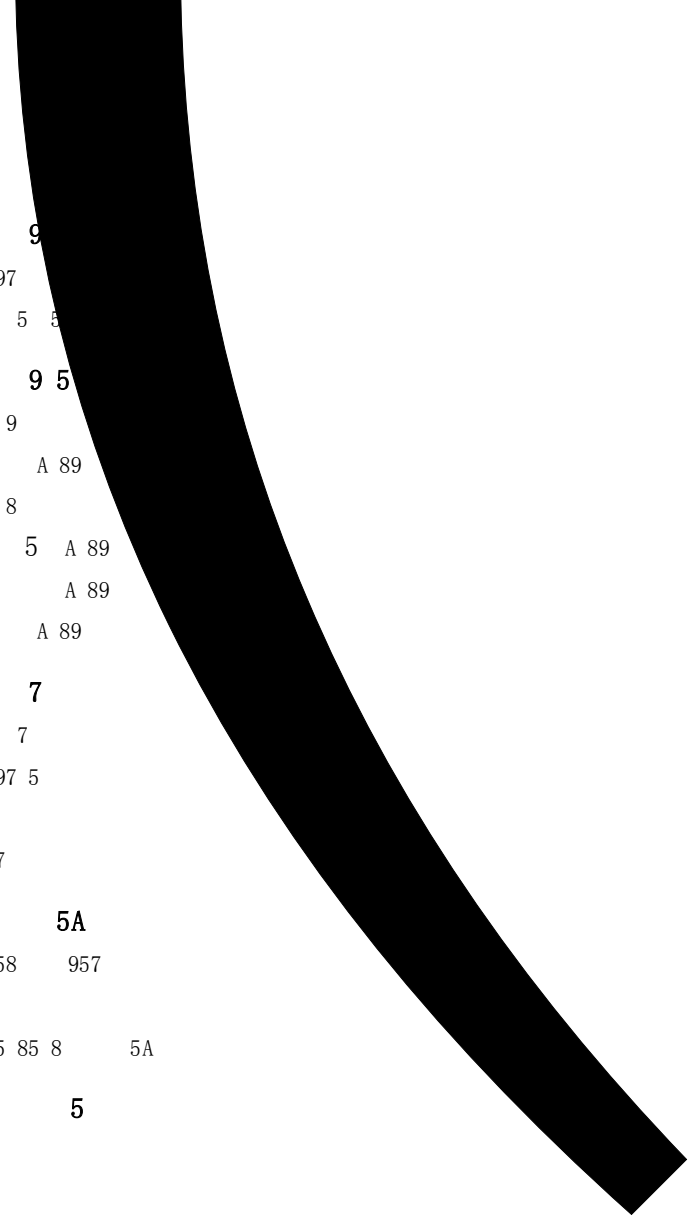

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CHAP.1 Specification

1.1 Specification

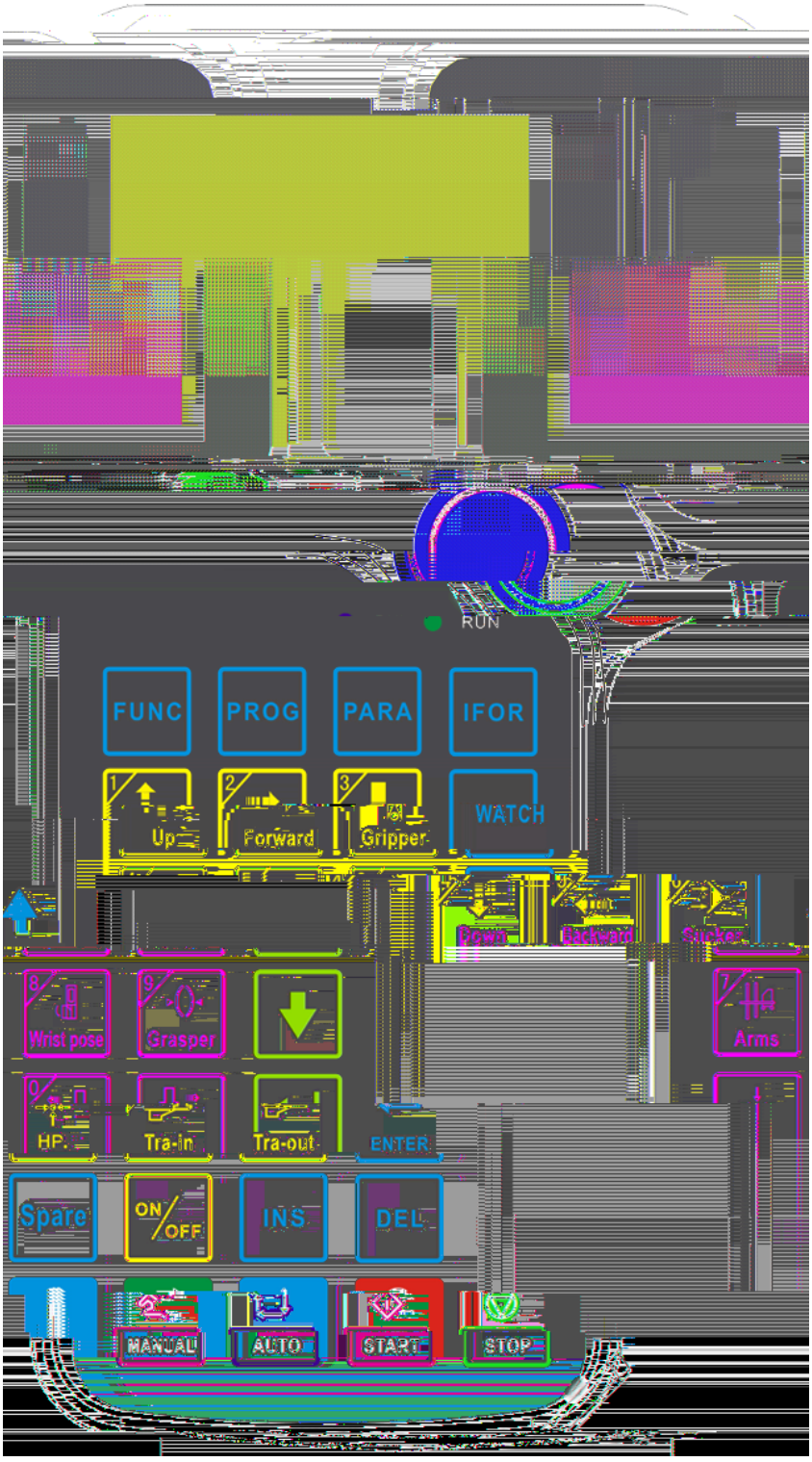
- a control Pad
- a Relay board
- a Power Supply
- a 37Pin Wire

1.2 Installation

-

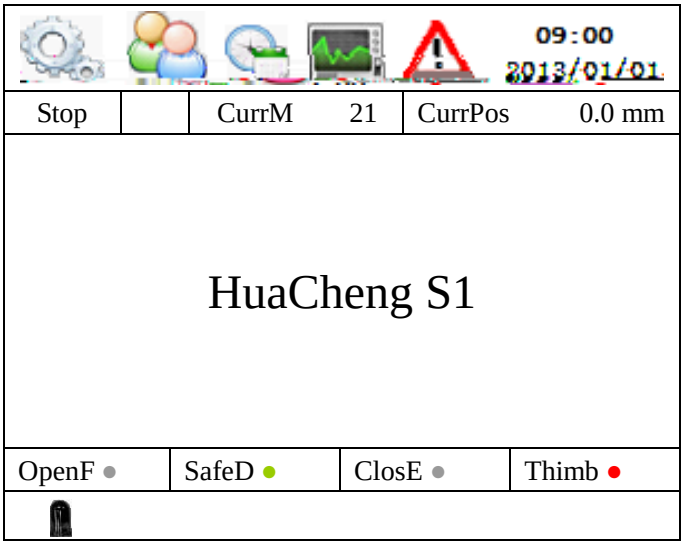
CHAP.2 Operation

2.1 Panel



2.2 STOP mode

At power on, system self-test then turn into STOP mode. Press "STOP" key in other mode will also enter STOP mode.



Signal is red or green when ON. Signal is gray when OFF.

2.3 Find 0-point

After power on, it is need to find mechanical 0-point.

To find this point, users should press

key in STOP mode.. Arms move from the Z-outsafe side to the Z-origin side.

After find the 0-point, users can turn to AUTO mode or MANUAL mode.

Arms can only move to a positive direction from this point. And it can not move to a position below this point when return. This point is defined as position 0.0mm.

Users can not change mode or edit parameters when finding the 0-point. Users can press emergency-stop button to break the process when error occurs.

2.4 MANUAL mode

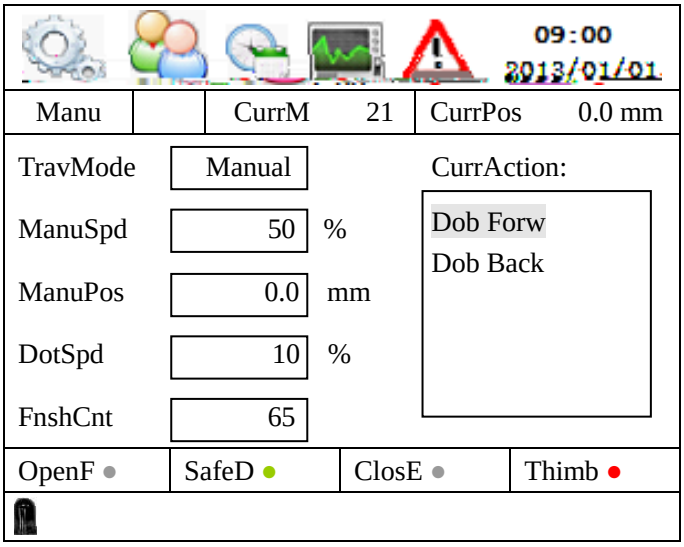
press

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

The following action is prohibit for safety reasons.

- After arms down in IMM mold-in area, can not do vertical 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.



- TravMode: Press

key to select manual mode or jogging mode.

  Fast mode: Press Tav.Out key once, arms move to the set ManuPos position. Press Tav.In key once, arms move to the waiting position.

  Jogging mode: Press Tav.Out key down, Arms go outside. Release the key, arms stop.

- ManuSpeed: Arms traverse with this speed in fast mode.
- ManuPos: Arms move to this position in Fast mode.
- DotSpeed Arms traverse with this speed in jogging mode
- FnshCnt The count of products taken out by Arms.

arm raising action

arm descending action

arm going forward

arm going backward

clip on/off.

Vacuum sucks on/off .

Arm rotating in/out action, press once more, acting to the other side

Traversing out.

Traversing in.

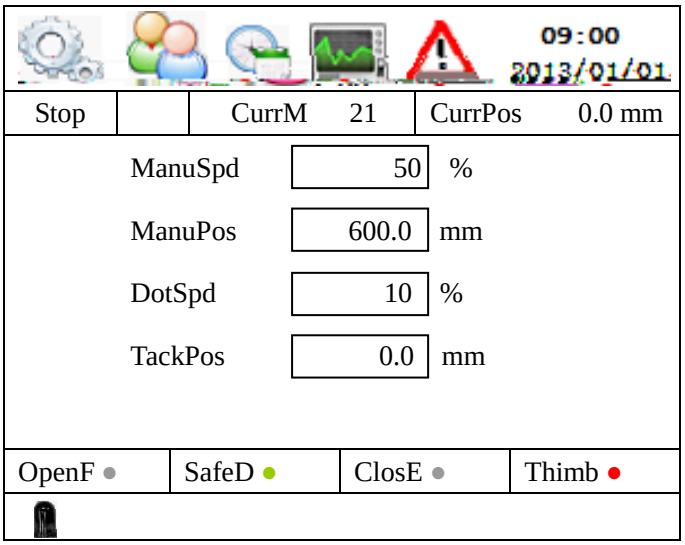
Arm select. Main/Vice/both option.

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

Spare valve ON/OFF.

Finding the 0-point

Press parameter key in MANUAL mode, show as follows.

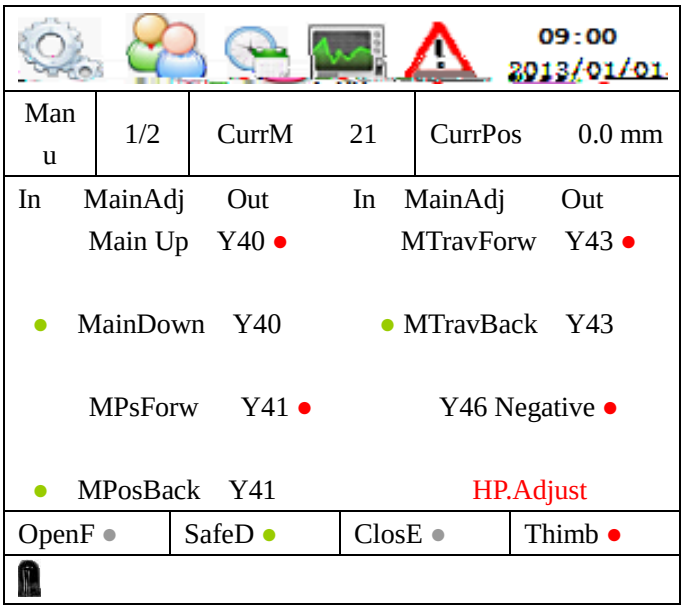


- ManuSpd Set traversing speed for Fast mode.
- ManuPos Set traversing position for Fast mode.
- DotSpeed Set traversing speed for jogging mode.
- TackPos Display Mold-in descending position.

2.5 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 cursor to the adjust position, press

key to make sure.

2.6 AUTO mode

Press

ey in STOP mode, system turn into Auto-prepare mode, then press "Start" key to turn into AUTO mode.

Auto		CurrM	21	CurrPos	0.0 mm
SetProNo		5000			
ActProNo		1			
AutoCycl		30.0	s		
TakeTime		5.0	s		
ProTime		5.0	s		
CurrAct		Spin Outct			

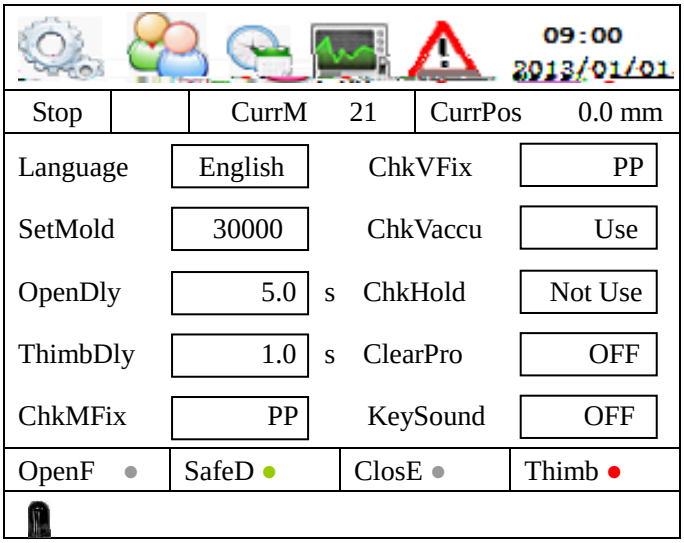
- SetProNo: The product set value. Alarm when picker cycle reached the value.
- ActProNo: Record current picker cycle number.
- AutoCycl: Time used in current cycle.
- TakeTime: Fetch time. Counting from IMM mold-opened to picker output MoldClose Enable.
- ProTime: Run time for action.
- CurrAct: Current action.

CHAP.3 Function

3.1 Basic

Press

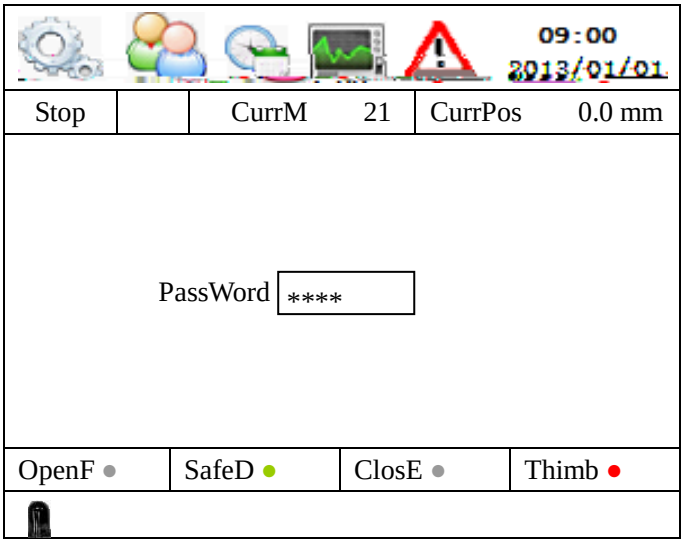
Key in STOP mode, enter FUNC Mode, panel shows as follows.



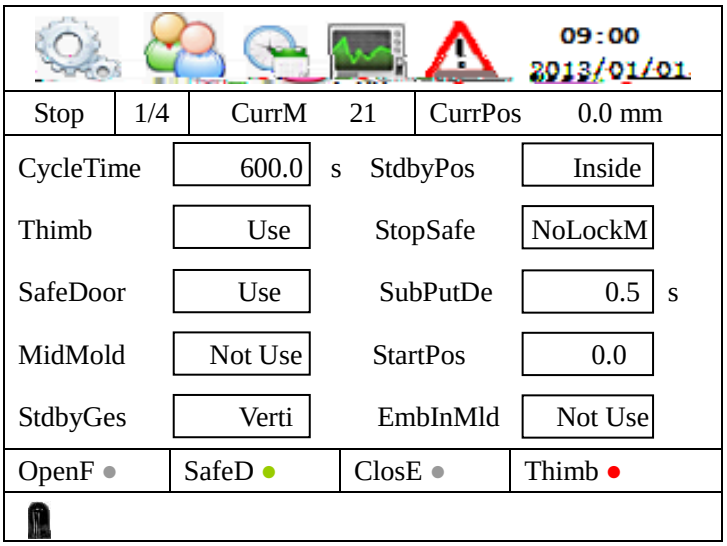
- Language: Chinese/English optional.
- SetMold: Alarm when picker cycle reached this set product number.
- OpenDly: Time for Mold-opened Delay. After received the Mold-opened signal, picker start waiting for this delay time, then shutdown Moldclose enable signal.
- ThimbDly: Time for Ejection Delay. After this delay, output Ejection enable signal.
- ChkMFix (Check main fix) :
  PP: Must get a limit signal ON when clip successfully.
  RP: Must get a limit signal OFF when clip successfully.
  No use: Do not concren the limit signal when clip.
- ChkVFix (Check vice fix) : Has same means as above.
- ChkVacuum:
  Use: Must get a limit signal ON when suck successfully.
  No use: Do not concren the limit signal when suck.
- ChkHold: Has same means as above.
- ClearPro: Clear current product count when set ON. It is OFF in normal operation.
- KeySound: When set ON, the controller beep when key down.

3.2 Special

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



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



1.

- CycleTime: The maximum 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 maximum, alarm runs.
- Thimb

  Not 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
- SafeDoor

  Not Use: Ignore Safety Door signal.

  Use: Check Safety Door signal before arms descend.
- MidMold

  Not Use: Ignore Mid-Mold signal.

  Use: Check Mid-Mold signal before arms descend.
- StdbyGes

  Define the fixture pose of first step in AUTO cycle.

  Vert: Stay vertival before Mold-opened signal.

  Hori: Stay horizontal before Mold-opened signal.

  In same case choose Hori, after mold opened, fixture turn vertical first before arms descend. And after current picker cycle complete, stay horizontal waiting for next cycle start.
- StdbyPos

  Define the position of tirst step in AUTO mode.

  Inside: Stay inside before Mold-opened signal. The Z-origin side.

  Outside: Stay outside before Mold-opened signal. The Z-outsafe side.
- StopSafe

  Define the MoldClose enable output style in STOP mode.

  Use: In STOP mode, MoldClose enable signal is always on.

  Not Use: In STOP mode, MoldClose enable signal shutdown when mold-opened signal turn ON. MoldClose enable signal output when safety door turn ON.
- SubPutDe

  When tranversing in/out, if Mid-Mold on, start timer, when timeout, vice arm goes down. (Only for H1).
- StartPos

  Define the Fetch position. This is the position of arm descending when a AUTO cycle start.

  .
- EmbInMld

  Select if it need to insert a cell into the mold.

  This function is ONLY for special machine. Users must select "Not" in normal application.

The following is spacial function page 2.

- PointCnt

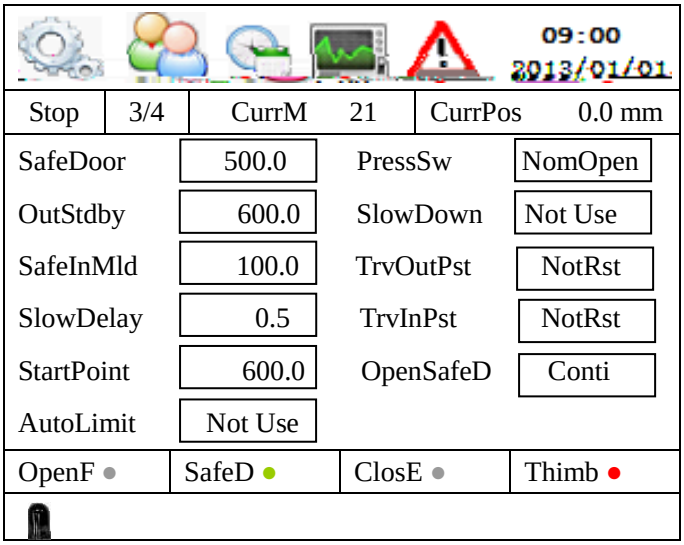
  Used when layout product. Each auto cycle, picker put down product at different

traversing.

InMold: Check the clips and suck limit signal only during Mold-in actions.

Full: Check the clips and suck limit signal all the time.

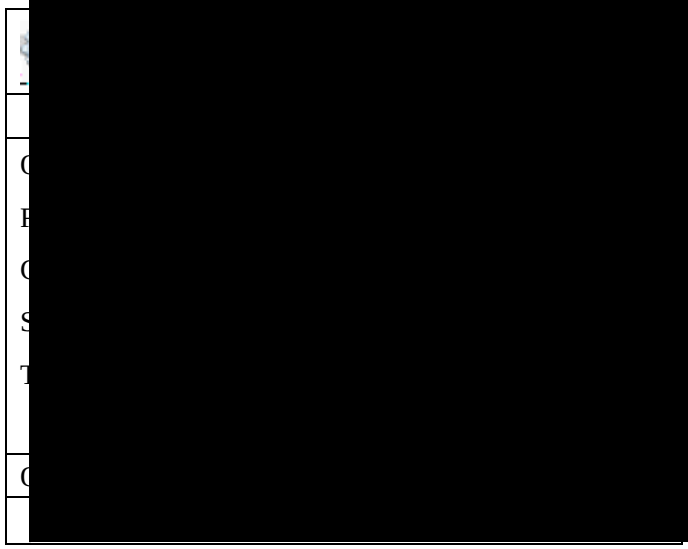
The following is spacial function page 3.



- SafeDoor
  Set the position of safety door. Picker layout position should exceed this point.
- OutStdby
  When picker standby outside, it runs to this point when AUTO mode start.
- SafeInMld
  When picker's arms descend in the IMM mold-in area, this value is the maximum position of Z-movement. When arms are at up-limit and current Z position is a little larger than the set value, arms can not descend.
- SlowDelay
  This function is used for invert-controlled machine. This defines the time from traversing start to the slow valve start. Servo system do not use this parameter.
- MultiPoint
  Start point for layout array.
- AutoLimit
  Not Use: Ignore Auto signal form IMM in AUTO mode.
  Use: Check Auto signal before new cycle. If received not, alarm.
- PressSW
  Define the style of pressure signal.
  NomOpen: OPEN style. Signal is OFF when normal, ON to alarm.
  NomClose: CLOSE style. Signal is ON when normal, OFF to alarm.
- SlowDown
  Not Use Disable main arm slow down function.
  Use Enable main arm slow down function.
- TravOutPst
  Define the pose restriction for traversing out.

NotRst: No rest
Vert: Must be v
Hori: Must be h

- TravInPst
  Define the pose
  Same as above.
- OpenSafeD
  Define the func
  Conti: Picker c
  Stop: Picker sta
  Rest: Picker res
  holdings. It star



- OpenDAlar

  Stop: When alarm cause of safe door at AUTO mode, stop this alarm if close the safe door, but do not continue automatically. MUST press Stop key, and restart AUTO mode.

  Conti: When alarm cause of safe door at AUTO mode, close safe door to continue automatically.

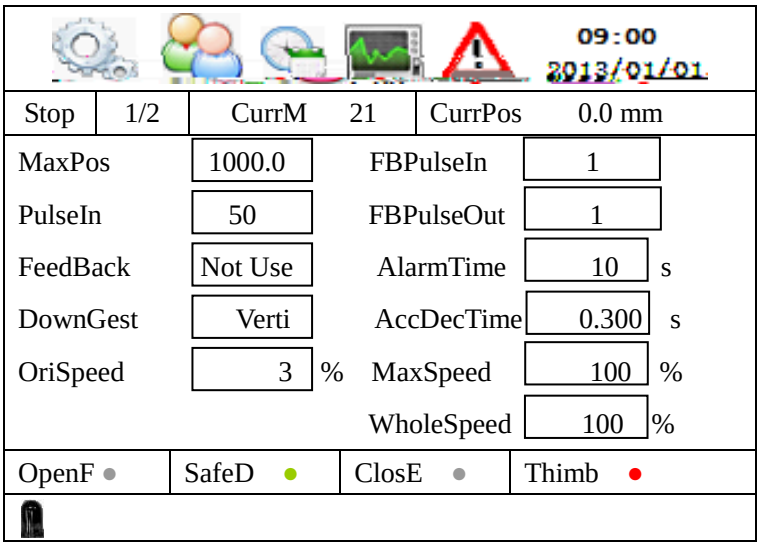
- Reserv1Time: If there's reserve action in program, this is the time for this action at AUTO mode.
- ConveyOn: If there's convey in program, this is the time of this action when at AUTO mode.
- StkClear: Clear the product number, the calculator will stack product from the first position.

- TestMould: The number of the test product. Every AUTO process, the first "TestMould" products will apply the TEST program. If set as 0, then disable this function.

Notes: When users set functions such as standby, traverse pose, please confirm the auto-program must being coordinate with these settings.

3.3 Servo

Input "7825" in password page, then press k ENTER ter servo function pages.



- MaxPos
  The maximum position arms can reach. All data set in MANUAL/AUTO mode can not exceed the maximum, otherwise alarm.
- PulseIn
  If send X pulses to servo, the arm will move D mm, then
  PulseIn = X / (10xD)
  It is the ratio of pulses and 0.1mm.
- FeedBack
  Users can use feedback function to check real position. For this application, OA+/OA-, OB+/OB- should be connect to servo.
  Not: Do not need feedback check.
  Use: The feedback position is shown in the actual area.
- DownGest
  Define the fixture pose when descending in IMM Mold-in area.
  Verti: Fixture must be vertical, otherwise alarm.
  Horiz: Fixture must be horizontal, otherwise alarm.

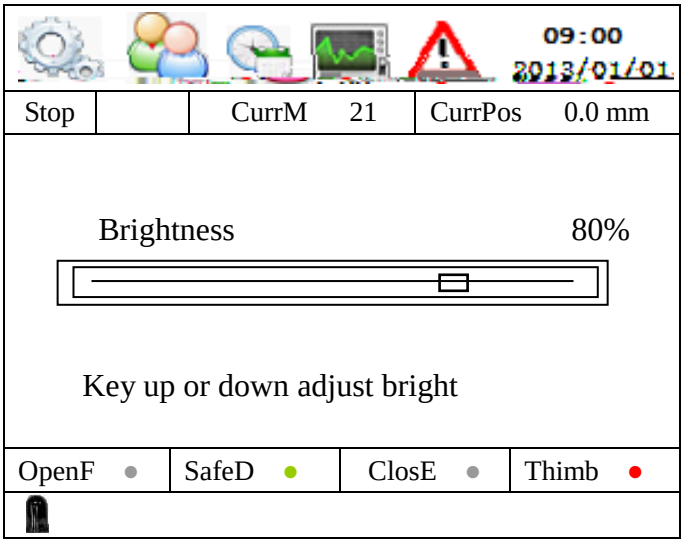
- OriSpeed
  Define the speed when finding the machincal 0-point. Too fast speed will cause a poor accuracy.
- FBPulseIn/FBPulseOut
  Feedback pulse = received pulse * FBPulseIn/FBPulseOut
  Normally FBPulseIn=1, FBPulseOut=1, so Feedback pulse = received pulse.
- AlarmTime
  Define the beep time for each alarm.
- AccDecTime
  Define the acceleration/ deceleration time.
- MaxSpeed
  Unit is %.
  100% speed = 500K pulse per secons.
- WholeSpeed

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

3.4 BackLight

Press

key in password page, enter backlight page.

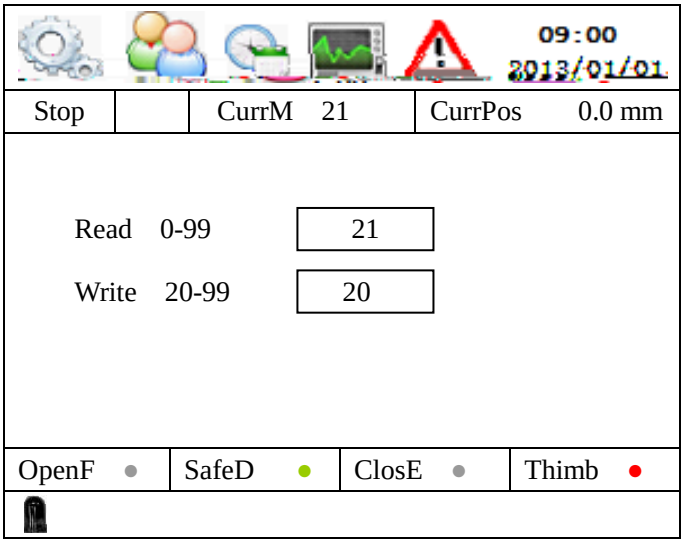


Use Up/Down key to adjust the brightness.

CHAP.4 Program

4.1 Load & Teach

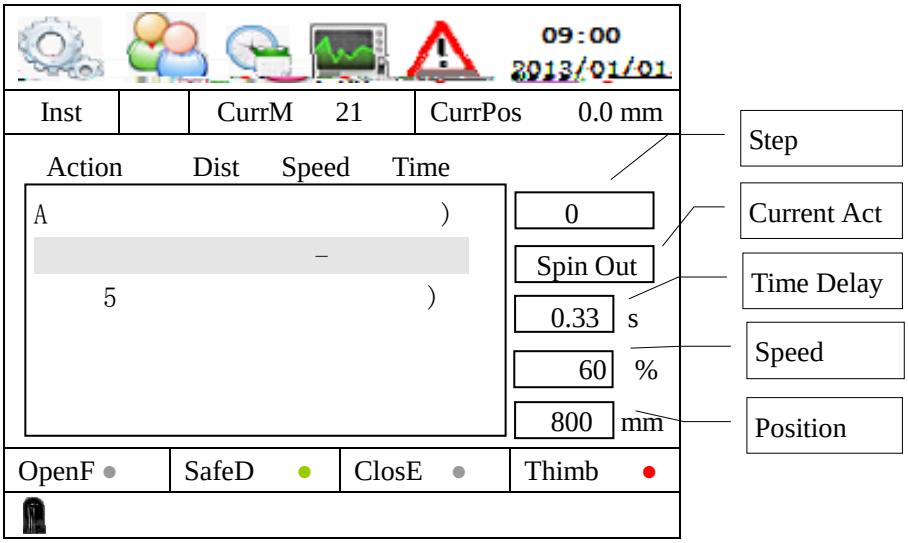
Press PROG key in STOP page, enter LOAD page.



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

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 ENTER.



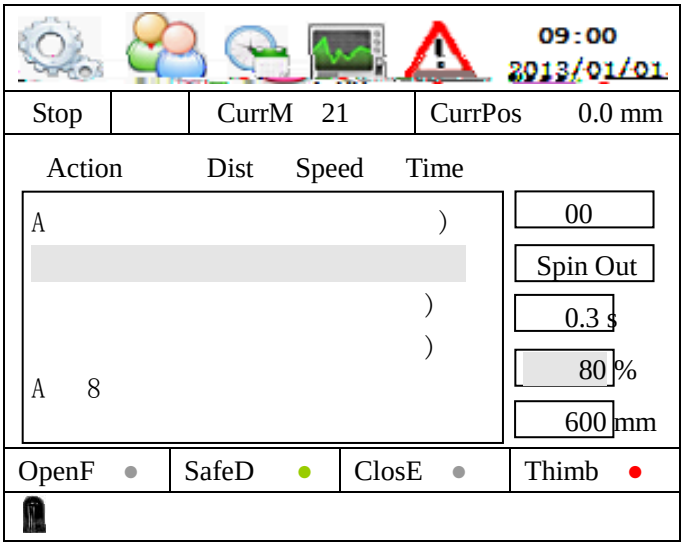
Press ENTER key step by step, picker will do the action list one by one. To teach a new action, using manual key to do this action, then press key ENTER nfirm the change.

INS Insert a new line.

DEL Delete currnt line.

4.2 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.



4.4 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

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

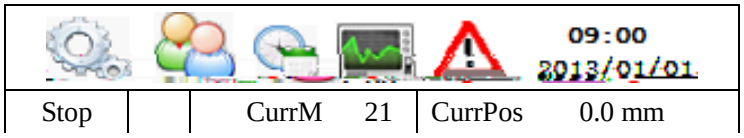
Program13 Both L route
Both arms descend -> Both arms go forward -> Suck On -> Vice arm clips on -> Both arms go backward -> Both arms rise -> Both arms go forward -> Pose Horizontal -> Traverse out -> Vice arm clips(V)62(ic)-7(e)4( )-59(a)4(rm)-47ET EMC /P 4MCID 159/Lang 378.15 Tm8

CHAP.5 Run status

5.1 Alarm record

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

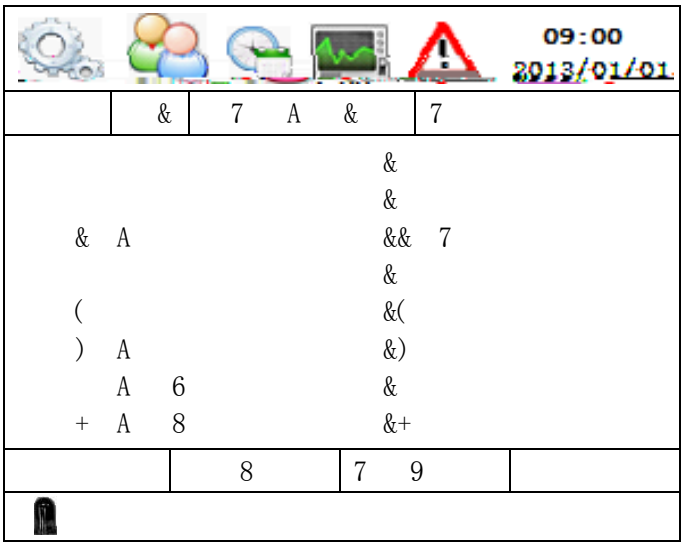
Press key again, enter the auto-cycle time page. In this page, 5 recent cycle time displayed.



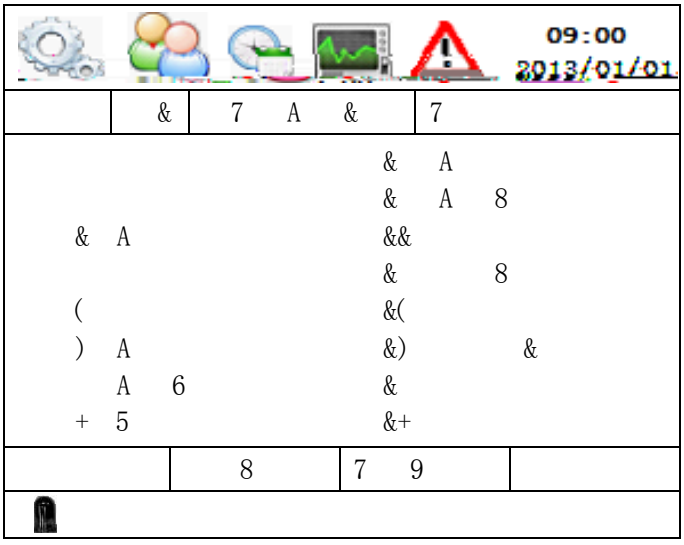
NO. MoldNum

5.2 Input/Output signal

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



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

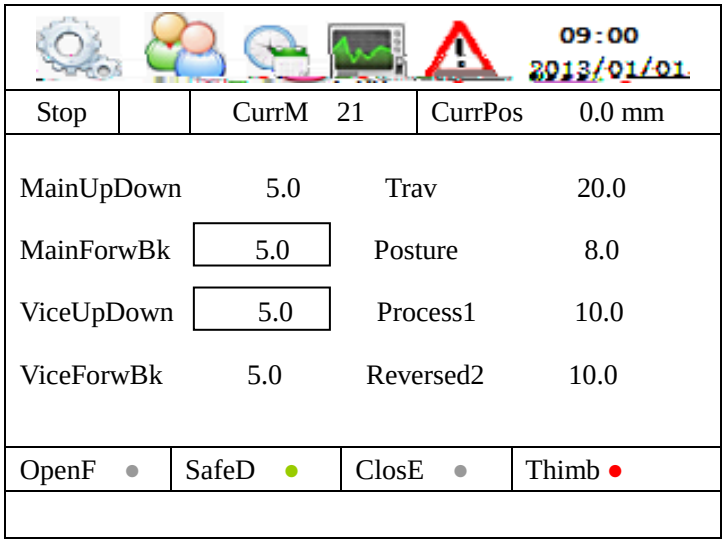


CHAP.6 Machine Settings

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

6.1 Time limit

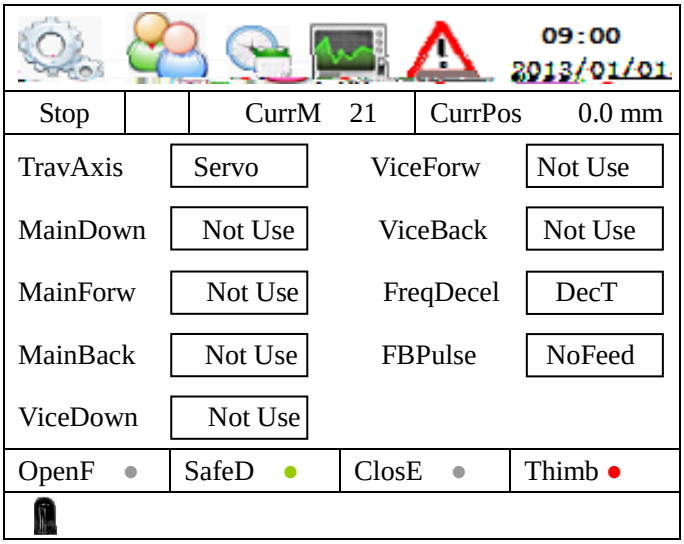
Press FUNC key twice in STOP page, then input password "****", enter the time limit page.



- MainUpDown
  Time limit for main arm rising/descending. If actions can not finish in limit time, alarm occurs.
- MainForwBk
  Time limit for main arm going forward/backward.
- ViceUpDown
  Time limit for vice arm raising/descending.
- ViceForwBk
  Time limit for vice arm going forward/backward.
- Trav.
  Time limit for traversing in/out.
- Posture
  Time limit for fixture pose turning.
- Process1
  Time limit for process1 action.
- Reversed2
  Time limit for reserved2 action.

6.2 Structure

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



- Trav.Axis
  Define the traverse axis style: servo/inverter/pnuematic.
- MainDown
  Define the use of main arm down limit signal.
- MainForw
  Define the use of main arm forward limit signal.
- MainBack
  Define the use of main arm forward limit signal.
- ViceDown
  Define the use of vice arm down limit signal.
- ViceForw
  Define the use of vice arm forward limit signal.
- ViceBack
  Define the use of vice arm backward limit signal.
- FreqDecel
  Speed decelerating style in invert/pnuematic control. DecT is decelerating by time. Dec.SW is by limit switches.
- FBPulse
  Use or not use feedback function.

CHAP.7 Alarm Info

Press "STOP" key to clear alarm and move to original point.

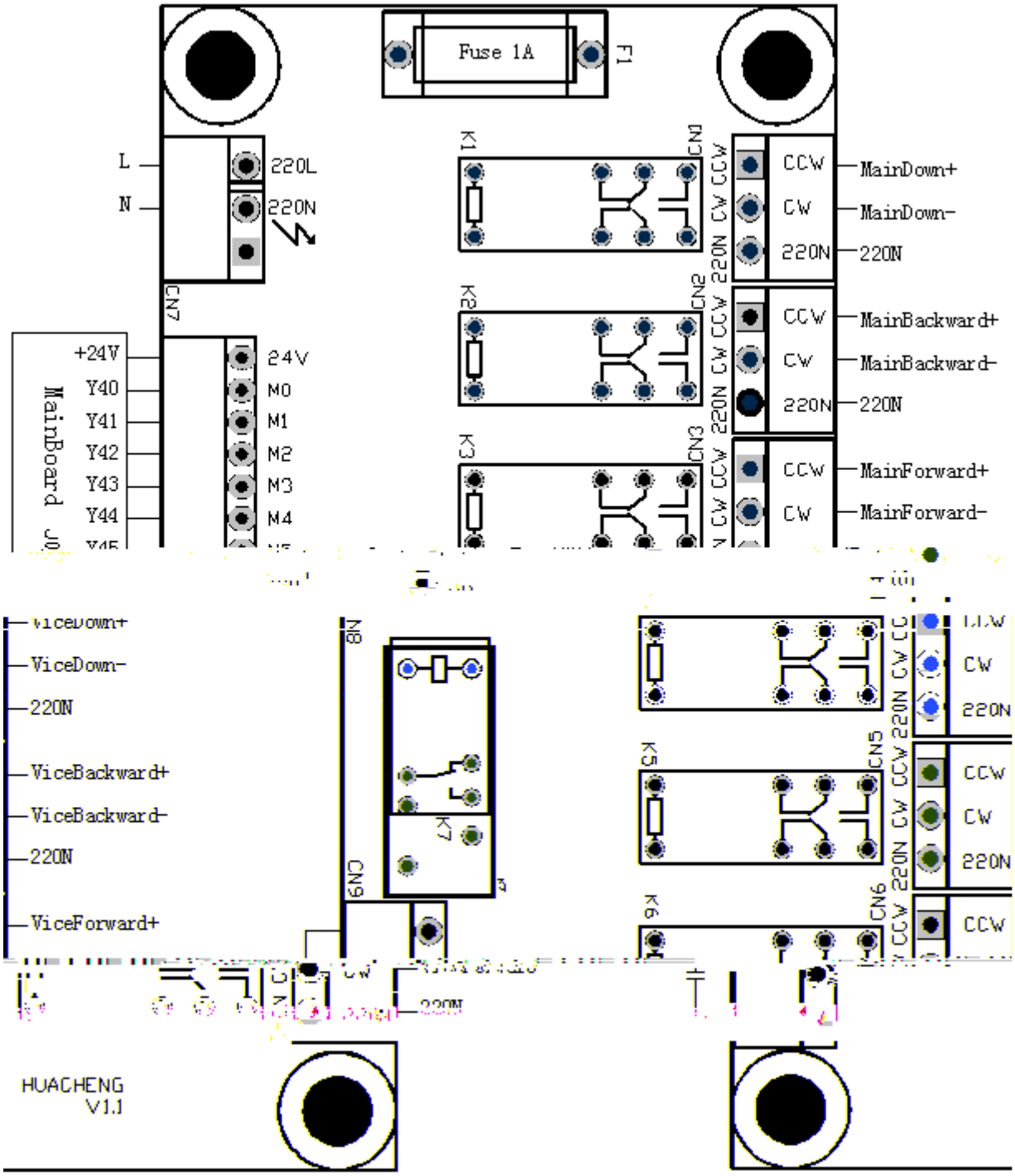
Error1 Mold Opened signal OFF, machine does not at waiting point
Error2 Mid-mold confirm signal OFF, machine does not at waiting point
Error3 Main arm rise limit OFF, machine does not at waiting point
Error4 Vice arm rise limit OFF, machine does not at waiting point
Error5 Main arm clamp limit ON, machine does not at waiting point
Error6 Vice arm clamp limit ON, machine does not at waiting point
Error7 Suck On limit ON, machine does not at waiting point
Error8 Embrace limit ON, machine does not at waiting point
Error9 Staying outside, machine does not at waiting point
Error10 Staying inside, machine does not at waiting point
Error11 Pose vertical limit OFF, machine does not at waiting point
Error12 Pose Horizontal limit OFF, machine does not at waiting point
Error13 When arms descend, Mold Opened signal OFF
Error14 When arms descend, Mid-mold confirm signal OFF
Error15 Mold Opened signal ON, Safety door signal OFF
Error16 Mold Opened signal ON, Mid-mold confirm signal OFF
Error17 Main arm rise limit ON, Main arm descend limit ON
Error18 Main arm go forward limit ON, Main arm go backward limit ON
Error19 Vice arm rise limit ON, Vice arm descend limit ON
Error20 Vice arm go forward limit ON, Vice arm go backward limit ON
Error21 Traverse out limit ON, Traverse in limit ON
Error22 Pose Horizontal limit ON, Pose vertical limit ON
Error23 Before arms descend, Mold Opened signal OFF
Error24 Before arms descend, Mid-mold confirm signal OFF
Error25 Before arms descend, Safety door signal OFF
Error26 Before arms descend, Pose vertical limit OFF
Error27 Before arms descend, Pose Horizontal limit OFF
Error28 Before arms descend, Main arm clamp limit ON
Error29 Before arms descend, Vice arm clamp limit ON
Error30 Before arms descend, Suck On limit ON
Error31 Before arms descend, Embrace limit ON
Error32 Before traversing, Main arm descend Valve ON
Error33 Before traversing, Vice arm descend Valve ON
Error34 Before traversing, Main arm rise limit OFF
Error35 Before traversing, Vice arm rise limit OFF
Error36 Before pose changing, Main arm descend Valve ON
Error37 Before pose changing, Vice arm descend Valve ON
Error38 Main arm descend Valve ON, Main arm rise limit ON
Error39 Main arm descend Valve ON, Main arm descend limit OFF

Error40 Main arm descend Valve OFF, Main arm rise limit OFF
Error41 Main arm descend Valve OFF, Main arm descend limit ON
Error42 Vice arm descend Valve ON, Vice arm rise limit ON
Error43 Vice arm descend Valve ON, Vice arm descend limit OFF
Error44 Vice arm descend Valve OFF, Vice arm rise limit OFF
Error45 Vice arm descend Valve OFF, Vice arm descend limit ON
Error46 Main arm go forward Valve ON, Main arm go forward limit OFF
Error47 Main arm go forward Valve ON, Main arm go backward limit ON
Error48 Main arm go forward Valve OFF, Main arm go forward limit ON
Error49 Main arm go forward Valve OFF, Main arm go backward limit OFF
Error50 Vice arm go forward Valve ON, Vice arm go forward limit OFF
Error51 Vice arm go forward Valve ON, Vice arm go backward limit ON
Error52 Vice arm go forward Valve OFF, Vice arm go forward limit ON
Error53 Vice arm go forward Valve OFF, Vice arm go backward limit OFF
Error54 Main arm clamp Valve ON, Main arm clamp limit OFF
Error55 Main arm clamp Valve OFF, Main arm clamp limit ON
Error56 Vice arm clamp Valve ON, Vice arm clamp limit OFF
Error57 Vice arm clamp Valve OFF, Vice arm clamp limit ON
Error58 Suck Valve ON, Suck limit OFF
Error59 Suck Valve OFF, Suck limit ON
Error60 Embrace Valve ON, Embrace limit OFF
Error61 Embrace Valve OFF, Embrace limit ON
Error62 Pose Horizontal Valve ON, Pose Horizontal limit OFF
Error63 Pose vertical Valve ON, Pose vertical limit OFF
Error64 Traverse out timeout
Error65 Traverse in timeout
Error66 Emergency stop
Error67 Program is not integrity, operate can not perform.
Error68 Operate cycle has arrived the product quantity set
Error69 operate not according to the taught
Error70 Waiting mold open time out
Error71 Servo problem, no pulse input
Error72 Servo Alarm
Error73 Safety door position not set
Error74 Putting down point less than the Safety Door point
Error75 Putting down point larger than the maximum
Error76 Outside waiting point less than the start point
Error77 Outside waiting point larger than the maximum
Error78 largest cycling putting down point larger than the maximum
Error79 Traverse out end-limit error
Error80 Traverse in end-limit error
Error81 Machine does not stay at waiting point, please go to origin manually
Error82 Machine does not stay at waiting point, please Traverse to waiting point
Error83 Before Traverse in /out, please change its pose

CHAP.8 Interface

8.1 The Main Control Board

8.2 Adjust The Position Of Board



System use PL+,PL- as position pulses output, use NL+, NL- as negative pules output. The maximum output speed is 500kps. And a motor turn around is 10000 pulse. Uses can use jogging in MANUAL mode to test the servo.

8.3 Panasonic A5

Settings:

No.	Description	Value
Pr0.01	Control mold	0

8.4 Mitsubishi MR-E

Settings:

Note: Motor turn a cycle when received 10000 pulse. If not, modify parameter please.

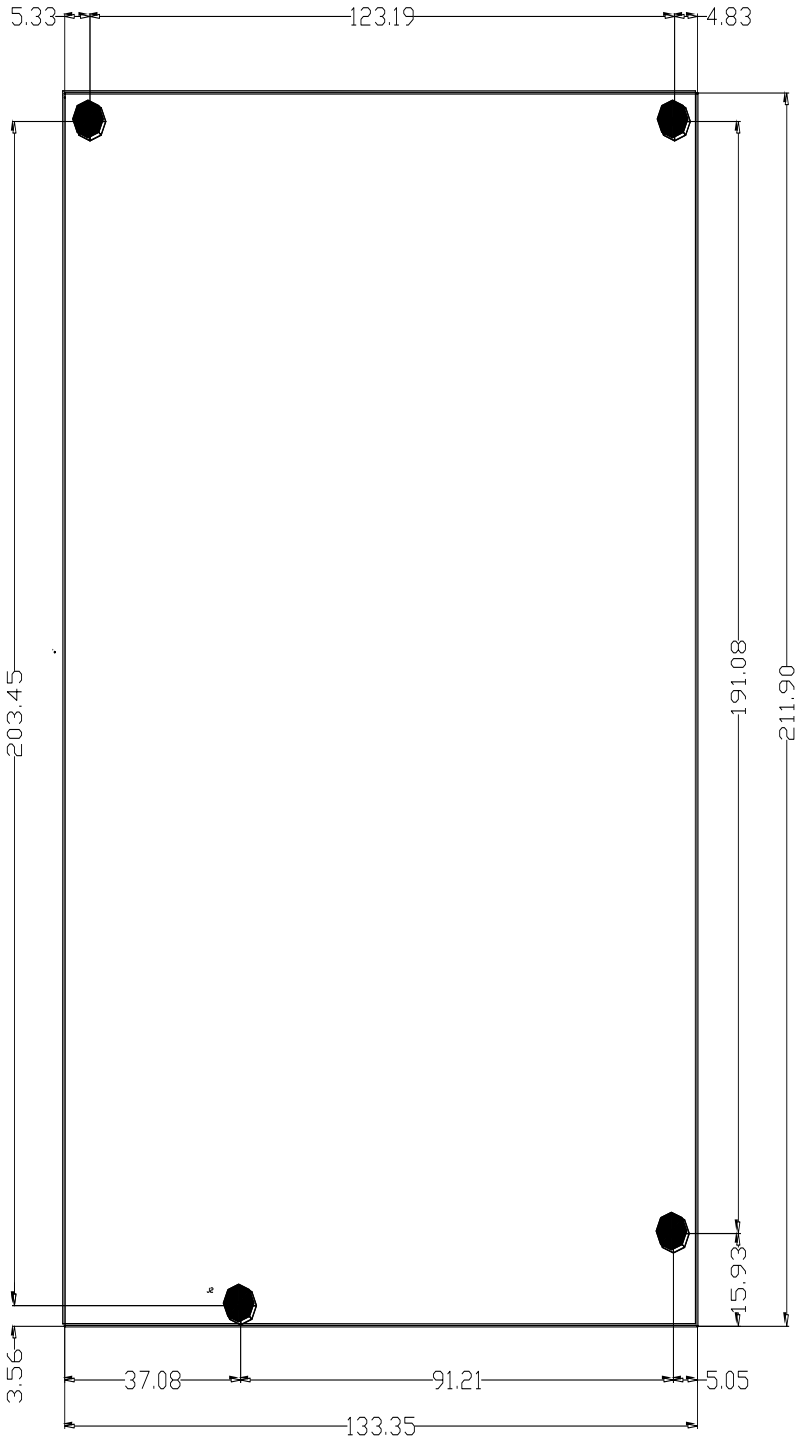
No.	Description	Value
No.0	Control mode	***0
No.3	Numerator of Electronic Gear	1
No.4	Denominator of Electronic Gear	1
No.21	Input pulse style	0000
No.27	Feedback pulse per cycle	10000

Wire Connection

System		**MR-E Servo**		
Signal	Description	Pin	Signal	Description
PL+	Positive pulses	23	PP	Positive pulse Input
PL-		22	PG	
NL+	Negative pulses	25	NP	Positive pulse Input
NL-		24	NG	
OA+	Feedback PhaseA	15	LA	Phase A Output
OA-		16	LAR	
OB+	Feedback PhaseB	17	LB	PhaseB Output
OB-		18	LBR	
GND	GND	14	LG	Logical GND
+24V	+24V	1	VIN	Signal Power+
G2	+24VG	13	SG	Signal Power-
SRDY	Servo ready	9	ALM	Alarm
Note Servo Pin4(SON), Pin6(LSP), Pin7(LSN), Pin8(EMG) should be connected with Pin13(SG).				

CHAP.9 Dimensions

Dimension of the Main Control Board



Specifications subject to change without notice!