HC-S2 两轴伺服机械手控制系统

用户手册

V1.2

深圳市华成工业控制有限公司

CATALOGUE

Installation Notes

1, Installation should be performed by workers with lisence in electric field.

2, Make sure the power is off before installation.

3, Install on metal material, keep off from the combustible thing.

4, Make sure the good connection to the ground.

5, The power supply is important for the control system. Controller installation should be avoided contactors, transformers and other AC accessories layout, Make sure your system has stable power supply and protection.

6, Read the Guide first before Installation, maintenance, and operation. Operrators should be familiar with the safety specification in machinical and electric area.

7, Environment temperature is below 50℃. Do not use in brume and frozen places.

Attention: Installing incorrectly may cause danger, including the human body injury and equipments damage.

1. Configuration and Installation

1.1 Packing List

1、A control Pad

2、Machine Control Board

3、A Power Supply

4、a 37Pin Wire

5、Electric tone-bit board (Optional)

1.2 Installation and Adjustment of Control System

1、Control System Installation Notes

1) Installation of the controller box, you need good ventilation, oil-proof, dust-proof conditions. If electric control box is closed it is easy to make the controller temperature is too high, affecting its normal work, be fitted with suction fan (box at the appropriate temperature is lower than 50 ° c).

2) The installation of controller should be avoided and contacts, transformers and other AC accessories layout too close, to avoid unnecessary surge interference.

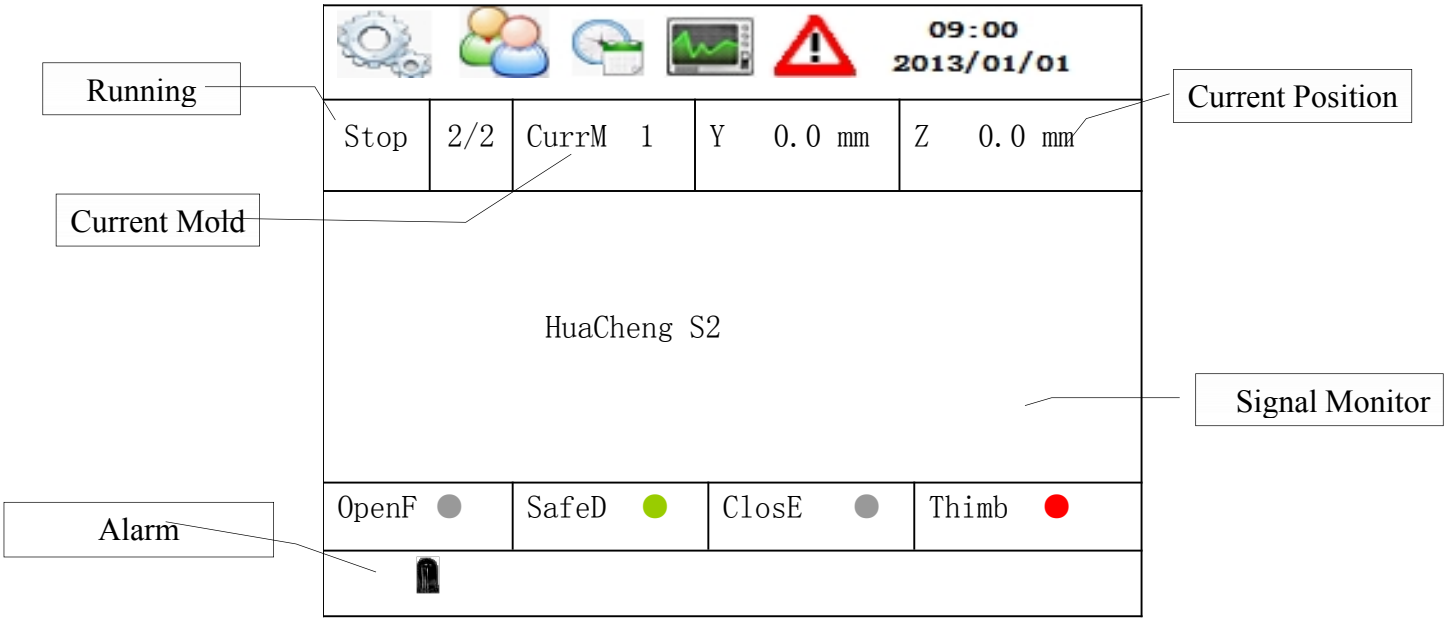
2、Maintenance Attention

Periodic maintenance of the control system to ensure the cleaning of electronic boards, relays work properly.

2. PANEL

2.1 Control Panel Dimensions

2.2 Main screen



3. Operate mode

3.1 Origin

The robot needs to return to origin after power on. This operation will let the servo axis to return to origin position and turn the fixtures to off status.

In the stop status and then press the origin button on the keyboard and then press the start button will execute the origin operation. The robot will return to the origin position by the order of Y-Z.

When Origin Action is on-going, user can not do other operator. User can press "Stop" key or "Emergency" button to stop the operation when something error.

3.2 Manual

3.2.1 Page

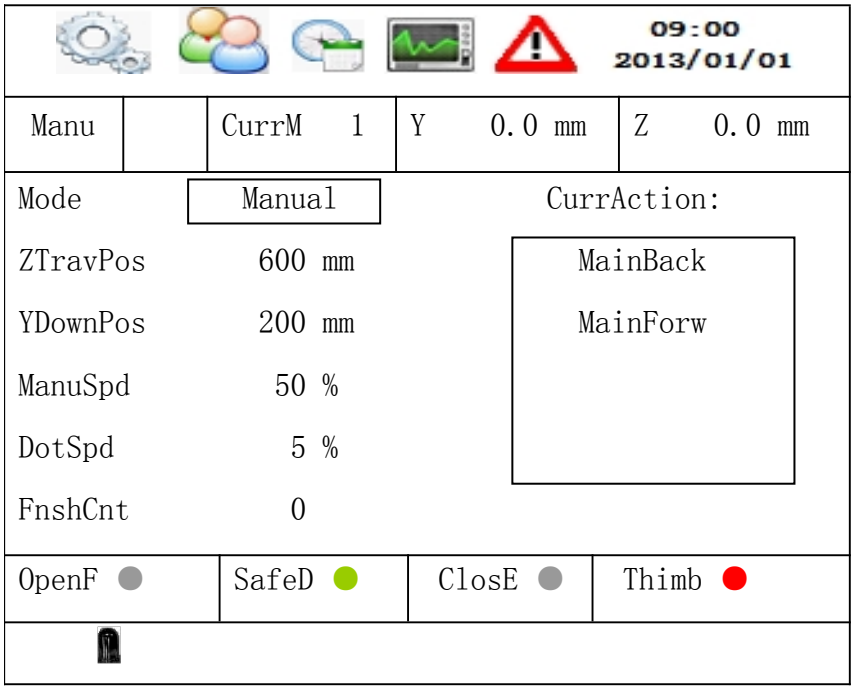
press 手动 key in STOP mode, system turn into MANUAL mode. Action key can be used to perform certain operation.

The fllowing action is prohibit for safety reasons.

After arms down in IMM mold-in area, can not do vertial or horizontal rotate.

After arms down in IMM mold-in area, traverse can not exceed the mold-in area.

Arms can not go down in IMM mold-in area without Mold-opened signal.



1、Mode: Press 输入 key to select between direct mode and jog mode.

Manual mode: Press Z+(Y+) key once, arm traverses(descends) directly to the set position. Press Z-(Y-) key once, arm traverses (descends) directly to the position 0.0.

Inching mode: Press down the act key,Z+,Z-,Y+,Y-. Arm moves respectively. When release the key, arm stops.

2、ZTravPos: The set position of traversing.

3、YDownPos: The set position of descending.

4、ManuSpd: Speed for manual dircet mode.

5、DotSpd: Speed for jogging mode.

3.2.2 Keyboard

Master/slave arm select.

Arm rising action

Arm decending action

Arm going forward

Arm going backward

Clip on/off.

Vacuum sucks on/off .

Arm rotating in/out action.

Traversing in.

Traversing out.

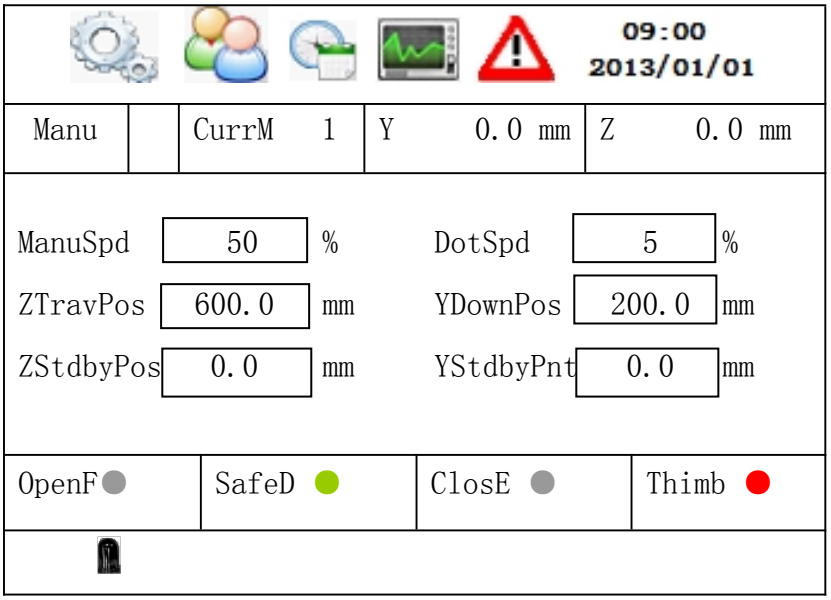
Finding the origin point

Spare select. SP1 /SP2 /Clipper /Trasport option.

Spare valve ON/OFF.

3.2.3 Manual Parameter

Press parameter key in MANUAL mode, show as follows.



1、ManuSpd: Set speed for manual direct mode.

2、ZTravPos: Set traversing position for manual mode.

3、DotSpd: Set speed for jog mode.

4、YDownPos: Set descending position for manual mode.

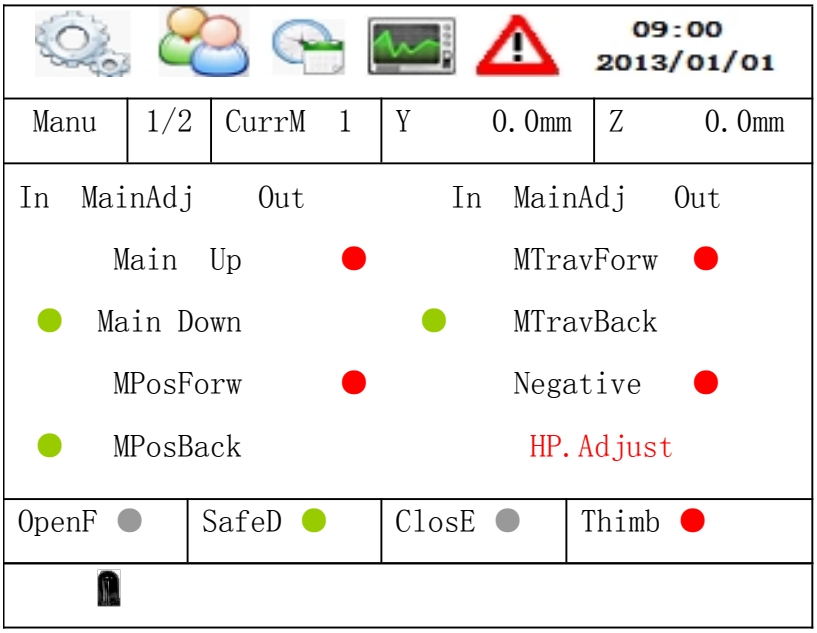
5、ZStdbyPos: Traversing start position in AUTO mode.

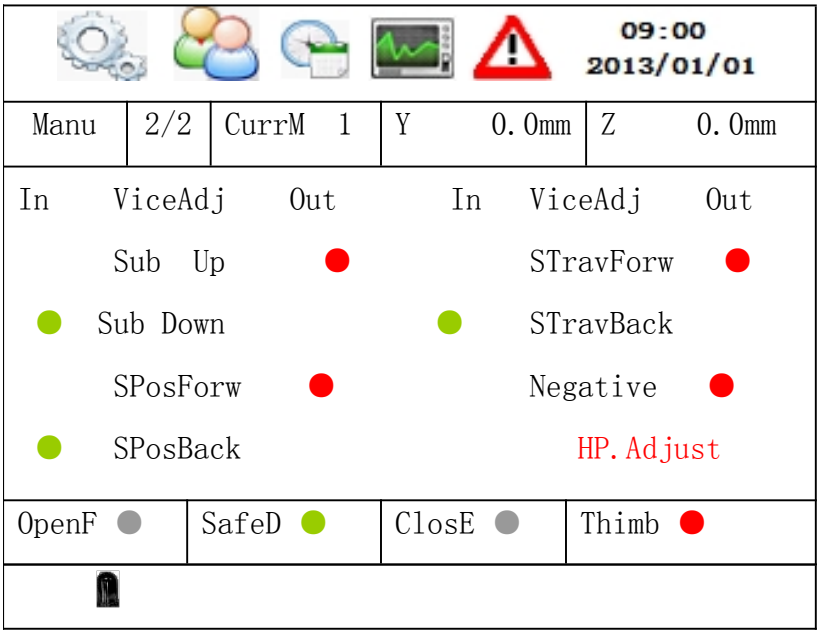
6、YStdbyPnt: Descending start position in AUTO mode.

3.2.4 Adjust mode

Press 

key twice, turn into ADJUST mode. In this mode, users can adjust the down-limit/forward-limit/backward-limit position of Main/Vice arm. Totally 7 output signal (6 actions and 1 direction) used to drive 12 relays.

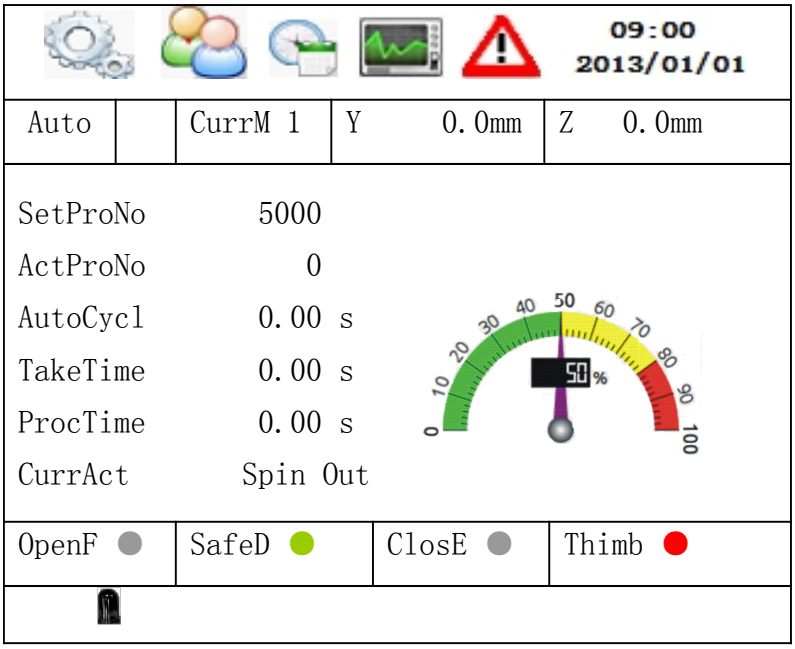




Moving cursur to the adjust position, press [HP.] key.

3.3 AUTO mode

Press [自动] key in STOP mode, system turn into Auto-prepare mode, then press "Start" key to turn into AUTO mode.



1、SetProNo: The product set value. Alarm when picker cycle reached the value.

2、ActProNo: Record current picker cycle number.

3、AutoCycl: Time used in current cycle.

4、TakeTime:Fetch time. Counting from IMM mold-opened to picker output MoldClose Enable.

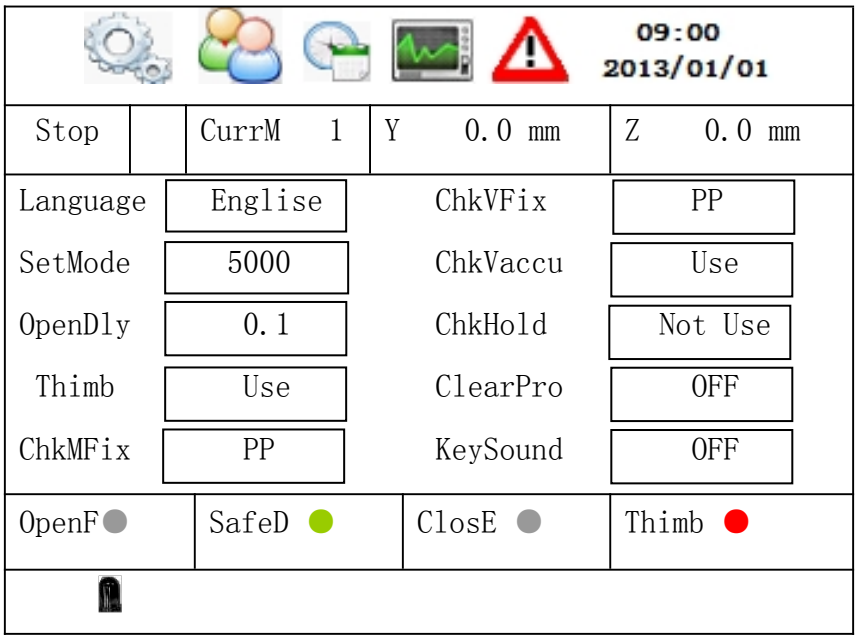
5、ProcTime: Run time for action.

6、CurrAct: Current action.

4. Function

4.1 Basic

Press 功能 FUNC Key in STOP mode, enter FUNC Mode, panel shows as follows.



1, Language: Chinese/English optional.

2, SetMold : Alarm when picker cycle reached this set product number.

3, OpenDly: Time for Mold-opened Delay. After received the Mold-opened signal, picker start waiting for this delay time, then shutdown Moldclose enable signal.

4. Thimb:

Not Use: Not not use Ejection function. Eject enable output is always ON.

Use: In auto cycle, shutdown Eject enable signal at Moldopened signal turn ON, after ejection delay time, output Eject enable signal.

5. ChkMFix (Check main fix) :

   PP: Must get a limit signal ON when clip successfully.

   RP: Must get a limit signal OFF when clip successfully.

   Not Use: Do not concren the limit signal when clip.

6. ChkVFix (Check vice fix) : Has same means as above.

7. ChkVaccu:

   Use: Must get a limit signal ON when suck successfully.

   Not Use: Do not concren the limit signal when suck.

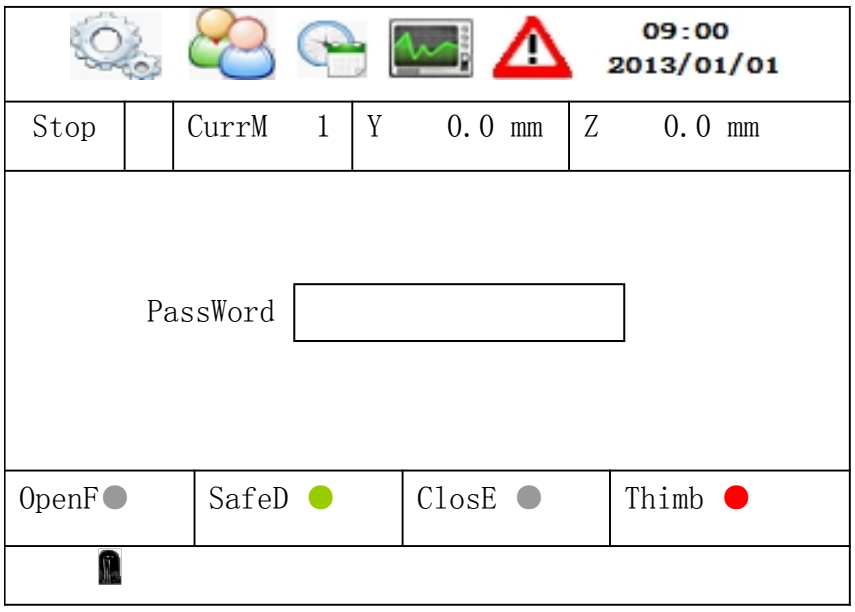
8. ChkHold: Has same means as above.

9. ClearPro: Clear current product count when set ON. It is OFF in normal operation.

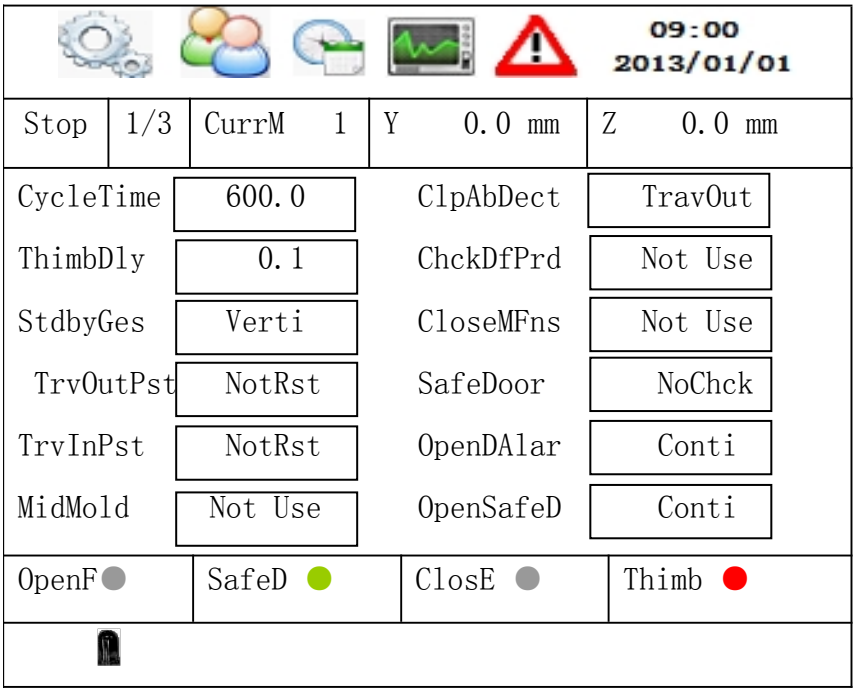
10. KeySound: When set ON, the controller beep when key down.

3.2 Special

Press 功能 FUNC key twice in STOP mode, enter password page.



Input "2011" ,then press 输入 key, enter special function pages. The following is spacial function 1 page.



1. CycleTime:

The maxium time set for picker cycle. Picker cycle time start count when Mold-opened signal ON. Then finish current cycle and wait for the next Mold-opened signal. If the waiting time is so long that picker cycle time exceed the maxium, alarm runs.

2. Thimb:

Time for Ejection Delay. After this delay, output Ejection enable signal.

3. StdbyGes

Define the fixture pose of first step in AUTO cycle.

Verti: Stay vertival before Mold-opened signal.

Hori: Stay horizontal before Mold-opened signal.

4. TraverOutPst

Define the fixture pose in traversing out.

NotRst: Each pose is allowed when traversing out.

Vert: Stay vertival when traversing out.

Hori: Stay horizontal when traversing out.

5. TraverInPst

Define the fixture pose in traversing in.

NotRst: Each pose is allowed when traversing in.

Vert: Stay vertival when traversing in.

Hori: Stay horizontal when traversing in.

6. MidMold

Not Use: Ignore the signal.

Use: Check Mid-Mold signal before arms descend.

7. ClpAbDect

TravOut: Always check the signal before outside descending.
InMold: Only check the signal in the injection mold machine.
FullRun: Check always.

8. ChckDfPrd

Not Use: Ignore the signal.

Use: Run mold recipe 44 when checked reject signal.

9. CloseMFns

Not Use: Ignore the signal.

Use: In auto cycle, the moldclosed signal must set before moldopened signal. This may happened when Moldclose failure.

10. SafeDoor

FullChck: Alarm when safety gate opened.

InMChck: Alarm of safety gate opened when arms in the injection mold machine.

NoChck: Do not check the signal

11、OpenDAlar

Stop: When alarm of safety gate opened in auto mode, the auto cycle stopped. Users operate manually and then Press "AUTO" key to restart the auto cycle.

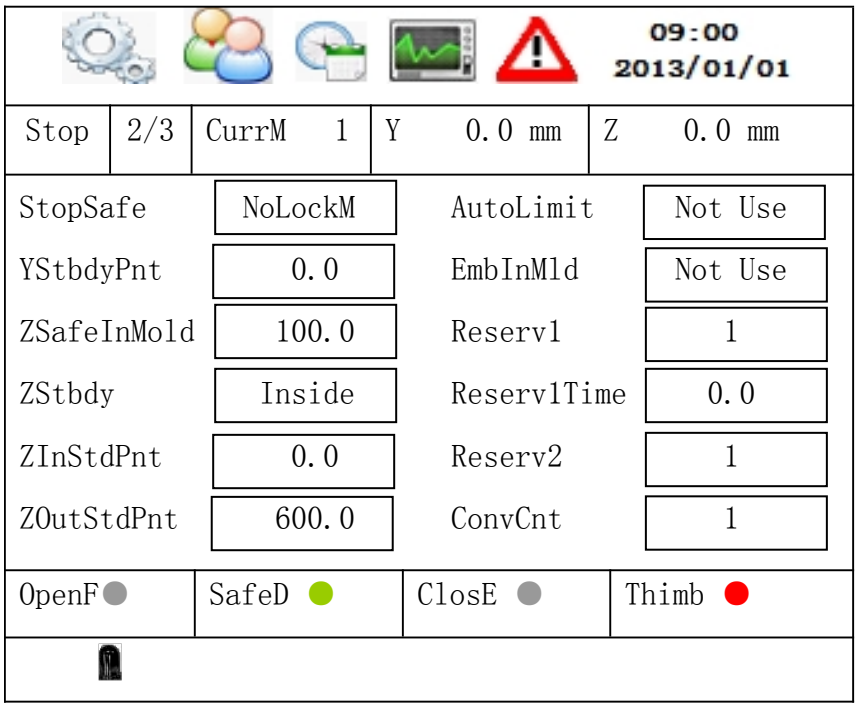
Conti: When alarm of safety gate opened in auto mode, close the safety gate will continue the auto cycle.

12、OpenSafeD

Conti: When clip/suck signal check failure in auto mode, Turn safety gate open and then close will continue the auto cycle.

Rest: When clip/suck signal check failure in auto mode, Turn safety gate open and then close will reset the arm. It will throw the got and run to the standby position.

The following is next page.



13、StopSafe

Disable: Mold close enable signal is off when turn to stop mode. Open safety gate and then close it, the signal turn on.

Enable: Mold close enable signal is always on in stop mode.

14. YStbdyPnt

When turn to auto mode, arm runs to the position waiting for Mold

opened signal.

15. ZSafeInMold

Arm can descend in the position less than the point. After arm goes down in the injection machine, it can traverse in the range from 0 to this point.

16. ZStdby

Inner: Arm stays above the injection machine, waiting for mold opened signal. It descends directly after mold opened.

Outer: Arm stays ouside the injection machine. When received the mold opened signal, it trverses to inside, then descends. It is used when there has not enough room above mold machine.

17. ZInStdPnt:

The position when Z standby point select inner. Arms run to the position after starting auto mode.

18. ZOutStdPnt

The position when Z standby point select outer. Arms run to the position after starting auto mode.

19. AutoLimit

Not use: Ignore the signal.

Use: Check the signal in auto mode.

20. EmbInMld

Not use: Picker product from the injection mold machine.

Use: Can teach a program to insert widget to the injection mold.

21. Reserv1

Used in auto mode, after the interval setting cycles Spare 1 action once.

22. Reserv1Time

Used in auto mode, Spare 1 turn on for such delay time. Then tuen off.

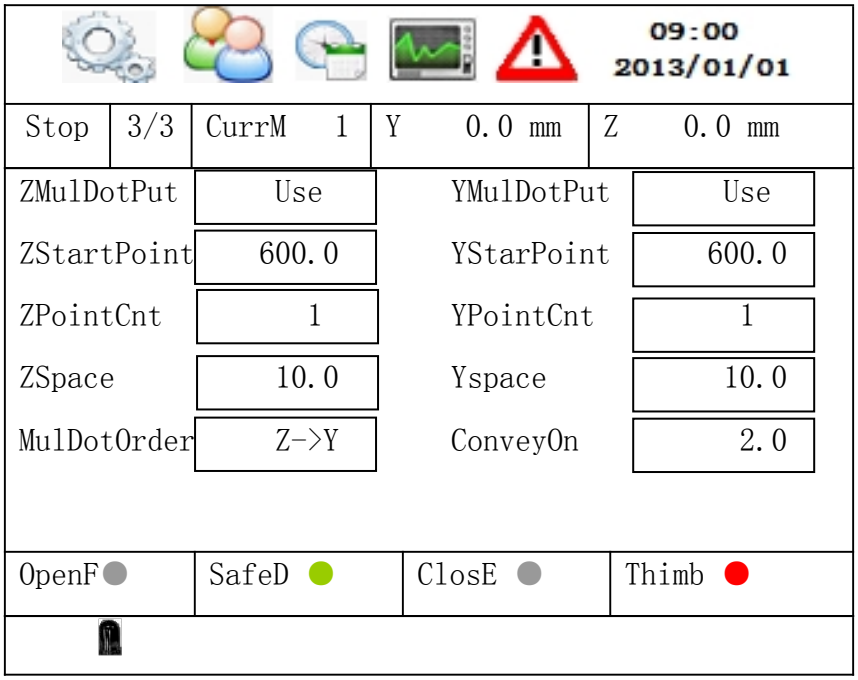
23. Reserv2

Used in auto mode, after the interval setting cycles Spare 2 action once.

24. ConvCnt

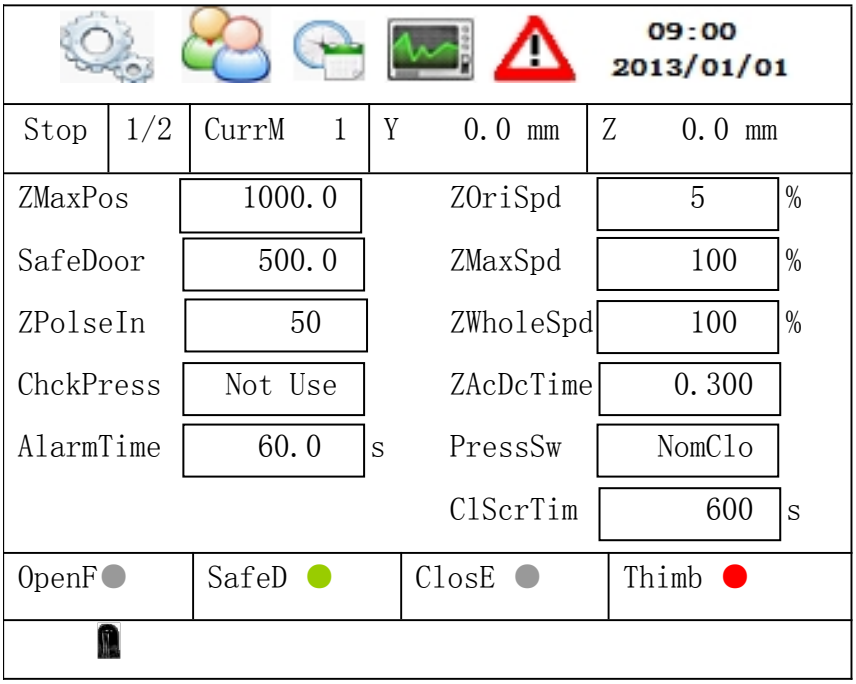
Used in auto mode, after the interval setting cycles Transport action once.

The following is next page.



25. ZMulDotPut: lay multi points in Z direction.
26. ZStartPoint : The first layout point.
27. ZPointCnt : Number of layout. Value from 0 to 99.
    The value should be 1 when stack function not use.
28. ZSpace: The gap bwteen two adjacent points.
29. MulDotOrder:
    Z->Y: Y stay position when Z stack a line. Then Y raises a gap distance and Z stack another line.
    Y->Z: Lay a vertical line at Z fixed position, then Z increase to another fixed position waiting Y stack a new vertical line.
30. YMulDotPut: lay multi points in Y direction.
31. YStarPoint: The first layout point.
32. YPointCnt: Number of layout. Value from 0 to 99.
    The value should be 1 when stack function not use.
33. Yspace: The gap bwteen two adjacent points.

Input password "****" ,then press 输入 key, enter special function pages. The following is spacial function 2 page.



1. ZMaxPos

The maxium position arms can reach. All data set in MANUAL/AUTO mode can not exceed the maxium, otherwise alarm.

2. SafeDoor

The Z position of safety gate, picker must put down product in the outside area..

3. ZPolseIn

Define the length unit, so that distance displayed is as same as the real distance.

e.g. servo motor need 10000 pulses to turn a cycle. And it move a 5mm distance.

PulseIn/PulseOut = 10000 / (5*10) = 250

PulseIn=250, PulseOut=1

4. ZOriSpd

Define the speed when finding the machincal 0-point. Too fast speed will cause a poor accuracy.

5. ZAcDcTime

Define the acceleration/ deceleration time.

6. ZMaxSpd

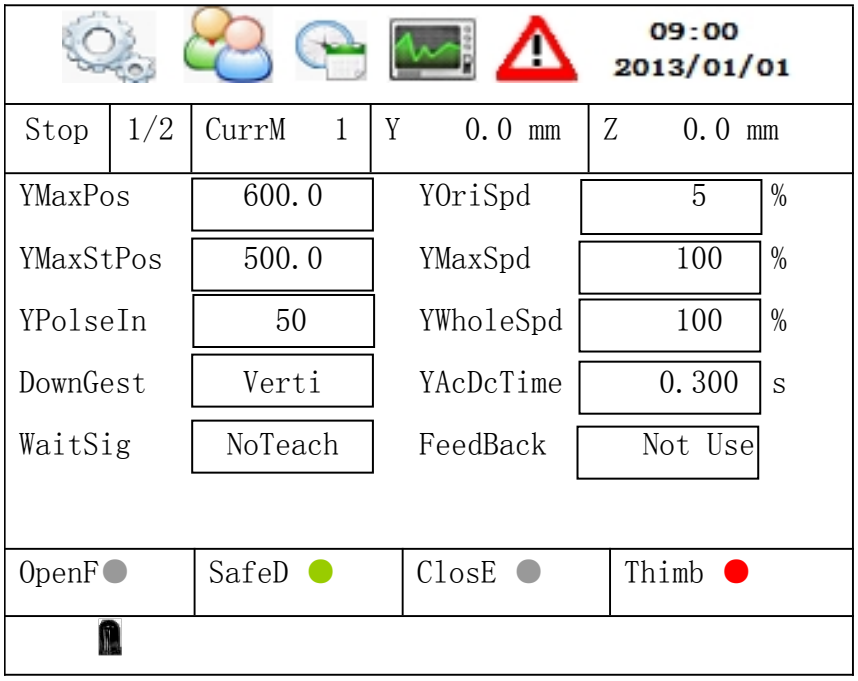
Unit is %.

100% speed = 500K pulse per secons.

7. ZWholeSpd
   Unit is %.
   If traversing speed is 50, and WholeSpeed is 80%, The action speed will be 50%*80%=40%.
8. ChckPress
   Not Use: Ignore the signal.
   Use: Alarm when pressure signal disable.
9. PressSw
   NomOpen: Pressure signal enable when input signal is ON.
   NomClo: Pressure signal enable when input signal is OFF.
10. AlarmTime
    Define the beep time for each alarm.
11. ClScrTim
    Define time for LCD backlight trun off. When key pressed, the timer reset.

Notes:
a. Incorrect descending pose inside IMM may caude mold damage. Users should be cautious to modify this function.
b. **The bold and italic list above is for picker manufacture. Users need not to modify these parameters.**

The following is next page.



12. YMaxPos

The maxium position arms can reach. All data set in MANUAL/AUTO mode can not exceed the maxium, otherwise alarm.

13. YMaxStPos

Define the maximum Y position that waiting for mold opened signal. The set Y-standby position must less than this value.

14. YPolseIn

Define the length unit, so that distance displayed is as same as the real distance.

e.g. servo motor need 10000 pulses to turn a cycle. And it move a 5mm distance.

PulseIn/PulseOut = 10000 / (5*10) = 250

PulseIn=250, PulseOut=1

15. YOriSpd

Define the speed when finding the machincal 0-point. Too fast speed will cause a poor accuracy.

16. YAcDcTime

Define the acceleration/ deceleration time.

17. YMaxSpd

Unit is %.

100% speed = 500K pulse per secons.

18. YWholeSpd

Unit is %.

If traversing speed is 50, and WholeSpeed is 80%, The action speed will be 50%*80%=40%.

19. DownGest

Vert. Ficture must be vertical when arms descending into the injection mold area.

Hori. Ficture must be horozontal.

20. FeedBack

System send Pulse/Sign signal to servo. Servo send feedback signal A/B/Z to system to confirm its moving. The feedback position displayed in product count in auto mode.

21. WaitSig

NoTeach:As default, system will wait for the mold opened signal when auto mode starts. And mold close enable signal turn on after arm sucked product and rised to Y top.

Teach: When in embeding widget application, arms will fetch a widget outside injection mold machine area, then wait for mold opened signal to bury it inside. That is, users can teach "Wainting for mold opened signal

" in the program, and also, user must teach "Enable mold close signal" to proper place.

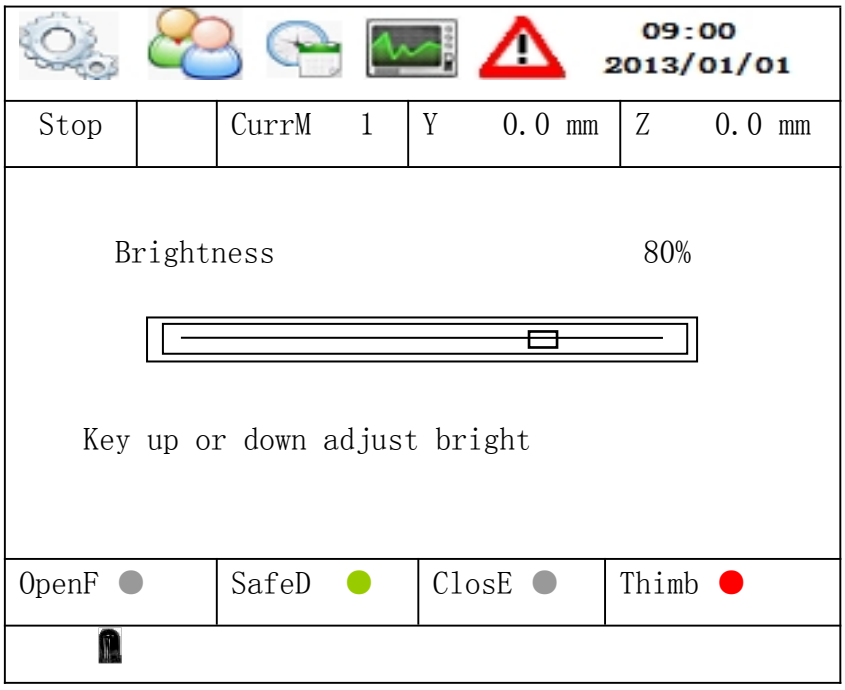
Notes:

c. Incorrect descending pose inside IMM may caude mold damage. Users should be cautious to modify this function.

d. The bold and italic list above is for picker manufacture. Users need not to modify these parameters.

4.3 Brightness

In stop page, Press 功能 FUNC key three times to enter brightness adjust page.

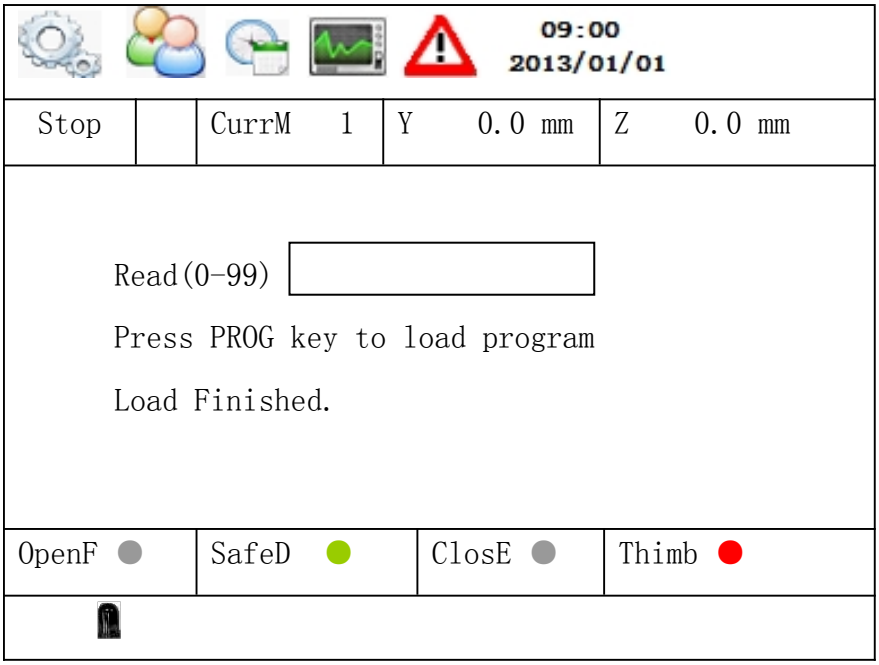


Use Up/Down arrow key to adjust brightness.

5 Program

5.1 Load a recipe

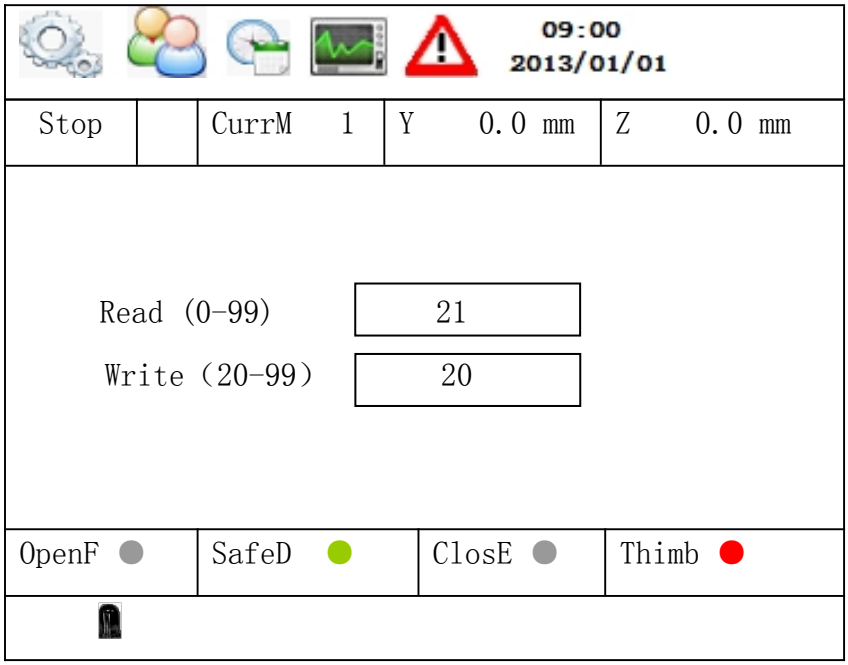
Press 程序 PROG key in STOP page, enter LOAD page.



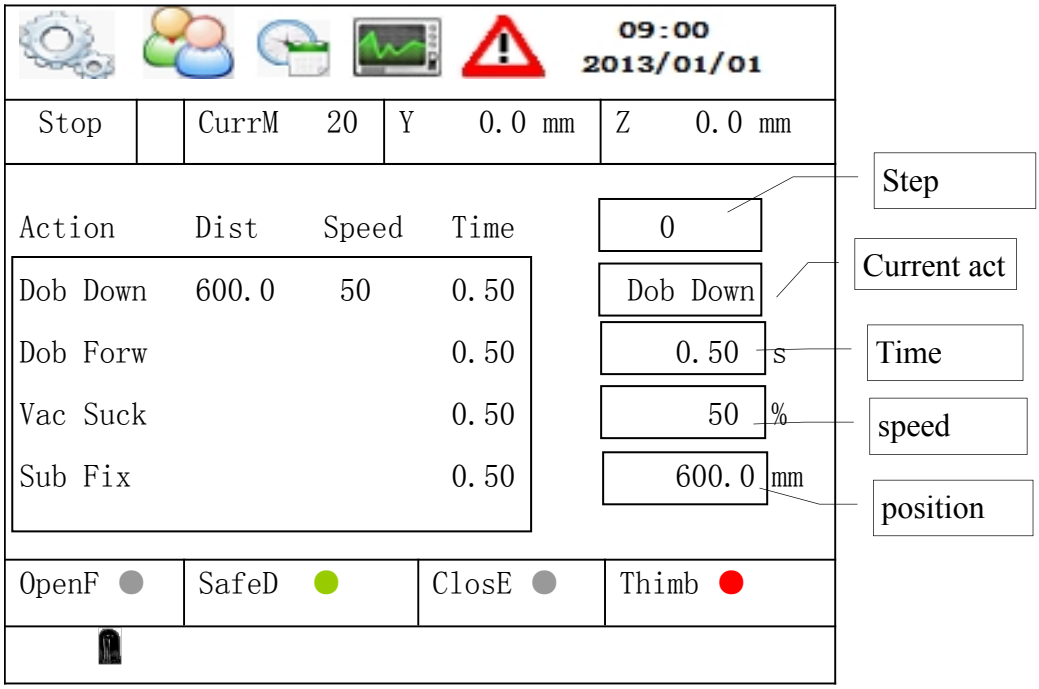
Iuput a mold number 21(0-99), then press 输入 key to load the program. The program runs in AUTO mode.

5.2 Teach

Press 程序 PROG key again in MOLD page, enter MOLD page. Users can read current mold to make a new one. Mold No. 0~19 is reserved for standard mold program.



To teach the program, press 输入 key.



Press 

key step by step, picker will do the action list one by one. To teach a new action, using manual key to do this action, then press 

key to confirm the change.

Insert a new line.

Delete currnt line.

5.3 Edit

In STOP mode, press "Parameter" key to enter program edit page, which is similar to above page. Users can modify delay time, traverse position, traverse speed, but can not change the action sequency.

5.4 Standard programs

Program1: Main L route suck forward side

Main arm descends -> Main arm goes forward -> Suck On -> Main arm goes backward -> Main arm rises -> Pose Horizontal -> Traverse out -> Main arm descends -> Suck off -> Main arm rises -> Traverse in -> Pose vertical -> Main arm goes backward

Program2: Main L route suck backward side

Main arm goes forward -> Main arm descends -> Main arm goes backward -> Suck On -> Main arm goes forward -> Main arm rises -> Pose Horizontal -> Traverse out -> Main arm descends -> Suck off -> Main arm rises -> Traverse in -> Pose vertical -> Main arm goes backward

Program3: Main U route suck forward side

Main arm goes forward -> Main arm descends -> Suck On -> Main arm goes backward -> Main arm rises -> Main arm goes forward -> Pose Horizontal -> Traverse out -> Main arm descends -> Suck off -> Main arm rises -> Traverse in -> Pose vertical -> Main arm goes backward

Program4: Main U route suck backward side

Main arm descends -> Suck On -> Main arm goes forward -> Main arm rises -> Pose Horizontal -> Traverse out -> Main arm descends -> Suck off -> Main arm rises -> Traverse in -> Pose vertical -> Main arm goes backward

Program5: Vice L route clip backward side

Vice arm goes forward -> Vice arm descends -> Vice arm goes backward -> Vice arm clips on -> Vice arm goes forward -> Vice arm rises -> Traverse out -> Vice arm clips off -> Traverse in -> Vice arm goes backward

Program6: Vice L route clip forward side

Vice arm descends -> Vice arm goes forward -> Vice arm clips on -> Vice arm goes backward -> Vice arm rises -> Traverse out -> Vice arm clips off -> Traverse in -> Vice arm goes backward

Program7: Vice U route clip backward side

Vice arm descends -> Vice arm clips on -> Vice arm goes forward -> Vice arm rises -> Traverse out -> Vice arm clips off -> Traverse in -> Vice arm goes backward

Program8: Vice U route clip forward side

Vice arm goes forward -> Vice arm descends -> Vice arm clips on -> Vice arm goes backward -> Vice arm rises -> Vice arm goes forward -> Traverse out -> Vice arm clips off -> Traverse in -> Vice arm goes backward

Program9: Vice L route clip backward side, release inside

Vice arm goes forward -> Vice arm descends -> Vice arm goes backward -> Vice arm clips on -> Vice arm goes forward -> Vice arm clips off -> Vice arm rises -> Vice arm goes backward

Program10: Vice L route clip forward side, release inside

Vice arm descends -> Vice arm goes forward -> Vice arm clips on -> Vice arm goes backward -> Vice arm clips off -> Vice arm rises

Program11: Vice U route clip forward side, release inside

Vice arm goes forward -> Vice arm descends -> Vice arm clips on -> Vice arm goes backward -> Vice arm clips off -> Vice arm rises

Program12: Vice U route clip backward side, release inside

Vice arm descends -> Vice arm clips on -> Vice arm goes forward -> Vice arm clips off -> Vice arm rises -> Vice arm goes backward

Program13: Both L route

Both arms descend -> Both arms go forward -> Suck On -> Vice arm clips on -> Both arms go backward -> Both arms rise -> Both arms go forward -> Pose Horizontal -> Traverse out -> Vice arm clips off -> Traverse out -> Main arm descends -> Suck off -> Main arm rises -> Traverse in -> Pose vertical

-> Both arms go backward

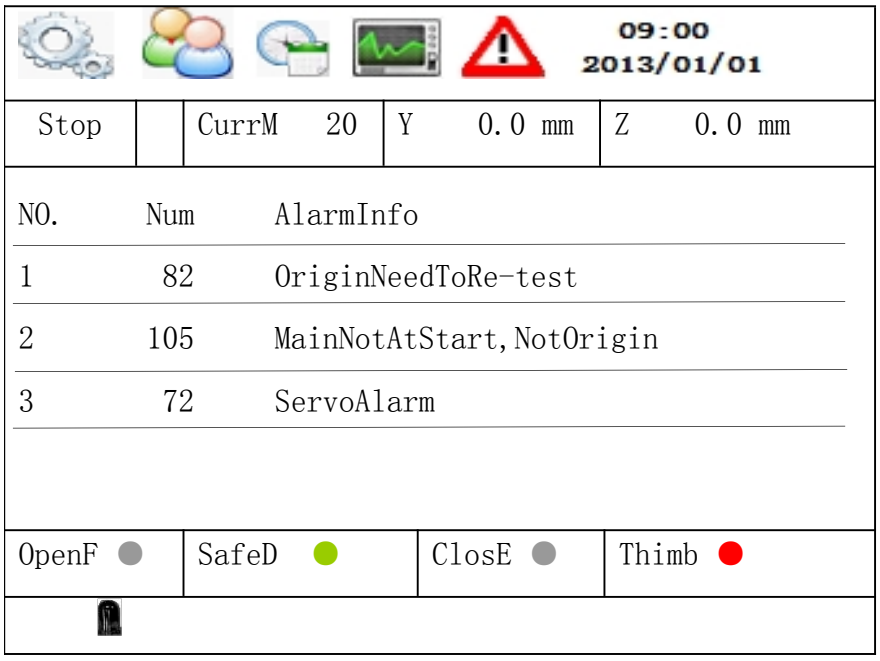
Program14: Both U route

Both arms go forward -> Both arms descend -> Suck On -> Vice arm clips on -> Both arms go backward -> Both arms rise -> Both arms go forward -> Pose Horizontal -> Traverse out -> Vice arm clips off -> Traverse out -> Main arm descends -> Suck off -> Main arm rises -> Traverse in -> Pose vertical -> Both arms go backward

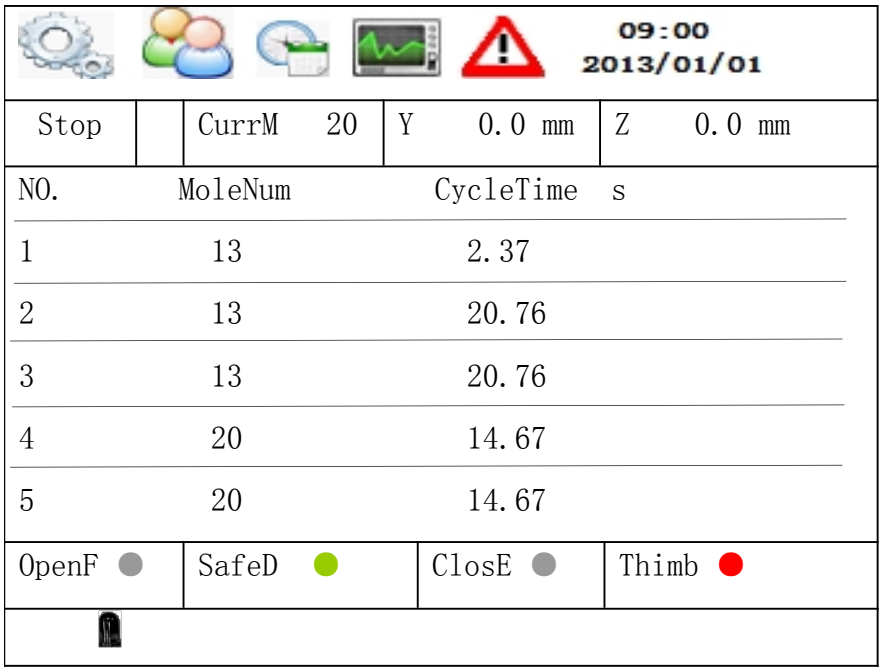
6 Run status

6.1 Alarm record

In STOP mode, press 信息 IFOR key, enter the alarm record page. The recent 50 alarm messages displayed.

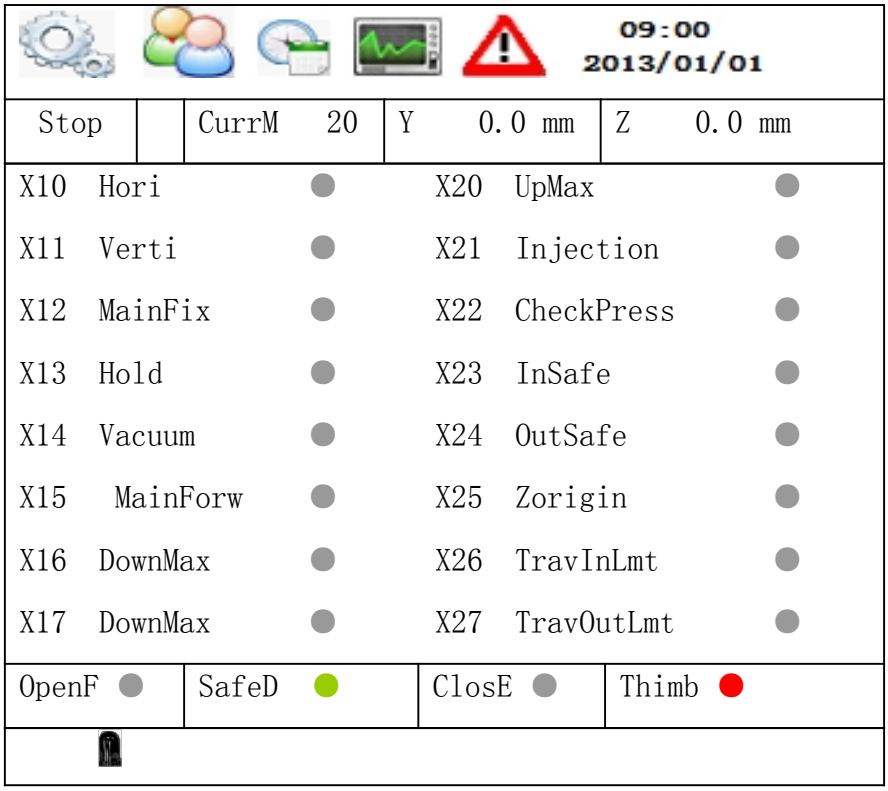


Press 信息 IFOR key again, enter the auto-cycle time page. In this page, 5 recent cycle time displayed.

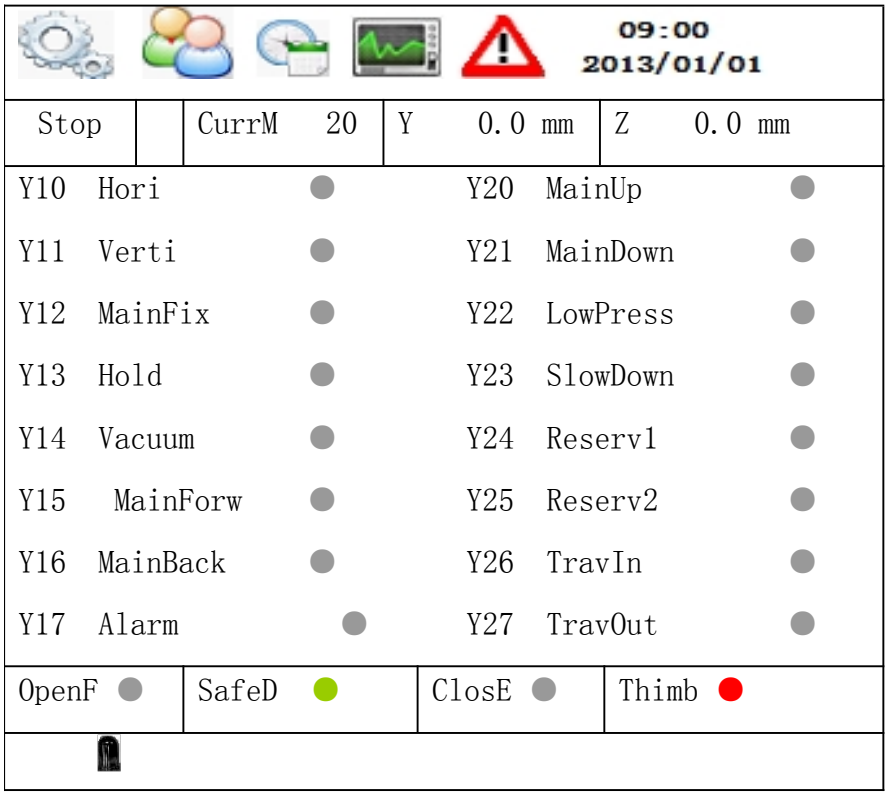


6.2 Input/Output signal

Press 监视 WATCH key, enter the input signal monitor page. Use up/down key to display all signals.



Press 监视 WATCH key again, enter the output signal monitor page.

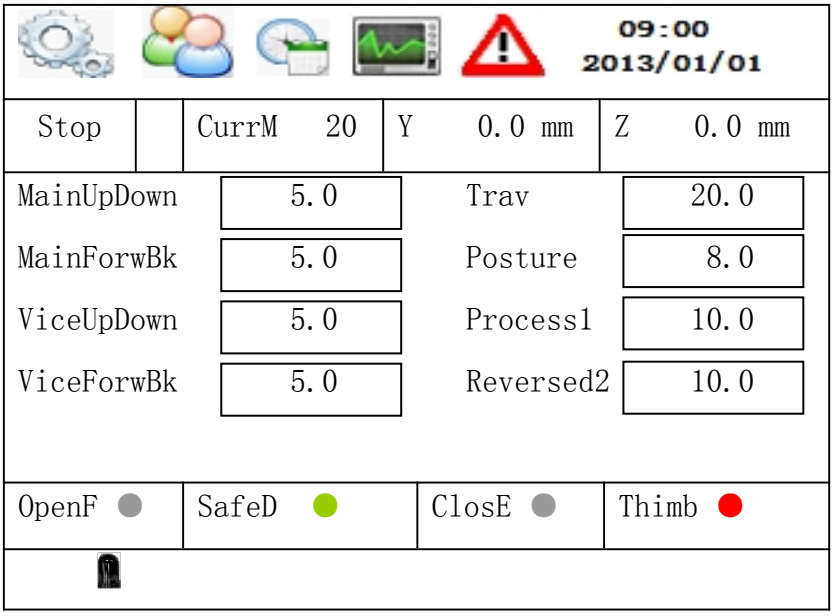


7 Machine Settings

Parameters in this chapter is related to machine definition. Manufacturers use these parameters but users must not modify them.

7.1 Time limit

Press 功能 FUNC key twice in STOP page, then input password "****", enter the time limit page.

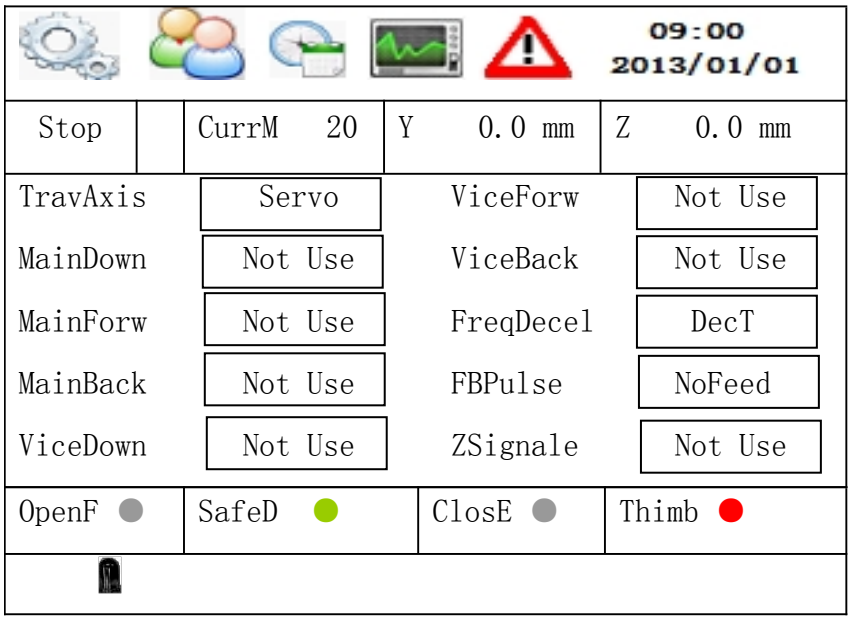


1. MainUpDown
   Time limit for main arm rising/descending. If actions can not finish in limit time, alarm occurs.
2. MainForwBk
   Time limit for main arm going forward/backward.
3. ViceUpDown
   Time limit for vice arm riseing/descending.
4. ViceForwBk
   Time limit for vice arm going forward/backward.

5. Trav
   Time limit for traversing in/out.
6. Posture
   Time limit for fixture pose turning.
7. Process1
   Time limit for process1 action.
8. Reversed2
   Time limit for reserved2 action.

7.2 Structure

Press 功能 FUNC key twice in STOP page, then input password "****", enter the machine structure page.



1. Trav Axis
   Define the traverse axis style: servo/inverter/pnuematic.
2. MainDown
   Define the use of main arm down limit signal.
3. MainForw
   Define the use of main arm forward limit signal.

4. MainBack
   Define the use of main arm forward limit signal.
5. ViceDown
   Define the use of vice arm down limit signal.
6. ViceForw
   Define the use of vice arm forward limit signal.
7. ViceBack
   Define the use of vice arm backward limit signal.
8. FreqDecel
   Speed deceletaing style in invert/pnuematic control. Dec.T is decelerating by time. Dec.SW is by limit switches.
9. FBPulse
   Use or not use feedback function.

8 Alarms

Press "STOP" key to clear alarm.

Alarm info.	reason	How to do
1. Mold Opened signal OFF.	No mold opened signal.	1. Injection mold machine (IMM) mold not open or signal off. 3. Wire connection.
2. Mid-mold confirm signal OFF	No middle mold opened signal.	1. IMM plate mold not opened or signal off. 2. Wire connection.
3. Main arm rise limit OFF	No Main Arm up-limit signal.	1. Low pressure. 2. Up-limit signal off. 3. Wire connection.
4. Vice arm rise limit OFF	No Vice Arm up-limit signal.	1. Low pressure. 2. Up-limit signal off. 3. Wire connection.
5. Main arm clamp limit ON	Main arm clamp signal on.	1. Signal is on. 2. ChkM.Fix select. PP/RP 3. Wire connection.
6. Vice arm clamp limit ON	Vice arm clamp signal on.	1. Signal is on. 2. ChkV.Fix select. PP/RP 3. Wire connection.
7. Suck On limit ON	Suck On limit signal on.	1. Signal is on. 2. Check suck valve status. 3. Wire connection.
8. Embrace limit ON	Embrace limit signal on	1. Signal is on. 2. Check embrace valve status. 3. Wire connection.
9. Staying outside	Z standby position is not inside safety gate area.	1. Check traversing in movement.
10. Staying inside	Z standby position is not outside safety gate area.	1. Check traversing out movement.

11. Pose vertical limit OFF	No pose vertical limit signal.	1. Low pressure. 2. Signal off. 3. Wire connection.
12. Pose vertical limit OFF	No pose horizontal limit signal.	1. Low pressure. 2. Signal off. 3. Wire connection.
13. When arms descend, Mold Opened signal OFF	Mold Opened signal OFF when arms descending in IMM..	1. Moldopened signal off. 2. Wire connection. 3. arms up limit off while Z-outside area signal off.
14. When arms descend, Mid-mold confirm signal OFF	Mid-Mold Opened signal OFF when arms descending in IMM.	1. Mid-mold signal off. 2. Wire connection. 3. arms up limit off while Z-outside area signal off.
15. Safety door signal OFF	No safety gate input signal.	1. Signal off. 2. Wire connection.
16. Mold Opened signal ON, Mid-mold confirm signal OFF	Arms start descending after mold opened signal turn on, but mid-mold signal off.	1. Signal off. 2. Wire connection.
17. Main arm rise limit ON, Main arm descend limit ON	Main arm both Up/down limit signal on.	1. Check signal. 2. Wire connection.
18. Main arm go forward limit ON, Main arm go backward limit ON	Main arm both forward/backward limit signal on.	1. Check signal. 2. Wire connection.
19. Vice arm rise limit ON, Vice arm descend limit ON	Vice arm both Up/down limit signal on.	1. Check signal. 2. Wire connection.

20. Vice arm go forward limit ON, Vice arm go backward limit ON	Vice arm both forward/backward limit signal on.	1. Check signal. 2. Wire connection.
21. Traverse out limit ON, Traverse in limit ON	Both Traversing in/out limit ON	1. Check signal. 2. Wire connection.
22. Pose Horizontal limit ON, Pose vertical limit ON	Both pose vertical/horizontal limit ON	1. Check signal. 2. Wire connection.
23. Before arms descend, Mold Opened signal OFF	Mold opened signal must be on when arms descending in IMM.	1. Check signal. 2. Wire connection. 3. If alarm outside IMM, Z-outside area signal off.
24. Before arms descend, Mid-mold confirm signal OFF	Mid-mold signal must be on when arms descending in IMM.	1. Check signal. 2. Wire connection. 3. If alarm outside IMM, Z-outside area signal off.
25.Before arms descend, Safety gate signal OFF	Safety gate signal must be on when arms descending in IMM.	1. Check signal. 2. Wire connection. 3. If alarm outside IMM, Z-outside area signal off.
26. Before arms descend, Pose vertical limit OFF	As selected, Pose must be vertical when arms descending in IMM.	1. Check signal. 2. If alarm outside IMM, Z-outside area signal off.
27. Before arms descend, Pose Horizontal limit OFF	As selected, Pose must be horizontal when arms descending in IMM.	1. Check signal. 2. If alarm outside IMM, Z-outside area signal off.
28. Before arms descend, Main arm clamp limit ON	Not in bury program, main clamp should be off before arms descending in IMM.	1. Check signal. 2. Check valve action.

29. Before arms descend, Vice arm clamp limit ON	Not in bury program, vice clamp should be off before arms descending in IMM.	1. Check signal. 2. Check valve action.
30. Before arms descend, Suck On limit ON	Not in bury program, sucker should be off before arms descending in IMM.	1. Check signal. 2. Check valve action.
31. Before arms descend, Embrace limit ON	Not in bury program, Embrace should be off before arms descending in IMM.	1. Check signal. 2. Check valve action. 3. Wire connection.
32. Before traversing, Main arm descend Valve ON.	Main arm descend valve on before traversing.	1. Check the valve.
33. Before traversing, Vice arm descend Valve ON	Vice arm descend valve on before traversing.	1. Check the valve.
34. Before traversing, Main arm rise limit OFF	Main arm up limit signal must be on before traversing cross safety gate.	1. Check signal. 2. Check valve action.
35. Before traversing, Vice arm rise limit OFF	Vice arm up limit signal must be on before traversing cross safety gate.	1. Check signal. 2. Check valve action.
36. Before pose changing, Main arm descend Valve ON	Pose can not change inside IMM area.	1. Check the command.
37. Before pose changing, Vice arm descend Valve ON	Pose can not change when vice arm descending.	1. Check the command.

38. Main arm descend Valve ON, Main arm rise limit ON	After main arm descending action, up-limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
39. Main arm descend Valve ON, Main arm descend limit OFF	After main arm descending action, down-limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
40. Main arm descend Valve OFF, Main arm rise limit OFF	After main arm rising action, up-limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
41. Main arm descend Valve OFF, Main arm descend limit ON	After main arm rising action, down-limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
42. Vice arm descend Valve ON, Vice arm rise limit ON	After vice arm descending action, up-limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
43. Vice arm descend Valve ON, Vice arm descend limit OFF	After vice arm descending action, down-limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
44. Vice arm descend Valve OFF, Vice arm rise limit OFF	After main arm rising action, up-limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.

45. Vice arm descend Valve OFF, Vice arm descend limit ON	After vice arm rising action, down-limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
46. Main arm go forward Valve ON, Main arm go forward limit OFF	After main arm go forward, forward limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
47. Main arm go forward Valve ON, Main arm go backward limit ON	After main arm go forward, backward limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
48. Main arm go forward Valve OFF, Main arm go forward limit ON	After main arm go backward, forward limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
49. Main arm go forward Valve OFF, Main arm go backward limit OFF	After main arm go backward, backward limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
50. Vice arm go forward Valve ON, Vice arm go forward limit OFF	After vice arm go forward, forward limit is still off.	1. Check signal. 2. Check the time limit. 3.Check the Valve.
51. Vice arm go forward Valve ON, Vice arm go backward limit ON	After vice arm go forward, backward limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
52. Vice arm go forward Valve OFF, Vice arm go forward limit ON	After vice arm go backward, forward limit is still on.	1. Check signal. 2. Check the time limit. 3. Check the Valve.

53. Vice arm go forward Valve OFF, Vice arm go backward limit OFF	After vice arm go backward, backward limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
54. Main arm clamp Valve ON , Main arm clamp limit OFF	After main arm clip on, confirm signal is off (clamp input signal is off when M.Fix select PP, or is on when RP).	1. Check air pressure. 2. Check signal. 3. Check the time limit. 4. Check M.fix function.
55. Main arm clamp Valve OFF , Main arm clamp limit ON	After main arm clip off, confirm signal is on (clamp input signal is on when M.Fix select PP, or is off when RP).	1. Check air pressure. 2. Check signal. 3. Check the time limit. 4. Check M.fix function.
56. Vice arm clamp Valve ON , Vice arm clamp limit OFF	After vice arm clip on, confirm signal is off (clamp input signal is off when V.Fix select PP, or is on when RP).	1. Check air pressure. 2. Check signal. 3. Check the time limit. 4. Check V.fix function.
57. Vice arm clamp Valve OFF , Vice arm clamp limit ON	After vice arm clip off, confirm signal is on (clamp input signal is on when M.Fix select PP, or is off when RP).	1. Check air pressure. 2. Check signal. 3. Check the time limit. 4. Check V.fix function.
58. Suck Valve ON, Suck limit OFF	After suck on, confirm signal is off.	1. Check air pressure. 2. Check signal. 3. Check the time limit.
59. Suck Valve OFF, Suck limit ON	After suck off, confirm signal is on.	1. Check air pressure. 2. Check signal. 3. Check the time limit.
60. Embrace Valve ON, Embrace limit OFF	After embrace on, confirm signal is off.	1. Check air pressure. 2. Check signal. 3. Check the time limit.

61. Embrace Valve OFF, Embrace limit ON	After embrace off, confirm signal is on.	1. Check air pressure. 2. Check signal. 3. Check the time limit.
62. Pose Horizontal Valve ON, Pose Horizontal limit OFF	After pose horizontal, confirm limit signal is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
63. Pose vertical Valve ON, Pose vertical limit OFF	After pose vertical, confirm limit signal is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
64. Traverse out timeout	Traverse out limit signal off while time run out.	1. Check traverse action. 2. Check the time limit.
65. Traverse in timeout	Traverse in limit signal off while time run out.	1. Check traverse action. 2. Check the time limit.
66. Emergency stop	Emergency stop.	1. Panel Emergency button. 2. Control board wire connection.
67. Program is not integrity, operate can not perform.	Program actions need be matched.	1. After program cycle, must return to the start. 2. A clip/suck on action need a off action. 3. Travers in/out are couple. 4. Both arms up/down are couple.
68. Auto cycle has arrived the product quantity set	Products reached set number.	1. Incease aim product. 2. Do not count product.
69. Operate not according to the taught	In manual mode, arm move inside IMM must accord to the program.	1. Check the forward/backward place when up/down in IMM area.

70. Waiting mold open time out	Moldopened signal off while waiting time run out.	1. Check the signal. 2. Increase the set waiting time.
71. Z.Servo problem, no pulse input	Has not received pulse feedback.	1. Confirm servo is moving. 2. Check control board connection with servo.
72. Z.Servo Alarm	Z servo alarm	1. Check the servo error code. 2. Check control board connection with servo.
73. Safety gate position not set		1. Set it correctly.
74. Putting down point less than the Safety Door point	Putting down position less than safety gate position in Z direction.	1. Set it correctly.
75. Putting down point larger than the maximum	Putting down position larger than Z maximum.	1. Set it correctly.
76. Outside waiting point less than the start point		1. Set it correctly.
77. Outside waiting point larger than the maximum	Position larger than Z maximum.	1. Set it correctly.
78. largest cycling putting down point larger than the maximum	For stack lay out. The start position + stack gap * stack number > maximum.	1. Set it correctly.
79. Traverse out end-limit error	Traverse out limit signal must be on when Traversing out.	1. Check the signal.

80. Traverse in end-limit error	Traverse in limit signal must be on when Traversing in.	1. Check the signal.
81. Machine does not stay at waiting point, please go to origin manually	System need some signal to confirm position after power on. (used in HZ system.)	1. Press traverse in manually.
82. Machine does not stay at waiting point, please Traverse to waiting point	Sometimes system can not confirm current position when servo alarm.	1. Run origin again.
83. Before Traverse in /out, please change its pose	If user select horizontal restrict, but press Z+/Z- when pose vertically.	1. Check the signal 2. Check the pose.
84. Can not descend.	(used in HZ system.)	
85. Low air pressure.		1. Check the pressure signal polarity.
86. InDownSafePtLowThanOri	Inside down safe position is lower than start position.	1. Reset inside down safe position, make sure it's lager than start position
87. InDownSafePtHighThanOri	Inside down safe postion is higher than start postion.	1. Reset inside down safe position, make sure it's smaller than start position
88. Can not descend in unsafe area.	Descending inside IMM, Z. position must less than the insafe position.	
89. TravPosLowerThanOrigin	Traver position is lower than start position.	1. Reset traver position, make sure it's smaller than start position
90. Traversing out position exceed the Z. maximum.		

91. Can not descend in outside unsafe area.	Arms need outside safe signal when descending outside.	1. Cehck the signal.
92. Can not descend in inside unsafe area.	Arms need inside safe signal when descending inside.	1. Cehck the signal.
93 Trial version limit		
94. Before Traverse out, pose need horizontal.	When travering, pose is not same as function defined(horizontal).	
95. Before Traverseut, pose need horizontal.	When travering, pose is not same as function defined(vertical).	
96 Before Traverse in, pose need vertical.	When travering, pose is not same as function defined(horizontal).	
97. Before Traverseut, pose need horizontal.	When travering, pose is not same as function defined(vertical).	
98 spare 1 on, while limit off.	After spare 1 on action, confirm limit off.	1. Check the signal. 2. Check the time limit.
99. spare 1 off, while limit on.	After spare 1 off action, confirm limit off.	1. Check the signal. 2. Check the time limit.
100. spare 2 on, while limit off.	After spare 2 on action, confirm limit off.	1. Check the signal. 2. Check the time limit.
101. spare 2 off, while limit on.	After spare 2 on action, confirm limit off.	1. Check the signal. 2. Check the time limit.

102 standby horizontally, can not vertical without mold opened signal.	Need mold opened signal to pose vertically.	
103 Outside safe limit off before pose changing.	Pose vert/hori, need outside safe area signal on.	
104 No auto signal.	Auto mode can not start without this signal.	
105. Y is not on standby position		1. Move Y up manually.
106.MainVPPole0n,MainDownPole0n	The up limit and down limit is both on.	1. Check the up limit and down limit if is exception 2. Check the I/O board link.
107. Y is not in starting position when traversing.	Y must mearly 0 position before traversing.	1. Check Y position value. 2. Check Y origin signal.
108. Y is not in starting position before pose changing.	Y must mearly 0 position before pose changing.	1. Check Y position value. 2. Check Y origin signal.
109. Y maximum not set.		
110. largest cycling putting down point larger than the Y.maximum	For stack lay out. The start position + stack gap * stack number > maximum.	
111. Y end limit error	End-limit signal must be on when descening.	1. Check the signal.
112. Y start limit error	start-limit signal must be on when rising.	1. Check the signal.

113. Y is not at starting point, rise manually	Y is not at starting point, rise manually to the starting position.	
114. Y descend exceed time limit		1. Check the speed. 2. Check the time limit.
115. Y rise exceed time limit		1 .Check the speed. 2. Check the time limit.
116.Descending position less than starting position		
117.Descending position larger than Y.maximum.		
118. Servo Y. alarm.		1. Check the servo error code. 2. Check control board connection with servo.