SAGA®
KATERINČIN

Slovak Art Glass Automatic

SAGARYT SGA

Machine UI Panel
Grinding arm UI Panel



SAGARYT SGA

The SAGARYT SGA version machine is equipped with two UI panels:

1. 1pc on the main control panel
2. 1pc on each grinding arm

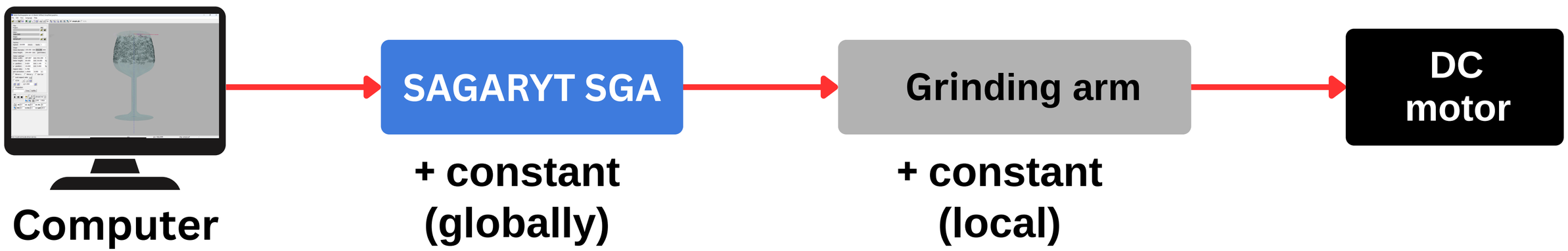
They are used to adjust variables such as:

1. Air pressure, both during decoration and during movement
2. Grinding tip speed
3. Servo motor position when is titled/deflected
4. Servo motor braking distance when is titled/deflected

They also display important information, values and the status of the machine it is in. This information is important for the operator of the SAGARYT machine.

Topology of the DC motor speed control and adjustment system

- The computer sends the DC motor speed values to the SAGARYT SGA machine via the USB interface. The machine then displays them on the display.
- The constant on the main panel sets the DC motor speed for all arms at once (globally).
- Possibility of individual fine-tuning of the DC motor speed on each arm separately.
- Positive constant - to increase the speed.
- Negative constant - to decrease the speed.



UI panel - Machine

The machine UI panel has 7 pages on the main screen, 6 in the case of a 2-position machine

***Scrolling between pages is possible by turning the encoder in the CW direction.**



1. Main panel



2. Pressure information



3. Air pressure graph



4. Grinding machine information



5. Grinding head parameters 1-5

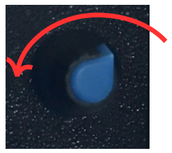


6. Grinding head parameters 6-10



7. Communication information

To go back one page, or to the very beginning, turn the encoder in the CCW direction.



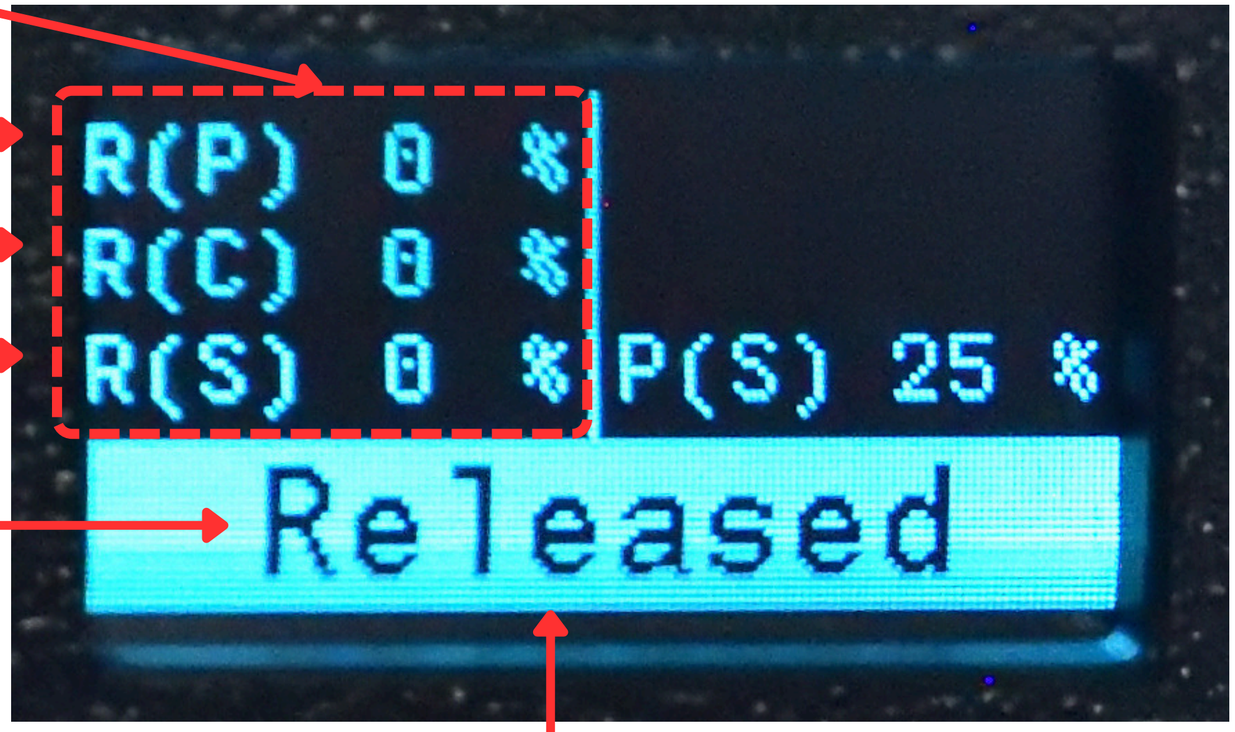
UI panel - Machine - Main page – part 1

Part of the display showing the parameters of the grinding tips speed

Signal value for grinding tip speed - from computer

Operator-set constant

The resulting sum of the signal from the computer and the operator-set constant

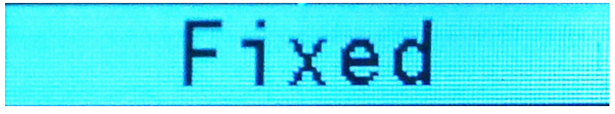


Machine status

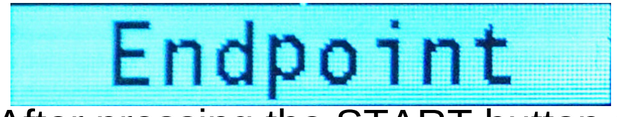
The constant set by the operator can be:

- Positive - Adds the speed globally
- Negative - Subtracts the speed globally

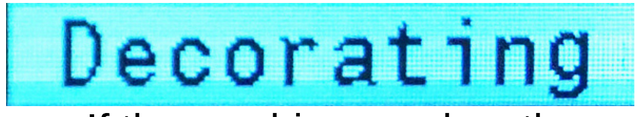
The machine has 5 statuses (Released, Fixed, Endpoint, Decorating, Paused)



After pressing the FASTEN button on the panel, the machine starts the vacuum pump and changes the status to “Fixed”



After pressing the START button on the panel, the machine starts moving the beam to the endpoint position and changes the status to “Endpoint”



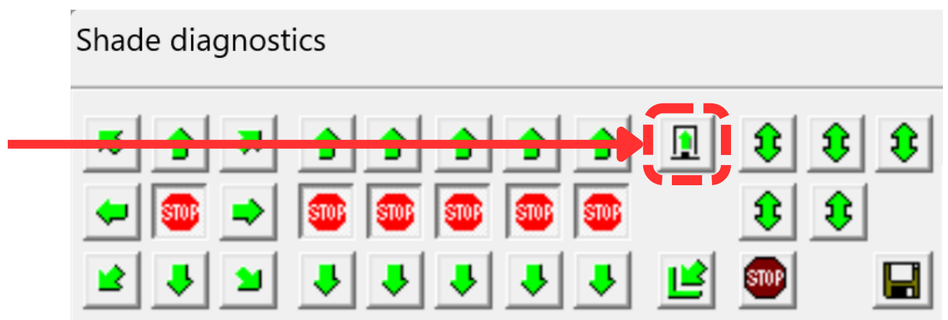
If the machine reaches the endpoint position, it starts decorating and changes state to “Decorating”

UI panel - Machine - Home page – part 2



- After decoration is complete, the computer issues a signal to turn off the vacuum pump, thereby releasing the glass cups (UV_PC signal).
- This signal will also change the machine status from “Decorating” to “Released”.

- If the decoration is interrupted by the operator, it is possible to release the glass cups (change the status) manually through the diagnostic window, by pressing the button



UI panel - Machine - Home page – part 3

Display if the machine has no active tool and the grinding tip is in a remote position



If the machine does not have an active tool - static pressure is used

Part of the display showing the air pressure parameter

Static pressure parameter

Display if the machine has an active tool and the grinding tip is in contact with the glass cup



If the machine has an active tool - work pressure is used

Signal value for pressure - from computer

Constant set by operator

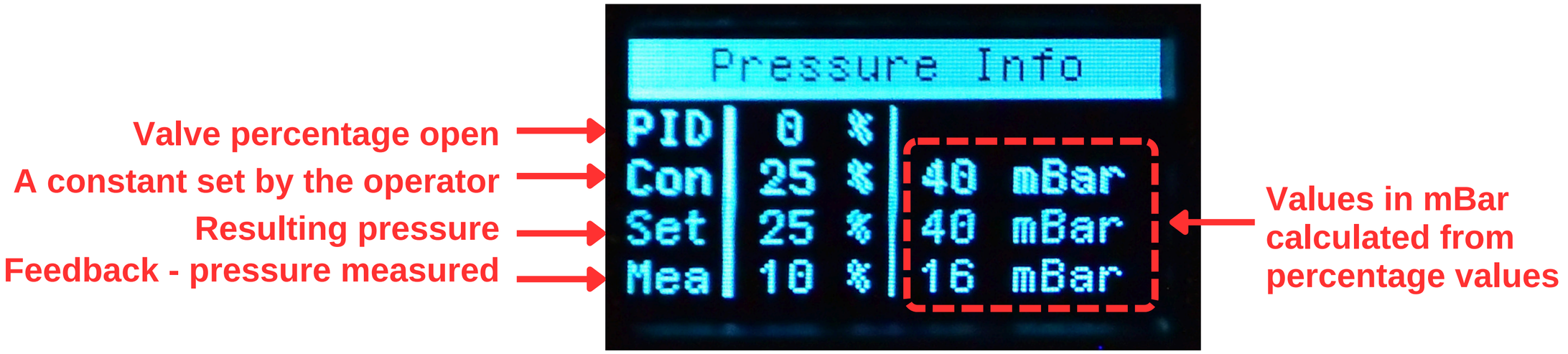
The resulting sum of the signal from the computer and the constant set by the operator

Attention!
The machine in the given configuration ignores the pressure setting from the computer! The pressure is defined by a constant set by the operator.

UI panel - Machine - Pressure information

Pressure information page, displays values in:

- Percentages (%)
- mBar - pressure unit calculated from percentage values (%)

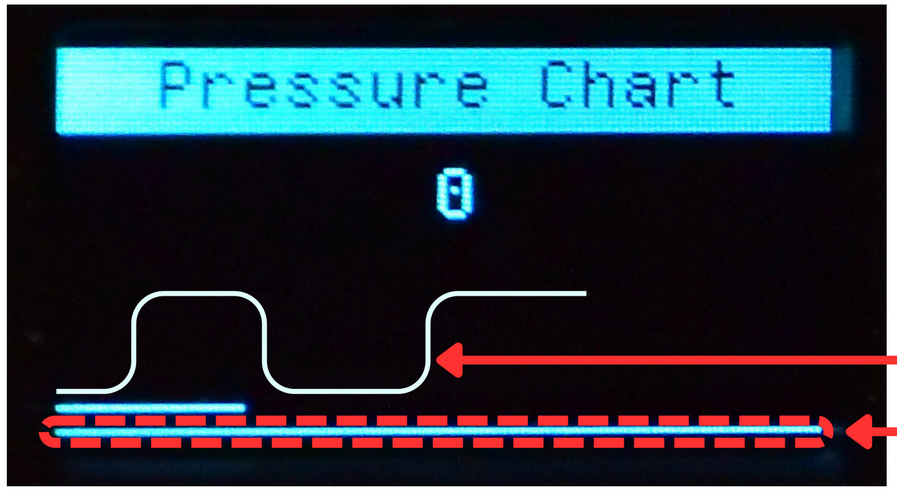


- **The operator can change the pressure value even while the machine is decorating.**
- In practice, a min: 24% and a max: 38% are commonly used, depending on the thickness and hardness of the glass.
- Air pressure directly affects the force the arm exerts on the glass and therefore the thickness of the line the machine decorates.

UI panel - Machine - Air pressure graph

The Air Pressure Graph page displays real-time air pressure in the machine beam and the pressure setpoint.

View of the machine at idle state with vacuum released and compressor off.

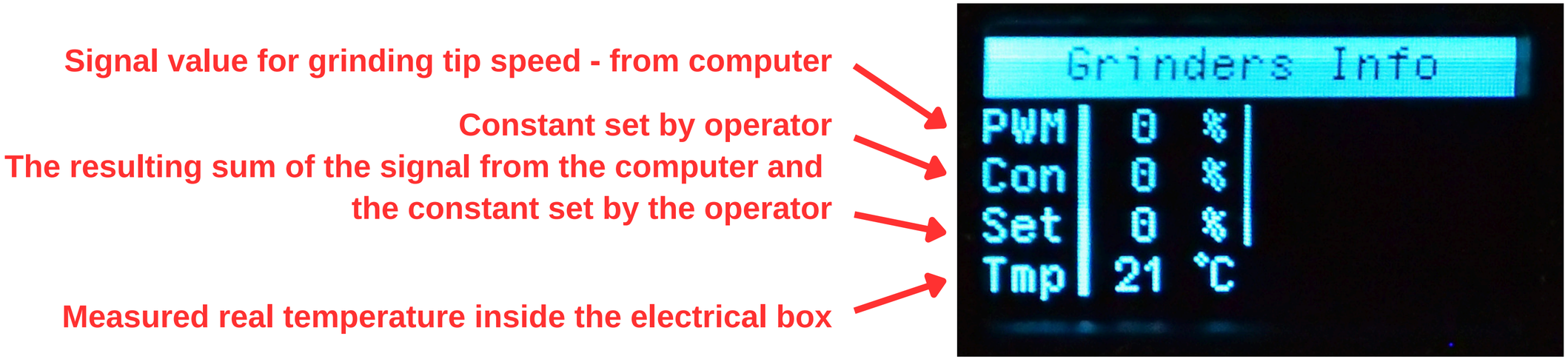


The curve shows the real value of the air pressure

The horizontal line shows the set air pressure value

UI panel - Machine – Grinding tips information

The grinding tip information page displays grinding tips RPM values in percentages (%).



The line dedicated to the air temperature in the electrical box displays the temperature in degrees Celsius.

UI panel - Machine - Grinding head parameters – part 1

- Individual adjustment of the grinding tip speed is possible for each arm; this constant is sent from the arm to the main machine board.

- The page is divided into two columns, one row representing one arm.

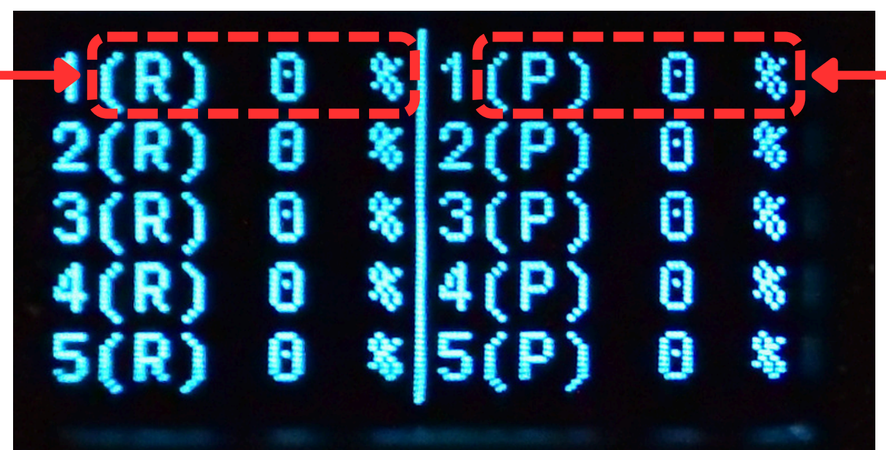
- The column:
  - left - constant for the speed of the grinding tip.
  - right - pressure constant **(this option is not yet available)**

- The machine in a relaxed state, with an inactive tool, will perform a communication check with the grinding heads every 5 seconds.
- If the arm does not respond, the number 404 will be displayed in place of the pressure and speed parameters - indicating a loss ofcommunication with the arm.

UI panel - Machine - Grinding head parameters – part 2

- Each row represents one grinding arm of the machine

Constant speed of the grinding tip on the arm



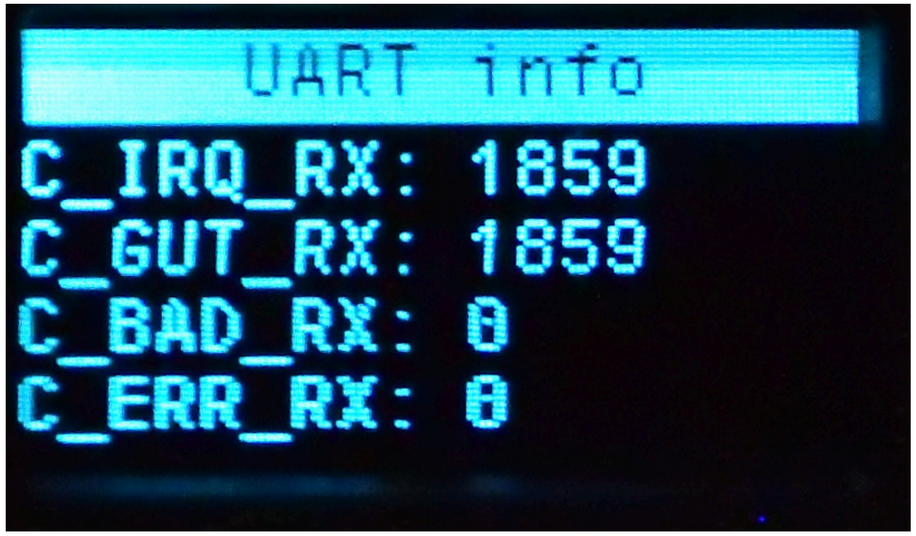
Constant air pressure on the arm

Attention!
Individual pressure adjustment for each grinding arm is not yet possible, although the pressure parameter for this mode is displayed.

- The machine in a relaxed state, with an inactive tool, will perform a communication check with the grinding heads every 5 seconds.
- If the arm does not respond, the number 404 will be displayed in place of the pressure and speed parameters - indicating a loss of communication with the arm.
- For a 6 or more-position machine, there are 2 pages for displaying parameters.

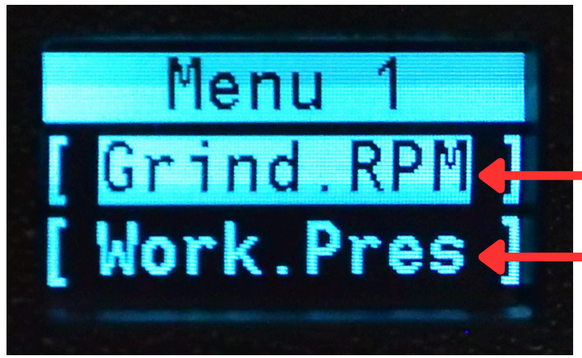
UI panel - Machine - Communication information

- The communication page is for development purposes and diagnostics; it is not directly important for the operator.



UI panel - Machine - Menu – part 1

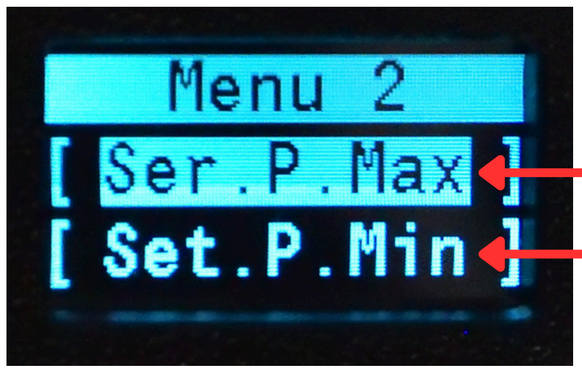
- After pressing the encoder, the operator will enter **Menu 1.**
- The operator moves between the individual Menus (Menu 1 to Menu 5) by turning the encoder in the CW or CCW direction.



Changing the speed constant of a DC motor

Changing the working pressure constant

- **Menu 2 contains the following parameters:**



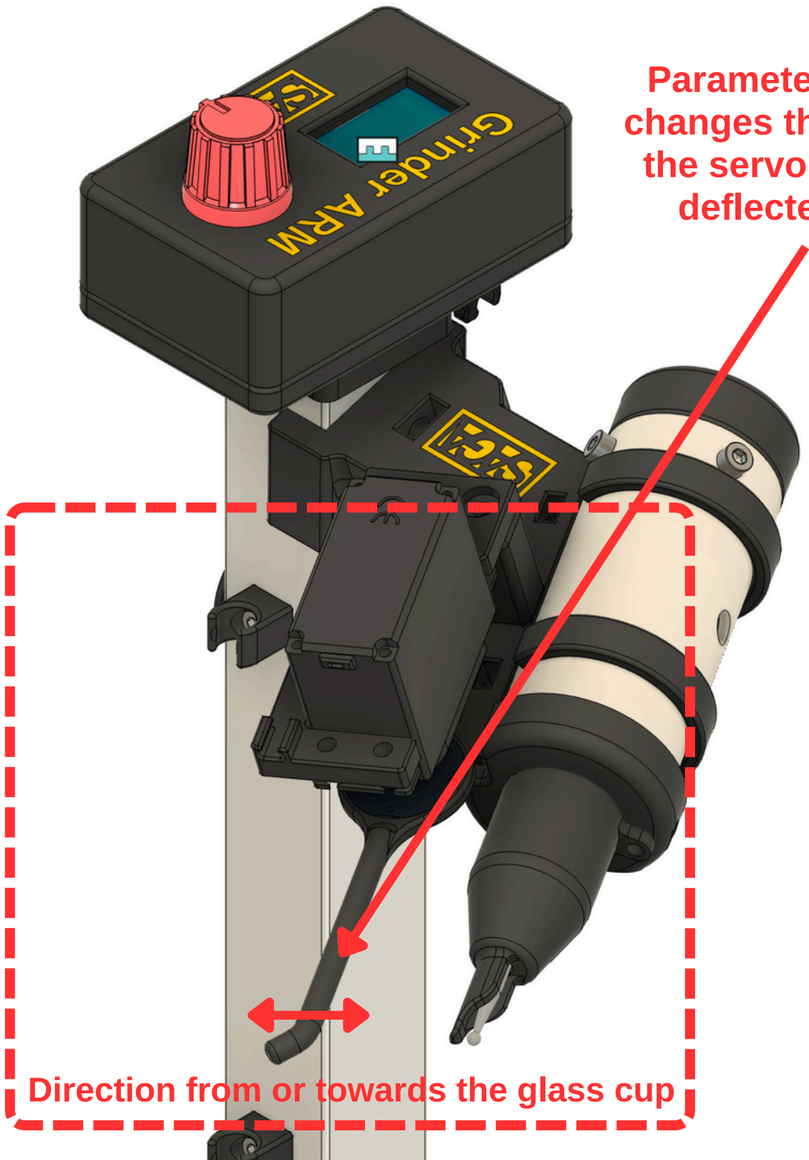
The position of the servo motor in the deflected state

The position of the servo motor in the tilted state

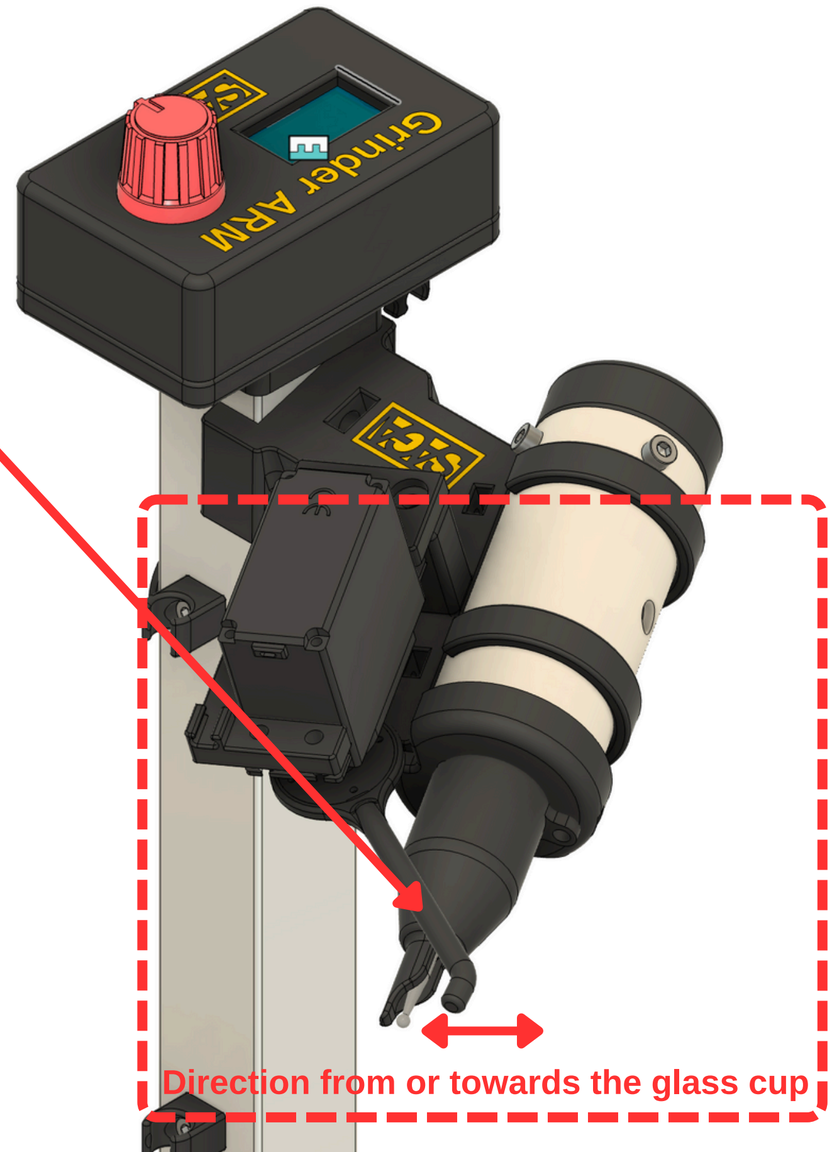
***These parameters can be adjusted during decoration.**

UI panel - Machine - Ser.P Parameter

- **Servo motor in the deflected position**
  The grinding tip touches the glass cup



- **Servo motor in the tilted position**
  The grinding tip does not touch the glass cup



UI panel - Machine - Menu – part 2

- **In Menu 3 there are parameters:**



% Distance at which the servo motor should start braking when deflecting

% Distance at which the servo motor should start braking when tilting

***These parameters cannot be edited during decoration.**

  - This parameter slows down the servo motor at a given point when the grinding tip contacts the glass cup.
  - Slowing down this movement will prevent a dot from forming on the glass when the grinding tip is placed on the glass cup.
  - It is also possible to slow down the opening of the servo motor.

- **In Menu 4 there are parameters:**



Free pressure constant

Machine information

UI panel - Machine - Menu – part 3

- **Menu 5 contains the following parameters:**



Reset parameters to factory defaults

Returning to the “Home” page

***Parameters can only be reset to their original settings when the machine is not decorating.**

UI panel - Machine - Menu 1 - Parameter part 1

- After changing the constant, to confirm and save it in memory, you must press the encoder again.
- Pressing the encoder returns the operator to the Menu page, where he can change other parameters, or return to the Main Page.

Attention!

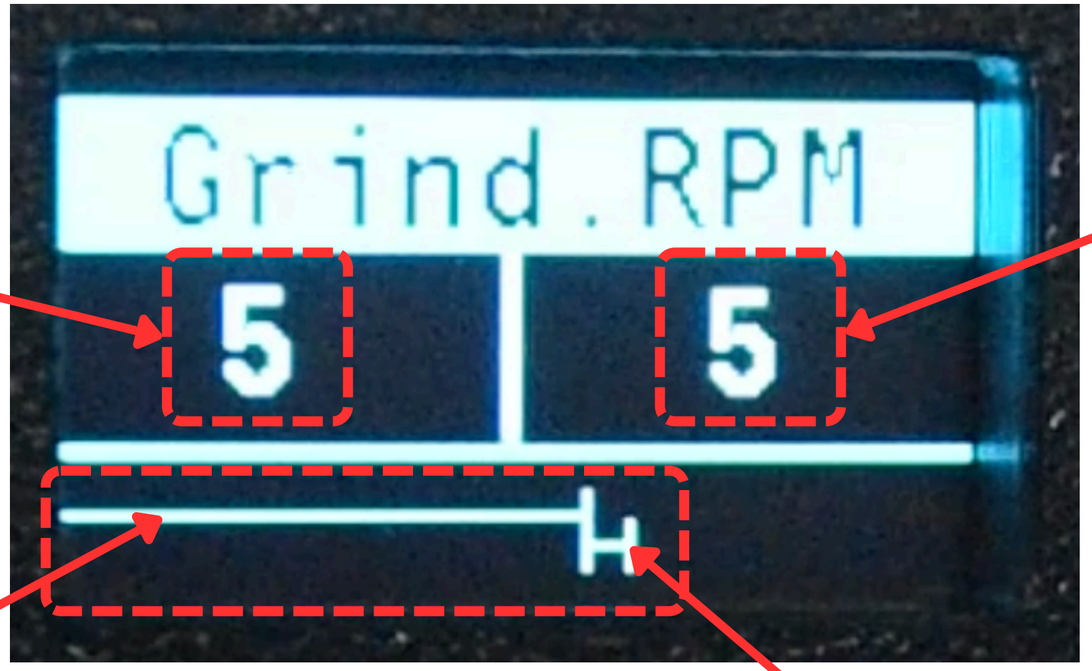
- **Each time a parameter is changed, these parameters are saved in the machine's memory.**
- **Saving parameters only takes place during the machine's idle state (when the machine is not decorating and the tool is not active).**
- **After finishing decorating, but also when the machine is in the idle state, you need to wait 2 minutes for the “Saving” message to appear on the machine display.**
- **After this message appears, the machine can be turned off.**

Attention!

Do not turn off the machine before or during saving these parameters!

UI panel - Machine - Menu 1 - Parameter part 2

- After pressing the encoder, the operator will enter **Menu 1.**
- In this menu, select the parameter you want to edit.
- Enter the parameter by pressing the encoder again.
- Parameter values are adjusted by rotating the encoder in the CW or CCW direction.



Parameter stored in machine memory

New parameter changed by operator

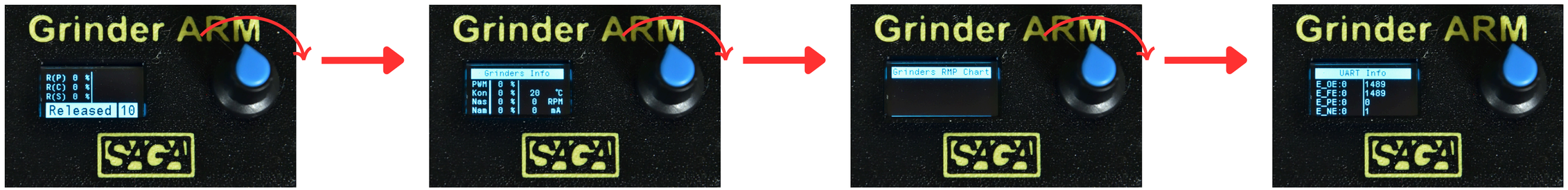
Visual representation of the input speed signal

Visual representation of the operator-set constant

UI panel - Grinding arm

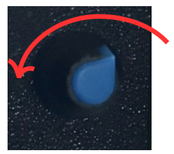
The UI panel of the grinding arm has 4 pages on the main screen

***Scrolling between pages is possible by turning the encoder in the CW direction.**



1. Home page
2. Grinding tips information
3. Grinding tips speed chart
4. Communication information

To go back one page, or to the very beginning, turn the encoder in the CCW direction.



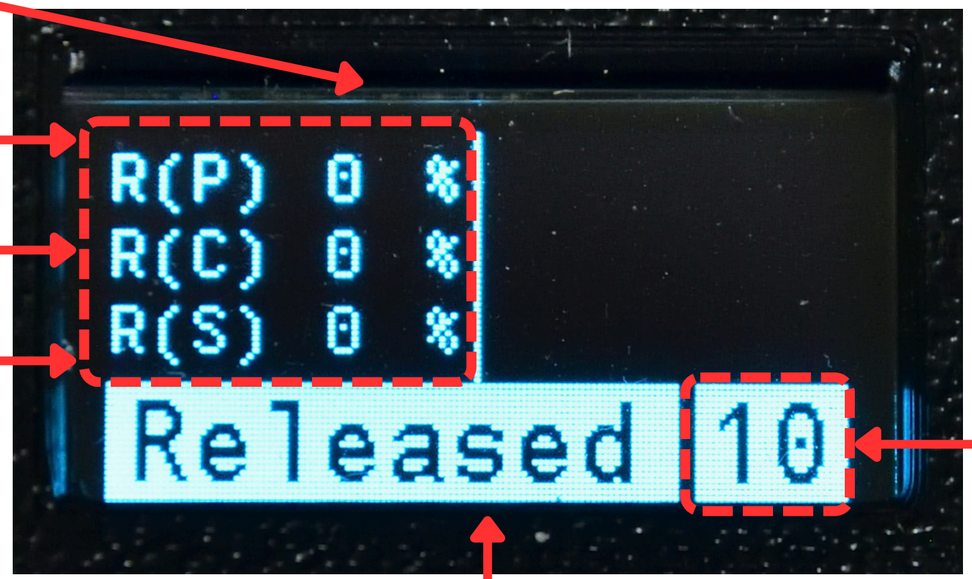
UI panel - Grinding arm - Home page – part 1

Part of the display showing the parameters of the grinding tips speed

Signal value for grinding tips speed - from the main panel

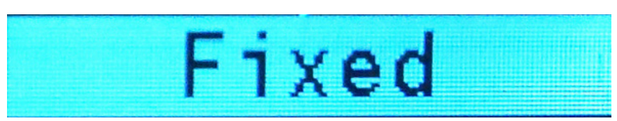
Constant set by operator

The resulting sum of the signal from the main panel and the constant set by the operator



Arm position on the machine

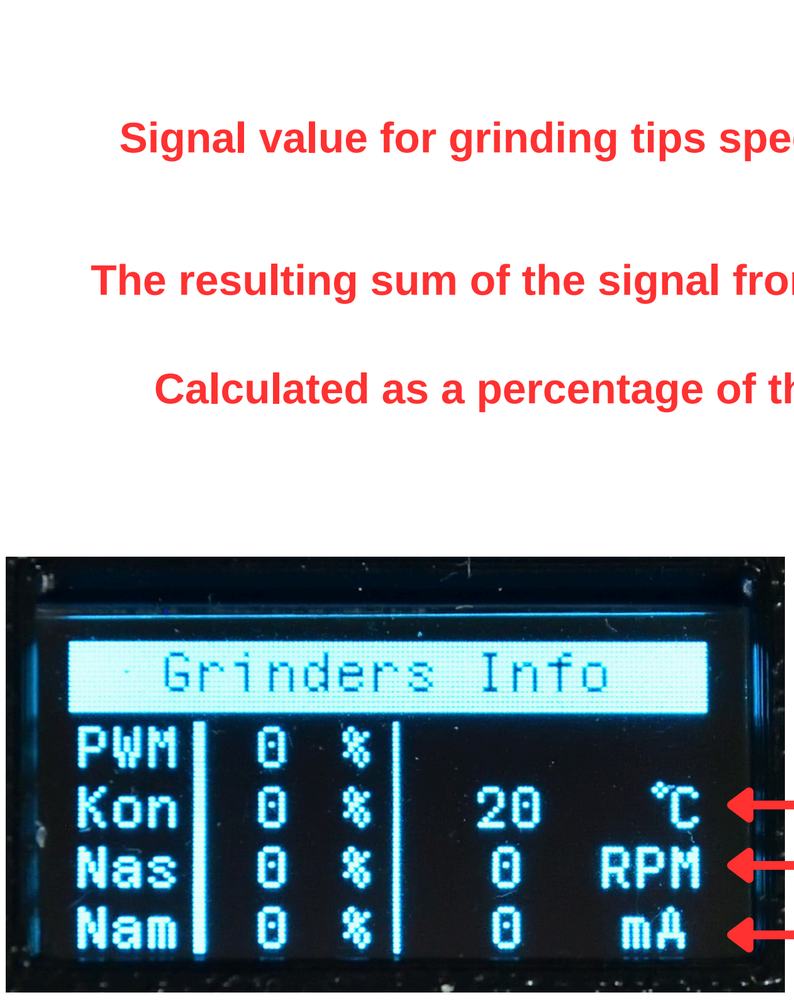
The grinding arm has 2 statuses (Released, Fixed)



After pressing the FASTEN button on the panel, the machine starts the vacuum pump and changes the status to “Fixed”.

UI panel - Grinding arm – Grinding tip information

The grinding tip information page displays grinding tips RPM values in percentages (%) as well as actual grinding tip RPM measured from feedback.



Signal value for grinding tips speed - from the main panel

Operator-set constant

The resulting sum of the signal from the computer and the operator-set constant

Calculated as a percentage of the feedback speed value



Electronics temperature inside the grinding arm

Actual speed of the grinding tip

Actual current drawn by the DC motor

UI panel - Grinding arm – Grinding tip speed graph

- Each grinding arm is equipped with speed feedback for the best line decoration results.
- The grinding tip speed values from the grinding tip feedback are plotted as a graph on this screen.

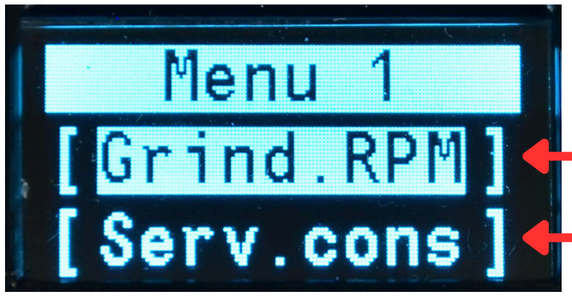
- The horizontal line shows the speed value set.
- The curve shows the real speed of the DC motor.



UI panel - Grinding arm - Menu - part 1

- After pressing the encoder, the operator will enter **Menu 1.**
- The operator moves between the individual Menus (Menu 1 to Menu 5) by turning the encoder in the CW or CCW direction.

- **Menu 1 contains the following parameters:**



***Only the DC motor constant parameter can be changed during decoration.**

Changing the speed constant of a DC motor

Changing the position constant of a servo motor

- **Menu 2 contains the following parameters:**



Changing the arm position

Grinding arm information

UI panel - Grinding arm – Servo motor constant

- After replacing the servo motor or other part on the grinding head, during which the servo motor had to be dismantled, it is necessary to adjust the position of the servo motor.
- The servo motor constant serves to correct this position of the servo motor rod relative to the others, so that they are all in one line.

Attention!
If the servo motor has been changed or dismantled, this parameter must be set, otherwise the distance between the glass cup in the tilted and deflected positions may be different.

UI panel - Grinding arm - Menu – part 2

- **Menu 3 contains the following parameters:**



Reset parameters to factory defaults

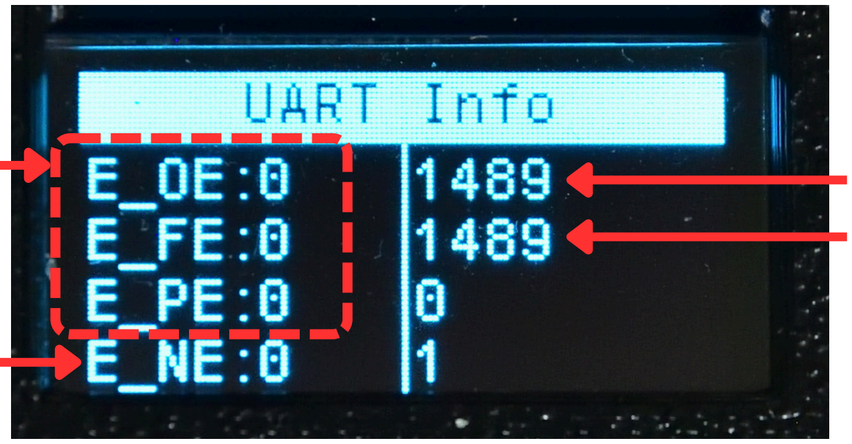
Returning to the “Home” page

***Parameters can only be reset to their original settings when the machine is not decorating.**

- The control on the grinding arm works the same as the control on the main panel.
- After pressing the encoder, the operator will enter **Menu 1.**
- In this menu, you select the parameter you want to edit.
- The parameter is entered by pressing the encoder again.
- Parameter values are adjusted by rotating the encoder in the CW or CCW direction.

UI panel - Grinding arm - Communication information

- This page is used to determine the error rate of the arm's communication, but also to determine whether the DC motor is failing and will need to be replaced.



3 parameters determining communication error rate

Parameter indicating communication line interference

Parameter of successful packet reception

Parameter of successful packet processing

- If the parameters **“E_OE, E_FE** and **E_OE”** increase, it means that the arm has a communication problem and you need to contact the manufacturer.
- If the **E_NE** parameter increases with each start-up of the DC motor, this means that the DC motor is already at the end of its service life and needs to be replaced with a new one.