HG9022/9023/9028/9026
染色机控制电脑
HG9022/9023/9028/9026 CONTROLLER FOR DYEING MACHINE

使用说明书
USER’S MANUAL

佛山市华高自动化设备有限公司
FOSHAN HUAGAO AUTOMATION CO.LTD.

CONTENTS

Brief Introduction of Characteristics

HG-902X dyeing machine to control a computer using 5.7-inch (320X240 pixel) multicolor / monochrome LCD display, using a friendly man-machine interface, high-definition&wide screen. This system can hold the whole process control totally automatically. It is the ideal equipment in dying line to improve the dying quality, reduce engine consume, alleviate the labor strength and increase economic performance.With the perfect effect of controlling temperature, this machine can be widely applied for different objects of controlling temperature, such as: Normal temperature dyeing machine, High temperature dyeing machine and yarn dyeing machine.

Main Specification

1. Output interface

Communicate with PLC, 64 switching value outputs at most.
Five 4~20mA analog inputs.
All the switching value outputs and analog outputs can be defined by users.

2. Input interface

Communicate with PLC, 64 switching value inputs at most.
Four PT100(temperature sensor) inputs.
Six analog input signals(4~20mA).
Two pulse value input signals
All the switching value outputs and analog intputs can be defined by users.

3. Temperature control specifications

Temperature measurement component: Pt100 platinum heat resistance.
Test temperature range: 000℃---150℃
Temperature Control range: 030℃ ---140℃
Temperature s Control Speed: 0.1℃---9.9℃/min

Temperature s Control accuracy: isotherm state ±0.5℃

Temperature control method: optimized automatically control

4. Programmable functions:

Programmable process number: 200(0—199), programmable steps number 200 (0—199).

5. Power working range

Power supplying range: AC90~240V
Power consume of the whole machine:≤20 W

6. Working environment:

Working temperature: ≤50 ℃,
Relative humidity ≤90%

7. Dimension of apparatus:

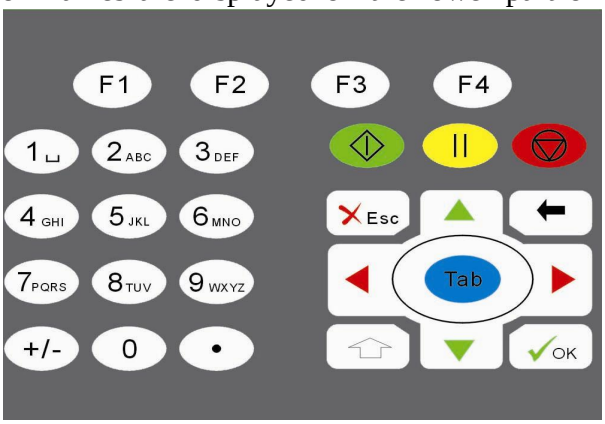
Wide (205) × high (259) × deep (80) mm^3

Installing hole dimension: 182×235 mm^2

II. Operating Guide

2. 1 Functions of keys

F1~F4 Assistant operating keys whose function names are displayed on the lower part of the screen.



“0” number 0;
“1” number 1 and space bar;
“2” number 2 and English letter abcABC;
“3” number 3 and English letter defDEF;
“4” number 4 and English letter ghiGHI;
“5” number 5 and English letter jklJKL;
“6” number 6 and English letter mnoMNO;
“7” number 7 and English letter pqrsPQRS;
“8” number 8 and English letter tuvTUV;
“9” number 9 and English letter wxyzWXYZ;
“+/-” +、-symbol;
“.” Decimal symbol;

RUN key make the computer to operating state;

STOP key make the computer to pause;

RST key make the computer to return to the previous page;

ESC make the computer escape from the current menu;

OK key enter next menu or confirm the current operation;

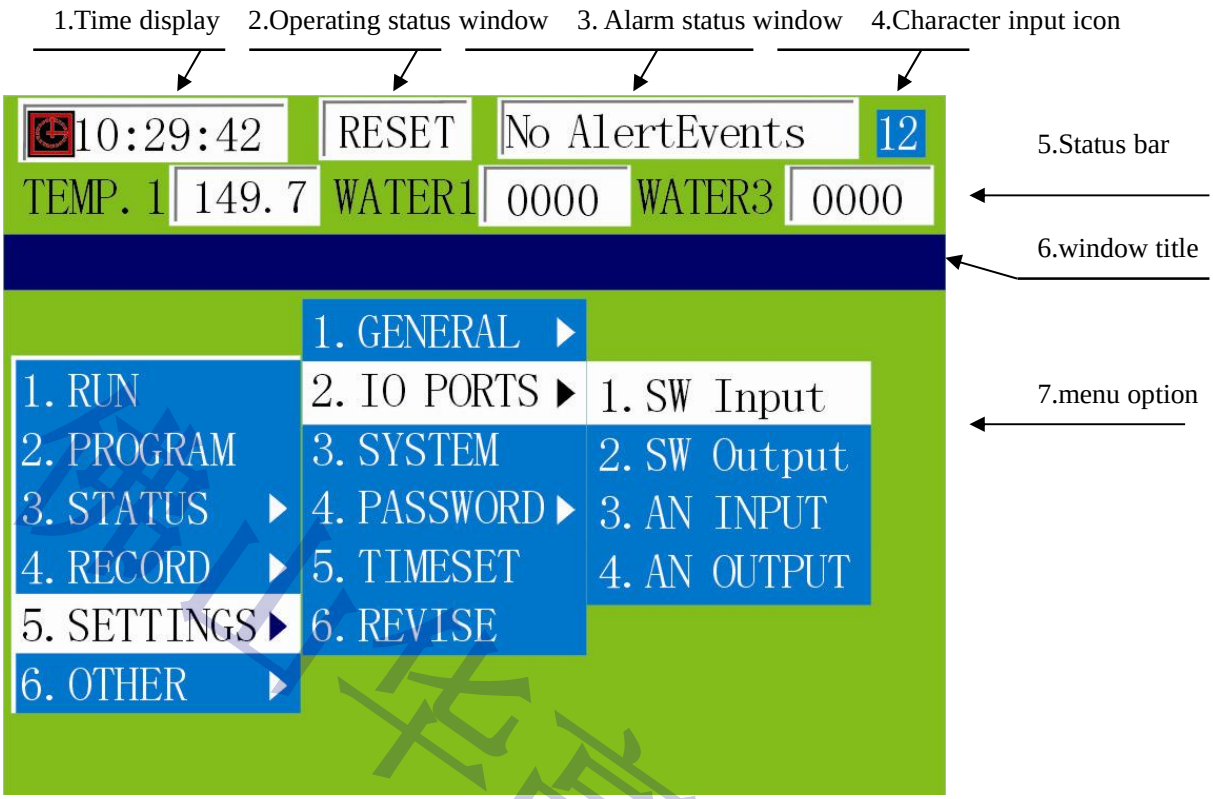
Delete key used to delete the characters and symbols input from the keyboard.

TAB key enter switch, from inquiry state to edit state, or exit from edit sate

Switch key switch input method under character editing state; under number editing state, the number chosen will add 1; with F1 and F2 , it is to adjust display contrast;

Direction key They are cursor-up/down/left/right moving keys under edit state, cursor-left and right keys respectively are page up and down under list state.

2．2 Main interface



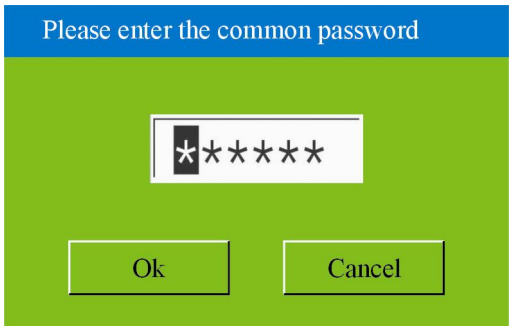
1. system time, display current time.
2. Operate status，display the current operating status：wait-ready-run-pause-end。
3. Alarm status window, recycle display current alarm record (online record), when a alarm signal disappears, the computer will automatically cancel the alarm display, but it is still possible to require the alarm event in Record.
4. Character input icon, display current input status, 12 means to enter number，En means to enter English letters，Ch means to enter Chinese character； press Switch key to switch input status.
5. Status display, display the current test value, respectively are: main temperature, main water level and material water level.
6. window title, display current window status, used to indicate different operation of window.
7. Menu option，display all menu list, press up and down key to move chosen event，right key and OK key to next menu，left key and ESC key to end the final menu, RST key to return to reset state, no matter the menu goes to which step, press RST key，the computer will return to the reset state.

Menu list：

1. RUN
2. PROGRAM
3. STATUS
    1. SW INPUT
    2. SWOUTPUT
    3. AN INPUT
    4. ANOUTPUT
4. RECORD
    1. RUN REC.
    2. ALARM LOG
5. SETTINGS
    1. GENERAL
        1. TIME
        2. TEMP
        3. WATER
        4. OTHERS
    2. IO PORTS
        1. SW INPUT
        2. SWOUTPUT
        3. AN INPUT
        4. ANOUTPUT
    3. SYSTEM
    4. PASSWORD
        1. PASSWORD1
        2. PASSWORD2
        3. PASSWORD3
    5. TIMESET
    6. REVISE
    7. OTHER FUNCTIONS
        1. BACKUP PARAMETERS
        2. LOAD PARAMETERS
        3. BACKUP TECHNOLOGY
        4. LOADING PROCESS
        5. USER-DEFINED

Notice：direct press menu number can directly carry out the menu, such as, press “5-2-3”,it will carry out 5. SETTINGS -2. IO PORTS -3. AN INPUT， in this way, we can save a lot of operation of direction keys and it is faster to enter the necessary menu.

2．3 Unlock and lock



It need users' right to enter part of menu or carry out part of operation. The computer will automatically asks the user to enter the password when right-needed operation is carried out. If you need to set up process, common password is ok; if you need to modify common parameters, advance password is asked. When you enter the right password first time, password is unnecessary for the following relative operation. This equals to unlock operation; however once you exit to main menu interface, the menu will be concealed and the computer will be relocked. The purpose of this setting is to avoid the unnecessary lost from operators by forgetting hand lock. For the sake of the users, it is our suggestion that users should modify the password to the easy-remembering one after first-using it.

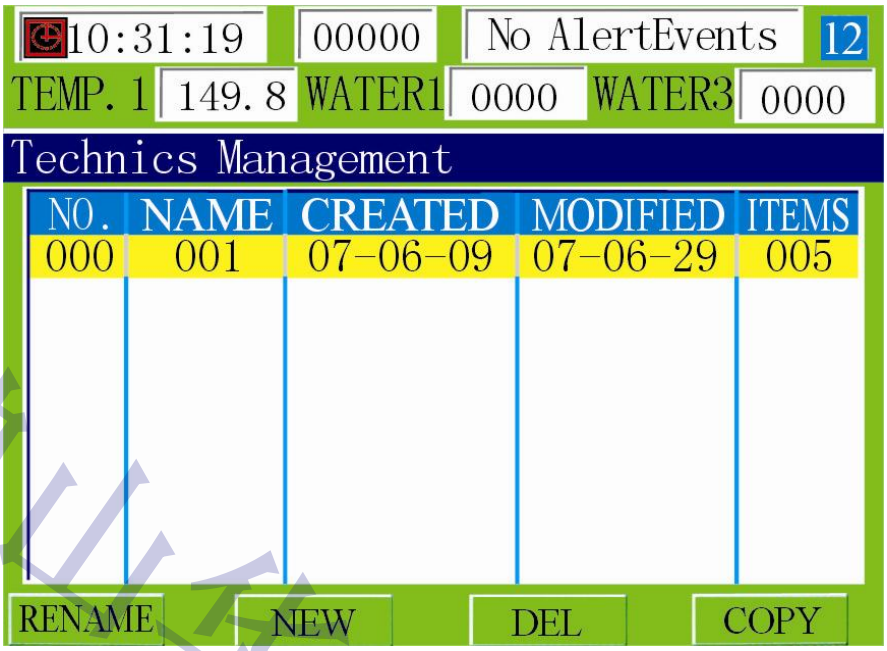
General password for the initial password 159357, mainly for technology programming;

High initial password for the password 427586, which mainly used parameter modification (neither including modify the function of inputting&outputting nor correction function);

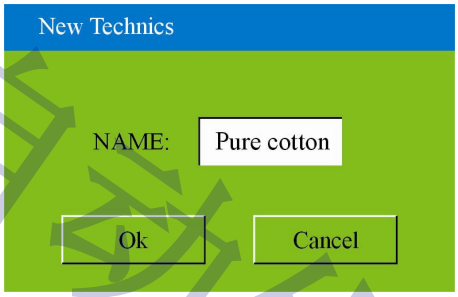
notice：advance password can modify&replace any of common password.

III、Process Management

3．1 Process Operation



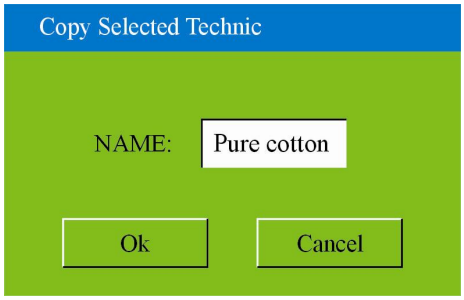
1． press F2 key to create new process， creating new process needs to enter process name. process name is at most 8 symbols(four Chinese characters)， press Switch key can switch the input method.



Notice： process name is not unique, process number is unique， so the process name can be same but the computer will automatically make the process number.

The computer can save 200 process at most. sequence number 0 ～ 199， the computer will automatically find the absence and save the new process.

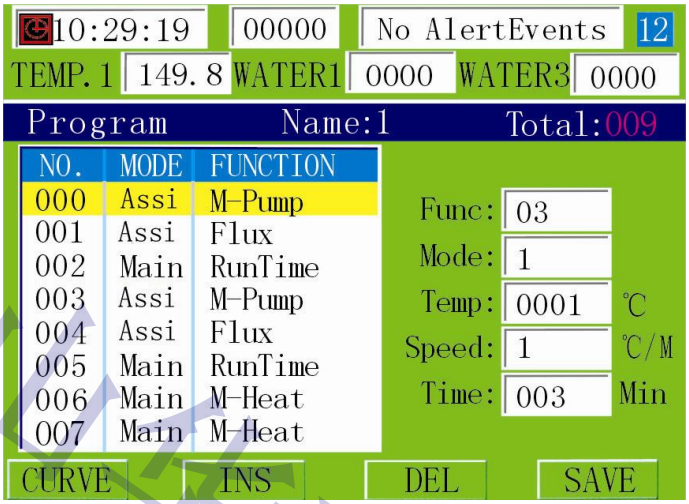
2. Press F3 key to enter the list of deleting process, choose the one to delete, then press F3 key again, the selected process will be deleted. After deleting the process, process list won't display the deleted process, so the sequence number in process list won't be continuious, only when the new process is saved there , the sequence number will display again.



3. Press F1 key to modify process name, this operation is only used for process name and modify has no influence on process contents.

4. Press F4 key can copy the whole chosen process. Copying process needs to enter the new process name.

3．2 Process Programming



1. In order to protect the integrality of process, the computer will automatically make end step at the last step , no need for user to program.
   If want to add new step, move the curse to the last step, press TAB key to composing state, the option in step list will change from light to gray and the curse appear in composing icon to indicate current input position. PressOK Key Or F4 to save after composing.， If want to cancel entering, press TAB Key or ESC key can exit form composing state.

2. Under list state, press F1 Key can check the composed process curve; press; press F2 Key can insert one step before the chosen step, the function of new inserted step is same; press TAB Key can compose function again; press F3 Key can delete the chosen step.

NO.	FUNCTION
000	Finish
001	Tip
002	Flux
003	M-Pump
004	M-Heat
005	RunTime
006	M-WaterIn
007	MWaterOut

3. Under composing state, when curse is on “function event”, press F1 can check all the function list help, right and left to page up and down, after choosing the suitable function , press “OK” key , the computer will automatically exit from help and enter the function number to “function event”. Function is as following picture. If enter indicate function, move the curse to “indicate event”, then press F1,the computer can jump indicate name list help, the operation way is same with the above.

3．3 The function of “Main”、“Assistant”、“Parallel” Modes

During full automatic dyeing, the system may need several functions, but the process programming only allow one function in each step. In order to run several functions at the same time, we divided these functions into main, assistant and parallel modes and combine them together in the process during programming, so as to reach the above requirement.

3．3．1 Main mode(Main)：

The mode item is 0, the main function works in the foreground. In this mode, the computer must complete the work before entering the next step. In other words, jumping step is not allowed or we can see only one main function is allowed to run at the same time, but a main function can be combined with several assistant functions and Parallel functions. However, the total functions of “main”+“assistant”+“parallel” can not be over 20.

3．3．2 Assistant mode(Assi)：

The mode item is 1. It works at background. In this mode, the computer can jump immediately to the next step and work together with the main function and assistant function of that step. One assistant function can work together with many main functions. The assistant function will stop only when its operating condition is ended or a function that will terminate appears, otherwise, it will continue to run until the whole process is completed.

3．3．3 Parallel mode(Para)：

The mode item is 2, it also works at background. The difference from the assistant function is that it can only work together with one main function, but not with several functions. It will end with the main function or after finishing its only function and can’t jump to next step

During programming, if a function will operate in combination with several main functions, you can set it into an assistant function. For example, starting the main pump, forward/reverse rotation. If a function will operate in combination with only one main function, you can make it into a parallel function. One assistant function can be deemed as several parallel function work in a several main function.

Notice: Since most of the functions can be operated in any of the three ways, it is needed to make out the main and the assistant. The assistant function and parallel function should not contradict with the main function, at the same time, the assistant function and parallel function should not contradict with each other. If wants to make a assistant function off, you’d better let assistant function to do that instead of parallel function though both of them can reach the same result.

Besides, assistant function and parallel function should be programmed before the main function, and three of them should be combined to one function range with main function as the main function. The computer will automatically combine a function range and take it as a unit.

3．4 Brief introduction of all Functions：

Finish, code **00** [main]

Every process needs the end step and this computer will automatically generate a end step. Stop all the outputs except Pressure relief and lock to end, then alarm.

Tip, code **01** [main]

Program prompt code in prompt event, move the curse to prompt event, press F1 key can see prompt name list help, use right and left key to choose the right prompt function, then press OK key, the computer will exit form help and enter the prompt code to Tip, no need user to enter.

Process will stop automatically and alarm when it reaches this step and appear prompt information, then press OK key to cancel the alarm and go to the next step automatically. If there is no need to go next step promptly, the time should be setup by the unit of minute. When time is up, it will go to the next step, or sometimes although the time isn't up, but you have finished your work, you can press RUN key to run the next step .

M-Heat, code **02** [main][assistant]

This function is used to control the temperature of main pump. Heating mode can be set in system parameter. There are relay mode and analogy mode（4～20mA）.

Edit a target temperature in the Temp item, the computer will carry out up/down-grading control according to the difference between actual temperature and target temperature and enter into heat preservation state in the allowed deflection range, the deflection range can be modified in parameter set item. Edit speed rate of up/down-grading temperature in Speed item , if program 0.0 , it indicates quick up/down grading temperature. The time item is used to edit heat preservation time. When actual temperature reaches to the allowed deflection range, it will count the heat preservation time and it will enter into next step after the time reaches.

This function is affected by maximum temperature protection function, if the temperature is higher than the set value, it will automatically stop heating and give alarm call. During the temperature control time, the computer will automatically coldness relief and frozen water, the time of each time coldness relief and interval time can be set in parameter set item.

M-WaterIn, code **03** [main][assistant][parallel]

This function is used for water intake as water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 00001～00003 are corresponding to the main vat's minimum, medium and maximum water levels；When use continuous liquid level, edit actual water level (unit: L); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter. Ctrl item is used to program the valve of water intake. There are 4 water intake channels in main vat. This item can edit 01～04， corresponding to the four water intake valves. Two water intake valves can be opened simultaneous, for example, edit 12 we will open water intake valves 1 and 2 at the

same time. Be sure the function of each valve such as: which one is for clear water intake and which is for hot water etc.Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water intake". This function is also affected by temperature of pressure relief, when the temperature in main vat is over the temperature of pressure relief, it will give the alarm of "high temperature water drain protection".

HiTFill, code **04** [main][assistant][parallel]

This function is same with main vat water intake, the only difference is this function has no limitation from pressure relief.

MWaterOut, code **05** [main][assistant][parallel]

This function is used for water drain as water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 00001～00003 are corresponding to the main vat's minimum, medium and maximum water levels; When use continuous liquid level, edit actual water level (unit: mm); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter(unload in process). Ctrl item is used to program the valve of water drain. There are 4 water drain channels in main vat. This item can edit 1～4, corresponding to the four water drain valves. Be sure the function of each valve such as: which one is for clear water drain and which is for dirty water etc. Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water drain". This function is also affected by temperature of pressure relief, when the temperature in main vat is over the temperature of pressure relief, the computer will not drain the water and give the alarm of "high temperature water drain protection".

Besides, this function is affected by the overtime setting of the main vat water drain. When the main vat is drained to the minimum water level, the computer will carry out overtime drain till drain the rest water clearly then will enter into next step.

HiTDrain, code **06** [main][assistant][parallel]

This function is same as the main vat water drain, the only difference is this function is not affected by pressure relief temperature.

Flux, code **07** [assistant][parallel]

The unit of forward、reverse rotation, interval time is second, up to 999 seconds. You can turn off the forward and reverse function by editing all these three items into 0. If only forward rotation or reverse rotation
is needed, you can edit reverse or forward and interval into 0;

RunTime, code **08** [main]

This function is only used to count time, so it can't change the current input and output state. It will enter into next step when time is up.

Wash1, code **09** [main]

times item is used to edit washing times;

ctrl item is used to setup water intake valve (left) and drain valve (right);

Time item is used to edit the washing time of each cycle;

When process runs to this step, turn on water intake to maximum water level in main vat, then stop water intake, open main pump, start to count the washing time. When washing time is up, it turns off main pump then turns on water drain. When the water is drained down to the minimum level, one washing cycle is completed. If edit Loop item as other digit other than 0, it will repeat the above operation till the washing times are finished. If need to heat, control the temperature is ok.

Wash2, code **10** [main]

This function is not loaded.

OverFall, code **11** [main]

Delay item is used to edit delay time for extra water, Ctrl item 1～4 are edited for controlling 4 water intake valves in main vat, Time item is to edit overflow time. When overflow, open water intake valve, overflow valve, when the water reached the maximum level, the main pump is started, it stops water intake and starts counting the overflow time. When the water level is lower than the maximum level, it will delay the time, when the delay time is up, it will go on water intake to the maximum level then stop water intake. This operation will repeat till the overflow time is ended, it will turn off the overflow valve and water intake valve then enter into the next step. in addition, other ways of setting are added to this function, for example, M-pump is free from the confine of high water level, high level of water intake valve can be opened, etc, which can be setup in SYSTEM →Overfall mode

M-Pump, code 12 [main][assistant][parallel]

Opening the main pump needs to set opening water level, when input by maximum, medium and minimum water level, Water item should be programmed minimum, medium and maximum water level in main pump as 00001～00003; If liquid level gauge is used, program actual water level; after opening of main pump, it won't be limited by water level but only minimum water level protect limitation. If program On/Off event as 0, it will shut down the main pump immediately without being limited by mode, time and water level. Time item is to program the opening time of main pump, the digit is other than 0, the pump start time will operate according to the edited time, when time is reached, the pump will stop; When time item is programmed as 0, it means that pump start will not be limited by time and the main pump will operate until the end step of shut down main pump or end step of parallel function, so if use main mode to start the main pump, the time item can't be 0, otherwise it can't enter into next step.

M-PumpRev, code **13** [assistant][parallel]

Rotate speed item is used to program speed of main pump, unit is percent, 100% is the

fastest speed， it outputs is 4～20mA to control the speed of main pump. On/off item is programmed as 0, it will turn off the function of main pump speed regulation.

ReverseRev, code **14** [assistant][parallel]

This function can control the speed of main pump according to the forward、reverse rotation. Program speed of main pump in forward rotation item, interval item and reverse rotation. When reach to this step, the computer will control the speed of main pump by 4-20mA output according to forward、reverse rotation state. This function is valid only when set permission in system parameter setting.

Besides, this function can't be used at the same time with main pump speed.

M-Add, code**15** [main]

This function is as same as that of M-Heat. The difference is that we open the valves of adding and heating isochronously, using the heating valves to control temperature only after warm-keeping.

Refl-Cool, code **16** [assistant][parallel]

Program opening temperature in the temperature item, the main vat temperature reaches the set temperature, the flux cooling valve will open and it will turn off when the main vat temperature is lower than the set temperature. This function is only affected by temperature limit. Edit On/Off as 0, it will turn off the function immediately.

Depress, code **17** [assistant][parallel]

If the temperature is higher than the set temperature, it will turn off the pressure relief valve; If the temperature is lower than the set temperature, it will turn on the pressure relief valve.

Edit temporary pressure relief temperature in Temp item, it is only effect in current process, in other words, it is process priority. With the end of this function, the parameter setting will return to the default setting; Edit Temp as 0, this function will be turned off.

VatLock, code **18** [assistant][parallel]

If the temperature is higher than the set temperature, it will turn on the vat locking valve; If the temperature is lower than the set temperature, it will turn on the vat locking valve.

Edit temporary vat locking temperature in temperature item, it is only effect in current process, in other words, the parameters in the process will take the priority.

With the end of this function, the parameter setting will return to the default setting; Edit Temp as 0, this function will be turned off.

Balance, code **19** [main]

Edit balance temperature in the temperature item. This function will open the balance according to time and is affected by set temperature and pressure relief temperature limit. The main vat temperature is higher than the set temperature or pressure relief temperature, the balance valve will open and it will turn off the balance function when time is up. Edit On/Off item as 0, it will turn off the function immediately.

Connect, code **20** [main]

This function will open the connection valve according to time and turn off the function when time is up. Edit On/Off as 0, it will turn off the function immediately.

Boosting, code **21** [main] [assistant] [parallel]

Time item is used to program pressurizing time，it turns off pressurizing function when time is up, no time limitation if program 0.

Edit On/Off as 0, it will turn off the function immediately.

Pressurizing is affected by pressure switch 1 and 2. If switch 1 is on, it turns off pressurizing valve; if it is off, it turns on pressurizing valve again. Switch 2 is on, it will open pressure relief valve automatically and it will be turned off till switch 2 is off.

Decompress, code **22** [main] [assistant] [parallel]

Pressure relief according to time. Open pressure relief valve when pressure relief,it will turn off pressure relief function when time is up.

Edit On/Off item as 0, it will turn off the function immediately.

FluxCTRL, code **23** [assistant][parallel]

This function is not loaded.

Motor Rev CTRL, code **24** [main]

This functions is used to control the on/off and the speed of cloth raising. Speed edit the speed of cloth-raising, in percentage terms, 100% for the full-speed running, that is, the computer output is 4 ~ 20mA to control the becker speed. On / off edit 0 for the close of this function.

This feature is also controlled by the main pump, GENERAL -> TIME -> Motor delay, which can be set up to open the round, this is the delay time for the main pump after starting.

Fan Rev, code **25** [main]

This function is used to control the on/off and the speed of becker. Speed edit the speed of becker, in percentage terms, 100% for the full-speed running, that is, the computer output is 4 ~ 20mA to control the becker speed. On / off edit 0 for the close of this function.

OF-Valve, code **26** [assistant] [parallel]

Program On/Off as 0, it will open overflow valve.

S-Heat, code **27** [assistant][parallel]

This function is used to control the temperature of assistant pump. Heating mode can be set in system parameter. There are relay mode and analogy mode（4～20mA）.

Edit a target temperature in the Temp item, the computer will carry out up/down-grading control according to the difference between actual temperature and target temperature and enter into heat preservation state in the allowed deflection range, the deflection range can be modified in parameter set item.

Edit speed rate of up/down-grading temperature in Speed item, if program 0.0, it indicates quick up/down grading temperature. The time item is used to edit heat preservation time. When actual temperature reaches to the allowed deflection range, it will count the heat preservation time and it will turn off the function after the time reaches.

This function is affected by maximum temperature protection function, if the temperature is higher than the set value, it will automatically stop heating and give alarm call.

During the temperature control time, the computer will automatically coldness relief and frozen water, the time of each time coldness relief and interval time can be set in parameter set.

S-WaterIn, code **28** [main][assistant][parallel]

This function is used for assistant vat water intake according to water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 00001 ～ 00003 are corresponding to the assistant vat's minimum, medium and maximum water levels；When use continuous liquid level, edit actual water level (unit: L); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter(unload in process)

Ctrl item is used to program the valve of water intake. There are 2 water intake channels in assistant vat. This item can edit 1～2， corresponding to the two water intake valves. Be sure the function of each valve such as: which one is for clear water intake and which is for hot water etc.

Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water intake".

SWaterOut, code **29** [main] [assistant] [parallel]

This function is used for assistant vat water drain as water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 00001 ～ 00003 are corresponding to the assistant vat's minimum, medium and maximum water levels；When use continuous liquid level, edit actual water level (unit: L);

Ctrl item is used to program the valve of water drain. There are 2 water drain channels in main vat. This item can edit 1～2， corresponding to the two water drain valves. Be sure the function of each valve such as: which one is for clear water drain and which is for dirty water etc.

Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water drain".

Besides, this function is affected by the overtime setting of the assistant vat water drain. When the assistant vat is drained to the minimum water level, the computer will carry out overtime drain till drain the rest water clearly then will enter into next step.

S-Reflux, code **30** [main] [assistant] [parallel]

This function is used for assistant vat reflux according to water level。

When use maximum, medium and minimum water levels, edit water level in the water item, 00001 ～ 00003 are corresponding to the assistant vat's, minimum, medium and maximum water levels； When use continuous liquid level, edit actual water level (unit: L); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter(unload in process)

Ctrl item is used to program reflux channels. There is only one reflux channel in assistant vat, so program 1 is ok.

Pump back, code **31** [main] [assistant] [parallel]

This function is used to pump the water in assistant vat to main pump according to water level.

When use maximum, medium and minimum water levels, edit water level in the Water item, 00001 ～ 00003 are corresponding to the assistant vat's, minimum, medium and maximum water levels； When use continuous liquid level, edit actual water level (unit: L);

Ctrl item is used to program pump channels. There is only one pump channel in assistant vat, so program 1 is ok.

Time item is programmed as 0.

Besides, this function is affected by the overtime setting of the assistant vat water drain. When the assistant vat is drained to the minimum water level, the computer will carry out overtime drain till drain the rest water clearly then stop after twice vat washing. Pumping to main pump usually needs open main pump or assistant pump. Inserting one step of opening main pump or assistant pump is ok.

S-Pump, code **32** [assistant] [parallel]

Opening the assistant pump needs to set opening water level, when input by maximum, medium and minimum water level, water item should be programmed minimum, medium and maximum water level in assistant pump as 00001～00003; If liquid level gauge is used, program actual water level; If program On/Off as 0, it will shut down the assistant pump immediately without being limited by mode, time and water level. Time item is to program the opening time of assistant pump, the digit is other than 0, the pump start time will operate according to the edited time, when time is reached, the pump will stop; When time item is programmed as 0, it means that pump start will not be limited by time and the assistant pump will operate until the end step of shutting down assistant pump or the end step of parallel function.

S-Whisk, code **33** [assistant][parallel]

This function is used to open the assistant mixing valve according to time. It will shut down the assistant mixing function when time is up. Program On and Off item as 0, it will automatically shut down the assistant mixing function.

This function is affected by the minimum water level control, it will shut down the assistant mixing valve.

F1-Heat, code **34** [main][assistant]

This function is used to control the temperature of dyestuff vat. Edit a target temperature in the Temp item, the computer will carry out up/down-grading control according to the difference between actual temperature and target temperature and enter into heat preservation state in the allowed deflection range, the deflection range can be modified in parameter set item. Edit speed rate of up/down-grading temperature in Speed item , if program 0.0 , it indicates quick up/down grading temperature. The time item is used to edit heat preservation time. When actual temperature reaches to the allowed deflection range, it will count the heat preservation time and this function will be closed after the time reaches.

This function is affected by maximum temperature protection function, if the temperature is over 85℃, it will automatically stop heating.

F1-WaterIn, code **35** [main][assistant][parallel]

This function is used for dyestuff vat water intake according to water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 00001 ～ 00003 are corresponding to the dyestuff vat's, minimum, medium and maximum water levels；When use continuous liquid level, edit actual water level (unit: L); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter(unload in process)

Ctrl item is used to program the valve of water intake. There are 2 water intake channels in dyestuff vat. This item can edit 1～2， corresponding to the two water intake valves. Be sure the function of each valve such as: which one is for clear water intake and which is for hot water etc.

Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water intake".

F1-WaterOut, code **36** [main] [assistant] [parallel]

This function is used for dyestuff vat water drain as water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 0007～0009 are corresponding to the dyestuff vat's minimum, medium and maximum water levels；When use continuous liquid level, edit actual water level (unit: L); Ctrl item is used to program the valve of water drain. There are 2 water drain channels in dyestuff vat. This item can edit 1～2， corresponding to the two water intake valves. Be sure the function of each valve such as: which one is for clear water drain and which is for dirty water etc.

Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water drain".

Besides, this function is affected by the overtime setting of the dyestuff vat water drain. When the dyestuff vat is drained to the minimum water level, the computer will carry out overtime drain till drain the rest water clearly then will enter into next step.

F1-Reflux, code **37** [main] [assistant] [parallel]

This function is used for dyestuff vat reflux according to water level.

When use maximum, medium and minimum water levels, edit water in the water level item, 00001 ～ 00003 are corresponding to the dyestuff vat's, minimum, medium and maximum water levels； When use continuous liquid level, edit actual water level (unit: L); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter(unload in process). Ctrl item is used to program the reflux channels. There is only one reflux channel in dyestuff, so program 1 is ok.

F1-Feed 1, code **38** [main][assistant][parallel]

Edit water the target one. When use maximum, medium, minimum water levels, Program 00001～00003 indicate the minimum, medium and maximum water levels of the vat respectively; When use continuous liquid level, program actual water height; feed to be lower than the set value, if reach the minimum water level, it will carry out feed delay and till all the remaining dyestuff is fed. It will stop after vat washing. Open edit the time of feeding valve, Pause is the pause time for feeding valve, this function is for 1 feed 1.

F1-**Feed 2,** code **39** [main][assistant][parallel]

This function is as same as the above one, which is for 2 feed 1.

F1-Feed3，code **40** [main][assistant][parallel]

water is the water level of F-Reflux.

Pause is the lingering time of F-Reflux reopening.

Time is the total time of dosing.

This step-by-step run-time functions, a return to open the valve, feed pumps, valves feeding 2, 1 mixing valve, When the water level reached the level set when a valve clearance to return, if set too low water level has begun to include Delay time, time to re-open after a return valve, so the cycle until the total feeding time. Between the clearance to return valve1, 2 feed valve clearance, clearance mixing valve1, the feeding valve and a mixing valve2 until the expected increase in expected low-water tank Bit, automatic washing tank into the state.

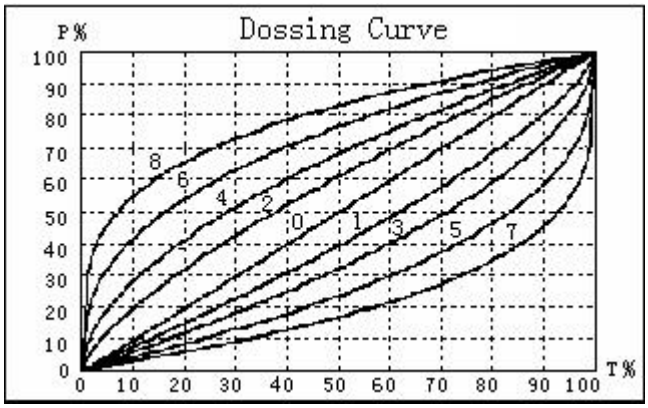
F1-Dosing, code **41** [main][assistant][parallel]

Remain item is to edit remaining dyestuff（the full vat 100%）。

Curve item is used to edit curve number （nine curves in total：0-8）.

Time item is used to edit feed time.

During the process of ration feed, the computer feed the set quantity of dyestuff according to the curve track; if reach the minimum water level, it will



carry out feed delay and till all the remaining dyestuff is fed. It will stop after twice vat washing. This function can be carried out by relay mode and analogy mode.The mode of feeding can be set in parameter setting.

F1-Pump, code **42 [assistant] [parallel]**

Opening the dyestuff pump needs to set opening water level, when input by maximum, medium and minimum water level, Water item should be programmed minimum, medium and maximum water level in dyestuff pump as 00001～00003; If liquid level gauge is used, program actual water level; If program On/Off as 0, it will shut down the dyestuff pump immediately without being limited by mode, time and water level. Time item is to program the opening time of dyestuff pump, the digit is other than 0, the pump start time will operate according to the edited time, when time is reached, the pump will stop; When time item is programmed as 0, it means that pump start will not be limited by time and the main pump will operate until the end step of shutting down dyestuff pump or the end step of parallel function.

F1-Whisk, code **43** [assistant][parallel]

This function will open the mixing valve according to time and turn off the function when time is up. Edit On/Off as 0, it will turn off the function immediately.

This function is affected by the control of set water level. It will turn off the mixing valve when water level reaches the set water level.

F1 to F2, code **44** [main]

This function is used to add the dyestuff of dyestyff vat1 to vat2.

F1-pump and F1-connect valve will be opened automatically, it will feed according to the set water level (high) of dyestuff vat1 till the initialization. If it reachs the low water level of F1, it will delay the feeding time, if it reachs the high water level of dyestuff vat2 first, the feed F1-pump and F1-connect valve will be closed; if dyestuff vat2 dropping water level is lower the max, it will begin to count the delay time, reopen F1-pump and F1-connect valve when time is up. Water edit the feeding water level, Delay edit the delay time, Time edit 0 is ok.

F2-Heat, code **45** [main][assistant]

This function is used to control the temperature of dyestuff pump. Edit a target temperature in the Temp item, the computer will carry out up/down-grading control according to the difference between actual temperature and target temperature and enter into heat preservation state in the allowed deflection range, the deflection range can be modified in parameter set item. Edit speed rate of up/down-grading temperature in Speed item , if program 0.0 , it indicates quick up/down grading temperature. The time item is used to edit heat preservation time. When actual temperature reaches to the allowed deflection range, it will count the heat preservation time and it will enter into next step after the time reaches. This function is affected by maximum temperature protection function, if the temperature is higher than the set value, it will automatically stop heating when temperature is over 85℃.

F2-WaterIn, code **46** [main][assistant][parallel]

This function is used for dyestuff vat water intake according to water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 00001 ～ 00003 are corresponding to the dyestuff vat's minimum, medium and maximum water levels；When use continuous liquid level, edit actual water level (unit: L); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter(unload in process). Ctrl item is used to program the valve of water intake. There are 2 water intake channels in dyestuff vat. This item can edit 1～2， corresponding to the two water intake valves. Be sure the function of each valve such as: which one is for clear water intake and which is for hot water etc.

Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water intake".

F2-waterOut, code **47**[main] [assistant] [parallel]

This function is used for dyestuff vat water drain as water level.

When use maximum, medium and minimum water levels, edit water level for the water intake in the water level item, 00001 ～ 00003 are corresponding to the dyestuff vat's minimum, medium and maximum water levels；When use continuous liquid level, edit actual water level (unit: L); Ctrl item is used to program the valve of water drain. There are 2 water drain channels in dyestuff vat. This item can edit 1～2， corresponding to the two water drain valves. Be sure the function of each valve such as: which one is for clear water drain and which is for dirty water etc. Time item is used for overtime alarm control, program 0 will not alarm; program the digit other than 0, time is up but the water level is not up the set value, it will give the alarm of "overtime water drain". Besides, this function is affected by the overtime setting of the assistant vat water drain. When the assistant vat is drained to the minimum water level, the computer will carry out overtime drain till drain the rest water clearly then will enter into next step.

F2-Reflux, code **48** [main] [assistant] [parallel]

This function is used for dyestuff vat reflux according to water level.

When use maximum, medium and minimum water levels, edit water level in the water item, 00001 ～ 00003 are corresponding to the assistant vat's, minimum, medium and maximum water levels； When use continuous liquid level, edit actual water level (unit: L); the mode of water intake can be set in parameter, respectively are: maximum, medium and minimum water level, continuous liquid level, flow meter(unload in process)

Ctrl item is used to program reflux channels. There is only one reflux channel in assistant vat, so program 1 is ok.

F2-Feed 1, code **49** [main][assistant][parallel]

Edit target water level in water level item. When use maximum,medium, minimum water levels, Program 00001～00003 indicate the minimum, medium and maximum water levels of the vat respectively; When use continuous liquid level, program actual water height; feed

to be lower than the set value, if reach the minimum water level, it will carry out feed delay and till all the remaining dyestuff is fed and the state of vat washing is formed. The Open item is used to edit the time for each open of the dyestuff valve, the Pause item is to edit the interval time for each stop of the dyestuff valve, this function is for 2 feed 1.

F2-Feed 2, code **50** [main][assistant][parallel]

This function is as same as the above one, but feed 2.

F2-Feed3, code **51** [main][assistant][parallel]

Water edit the water level of refluence .

Delay edit the delay time of reopening the return valve.

Time edit the total time of feeding.

This function is expected to open feed2 return valves, dyestuff pump2, expected to feed valve2, when the water level reached the water level settings, Kwan is expected to return valve2, if set too low water level has begun to include delay time, Time to re-open after2 is expected to return valve; time yet, but if the water level has been lower than the salt water level is also expected to re-open a valve to return. This cycle, until the total feeding time, Kwan is expected to return valve2, 2 related material feed valve 2, 2, is expected to open a feed valve, until the expected increase in the low water level is expected cylinder, automatic washing tank into the state.

F2-Dosing, code **52** [main][assistant][parallel]

Remain item is to edit remaining dyestuff（the full vat 100%）.

Curve item is used to edit curve number（nine curves in total：0-8）.

Time item is used to edit feed time.

During the process of ration feed, the computer feed the set quantity of dyestuff according to the curve track; if reach the minimum water level, it will carry out feed delay and till all the remaining dyestuff is fed. It will stop after twice vat washing. This function can be carried out by relay mode and analogy mode. The mode of feeding can be set in parameter setting.

F2-Pump, code **53 [assistant] [parallel]**

Opening the dyestuff pump needs to set opening water level, when input by maximum, medium and minimum water level, Water item should be programmed minimum, medium and maximum water level in dyestuff pump as 00001～00003; If liquid level gauge is used, program actual water level; If program On/Off as 0, it will shut down the dyestuff pump immediately without being limited by mode, time and water level. Time item is to program the opening time of dyestuff pump, the digit is other than 0, the pump start time will operate according to the edited time, when time is reached, the pump will stop; When time item is programmed as 0, it means that pump start will not be limited by time and the main pump will operate until the end step of shutting down dyestuff pump or the end step of parallel function.

F2-Whisk, code**54** [assistant][parallel]

This function will open the mixing valve according to time and turn off the function

when time is up. Edit On/Off as 0, it will turn off the function immediately.
This function is affected by the control of minimum material water level. It will turn off the mixing valve when water level reaches minimum water level.

F2 to F1, code **55** [main]

This function will add F2 to F1, F2-pump and F2-connect valve will be opened automatically, it will feed according to the set water level (high) of dyestuff vat2 till the initialization. If it reachs the low water level of F2, it will delay the feeding time, if it reachs the high water level of dyestuff vat1 first, the feed F2-pump and F2-connect valve will be closed; if dyestuff vat1 dropping water level is lower the max, it will begin to count the delay time, reopen F2-pump and F2-connect valve when time is up. Water edit the feeding water level, Delay edit the delay time, Time edit 0 is ok.

IV、Process Running

4．1 Run

Under main interface, press 1 key to enter process list, choose the needed running process then press OK key, it can enter into running interface and prepare for running, then press RUN key to begin.

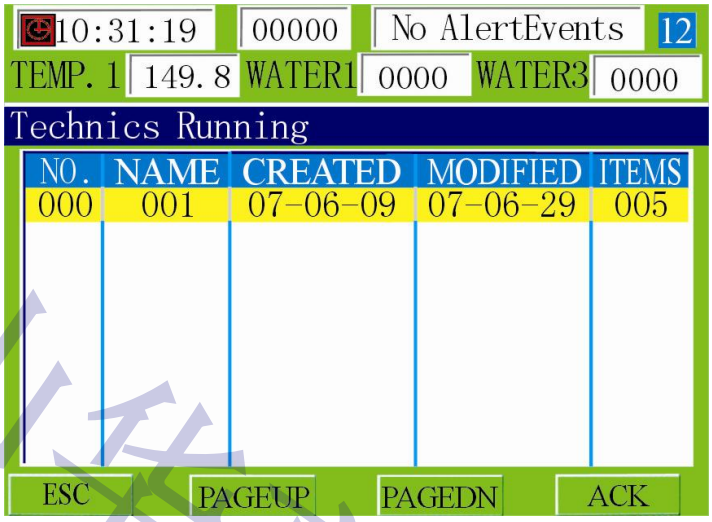


Chart of running process list

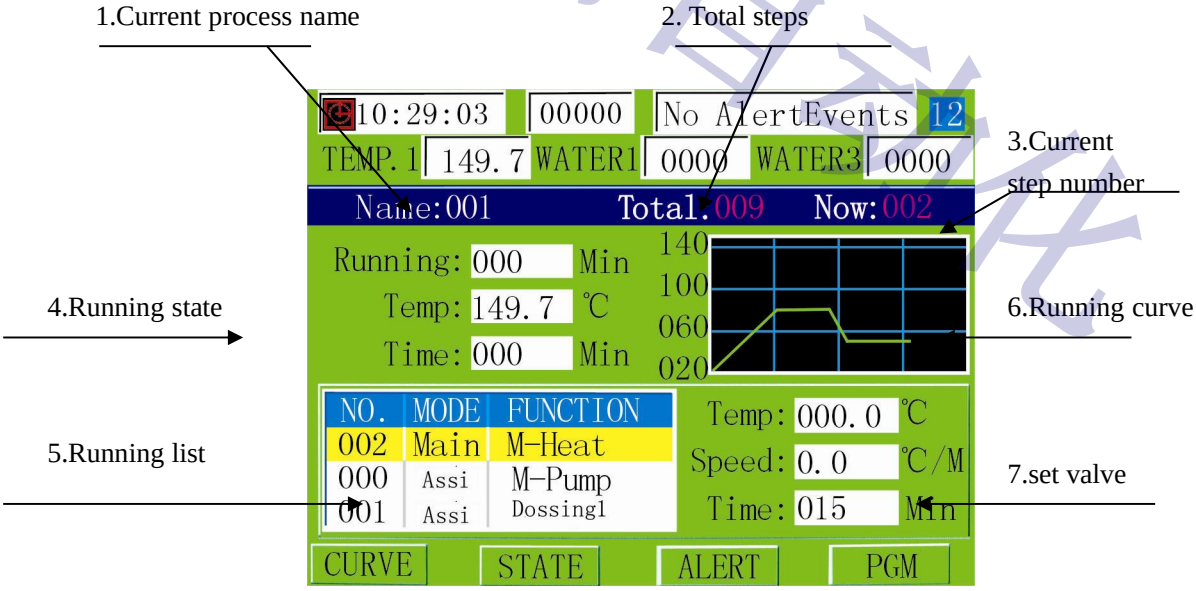


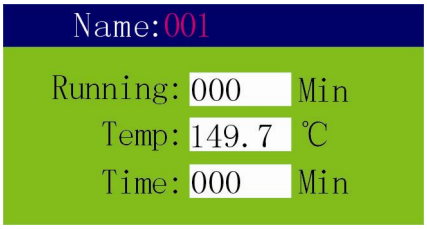
Chart of running main interface

1．Display the current running process name.

2. Display the total steps of current running process.

3. Display the step number of the current running process. This step number is mainly use the main function, or we can say, when a main function is running together with several assistant functions and parallel functions, the computer will only show the step number of main function.

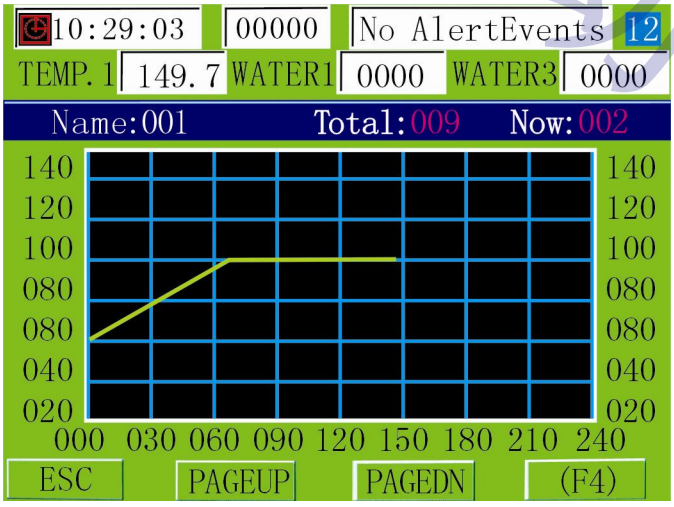
4. Display the state of each function, press up and down key to choose the different function in running list. It can separately display the current state of relative function. As the above picture, if you choose the first item M-Heat , it will display the current temperature and heat preservation time.



5. Running list，display the function of current running, including main, assistant and parallel. This running list has only one main function which is running, but it can run with several assistant or parallel function at the same time and the parallel function will end with the end of main function and it won't be taken to next function range; However, the assistant function can be taken to next function range to run and it can jump several function ranges till the step of turning off the function or it is completed itself.

6. Running curve， display the current temperature curve, one case for one hour, one page can display four hours' temperature curve, it will turn to next page automatically if one page is full; the range of temperature display is 20～150℃.If wants to inquire the complete curve, press F1 to see the enlarged complete curve record.

Red line is current curve, green line is setting curve.



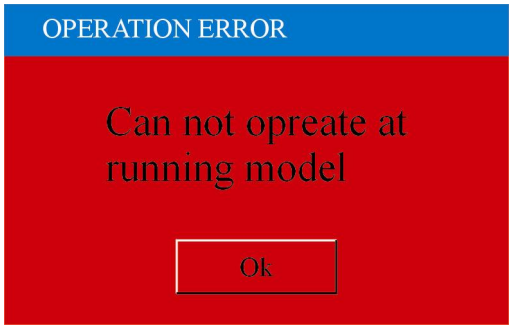
Display the running function property, press up and down key to choose the different function in running list. It can separately display the setting of relative function. Be convenient to make contrast with the actual value and check the running state of all the

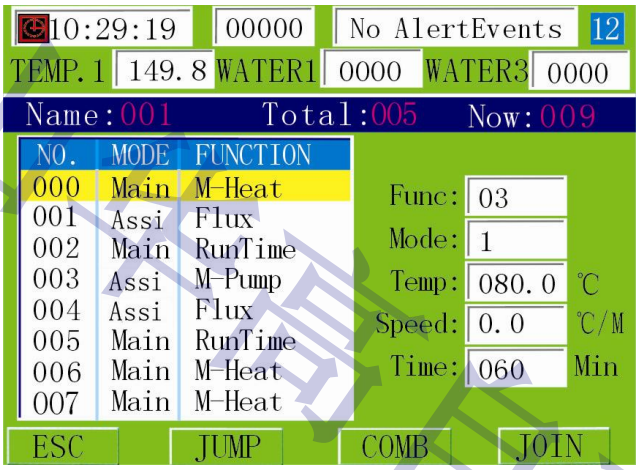
functions.

Note：if want to exit from the main interface after the process is running, press Pause key then press RST key ! The purpose of doing this is to prevent from the unexpected escape because of careless mis-press ESC key.

4．2 Pause and Jump

If you want the jump operation, press Pause key to stop the running function or the following warning window will appear “the operation is unallowed during running state!” As the right picture. Under Pause state, press F4 key to enter into the complete step list window.





Jump Running Window

4．2．1 Pause

If want to pause running process, press Pause key is ok. Pause operation just can make the running main and parallel function, assistant can’t be paused; If want to stop all the operation or want to make the process run, press RST key under pause state.

4．2．2 Direct jump operation

Under pause state, move the shift key to choose the needed step number, press F2(direct jump key), the computer will add the same function range to running list from the chosen step number. If the chosen function is main function, it only add this step to running list; if not, it will add all the next functions from this step of the same function range to the running list, the function before this step can’t be added.

Notice： Carrying out direct jump will cancel all the previous running main and assistant functions, so be careful to use!

4．2．3 Jump Operation

If want to jump to next function range to run and don’t want to cancel the previous

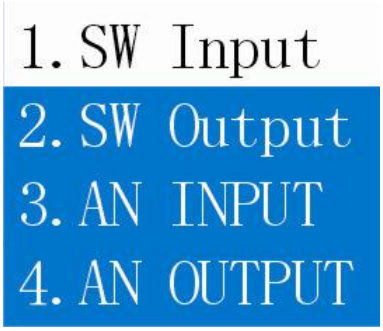
running assistant, you can choose jump operation, move the curve to any step of the needed running function range, press F3 (Comb), the computer will automatically look for all the functions of the same function and add them into running list; the advantages of jump operation is that it can remain the previous running assistant function, and it can automatically search all the functions step number of the same function range and add them in the running list.

4．2．4 Add

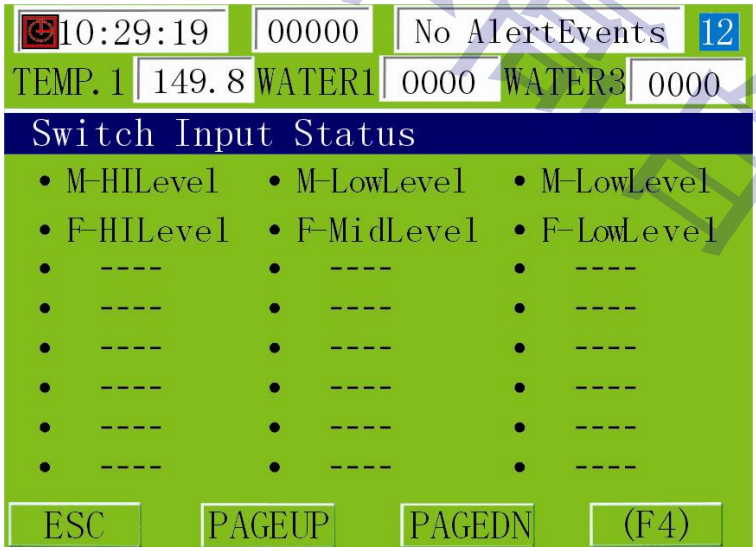
The usage of this function is similar to combined function. Under pause state, it can add function to running list freely. The functions added can be any step of the whole process, or we can say it can borrow the future function; the main function in running list is only one, if the function added is main function it will replace the previous main function, then it will mainly run the new main function, the computer will automatically turn to the following function of this main function; if the added assistant or parallel function have existed, they will be replaced by the new ones.

4．3 Running state

Under running main interface, press F2 key， the input and output state window appears



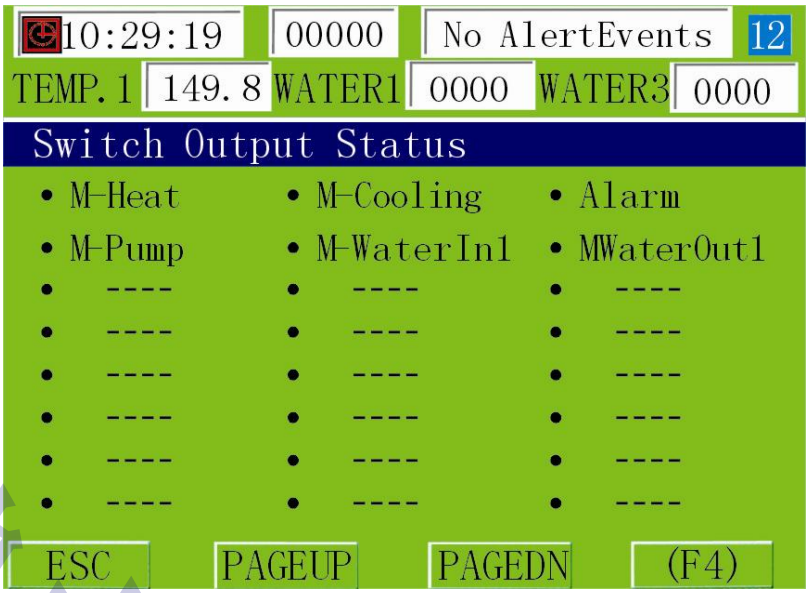
4．3．1 Switch input state



Choose 1 to enter the inquiry window of switch input state, the prompt red light indicates signal input, or the prompt light will be dark when no signal.

Press F2、F3 key can page up and down to look other input state.

4．3．2 Switch output state



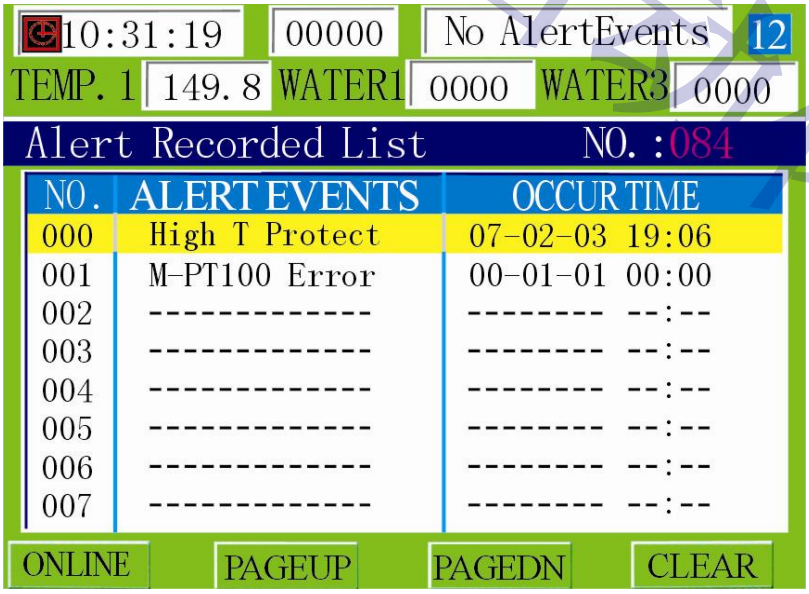
Choose 2 can enter the inquiry window of switch input state, the prompt red light indicates signal output, or the prompt light will be dark when no signal.

Pres F2、F3 key can page up and down to look other output state.

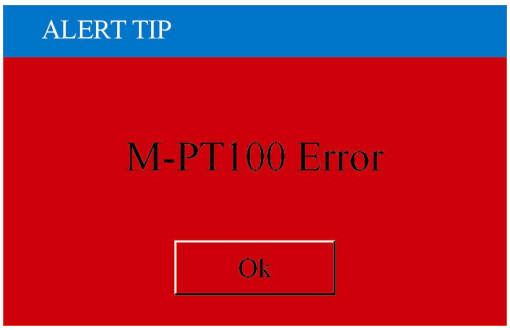
4．3．3 Analog input and output state

Respectively choose 3 or 4 can look the analog input and output state.

4．4 Alarm state



Online alarm record is to record the current alarm event. The computer will automatically delete the alarm record from online alarm record if the alarm event disappear.



When a alarm event happen, the computer will automatically jump the alarm warning window as the above picture and give the call with the calling light output. When press OK key or the calling time is up, the indicate window will disappear and turn off the calling output, but if the alarm event doesn't disappear, the calling light output will keep on till there is no the record of alarm event.

After the alarm event happen, the computer will keep the record to the online alarm list and history record. The alarm history record list is as the above picture, press F1 key can switch inquiry online and history record list.

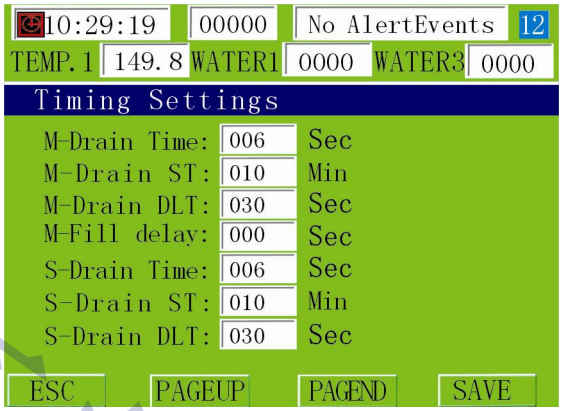
V、Parameter setting

The needed parameters for computer running have usually been set well when it is from the factory or after the first debug. There is no need for user to debug. Parameter plays a very important role for the normal running of computer, so the advance password is required for modifying the general parameter, in case that some strangers mis-change. Especially for the input and output setting, the wrong setting can cause very serious result, so special password is required for input and output setting.

5．1 General parameters

General parameters are divided into four types: time parameters; temperature parameters; water level parameters; other parameters.

5．1．1 Time parameters



1．Main vat direct draining valve opening time(M-Drain Time)：

To set the opening time of the coldness relief valve; the unit is second; this time can’t be so long, otherwise it will waste steam.

2．Main vat direct draining interval (M-Drain ST）

During heating, condensed water will be accumulated in the heat exchanger after a period of operation, direct draining is used to drain off the condensed water in the exchanger so as to increase heating efficiency. Direct draining interval is to set the interval of computer automatically open the coldness relief valve, the unit is minute.

3．Main vat direct draining delay(M-Drain DLT)：

During computer controlled water draining, when the water is drained to the minimum level, there is still some water remaining in the dye vat. The setting of delay parameter is to prolong the draining time and allow the water in the vat to be completely drained off. The unit is second.

4．Main vat water intake delay(M-Fill delay）

Water intake delay is to prolong some time for water intake after the water have reached the target water level because many output valves have relation with water level signal, if the water level is floating around the target valve, the water level signal will appear some time and disappear some time, which can affect the control effect of computer, so prolong the water intake time is to solve this problem.

5．Assistant vat direct draining opening time(S-Drain Time):

Assistant vat direct draining interval; Assistant vat direct draining delay;

Assistant vat direct water intake delay; dyestuff vat draining delay; dyestuff vat water intake delay etc are same with the main vat, so no need to say it again.

6．Dyestuff vat1(2) feed delay(F1(2)-Feed DLT)：

When the dyestuff is feeded to the minimum level, there is still some dyestuff remaining. The setting of delay parameter is to prolong the feeding time and allow the dyestuff to be completely feeded. However, this time can't be too long, it should be set according to the debug because the dyestuff pump is easily broken after completing the dyestuff feeding but the time is not up.

7. Dyestuff vat1(2) direct draining delay(F1(2)-Drain DLT)：

During computer controlled water draining, when the water is drained to the minimum level, there is still some water remaining in the dye vat. The setting of delay parameter is to prolong the draining time and allow the water in the vat to be completely drained off. The unit is second.

8．Dyestuff vat1(2) water intake delay(F1(2)-Fill delay)

Water intake delay is to prolong some time for water intake after the water have reached the target water level because many output valves have relation with water level signal, if the water level is floating around the target valve, the water level signal will appear some time and disappear some time, which can affect the control effect of computer, so prolong the water intake time is to solve this problem.

9．Washing items of dyestuff vat1(2)：

First Wash：the time of the first time to open the dyestuff vat water intake after feeding delay, Set this item as 0, it means no washing after feeding.

First delay：set the delay time of the first water wash, this time is used to make the washed dyestuff into main vat. Set 0 won't delay and it will directly begin the second washing process.

Second Wash、Second delay：same setting with the first wash. Set this item as 0 , it means wash once.

Third wash、third delay：same setting with the first wash. Set this item as 0 , it means wash twice.

Notice: during the third time delay, no need to open the feed valve, but open the dyestuff drain to drain the water of the third time instead of in pouring to main vat.

10. Warning last time(Alert Time)

When the alarm event happen, the computer will automatically jump the alarm indicate window and give the call, if there is nobody there, it will keep warning which is quite annoying. The purpose of this setting is to set the warning last time , when the time is up, the computer will close the warning window and calling. However, if the alarm event doesn't disappear, the warning light won't be off.

Notice：If program 0, it won't cancel the alarm automatically.

11．Main pump open delay(MPump delay)：

This parameter is good for protect main pump, prevent from opening main pump without water. Usually set it as several seconds.

12. Cloth-raising round open delay(Motor delay)

This parameter is the delay time for the main pump after starting, the cloth-raising round can be started only after the starting of the Main pump, if there will be a long time for the main pump to start, the delay time can be extended accordingly.

13．Time of automatically forward rotation(Auto Influx)：

If SYSTEM-> MPump Run mode are set as automatically open， then the control function of forward/reverse rotation will automatically carry out, and this parameter will be the windows default.

14．Automatically interval(Auto Pause)：

Same with above, omitted.

15．Automatically reverse rotation time(Auto Efflux)：

Same with above, omitted.

5．1．2 Temperature parameters

1．Temperature deviation parameter(M-Temp Excu)：

“+”“-”input method，press +/- key to enter“+”， then press once will enter “-”, When enter“+”“-”, the curse can’t automatically move to next, then press Right key is ok.

The maximum calibration scope is：-9.9～+9.9℃

2．Default pressure relief temperature(Decomp. Temp)：

Use to set the temperature of turning off pressure relief valves. When the temperature is higher than this set temperature, it will turn off the pressure relief valve; otherwise, it will open the pressure relief valve; but if there is the step of pressure relief function edited in process, the control temperature of pressure relief is depended on it, in other word, the process takes the priority.

3．Default vat locking temperature(VatLock Temp)：

Use to set the temperature of opening vat lock. When the temperature is higher than this set temperature, it will open the vat lock valve; otherwise, it will turn off the vat lock valve; but if there is the step of the vat lock function edited in process, the control temperature of the vat lock is depended on it, in other word, the process takes the priority.

4．Maximum protective temperature(Maximum Temp)：

It is used to set the protective high temperature. When the temperature is higher

than this set temperature, the computer will jump the high temperature protective window and turn off the related output valve to protect the safety of equipment and staff.

5．Alarm temperature deviation parameter(Alert TempE)：

Use to set the temperature deflection range. When the deflection of temperature and target temperature is over the deflection value, it will alarm. This item is related to the set time of temperature alarm waiting, when both the deflection is over set temperature and waiting time is over set time, it will alarm.

6．Maximum temperature of heat preservation(HP upper limit)：

Set the maximum temperature deflection between actual temperature and set temperature during heat preservation. When temperature is over the maximum temperature limitation, it will open cooling valve to decrease the temperature.

7．Minimum temperature of hear preservation(HP lower limit)：

Set the minimum temperature deflection between actual temperature and set temperature during heat preservation. When temperature is lower the minimum temperature limitation, it will open heating valve to increase the temperature.

8．Default pressurizing temperature(Boosting Temp)：

When the actual temperature reaches pressurizing temperature, there will be pressurizing temperature output. (need to be set in input and output setting)

5．1．3 Water level related parameters.

1．Water level of main vat(M-Water High)：

Set the actual water level of the full vat, or use the full-scale value of the continuous liquid level gauge, unit is litre. If the full –scale value of the continuous liquid level gauge is 10000L, this value should be set as 10000.

2．Main vat water level deviation(M-Water Offset)：

If the 0 scale of the liquid level gauge is different from that of the vat, the difference can be compensated by setting this parameter. The compensated range is -9999～+9999L

3．Advanced water intake control for the main vat(MWater advance)：

In order to avoid over water intake, you can set this parameter to turn off the water intake valve in advance.

4．Maximum, medium, minimum water level setting of main vat：

This item is used to set the actual value of the continuous liquid level gauge corresponding to the maximum, medium, and minimum water level in main vat. For example, suppose the water level of main vat is 10000L， but 9000 is the maximum water level， M-High Water is 9000; if 5000L is medium water level，

M-Mid Water is 5000; if 1000L is minimum water level， M-Low Water is 1000.

5．Maximum, medium, minimum water level of assistant and dyestuff vat1(2):
The same setting with the main vat, no need to repeat.

6. Dyestuff vat1(2) salt water:
This item is used to set the actual value of the continuous liquid level gauge corresponding to dyestuff vat1(2) salt water. It is effective only when Feeding circularly is carried out, when the water level is lower than initialization of salt water, reopen the dyestuff vat refluence valve .

7. Yarn-water level(No.1-13 Level):
This item is used to set the corresponding water level for each layer in yarn, the layers can be the consecutive 6 among 1-13 layer. The initial layer can be set in others -> least layer.

8．Water gauge flow parameter(Flux Settings)：
This item is unload.

5．1．4 Other parameters

1．Networking Address：
This item is used to set the networking address of this computer, mainly use to monitor the system. In the same net, each computer only can has one address, it can’t be repetitive, so need to be careful.

2．Range of Press：
This item is used to control the flow value, the computer will automatically control the main pump speed according to the pressure difference

3．ML Heat/Cool：
This item is used when it is manual operation, if there is the corresponding switch signal input, the computer will output according to this set value.
4-20mA, it is convenient for the manual operation of PLC without analogy output.

4．ML Fill：
Same with above, omitted.

5．ML MPump speed：
Same with above, omitted.

7．M-Pump speed：
To set the default main pump speed, when no edition of main pump speed adjustment in process, the computer will set the speed according to this item to

control the main pump speed.

8．Automatic forward rotation pump speed(AutoInflux Rev)：

If SYSTEM -> Direction mode are set as ENABLE

then the control function of forward/reverse rotation will automatically carry out according to this parameter.

9．Automatic interval pump speed(AutoPause Rev)：

Same with above, omitted.

10．Automatic reverse rotation pump speed(AutoEfflux Rev)：

Same with above, omitted.

11．Main vat temperature control P value：

This item is the proportion modulus during PID adjustment, enlarge it can speed adjustment and reduce the deflection, but too large can cause unstable system.

12．Main vat temperature control I value：

This item is the integral time during PID adjustment, its function is to reduce the error, increase no deflection, the smaller the set value is, the larger function it has.

13．Main vat temperature control D value：

This item is the differential time during PID adjustment, its function is to preview the deflection, reduce over adjustment, the smaller the set value is, the weaker function it has.

14．Dyestuff vat feeding PID parameter:

This parameter item is same with the PID of main vat temperature control, so omitted.

15. Yarn-least layer:

This item is used with Yarn-water level. Virtual value is 1-8 layer.

Because the yarn layer of water level can only be set six storeys, in order to use conveniently, you can set a minimum which is 1, the Yarn-water level will be 1-6, if the minimum is 2, the Yarn-water level will be2-7, because the computer only can support 13 layers' water-level setting, the minimum layer only can be set 8 at most, that is, the Yarn-water level can be 8-13 layer at most.

5．1．5 M_WATER

This item is used to set the water level of the anomalous vat.

5．1．6 PLC TIMER

This item is used to set the PLC register D100~D115. use for time-on-pad.

5．2 System parameters

1．The language used in computer main interface.

This item is to set the language used for user in the computer main interface, 0-chinese，1-English.

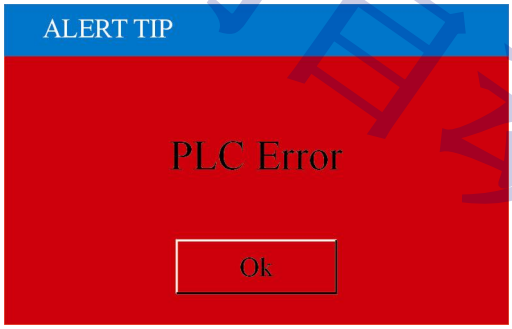
2． PLC type：

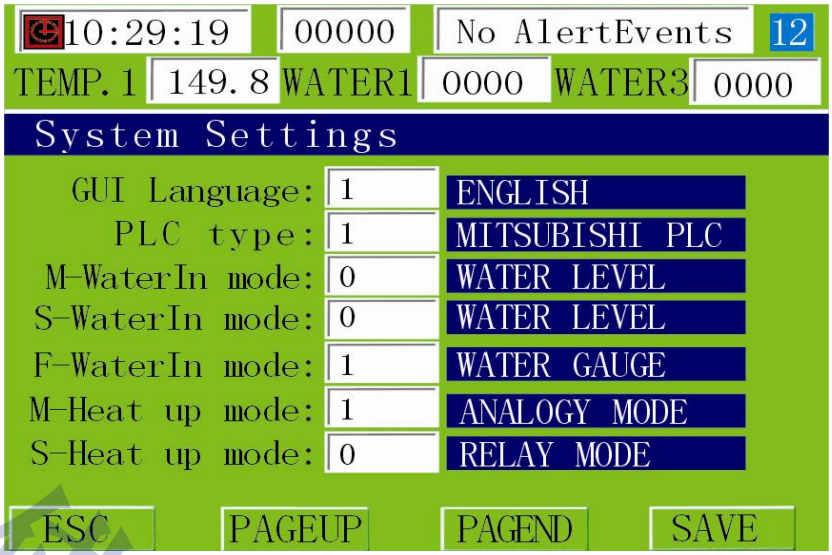
Choose PLC type in this item, wrong set computer or failure of communicate with PLC, it will give the warning “PLC wrong connect”

The main supported PLCs :

1. SANLING FXIN and SANLING FX2 SERIES（support communication of RS485 or RS422）
2. LG–Master-K SERIES, supportRS485 communication.
3. TAIDA DVP-ES SERIES, support RS485 communication.

It also supports the two built-in input and output modules, HG-I / O 1616:16 point input +16 point output; HG-I / O 0824: 8 point input +24 point output module. Because it is built-in input and output modules, users need to be customized in the factory.





3. Water intake modes:

There are 4 water intake modes: M-WaterIn mode, S-WaterIn mode, F1-WaterIn mode and F2-WaterIn mode, they are set according to the sensor which is actually used. 0 - WATER LEVELl; 1 - WATER GAUGE; 2 - FLOWMETER.

If this setting is incorrect, the computer control will be abnormal by collecting the wrong data during process operation, so you should be sure of the right mode.

4. Temperature control methods(M-Heat up mode):

This item is to choose the temperature control method of each vat, 0-relay mode；1-analogy mode; 2-mixed mode.

Relay mode is to reach the up/down grading temperature according to the speed by the on and off time of relay in a controlled cycle.

Analogy mode is to reach the up/down grading temperature according to the speed by the control of opening range of analogy valve to control the fast/slow up/down grading temperature.

Mixed mode is the mixed one of the Relay mode and Analogy mode.

5. Feeding method of dyestuff vat1(2)(F1(2)-Feed mode):

This item is similar to temperature control, 0-relay mode； 1-analogy mode.

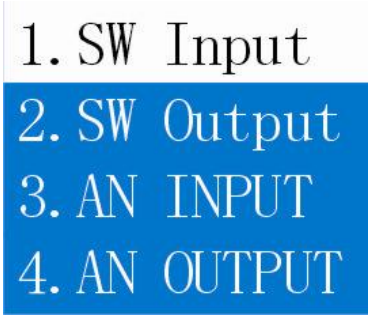
6. Main pump opening method(MPump Run mode):

Set the main pump is automatically open by using cooperately with MPump Level when set automatically open, the main pump will automatically open when the main vat water level reaches the minimum water level; when the water level is lower than the minimum water level, it will turn off automatically, no need to program main pump function in process.

7. Pump speed control of direction exchange(MPump Rev mode):

Set the main pump is automatically adjust the speed, when set automatically adjust

the speed, the computer will automatically control the main pump speed according to the default value of forward and reverse rotation.



8. Alert/Call mode：

Set this item as 0- COMBINED means the alarm and call will output at the same time, set 1- DIVIDED means the outputs of alarm and call is separate, in other word, the computer will only give the calling output when automatically run to prompt function and it only gives alarm output when only have alarm event, it is used to make out the different output state.

9. Overflow control:

This item is used to control the on/off state of main pump、overflow valve and waterin valve. There are three ways:

Waterin close limited: the main pump and waterin are restricted by the high water level, the main pump will not be opened until it reachs the high water level, open or close the waterin valve, delay or reopen is effective.

Limited open: the main pump is restricted by the high water level, the main pump will not be opened utill it reachs the high water level, open the waterin valve till the completion of the overflow;

Unlimited: the main pump and waterin both are not restricted by the high water level, but the main pump is restricted by low water level;

10. Batch input parameters:

When batch input parameters are effective, the parameters of cloth weight, yarn layers, bietc are required, when the parameters are input, according to which, the waterin is calculated, Note: If water edit non-zero, waterin according to the initialization, edit 0 according to bath ratio, both of which can be mixed used, in case of some special conditions.

11. Fill Timeout:

This is for the choice of waterin time, alarm: this is for the alarming time of waterin overtime, do not jump further; Jump state: step directly after waterin, in order to be easier for some vats to waterin according to the time.

12. Drain Timeout:

This is for the choice of drainage time, alarm: this is for the alarming time of drainage overtime, do not jump further; Jump state: step directly after drainage, in order to be easier for some vats to drainage according to the time.

13. Run Valve Ctrl:

This is for the choice of the pause state of operation vat, 0 stands for the operation valve is open when it pauses, 1 stands for the operation valve is closed when it

pauses.

14. DrainCW Heat:

This is for the choice of the Drain valve open or not when heating.

15. Water Change:

This is for change the water level when the vat is anomaly.

16. F1 Feed2 20mA(F2 Feed2 20mA):

This is for Feed2 fucntion. Set 0 the computer will full output 20mA.

17. WTM Pulse Unit:

This is for set the unit of the water meter.

18. Heat limited:

This is for the Heat valve is linited or not by main pump.

19. Manul Depress:

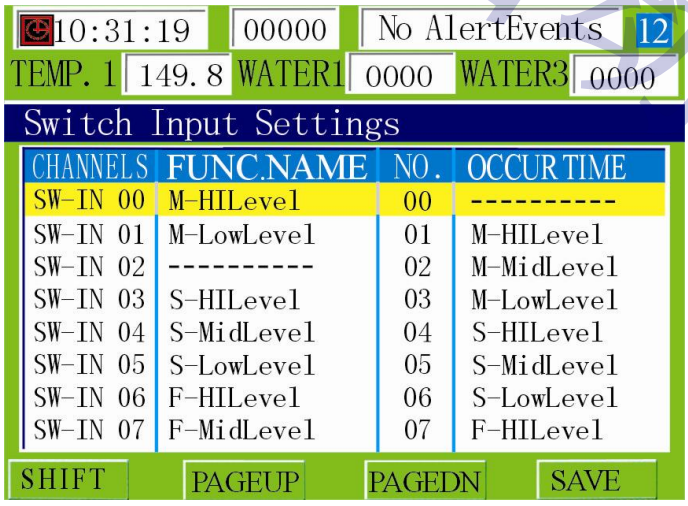
This is for the depress valve is output enable or not when force nanul state.

5．3 Input and output setting

There are four items of input and output setting. They are :Switch input, switch output, analog input and analog output. Input and output setting can be operated by using special password.

5．3．1 on-off input

There are 64 on and off input channels.



The left list is the needed set input channels, from 00～63 can be set，press right and left key to page up and down，up and down key to move the curse position

The right list is the chosen input function mode, press right and left key to page up and

down，up and down key to move the curse position

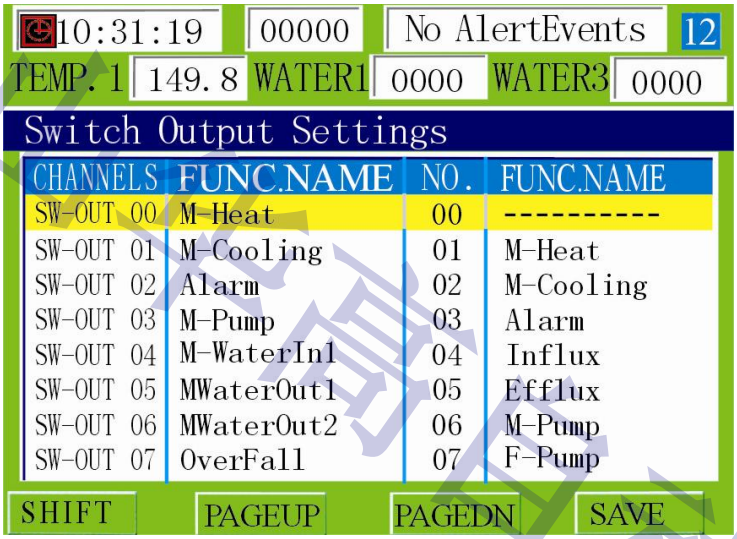
Both in the left and right list, only the side with high light is the current operation objects, press TAB key can switch the needed operation list.

If want to set one item input channel, the curse should switch to left list, move the curse to the needed set on and off input position, choose the input channel, then switch the curve to right list to choose function. When choose the right function press OK key is ok. The previous chosen function will add to the corresponding input channel in left list, the same way to set all the input channels, then press F4（Save）key to save the setting.

Notice：setting input item can be set all then save, no need to set one and save one.

5．3．2 On-off output

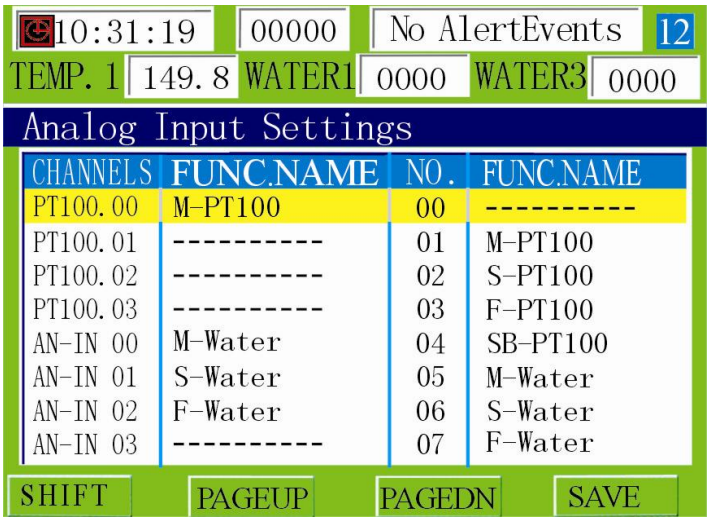
There are 64 on and off output channels. The setting method is same with on-off input setting, no need to repeat.



5．3．3 Analog input

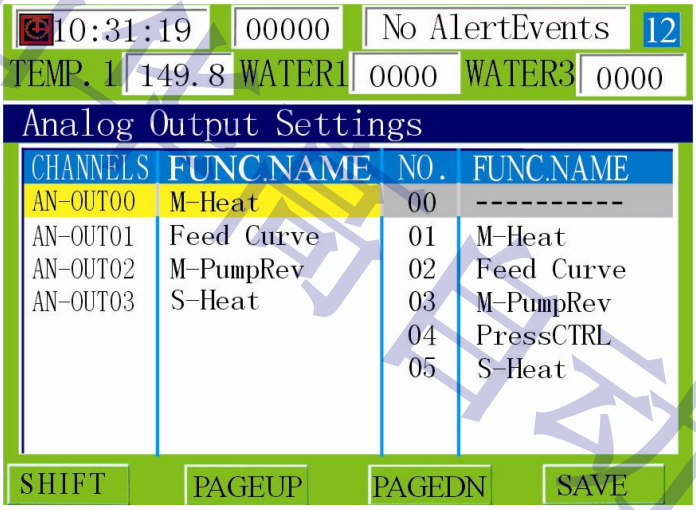
There are 10 analog input channels. The setting method is same with on-off input setting, no need to repeat.

Notice：The first four is temperature sensor(PT100) input, the following 6 are 4～20mA input！

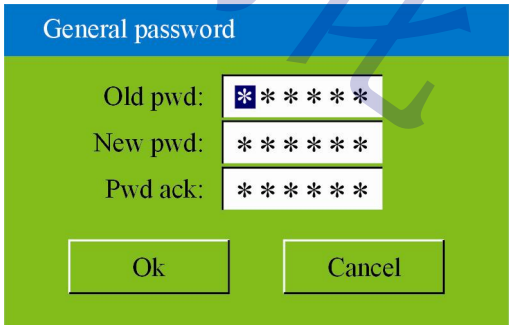


5．3．4 Analog output

There are 4 analog output channels. The setting method is same with on-off input setting, no need to repeat.



5．4 Password Modification



There are three kind of password: general password, advance password, special password. Owning the different password can have different using right. general password is used to modify the process, advance password is used to modify the general parameter, special password is used to input and output setting and checkout setting. The original general password is 159357，the original advance password is 427586.

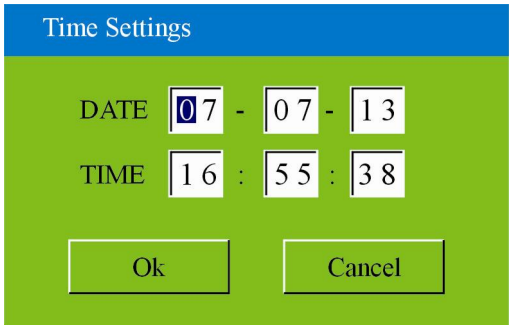
For safety, the user has better change them into his or her easy-remembered password the high grade password is compatible, such as the advance password is also workable in general password..

5．5 The setting of date and time

If you find the date and the time is wrong, you can modify them here. Only need to input as the curse position .

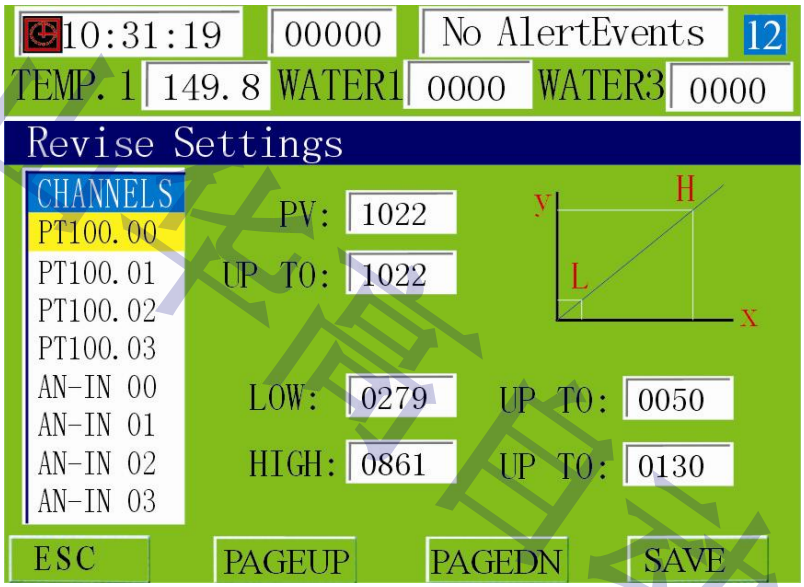
The form of date：year-month-day；

The form of time：hour-minute-second.



5．6 The setting of checkout

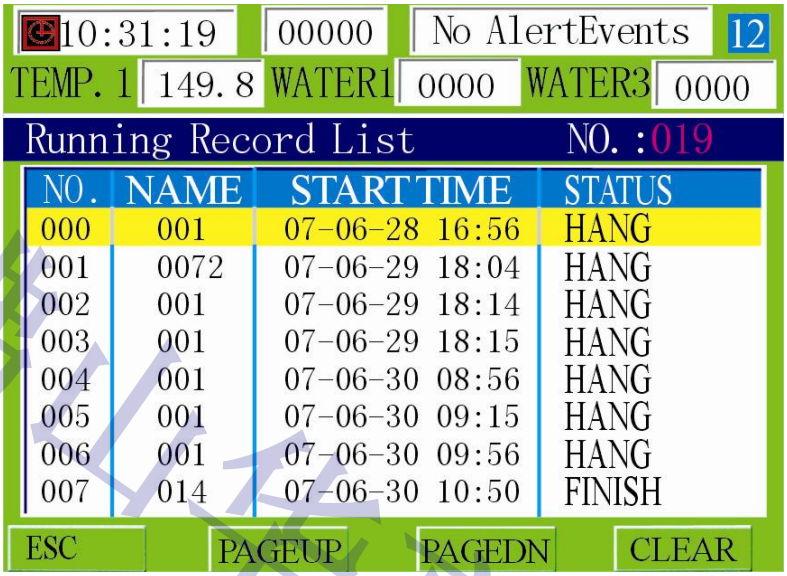
This item is used when adjust before going out the factory. It
Will be set well usually before going out the factory, no need for user to set.



VI、History Record

There are two kind of history record, one is process running record, the other is alarm event record. The computer can save 100 process running records and 200 alarm event records.

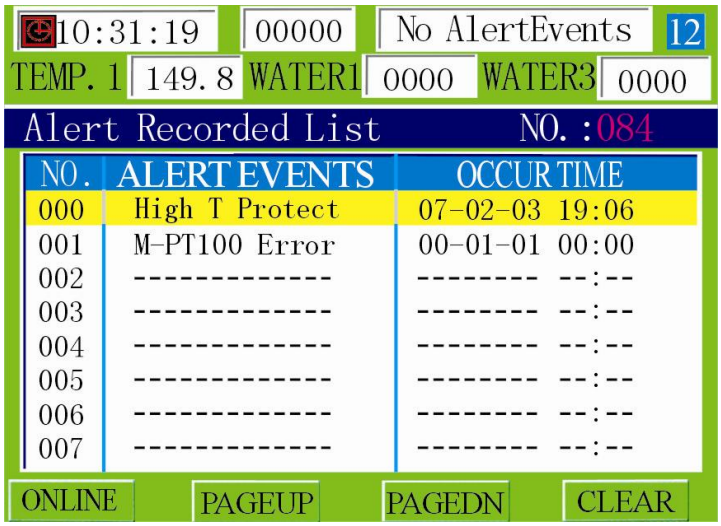
6．1 Running record

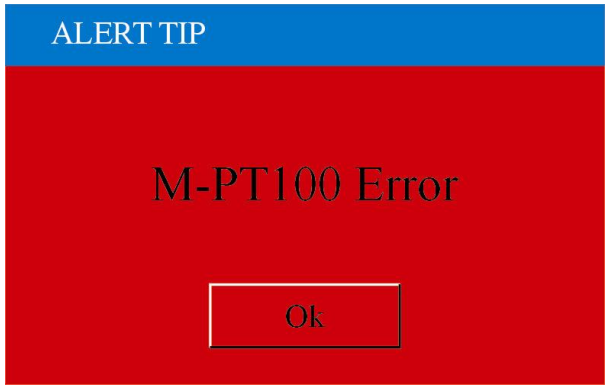


Enter the running record menu can look the history record list of process running,press up and down key to find the needed required record then press OK key to enter into the main interface of running record, it will display the information of the recorded process name, total steps, opening time, end time and finished or not.

The user can also press F2 key to inquire the record curve of process running, the green is for setting curve, the red is the actual running curve. Press F3 key can inquire the setting value of each step of process.

6．2 Alarm record





Online alarm record is to record the current happen alarm event, the computer will automatically delete the alarm record when the alarm event disappear.

When the alarm event happen, the computer will automatically jump the warning window as the above picture, and it will output calling with the calling light together;

After press OK key or when the calling waiting time is up, the window will disappear and close the calling output, but if the alarm event doesn't disappear, the calling light will be on till there is no record in online alarm record list.

After alarm event happen, the computer will keep the record in online alarm list and history record. The alarm history record list is as the above picture, press F1 key can switch inquiry online and history record list.

VII other features

7.1 BK PAR.

This feature is used to back up the computer in a variety of parameters, divided into general parameters, input and output, system parameters and all parameters. Users can choose their own need to back up the parameters and can back up several sets of parameters, but different from the new directory, to preserve the classification. To do this before inserting U disk.

In the new directory, enter the directory name will be determined after the open directory, a new file in the directory list is empty, according to exit from the key to the show just before the new directory, according to the arrow keys to select and identify key re-entry directory.

Contents of the computer folder similar to that used classified documents stored. For example, to back up several sets of parameters or processes, may

Some new directory (multi-level directory), are as follows: parameter 1, parameter 2, Technology 1, Technology 2, and so on, of course, can use their own

Easy to distinguish the new name for future use. In the preservation before the first selection list, according to the determined by the Save button and then open the key security deposit, the parameters will be saved to the appropriate directory. Press OK key to the next level, press ESC key to the last level.

Note: The directory name and file name display, with square brackets is the directory

name, After the file name show file types, such as: CFG, PGM, and so on.

To remove the non-CFG, PGM files or directories, and the need to complete the double switch Shift + F3

7.2 LOAD PAR.

This feature will be used before the backup disk in the U among the various parameters to copy the computer. Inserting U disk to do this before.

7.3 BK PGM.

This feature is used to back up computer technology, users need to back up theirchoice of back-up process, and can process more than a backup, but

The different needs of the new directory, to preserve the classification. Inserting U disk to do this before.

7.4 LOAD PGM.

This feature will be used to back up before the U disk replication process to which the computer. Multi-copy can greatly reduce the trouble of locking technology Programming, saving valuable time. Inserting U disk to do this before.

7.5 Custom

For the user-defined company name.

Ⅷ、Communication agreement between HG-902X and PLC

8.1 SANLING FX SERIES（Be available to FX1N-FX2N）

Impropriate resource：M272～M335 64 outputs in total，corresponding to the switch outputs 00～63 of HG-902X.
M336～M399 64 inputs in total， corresponding to the switch inputs 00～63 of HG-902X.
D100～D115 16 data register.

The communication mode :1. **RS485, using module FX1(2)N-RS485-BD.**
Baud rate：9600、data bit：8、odd and even checkout: no、
Stop bit：1. DATASUM：YES

2.RS422, connect RSS422 directly, communication parameters are not needed.

8.2 LG–Master-K SERIES（except for K10S1）

Impropriate resource：M250～M28F 64 outputs in total， corresponding to the switch outputs 00～63 of HG-902X.
M290～M32F 64 inputs in total， corresponding to the switch inputs 00～63 of HG-902X.
D100～D115 16 are data register.

The communication mode of HG-902X is **RS485 with all kinds of PLC.**
Baud rate：9600、data bit：8、odd and even checkout: no、Stop bit：1.

8.3 TAIDA DVP-ES SERIES

Impropriate resource：M272～MS335 64 outputs in total，corresponding to the switch outputs 00～63 of HG-902X.
M336～M399 64 inputs in total， corresponding to the switch inputs 00～63 of HG-902X.
D100～D115 16 are data register.

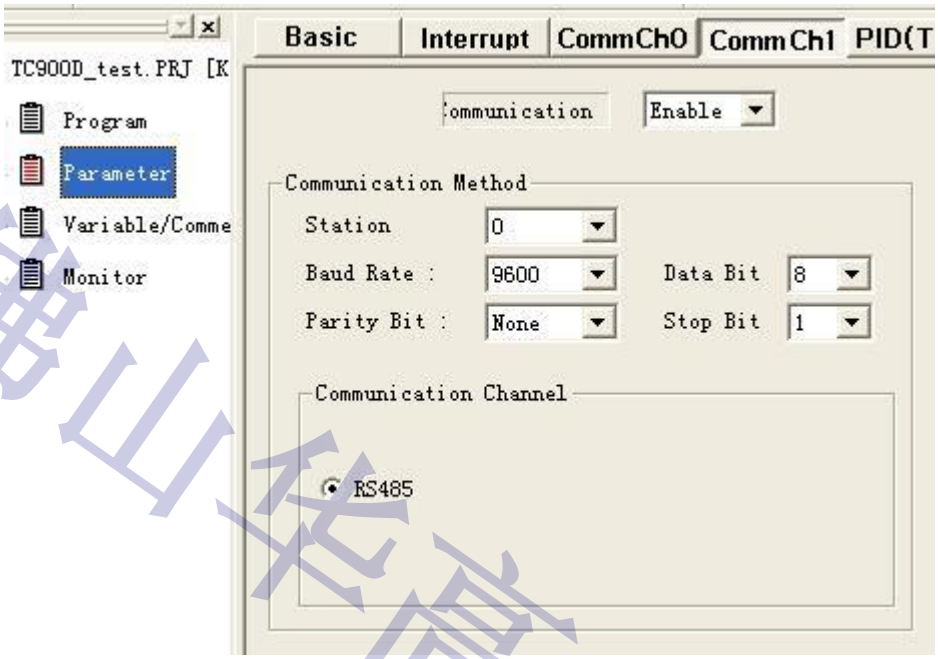
The communication mode of HG-902X is **RS485 with all kinds of PLC.**
Baud rate：9600、data bit：7、odd and even checkout: EVEN、Stop bit：1.

The Usage of Data Register D100~D115:

D100：Reservation；
D101：Main Vat direct draining valve opening time；
D102：Main Vat direct draining delay
D103：Main Pump open delay；
D104：Cloth-raising Motor start delay；
D105：Dyestuff Vat1 feed delay；
D106：Dyestuff Vat1 draining delay；
D107：Dyestuff Vat2 feed delay；

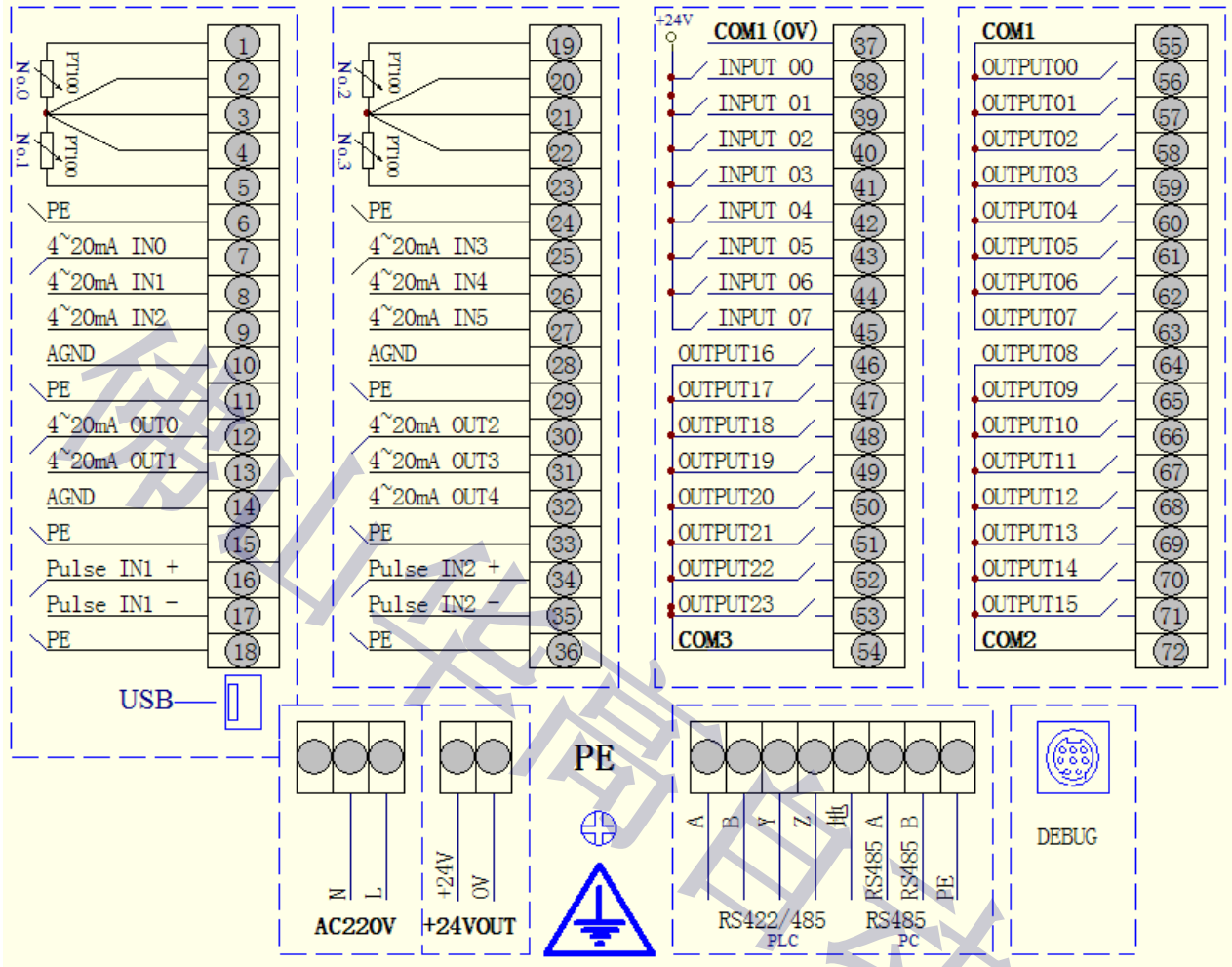
D108：Dyestuff Vat2 draining delay；

There are two lines RS485 communication of HG-902Xcompter: one is RS485/422, which is used to communicate with PLC, the other is RS485 which is used to monitor. Connect line mark A stands for "+"side, B is for "–"side, if wrong connected, it will cause failure of communication.

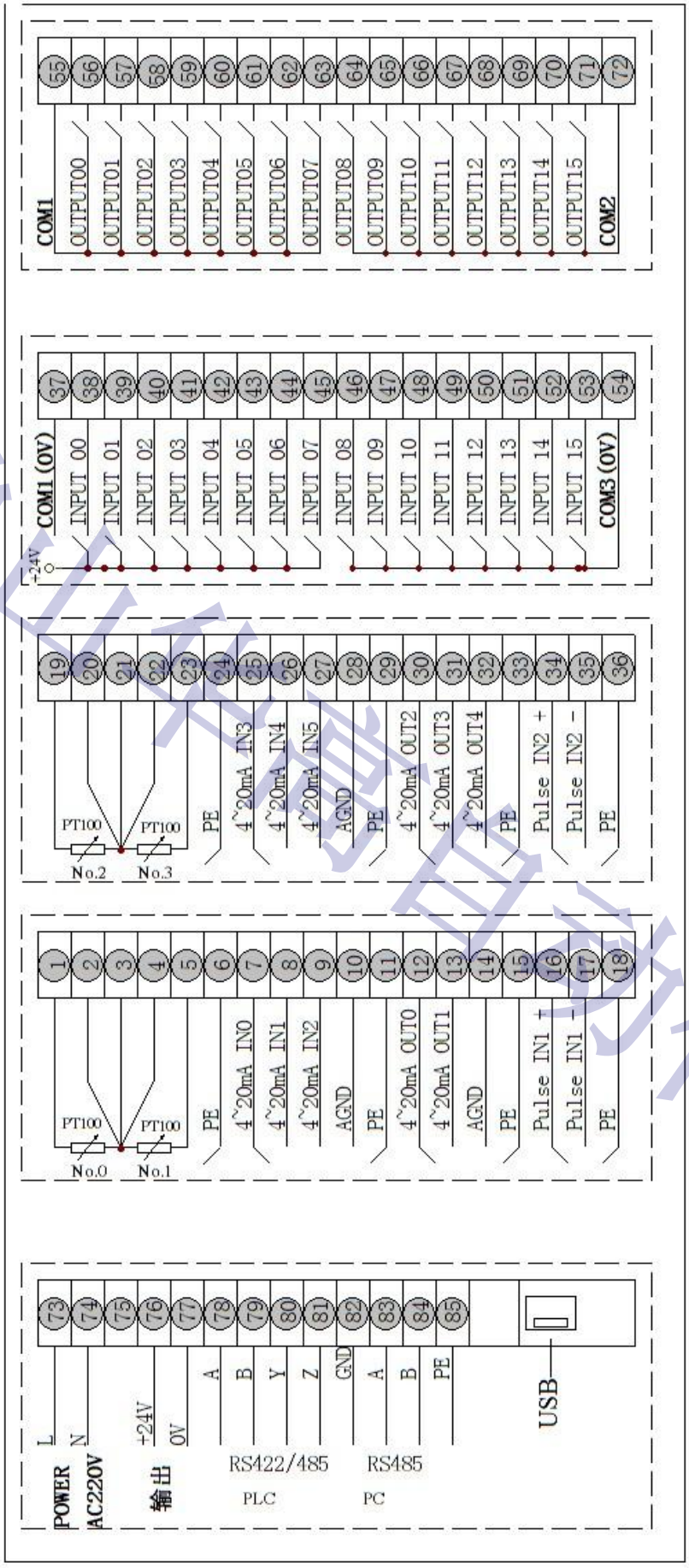


KGL_WE LG PLC COMMUNICATION SETTING

Ⅸ、HG-9026/9028 wiring diagram



HG-9022/9023 wiring diagram


55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
COM1
OUTPUT00
OUTPUT01
OUTPUT02
OUTPUT03
OUTPUT04
OUTPUT05
OUTPUT06
OUTPUT07
OUTPUT08
OUTPUT09
OUTPUT10
OUTPUT11
OUTPUT12
OUTPUT13
OUTPUT14
OUTPUT15
COM2
37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54
COM1 (0V)
INPUT 00
INPUT 01
INPUT 02
INPUT 03
INPUT 04
INPUT 05
INPUT 06
INPUT 07
INPUT 08
INPUT 09
INPUT 10
INPUT 11
INPUT 12
INPUT 13
INPUT 14
INPUT 15
COM3 (0V)
+24V
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
PT100
PT100
No.2
No.3
PE
4~20mA IN3
4~20mA IN4
4~20mA IN5
AGND
PE
4~20mA OUT2
4~20mA OUT3
4~20mA OUT4
PE
Pulse IN2 +
Pulse IN2 -
PE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
PT100
PT100
No.0
No.1
PE
4~20mA IN0
4~20mA IN1
4~20mA IN2
AGND
PE
4~20mA OUT0
4~20mA OUT1
AGND
PE
Pulse IN1 +
Pulse IN1 -
PE
73 74 75 76 77 78 79 80 81 82 83 84 85
L
N
POWER
AC220V
+24V
0V
输出
A
B
Y
Z
GND
RS422/485
PLC
A
B
PE
RS485
PC
USB

The content of this user's manual is just for reference, if there is any change, please forgive not to be notified, or you can refer to the supplement explanation" of attached page.

佛山市华高自动化设备有限公司

咨询热线：400-800-7812

官方网站：www.fshg88.com

电话：0757-81631133/0757-83273176

传真：0757-83273179

邮编：528200

E-mail：hg@fshuagao.com

地址：佛山市南海区桂城天安数码城 5 栋 B 座 1008

扫描二维码
直接访问官网
获得更多资讯