SANDOLAB TP

Operation Manual

July 2018

Revision 1.2

CONTENT

A. Introduction of Machine

1. Outlook

2. Operation Panel

3. Description of the operation panel

◆ EMG.STOP：The machine will be switched off whilst this button is pressed.

◆ POWER-START：After main breaker is switched on, you must press this button to start the machine and the lamp will be glowing at the same time.

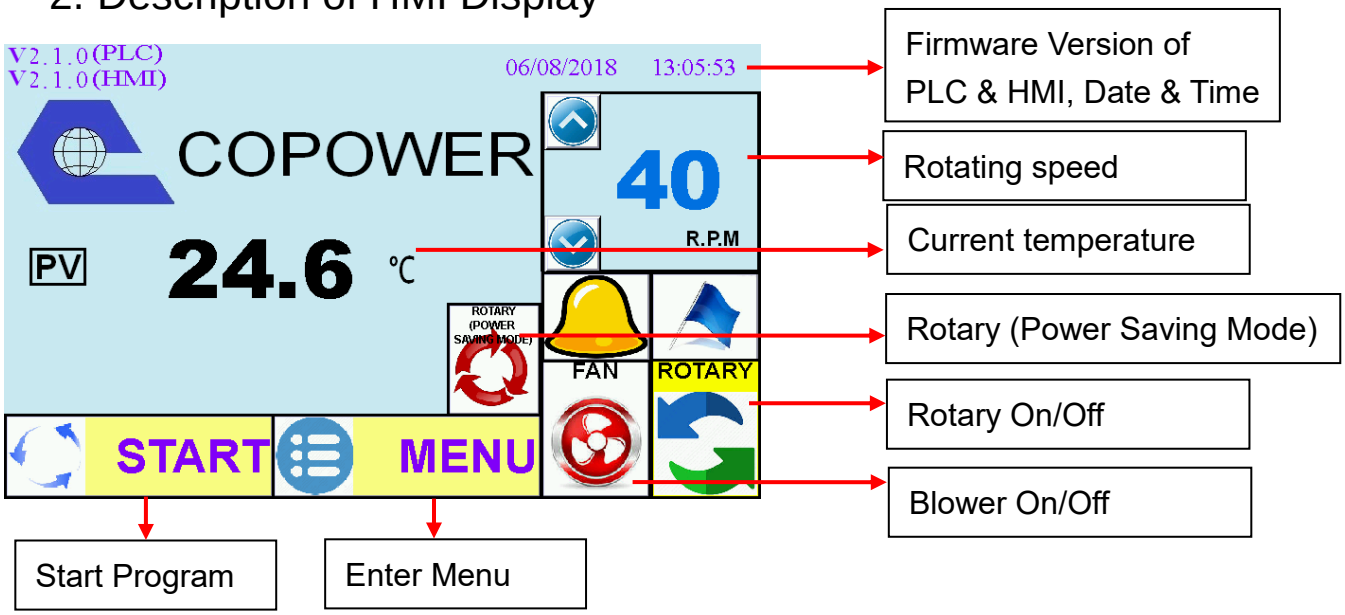
◆ INCHED：This pushbutton is used for rotating the reel manually.

◆ USB：It is used to import and export of dyeing programs via USB flash driver.

B. HMI Touch Panel

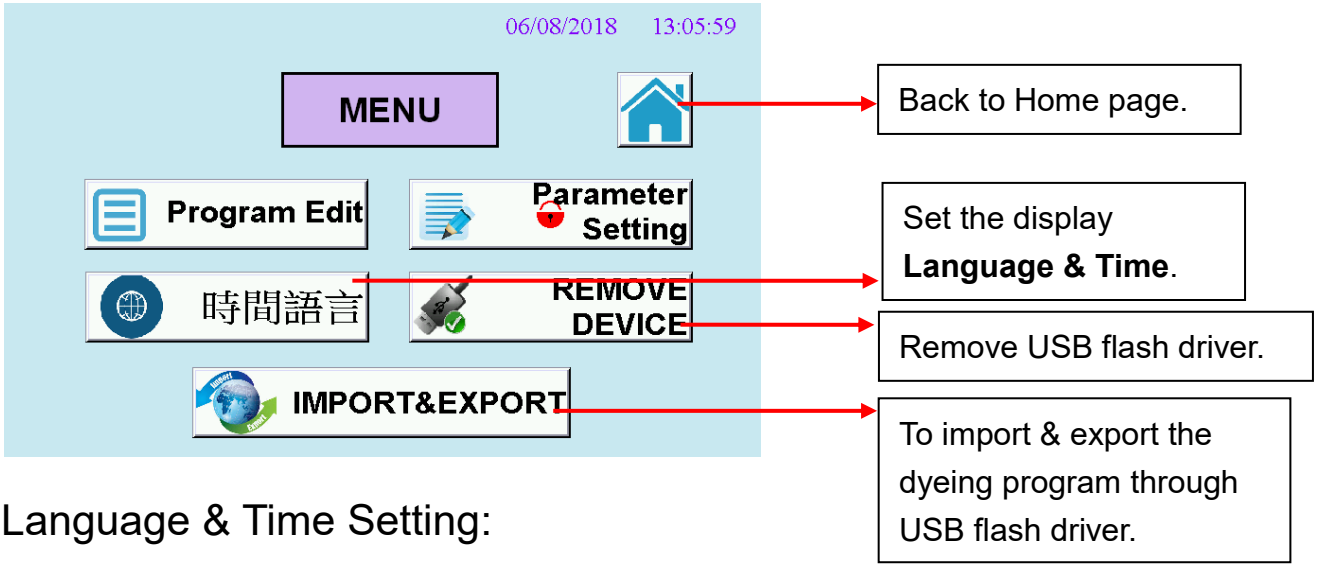
1. Outlook

2. Description of HMI Display

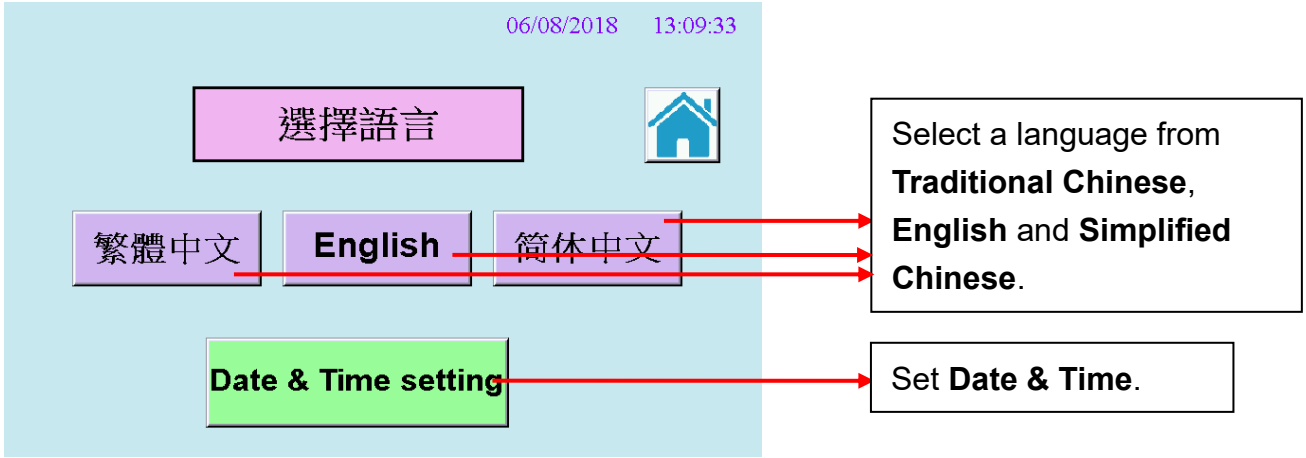


The **START** button will be disabled while Rotary is running under power saving mode.

MENU:



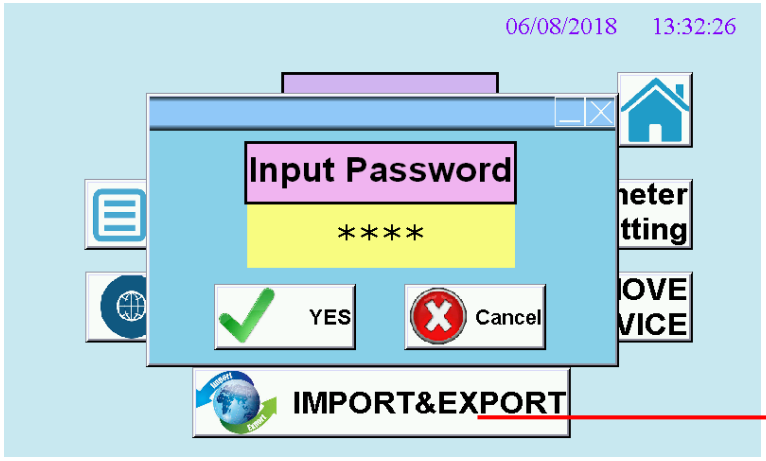
Language & Time Setting:



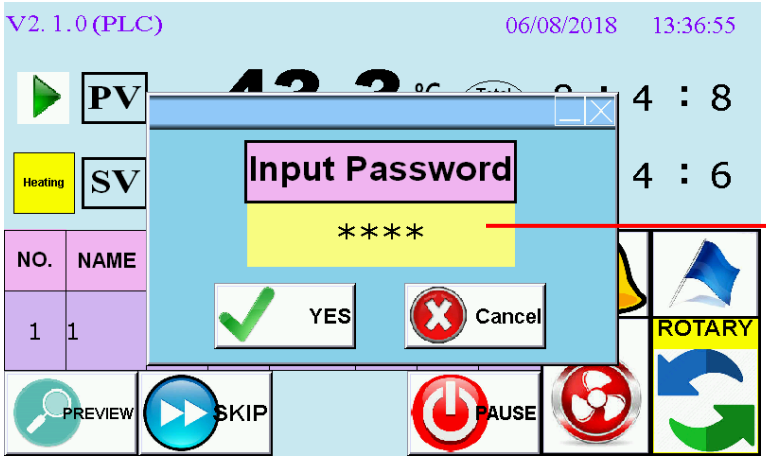
Set field for **Date & Time**

Set **Date & Time**.

Password Verification:

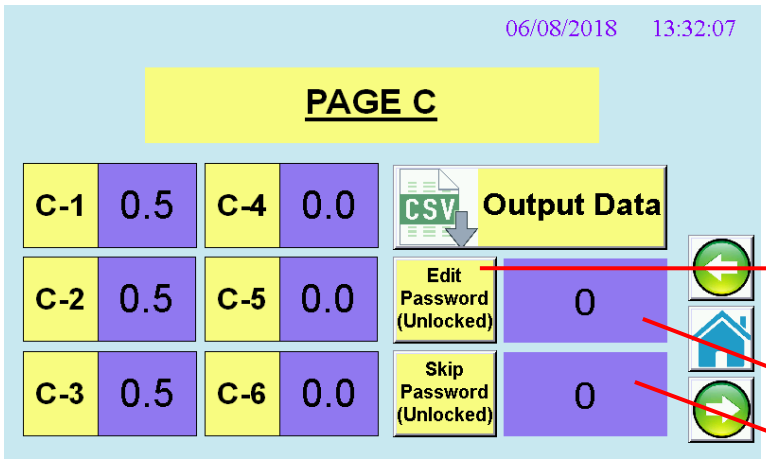


The **Import & Export** function has been protected by password.



The **Skip step** function has been protected by password.

Password setting in PAGE C:



Click this button to toggle between Locked and Unlocked of Password function.

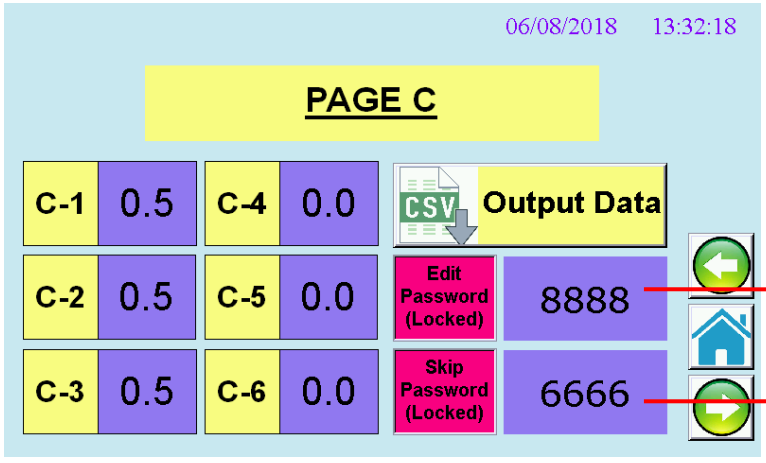
Click here to specify password.

Edit Password (Unlocked/Locked)

- **Locked**: It is allowing user to specify the password and **Program Edit** function will be protected by password.
- **Unlocked**: The password function is disabled.

Skip Password (Unlocked/Locked)

- **Locked**: It is allowing user to specify the password and **Skip step** function will be protected by password.
- **Unlocked**: The password function is disabled.



To specify the password for **Program Edit** function.

To specify the password for **Skip step** function.

C. Application Examples

1. New a dyeing program

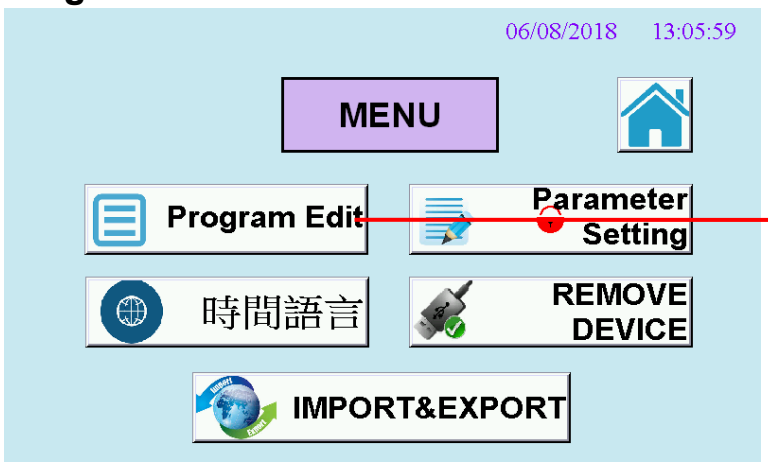
Example：Program No.: 1, Program name: 123

Program details:

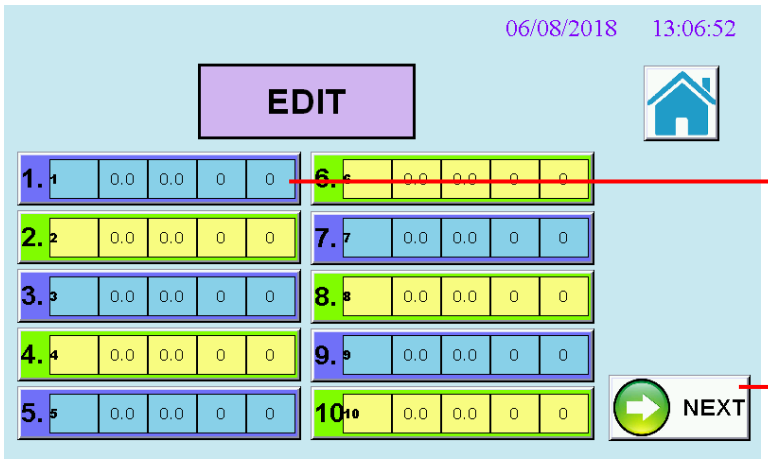
Program No. : 1			Program Name: 123	
Step	Target Temp. (°C)	Gradient (°C /Min)	Holding Time (Min.)	Dosing Time (Min.)
1	60	3	0	0
2	100	2	30	10
3	40	4	0	0

a. Step 1: Target Temperature=60°C, Gradient = 3°C /min, Holding Time = 0min
b. Step 2: Target Temperature =100°C, Gradient = 2°C /min, Holding Time = 30min, Dose Alarm = 10 min
c. Step 3: Target Temperature =40°C, Gradient = 4°C /min, Holding Time = 0min

Program Edit:



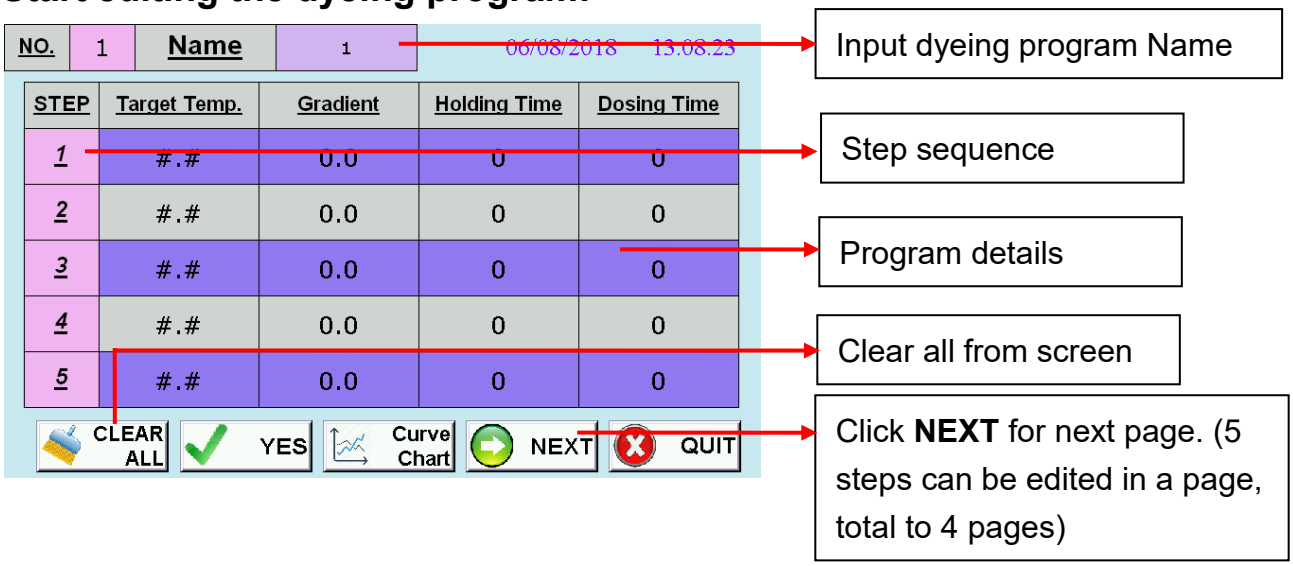
Click **Program Edit**

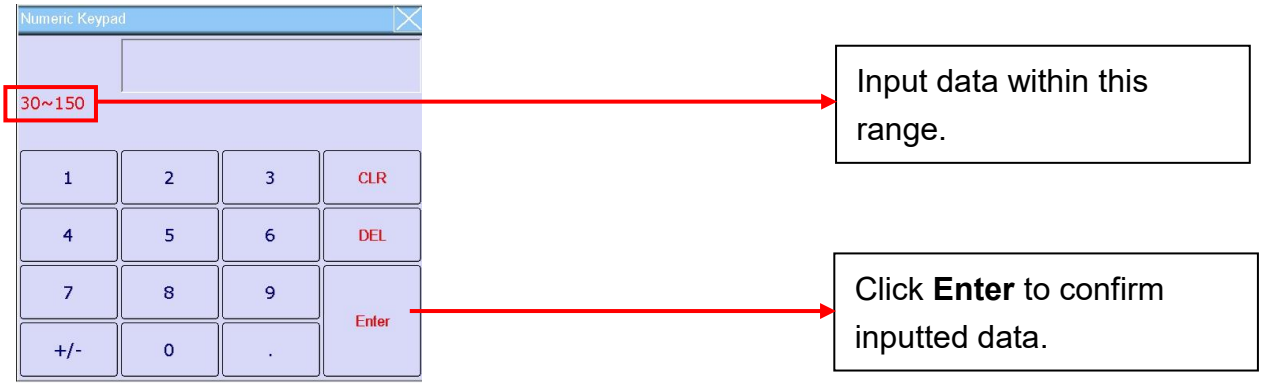


Click “**1**” for editing the Dyeing Program 1.

Click **NEXT** for next page. (10 Programs can be edited in a page, total to 10 pages)

Start editing the dyeing program:





Step 1: Target Temperature=60℃, Gradient = 3℃/min, Holding Time = 0min

a. Click the **Target Temp**. column of **Step 1**, input **60**, then click **Enter** to confirm inputted data.
b. Click the **Gradient** column of **Step 1**, input **3.0**, then click **Enter** to confirm inputted data.

Step 2: Target Temperature =100℃, Gradient = 2℃/min, Holding Time = 30min, Dose Alarm = 10 min

a. Click the **Target Temp**. column of **Step 2**, input **100**, then click **Enter** to confirm inputted data.
b. Click the **Gradient** column of **Step 2**, input **2.0**, then click **Enter** to confirm inputted data.
c. Click the **Holding Time** column of **Step 2**, input **30**, then click **Enter** to confirm inputted data.

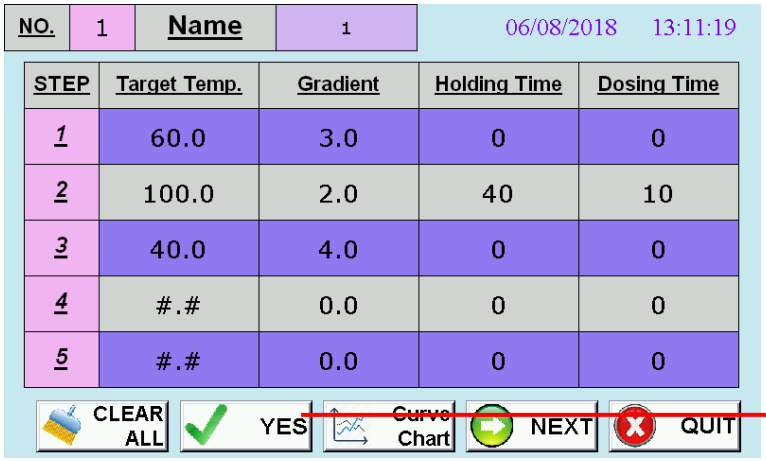
d. Click the **Dosing Time** column of **Step 2**, input **10**, then click **Enter** to confirm inputted data.
   When the program entering the holding stage of step 2, at after 10 minutes the machine will inform operator to dose the chemical into beaker by buzzer and message display.

Step 3: Target Temperature =40℃, Gradient = 4℃/min, Holding Time = 0min

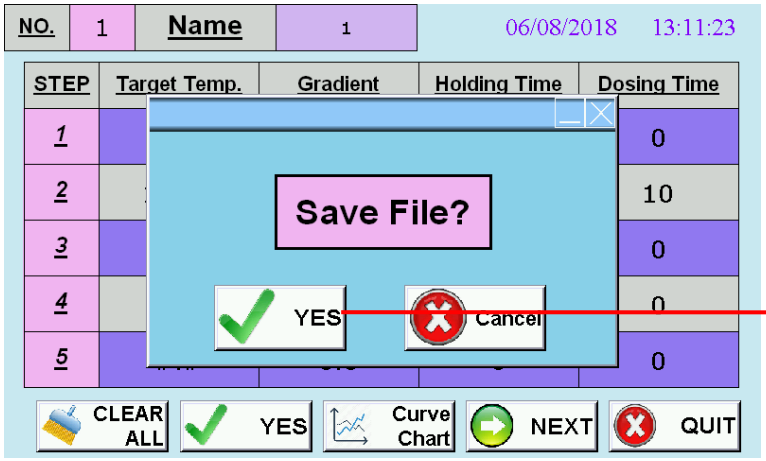
a. Click the **Target Temp**. column of **Step 3**, input **40**, then click **Enter** to confirm inputted data.
b. Click the **Gradient** column of **Step 3**, input **4.0**, then click **Enter** to confirm inputted data.

✧ If you input 999 at the holding time field, it means that machine will enter into the Constant dyeing mode and the temperature will be kept as the target temperature you specified.
✧ If you input 999 at the dosing time field, it means while machine is entering into the holding time stage and dosing chemical alarm will be activated at once.

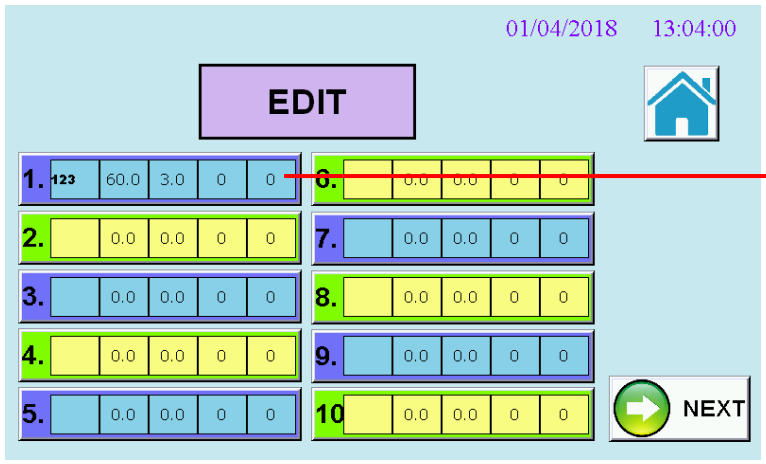
Complete Editing



Click **YES** button



Click **YES** to save program

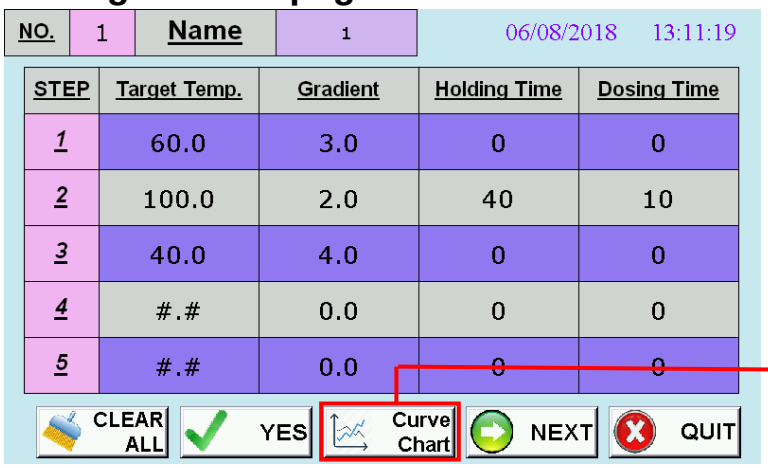


The content of step 1 will be displayed, once you complete the edit for dyeing program 1.

2. Preview the curve chart

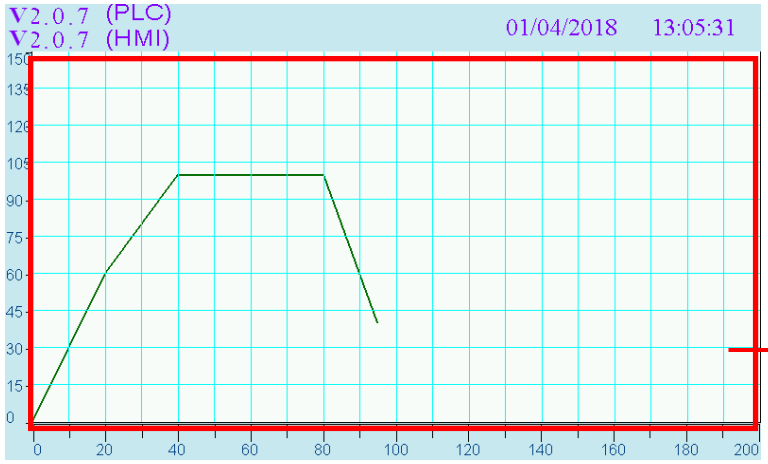
Click **Curve Chart** button to preview the curve chart of the dyeing program you selected.

In Program Edit page



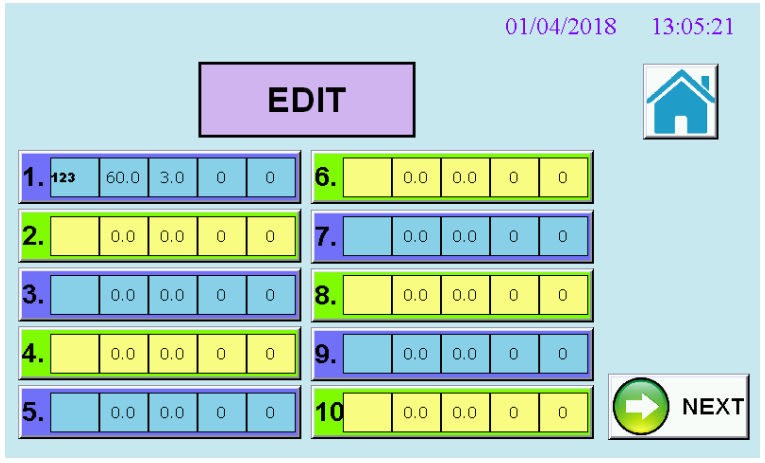
Preview the curve chart

Preview the curve chart



Tap on this area to quit preview.

Back to Edit page



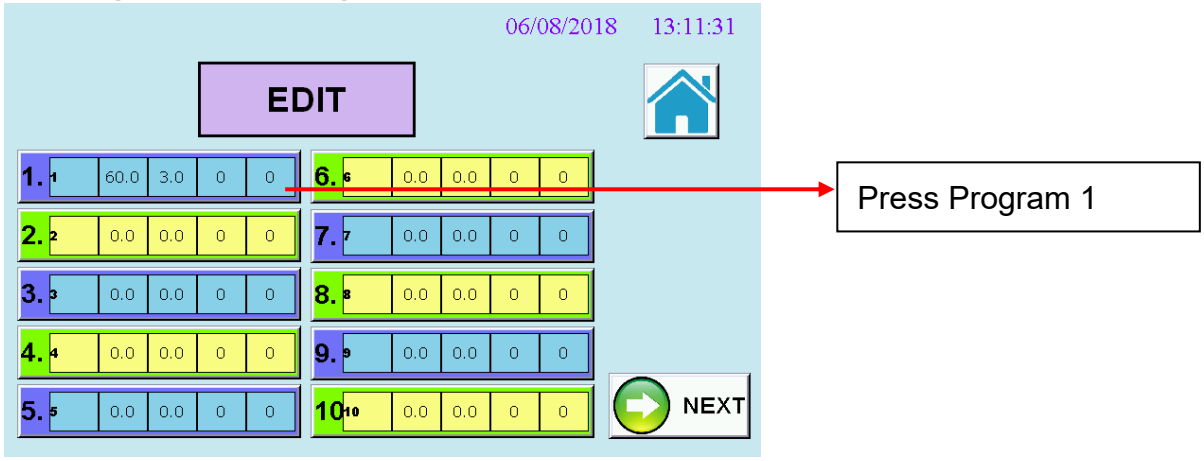
3. Modify an existing dyeing program

EX: Modify the step2 of program 1

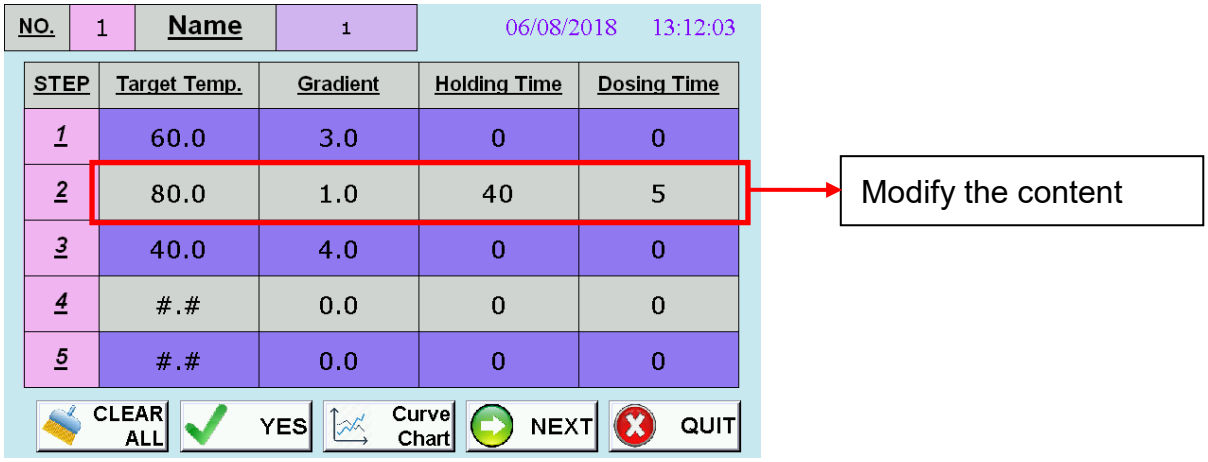
Original Step 2: Target Temperature =100℃, Gradient = 2℃/min, Holding Time = 30min, Dose Alarm = 10 min

Newly Step 2: Target Temperature =80℃, Gradient = 1℃/min, Holding Time = 40min, Dose Alarm = 5 min

In Program Edit page:



Modify the step 2:

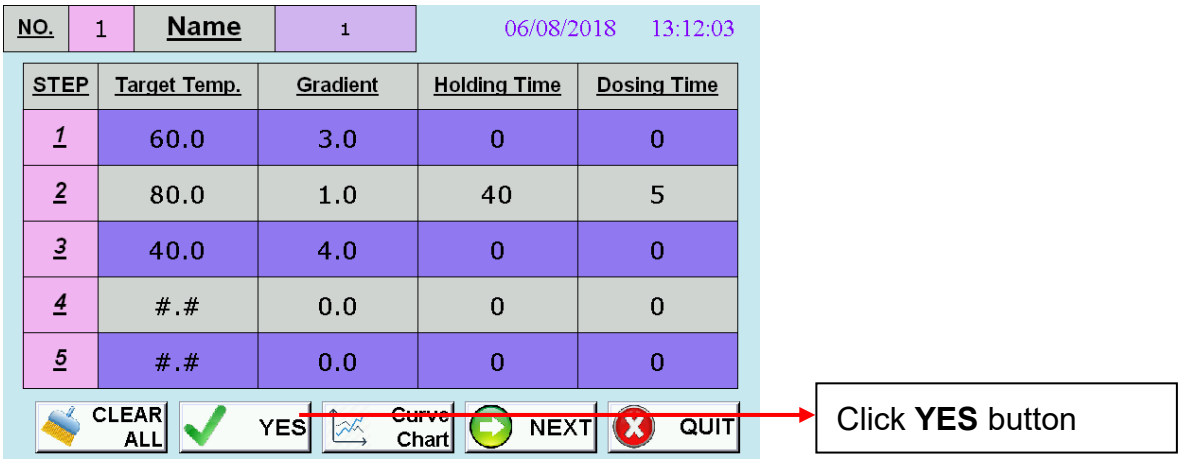


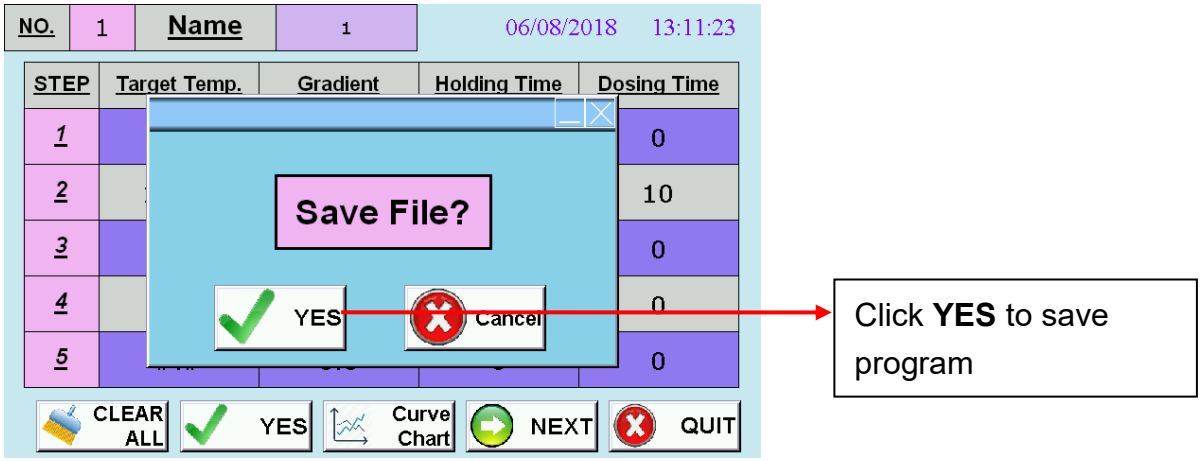
a. Click the **Target Temp**. column of **Step 2**, input **80**, then click **Enter** to confirm inputted data.

b. Click the **Gradient** column of **Step 2**, input **1.0**, then click **Enter** to confirm inputted data.

c. Click the **Holding Time** column of **Step 2**, input **40**, then click **Enter** to confirm inputted data.
d. Click the **Dosing Time** column of **Step 2**, input **5**, then click **Enter** to confirm inputted data.

Complete Modification:





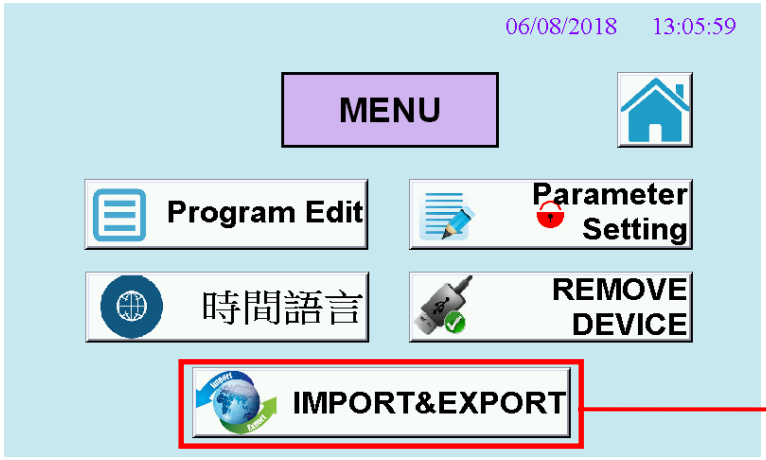
4. Import / Export programs

Export:

It is used to export all the dyeing programs from HMI to USB device. Please be noted that USB device must be formatted as FAT32.

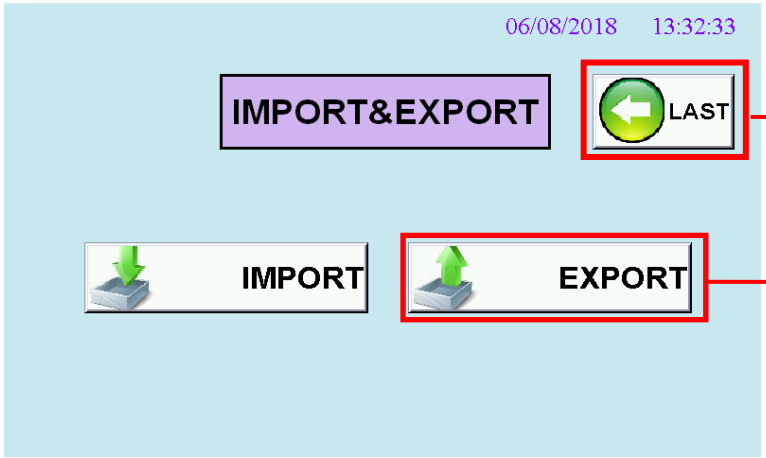
- ✧ Export Path: H:\HMI\HMI-000 (EX. H disk is the USB Device.)
- ✧ Export File Name: recipe.csv (It can be opened by Microsoft EXCEL.)

Main menu:



Plug in a USB device to HMI, click **IMPORT&EXPORT** button with password

Program Import & Export:



Back to home page

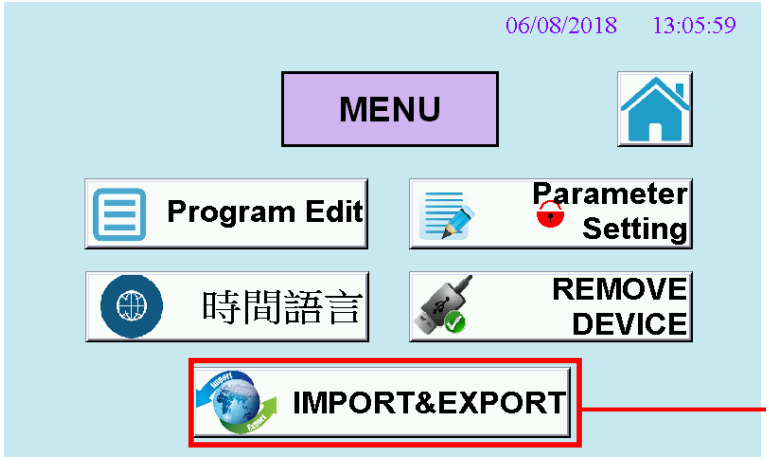
Click **EXPORT** button to transfer all the dyeing programs from HMI to USB device.

Import:

It is used to import all the dyeing programs from USB device to HMI.

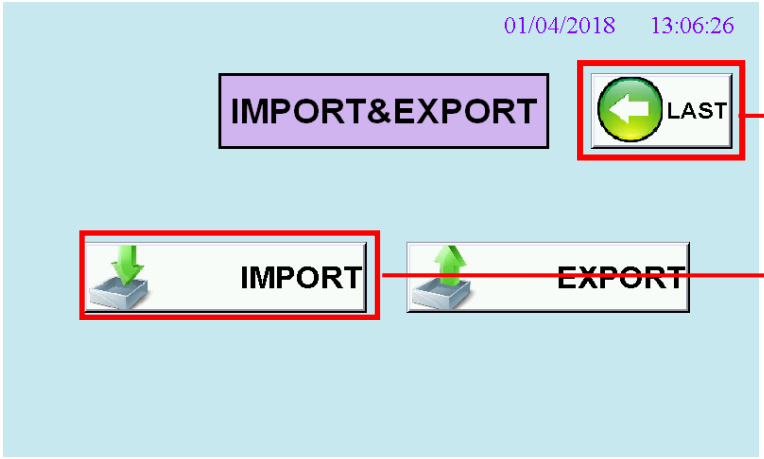
- ✧ Export Path: H:\HMI\HMI-000 (EX. H disk is the USB Device.)
- ✧ Export File Name: recipe.csv (It can be opened by Microsoft EXCEL.)

Main menu:



Plug in a USB device to HMI, click **IMPORT&EXPORT** button with password inputting

Program Import & Export:

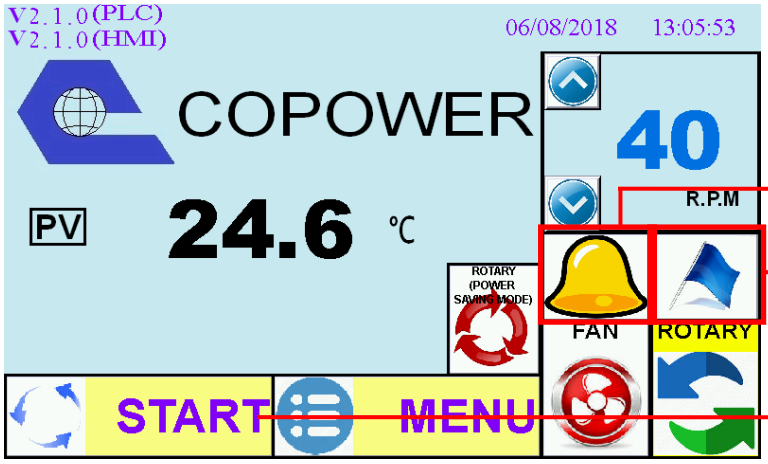


Back to home page

Click **IMPORT** button to transfer all the dyeing programs from USB device to HMI.

5. Run a dyeing program

Start program:

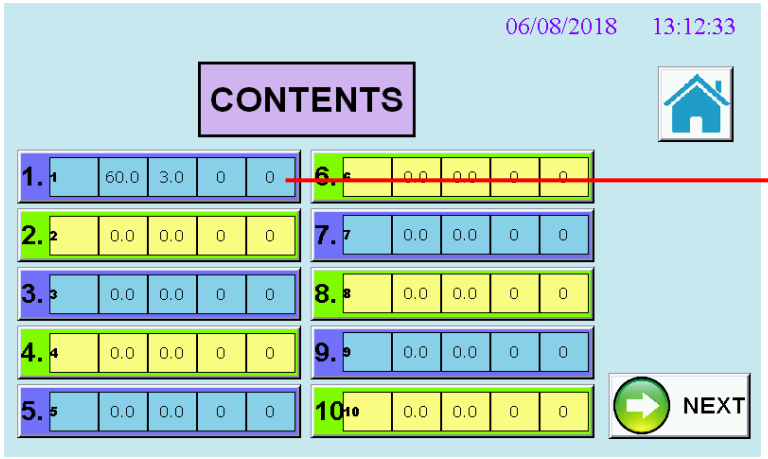


Alarm status icon

FINISH status icon

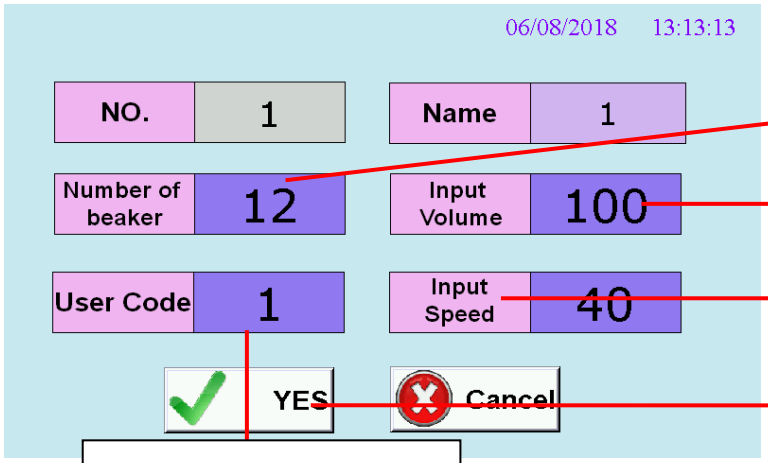
Click **START** to run a dyeing program

Selection of a dyeing program:



Select a dyeing program to be run. EX. Program-1 is being selected.

Enter numbes of beaker and volume inside of beaker will be dyed for this round:



Input **Number of beaker**

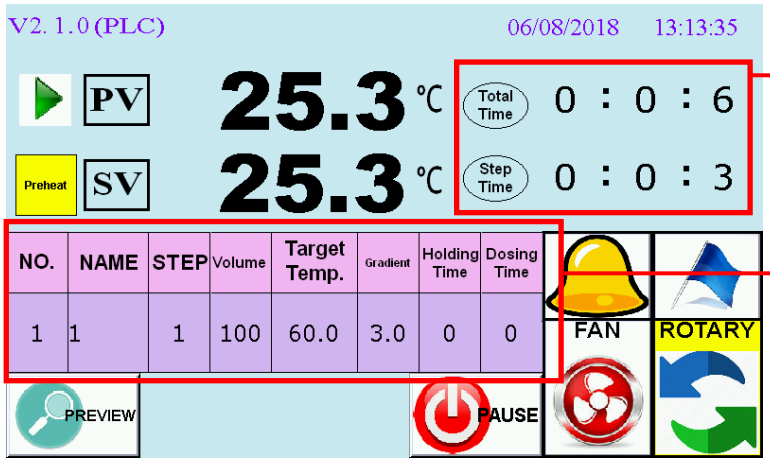
Input **Volume** of inside beaker

Input **Speed** of rotating

Press **YES** to start running the dyeing program

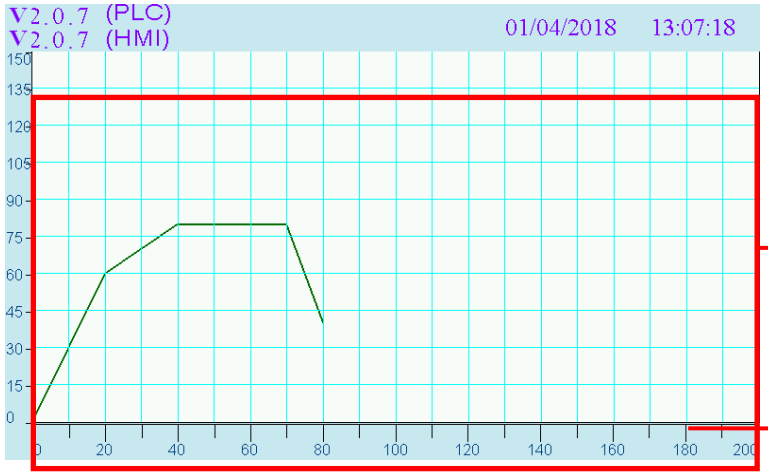
Input an **Operator ID** in User Code field

Begin to perform the dyeing program:



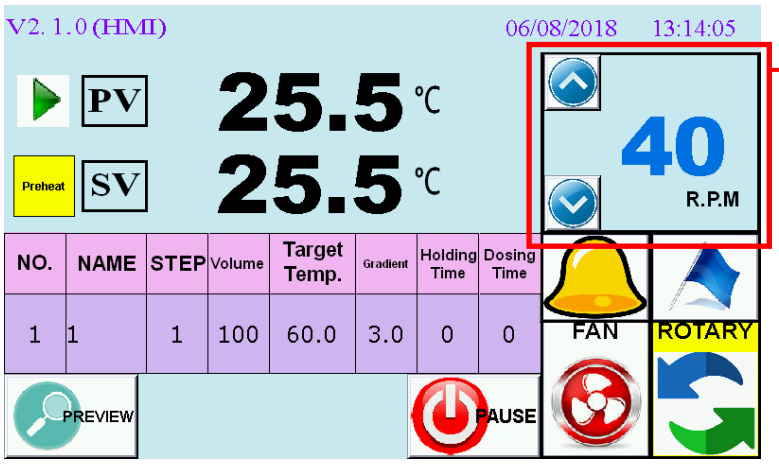
Tap on this block, it will toggle display between **lapsed time** and **remained time**.

Tap on this block, it will switch display in the **text content of current step**, **curve chart** of this dyeing program and **rotation speed**.



Tap on this block, it will switch display to **Speed** mode.

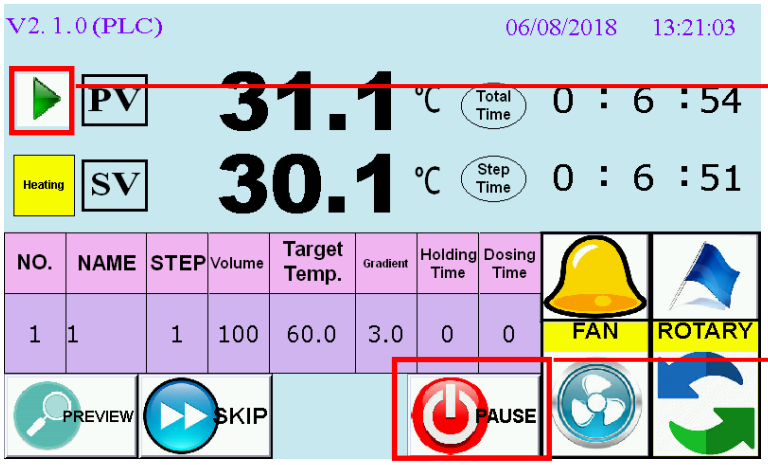
The **X** axis correspond to **time (min)** and **Y** axis correspond to **temperature (°C)**.



Click **Up** and **Down** button to adjust the rotation speed. (speed range: 1 ~ 60 R.P.M.)

6. To pause/quit the dyeing program is being performed

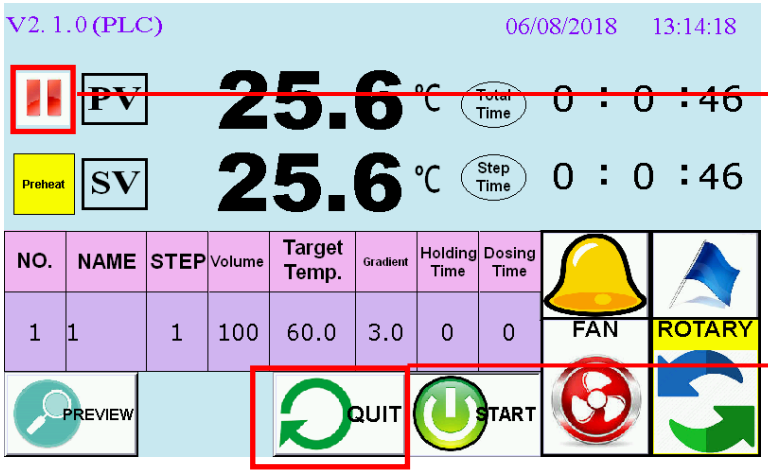
Dyeing Program is being performed



Running status icon

Press **PAUSE** to stop running the dyeing program & PV will be maintained.

Pause the dyeing program



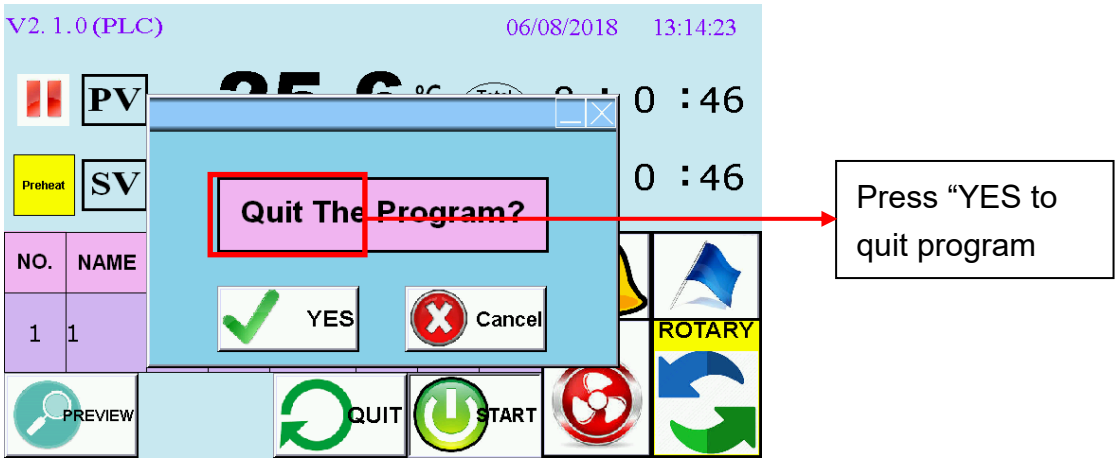
Pause status icon

Click **QUIT** to terminate the running program

Click **PAUSE** button, *QUIT* and *START* button will be displayed for next selection.

Click **START** button, the dyeing program will be continued with interruption.

Quit the dyeing program

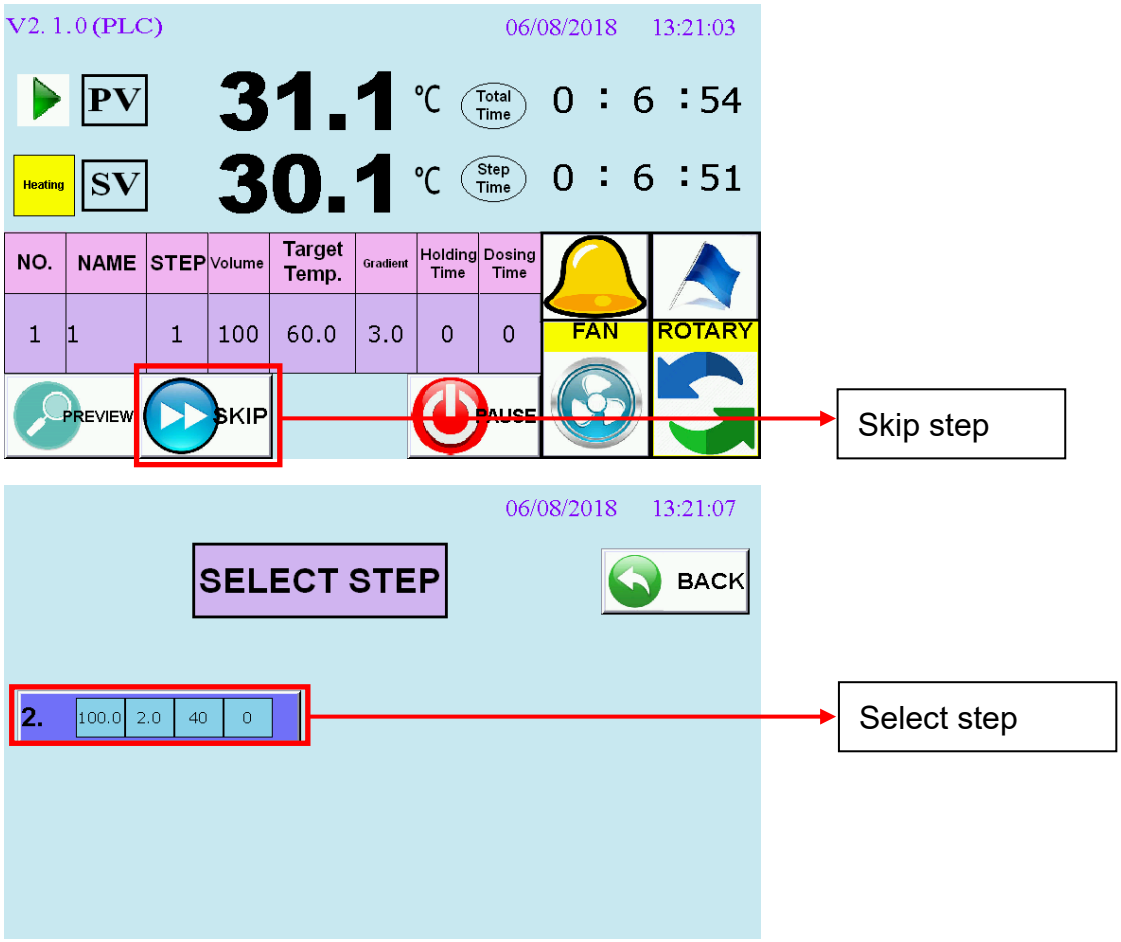


Click **Quit** button, the system will display **YES** and **Cancel** icon for your option.

If click **YES**, this dyeing program will be terminated and back to home page, otherwise it will back to last page.

7. To skip step at the program which is being performed

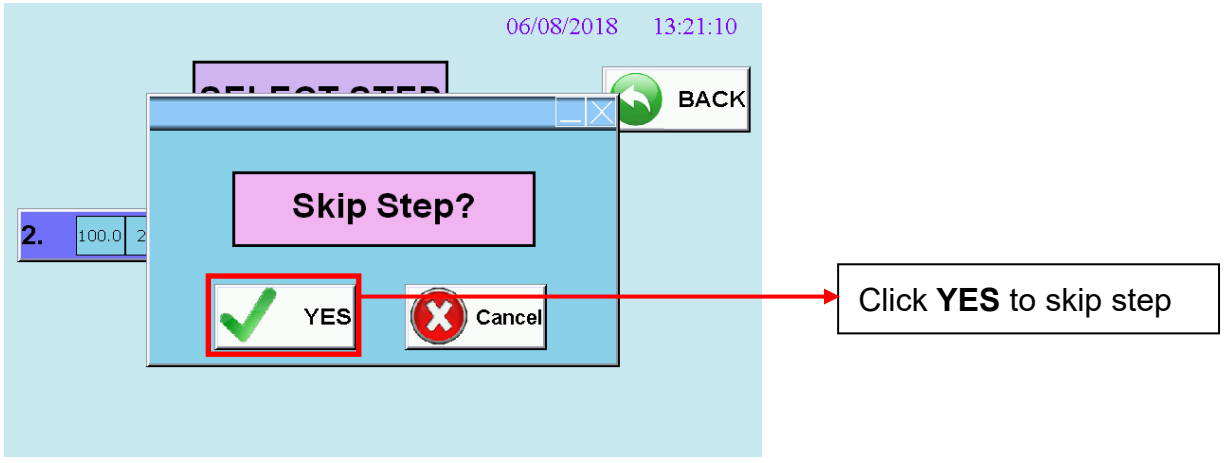
Dyeing Program is being performed



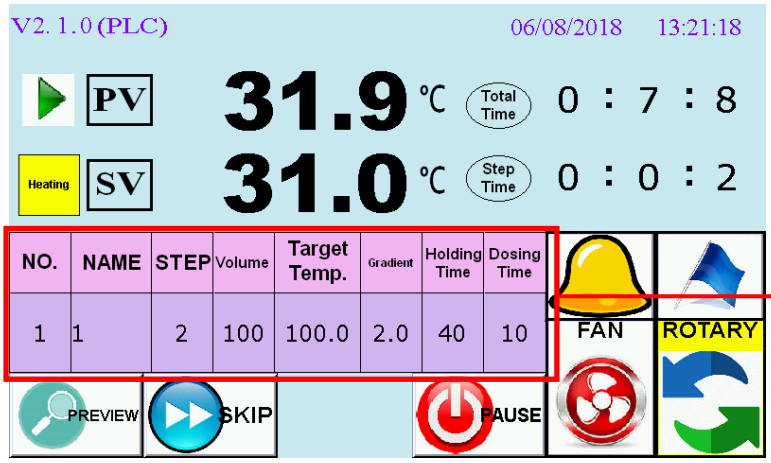
You can only select the next step to be skipped.

Once you tap on this step, the system will display **YES** and **Cancel** icon for your option.

Select step



After skip



The next step content will be displayed.

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8. Trouble Shooting

8.1 Description of Alarm Message

Alarm Contents	Cause
Dosing Alarm	Call operator to dose chemical now. Press YES key to stop buzzing.
Heater Alarm	1. Please ensure the Parameters in PAGE E (E-11(40) & E-12(999)) whether same as default value.
	2. Please check the LED on SSR whether glowing during rising temperature.
	3. Please check the heater circuit.
Cooling Fan Error	1. Please check the cooling blower whether running continuously.
	2. Please check the SSR whether keep ON continuously.
	3. We might need to adjust the E-21 (10) & E-22 (60) settings in accordance with the need for large volume beaker.
Over Temp. Alarm	1. Please check the SSR whether keep ON continuously.
	2. Please check the cooling blower whether running properly during rising temperature.
	3. We might need to adjust the E-31 (10) & E-32 (999) settings in accordance with the need.
Temp. Sensor Short	1. 確認是否在保溫段第 6 分鐘後仍持續加熱超過 1 分鐘。
	2. We might need to adjust the E-51 (6) & E-52 (60) settings in accordance with the need.
	3. Please replace a temperature sensor if malfunction.
Inverter Error	1. Please check the pin connection of RJ-11 which is RS485 connector and connected between HMI and Inverter.
	2. Please check the Inverter setting whether correct. (2-00=d4, 9-04=d1)
	3. Please replace a new Inverter if malfunction.

8.2 Hardware Error

Symptom	Diagnostic Analysis
Reboot the machine without error message	1. If power went off from FY-400 temperature controller, please check the **setting of FY-400** or replace a **new one** for a trial.
Incorrect temperature displayed on the FY-400 temperature controller	1. Please replace **over-temperature sensor** if malfunction.
	2. Please replace **FY-400 temperature controller** if malfunction.
Incorrect temperature displayed on the HMI	1. Please replace **Rotating connector inserter set assembly (male)** if malfunction.
	2. Please replace **Rotating connector inner race assembly (female)** if malfunction.
	3. Please replace **temperature sensor** if malfunction.
The cooling blower is not working properly.	1. Please replace **Relay-1** if malfunction.
	2. Please replace **Blower** if malfunction.
The temperature can't be risen while running the dyeing program.	1. Please replace **FY-400 temperature controller** if malfunction.
	2. Please replace **Relay-2** if malfunction.
	3. Please replace **SSR** if malfunction.
	4. Please replace **DTC-1000** if malfunction.
	5. Please replace **PLC** if malfunction.
	6. Please replace **Heating module** if malfunction.
HMI is out of order	1. Please replace **HMI** if malfunction.

D. Notes

- Please adjust the leveling to prevent to affect the dyeing result while installing the machine.
- The over temperature protection function has been designed. The default setting is 150 °C for this temperature controller.
- Maximum gradient 4 °C/min is allowed for the dyeing program.
- If display unknown code on the screen during operation, please turn off the power for 10 second and then turn on again.
- While machine running，if the motor isn't running, please turn off the power，after 10 second, then turn on the power again.
- After the dyeing program is completed, please don't open the beaker lid directly. As we know, it will create pressure inside the beaker while rising temperature. For security reason, operator must cool the beaker before open the lid, to avoid danger by the high temperature pressure.
- If you want to open the door while dyeing program is on processing, please keep far away from the high temperature rotary reel.
- The rotary reel will slow down the speed while the front door is open.
- If the alarm is not off within 2 minutes, please turn off the machine and cool it, then restart the program again. If the situation persists, please contact the service technician.

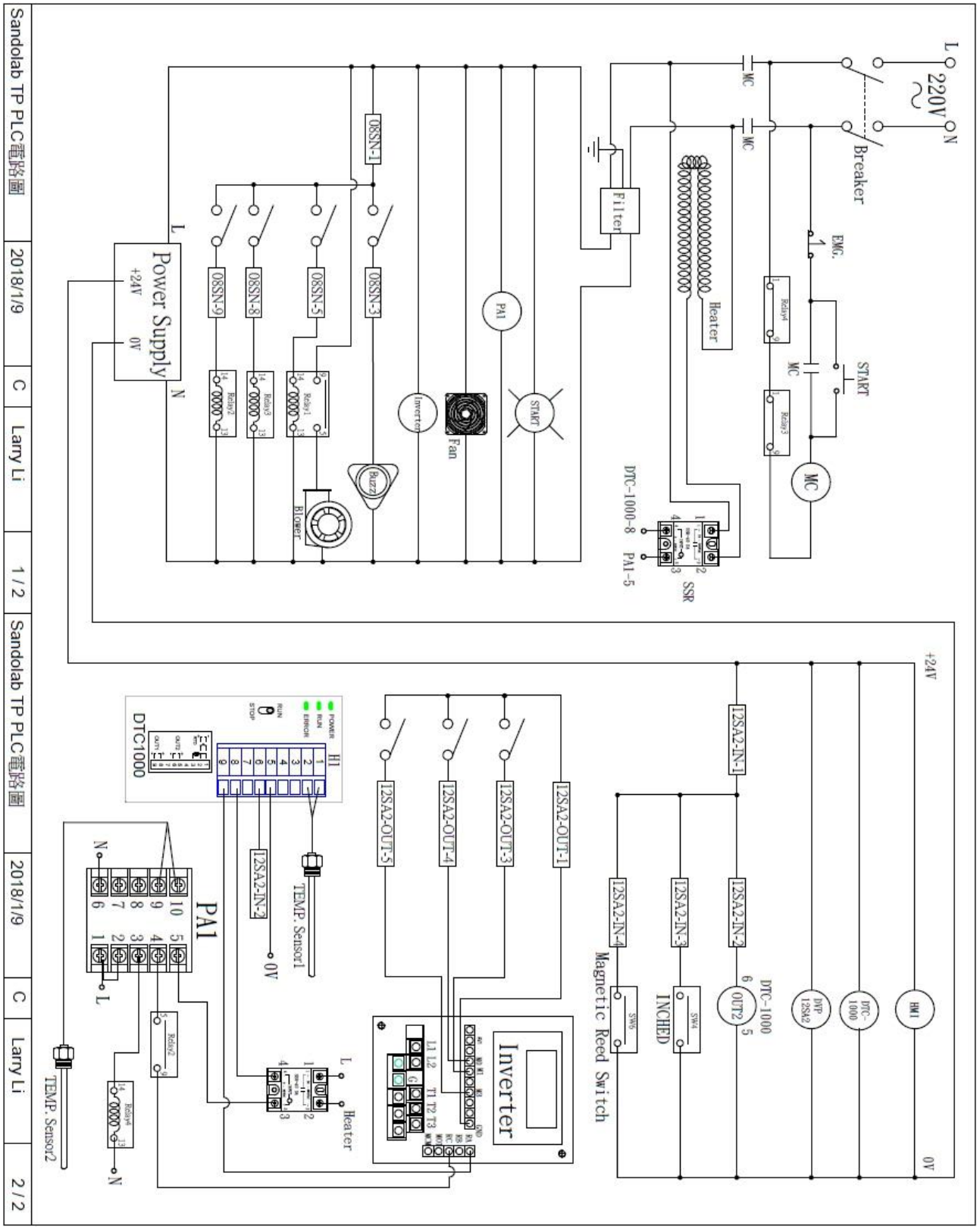
E. Specification

- Power consumption：5KW
- Rotation speed：60 R.P.M.
- Power frequency：50Hz/60Hz
- Dimension：670×710×750mm(W×D×H)
- Power source：220V，single phase
- Net weight：Approximate 135kgs
- Power current：21A~22A

F. Advantage

- No temperature difference between each beakert.
- No temperature dropping during loading or unloading the beakers. It can be used for constant temperature dyeing as the traditional glycerol dyeing machine. It’s more efficient to the IR dyer.
- Energy saving. It will not waste time to heat up again.
- No more service on temperature sensor cable. The cable is fixed on the drum, is much reliable than other brands.
- Intelligent design for chemical dosing lid, easy to operate and easy check whether the chemical has added. To avoid the mistake such as over-adding or miss-adding happened.
- Special accessory used for dyeing polyester fabrics. Not only getting good result but also no wrinkle on the fabric.
- The bidirectional rotation is available and can be enable/disable as customer’s need. The interval time of rotation can be defined in the parameter setting.

G. Wiring Diagram



H. Parameter settings of the AC motor drive (VFD-S)

@: The parameter can be set during operation,*: Twice the value for 460V class.

Parameters	Explanation	Settings	Factory Setting	Copower Setting
Group 0: User Parameters				
0-00	Identity Code of AC Drive	Read-only	d #	
0-01	Rated Current Display	Read-only	d##.#	
0-02	Parameter Reset	d10: Reset Parameter to Factory Setting	d0	
0-03	Start-up Display Selection @	d0: F (setting frequency) d1: H (actual frequency) d2: (user-defined unit) d3: A (output current)	d0	
0-04	User-Defined Unit @	d0: Display User-Defined Unit (u) d1: Display Counter Value (C) d2: Display Process Operation (1= tt) d3: Display DC-BUS Voltage (U) d4: Display output voltage (E) d5: Display frequency commands of PID (P) d6: Display PID feedback (after multiplying by Gain) (b)	d0	
0-05	User-Defined Coefficient K @	d0.1 to d160	d1.0	
0-06	Software Version	Read-only	d#.#	
0-07	Password Input	d0 to d999	d0	
0-08	Password Decode	d0 to d999	d0	
Group 1 Basic Parameters				
1-00	Maximum Output Freq.	d50.0 to d400 Hz	d60.0	
1-01	Maximum Voltage Frequency (Base Freq)	d10.0 to d400 Hz	d60.0	
1-02	Maximum Output Voltage	d2.0V to d255V*	d230*	
1-03	Mid-Point Frequency	d1.0 to d400 Hz	d1.0	
1-04	Mid-Point Voltage	d2.0V to d255V*	d12*	
1-05	Minimum Output Frequency	d1.0 to d60.0 Hz	d1.0	
1-06	Minimum Output Voltage	d2.0V to d255V*	d12*	
1-07	Upper Bound of freq.	d1 to d110%	d100	
1-08	Lower Bound of freq.	d0 to d100%	d0	

1-09	Acceleration Time 1 (Tacc1) @	d0.1 to d600 Sec	d10.0	
1-10	Deceleration Time 1 (Tdec1) @	d0.1 to d600 Sec	d10.0	d2.0
1-11	Acceleration Time 2 @	d0.1 to d600 Sec	d10.0	
1-12	Deceleration Time 2 @	d0.1 to d600 Sec	d10.0	
1-13	Jog Acceleration / Deceleration Time @	d0.1 to d600 Sec	d10.0	d5.0
1-14	Jog Frequency @	d1.0 Hz to d400 Hz	d6.0	
1-15	Auto Acceleration / Deceleration	d0: Linear Acceleration/Deceleration d1: Auto Acceleration, Linear Deceleration d2: Linear Acceleration, Auto Deceleration d3: Auto Acceleration/Deceleration d4: Linear Acceleration; Auto Deceleration, Stall Prevention during Deceleration d5: Auto Deceleration; Auto Acceleration, Stall Prevention during Deceleration	d0	
1-16	S-Curve in Acceleration	d0 to d7	d0	
1-17	S-Curve in Deceleration	d0 to d7	d0	
1-18	Jog Decelerating Time	d 0.0 Jog Decelerating Time Determined by Pr.1-13 d 0.1 to d600	d0.0	
Group 2 Operation Method Parameters				
2-00	Source of Frequency Command	d0: Master Frequency input determined by digital keypad. (record the frequency of power loss and it can do analog overlap plus) d1: Master Frequency determined by analog signal DC 0V-10V (external terminal AVI). (won't record the frequency of power loss and it can't do analog overlap plus) d2: Master Frequency determined by analog signal DC 4mA - 20mA (external terminal AVI). (won't record the frequency of power loss and it can't do analog overlap plus) d3: Master Frequency determined by Potentiometer on the digital keypad.	d0	d4

		(won't record the frequency of power loss and it can do analog overlap plus) d4: Master Frequency operated by RS-485 serial communication interface and record frequency of power loss. (record the frequency of power loss and it can do analog overlap plus) d5: Master Frequency operated by RS-485 serial communication interface and won't record frequency before power loss. (won't record the frequency of power loss and it can do analog overlap plus)		
2-01	Source of Operation Command	d0: by Digital Keypad d1: by external terminals, keypad STOP enabled d2: by external terminals, keypad STOP disabled d3: by RS-485 communication interface, keypad STOP enabled d4: by RS-485 communication interface, keypad STOP disabled	d0	d1
2-02	Stop Method	d0: Ramp Stop d1: Coast Stop	d0	
2-03	PWM Carrier Frequency	d3: 3KHz d7: 7KHz d4: 4KHz d8: 8KHz d5: 5KHz d9: 9KHz d6: 6KHz d10: 10KHz	d10	d5
2-04	Reverse Operation	d0: Enable REV d1: Disable REV	d0	
2-05	Loss of ACI Signal	d0: 0 Hz, continue running d1: Stop the frequency output d2: Last ACI input command	d0	
2-06	Analog Auxiliary Frequency Operation	d0: Disable d1: Enable + AVI d2: Enable + ACI	d0	
Group 3 Output Function Parameters				
3-00	Analog Output Signal	d0: analog frequency d1: analog current	d0	
3-01	Analog Output Gain @	d1 to d200%	d100	
3-02	Desired Freq. Attained	d1.0 to d400 Hz	d1.0	
3-03	Terminal Count Value	d0 to d999	d0	

3-04	Preliminary Count Value	d0 to d999	d0	
3-05	Multi-Function Output1 (Photo-coupler Output)	d0: Not Used d1: AC Drive Operational	d1	
3-06	Multi-Function Output2 (Relay Output)	d2: Max. Output Freq. Attained d3: Zero Speed d4: Over Torque d5: Base-Block (B.B.) d6: Low Voltage Detection d7: AC Drive Operation Mode d8: Fault Indication d9: Desired Freq. Attained d10: PLC Program Running d11: PLC Program Step Complete d12: PLC Program Complete d13: PLC Program Operation Pause d14: Terminal Count Value Attained d15: Preliminary Count Value Attained d16: Ready State Indicator d17: FWD command indication d18: REV command indication	d8	d1
Group 4 Input Function Parameters				
4-00	Potentiometer Bias Frequency @	d 0.0 to d 100.0%	d0.0	d20
4-01	Potentiometer Bias Polarity @	d0: Positive Bias d1: Negative Bias	d0	
4-02	Potentiometer Frequency Gain @	d1 to d200 %	d100	d84
4-03	Potentiometer Reverse Motion Enable	d0: Forward Motion Only d1: Reverse Motion enabled	d0	
4-04	Multi-Function Input Terminal 1 (M0, M1)	d0: Parameter Disable d1: FWD/STOP, REV/STOP d2: FWD/REV, RUN/STOP d3: 3-wire Operation Control Mode d4: E.F. External Fault Input (N.O.) d5: E.F. External Fault Input (N.C.) d6: Reset d7: Multi-Step Speed Command 1 d8: Multi-Step Speed Command 2 d9: Multi-Step Speed Command 3 d10: Jog Operation d11: Acceleration/deceleration Speed	d1	d2
4-05	Multi-Function Input Terminal 2 (M2)		d6	
4-06	Multi-Function Input Terminal 3 (M3)		d7	
4-07	Multi-Function Input Terminal 4 (M4)		d8	
4-08	Multi-Function Input Terminal 5 (M5)		d9	

		Inhibit d12: First or Second Acceleration/deceleration Time Selection d13: Base-Block (B.B.) (N.O.) d14: Base-Block (B.B.) (N.C.) d15: Increase Master Frequency d16: Decrease Master Frequency d17: Run PLC Program d18: Pause PLC d19: Counter Trigger Signal d20: Counter Reset d21: Select ACI / Deselect AVI d22: Disable PID function d23: JOG FWD d24: JOG REV d25: The source of master frequency is AVI. d26: The source of master frequency is ACI.		
4-09	Line Start Lockout	d0: Disable d1: Enable	d0	
4-10	Up/down frequency command mode	d0: Up/down frequency by acceleration/deceleration time d1: Up frequency according to constant speed, down frequency according to deceleration time d2: Up frequency according to acceleration time, down frequency according to constant speed d3: Up/down frequency by constant speed	d3	
4-11	Acceleration /Deceleration speed of constant up/down frequency	d0 to d1000 Hz/sec	d1	
Group 5 Multi-Step Speed and PLC Parameters				
5-00	1st Step Speed Freq.	d0.0 to d400 Hz	d0.0	d1
5-01	2nd Step Speed Freq.	d0.0 to d400 Hz	d0.0	d10
5-02	3rd Step Speed Freq.	d0.0 to d400 Hz	d0.0	d1
5-03	4th Step Speed Freq.	d0.0 to d400 Hz	d0.0	
5-04	5th Step Speed Freq.	d0.0 to d400 Hz	d0.0	

5-05	6th Step Speed Freq.	d0.0 to d400 Hz	d0.0	
5-06	7th Step Speed Freq.	d0.0 to d400 Hz	d0.0	
5-07	PLC Mode	d0: Disable PLC Operation d1: Execute one program cycle d2: Continuously execute program cycles d3: Execute one program cycle step by step d4: Continuously execute one program cycle step by step d5: Disable PLC operation, but can set direction of 1st speed to 7th speed	d0	
5-08	PLC Forward/ Reverse Motion	d0 to d255 (0: FWD 1: REV)	d0	
5-09	Time Duration Step 0	d0 to d65500 Sec	d0	
5-10	Time Duration Step 1	d0 to d65500 Sec	d0	
5-11	Time Duration Step 2	d0 to d65500 Sec	d0	
5-12	Time Duration Step 3	d0 to d65500 Sec	d0	
5-13	Time Duration Step 4	d0 to d65500 Sec	d0	
5-14	Time Duration Step 5	d0 to d65500 Sec	d0	
5-15	Time Duration Step 6	d0 to d65500 Sec	d0	
5-16	Time Duration Step 7	d0 to d65500 Sec	d0	
Group 6 Protection Parameters				
6-00	Over-Voltage Stall Prevention	d0: Disable d1: Enable	d1	
6-01	Over-Voltage Prevention Level	230V series: d350 to d410V 460V series: d700 to d820V	d390 d780	
6-02	Over-Current Stall Prevention Level	d20 to d150%	d130	
6-03	Over-Torque Detection Mode	d0: Disabled d1: Enabled during constant speed operation and continue to run to OL1 or OL. d2: Enabled during Constant Speed Operation and halted after detection d3: Enabled during running and continues before Continuous Output Time Limit (Pr.6-05) is reached d4: Enabled during running and halted after Over-Torque detection	d0	d2
6-04	Over-Torque Detection Level	d30 to d200%	d150	d50
6-05	Time setting for Over-torque Detection	d0.1 to d10.0 Sec	d.01	d1

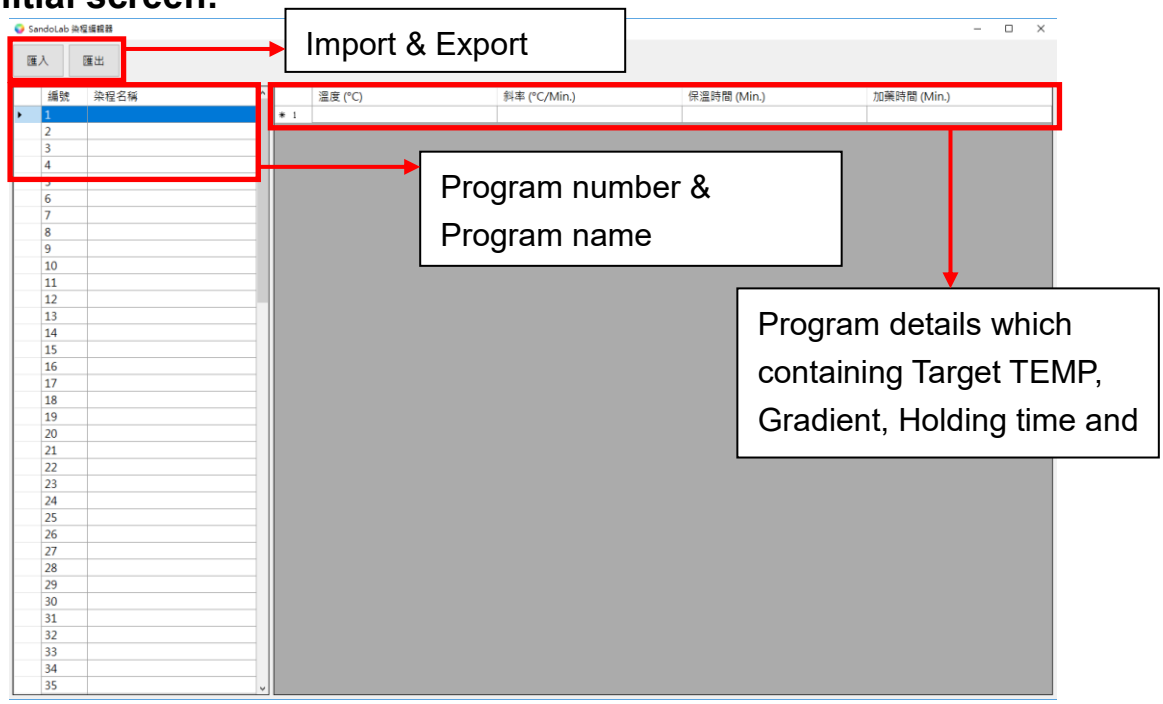
6-06	Electronic Thermal Overload Relay Selection	d0 to d2	d2	
6-07	Electronic Thermal Characteristic	d30 to d600 Sec	d60	
6-08	Present Fault Record	d0: No Fault occurred d1: Over Current (oc) d2: Over Voltage (ov) d3: Over Heat (oH) d4: Over Load (oL) d5: Over Load (oL1) d6: External Fault (EF) d7: Not Used d8: Not Used d9: Current exceed during Acceleration (ocA) d10: Current exceed during Deceleration (ocd) d11: Current exceed during Steady State (ocn) d12: Ground Fault (GF)	d0	
6-09	Third Most Recent Fault Record			
6-10				
Group 7 Motor Parameters				
7-00	Motor Rated Current @	d30 to d120%	d85	
7-01	Motor No-Load Current @	d0 to d90%	d50	
7-02	Torque Compensation @	d0 to d10	d01	
7-03	Slip Compensation @	d0.0 to d10.0	d0.0	
Group 8 Special Parameters				
8-00	DC Braking Voltage Level	d0 to d30%	d0	
8-01	DC Braking Time during Start-Up	d0.0 to d60.0 Sec	d0.0	
8-02	DC Braking time during Stopping	d0.0 to d60.0 Sec	d0.0	
8-03	Start-Point for DC Braking	d0.0 to d400 Hz	d0.0	
8-03	Start-Point for DC Braking	d0.0 to d400 Hz	d0.0	
8-04	Momentary Power Loss Operation Selection	d0: Stop Operation after Momentary Power Loss d1: Continues after Momentary Power Loss, speed search starts with Master Frequency d2: Continues after Momentary Power Loss, speed search starts with Minimum Output Frequency	d0	d1
8-05	Maximum Allowable Power Loss Time	d0.3 to d5.0 Sec	d2.0	

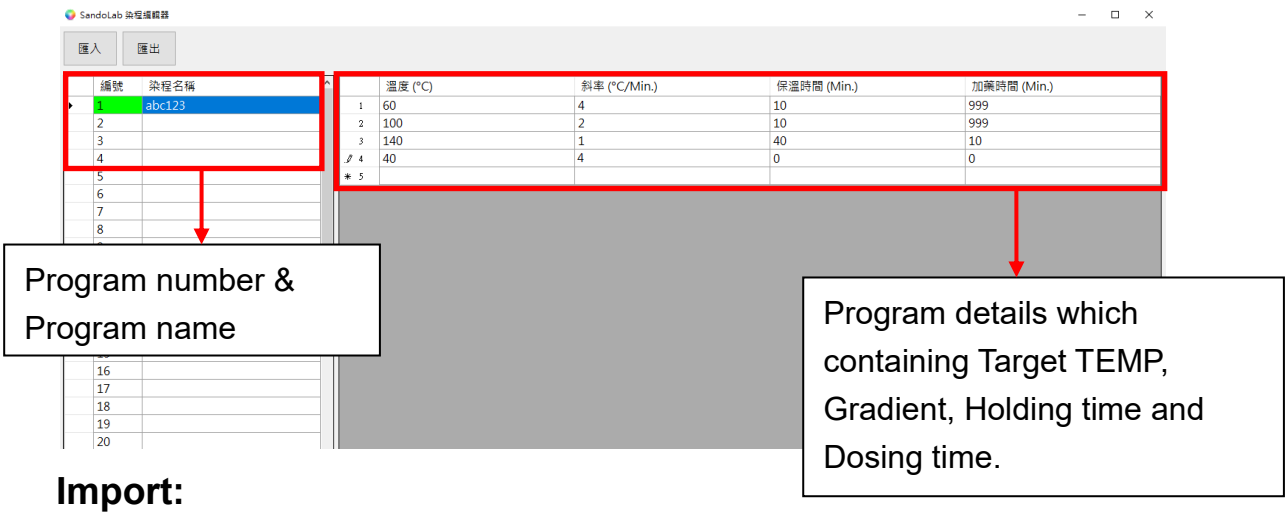
8-06	B.B. Time for Speed Search	d0.3 to d5.0 Sec	d0.5	
8-07	Maximum Speed Search Current Level	d30 to d200%	d150	
8-08	Skip Frequency 1 Upper Bound	d0.0 to d400 Hz	d0.0	
8-09	Skip Frequency 1 Lower Bound	d0.0 to d400 Hz	d0.0	
8-10	Skip Frequency 2 Upper Bound	d0.0 to d400 Hz	d0.0	
8-11	Skip Frequency 2 Lower bound	d0.0 to d400 Hz	d0.0	
8-12	Skip Frequency 3 Upper bound	d0.0 to d400 Hz	d0.0	
8-13	Skip Frequency 3 Lower Bound	d0.0 to d400 Hz	d0.0	
8-14	Auto Restart After Fault	d0 to d10	d0	
8-15	AVR Function	d0: AVR Function Enable d1: AVR Function Disable d2: AVR Function Disable when Deceleration	d2	
8-16	Dynamic Braking Voltage	d350 to d450V*	d380*	
8-17	DC Braking Lower Bound Limit	d0.0 to d400 Hz	d0.0	
Group 9: Communication Parameters				
9-00	Communication Address @	d1 to d254	d1	
9-01	Transmission Speed @	d0: Baud Rate 4800 bps d1: Baud Rate 9600 bps d2: Baud Rate 19200 bps d3: Baud Rate 38400 bps	d1	
9-02	Transmission Fault Treatment @	d0: Warn and Keep Operating d1: Warn and Ramp to Stop d2: Warn and Coast to Stop d3: Keep Operating without Warning	d0	
9-03	Modbus Communication Watchdog Timer @	d0: Disable d1 to d20: time setting (1 sec increment)	d0	
9-04	Communication Protocol @	d0: 7,N,2 (Modbus, ASCII) d1: 7,E,1 (Modbus, ASCII) d2: 7,O,1 (Modbus, ASCII) d3: 8,N,2 (Modbus, ASCII) d4: 8,E,1 (Modbus, ASCII) d5: 8,O,1 (Modbus, ASCII) d6: 8,N,2 (Modbus, RTU) d7: 8,E,1 (Modbus, RTU) d8: 8,O,1 (Modbus, RTU)	d0	d1

Appendix: Description of Sandolab Edit Program

Up to 100 dye programs within 20 steps can be edited by this software.

Initial screen:





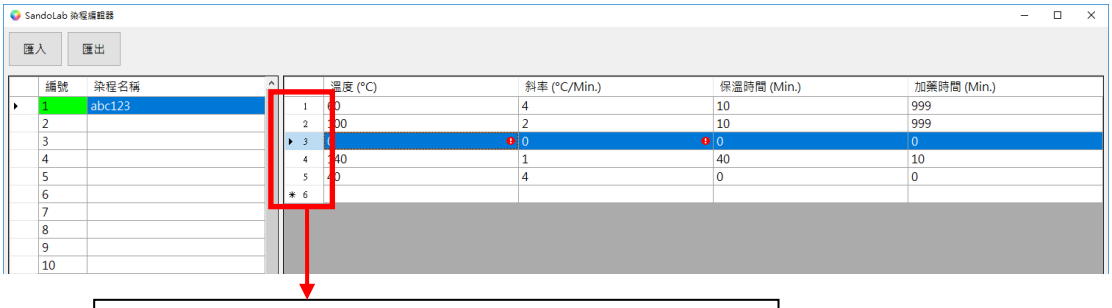
Import:

Select the **Import** tab, software will search **recipe.csv** from root of USB flash driver to be imported.

Export:

Select the **Export** tab, software will export the details of dyeing programs to USB flash driver and save as **recipe.csv**.

Insert & Delete a step data:



Click tab to focus on the content.
Press **Insert** key to insert a new step data.
Press **Delete** key to delete this step data.

Please make a request to Copower if you need this software.