

# **HPW**

**Digital control of welding Process,  
movements and drive units**



## **1 Introduction**

Control device for the complete management of the machine starting from only one control panel, allowing :

- Numerical management of the welding process, its associated movements and drive units
- Traceability, a program integrates all the parameters allowing the repetitivity of the welding
- Quality follow-up in option, record and storage of the essential parameters of welding (Current, Voltage, Wire feeding, Movement)
- User friendly and intuitive interface allowing the programming, controls and follow up
- Intuitive built up of cycle machine thanks to a graphic programming
- Touch screen facilitating the HPW use
- Off line Programming on PC, data exchange via USB key
- Optimisation of the machine integration
- Control via Industrial PC

## **2 Numerical management of the welding process, its associated movements and drive units**

*Multipurpose welding controls allowing the use of the processes :*

- TIG in DC or pulse mode.
- TIG Variable Polarity mode.
- Plasma in DC or pulse mode.

Control of the welding current, wire feeding, arc voltage control and gases.

*Multipurpose movement controls allowing configuration of any type, longitudinal or circular :*

- Carriage of a seamer or mechanisation
- Column & boom axis
- Lathe, positioner or rotator
- Turn table
- Adaptation of customer movement
- ....

Control of the welding speed, position counting and limit switch management

*Multipurpose drive unit controls :*

- pneumatic tailstock
- pneumatic slide
- Seam welding bench jaws
- Seam welding bench clamp
- ....

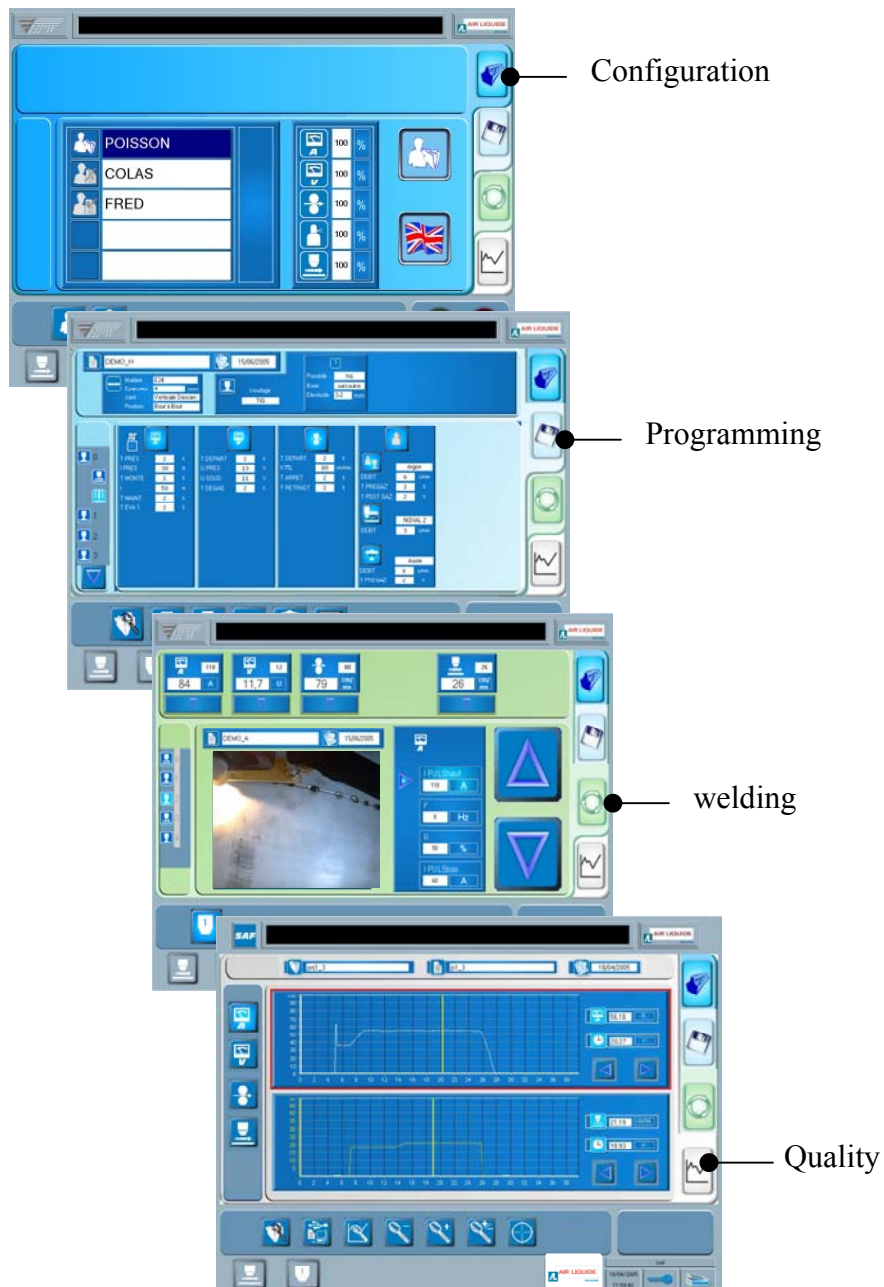


### **3 User friendly and intuitive interface allowing the programming, controls and follow up**

Intuitive, interactive and user friendly, this HPW interface software allows an easy navigation, facilitating the dialogue between the machine and the operator, also the flexibility of the welding to your production constraints.

HPW interface is divided according to the type of work to carry out in four indexes :

- Configuration
- Programming
- Welding
- Quality

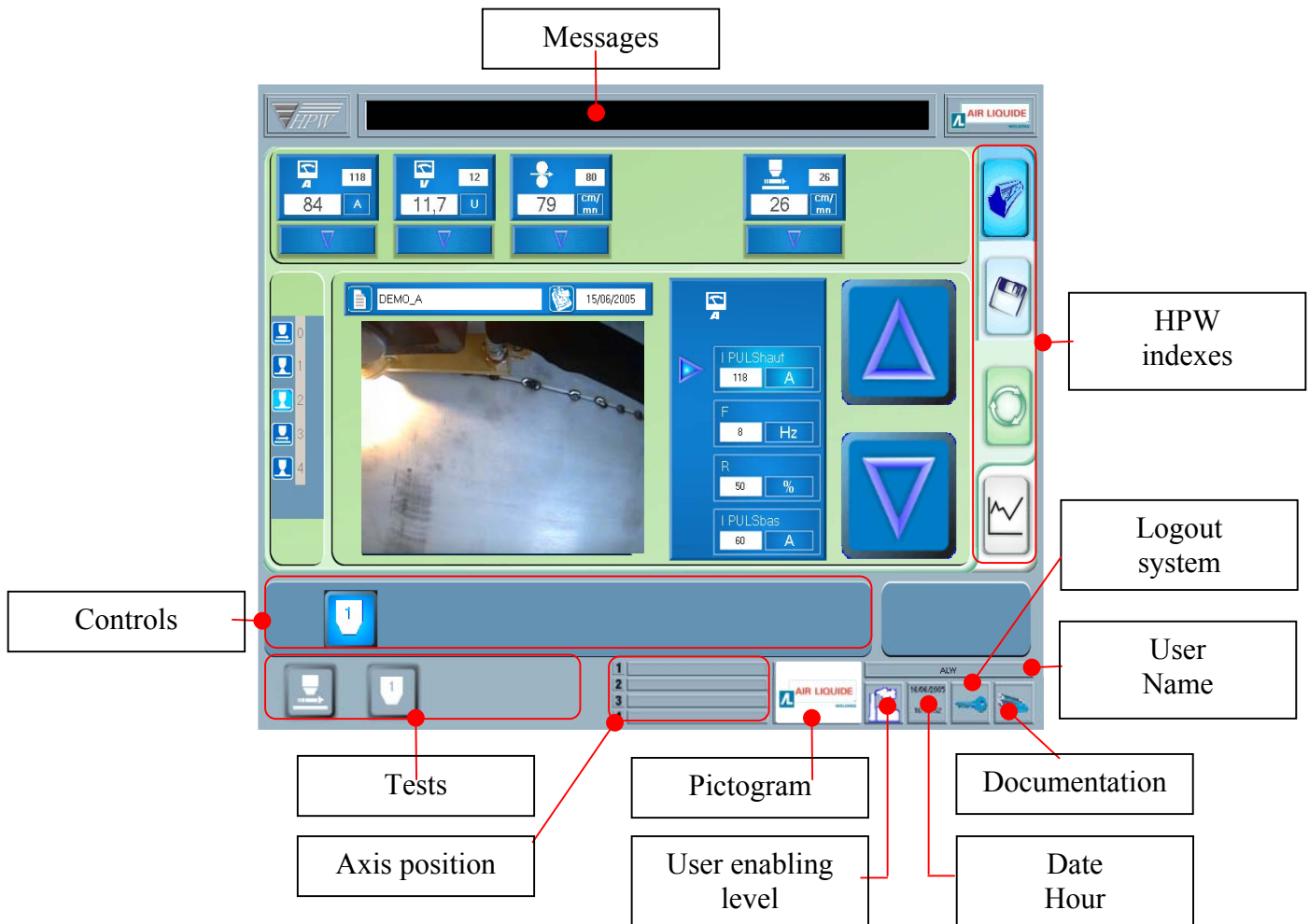


For an easy navigation, management and control of the machine, the dialogue with HPW is done starting from a touch screen, industrial LCD of 15 inches.

## 4 General functions

In order to facilitate the use of HPW interface, the user will always find at the same place the principal functions such as :

- The indexes
- Controls related to the selected index
- Messages of information, safety or alarms
- Position of the welding axis controlled by HPW
- Name of the machine user
- Enabling level of the user
- Logout system
- System date and hour
- A personalized pictogram, the customer logo for example

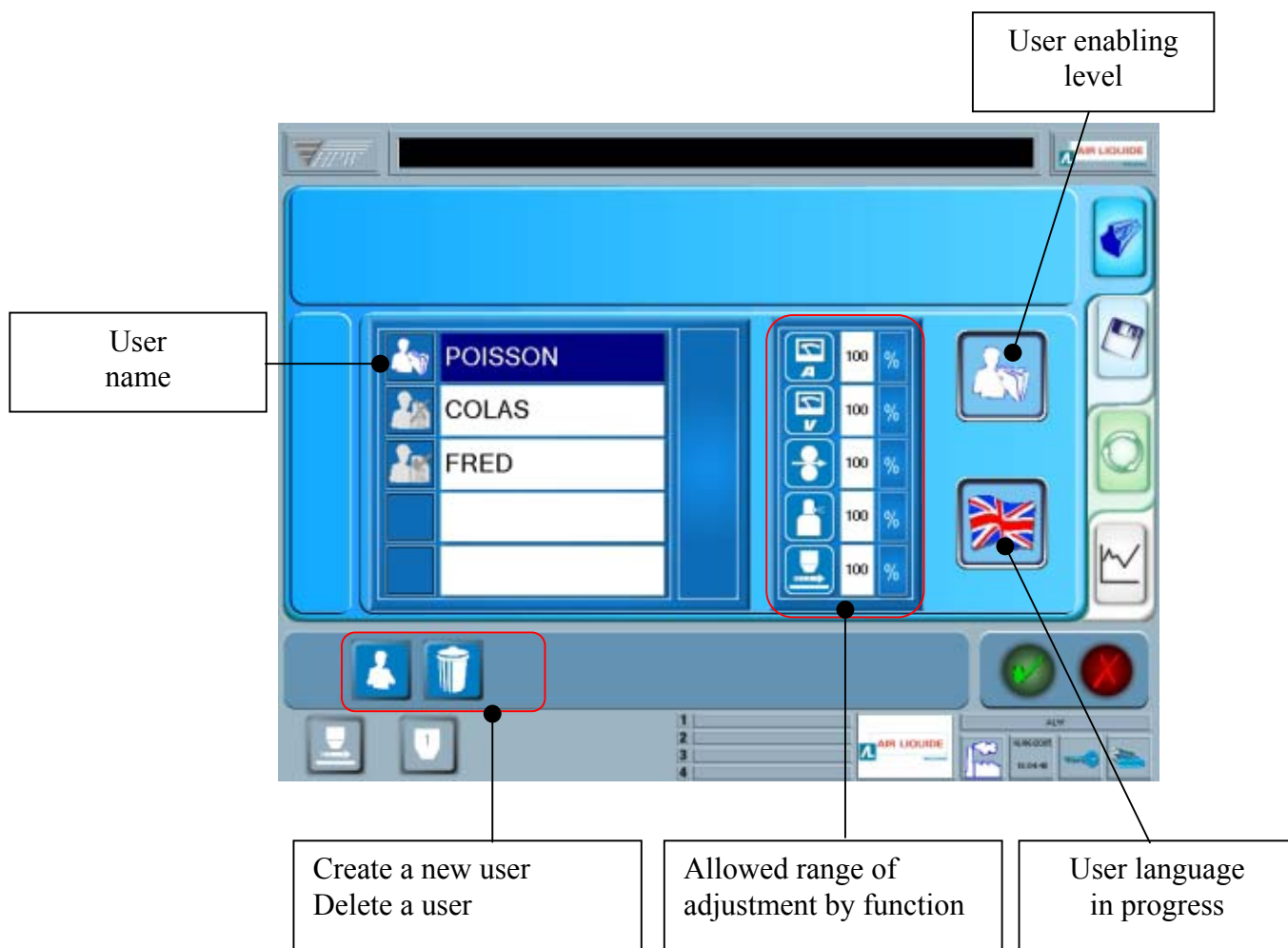


## 5 Configuration index

Configuration of the machine according to the customer application, definition of the processes used as well as the movements and drive units.

Creation of the enabling levels of the various machine users :

- Operator level : allows to modify the parameters in a range defined by the administrator of the system, not possible to save the adjustments.
- Qualified operator level : allows to modify the parameters in a range defined by the administrator of the system, possible to save the adjustments
- Administrator level: Management of the user profiles, programs or project (create, delete, copy...), welding and save of adjustments
- Factory level : Maintenance



## 6 Programming index

**Traceability, machine cycle, a program integrates all the parameters allowing the repetitivity of the welding**

The programming index includes all the information related to the welding, it is divided into 4 principal areas :

- Welding information
- Welding parameters
- Machine cycle
- Tool box

The screenshot shows a software interface for welding programming. It is divided into four main sections, each highlighted with a red box and a callout label:

- Welding information:** Located at the top, it displays program details such as 'DEMO\_H', '15/06/2005', 'Matière: E24', 'Épaisseur: 4 mm', 'Joint: Verticale Descen', 'Position: Bout à Bout', 'Procédé: TIG', 'Buse: MEC4 018', and 'Electrode: 3.2 mm'.
- Machine cycle:** The central area, showing a sequence of steps (0-3) with associated times and parameters. For example, Step 0 includes 'T PRES: 2 s', 'I PRES: 30 A', 'T MONTE: 2 s', 'I: 50 A', 'T MAINT: 2 s', and 'T EVA 1: 2 s'. Step 1 includes 'T DEPART: 2 s', 'U PRES: 13 V', 'U SOUD: 11 V', and 'T DEGAG: 2 s'. Step 2 includes 'T DEPART: 2 s', 'V FIL: 80 U/min', 'T ARRET: 2 s', and 'T RETRACT: 2 s'. Step 3 includes 'DEBIT: 6 U/min', 'T PREGAZ: 2 s', and 'T POST GAZ: 2 s'. Gas parameters for Argon, NOXAL 2, and Azote are also shown.
- Tool box:** A horizontal bar at the bottom containing icons for various functions like saving, deleting, and opening programs.
- Welding parameters:** A vertical bar on the right side of the interface, containing icons for different welding parameters and settings.

### Welding information

Allows to inform the type of part to be welded and the process used. Indication also of the program name and its creation date.

### Welding parameters

Programming of the process and movement parameters

### Tool box

Include all the bricks cumulable in a machine cycle but also the traditional functions such as :

- Program saving
- Delete a brick
- Open new program or project

### Machine cycle

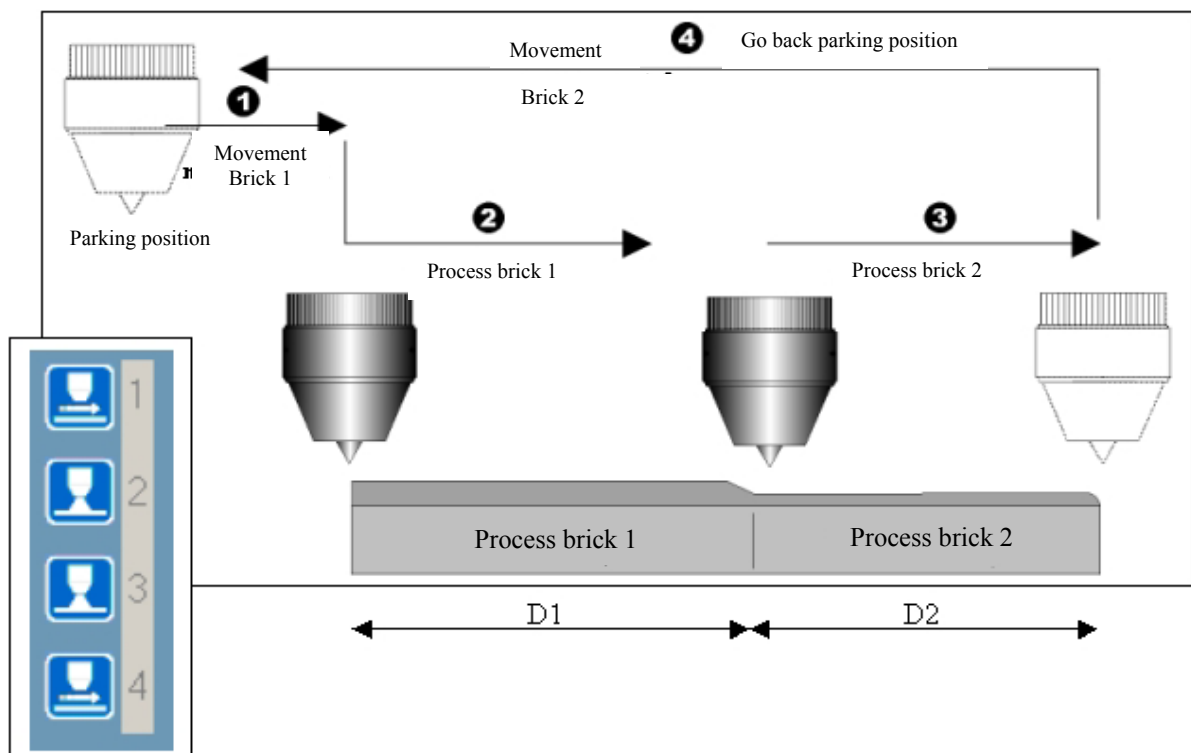
Built up of its own machine cycle by compiling bricks Process, Movement or drive units :

- The process brick includes all the parameters related to the welding, process and movement.
- The movement brick enables to move without welding the work piece or the head
- The drive unit brick allows to activate a pneumatic tailstock, a pneumatic slide, the opening seam welding bench jaws ...

The machine cycle definition is intuitive and easy to understand thanks to a graphic programming.

See below, typical example of welding, the torch located in a parking position will execute the following cycle :

- Positioning to the beginning of the work piece : activation of a movement brick which defines the distance to move and the speed
- Start of welding with first process parameters and automatic change of the latter as soon as the D1 distance is reached
- Go back to the parking position automatically as soon as the welding distance D2 is reached



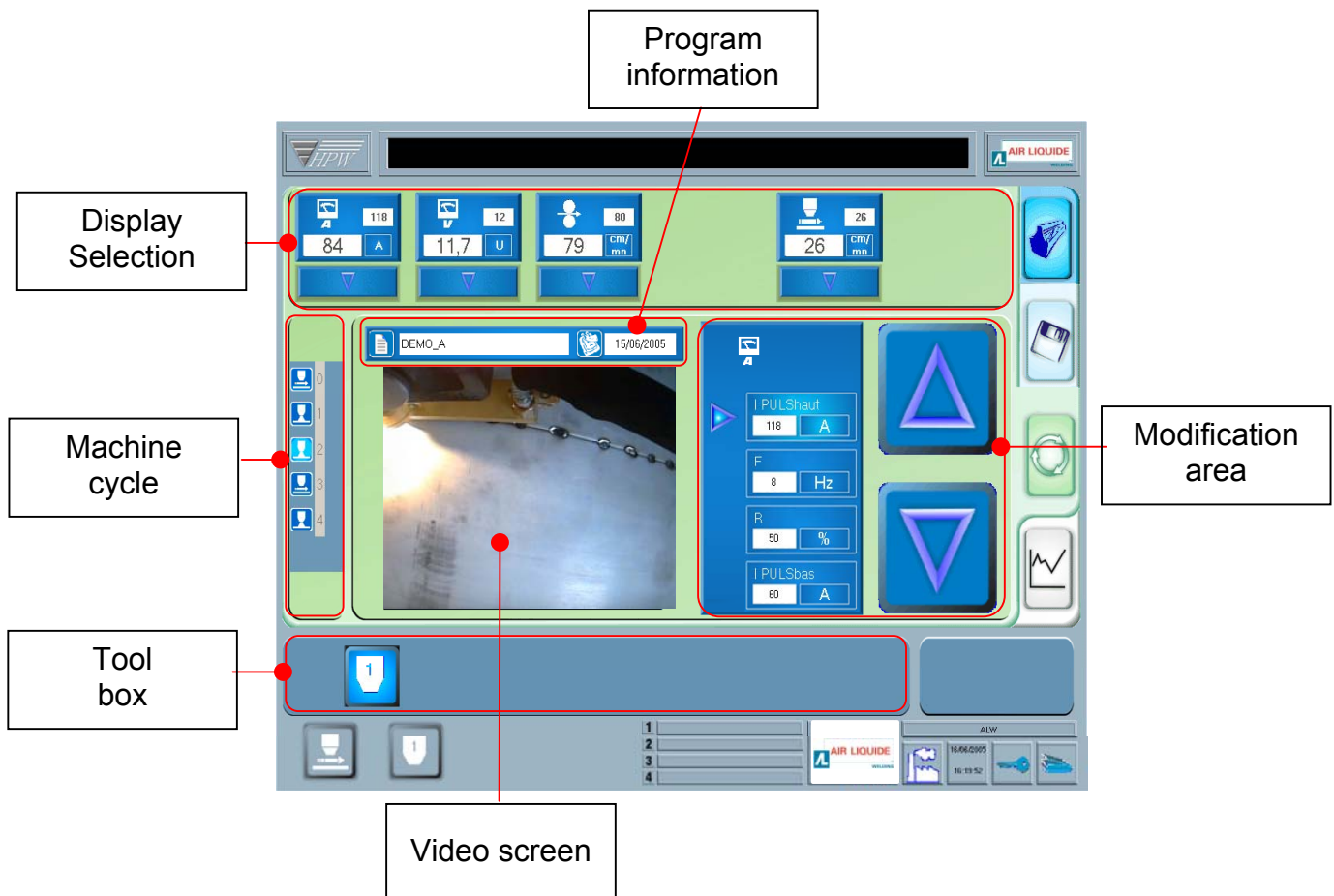


## 7 Welding index

It is the working area during welding, giving access to the follow-up and modifications.

it is divided into 6 principal areas:

- Display of order and measurement, function selection
- Program information
- Machine cycle
- Parameters modification during welding
- Video screen
- Tool box



### Display of order and measurement, function selection

This zone has a double role:

- Display of order and return measurement by function, current, voltage, wire feeding, welding speed (in TIG or Plasma), plasma gas flow rate (in Plasma)
- Selection of the parameter to be modified during welding with the + and - keys located on the modification area

### Program information

Reminder of the program name and its creation date.

### Machine cycle

Reminder of the machine cycle defined in the programming index.  
The active brick is lightened on in order to give a better visibility on the cycle progress.



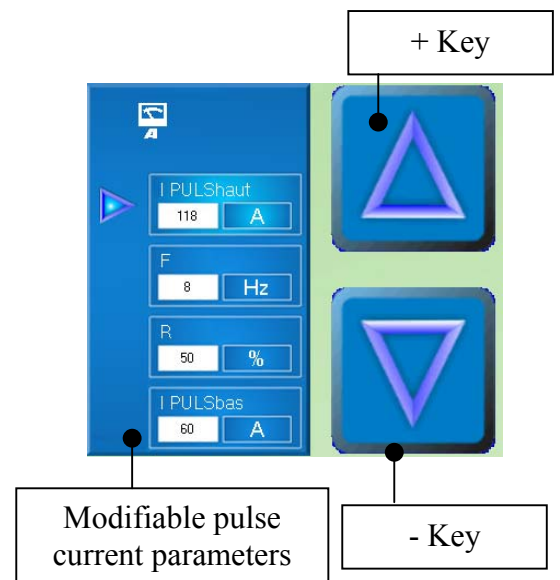
### Parameters modification during welding

Allows to adjust during welding all the parameters :  
Current, Voltage, Wire feeding, welding speed (in TIG or Plasma), plasma gas flow rate (in Plasma).  
The parameter to be modified is selected on the indicator zone.

+ and - keys of the modification zone allow the adjustment of the parameter.

For example, for the current :

- In DC mode, only one parameter is displayed and adjustable
- In pulse mode, four parameters can be adjusted : High and low pulse current, Pulse frequency and the ratio High/Low current.



### Video screen

In option, it is possible to insert into the HPW interface the image of the welding arc, bringing a significant quality profit by giving more information for the adjustments of the torch position into the welding joint, this without any ocular tiredness and with the shelter of the arc radiations.

### Tool box

Includes the controls to prepare the welding as well as actions during welding cycle such as the switch of the heads in case of multi cathode for example

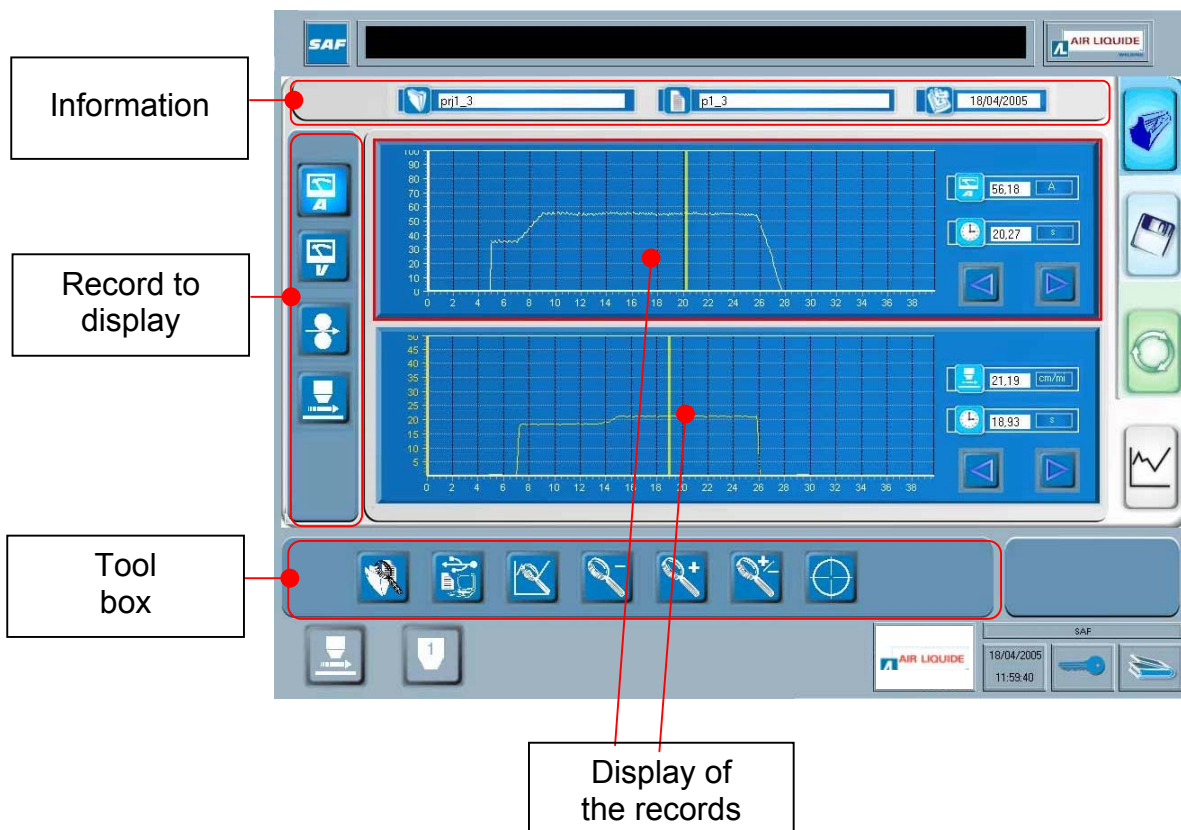
## 8 Quality index

This optional index allows the quality follow-up, the record and storage of the essential welding parameters.

A measurements acquisition device records during welding the essential parameters. The quality index allows then the management of these records.

It is divided into 4 principal areas :

- Project / program information
- Record to display
- Display of the record
- Tool box



### Project / program information

The signals recorded during the day of welding are stored in a project. The information area reminds which is the project and welding program selected, also its creation date

### Display of the record - Record to display

HPW gives the possibility to display two records at the same time, on two separate windows, the contents of the windows being defined by the selection of icons located in the "Record to display" area.

### Tool box

Include the controls for the management of the records :

- Open, delete, export
- Zoom on record

## **9 Main technical characteristics of the HPW control system**

The HPW control system uses the last improvements as regards power and capacity processor, it includes mainly :

- Celeron Processor 2Ghz / 256Mo of RAM / Bus PCI and AGP
- Flat touch screen of 306 x 230 mm, industrial quality
- Hard disk of 40Go
- USB 2.0