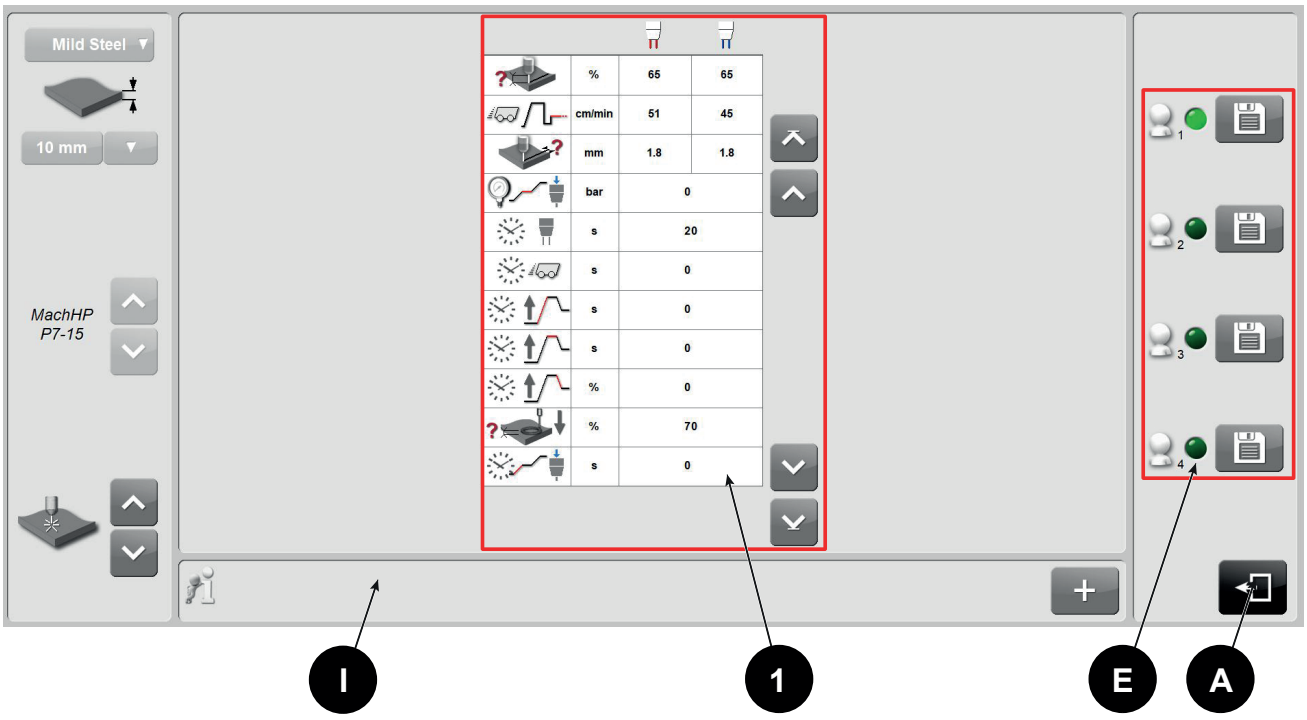
➜ used for setting the time t2: cutting stage time, to pressure P1.

➜ used for setting the time t3: second heating gradient (from the stage pressure to cutting pressure)

Area (i) indicates the information specific to that parameter. After the values are edited, press one of the four buttons in **area (E)** to save them.
In **area (E)**, the customer scales that are already present flash in green. If the indicator is green and steady, that set of parameters is the one currently being edited.
You can press **button (A)** to cancel.

4.9 Description of **Essential** *oxy-fuel cutting parameters*

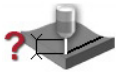
Access to **Essential** oxy-fuel cutting parameters is identical to **HPi** plasma. (see section 4.6 Description of **HPi** plasma parameters)



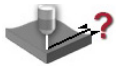
Description of parameters:

Area (1) contains the quality parameters T00 (red), T01 (blue).

Quality T00 Quality T01

 ➜ is used for setting the cutting height for sensing (50%=5mm)

➜ is used for setting the cutting speed

 ➜ is used for setting the kerf compensation (= kerf width = 2*compensation)

➜ is used for setting the cutting oxygen stage pressure

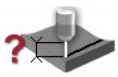
➜ is used for setting the overheating time (t5): starts when the plate is detected; the end is when cutting starts

➜ is used for setting the time for starting movement (t9): starts when the cutting stage starts; the end of this time triggers the start of movement XY

➜ is used for setting the retract time (t12): This time starts when the cutting oxygen pressure has reached the retract pressure. The tool holder goes up during that time. The end of that time triggers the start of time t14. Retracting is used for avoiding dross during the striking phase

➜ Retract height hold time (s): This is time t14. It starts at the end of the retract time (t12). During that time, the tool holder is kept high and stable. At the end of the time, the tool holder is moved down (time G4)

➜ used for setting the retract descent time (as a % of time t12). The end of this time starts t16

 ➜ used for setting the detection height; upon striking, in the down movement stage (50%=5mm), this limit is used for stopping the descent of the tool holder, stopping heating and starting overheating

➜ used for setting the time t1: first heating gradient (from 0 bar to stage pressure)

➜ used for setting the time t2: cutting stage time, to pressure P1

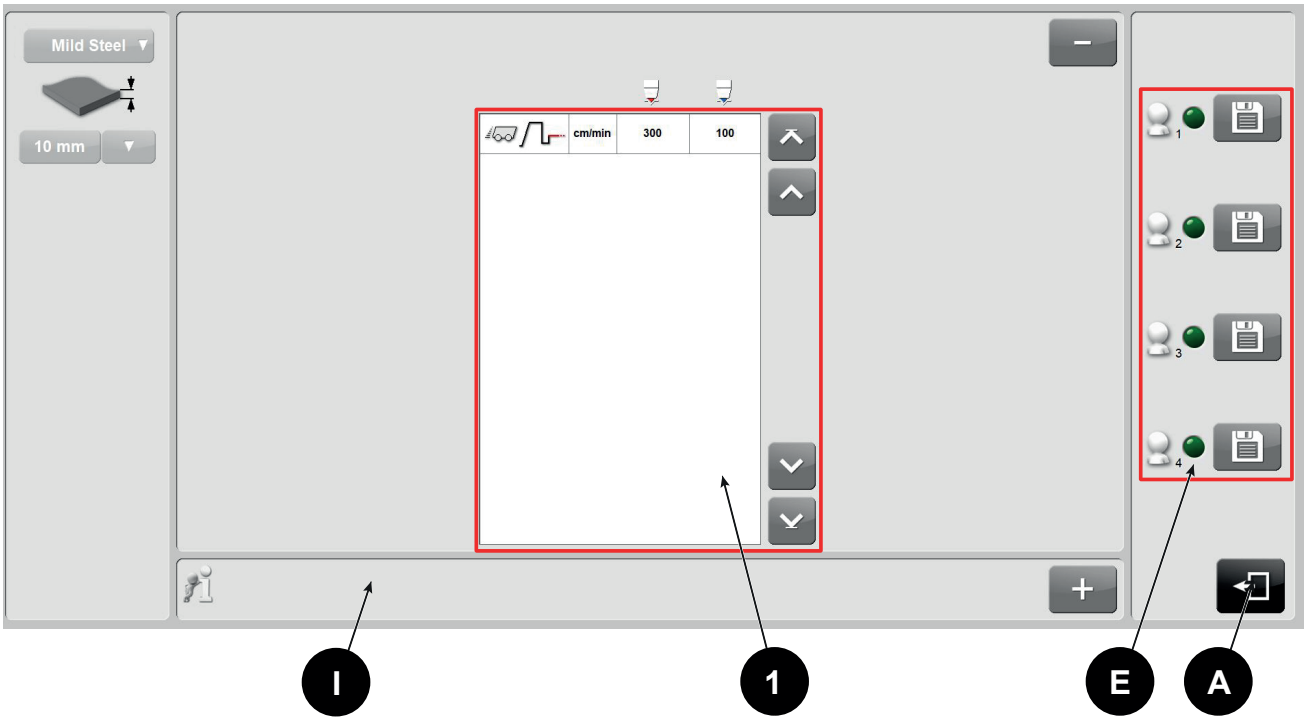
➜ used for setting the time t3: second heating gradient (from the stage pressure to cutting pressure)

Area (i) indicates the information specific to that parameter. After the values are edited, press one of the four buttons in **area (E)** to save them.
In **area (E)**, the customer scales that are already present flash in green. If the indicator is green and steady, that set of parameters is the one currently being edited.
You can press **button (A)** to cancel.

4.10 Description of Essential marker parameters

Access to **Essential** marker parameters is identical to **HPi** plasma. (see section 4.6 Description of **HPi** plasma parameters)

Description of parameters:



Area (1) contains the quality parameters T00 (red), T01 (blue).

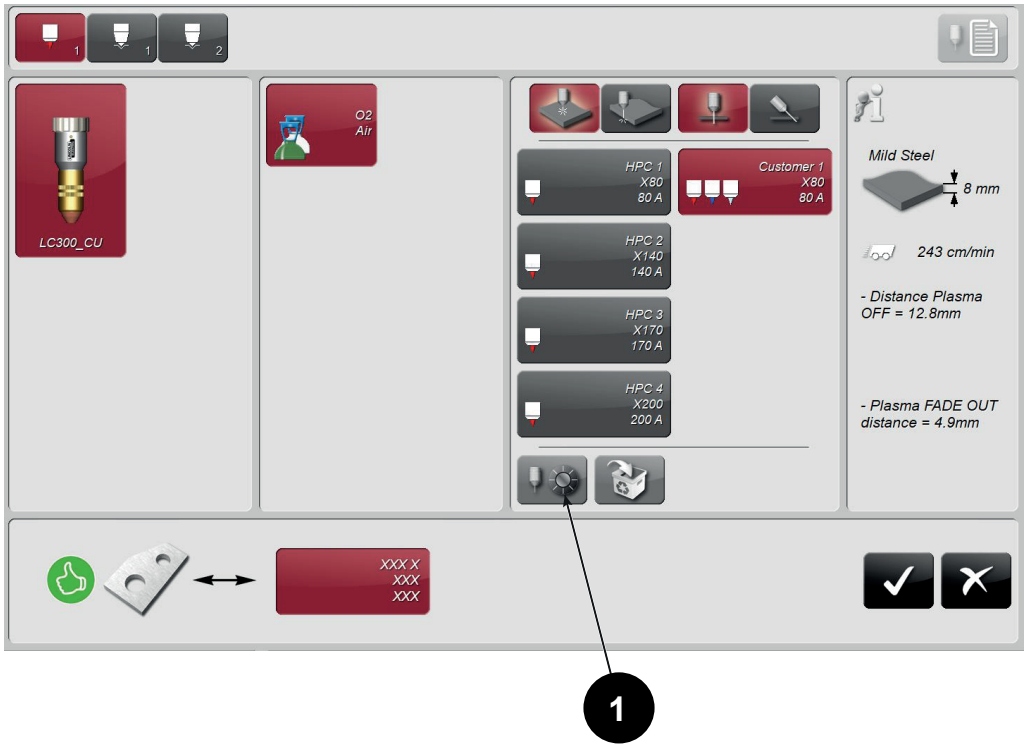
Quality T00 Quality T01

➜ is used for setting the marking speed

Area (i) indicates the information specific to that parameter. After the values are edited, press one of the four buttons in **area (E)** to save them.
In **area (E)**, the customer scales that are already present flash in green. If the indicator is green and steady, that set of parameters is the one currently being edited.
You can press **button (A)** to cancel.

4.11 Description of FINELINE *plasma parameters*

The simplified scale window will open if you are on level 2 on the page, or if you are in a cycle and press **button (1)**.

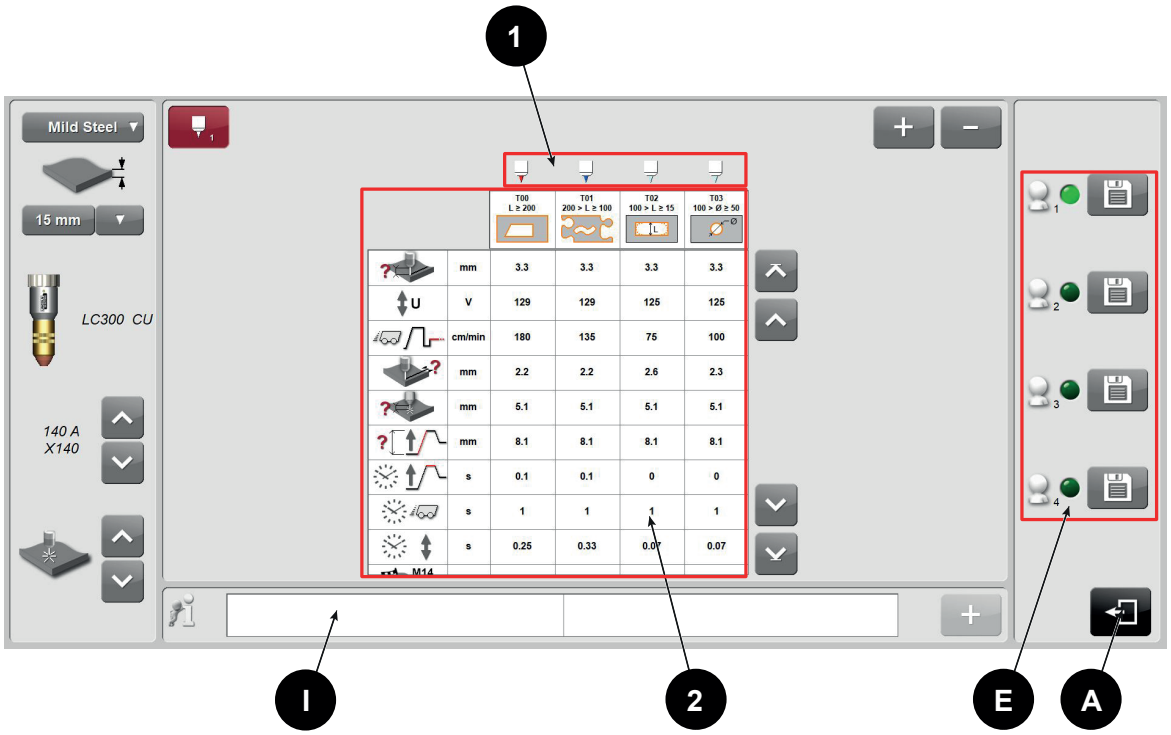


Or, if you are not in a program on the cycle page, then press anywhere in the process parameters display area.

Outside a program in a cycle page

Sign in the process parameters display area

Description of parameters:



Area (1) contains the quality parameters T00 (red) , T01 (blue) or T02 - T09 (cyan)

Quality T00 Quality T01 Quality T02

Area (2) shows the type of contour (internal or external) and the min/max diameter for the qualities corresponding to holes

In the first line of **area (2)** the type of contour corresponding to the quality is indicated.

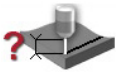
fast external and internal contours

small contours or high-quality cutting

very small internal contours, but not circular

circular hole

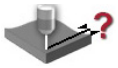
The minimum and maximum dimensions or diameters are indicated on each quality. These diameters transform the program.



➜ is used for setting the cutting height for sensing (in relation to the plate)

➜ is used for setting the sensing voltage while cutting

➜ is used for setting the cutting speed



➜ is used for setting the kerf compensation (= kerf width = 2*compensation)

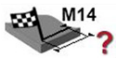
➜ is used for setting the strike height (Ha): the height of the torch in relation to the plate when the arc is established.

➜ is used for setting the piercing height (Hp): the height by which the torch is raised at the end of the shortening time.

➜is used for setting the time during which it is held at the piercing height (or retract).

➜ is used for setting the time for the movement start (TDM): The time starts when RIC is detected (when the arc is transferred). The end of that time triggers the start of the movement XY.

➜ Sensing start time (TMP): This time is executed after sensing is frozen during a cut. It starts when the sensing conditions are fulfilled. The end of this time triggers sensing voltage with the previously acquired voltage.



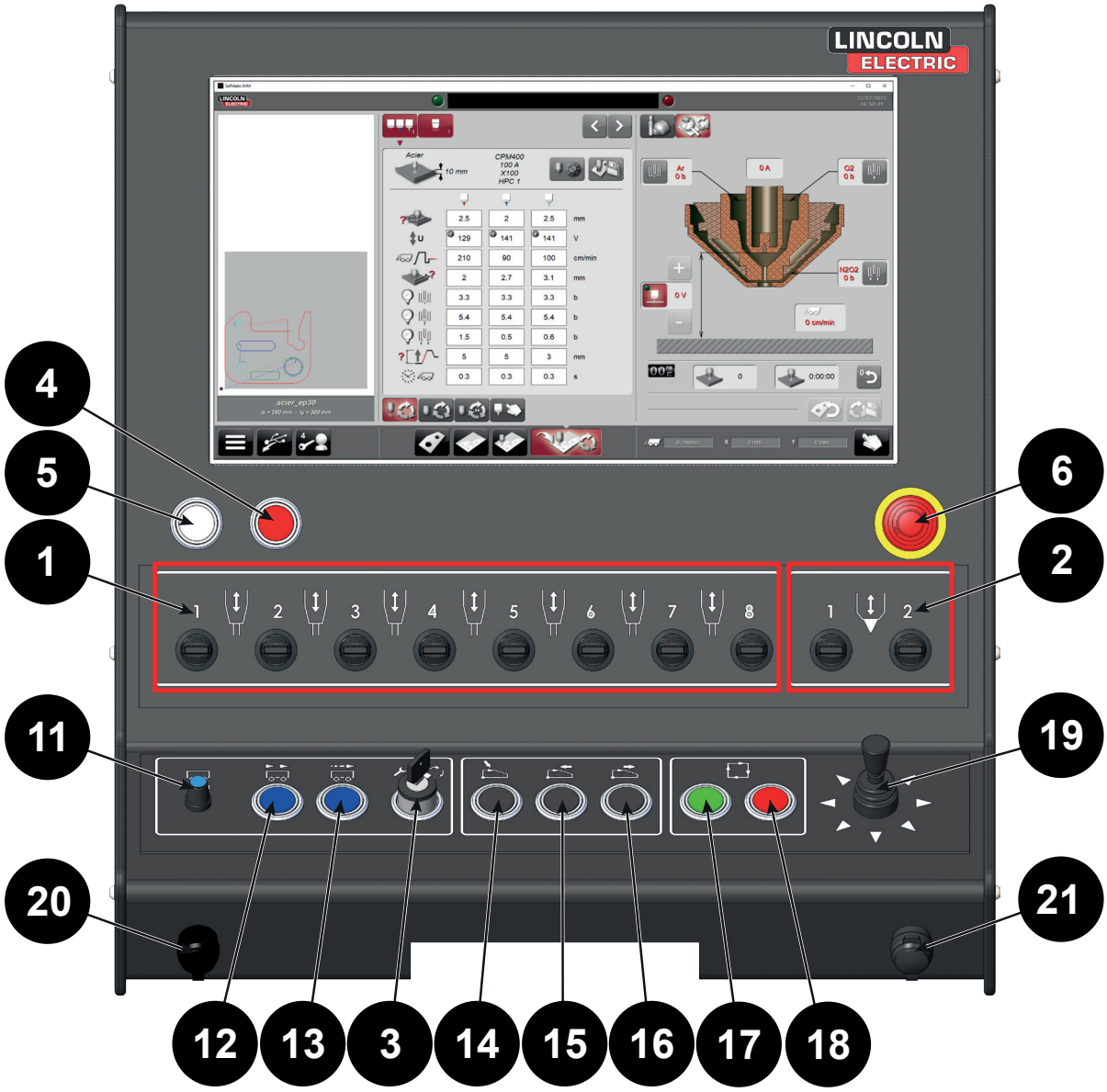
➜ Positioning distance of code M14 in relation to the end of cutting. The M14 code is used to freeze sensing, and then to stop the arc at the end of the distance M14 set here. When the distance is covered, the machine continues its movement up to the end of the cut M3.

➜ Arc stopping distance after M14. The M14 code is used to freeze sensing, and then to stop the arc at the end of the distance M14 set here. When the distance is covered, the machine continues its movement up to the end of the cut M3.
If the distance is greater than the cutting distance still to be covered, the arc stops on the code for the end of the cut M3.

Area (i) indicates the information specific to that parameter. After the values are edited, press one of the four buttons in **area (E)** to save them.
In **area (E)**, the customer scales that are already present flash in green. If the indicator is green and steady, that set of parameters is the one currently being edited.
You can press **button (A)** to cancel.

5.1 Description of controls on the console

Important! The arrangement of buttons may vary depending on the machine.



1	Oxy-fuel cutting tool up and down buttons (available depending on the machine type)
2	Plasma tools up and down buttons (available depending on the machine type)
3	Intervention mode key (available depending on the machine type)
4	Off button
5	Luminous On button
6	Emergency stop button
11	Machine speed setting defined by the joystick
12	Button for switch to high speed
13	Button for switch to held movement
14	Back to program zero point
15	Reverse over the path
16	Forward on the path
17	Cycle start
18	Cycle stop/pause
19	Manual movement in the direction
20	USB port
21	Network port

Emergency stop (**button 6**)

Emergency stop panic button. The energy to the cutting gantry, and to the other components of the machine (extraction etc.) is switched off. The fault indicator (3) is not on.

Power On/Off (**button 4 and button 5**)

Pressing the white button (2) powers up the gantry (KM1 stuck in the cabinet). The white indicator remains on.

Use the red button (3) to power down the machine, and not the devices (filter etc.)

Tool holder up/down (**button 1 and button 2**)

In manual mode, the up/down buttons (1 and 2) make the relevant tool holder move up or down.
In oxy-fuel cutting mode, the up/down buttons (1) increase or decrease the sensing height.
In plasma cycle mode, the up/down button (2) increases or decreases the arc voltage, and thus increases or decreases the sensing height.
NB: the final sensing heights are not saved for the next cut.

8-way joystick (**button 19**)

To avoid accidental movement, the joystick (19) has a central lock. Press the central cover to unlock movement and use the joystick in the eight usual directions. There is no need to go through the centre to change directions.

Cycle start/stop (**button 17 and button 18**)

Starts or stops the program loaded in the NC.
Cycle stopping also stops a held job or a return to home position.
When a program is running, the green Cycle start button (17) is on and steady.
When the program under way stops, the green indicator (17) flashes. When the program is reset, the green indicator (17) goes off.

Reverse and forward on the path (**button 15 and button 16**)

Forward on the cycle, reverse on the cycle.
Operating conditions:

- A program has been selected
- A cycle start has been programmed
- A cycle stop has been programmed (green indicator 17 flashes)

Back to program zero point (**button 14**)

Back to program zero point.
The green indicator 9 is on during the return to the zero point.

NB: The function for a return to the previous strike is only available only on the HMI.

Button for switch to held movement (**button 13**)

Press button 13. The blue button flashes for 4 to 5 seconds. The first action taken at that time with the joystick will be held.
To exit the Hold jog mode: Three typical actions

- Press the Hold jog button (13) once again
- Press the Cycle stop button (18)
- Apply a jog control different from that under way (19)

High speed (**button 12**)

The machine switches to high speed (programmed in the setup) while button (12) is pressed, in the following cases:

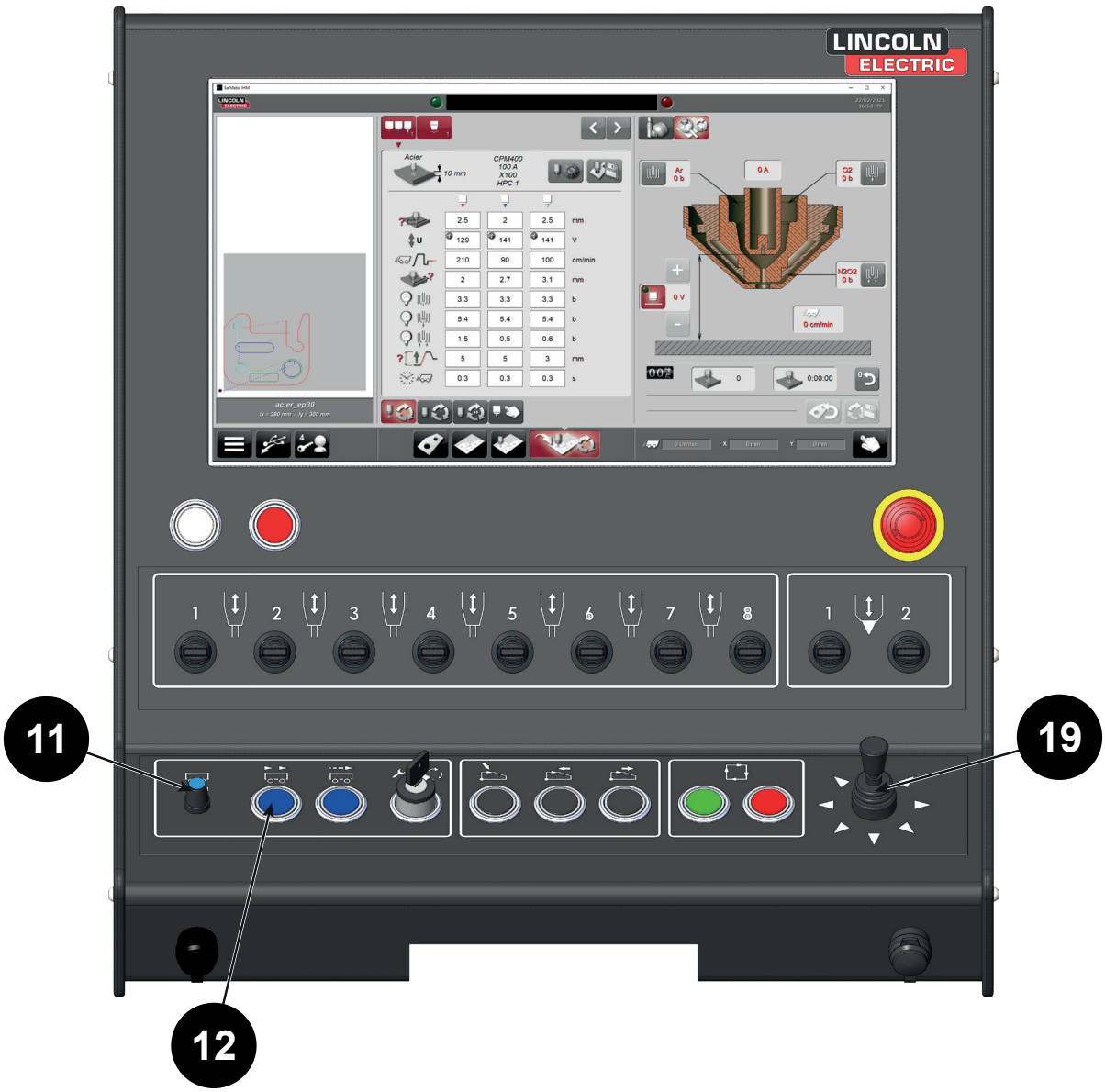
- Manual jog
- Hold jog
- Dry run program (mind the mechanical passage of corners!)

Speed adjustment (**button 11**)

Programmed speed variation from 0 to 120% with button 11.

5.2 Moving the different axes

On **OPTITOME**, **OXYTOME**, **PLASMATOME** and **ALPHATOME**.



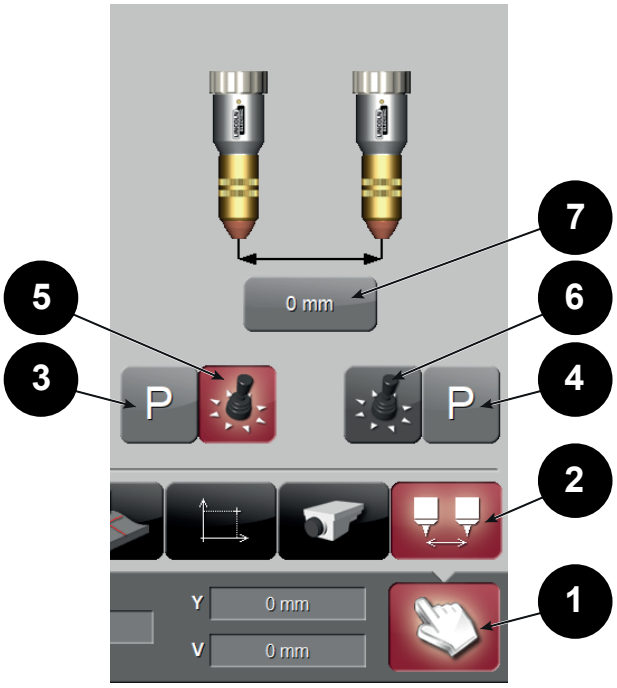
The controls are on the console

- Axis movement using the joystick (**reference 19**) (it has an unlocking control), which is to be used to carry out a movement).
- Potentiometer (**reference 11**) for setting the speed.
- Button for switch to high speed (**reference 12**).

If there is no movement:

- Make sure the emergency stop is not active.
- Make sure you are not against the software limits (set during the installation); test by carrying out the opposite movement.
- Make sure there is no alarm (torch impact safety etc.)
- Make sure that the programmed speed is not 0 (increase it using the speed setting button).

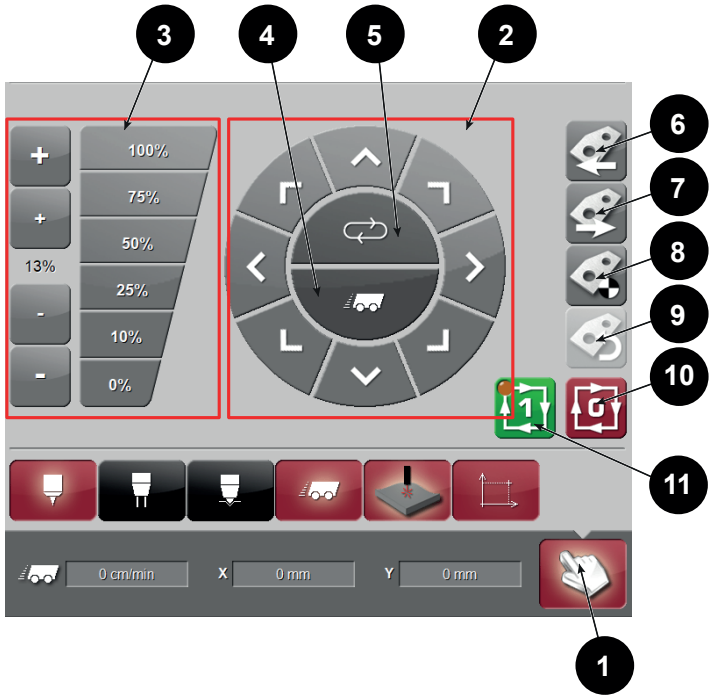
Case of dual-torch installation:



To access manual torch movement, click on **button 1** then **button 2**.
Button 3 sends the left-hand torch to its parking position, and **button 4** sends the right-hand torch to its parking position.
Buttons 5 and **6** are used for selecting the torches that will move during a manual jog movement with the joystick.
Button 7 defines the distance in millimetres between the two torches.

On **EUROTOME**

There is no joystick to control the axes. The controls are on the HMI



To access the machine controls, press **button (1)**.

The controls in **area (2)** allow you to move axes X and Y in 8 directions

The controls in **area (3)** allow you to modify the machine movement speed.

The machine switches to high speed when **button (4)** is pressed in the following cases:

- Manual jog
- Hold jog
- Dry run program (mind the mechanical passage of corners!)

Jog movement is held by pressing **button (5)** (press this button before pressing Jog)
To exit the Hold jog mode: Three typical actions

- Press the Hold jog button once again
- Press the Cycle stop button (10)
- Apply a jog control different from that under way

Buttons (6) and **(7)** are cycle forward and return controls.
Operating conditions:

- A program has been selected
- A cycle start has been programmed

Button (8) is the button for a return to the program zero point.

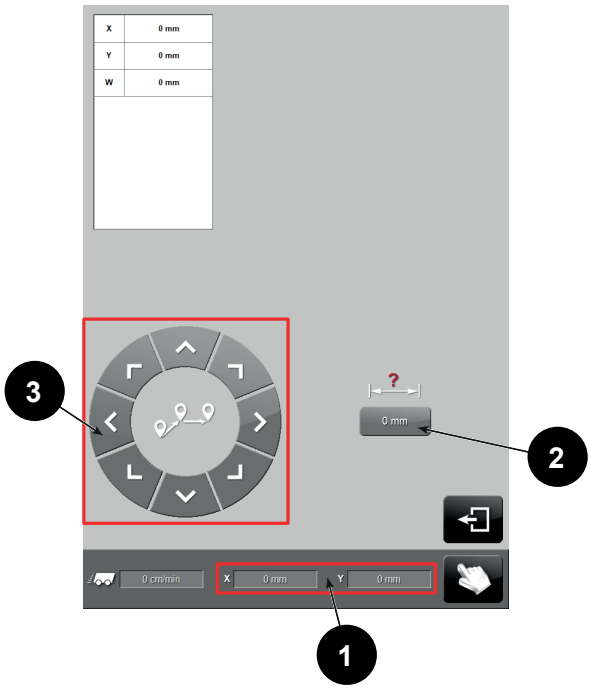
Button (9) is the button for a program reset

Button (10) is the Cycle stop button (program paused)
Cycle stopping also stops a held job or a return to home position.

Button (11) is the Cycle start button
When a program is running, the Cycle start indicator (on the button) is on and steady.
When the program under way stops, the indicator flashes. When the program is reset, the indicator goes off.

On all types of machine

Incremental jogging allows you to move the machine along one or both axes over a predefined distance.
To enter or exit the incremental jog mode, click in **area 1**.

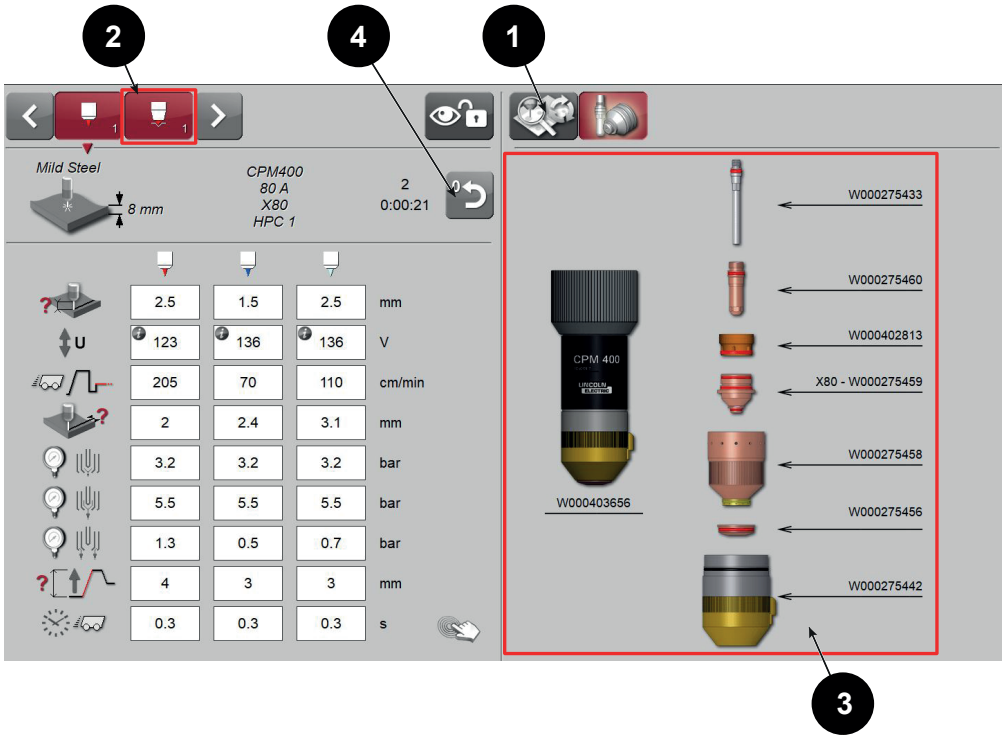


Button (2) is used for defining the distance to cover.
The movement is started when one of the buttons in **area 3** are clicked.

5.3 Selecting and changing consumables

Once the plasma process is selected (NCRun) press **button (1)** on the right-hand page. The window below will be displayed.

If you cannot see **button (1)**, deselect the manual menu by pressing:



Button (1) must be deselected and **area (2)** must be on the selected process (select with the arrows to the left and right).

Area (3) contains the part numbers of the consumables (for verification or order).

To change consumables and for machines with no single-beam cells at the front and rear:

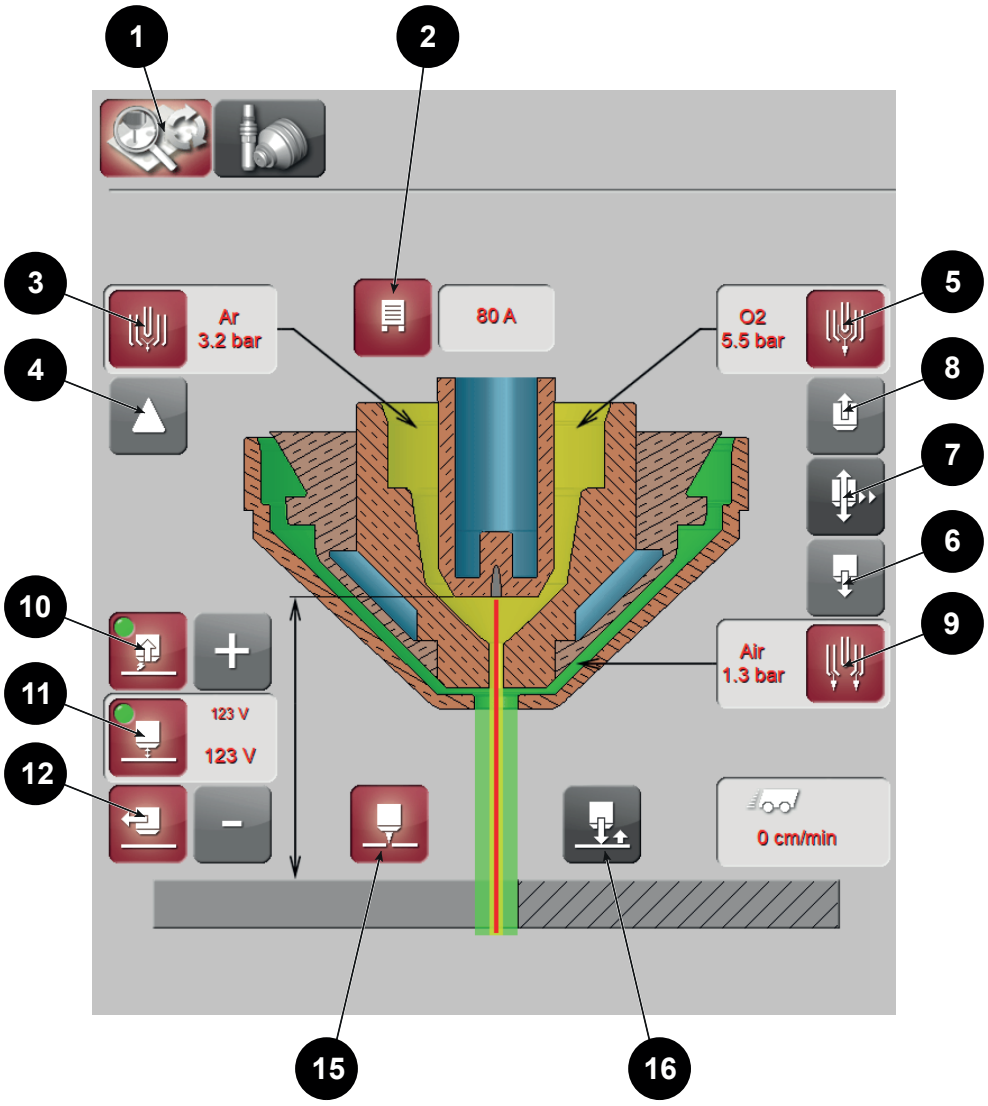
- Set the machine to the correct X/Y position and the correct height to change the consumable
- Press the emergency stop
- Change the consumable
- Reset the strike counter if it is being tracked. (**button 4**)
- Carry out a graphics-based restart (section on “Carrying out a graphics-based restart”) or start a new program.

5.4 Preparing the plasma process (switching on the power source, extraction gas test etc.)

Once the plasma process is selected (NCRun) press **button (1)** on the right-hand page. The following window will be displayed, with the buttons of the manual banner.

If you cannot see **button (1)**, deselect the manual menu by pressing:

For HPi plasma



Button (2) is used to control:
- Starting up the power source.
- Shutting down the power source if it is operating.
- The button is grey if the power source is not being powered, red if it is, and flashing if it is starting up.

Button (3) is used to control:
- If the power source is not powered, a pilot gas test
- If the power source is powered, a pilot arc control
- Stopping the control if it is active

The **Stop button (4)** is used for stopping any manual control (process or detection).

Button (5) is used to control:
- If the power source is not powered, a cutting gas test.
- If the power source is powered, a cutting arc control.
- Stopping the control if it is active.

Button (6) is used for lowering the selected tool holder. By default, the speed is the slow manual speed (unless **button 7** is pressed) Movement is forced in slow speed if there is a movement during sensing. Downward movement is not allowed in the event of a torch impact or if the tool holder reaches the lower limit.

If it is active, **button (7)** allows you to set a speed = high manual speed for the tool holder movements (**button 6** or **button 8**). This button is deselected automatically if you do not press one of **buttons 6** or **8**.

Button (8) is used to raise the selected tool holder. By default, the speed is the slow manual speed (unless **button (7)** is pressed) Movement is forced in slow speed if there is a movement during sensing. Upward movement is not allowed if the tool holder reaches the upper limit.

Button (9) is used to control:
- An annular gas test.
- Stopping the control if it is active.

Button (10) activates the Touch & Go function. While cutting, this function makes it possible to detect contact with the torch (dross) and raise the torch to avoid an impact and a break in cutting. After a few seconds, sensing resumes.

Button (11) allows you to activate sensing. It also activates plate edge detection. Sensing is only activated when the conditions are fulfilled, namely:
- Tool holder at cutting height
- Reference taken (after distance D404)
- No sensing freeze condition (insufficient speed or code M114 or plate edge freeze) + sensing start delay.

The indicator at the top left of the button indicates if sensing is active.

Button (12) is used to activate/deactivate plate edge freezing.
Plate edge freezing is active
- If sensing is under way
- If plate edge detection is active
- If the difference between the setting and the measurement is greater than plate-edge voltage in the scales.

Freeze stops after 10 seconds (to check that there is still no plate) or when the voltage value is close to the setting (difference < plate-edge voltage) + sensing start time.

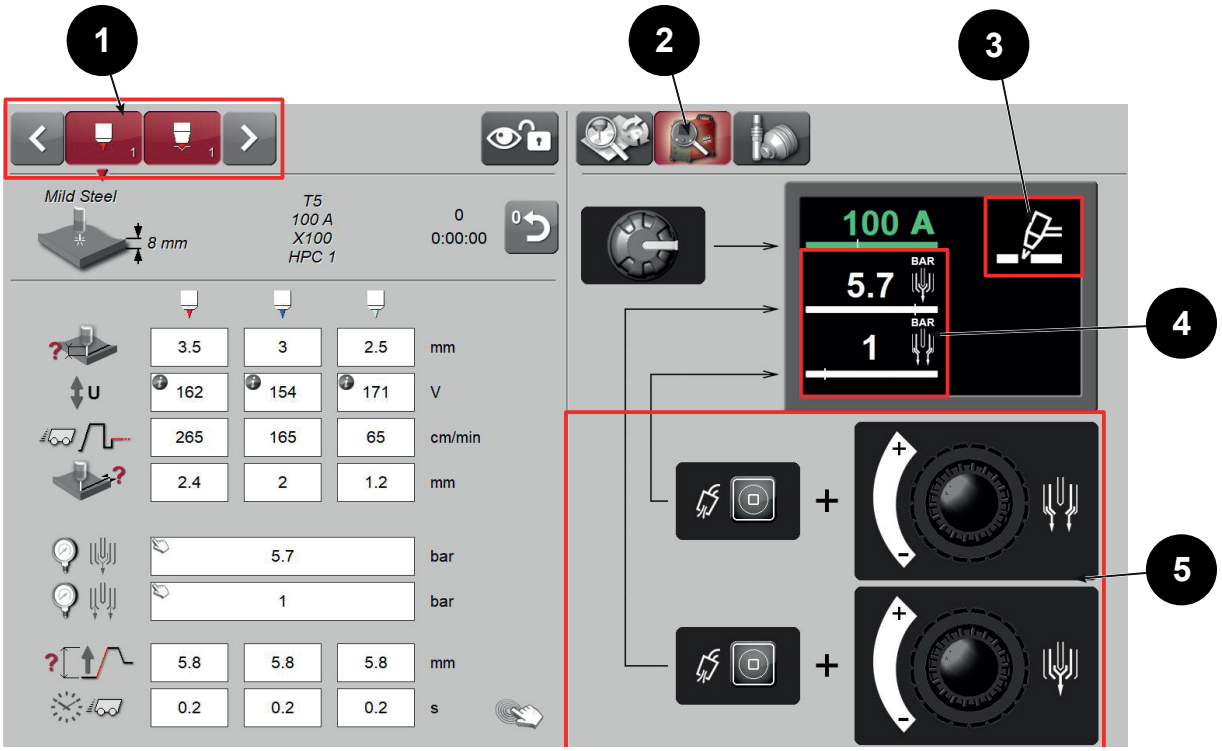
Button (15) is used for selecting cutting in mid plate (if red) or on the edge of the plate (if grey)

Button (16) is used for triggering plate detection. After detection, the torch stops at the strike height (Ha). Pressing the **Stop button (4)** or pressing **button (16)** once again stops detection.

For FLEXCUT 200 plasma

After selecting the plasma process (NCRun) set the required process in **area (1)**, to select cutting or marking. When you press **button (2)**, the following window is displayed, which shows the pressure values to set manually.

If you cannot see **button (2)**, deselect the manual menu by pressing:



Then check that you are in the selected mode:

- On the HMI display (**area 3**)
- On the power source display

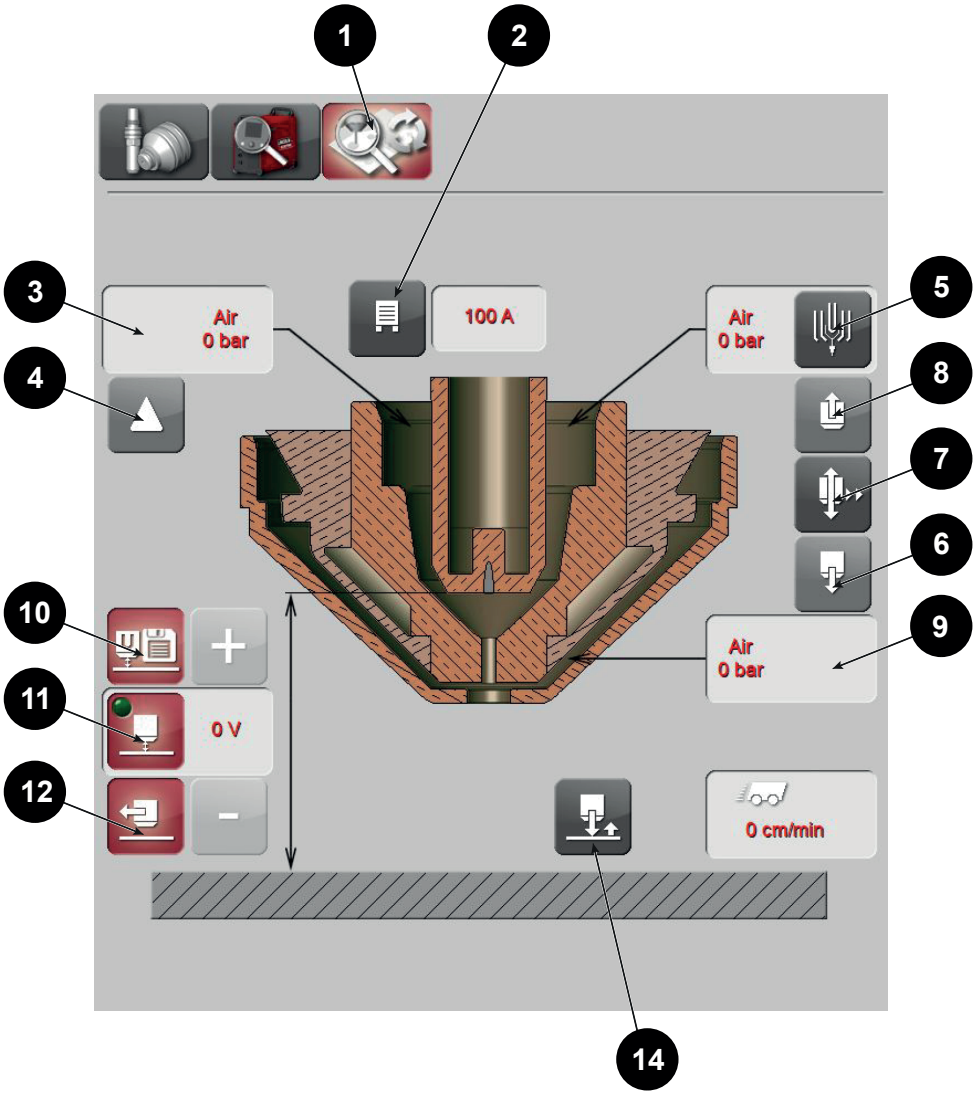
Cutting mode

Marking mode

Then adjust the gas pressure to the values indicated in **area (4)** and set the power source as indicated in **area (5)**.

Then, if needed, repeat the operation for marking, by modifying the selection in **area (1)**.

Then press **button (1)** below (to the right of the screen) to access the cycle view:



Button (2) allows you to control the following, if the remote starting option is available:
- Starting up the power source.
- Shutting down the power source if it is operating.
- The button is grey if the power source is not being powered, red if it is and if it is starting up (approximately 40 seconds).

Area (3) shows the cutting gas pressure setpoint.

The **Stop button (4)** is used for stopping any manual control (process or detection).

Button (5) is used to control:
- If the power source is not powered, a cutting gas test.
- If the power source is powered, a cutting arc control.
- Stopping the control if it is active.

Button (6) is used for lowering the selected tool holder. By default, the speed is the slow manual speed (unless **button 7** is pressed) Movement is forced in slow speed if there is a movement during sensing. Downward movement is not allowed in the event of a torch impact or if the tool holder reaches the lower limit.

If it is active, **button (7)** allows you to set a speed = high manual speed for the tool holder movements (**button 6** or **button 8**). This button is deselected automatically if you do not press one of **buttons 6** or **8**.

Button (8) is used to raise the selected tool holder. By default, the speed is the slow manual speed (unless **button 7** is pressed) Movement is forced in slow speed if there is a movement during sensing. Upward movement is not allowed if the tool holder reaches the upper limit.

Area (9) shows the annular gas pressure setpoint.

Button (10) activates the save voltage function. This function allows you to use the voltage measured after striking as the sensing setpoint and not the voltage provided in the cutting parameters.

Button (11) allows you to activate sensing. It also activates plate edge detection. Sensing is only activated when the conditions are fulfilled, namely:

- Tool holder at cutting height
- Reference taken (after distance D404)
- No sensing freeze condition (insufficient speed or code M114 or plate edge freeze) + sensing start delay.

The indicator at the top left of the button indicates if sensing is active.

Button (12) is used to activate/deactivate plate edge freezing.
Plate edge freezing is active

- If sensing is under way
- If plate edge detection is active
- If the difference between the setting and the measurement is greater than plate-edge voltage in the scales.

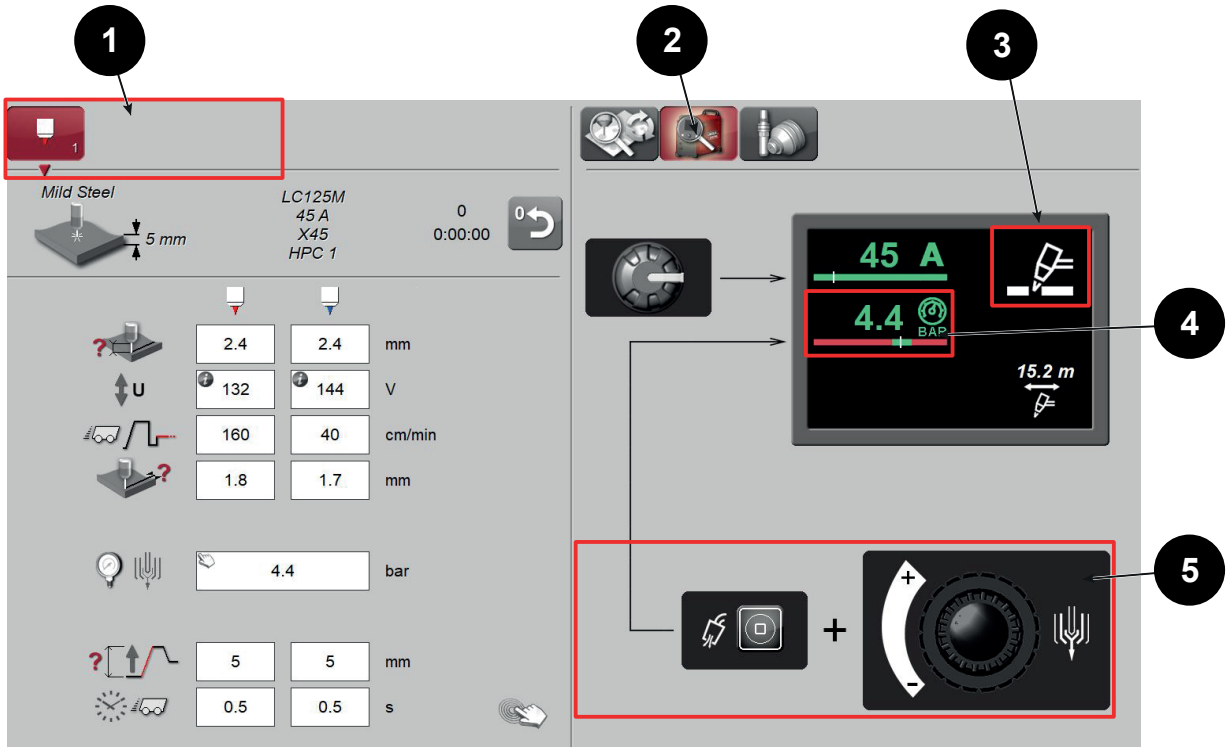
Freeze stops after 10 seconds (to check that there is still no plate) or when the voltage value is close to the setting (difference < plate-edge voltage) + sensing start time.

Button (14) is used for triggering plate detection. After detection, the torch stops at the strike height (Ha). Pressing the **Stop button (4)** or pressing **button (14)** once again stops detection.

For FLEXCUT 125 plasma

After selecting the plasma process (NCRun) set the required process in **area (1)**, to select cutting or marking. When you press **button (2)**, the following window is displayed, which shows the pressure values to set manually.

If you cannot see **button (2)**, deselect the manual menu by pressing:



Then check that you are in the selected mode:

- On the HMI display (**area 3**)
- On the power source display

Cutting mode

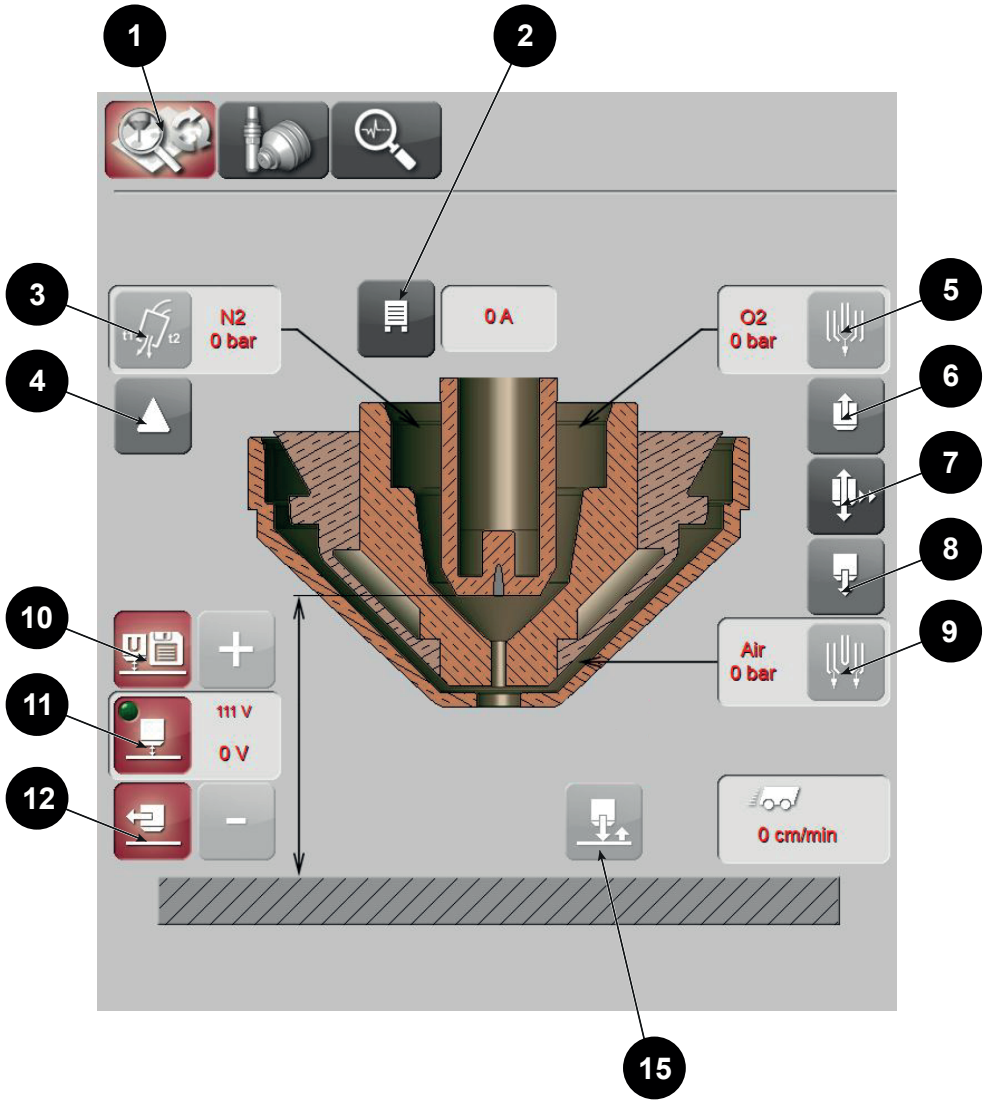
Marking mode

Then adjust the gas pressure to the values indicated in **area (4)** and set the power source as indicated in **area (5)**.

Then, if needed, repeat the operation for marking, by modifying the selection in **area (1)**.

The Cycle view window is identical to that in **FLEXCUT 200**.

For FINELINE plasma



Button (2) is used to control:
- Starting up the power source
- Shutting down the power source if it is operating.
- The button is grey if the power source cannot be powered, red if it is powered, and flashing if it is starting up.

Button (3) is used to control:
- If the power source is ready to supply power, a pilot gas test.
- Stopping the control if it is active.

The **Stop button (4)** is used for stopping any manual control (process or detection).

Button (5) is used to control:
- If the power source is ready to supply power, a cutting gas test, away from the manual cutting mode.
- If the power source is ready to supply power, cutting arc control, in manual cutting mode.
- Stopping the control if it is active.

Button (6) is used for lowering the selected tool holder. By default, the speed is the slow manual speed (unless **button (7)** is pressed) Movement is forced in slow speed if there is a movement during sensing. Downward movement is not allowed in the event of a torch impact or if the tool holder reaches the lower limit.
If it is active, **button (7)** allows you to set a speed = high manual speed for the tool holder movements (**button (6)** or **(8)**). This button is deselected automatically if you do not press one of **buttons (6)** or **(8)**.

Button (8) is used to raise the selected tool holder. By default, the speed is the slow manual speed (unless **button (7)** is pressed) Movement is forced in slow speed if there is a movement during sensing. Upward movement is not allowed if the tool holder reaches the upper limit.

Button (9) is used to control:
- An annular gas test.
- Stopping the control if it is active.

Button (10) activates the save voltage function. This function allows you to use the voltage measured after striking as the sensing setpoint and not the voltage provided in the cutting parameters.

Button (11) allows you to activate sensing. It also activates plate edge detection. Sensing is only activated when the conditions are fulfilled, namely:
- Tool holder at cutting height
- Reference taken (after distance D404)
- No sensing freeze condition (insufficient speed or code M114 or plate edge freeze) + sensing start delay.

The indicator at the top left of the button indicates if sensing is active.

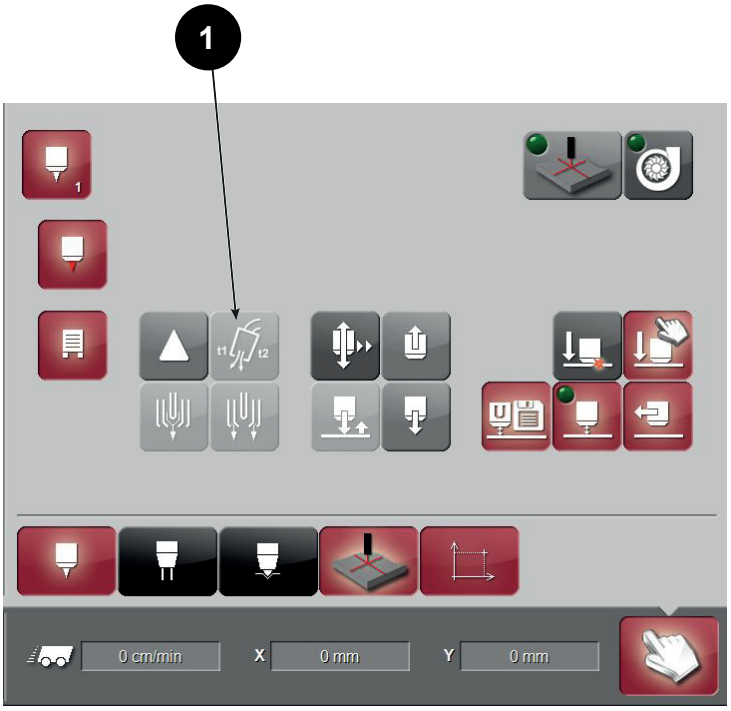
Button (12) is used to activate/deactivate plate edge freezing.
Plate edge freezing is active
- If sensing is under way
- If plate edge detection is active
- If the difference between the setting and the measurement is greater than plate-edge voltage in the scales.

Freeze stops after 10 seconds (to check that there is still no plate) or when the voltage value is close to the setting (difference < plate-edge voltage) + sensing start time.

Button (15) is used for triggering plate detection. After detection, the torch stops at the strike height (Ha). Pressing the **Stop button (4)** or pressing **button (15)** once again stops detection. Important: sensing is only possible if the power source is in service.

For the pre-gas/post-gas test, press the manual control button and then **button 1**.

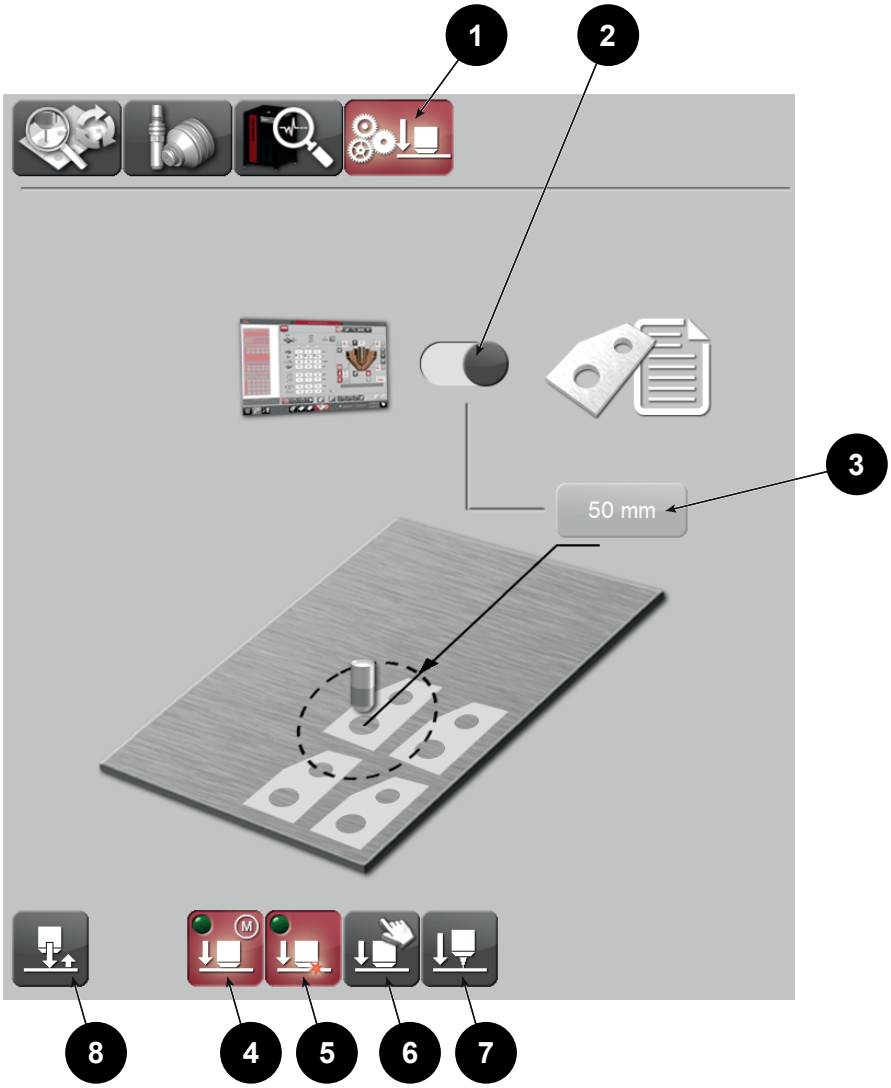
Manual control



5.5 Manual detection with plasma (for a detection test or program zero point)

First of all, you need to load the cutting parameters relating to the plate (see section “Positioning the plate with the laser”). Indeed, the raising height after detection depends on the loaded parameter

Important: with **FINELINE**, the power source must be in service to detect the plate.

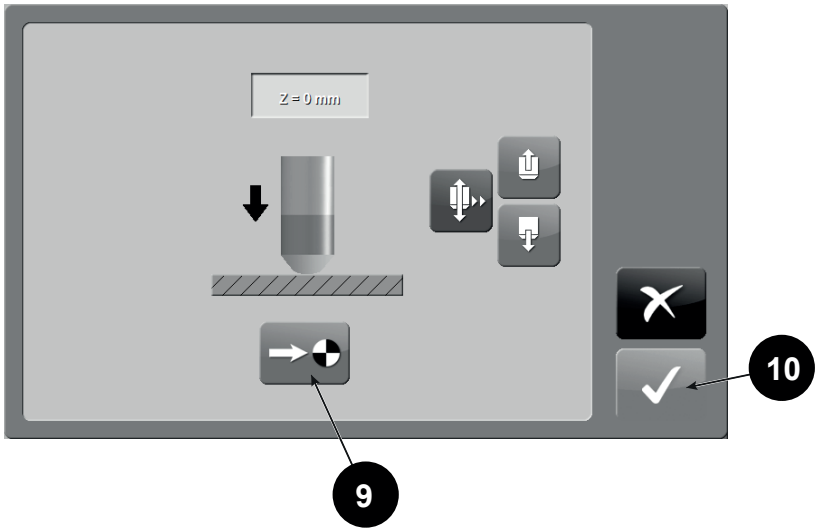


The plate detection adjustment screen is accessible by clicking on **button 1**.
Button 2 specifies who decides whether or not the plate is to be detected when the program is executed.

- If the selector is set to the right, the decision is made by the cutting program.
- If the selector is set to the left, the decision is up to the machine. Detection is required at the first strike. After that, with each strike, if the distance between the current position and that last detected is greater than the value of **button 3**, detection is repeated.

Buttons 4 to **7** make it possible to select the type of detection that will be used during program execution.

- **Button 4**: detection by motor torque. The green LED goes on when the torch detects the plate. This detection mode is of use, for example, with wrapped or oxidised plates, where electrical contact is not possible. Only valid with **FINELINE** or **FLEXCUT**.
- **Button 5**: detection by electrical contact. The green LED goes on when the torch detects the plate. Valid with **FINELINE**, **FLEXCUT** or **HPi**.
- Motor torque and electrical contact detection may be selected at the same time. In that case, the plate detection signal is given by the first mode that detects the plate.
- **Button 6**: manual detection. Only valid with **FINELINE** or **FLEXCUT**. Every time detection is needed, the machine asks the operator to manually position the torch at plate height.

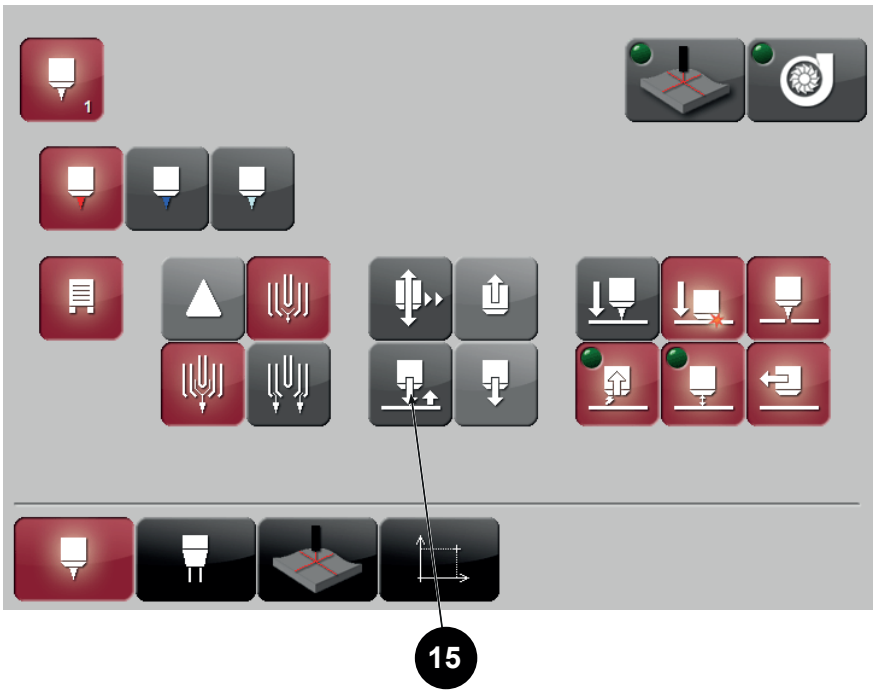


Once the torch is placed in contact with the plate, define that position by clicking on **button 9** and confirm with **button 10**.

- **Button 7**: pilot arc plate detection. Valid only with **HPi**, if the selected cutting process allows it.

Button 8 allows you to carry out a plate detection test. After detection, the torch stops at the strike height (Ha). A second press stops detection. In the case of **FINELINE**, the power source must in service.

Other solution:
Press **button (15)** of the manual controls

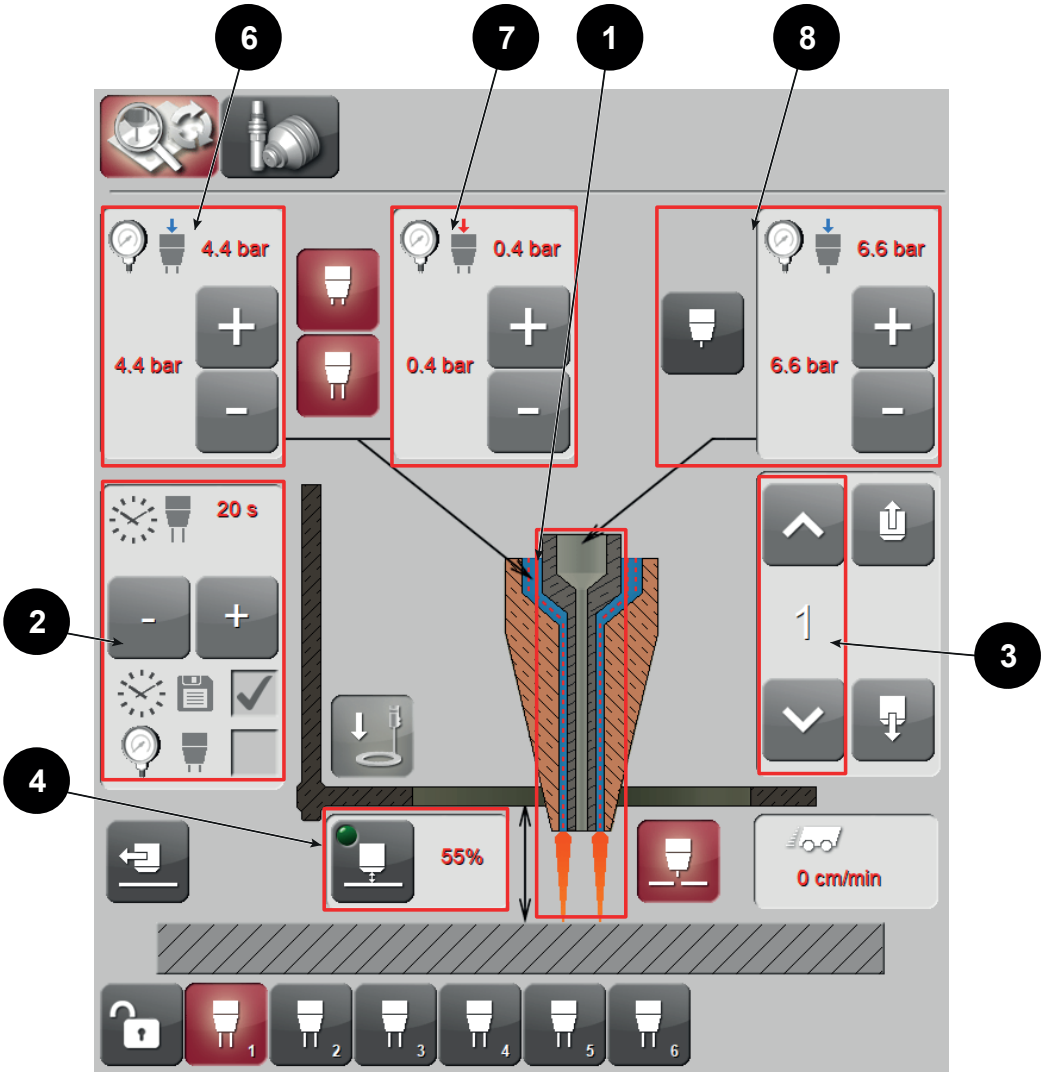


5.6 Preparing the oxy-fuel cutting process

Once the plasma process is selected (NCRun) press **button (1)** on the right-hand page. The following window will be displayed, with the buttons of the manual banner.

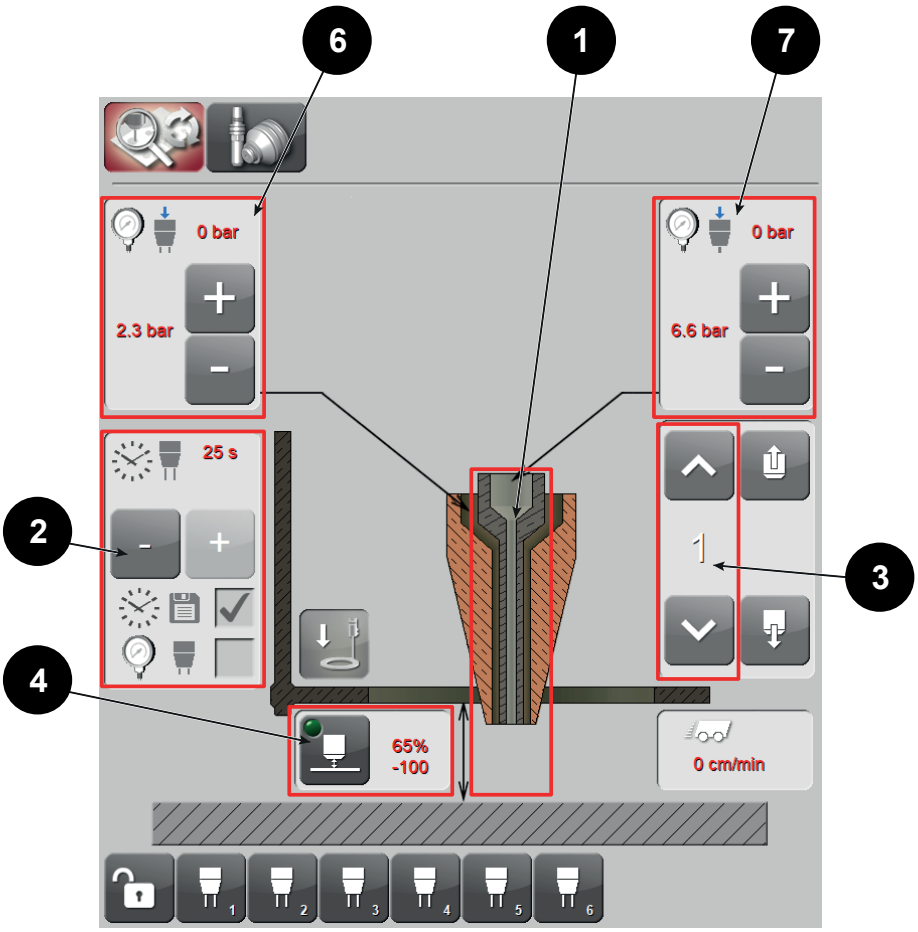
If you cannot see **button (1)**, deselect the manual menu by pressing:

For Hpi² oxy-fuel cutting



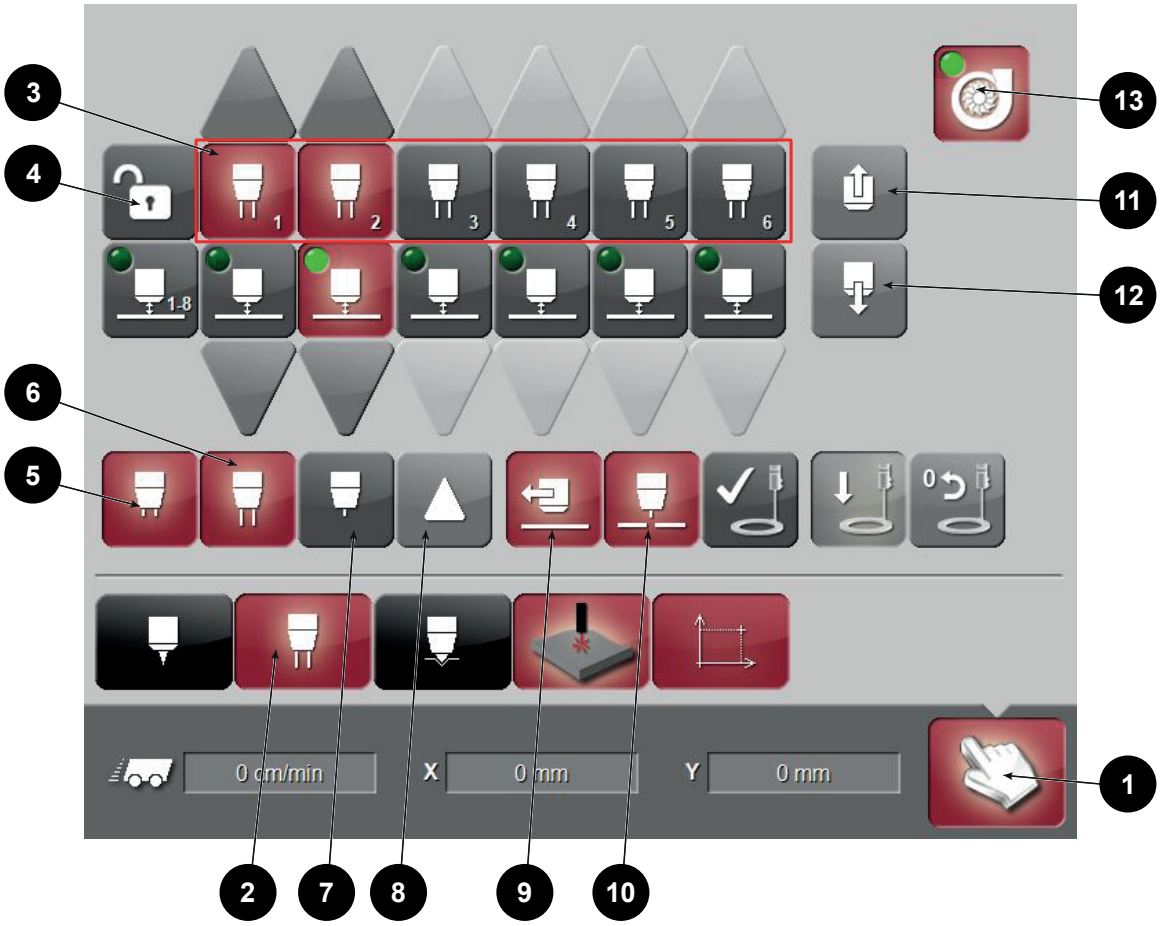
Area 1: cycle status display area
Area 2: overheating adjustment area
Area 3: torch selection area
Area 4: sensing setpoint display area
Area 6: display of return and modification of the heating oxygen pressure setpoint (changes colour with the quality used). It may be used to check if there is a problem with a gas assembly (valve or pipe blocked). Heating and overheating controls are common to heating oxygen and fuel
Area 7: view of return and modification of fuel gas pressure setpoint (changes colour with the quality used). It may be used to check if there is a problem with a gas assembly (valve or pipe blocked) Heating and overheating controls are common to heating oxygen and fuel
Area 8: display of return and modification of cutting oxygen pressure setpoint (changes colour with the quality used). It may be used to check if there is a problem with a gas assembly (valve or pipe blocked)

For Essential oxy-fuel cutting



Area 1: cycle status display area
Area 2: overheating adjustment area
Area 3: torch selection area
Area 4: sensing setpoint display area
Area 6: display of return and modification of the heating oxygen pressure setpoint (changes colour with the quality used). It may be used to check if there is a problem with a gas assembly (valve or pipe blocked)
Area 7: display of return and modification of cutting oxygen pressure setpoint (changes colour with the quality used). It may be used to check if there is a problem with a gas assembly (valve or pipe blocked)

The same oxy-fuel cutting controls for **Essential** or **HPi²** can be found in the manual banner,with a few additional controls:



To select the manual oxy-fuel cutting controls, press **button (1)** in the right-hand area of the HMI, then on **button (2)**.
Manual controls are available outside a program or when a program is paused.

In **area (3)** select the torches on which manual action will be taken. In this area, all the torches declared are available. Caution! You cannot select two different types of torch.
If the torch is red, it is selected.
Torch deselection alone is possible during the program.
When the program is paused, a deselected torch can be selected.

Use of **button (4)**:
If the lock is open, the torches selected in the program will be used.
If the lock is closed, the torches that will cut the part will be those selected in **area (3)** (when an oxy-fuel cut will be requested of course).

Button (5) is used for switching on (or off) the torch and entering (or leaving) the heating phase: it is the heating control.

Button (6), if the heating control is already active, is used to control overheating

Button (7) has two functions:

- if the heating control is already active, is used to start an oxy-fuel cutting command. If overheating is under way, it disappears after t6.
- If the heating control is not active, it is used for starting a gas test with the cutting pressure values (checking that the pressure return is equal to the setpoint at all torches, for instance). The gas test also makes it possible to lower the pressure in the cutting oxygen pipes, before a cylinder change (in the case of a gas test, there is no control of the pressure measured in relation to the setpoint).

Button (8) allows you to stop the process requests (manual or cycle paused) as follows:

- if heating, overheating and cutting are requested and/or active, then cutting and overheating are stopped
- if heating and overheating are requested and/or active, then overheating is stopped
- if heating and cutting are requested and/or active, then cutting is stopped
- if heating alone is requested and/or active, then heating is stopped.

By pressing the **button (9)**, you activate/deactivate blocking of sensing on the plate edge (active when red). When a plate edge or hole is detected (the sensor voltage changes suddenly), sensing is frozen. Sensing will be in service again with the same setpoint when the setpoint is close to the measurement (i.e. the torch is again above the plate).

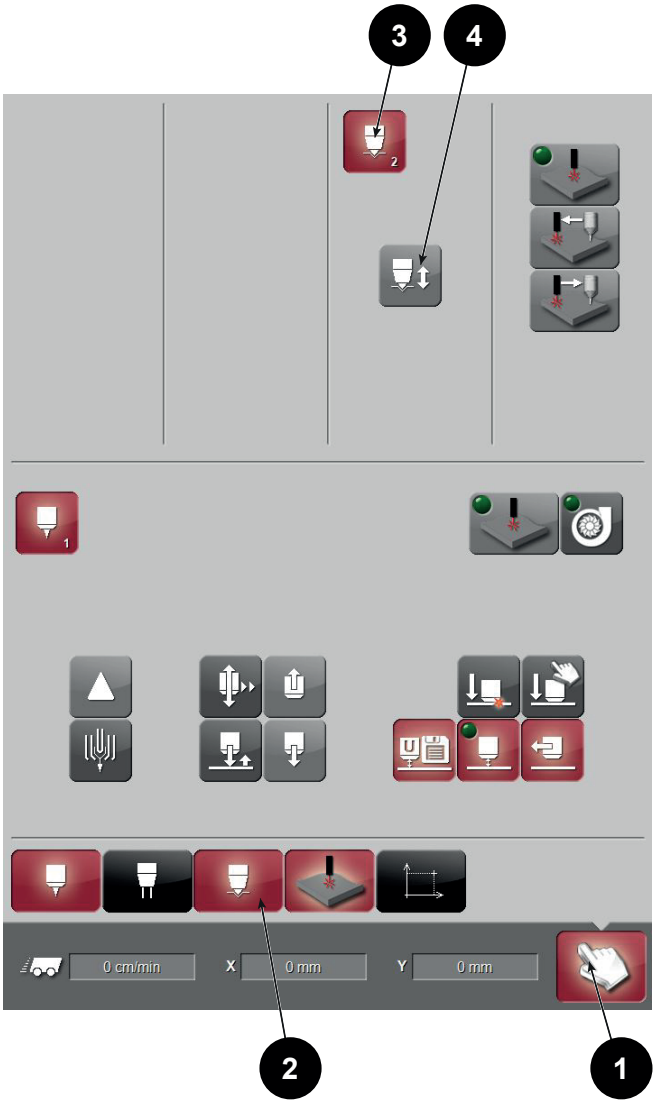
Button (10) activates/deactivates the option for mid-plate striking (active when red). It striking at the edge of the plate is active, the cutting pressure stage is not taken into account: times t1, t2, t3 are 0.

Button (11) is used for managing the manual rise of the tool holder at high speed for all the selected torches (not suitable for process height settings). The tool holder stops at the upper limit.
During manual cutting (other than first descent) the movement of the HMI buttons is slow, to allow a height regulation by the HMI (if the sensors are not active)

Button (12) is used for managing the manual descent of the tool holder at high speed for all the selected torches (not suitable for process height settings). The tool holder stops at the detection height defined in the scales (if the sensor is present and active).
During manual cutting (other than first descent) the movement of the HMI buttons is slow, to allow a height regulation by the HMI (if the sensors are not active)

Button (13) is used to switch the extraction on and off manually. The extraction system is started automatically when the process of a program starts, and stops xx seconds after the end of the last cut (value adjustable in setup). Manual controls are present to anticipate the starting or stopping of the extraction system. Red button: on command sent. LED on = extraction operating; LED off = extraction stopped or insufficient.

The controls specific to sensors are covered in the section “Preparing the oxy-fuel cutting process”.



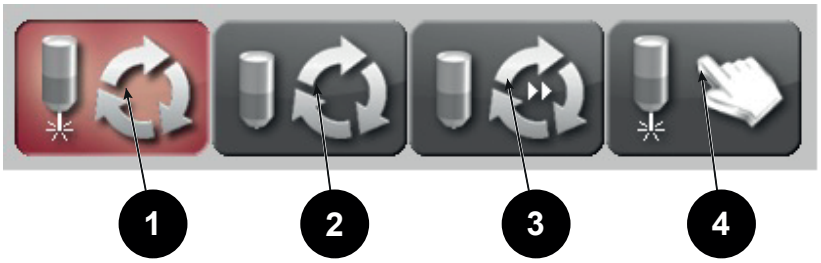
To select the manual marking controls of the **Essential** marker, press **button (1)** in the right-hand area of the HMI, then **button (2)**.

After that, select the marker with **button (3)** and manoeuvre it (up/down) with **button (4)**.

5.8 Selecting the execution mode (cutting, dry running etc.)

Program execution modes are common to all processes; they are available by pressing the Cycle page button (at the bottom of the central page), after first loading the program and confirming the cutting scales, before the program is started:

Cycle page



Each cutting mode is incompatible with the others. If you select one of them, you deselect the others.

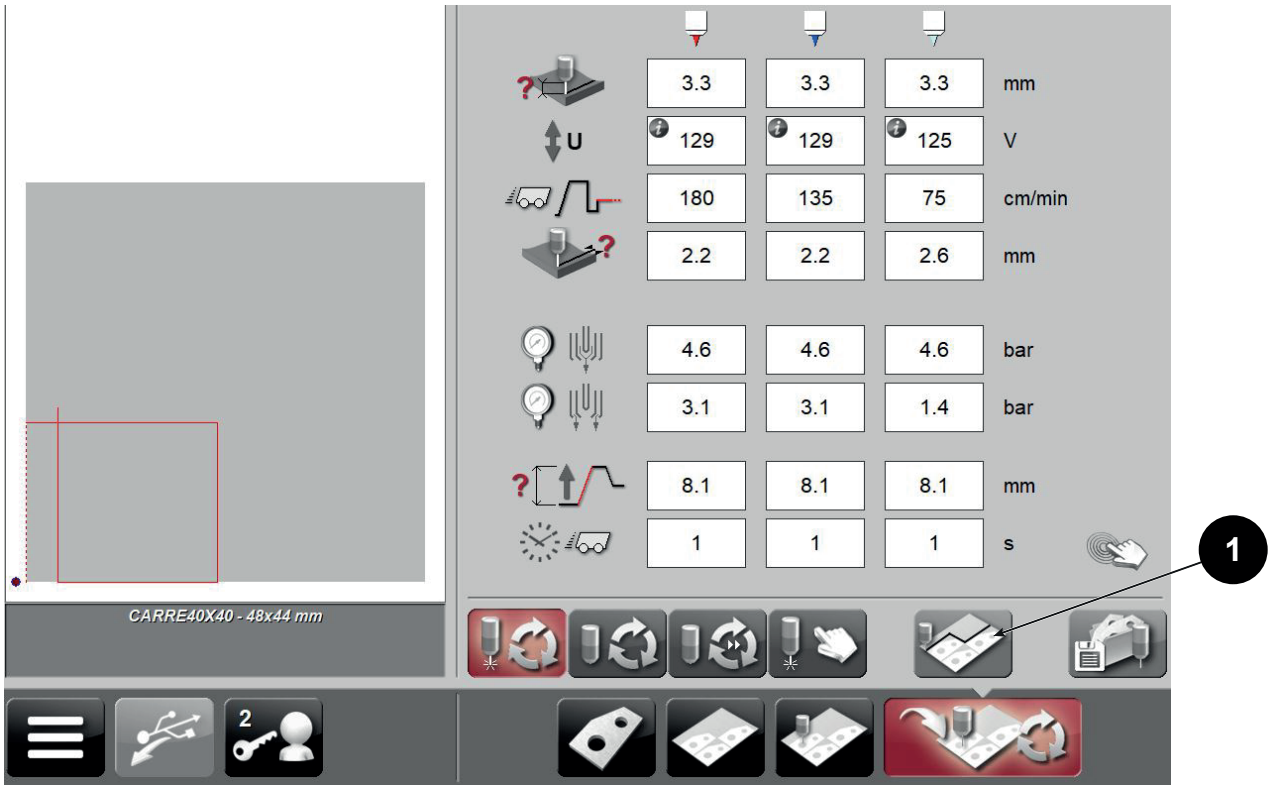
Button (1) is the button selected by default. It allows the program to run at the cutting speed using the process.
Button (2) allows the program to run in dry running mode (no process) at the cutting speed.
Button (3) allows the program to run in dry running mode (no process) at a high speed (5 m/min).
Button (4) allows you to ask for manual plate detection and then control a pilot arc and then the cutting arc.

Control takes the form of jogs. Stopping the jogs or pressing Stop cut stops the cutting.

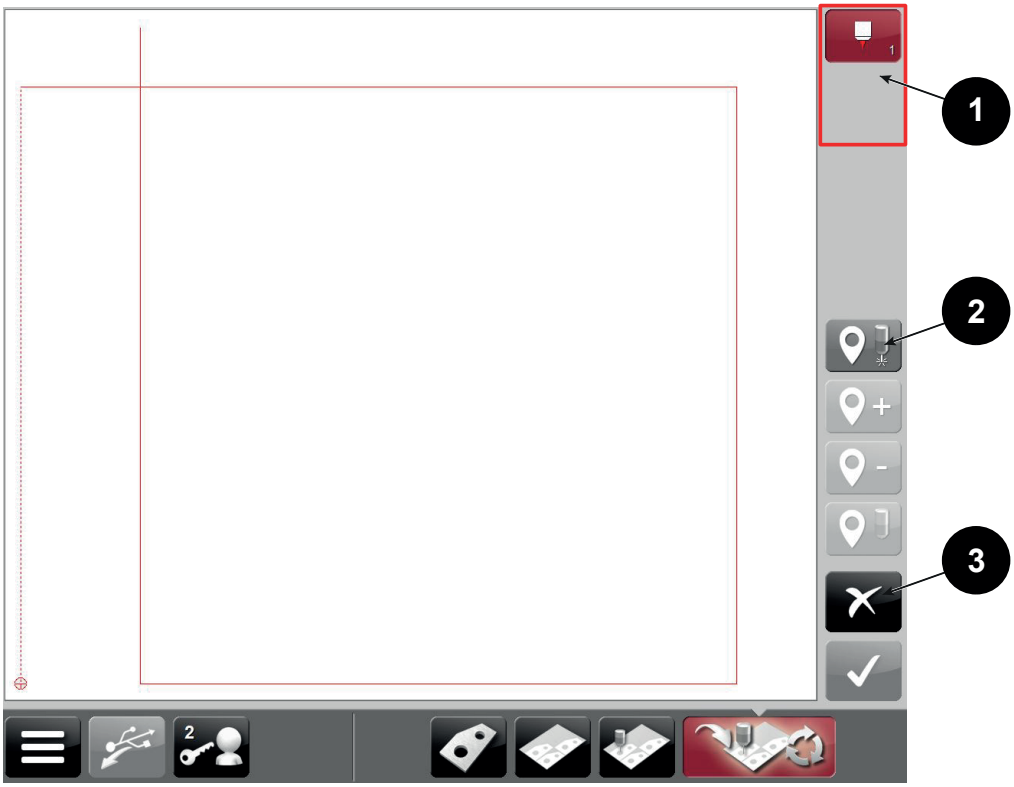
5.9 Skeleton or scrap cutting

For skeleton cutting, you must first select the cutting parameters (which is the case, for example, after a program has been cut).

Press **button 1**.



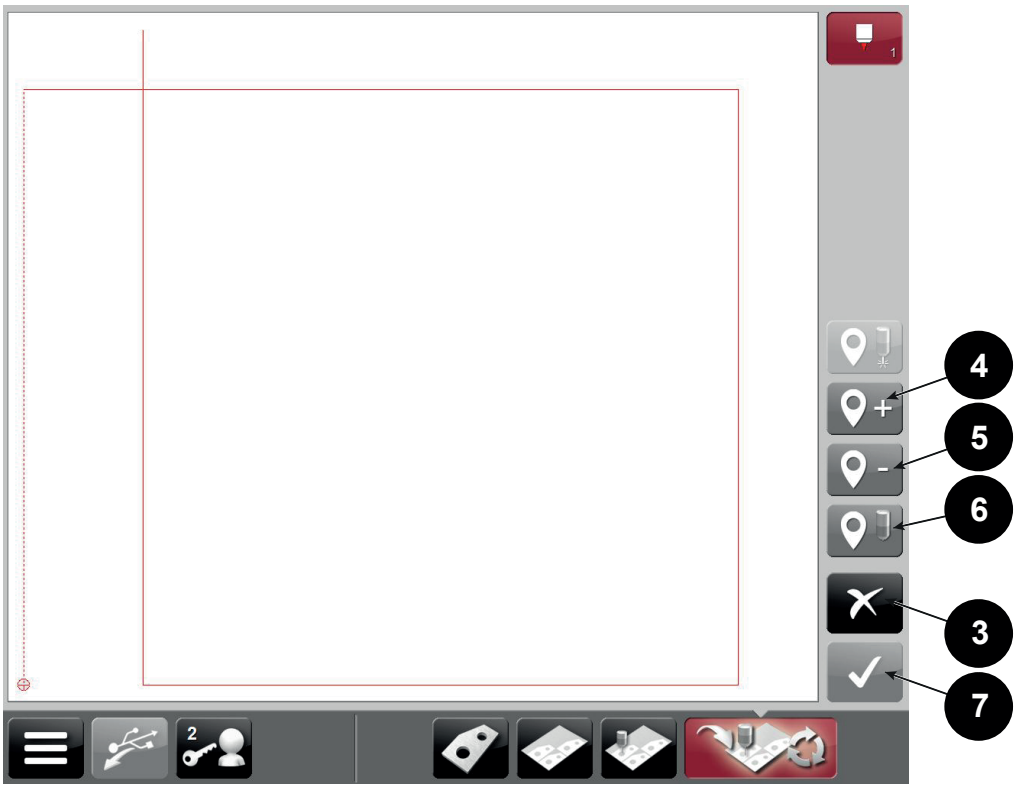
The following window will be displayed:



Press inside **area (1)** to select the process used (if the program is a multi-process program).
You can select the process for each strike.

Then go to one of the ends of the skeleton cut and press **button (2)**.

Other buttons may then be selected:



To add a point on the cutting path, press **button (4)**

To delete the last point saved, press **button (5)**

To define the last point of the cut, press **button (6)**

NB: several cuts can be defined for the same skeleton cutting program (in that case, press **button (2)** once again) after defining the end of the previous cut.

Then press **button (7)** to confirm, and press the **Cycle start** button to run the program.

The program will then run from the last point selected.

You can cancel at any time using **button (3)**.

6.1 Viewing the cycle in progress (cut preparation window)

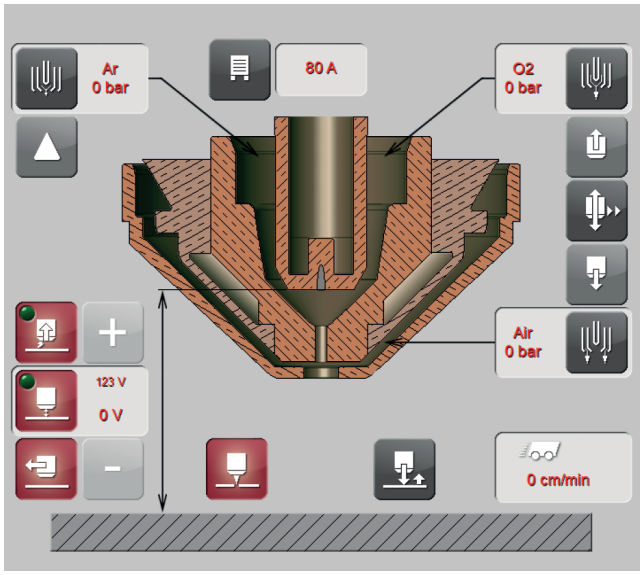
To access the cycle status views, press the button on the right-hand page. If you do not see the button, deselect the manual menu.

Manual menu

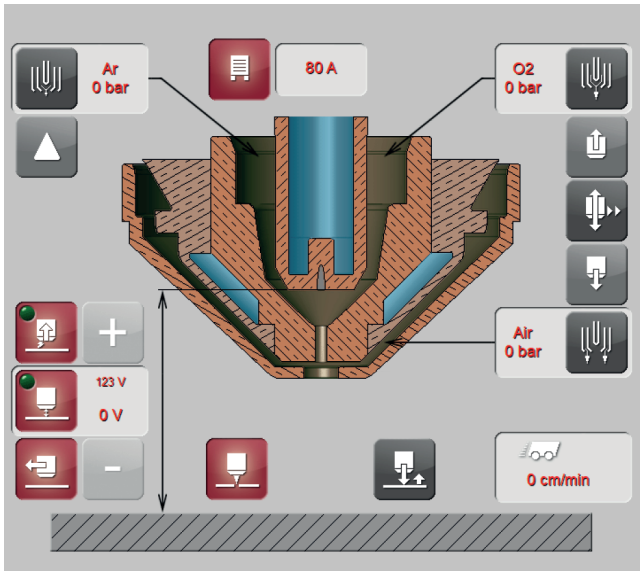
For HPi plasma

The different statuses displayed for **HPi** plasma:

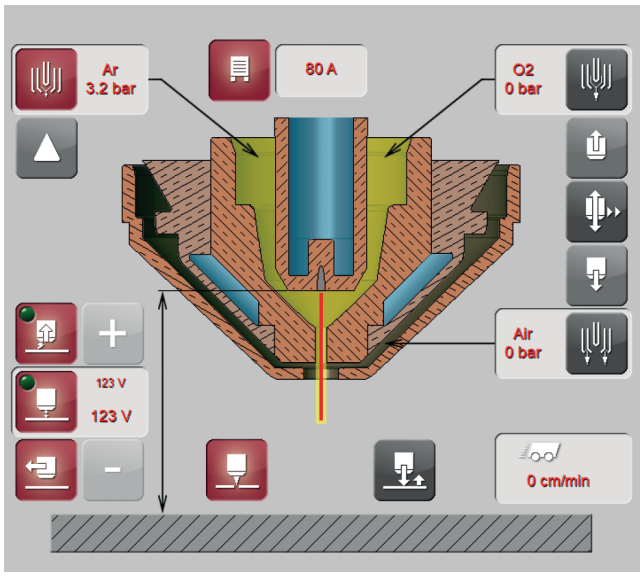
Initial status, power source off



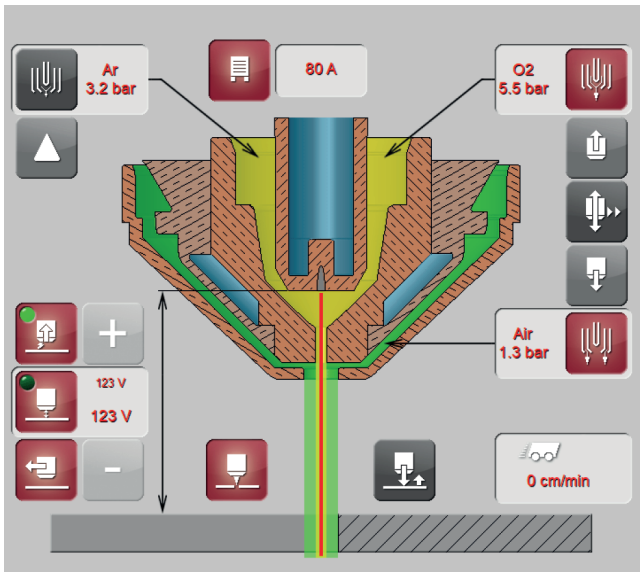
Power source on



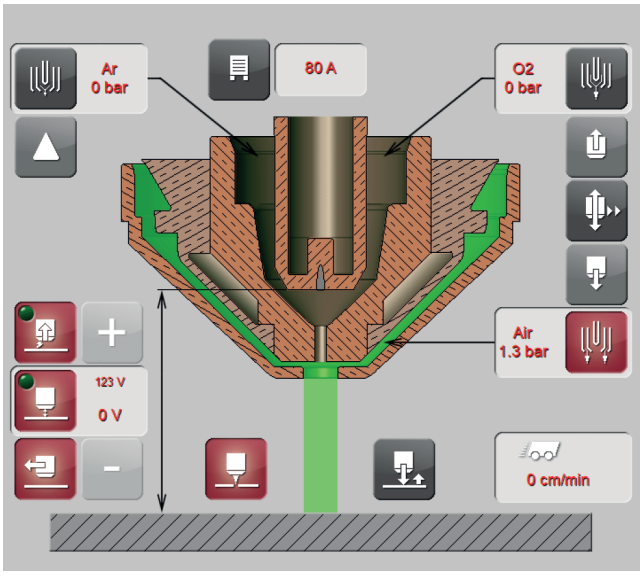
Pilot arc on



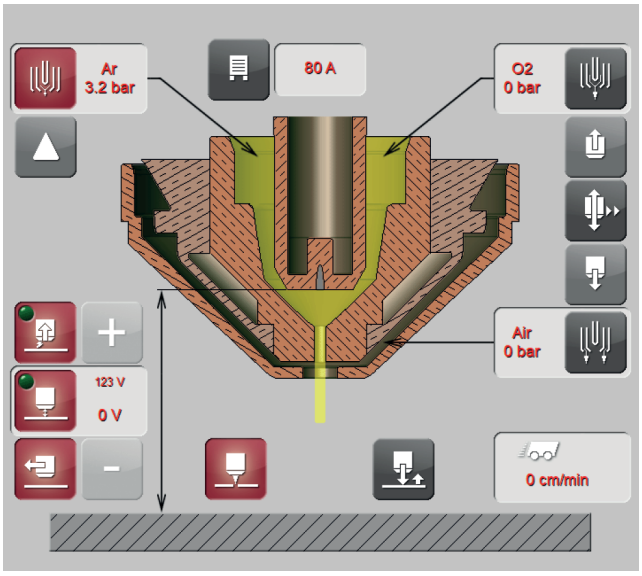
Cutting arc (with annular gas)



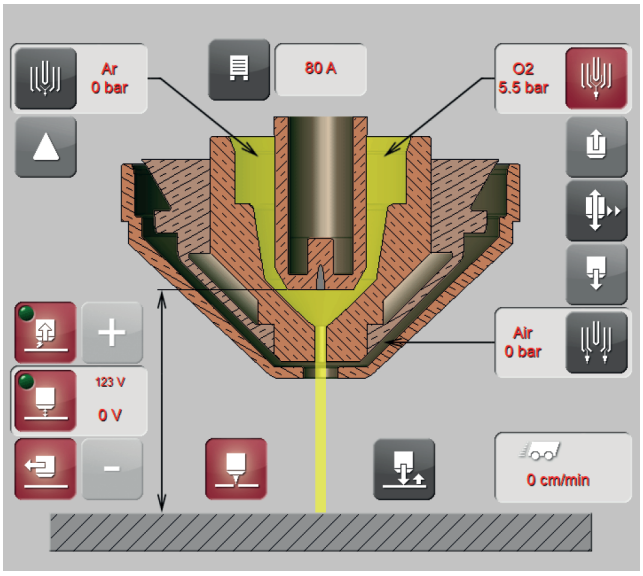
Annular gas test (with no power source)



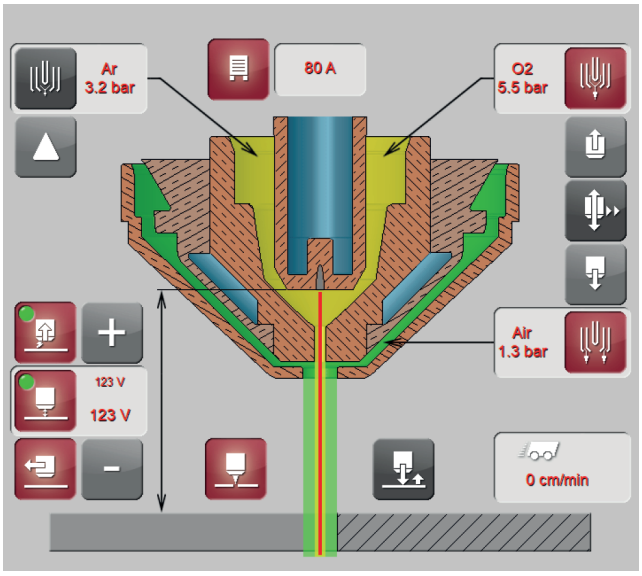
Pilot gas test (with no power source)



Cutting gas test (with no power source)



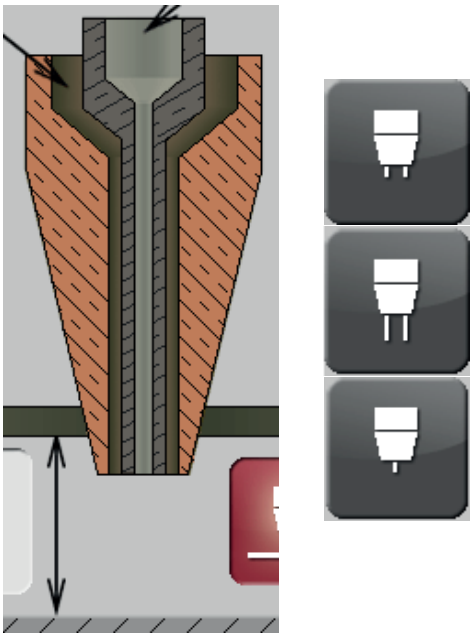
Sensing active (+voltage return)



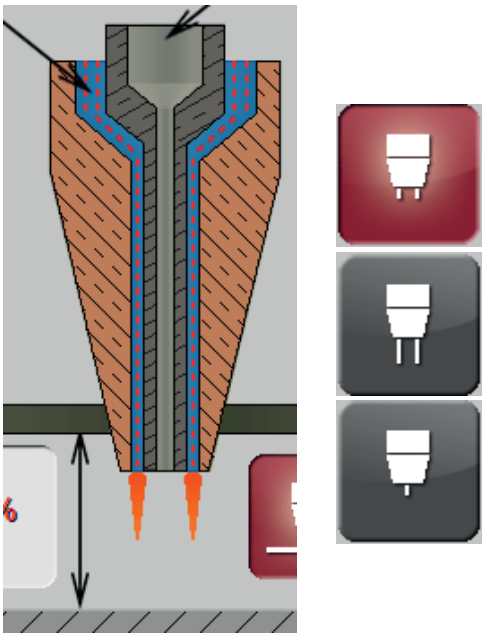
For oxy-fuel cutting

In the cycle viewing page, several statuses are possible for the torch:

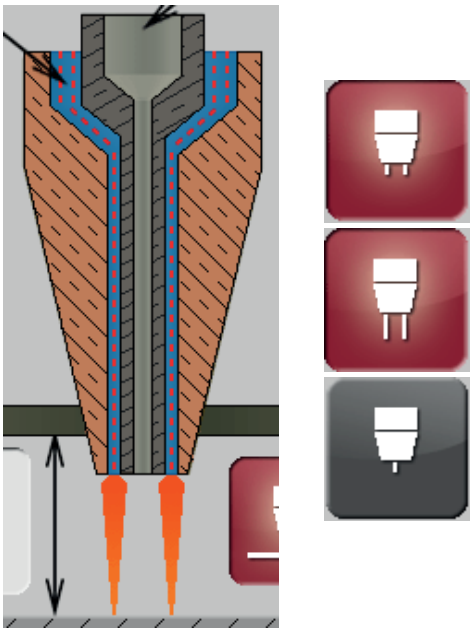
Torches off



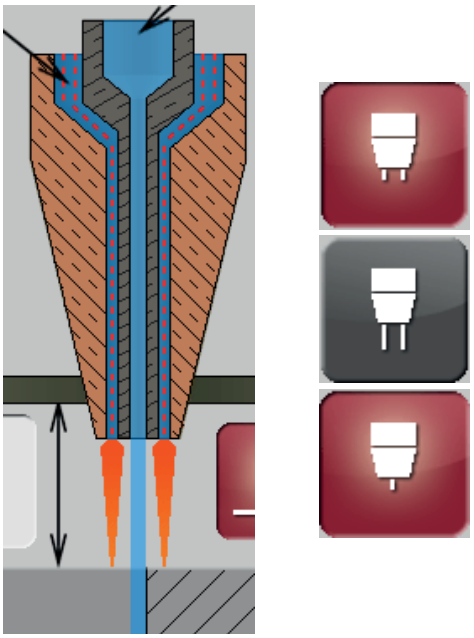
Torches heating

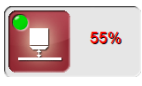


Torches overheating



Torches cutting



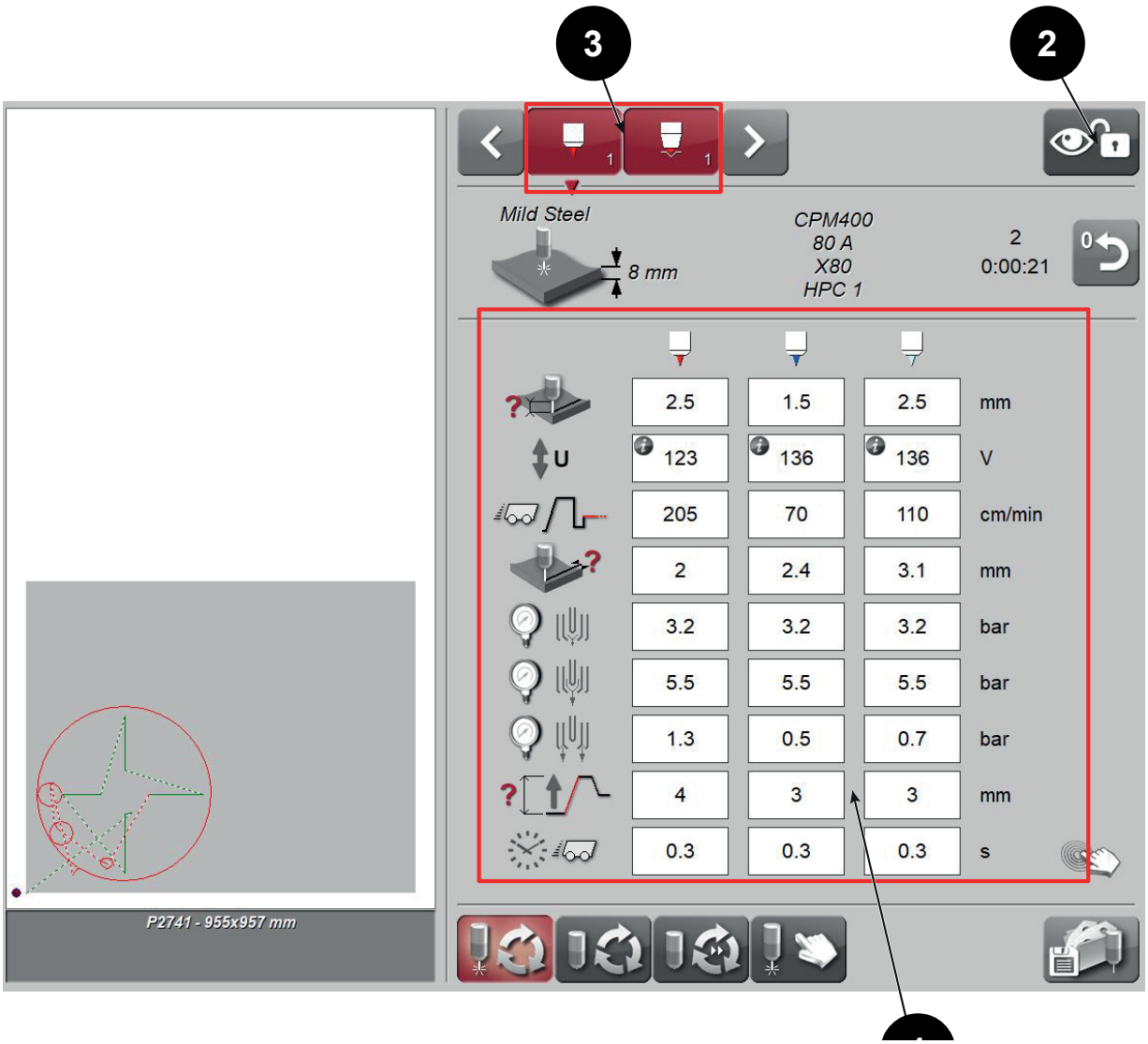


For sensing, the green LED is on (below) to show that sensing is active
If the button is red, that means sensing is requested

6.2 Viewing the parameters in progress (parameters + cycle page)

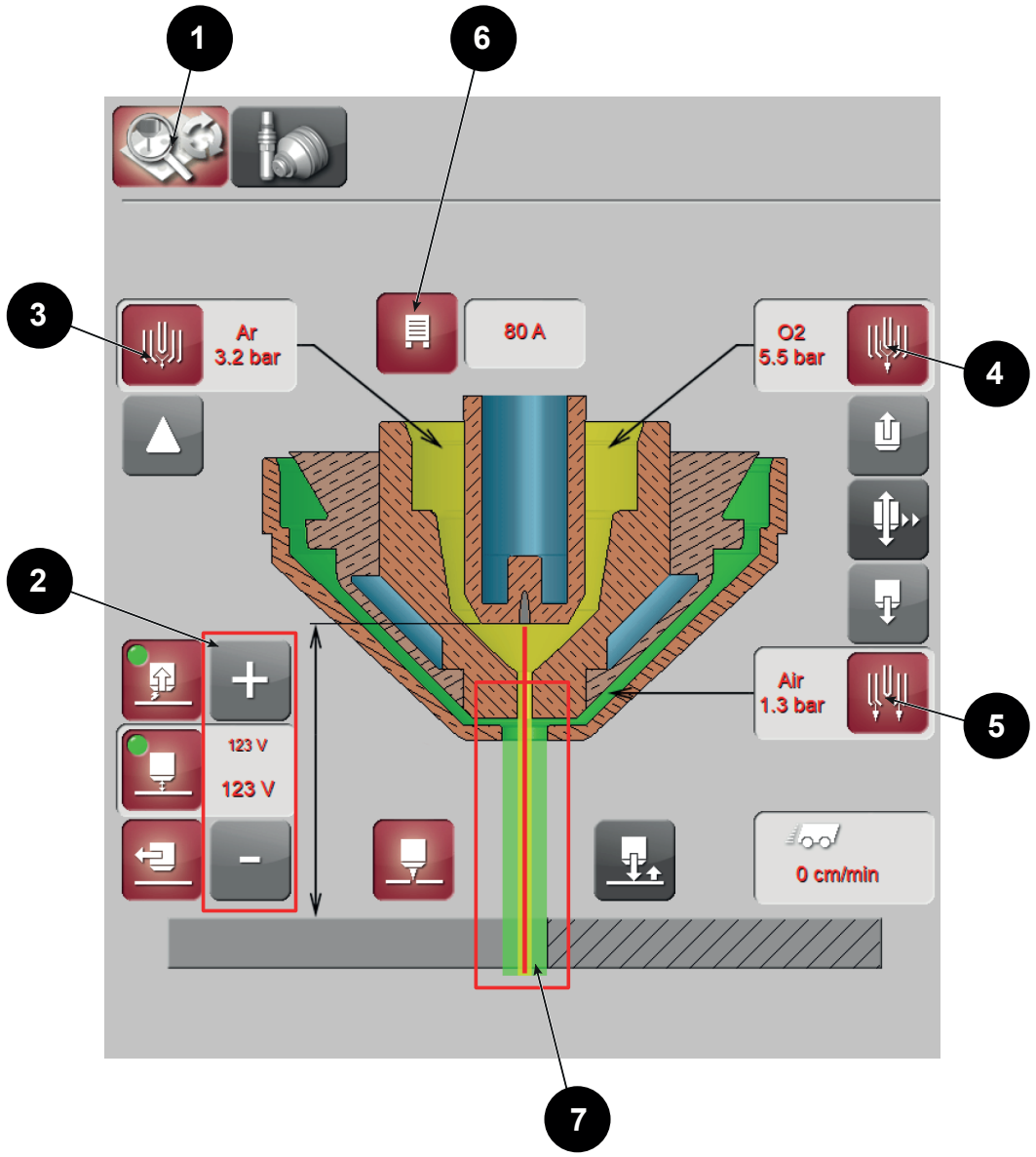
During the cycle, the parameters of **area (1)** are updated in real time by default according to the cutting/ marking in progress.

To freeze the parameter for an analysis, press **button (2)** for locking. Selecting a set of parameters for viewing (**area 3**) also activates locking.



The locked display appears like this.

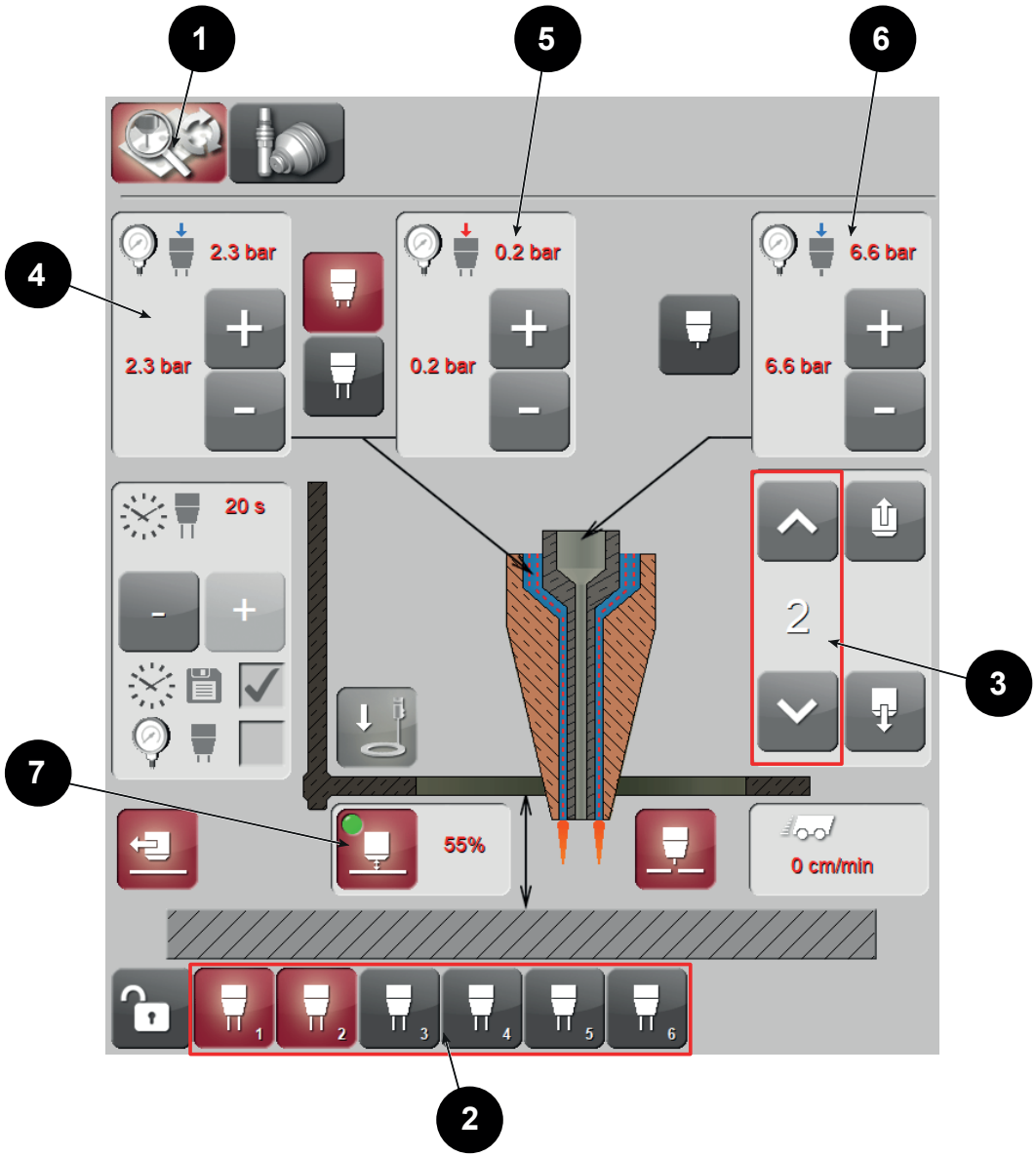
For HPi plasma



Press **button (1)** on the right-hand page to view these parameters.

- **button (2)**: Part electrode voltage (with +/- to modify the setpoint) and cutting speed.
- **button (3)**: Pilot gas pressure (and type of gas) return
- **button (4)**: Cutting gas pressure (and type of gas) return
- **button (5)**: Annular gas pressure (and type of gas) return
- **button (6)**: Power source status and cutting intensity used
- **button (7)**: Display of maintenance information.

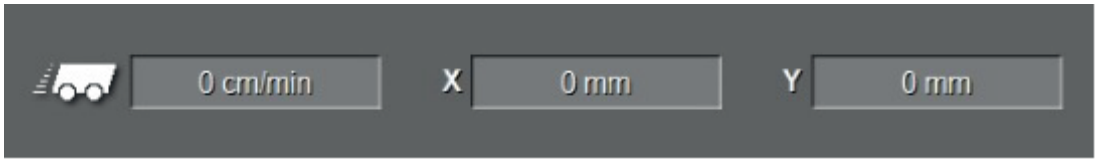
For oxy-fuel cutting



Press **button (1)** on the right-hand page to view these parameters.

- **button (2)**: Display of all the torches selected for cutting
- **button (3)**: Selection of a torch for viewing the data in this window
- **button (4)**: Heating oxygen pressure return for the selected torch
- **button (5)**: Fuel gas pressure return for the selected torch (**HPi²** oxy-fuel cutting only)
- **button (6)**: Cutting oxygen pressure return for the selected torch
- **button (7)**: Active sensing return (green LED on)

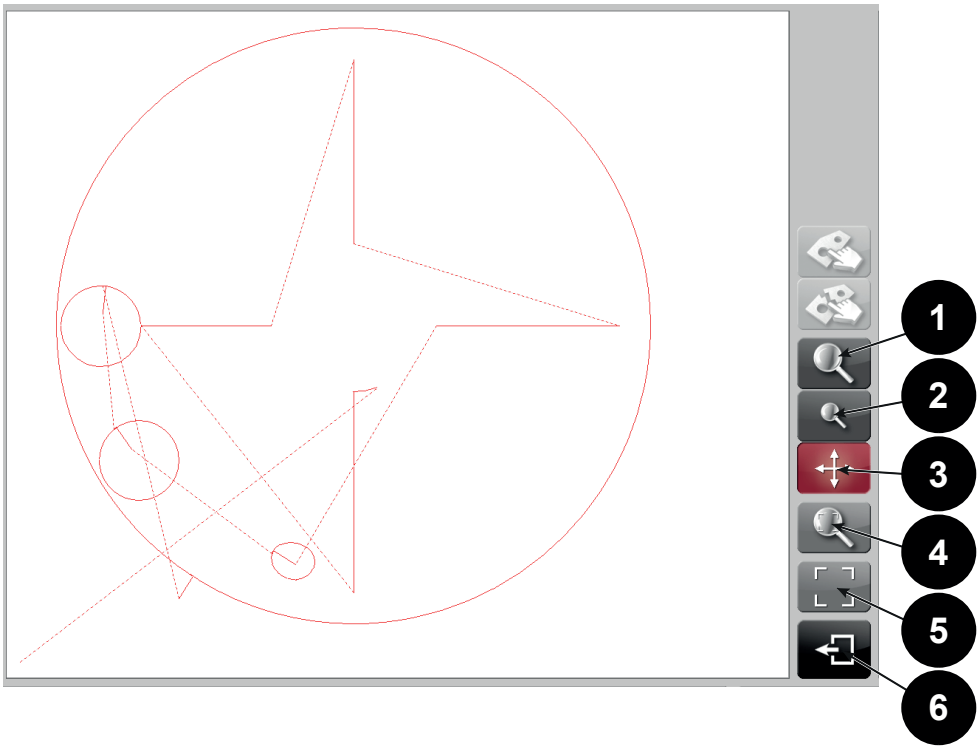
Speed in real time (also visible on the previous screen) and the machine position in relation to the program under way are visible in the area at the bottom right of the screen.



6.3 Following the cut in progress (path display)

The area for following the path can be found in the left-hand part of the screen (on a white background when the program is in progress.

For a wider view and for displaying the display functions, press the drawing area. The following screen is displayed on two-thirds of the screen.



Several functions are now available:

Button (1) is used to zoom in (several consecutive zooms are possible by then pressing on the area to zoom).

Button (2) is used to zoom out (several consecutive zooms are possible by then pressing on the area to zoom).

Button (3) when active is used to reposition the area to display.

Press **button (4)** to go back to the initial display (complete view of the part).

With **button (5)**, the program is displayed on the whole screen.

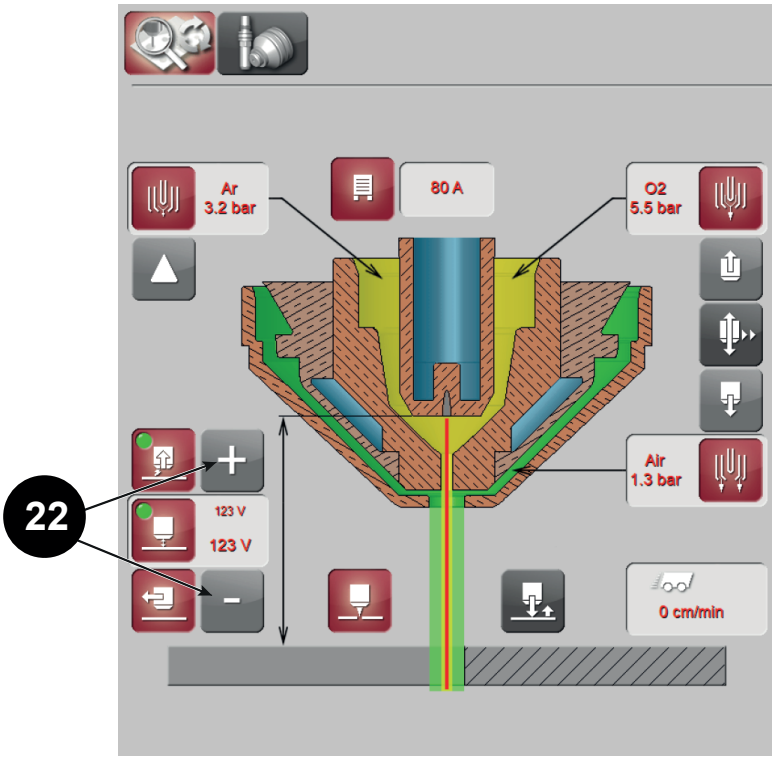
Then press this button to go back to the two-thirds screen display.

Button (6) is used to go back to displaying the program on a third of the screen.

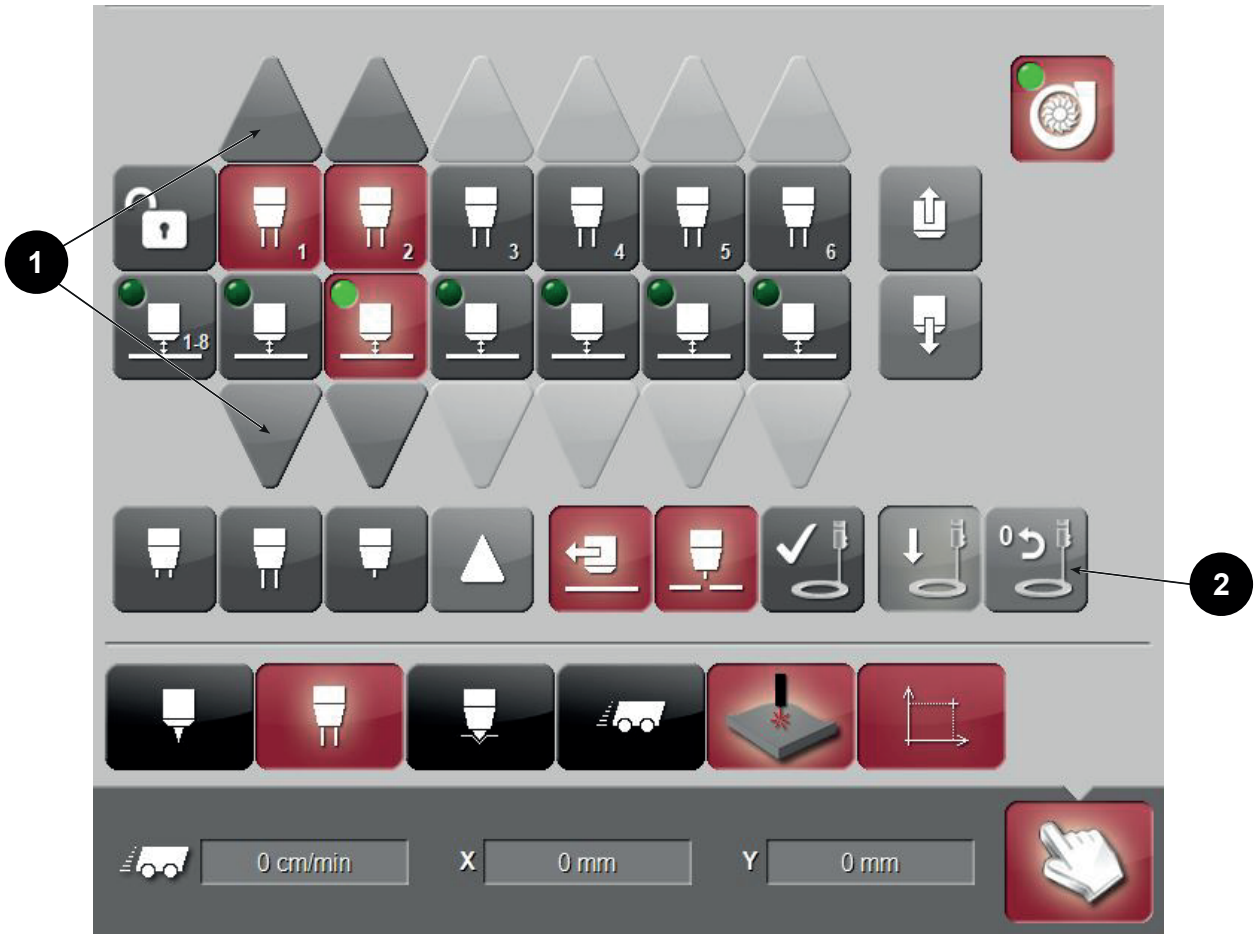
6.4 Editing process parameters: cutting speed and sensing

During the cutting process and sensing, the height of each torch can be modified. To do so, use the up/down buttons on the HMI or the up/down buttons (**button 5** below if it is declared) or **buttons 22** in the cutting page. These controls are only active when sensing is active.

For oxy-fuel cutting, use the buttons in **area (6)**

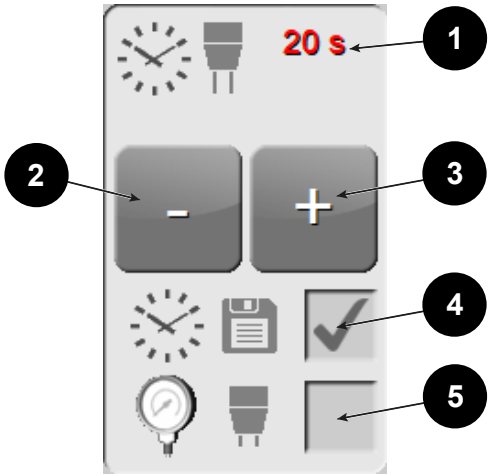


For oxy-fuel cutting, if the buttons for the up and down movements are not present on the machine, these buttons are displayed on the HMI (in the Manual page (**buttons (1)**)
Sensing height corrections may be cancelled by pressing **button (2)**.



6.5 Modifying the overheating time

Access the cycle page by pressing the button in the right-hand area during oxy-fuel cutting.



Area (1) displays the remaining overheating time.

Pressing **button (2)** once makes it possible to interrupt overheating.

Pressing **button (3)** for the first time allows you to extend overheating. Pressing it again interrupts overheating.

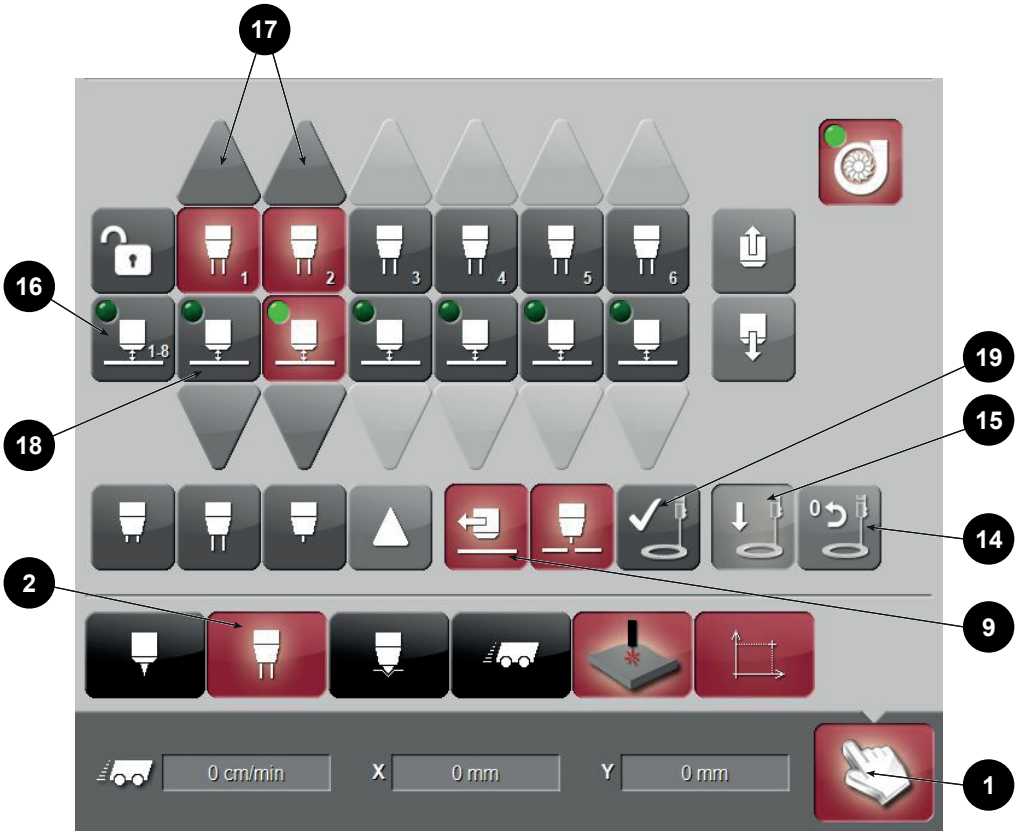
When **box (4)** is checked, the changes to the overheating time are applied to all the strikes in the program. They are valid as long as a new program is not loaded.

To make modifications permanent, the cutting scales must be modified (see section “Description of **HPi²** oxy-fuel cutting parameters”).

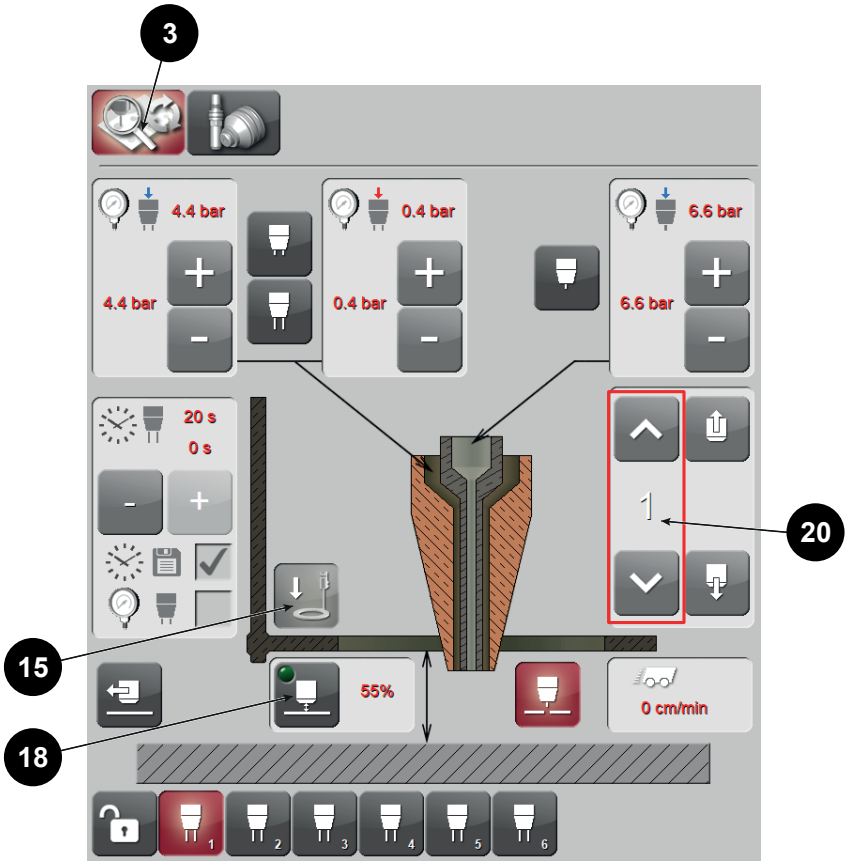
When **box (5)** is checked, overheating is carried out with heating pressures. Important! This box does not modify the cutting scales, but overheating pressures are not used while overheating (only when igniting). This feature can be used for starting cuts on the edge of the plate.

6.6 Managing sensing during oxy-fuel cutting

All the controls present on the manual page (pressing **button (1)** then **(2)**)



Some controls are also available on the cycle display page (see below)
This page is accessible by pressing **button (3)**



Button (14) (pulse) is used to reset all the manual settings of the torch height (see following section).

Button (15) is used for manually raising all the sensors (if they can be retracted)

If the sensors are raised, then this button lowers all the sensors. This button is greyed if the sensors are deactivated (**button (19)**)

Button (16) is used for activating or deactivating sensing for all the torches with the function.

Buttons (17) are used for modifying the sensing height using a sensor for each torch with the function. These buttons are only accessible in machines that do not have physical adjustment controls (see following section).

Button (18) is used for activating or deactivating sensing using sensors for each torch.
Button deactivated (grey): sensing deactivated.
Button activated (red): sensing permitted. LED on = sensing active.
For the cycle page, the number of the viewed torch is indicated in **area (20)**.
If the torch is not of the same type as that in the program, then it is greyed (**button (18)**).

Important! Sensing stops with an M14 or M114 code or under speed in the part program, even if sensing is selected.
Sensing is also suspended if the plate edge safety system is active (**button (9)**) and you are on the plate edge.

Button (19) deactivates all the sensors. In that case, the sensors must not move, and automatic ignition is also deactivated (if the sensors can be retracted). This control can be used for bevelling torches or multiple torch compasses.

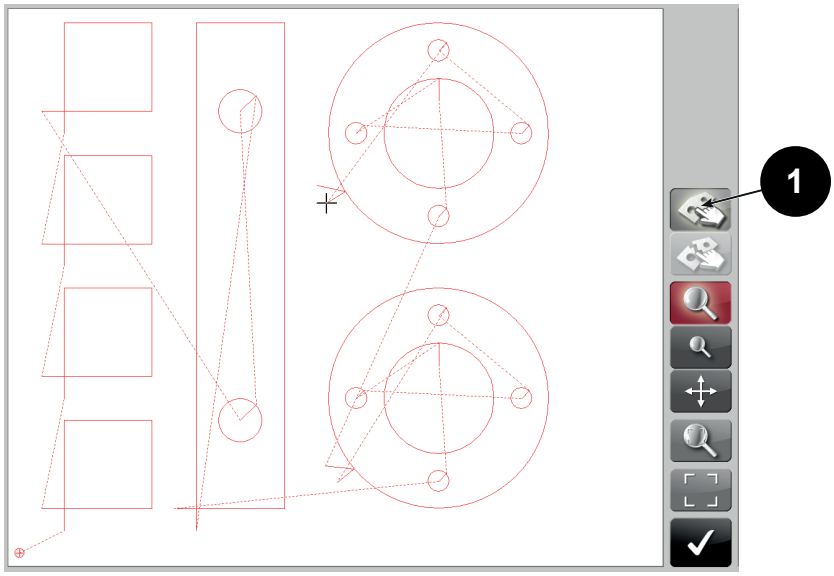
6.7 Managing a cutting incident (offset, path) etc.

If there is a cutting incident that makes it necessary to restart the cut:

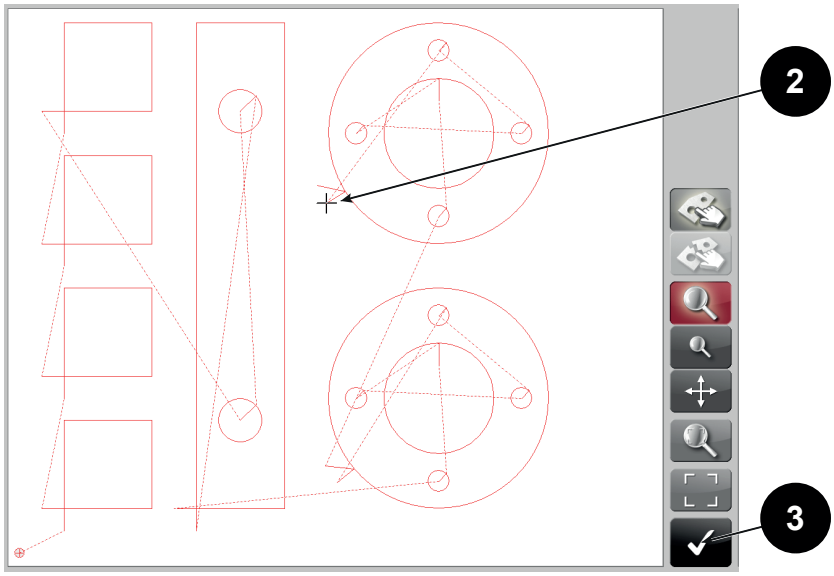
- Stop the program if it is not stopped (stop button on the console). The Cycle start button starts flashing.
- Remove the reason for the cutting incident.
- Go back or forward on the path to the location of the incident.
- Offset with a jog outside the part to cut so that it is not damaged by striking.
- Press Cycle start to restart the program.

6.8 Carrying out a graphics-based restart

If there is an incident or a specific job, a graphics-based restart may be needed.
To do so, the program must be paused (green button flashing)
Then press the Display area of the path located on the left of the screen.



Press **button (1)** to start the graphics-based restart



Then select the required strike for the restart (**cross (2)**).
Then confirm by pressing **button (3)**.
Start a cycle to restart the program with the selected strike.

6.9 Exiting a program (reset)

- Press Cycle stop at the chosen time.
- Wait for the end of the cycle, or after a cycle stop, ask for a program reset at the bottom right of the screen.

Program reset

Press this button if it is not visible.

Pressing the emergency stop also leads to a program exit.

On the other hand, switching to the Maintenance mode does not lead to a program exit.

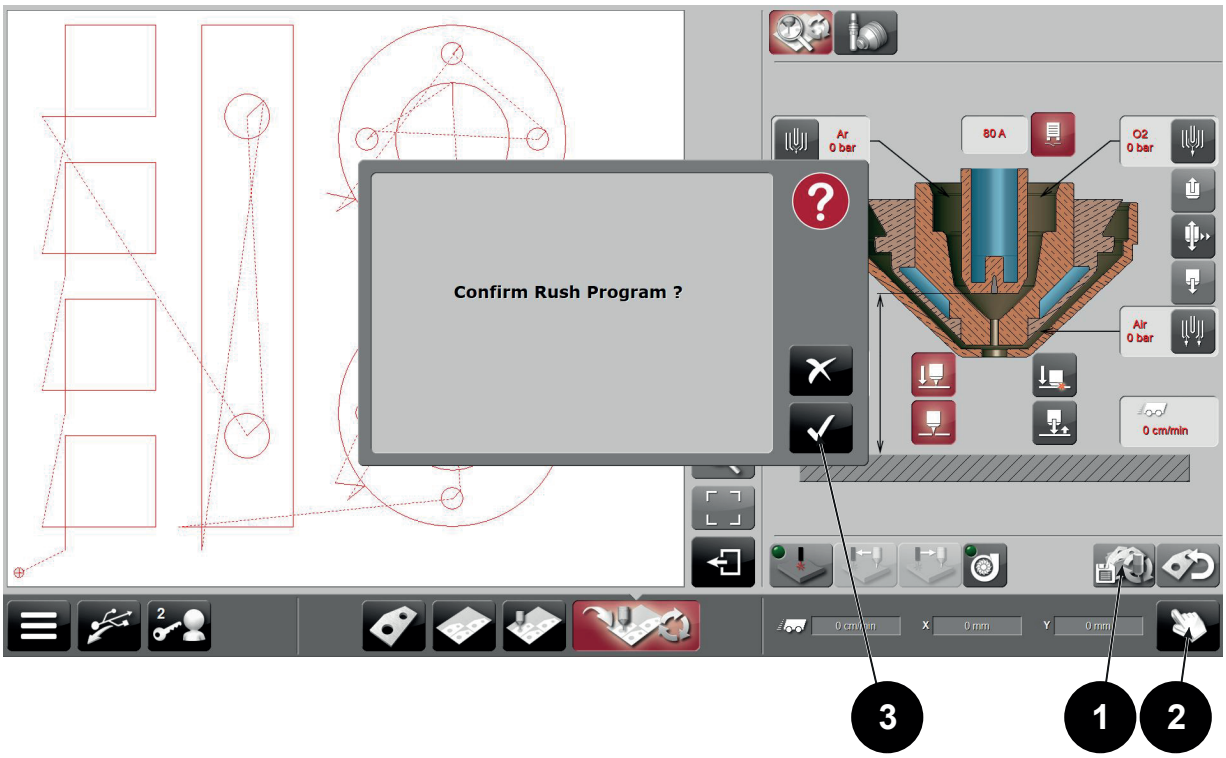
6.10 Saving a rush and resuming a rush

In some cases, it may be of use to save a program being cut to pick it up later.

This is done using the Rush function:

Saving the rush

When the program is under way, stop the cycle (program pause).

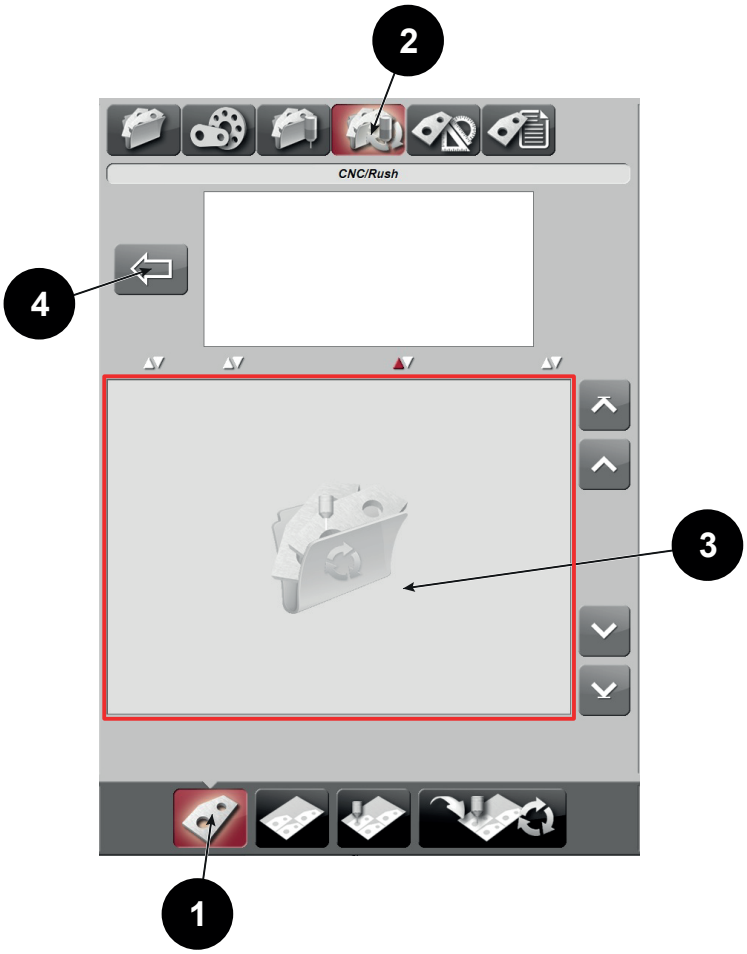


Press **button (1)**; if it is not visible, press **button (2)**.

Then select saving with **button (3)**.

Retrieving the Rush program

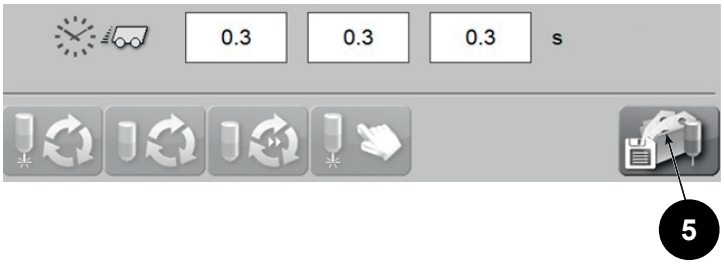
To reload the Rush program, press **button (1)**, then **button (2)**.
Select the program to resume in **area (3)** and change it in the numerical control by pressing **button (4)**.



6.11 Saving a job

Saving a program and the associated parameters (job) is available by pressing the Cycle page button (at the bottom of the central page), after first loading the program and confirming the cutting scales.

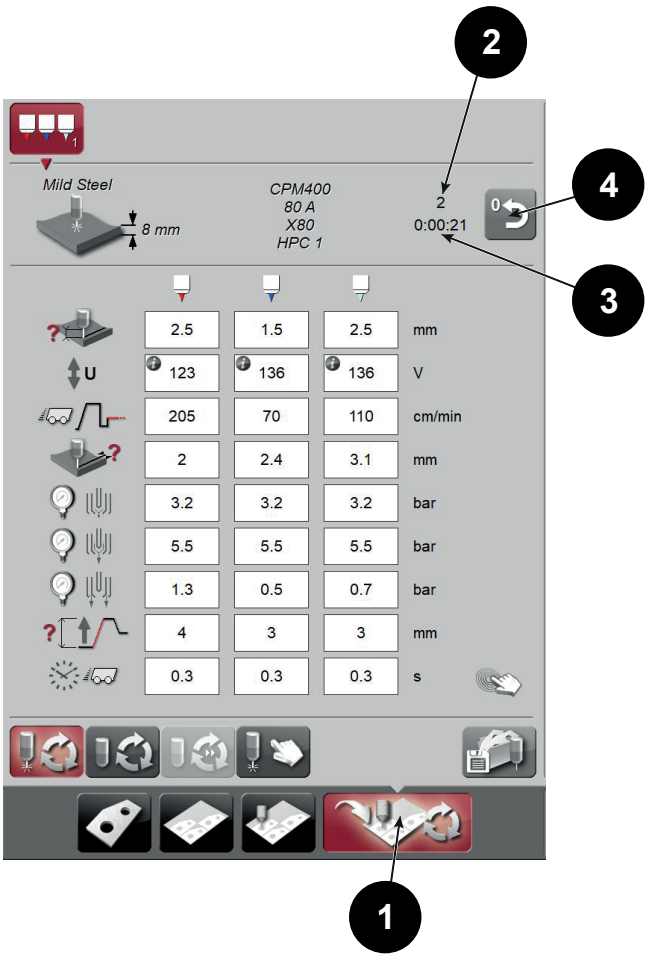
Cycle page



Button (5) is used for saving a program in a list (job).

7.1 Consumable maintenance: number of strikes/alerts

Display of the number of strikes/cutting time

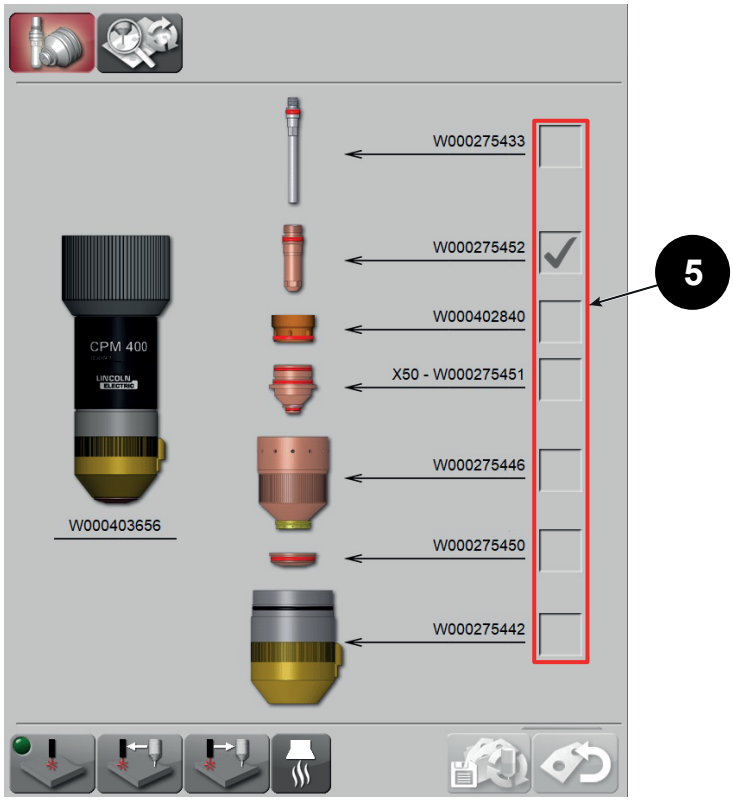


Press **button (1)** to display the cycle page
Area (2) provides the number of strikes carried out by this set of consumables
Area (3) provides the cutting time completed with this set of consumables.

Resetting the number of strikes and cutting time

During a change of consumables, reset the strikes/cutting time counter by pressing **button (4)**.
This reset is required for alerts about the wearing of consumables to operate.

Then, in the right-hand part of the screen, check the consumables replaced in **area (5)**.



Then confirm the selection.
The changed consumables are then noted in the production monitoring file (see section on “Retrieving production reports (level 2)”).

*7.2 Testing the solenoid valves (***HPi** *plasma)*

Leak tests are required every month in order to make sure that the gas selection solenoid valves are not leaking (risk of mixing gases)
Procedure:

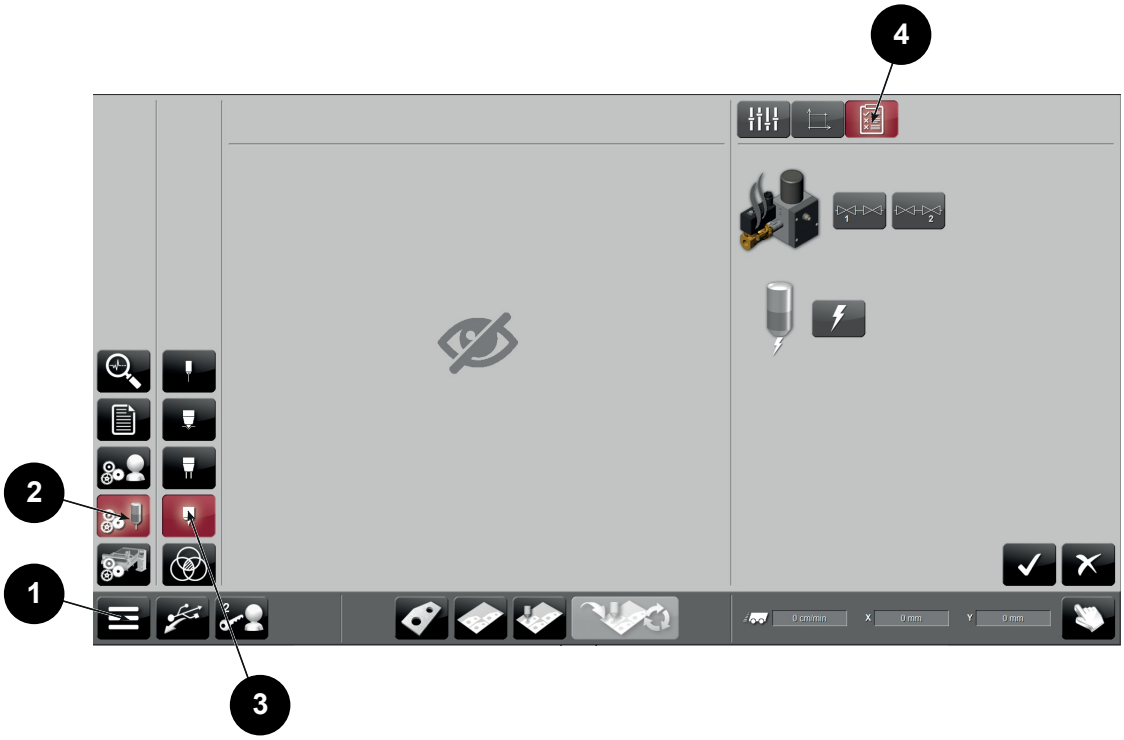
- Open the gas supplies and read the pressure at the pressure relief valves
- Start the test
- Shut the gas supplies
- Wait for 3 minutes
- Check the behaviour of the pressure values at the pressure relief valves.

For locating the different solenoid valves, refer to documentation:

- 86954515: **NERTAJET HPi** plasma installation
- 86954617: Optional **HPi** Stainless steel
- 86954618: Optional vortex

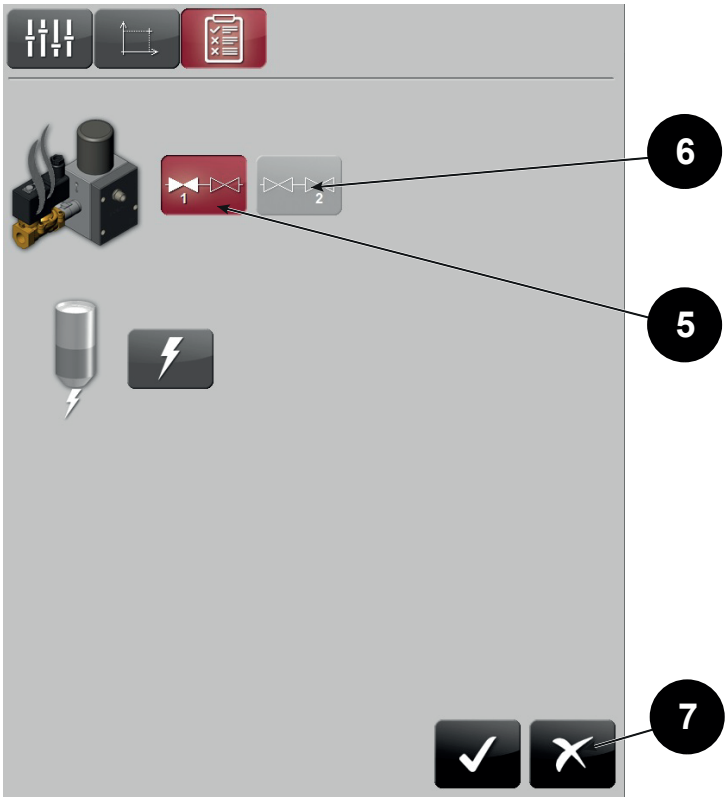
To access the tests (in level 2):

Successively press **buttons (1) ➜ (2) ➜ (3) ➜ (4)**



Then press **button (5)** to start the tests of valve 1, then **button (6)** to restart the tests of valve 2 (display the pressure values at each test)

If the pressure drops, then there is a leak and the valve must be replaced.



Case of leak test 1:

Gas pressure drops: Possible leak from solenoid valve

- Ar Y5
- O2 Y1 or Y3
- N2H2 (or Air on T5) Y11
- Air Y7
- ArH2 Y12 or Y15
- N2 Y13 or Y16

Case of leak test 2:

Gas pressure drops: Possible leak from solenoid valve

- O2 Y9
- N2 Y6

The affected solenoid valves must be inspected, along with the line in which they are located.

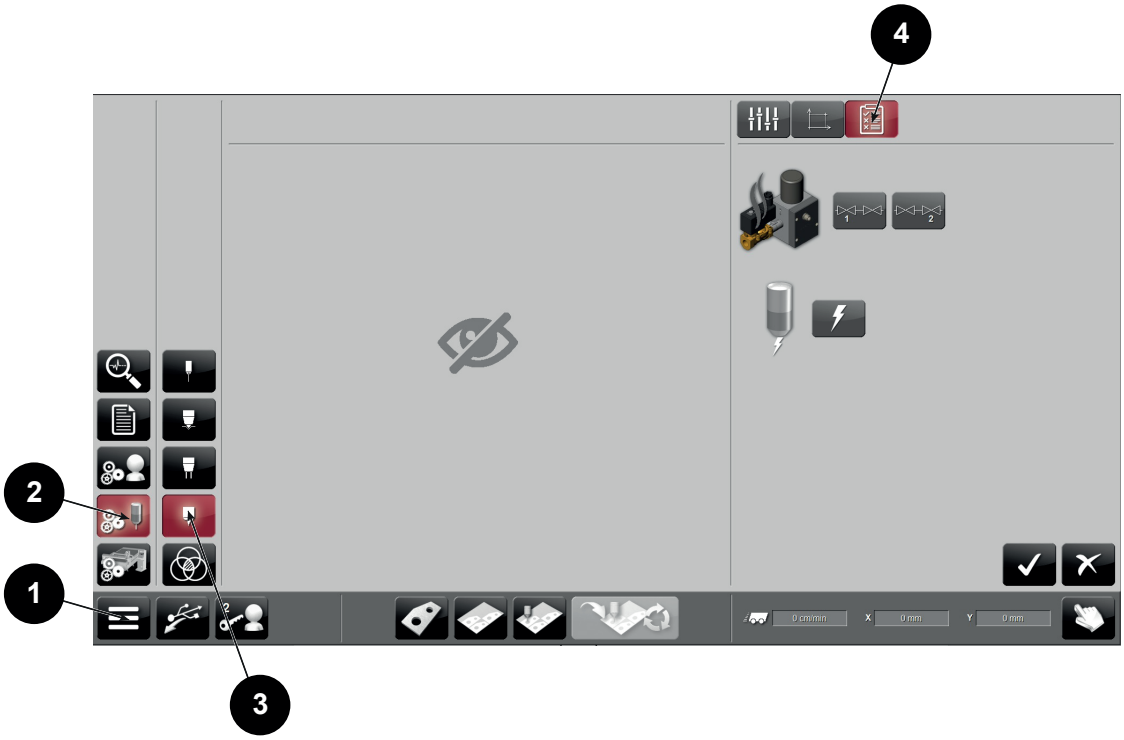
Exit the window using **button (7)**

7.3 Carrying out an HF test (level 2)

An HF test may be required in the event of troubleshooting, to make sure that the spark emission during the strike operates correctly.

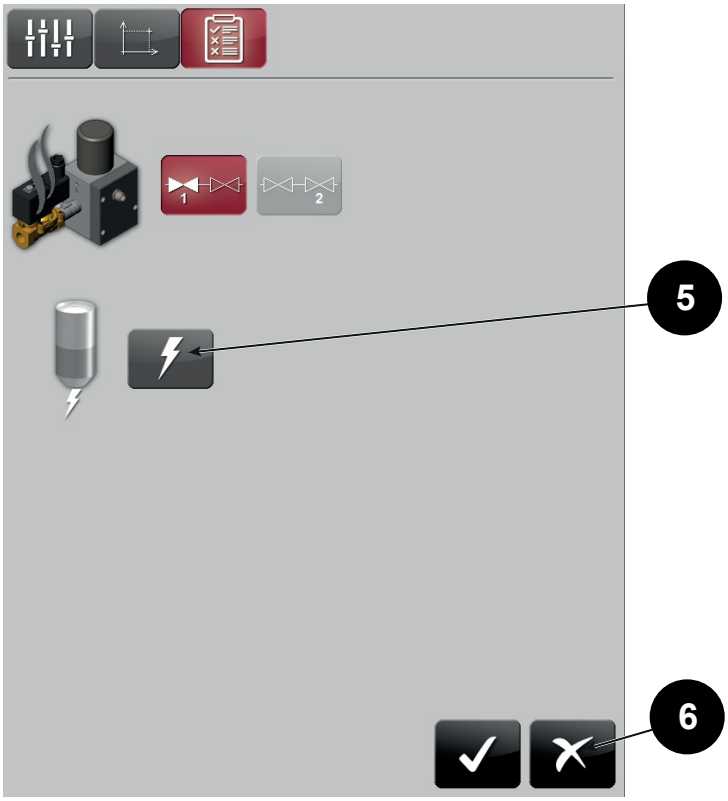
To access the tests (in level 2):

Successively press **buttons (1) ➜ (2) ➜ (3) ➜ (4)**



Then press **button (5)** to start the HF test and press it once again to stop.

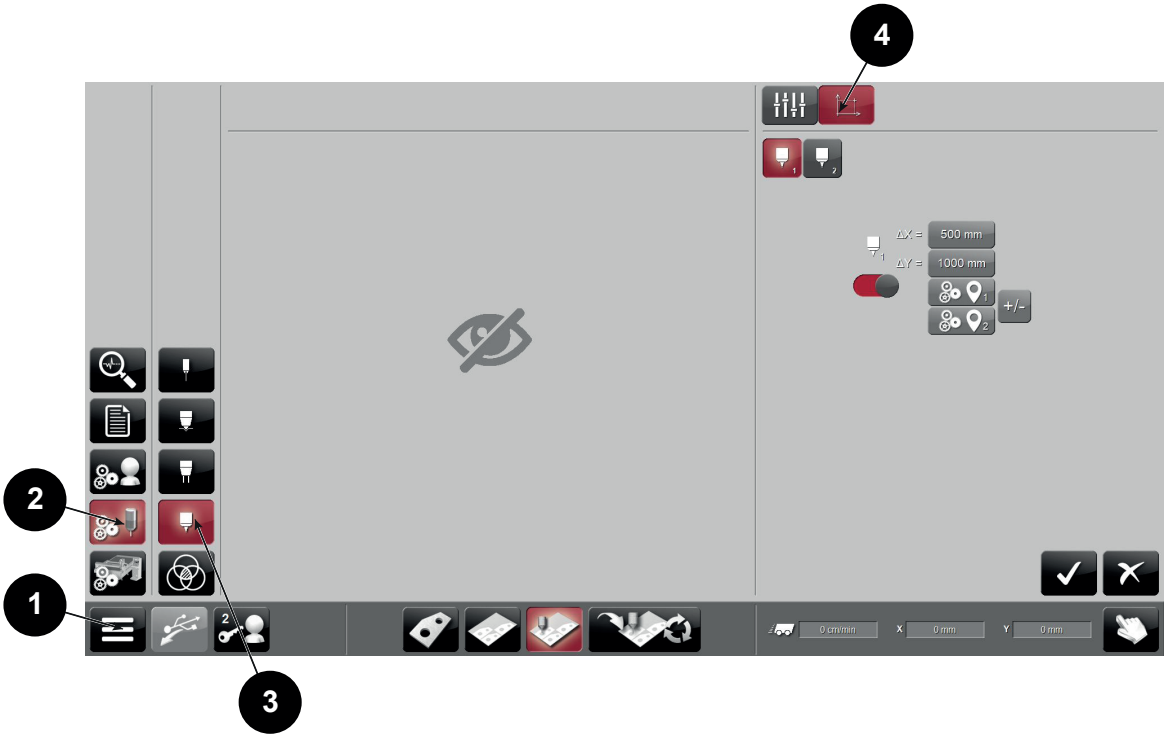
Then press **button (6)** to exit the page

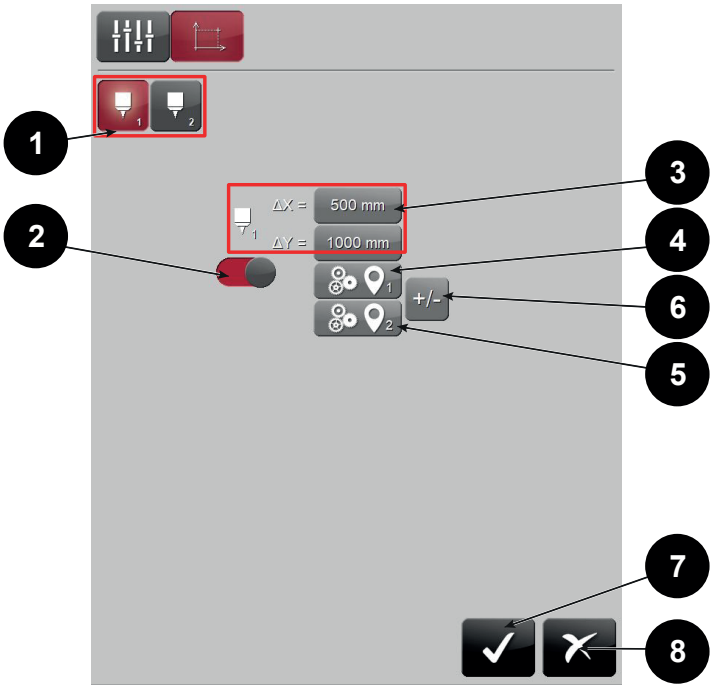


7.4 Adjusting the process offsets (level 2)

Fixed (tool-related) offsets for plasma

Successively press **buttons (1) ➜ (2) ➜ (3) ➜ (4)**





First select the tool to which the offset applies, using **button (1)**, then activate it with **selector (2)**.

Note that the offset is provided in relation to the main tool = XY coordinates

Two solutions for adjustment

- Either in **area (3)**, set the plasma offset in relation to the torch, that is the movement the tool holder must make to go from the main tool position to the selected tool position
- Or position the main torch above a reference point, press **button (4)**, then place the plasma torch above the reference point and press **button (5)**.

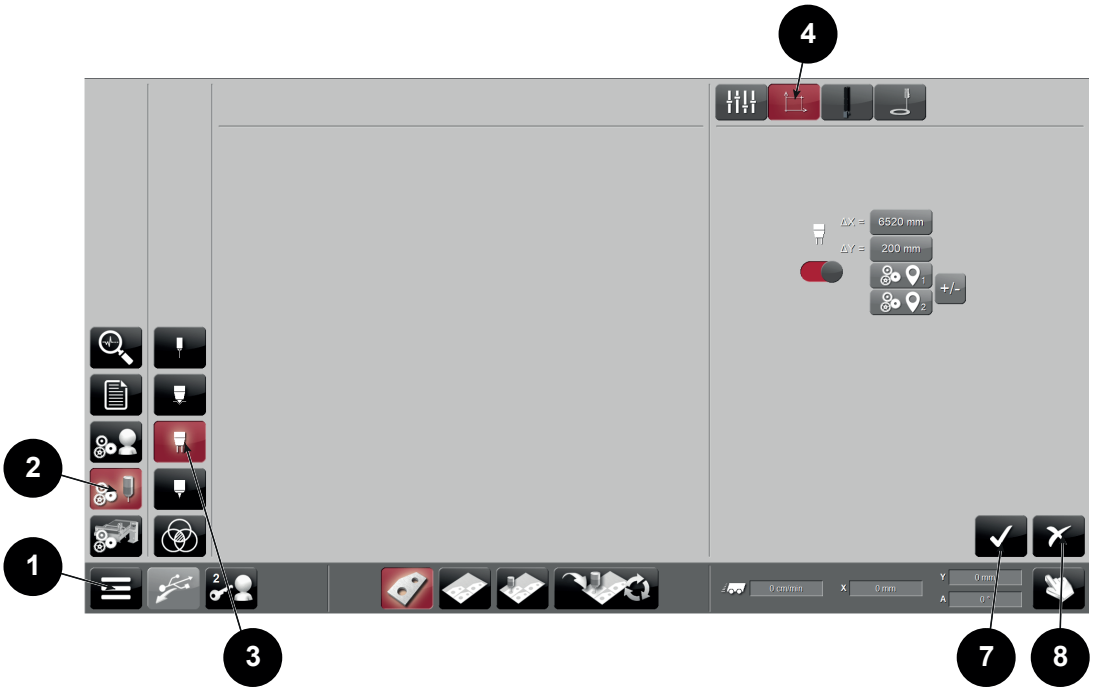
If you observe an inversion of the direction in relation to that required, press **button (6)** to invert the movement direction.

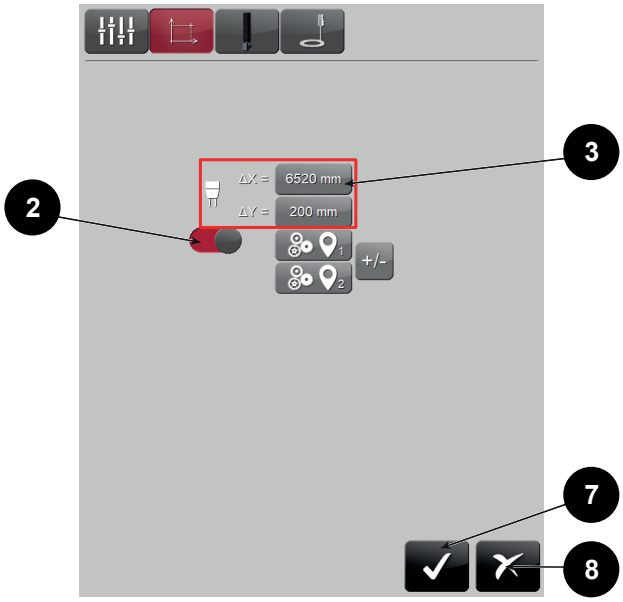
Then press the emergency stop button.

Then confirm by pressing **button (7)** or cancel by pressing **button (8)**.

Fixed (tool-related) offsets for oxy-fuel cutting

Successively press **buttons (1) ➜ (2) ➜ (3) ➜ (4)**





This adjustment is active only with oxy-fuel cutting + plasma programs.

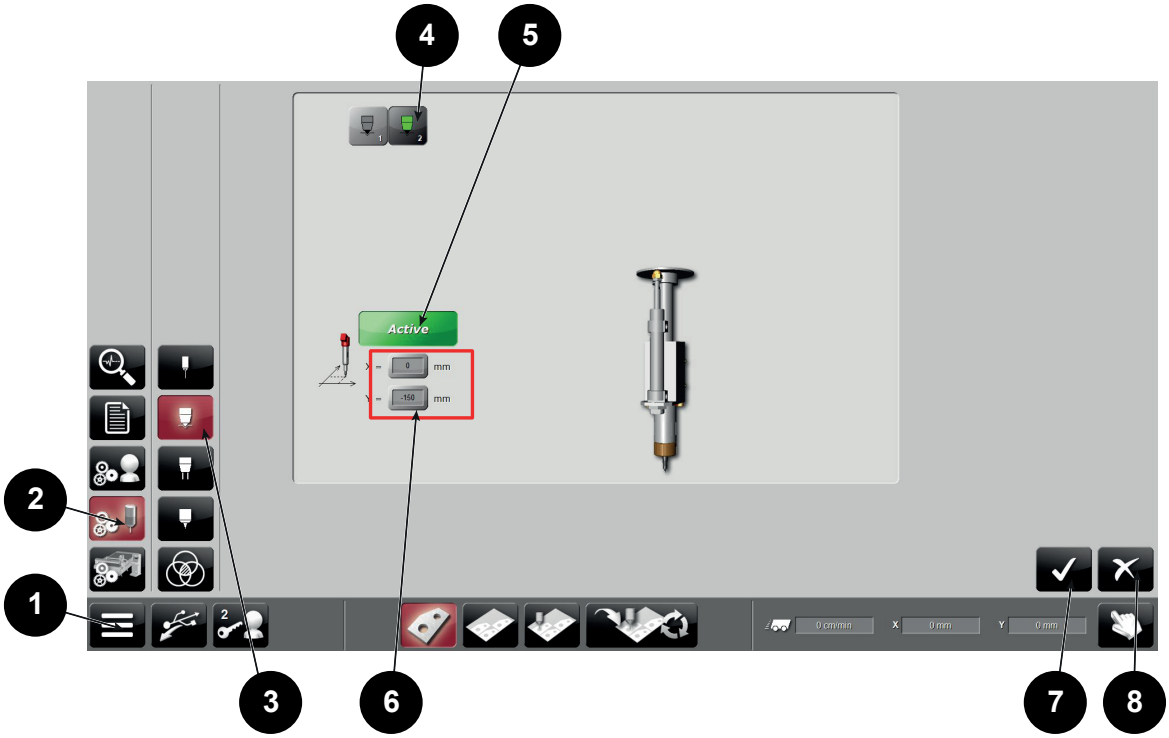
The zero point of the offsets is in relation to the master tool, and the offset may be positive or negative. Confirmed offsets are taken into account whenever oxy-fuel cutting is called up by the part program (S2 etc.).

To enter an offset:

- Activate the function with **button (2)**.
- Enter the X and Y offset values in **area (3)**.

Then confirm by pressing **button (7)** or cancel by pressing **button (8)**.

Fixed (tool-related) offsets for Essential markers



The zero point of the offsets is in relation to the master tool, and the offset may be positive or negative. Confirmed offsets are taken into account whenever the marker is called up by the part program (S3 etc.).

To enter an offset:

- Activate the function with **button (5)**.
- Enter the X and Y offset values in **area (6)**.

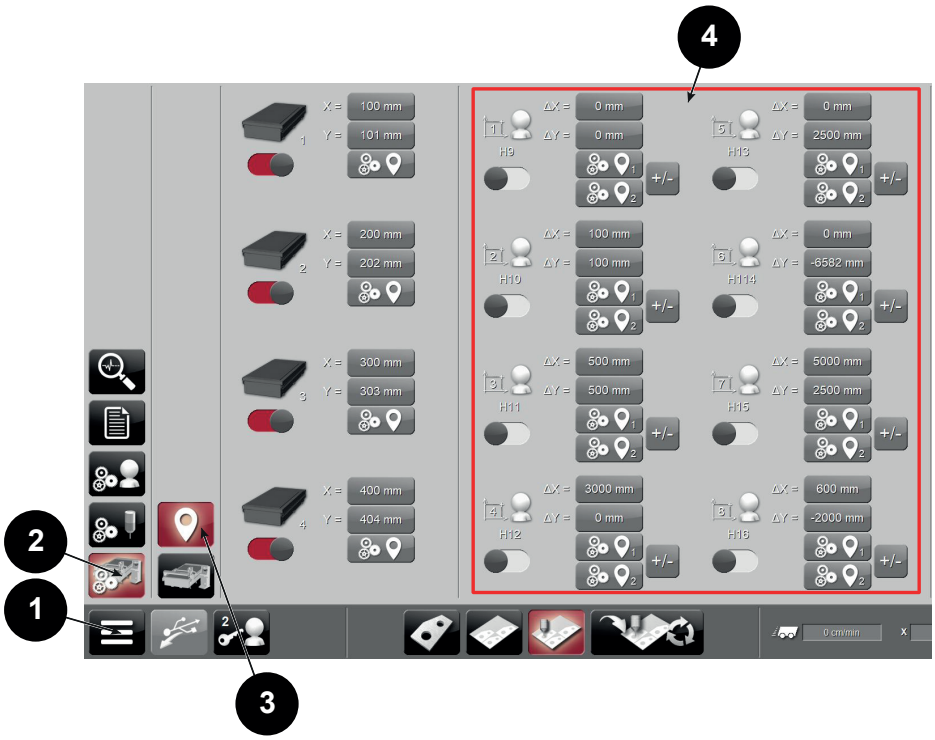
Then confirm by pressing **button (7)** or cancel by pressing **button (8)**.

Free (program-related) offsets

Free offsets are called up by the part program, and are not directly related to the tool.

There are 8 possible offsets: H9 to H16

To adjust these offsets (level 2):



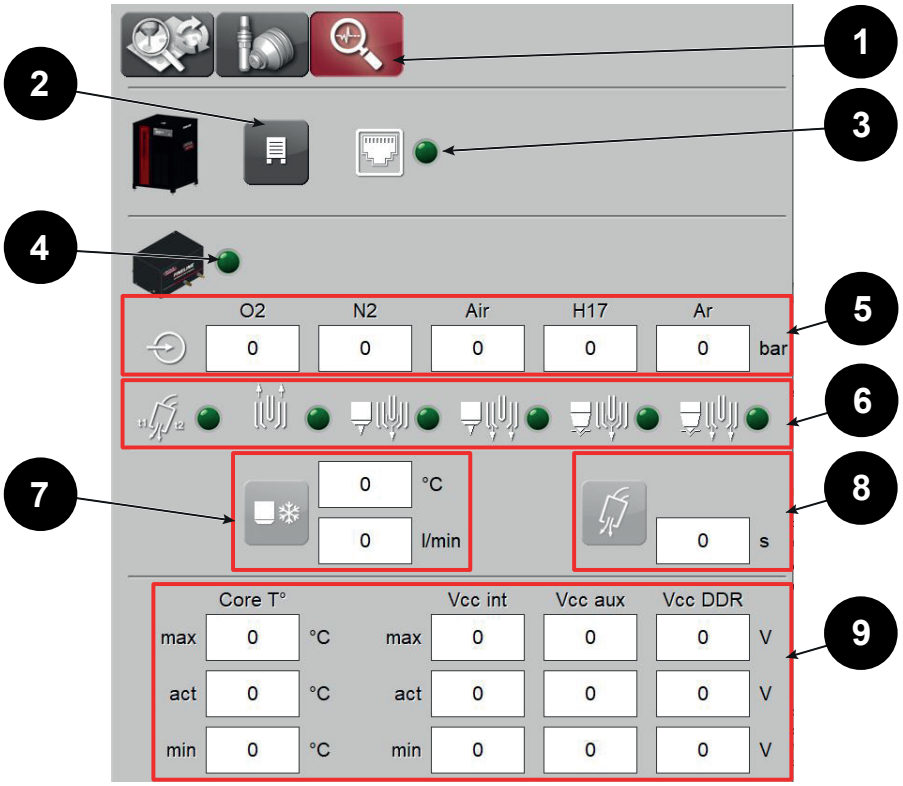
Successively press **buttons (1) ➜ (2) ➜ (3)**, the free offset adjustments are in **area (4)**.

7.5 Viewing the return from the FINELINE installation

Once the plasma process is selected (NCRun) press **button (1)** on the right-hand page. The window below will be displayed.

If you cannot see **button (1)**, deselect the manual menu

Manual menu



Button (2) is used to control:

- Starting up the power source
- Shutting down the power source if it is operating.
- The button is grey if the power source cannot be powered, red if it is powered, and flashing if it is starting up.

Indicator (3) shows the status of communication between the machine and **FINELINE** (light green = in service)

Indicator (4) shows the status of the gas controller (light green = in service)

Power source supply pressure values are displayed in **area (5)**.

The statuses of gas lines are shown in **area (6)** (light green = open)

The cooler can be shut down or started up from **area (7)**. The liquid flow rate and temperature are also indicated

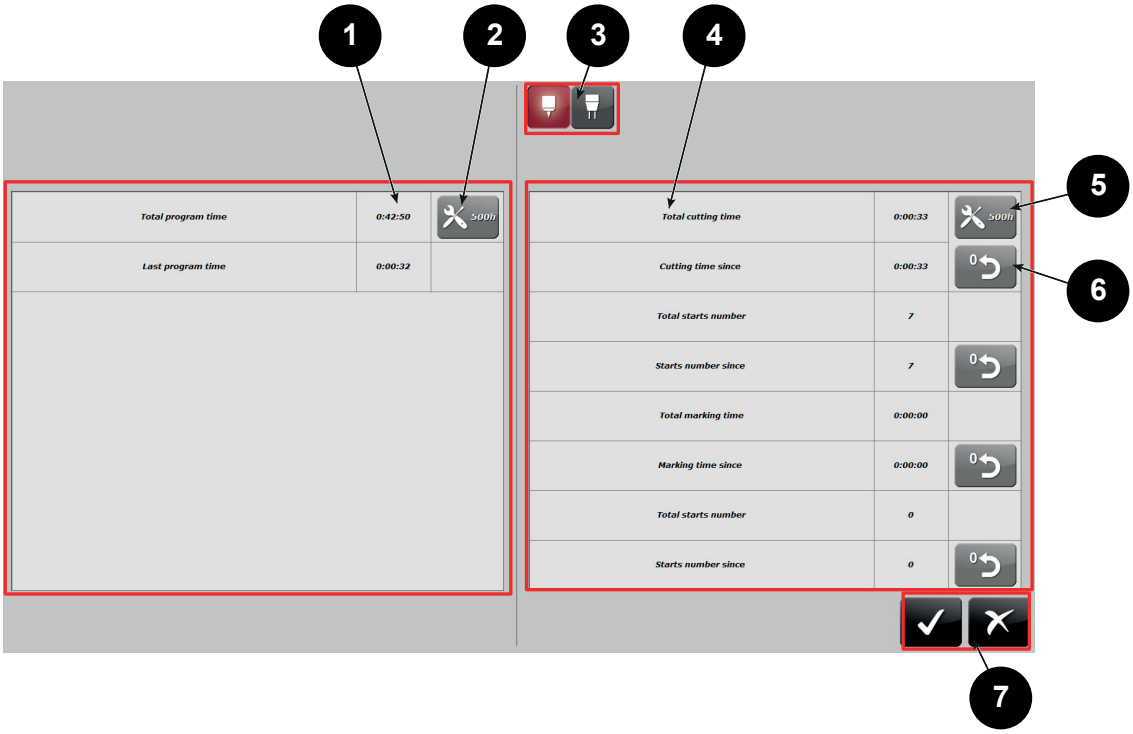
A manual purge can be controlled from **area (8)**. The purging time left for the purge under way is indicated on the right.

The temperatures of the different power source components are displayed in **area (9)**.

7.6 Viewing the cycle times (level 2)

To view the cycle times of the latest programs, go to:

The following screen is displayed:

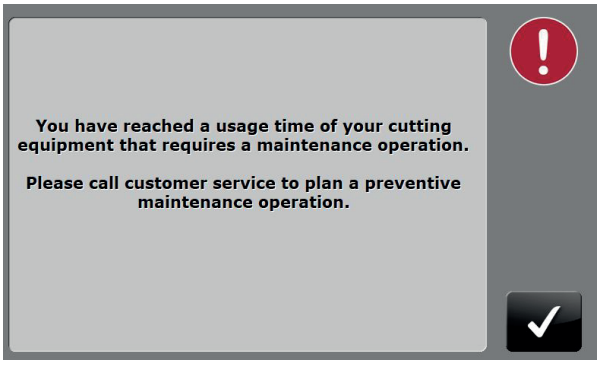


Area (1) contains the total program time for all processes, and the time of the last program.
Pressing **button (2)** allows you to set the program time between each maintenance operation
To select the cutting time for each process, select it in **area (3)**.

For plasma, several counters are available in **area (4)**:

- The overall cutting counter. Pressing **button (5)** allows you to set the plasma cutting time between each maintenance operation.
- A cutting time, which can be reset by the operator (level 2), by pressing **the reset button (6)**
- A total strike number
- A resettable strike counter
- Identical counters for marking.

To exit the page, press one of the buttons in **area (7)**.
When one of the limits is reached, the following message is displayed every time the machine starts.

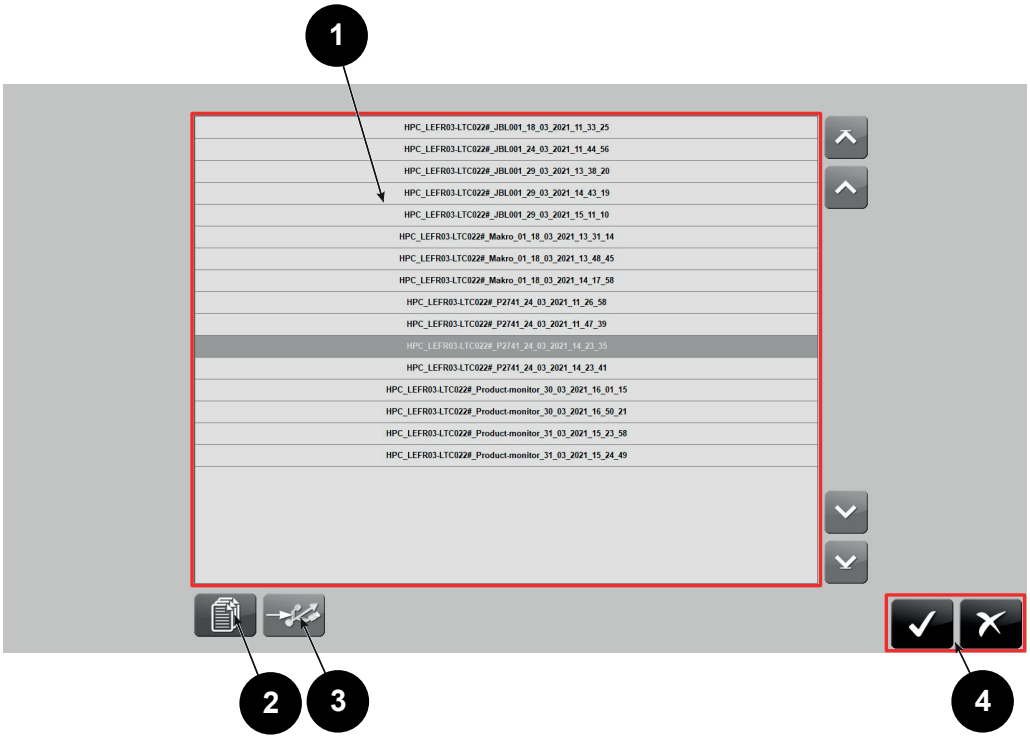


The times are reset by the technicians of **Lincoln Electric** when they maintain the machine.

7.7 Retrieving production reports (level 2)

To obtain production reports of the programs applied in the machine, go to:

The next screen is then displayed, with the list of production reports:



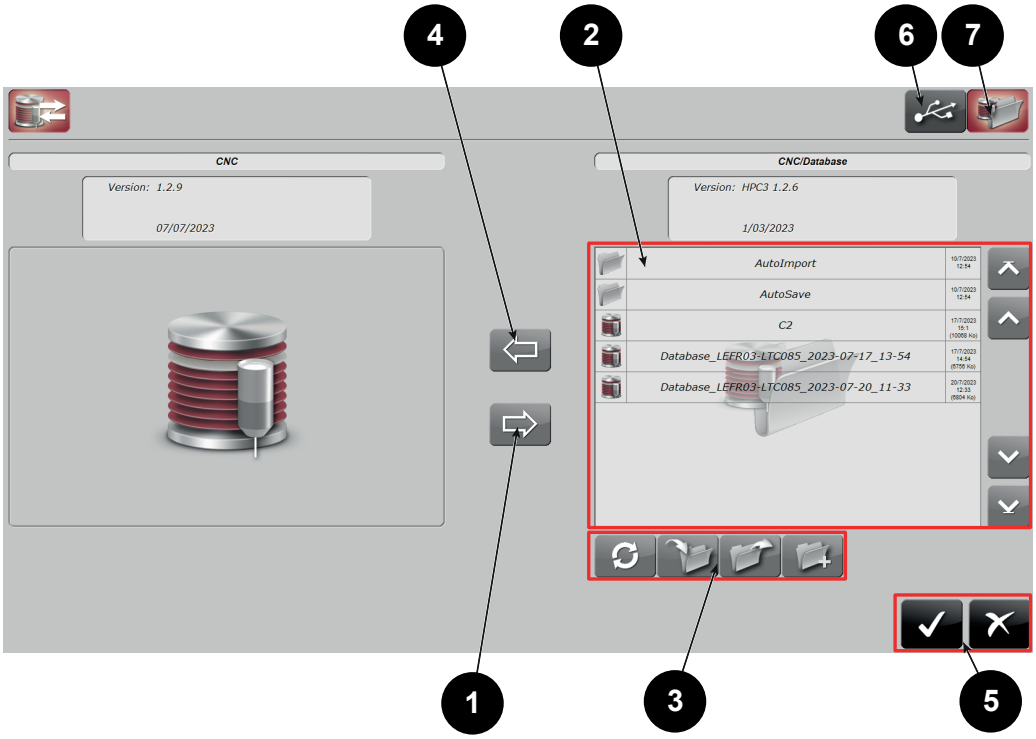
Select a file in **area (1)** or all the files by pressing **button (2)**.
Insert a USB stick and then press **button (3)** to transfer the production reports to the stick.
Exit the page by pressing one of the buttons in **area (4)**.

Production reports contain the cutting time of each process, any faults and changes in consumables.

7.8 Loading/saving a process database (level 2)

To access the management of the process database (level 2) go to:

The following screen is displayed:



<u>Exporting a database:</u>

To export the database from the NC system to the target folder:

- In **area (2)**, select the target directory (using the buttons of **area (3)**),
- Press **button (1)**; a window will be displayed to select the name of the database,
- Enter the required name (a default name is proposed, containing the serial number of the machine, and the export date/time),
- Then press Enter.

Enter key

Buttons 6 and **7** are used for selecting the location:

- Of the source for a database import
- Of the target for a database export

The possible choices are:

- A USB drive if connected
- A local disc of the machine

Two folders are always present on the local disc:

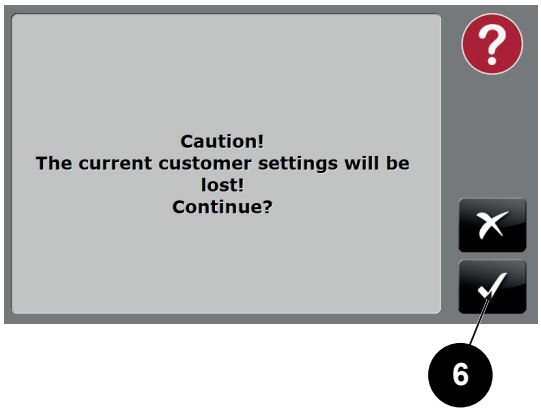
- AutoImport: If a database is present in this folder, it will be imported automatically when the machine next starts up, and then the folder will be emptied.
- AutoSave: Every time the machine starts, the current database will be saved in it.

Importing a database:

- Select a database present in the source folder that is to be imported (**area (2)**),
- To navigate the directories, use the buttons in **area (3),**
- Press **button (4)** to import the database.

Caution! The import will overwrite all the customer parameters.

- Confirm with **button (6)** to finalise importing.

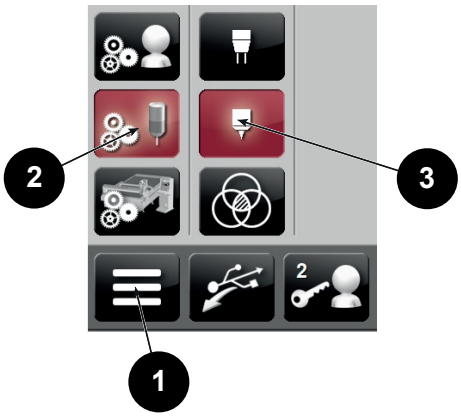


To exit the page, press one of the buttons in **area (5)** (no action of these buttons).

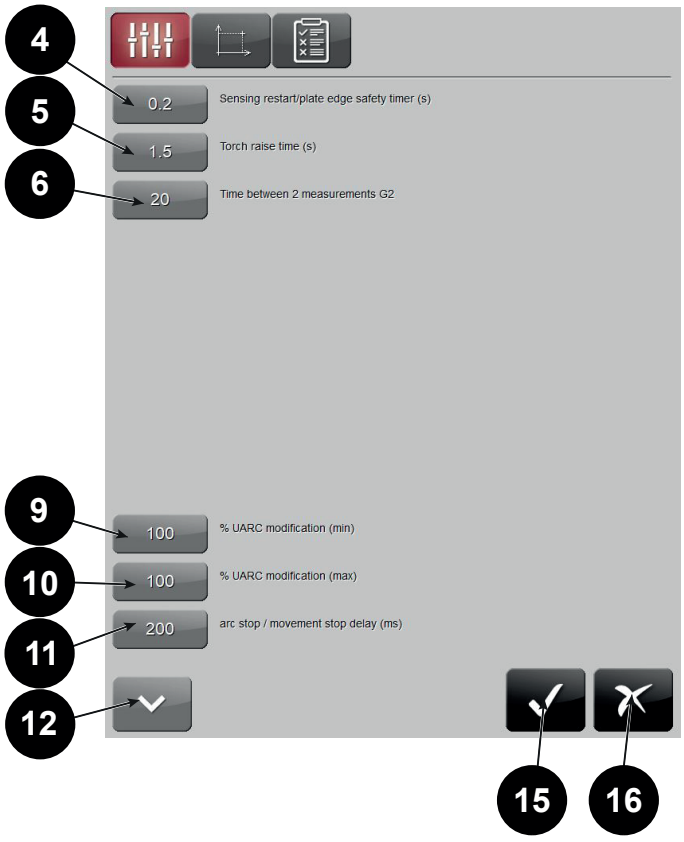
7.9 Editing the setup parameters relating to Hpi plasma (level 2)

Important! These parameters affect cutting. Modifying them could affect cutting quality or lead to more frequent stopping.

To access the adjustments relating to **HPi** plasma, press **buttons (1)**, **(2)** and **(3)** (bottom left of the screen)



The following screen is displayed to right of the screen:



Sensing restart time after plate-edge safety (area (4)):
Indicates the sensing freeze time after detecting the edge of the plate, after which sensing resumes.

Torch raise time (area (5)):
Indicates the torch raising time in seconds, at the end of the cut.

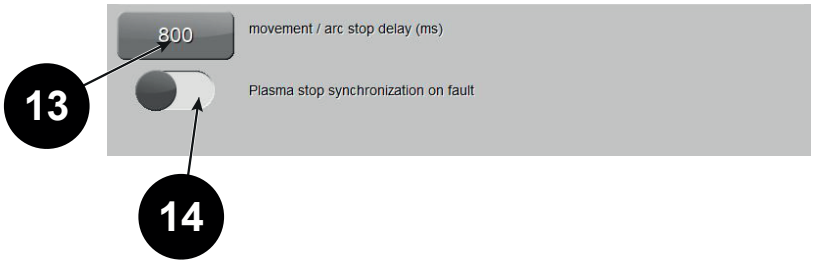
Time between 2 G2 measurement - (area (6))
Time interval (in ms) between two arc voltage measurements The difference between the two measurements is compared to G2 (in cutting parameters); if it is greater than this value, the plasma arc is stopped and an alarm appears.

%modification Uarc (MIN) area (9)
Permission to modify the reference voltage with the potentiometer. (100% = up to 0)

%modification Uarc (MAX) area (10)
Permission to modify the reference voltage with the potentiometer. (100% = up to twice the setpoint value.

Arc/movement stopping time area (11)
Time in ms

When you press button (12), you go to the following page



Movement/arc stopping time area (13)
Time in ms

Synchronised plasma stop in case of error (box 14):
This option is used when there are several plasmas: a plasma fault stops all cutting.

To confirm, press the emergency stop button and press **button (15)**.

To exit without saving, press **button (16)**.

7.10 Changing cyan qualities into blue qualities

To access the management of quality changes (level 2) go to:

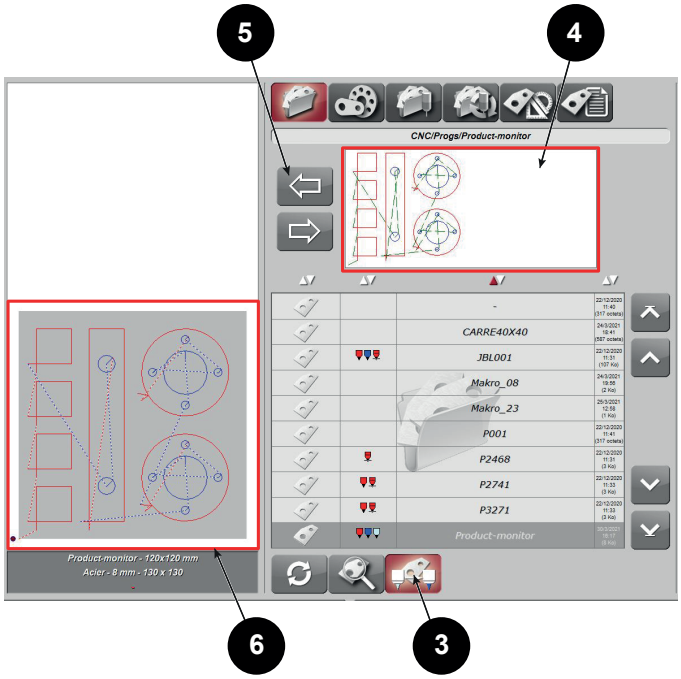
Some programs used for **HPi** plasma applications are written with 3 cutting qualities (red, blue, cyan).

To change the process used, you need to replace the cyan quality with the blue quality.

The option must first be permitted in the setup:

- Press **selector (1)** to allow the modification of the qualities cyan (T02) and blue (T01)
- Press the emergency stop button,
- Then confirm by pressing **button (2)**.

Then, while selecting a program with cyan quality cutting (T02), **button (3)** is displayed.



Press **button (3)**.

The program is displayed without the cuts in cyan, in **area (4)**.

Then load the program in the NC with **button (5)**.

The program view then appears without the cyan cuts (**area (6)**). The program is ready to be cut without the cyan quality.

7.11 Adjusting the tool holder (level 2)

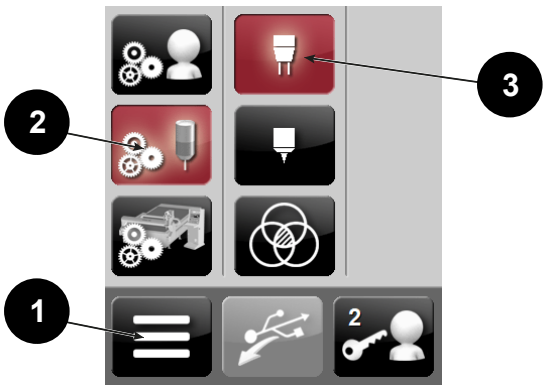
No tool holder adjustment is available in level 2 with **HPi** plasma or **Essential** plasma.

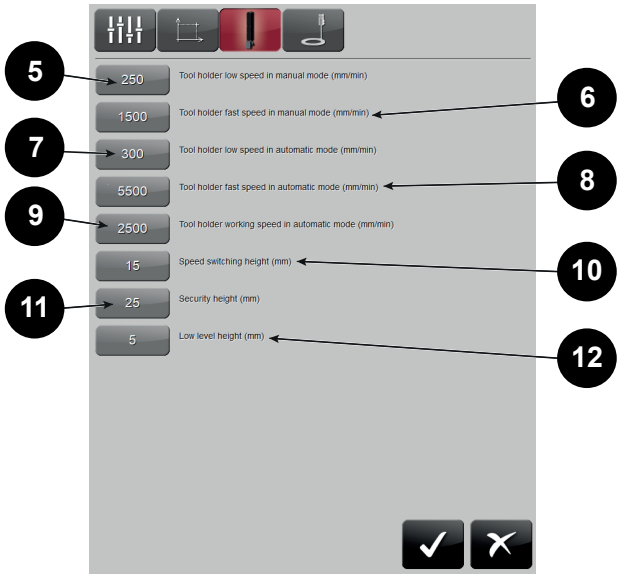
<u>For Hpi² oxy-fuel cutting</u>

Some programs used for **HPi** plasma applications are written with 3 cutting qualities (red, blue, cyan).

To change the process used, you need to replace the cyan quality with the blue quality.

The option must first be permitted in the setup:





Slow tool holder speed in manual mode (**area (5)**): This is the speed of the tool holder when it is controlled manually by the operator from the console (using hardware buttons) away from cutting.

High tool holder speed in manual mode (area (6)): This is the speed of the tool holder when it is controlled manually by the operator from the HMI (using main up/down buttons)

Slow tool holder speed in automatic mode (area (7)): This is the tool holder speed during the program in the slow-speed phases

High tool holder speed in automatic mode (area (8)): This is the tool holder speed during the program in the following high-speed phases

Automatic tool holder working speed (area (9)): This is the tool holder speed for the slow-speed phases (sensing etc.)

Speed switching height (area (10)): This is the height at which the tool holder switches from high to slow speed in automatic mode when a plate is detected (case P400=1 in the program). This height is relative to the detection height, which means that complete detection at a slow speed is carried out the first time.

Safety height (area (11)): This is the height to which the tool holder rises at the end of the cut (case P399=0 in the program) for high-speed movement towards the next strike.

Low head height (area (12)): This is the height to which the tool holder rises at the end of the cut (case P399=1 in the program) for high-speed movement towards the next strike.

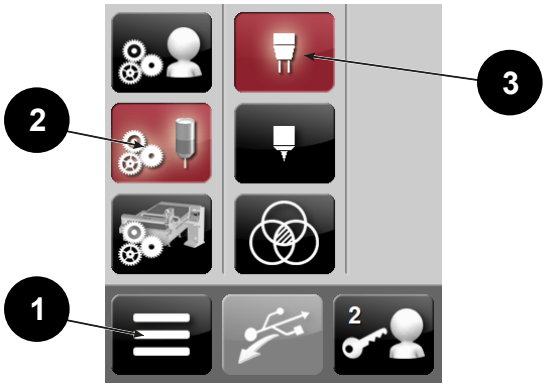
The button is used to save the changes on this page. This button is only available if the installation is not powered (emergency stop or pressing the power down button).

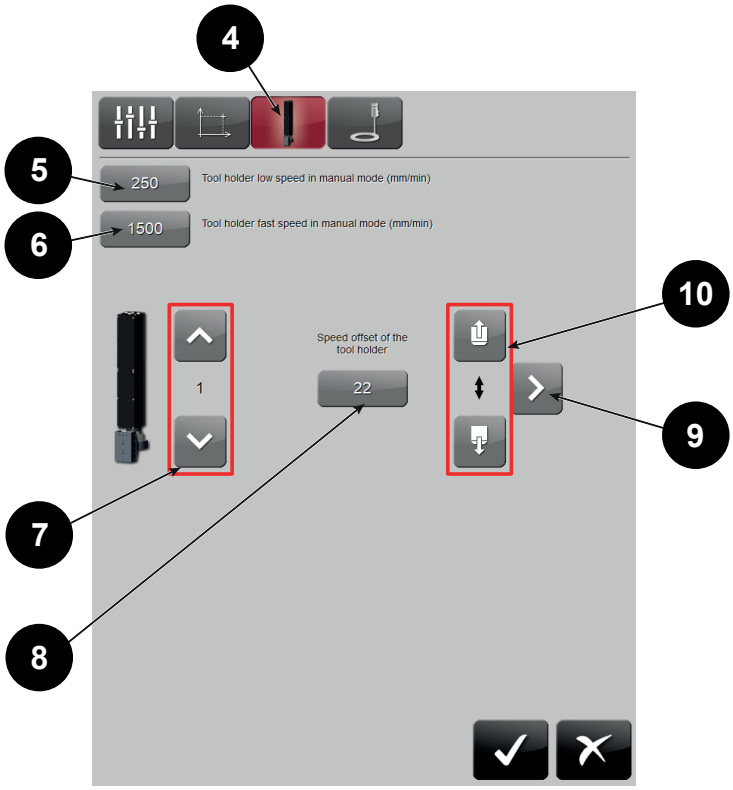
The button is used to cancel the changes on this page.

For Essential oxy-fuel cutting

Important! These parameters affect cutting. Modifying them could affect cutting quality or lead to more frequent stopping.

To access the adjustments relating to Essential plasma, press buttons (1), (2) and (3) (bottom left of the screen)





Then, press **button (4)** to access the tool holder speed offset adjustments.

Slow tool holder speed in manual mode (mm/min) – **button (5)**: Linear movement speed of the tool holder slide during slow-speed manual operation.

High tool holder speed in manual mode (mm/min) – **button (6)**: Linear movement speed of the tool holder slide during high-speed manual operation.

Tool holder selection area - **area (7)** is used for selecting which tool holder is to be adjusted. The tool holder is changed by pressing the up or down arrows

Tool holder speed offset (**box 8**):
This value compensates for the tool holder speed offset at zero speed. It is adjustable using **button 4**, making sure there is no upward or downward movement. Important: this value can be modified with no confirmation or emergency stop. The torch must however be selected in the manual banner.

On the other hand, you must confirm (with an emergency stop) to save the value.

Selected torch

Confirmation button

Zero tool holder speed (**button 9**)
This button is present to adjust the tool holder offset. It unlocks the variable speed drive and gives it a zero speed (taking account of the offset set in **box 3**). It is active if the tool holder is selected (in the manual banner, see “Manual controls”) and the upper and lower stops are not reached.

Slow oxy cutting movement (**area 10**)
In the case of Eurotome, the slow up/down controls of the tool holder are left accessible on this page, to allow easy manipulation. These controls are not visible if control is from the console (**box 5**) They are active if the tool holder is selected (in the manual banner, see “Manual controls”)

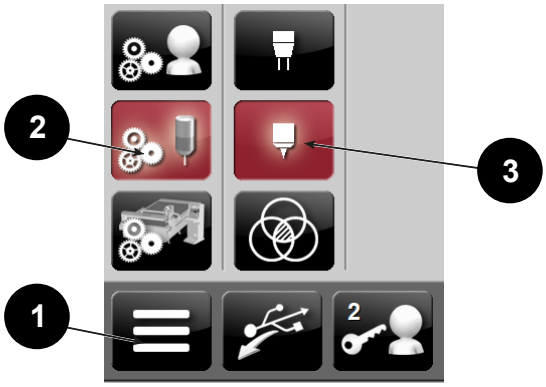
The button is used to save the changes on this page. This button is only available if the installation is not powered (emergency stop or pressing the power down button).

The button is used to cancel the changes on this page.

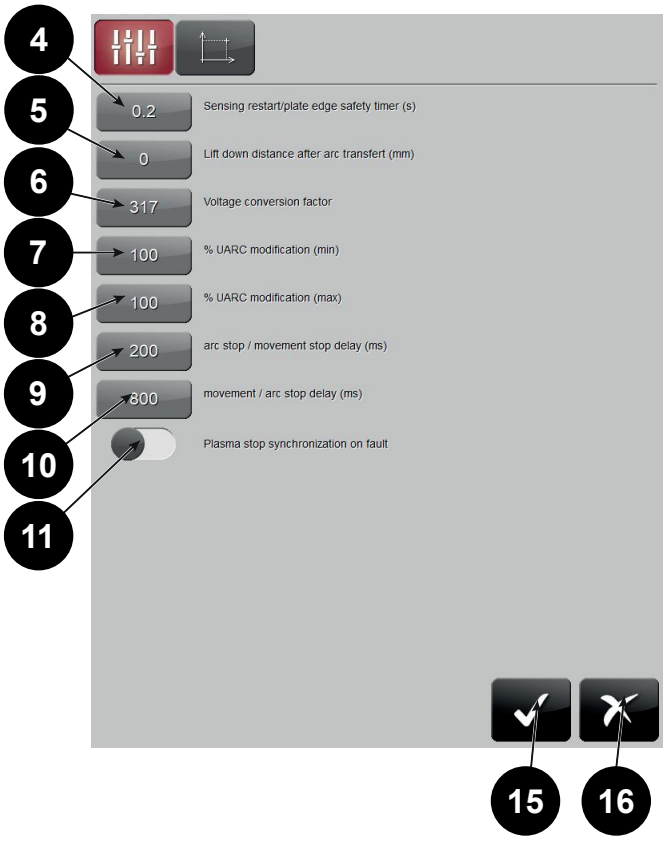
7.12 Editing the setup parameters relating to Essential plasma (level 2)

Important! These parameters affect cutting. Modifying them could affect cutting quality or lead to more frequent stopping.

To access the adjustments relating to Essential plasma, press **buttons (1)**, **(2)** and **(3)** (bottom left of the screen)



The following screen is displayed to right of the screen:



<u>Sensing restart time after plate-edge safety (area (4)):</u>
Indicates the sensing freeze time after detecting the edge of the plate, after which sensing resumes.

<u>Arc shortening distance area (5):</u>
Height to which the torch descends after the arc transfer (RIC) to allow the transfer. Inactive with **Flexcut 125, Flexcut 200** and **Fineline**.

<u>Voltage conversion factor - area (6):</u>
Indicates the electrode-part voltage that matches a 10V return.

<u>%modification Uarc (MIN)</u> <u>area (7):</u>
Permission to modify the reference voltage with the potentiometer. (100% = up to 0)

%modification Uarc (MAX) area (8):
Permission to modify the reference voltage with the potentiometer. (100% = up to twice the setpoint value)

Arc/movement stopping time area (9):
Time in ms

Movement/arc stopping time area (10):
Time in ms

Synchronised plasma stop in case of error (box 14):
This option is used when there are several plasmas: a plasma fault stops all cutting.

To confirm, press the emergency stop button and press **button (15)**.

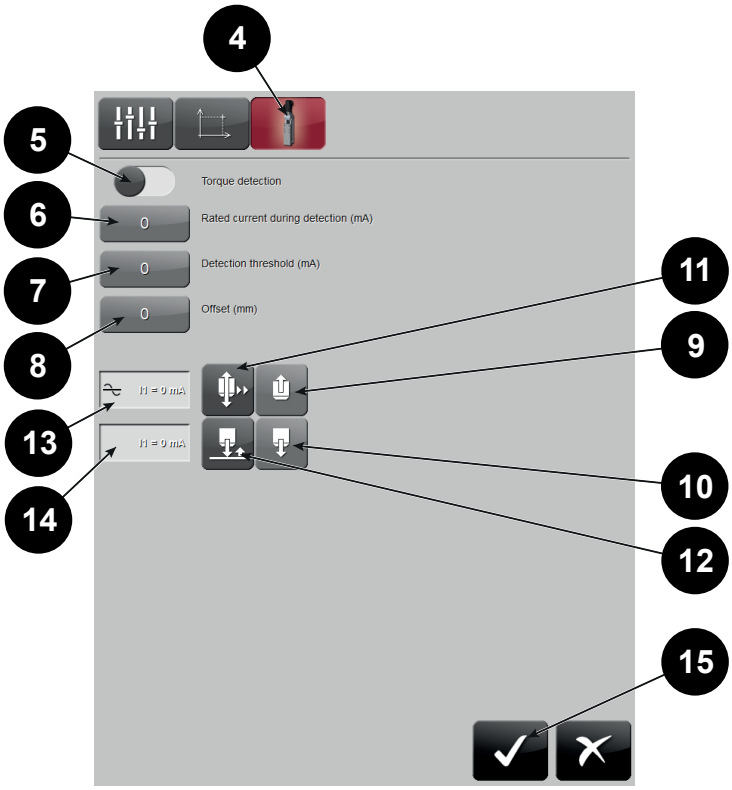
To exit without saving, press **button (16)**.

7.13 Adjusting motor torque plate detection (level 2)

These settings are available with **Essential** plasma or **Fineline** plasma.

Over time, the mechanical characteristics of the tool holder may vary (appearance or disappearance of stiff points, impacts etc.). These variations may affect the motor torque plate detection quality.

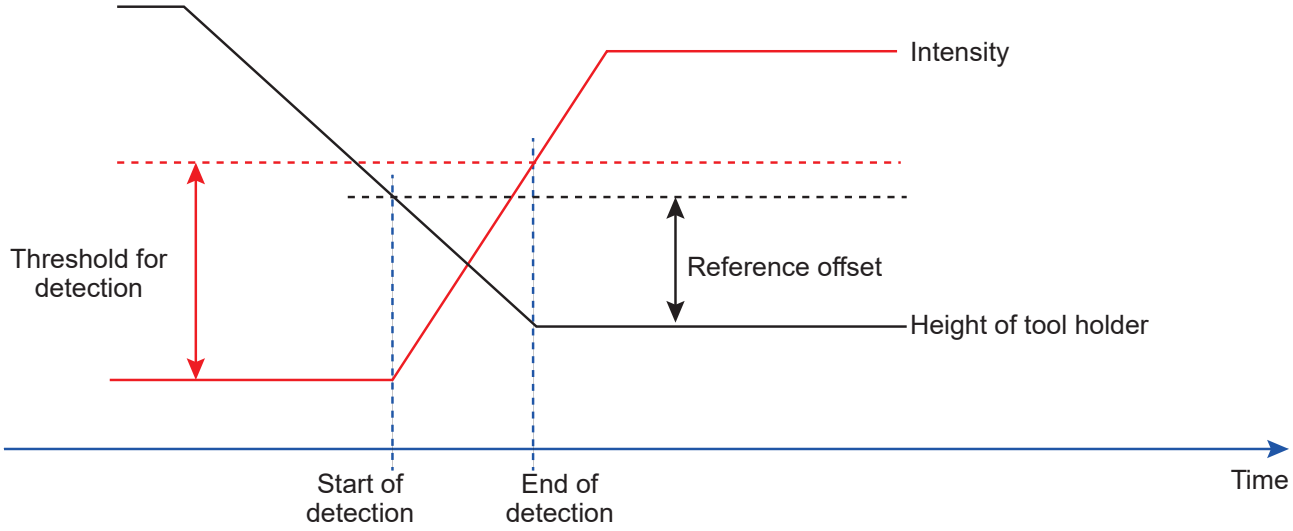
To access the adjustments



Lastly, click on **button 4** to display the settings screen.

Button 5 is used for activating the motor torque plate detection function. If the function is not enabled, this type of detection will not be proposed.
Bubble 9 and **10** are used for activating the tool holder at the speed defined by **button 11**.
Button 12 is used for starting the plate detection procedure.
Value 14 represents the intensity in real time of the tool holder motor.
Value 13 represents the average intensity of the tool holder during the detection procedure. That average intensity is to be completed in **button 6**.
Button 7 contains the value of the detection limit. This value is relative to the nominal intensity. It represents the increased motor intensity that triggers the plate detection signal.
Button 8 contains the height offset value. That is the height difference between the instant when the intensity starts rising (start of detection) and that when it exceeds the threshold (end of detection).

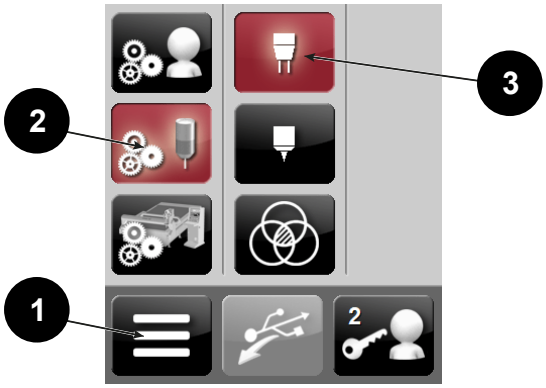
The chart below symbolises the movement of the tool holder and the change in motor intensity.

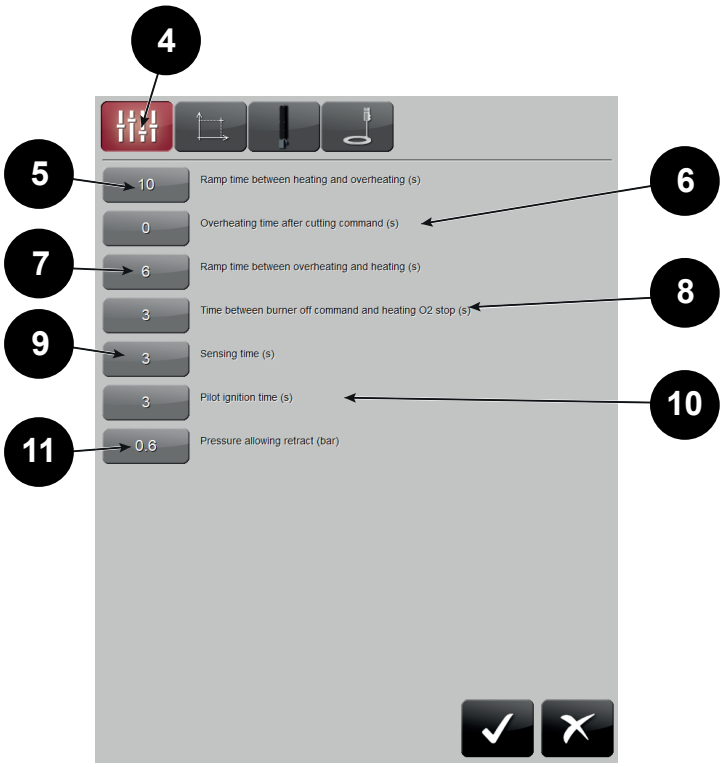


7.14 Editing the setup parameters relating to HPi² *or* Essential *oxy-fuel (level 2)*

Important! These parameters affect cutting. Modifying them could affect cutting quality or lead to more frequent stopping.

To access the adjustments relating to Essential plasma, press **buttons (1)**, **(2)** and **(3)** (bottom left of the screen)





Press **button (4)** to access the cycle time settings.

Time of gradient between heating and overheating (s) – **button (5)**: It starts when the plate is detected. When it starts, the heating oxygen pressure is at the heating scale: at the end, it is at the overheating pressure.

Overheating time after cutting command (s) – **button (6)**: During this time, the heating oxygen pressure is that of overheating. At the end of the time, the descent gradient towards the heating setting) starts.

Time of gradient between overheating and heating (s) – **button (7)**: It takes place after the overheating time after the cutting command (see previous line). After this time, the machine is at the heating setting (regarding the heating oxygen pressure)

Time of between shutdown command and stopping of heating O2 (s) – **button (8)**:. At the start of the time (i.e. when a process stop is requested by the HMI or the program), the fuel gas is switched off. At the end, the oxygen gas is shut off. During that time, oxygen continues to be regulated at the heating pressure.

Sensing start time(s) – **button (9)**: It starts when the sensor down command is activated; at the end of the time, sensing at the value in the scale starts, if it is activated. It is used to not sense near the strike point (disturbance) and wait for the sensor to be in the low position and stable.

Pilot ignition time(s) – **button (10)**: Torch ignition time

Pressure allowing retract (bar) – **button (11)**: Cutting oxygen pressure limit (Pr) after which tool holder retract is allowed (for t12). The limit is crossed during the cutting oxygen raising gradient started after overheating time t5.

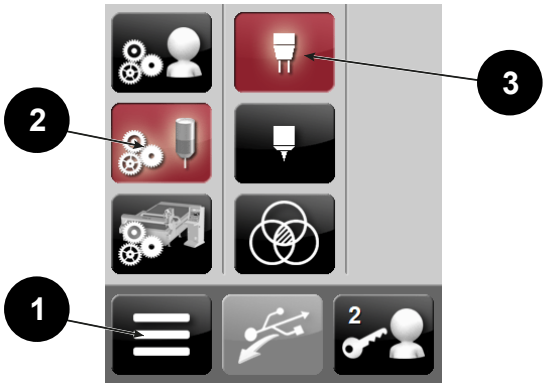
The button is used to save the changes on this page. This button is only available if the installation is not powered (emergency stop or pressing the power down button).

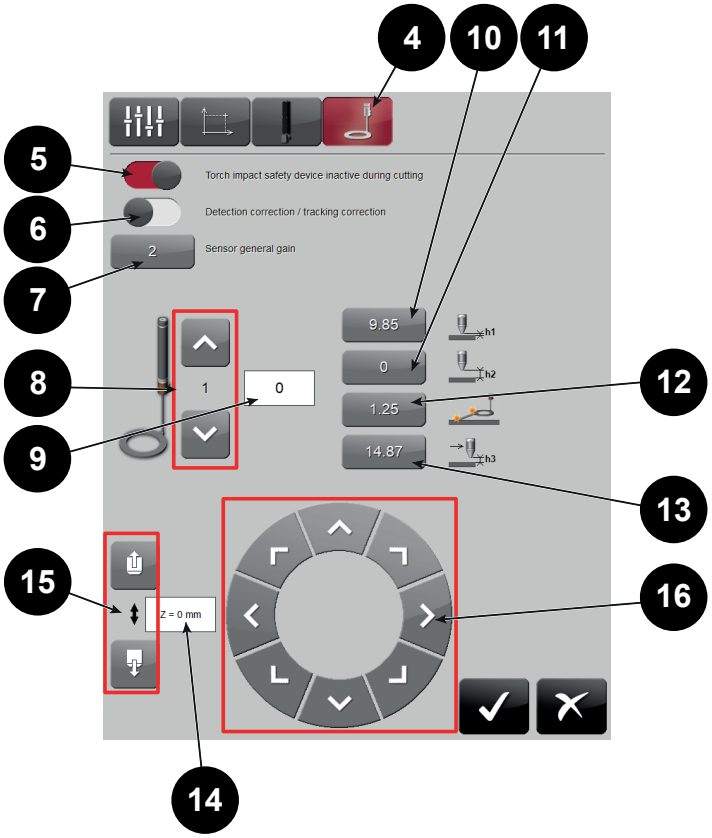
The button is used to cancel the changes on this page.

7.15 Adjusting the HPi² oxy-fuel cutting sensors

Important! These parameters affect cutting. Modifying them could affect cutting quality or lead to more frequent stopping.

To access the adjustments relating to Essential plasma, press **buttons (1)**, **(2)** and **(3)** (bottom left of the screen)





Sensor impact not active while cutting (**box 5**): deactivates the sensor impact alarm during oxy-fuel cutting.

Detection correction/sensing correction (**box 6**): if this box is checked, then the height from the manual height correction during cutting (= during sensing) is saved and used as the reference for detecting the next plate.
Sensor gain (**button 7**): it is general for all the declared sensors (value modifiable from 1 to 255). The higher the value, the more responsive the sensing. Gain must be adjusted when the machine is not being powered.

Sensor voltage value (**area 6**): displayed for the torch selected in **area 8** (allows the repairer to rapidly diagnose the sensors).

Area (14) contains the height of the torch in relation to the plate.

Sensor calibration:
Sensor selection area (**area 8**): used for selecting the torch to be viewed or adjusted. The torch is changed by pressing the up or down arrows.
The torch must be activated in the manual banner and the machine must not be in an emergency stop condition.
With **EUROTOME**, use the controls of **area (15)** to move the torch.

- Press **button (10)** to save the value of the sensor when the nozzle is placed at h1 above the plate. (h1 =0mm meaning nozzle in contact).

The value is approximately 105

- Press **button (11)** to save the value of the sensor when the nozzle is placed at h2 above the plate. (h2 =5mm).

The value is approximately 120

- Press **button (12)** to save the value of the sensor when the sensor touches the plate. (place a metal tool in contact between the sensor and the plate to simulate a sensor impact).

The value is approximately 45

- Press **button (13)** to save the value of the sensor when the nozzle is placed 2 cm away from the edge of the plate and h3 above the plate. (h3= 5mm)/ With **EUROTOME**, use the controls of **area (16)**.

The value is approximately 125
Lastly, power down the machine.

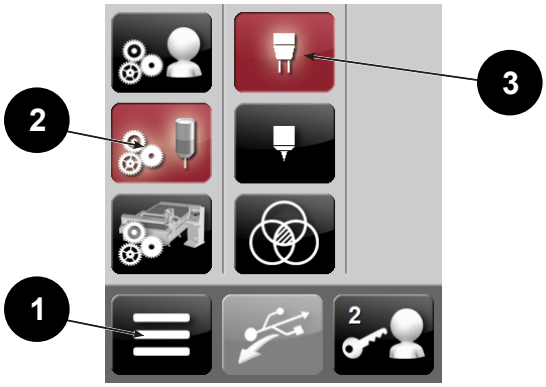
The button is used to save the changes on this page. This button is only available if the installation is not powered (emergency stop or pressing the power down button).

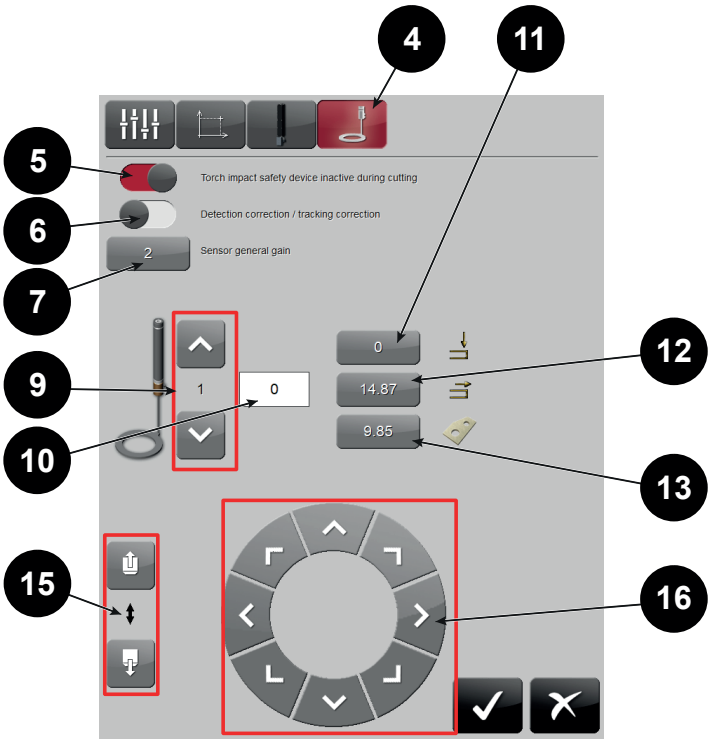
The button is used to cancel the changes on this page.

7.16 Adjusting the Essential oxy-fuel cutting sensors

Important! These parameters affect cutting. Modifying them could affect cutting quality or lead to more frequent stopping.

To access the adjustments relating to Essential plasma, press **buttons (1)**, **(2)** and **(3)** (bottom left of the screen)





Sensor impact not active while cutting (**box 5**): deactivates the sensor impact alarm during oxy-fuel cutting.

Detection correction/sensing correction (**box 6**): if this box is checked, then the height from the manual height correction during cutting (= during sensing) is saved and used as the reference for detecting the next plate.
Sensor gain (**button 7**): it is general for all the declared sensors (value modifiable from 1 to 255). The higher the value, the more responsive the sensing. Gain must be adjusted when the machine is not being powered.

Use of retractable sensors – **box (6)**: When the box is checked, retractable sensors are used on all the torches with a sensor.

Sensor voltage value (**area 10**): displayed for the torch selected in **area 8** (allows the repairer to rapidly diagnose the sensors).

Sensor calibration:
Sensor selection area (**area 8**): used for selecting the torch to be viewed or adjusted. The torch is changed by pressing the up or down arrows.
The torch must be activated in the manual banner and the machine must not be in an emergency stop condition.
With **EUROTOME**, use the controls of **area (15)** to move the torch.
Place the nozzle 5 mm away from the plate (use an Allen key. Remove the Allen key once the torch is in position).

- Press **button (11)** to save the value of the sensor when the nozzle is placed 5 mm above the plate.

The value is approximately 120.
Then offset the torch to the edge of the plate.

- Press **button (12)** to save the value of the sensor when the nozzle is placed 2 cm away from the edge of the plate and 5 mm above the plate. With **EUROTOME**, use the controls of **area (16)**.

The value is approximately 125.
Return to the plate

- Press **button (13)** to save the value of the sensor when the torch touches the plate.

The value is approximately 105
Lastly, power down the machine.

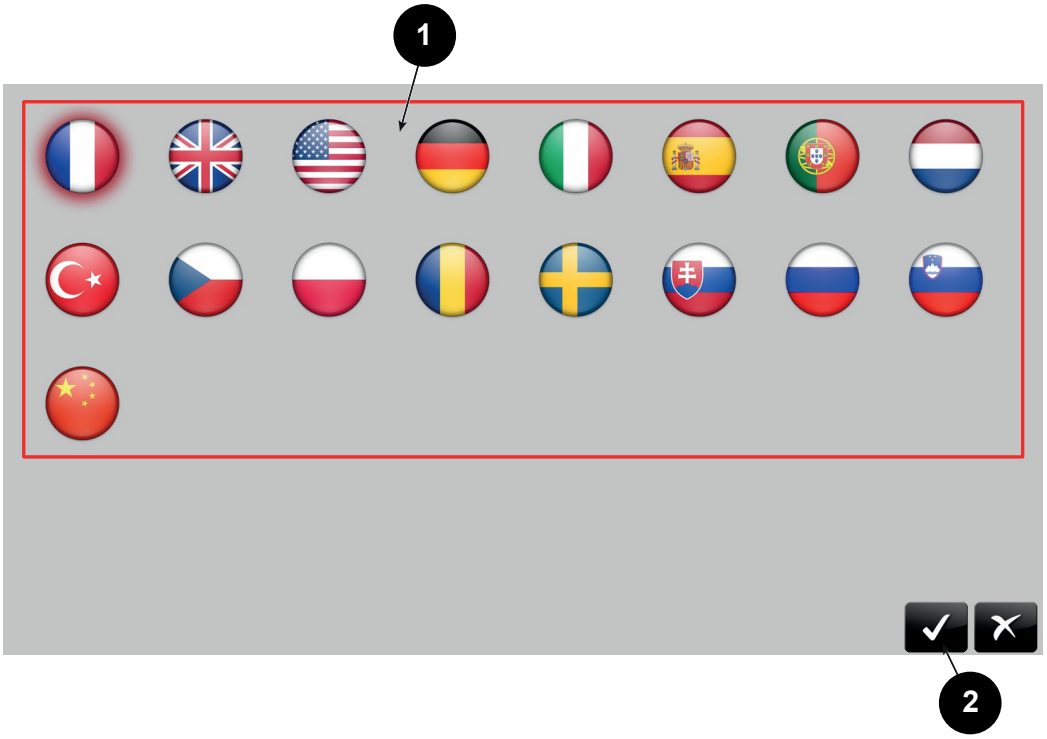
The button is used to save the changes on this page. This button is only available if the installation is not powered (emergency stop or pressing the power down button).

The button is used to cancel the changes on this page.

8.1 Modifying the HMI language (level 2)

To access the management of the process database (level 2) go to:

The following screen is displayed:



- Select the language in **area (1)** (matching the flag)
- Press the emergency stop button,
- Press **button (2)** to change the language of the HMI.

8.2 Permitting access to documentation by users

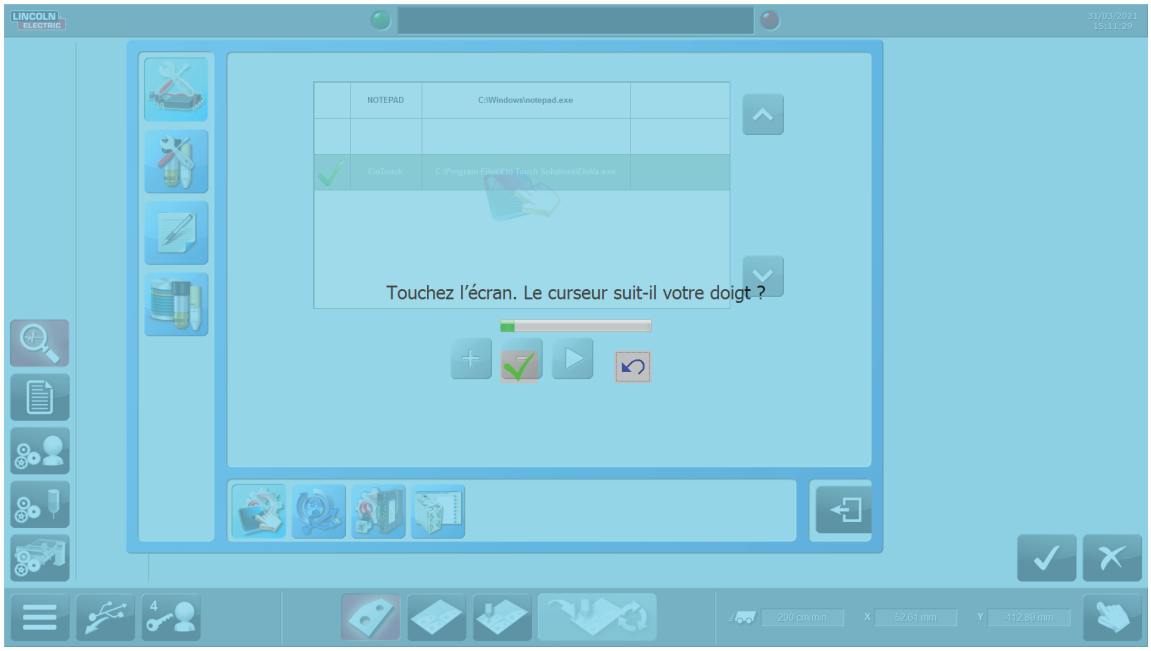
To access the management of the process database (level 2) go to:

- Press **selector (1)** to permit access to documentation on level 1
- Press the emergency stop button,
- Then confirm by pressing **button (2)**.

8.3 Modifying the touch screen adjustments (level 2)

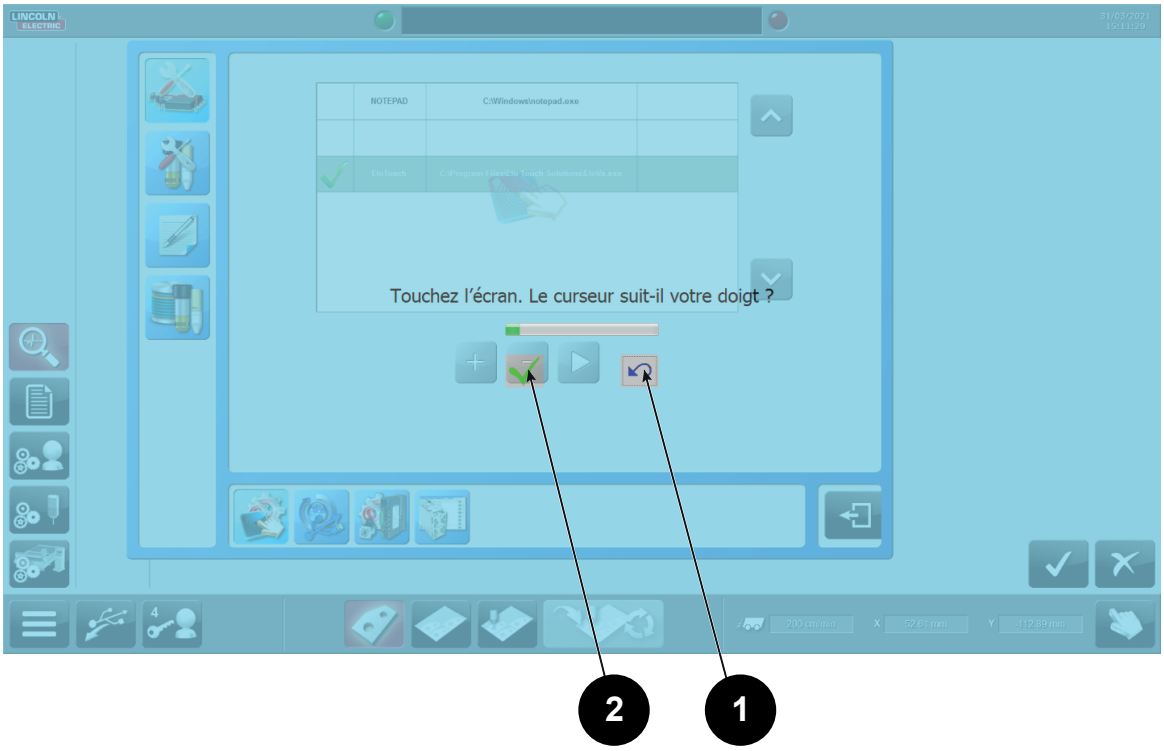
To adjust the touch screen (after a change of screen for example), go to:

The adjustment software will open.



Press each target.

At the end of calibration, the following screen opens:

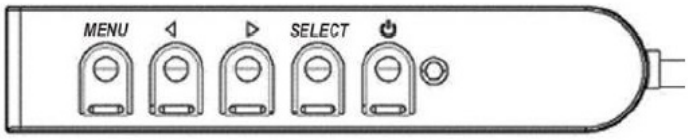


Touch the screen, and repeat the test (**button (1)**) till you reach the right sensitivity
Confirm when correct (**button (2)**)

The software goes off at the end of calibration.

1 - Touch screen

OSD buttons can be found on the wired control box located inside the console.
These buttons are used for adjusting the display parameters:



Button	Function when the OSD menu is not displayed	Function when the OSD menu is displayed
Menu	Display main OSD menu	Back to previous OSD menu
◀	Display Contrast submenu	Decrease value of selected parameter/select previous menu item
▶	Display Brightness submenu	Increase value of selected parameter/ select next menu item
Select	Display video priority submenu	Select the parameter to adjust/select the submenu to open

The box must be connected (RJ45 connector located between the two cables already connected) for adjustment and disconnected with adjustment is complete).

2 - Care

For a long and trouble-free life, the machine requires a minimum level of care and maintenance.

The frequency of such maintenance is indicated for production in one work shift per day. For higher production rates, increase the maintenance frequencies accordingly.

Your maintenance department could photocopy these pages to track maintenance frequencies and times and the operations completed (tick the appropriate box).

Every week		
Date of the operation:		
		See if the screen is dirty
		Cleaning the screen: · Switch off the power to the machine · Use window cleaner applied on a clean cloth or sponge. Never apply cleaner directly on the touch screen. Do not use alcohol (methyl, alcohol or isopropyl alcohol) or thinner, benzene or other strong solvent. Do not clean the screen with a cloth or a sponge which may scratch the surface

Ordering procedure:

Almost all the parts of a machine or installation are referenced in the photographs and sketches.

The descriptive tables contain three types of item:

- items normally held in stock: ✔
- items not held in stock: ✘
- articles upon request: no reference

(For such parts, please complete the list of parts page and send us a copy. In the Order column, state the number of parts required and indicate the type and number of your equipment.)

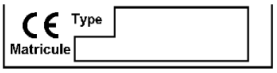
For items referenced in the photographs or sketches but not included in the tables, please send us a copy of the relevant page and highlight the relevant reference.

Example:

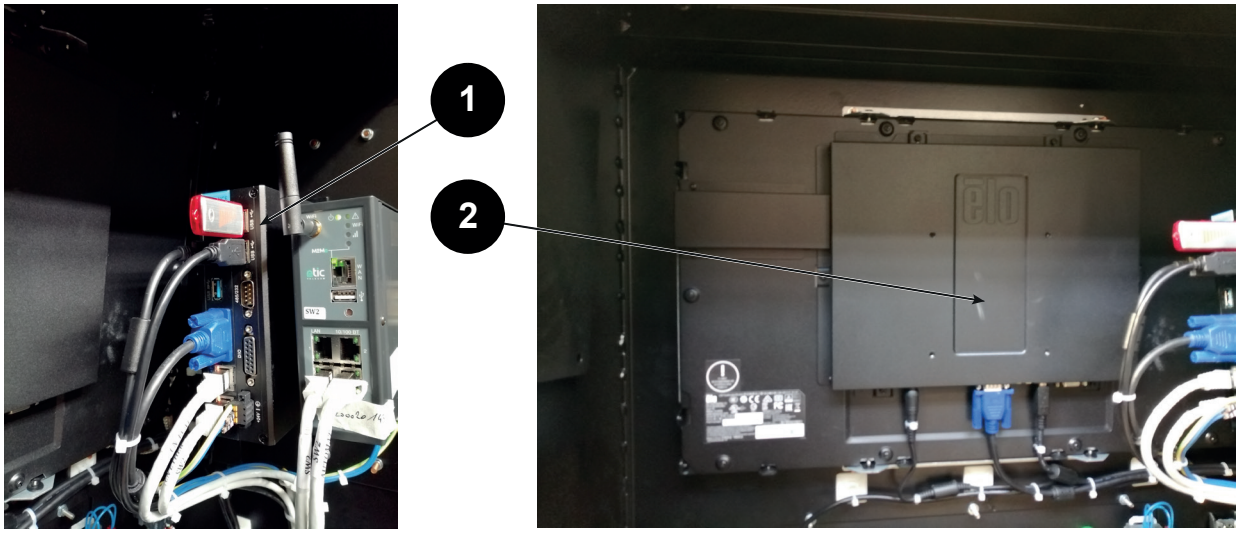
✔	normally held in stock.
✘	not in stock
	upon request.

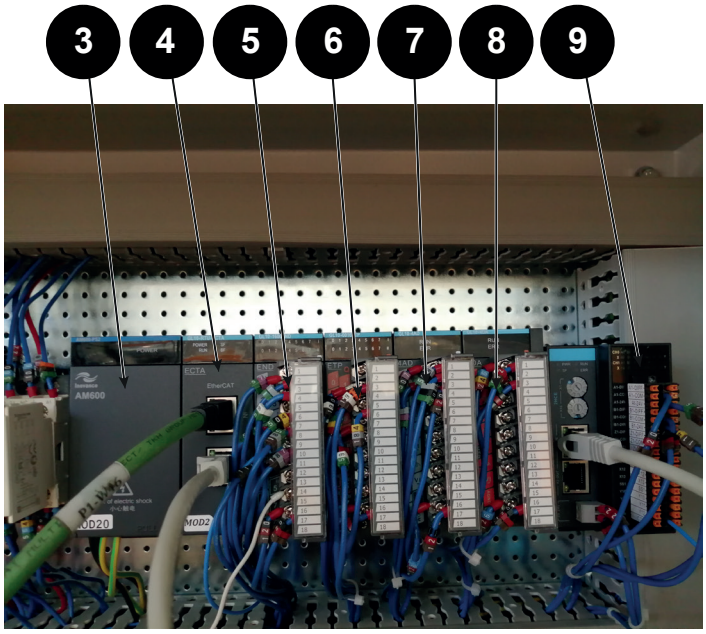
Ref.	Part no	Stock	Order	Description
E1	W000XXXXXX	✔		Machine interface board
G2	W000XXXXXX	✘		Flow meter
A3	P9357XXXX			Printed front plates

- While ordering parts, please indicate the quantity and note the number of your machine in the box above.



TYPE:
Number:





✔	normally held in stock.
✘	not in stock
	upon request.

Ref.	Part no	Stock	Order	Description
1	AS-CS-07087071	✘		PA9000 CNC CPU Windows 7 + standard dongle
	AS-CS-07087072	✘		PA9000 CNC CPU Windows 10
2	AS-CS-C5703732	✔		16/9 touch screen + power supply
3	AS-CS-C5703329	✔		GL10 power supply module
4	AS-CS-C5703330	✔		GL10 EtherCAT module
5	AS-CS-C5703324	✔		GL10 16 digital inputs module
6	AS-CS-C5703325	✔		GL10 16 digital outputs module
7	AS-CS-C5703326	✔		GL10 4 analogue inputs module
8	AS-CS-C5703327	✔		GL10 4 analogue outputs module
9	AS-CS-C5703328	✔		GL10 2 encoder module

- While ordering parts, please indicate the quantity and note the number of your machine in the box above.

CE Type
Matricule

TYPE:
Number:

PERSONAL NOTES

Lincoln Electric France S.A.S.
Avenue Franklin Roosevelt 76120 Le Grand Quevilly
76121 Le Grand Quevilly cedex
www.lincolnelectriceurope.com