



Two axis servo robot controller instruction

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Shenzhen TOOLCEN Automation Equipment Co., Ltd

Shenzhen TOOLCEN Automation Equipment Co., Ltd. is located in the country's largest economic zone ---- Shenzhen City. Is a collection research and development, design, manufacture, sales and service in the integration of integrated enterprise.

The company is committed to packaging, electrical appliances, daily necessities, medical and other fields, R & D and production of single-axis, two-axis, three-axis, five-axis servo injection molding, the company has a number of industries, Machine tool, further development and production of IML in-mold labeling system, IMD mold inlay system, PET preforms to take special robots, and CNC lathe loading and unloading manipulator, CNC machining center loading and unloading manipulator, punch - forging manipulator, more Joint robot applications, for the automation industry to provide professional intelligent equipment.

We uphold the "innovation as the driving force, market-oriented, customer-centric to serve as a fundamental" concept, is a new technology services company, to provide customers with the best overall automation program.



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1.Specification

Thank you for using this product,before use,please read this manual in detail.When installation maintenance,be sure to comply with the following considerations.

1.1 Specification

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

1.2 Installation notes

- Installation should be performed by workers with license in electric field.
- Make sure the power is off before installation.
- Install on metal material, keep off from the combustibile thing.
- Make sure the good connection to the ground.
- The power supply is important for the control system. Controller installation should be avoided contractors, transformers and other AC accessories layout, Make sure your system has stable power supply and protection.

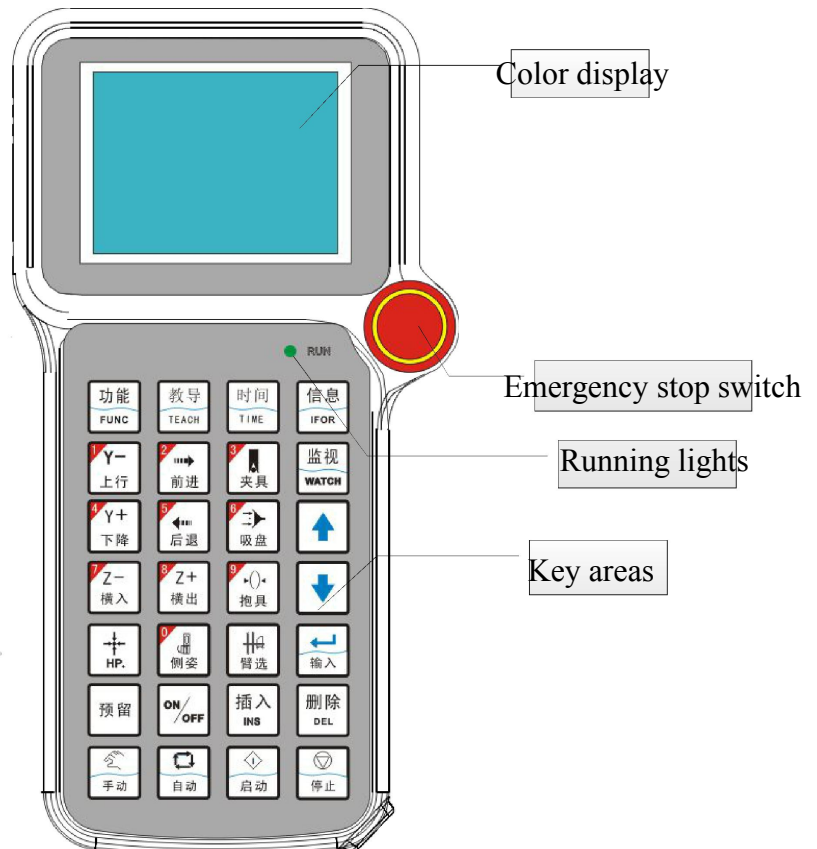
Read the Guide first before Installation, maintenance, and operation. Operators should be familiar with the safety specification in mechanical and electric area.

Environment temperature is below 50°C. Do not use in brume and frozen places.







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

2.Operate panel

2.1 Appearance and instructions



2.2 Main screen

	 09:00 2013/01/01					
Running	Stop	2/2	CurrM 1	Y 0.0 mm	Z 0.0 mm	
Current Mold						
	OpenF 	SafeD 	ClosE 	Thimb 		
Alarm						

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  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.

Manu		CurrM 1	Y 0.0 mm	Z 0.0 mm	
Mode	Manual		CurrAction:		
ZTravPos	600 mm		MainBack		
YDownPos	200 mm		MainForw		

ManuSpd	50 %		
DotSpd	5 %		
FnshCnt	0		
OpenF ●	SafeD ●	ClosE ●	Thimb ●

1、 Mode: Press ‘INPUT’ 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 Key board



Master/slave arm select.



Arm rising action



Arm descending action



Arm going forward



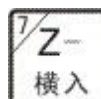
Arm going backward



Vacuum sucks on/off .



Arm rotating in/out action.



Traversing in.



Traversing out.



Finding the origin point



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



Spare valve ON/OFF.

3.2.3 Manual Parameter

Press 'PARAMETER' key in MANUAL mode, show as follows.

Manu		CurrM 1	Y	0.0 mm	Z 0.0 mm
ManuSpd	50	%	DotSpd	5	%
ZTravPos	600.0	mm	YDownPos	200.0	mm
ZStdbyPos	0.0	mm	YStdbyPnt	0.0	mm
OpenF ●		SafeD ●		ClosE ●	
				Thimb ●	

- 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 'PARAMETER' 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.

Manu	1/2	CurrM 1	Y	0.0mm	Z 0.0mm
In	MainAdj	Out	In	MainAdj	Out
●	Main Up	●	●	MTravForw	●
●	Main Down	●	●	MTravBack	

MPosForw	●	MPosBack	●	Negative	●	HP. Adjust	
OpenF	●	SafeD	●	ClosE	●	Thimb	●

Manu	2/2	CurrM	1	Y	0.0mm	Z	0.0mm
In	ViceAdj	Out		In	ViceAdj	Out	
●	Sub Up	●		●	STravForw	●	
●	Sub Down			●	STravBack		
●	SPosForw	●			Negative	●	
●	SPosBack				HP. Adjust		
OpenF	●	SafeD	●	ClosE	●	Thimb	●

Moving cursur to the adjust position, press key.

3.3 AUTO mode

Press ‘AUTO’ key in STOP mode, system turn into Auto-prepare mode, then press “Start” key to turn into AUTO mode.

Auto		CurrM	1	Y	0.0mm	Z	0.0mm
SetProNo		5000					
ActProNo		0					
AutoCycl		0.00 s					
TakeTime		0.00 s					
ProcTime		0.00 s					
CurrAct		Spin Out					
OpenF	●	SafeD	●	ClosE	●	Thimb	●

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

Stop		CurrM	1	Y	0.0 mm	Z	0.0 mm
Language	English		ChkVFix	P			
SetMode	5000		ChkVaccu	Use			
OpenDly	0.1		ChkHold	Not Use			
Thimb	Use		ClearPro	OFF			
ChkMFix	PP		KeySound	OFF			
OpenF	●	SafeD	●	ClosE	●	Thimb	●



- 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 Mold-close 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 Mold-opened signal turn ON, after ejection delay time, output Eject enable signal.
- 3.2.5 ChkMFix (Check main fix) :
 - AP: Must get a limit signal ON when clip successfully. RP: Must get a limit signal OFF when clip successfully. Not Use: Do not concern the limit signal when clip.
- 3.2.6 ChkVFix (Check vice fix) : Has same means as above.
- 3.2.7 ChkVaccu:
 - Use: Must get a limit signal ON when suck successfully.
 - Not Use: Do not concern the limit signal when suck.
- 5.1 ChkHold: Has same means as above.
- 5.2 ClearPro: Clear current product count when set ON. It is OFF in normal operation.
- 5.3 KeySound: When set ON, the controller beep when key down.

4.2 Special

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

 09:00 2013/01/01							
Stop		CurrM	1	Y	0.0 mm	Z	0.0 mm
PassWord <input style="width: 150px; height: 20px;" type="text"/>							
OpenF ●	SafeD ●	ClosE ●	Thimb ●				
							

Input “2011”, then press ‘ INPUT ’ key, enter special function pages. The following is spacial function 1 page.

 09:00 2013/01/01							
Stop	1/3	CurrM	1	Y	0.0 mm	Z	0.0 mm
CycleTime	600.0	ClpAbDect	TravOut				
ThimbDly	0.1	ChckDfPrd	Not Use				
StdbyGes	Verti	CloseMFns	Not Use				
TrvOutPst	NotRst	SafeDoor	NoChck				
TrvInPst	NotRst	OpenDAlar	Conti				
MidMold	Not Use	OpenSafeD	Conti				
OpenF ●	SafeD ●	ClosE ●	Thimb ●				
							

1. CycleTime:

The maxim 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 maxim, 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 vertical 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 vertical 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 vertical 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 mold-closed signal must set before mold-opened signal. This may happened when Mold-close 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.

							
Stop	2/3	CurrM	1	Y	0.0 mm	Z	0.0 mm
StopSafe	NoLockM	AutoLimit	Not Use				
YStbdyPnt	0.0	EmbInMld	Not Use				
ZSafeInMold	100.0	Reserv1	1				
ZStbdy	Inside	Reserv1Time	0.0				
ZInStdPnt	0.0	Reserv2	1				
ZOutStdPnt	600.0	ConvCnt	1				
OpenF ●	SafeD ●	ClosE ●	Thimb ●				
							

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 outside 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.

2. 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.

 09:00 2013/01/01					
Stop	3/3	CurrM 1	Y	0.0 mm	Z 0.0 mm
ZMulDotPut	Use		YMulDotPut	Use	
ZStartPoint	600.0		YStarPoint	600.0	
ZPointCnt	1		YPointCnt	1	
ZSpace	10.0		Yspace	10.0	
MulDotOrder	Z->Y		ConveyOn	2.0	
StkClear	OFF		TestMould	0	
OpenF ●	SafeD ●	ClosE ●		Thimb ●	
					

4. ZMulDotPut: lay multi points in Z direction.

5. ZStartPoint : The first layout point.

6. ZPointCnt : Number of layout. Value from 0 to 99.

The value should be 1 when stack function not use.

28. ZSpace: The gap between 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. StkClear: Clear the product number, the calculator will stack product from the first position.

31. YMulDotPut: lay multi points in Y direction.

32. YStarPoint: The first layout point.

33. YPointCnt: Number of layout. Value from 0 to 99.

The value should be 1 when stack function not use. 34.

Yspace: The gap between two adjacent points.

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.

35. 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.

Input password “*****”, then press ‘ INPUT ’ key , enter special function pages. The following is spacial function 2 page.

Stop	1/2	CurrM	1	Y	0.0 mm	Z	0.0 mm
ZMaxPos				ZOriSpd	5		%
SafeDoor				ZMaxSpd			%
ZPolseIn		50		ZWholeSpd	100		%
ChckPress		Not Use		ZAcDcTime	0	300	
AlarmTime			s	PressSw			
				ClScrTim	600		s
OpenF	●	SafeD	●	ClosE	●	Thimb	●

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.

$$\text{PulseIn/PulseOut} = 10000 / (5 * 10) = 250$$

$$\text{PulseIn}=250, \text{PulseOut}=1$$

4. ZOriSpd

Define the speed when finding the mechanical 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 second.

7. ZWholeSpd Unit

is %.

If traversing speed is 50, and Whole Speed 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 back light turn off. When key pressed, the timer reset.

Notes:

- a. Incorrect descending pose inside IMM may cause mold damage. Users should be cautious to modify this function.**

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

The following is next page.

 09:00 2013/01/01					
Stop	1/2	CurrM	1	Y 0.0 mm	Z 0.0 mm
YMaxPos	600.0	YOriSpd	5	%	
YMaxStPos	500.0	YMaxSpd	100	%	
YPulseIn	50	YWholeSpd	100	%	
DownGest	Verti	YAcDcTime	0.300	s	
WaitSig	NoTeach	FeedBack	Not Use		
OpenF 	SafeD 	ClosE 	Thimb 		
					

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. YPulseIn

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.

$$\text{PulseIn/PulseOut} = 10000 / (5 * 10) = 250$$

$$\text{PulseIn}=250, \text{PulseOut}=1$$

15. 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. 16.

16,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 embedding 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 “Waiting for mold opened signal” in the program, and also, user must teach “Enable mold close signal” to proper place.

17. YOriSpd

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

18. YMaxSpd Unit

is %.
 100% speed = 500K pulse per secons.

19. YWholeSpd Unit



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

20. YAcDcTime

Define the acceleration/ deceleration time. 21.

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.

 09:00 2013/01/01				
Stop	1/2	CurrM 1	Y0.0 mm	Z0.0 mm
FixReverse		<input type="text"/>		
OpenF ●	SafeD ●	ClosE ●	Thimb ●	
				

22. FixReverse

Not Use: Don't change the postures when running.

Use: For all Postures set above, if Horizon set, the Vertical will be used actually, if Vertical set, Horizon used.

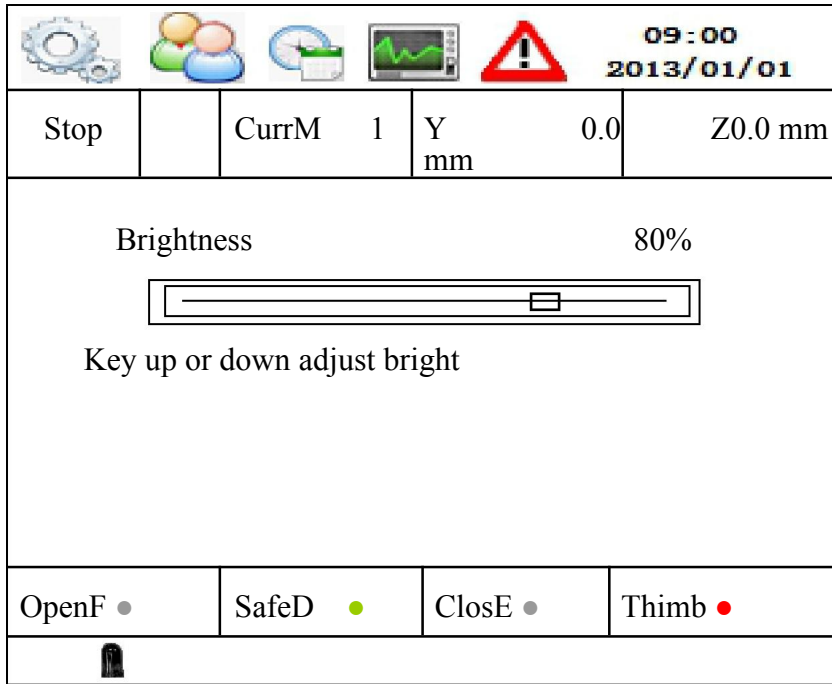
Notes:

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

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

4.3 Brightness

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

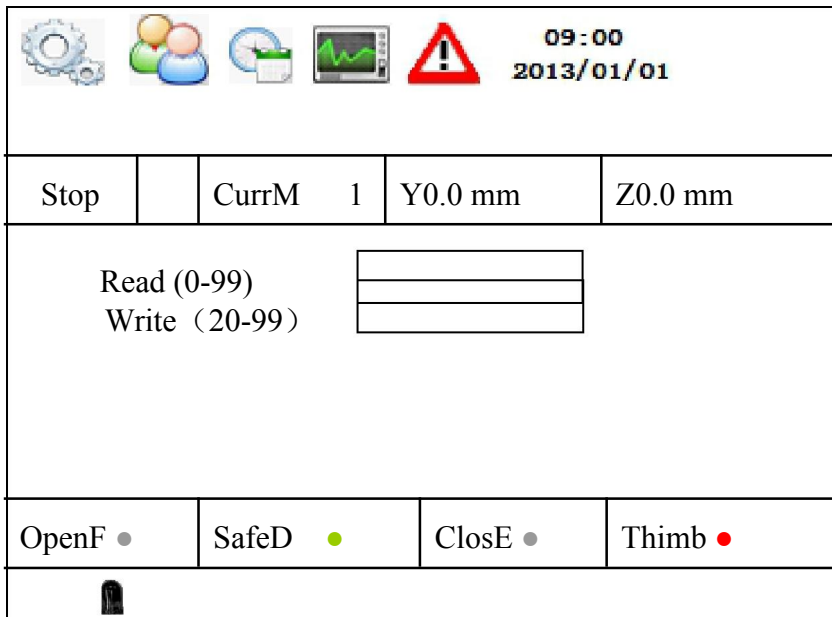


Use Up/Down arrow key to adjust brightness.

5. Program

5.1 Load a recipe and Teach

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



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

Users can read current mold to make a new one. Mold No.20~99 is reserved for standard mold program.

To teach the program, press 'INPUT' key. Press 'INPUT' 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 'INPUT' key to confirm the change



Stop		CurrM	20	Y	0.0 mm	Z	0.0 mm
Action	Dist	Speed	Time	0			
Dob Down	600.0	50	0.50	Dob Down	Time		
Dob Forw			0.50	0.50 s	speed		
Vac Suck			0.50	50 %	position		
Sub Fix			0.50	600.0 mm			
OpenF	●	SafeD	●	ClosE	●	Thimb	●

5.2 Edit

In STOP mode, press “RAR” 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 sequence.

5.3 Standard programs

Program1: Main L route suck forward side Main arm descends -> Main arm goes forward arm rises -> Pose Horizontal -> Traverse out -> -> Traverse in -> Pose vertical -> Main arm goes backward -> Suck On -> Main arm goes backward -> Main Main arm descends -> Suck off -> Main arm rises 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 ‘ IFOR ’ key, enter the alarm record page. The recent 50 alarm messages displayed.

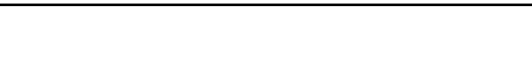
 09:00 2013/01/01																	
Stop		CurrM	20	Y 0.0 mm	Z 0.0 mm												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NO.</th> <th style="width: 15%;">Num</th> <th style="width: 75%;">AlarmInfo</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>82</td> <td>OriginNeedToRe-test</td> </tr> <tr> <td>2</td> <td>105</td> <td>MainNotAtStart, NotOrigin</td> </tr> <tr> <td>3</td> <td>72</td> <td>ServoAlarm</td> </tr> </tbody> </table>						NO.	Num	AlarmInfo	1	82	OriginNeedToRe-test	2	105	MainNotAtStart, NotOrigin	3	72	ServoAlarm
NO.	Num	AlarmInfo															
1	82	OriginNeedToRe-test															
2	105	MainNotAtStart, NotOrigin															
3	72	ServoAlarm															
OpenF 	SafeD 	ClosE 	Thimb 														
																	

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

 09:00 2013/01/01																							
Stop		CurrM	20	Y 0.0 mm	Z 0.0 mm																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NO.</th> <th style="width: 20%;">MoleNum</th> <th style="width: 70%;">CycleTime s</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>13</td> <td>2.37</td> </tr> <tr> <td>2</td> <td>13</td> <td>20.76</td> </tr> <tr> <td>3</td> <td>13</td> <td>20.76</td> </tr> <tr> <td>4</td> <td>20</td> <td>14.67</td> </tr> <tr> <td>5</td> <td>20</td> <td>14.67</td> </tr> </tbody> </table>						NO.	MoleNum	CycleTime s	1	13	2.37	2	13	20.76	3	13	20.76	4	20	14.67	5	20	14.67
NO.	MoleNum	CycleTime s																					
1	13	2.37																					
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3	13	20.76																					
4	20	14.67																					
5	20	14.67																					
OpenF 	SafeD 	ClosE 	Thimb 																				

6.2 Input/Output signal

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

 09:00 2013/01/01					
Stop		CurrM	20	Y 0.0 mm	Z 0.0 mm



X10	Hori	●	X20	UpMax	●
X11	Verti	●	X21	Injection	●
X12	MainFix	●	X22	CheckPress	●
X13	Hold	●	X23	InSafe	●
X14	Vacuum	●	X24	OutSafe	●
X15	MainForw	●	X25	Zorigin	●
X16	DownMax	●	X26	TravInLmt	●
X17	DownMax	●	X27	TravOutLmt	●
OpenF ●		SafeD ●		ClosE ●	
				Thimb ●	

Press 'watch' key again, enter the output signal monitor page.

Stop		CurrM 20	Y 0.0 mm	Z 0.0 mm	
Y10	Hori	●	Y20	MainUp	●
Y11	Verti	●	Y21	MainDown	●
Y12	MainFix	●	Y22	LowPress	●
Y13	Hold	●	Y23	SlowDown	●
Y14	Vacuum	●	Y24	Reserv1	●
Y15	MainForw	●	Y25	Reserv2	●
Y16	MainBack	●	Y26	TravIn	●
Y17	Alarm	●	Y27	TravOut	●
OpenF ●		SafeD ●		ClosE ●	
				Thimb ●	

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

09:00 2013/01/01							
Stop		CurrM	20	Y	0.0 mm	Z	0.0 mm
MainUpDown		5.0		Trav		20.0	
MainForwBk		5.0		Posture		8.0	
ViceUpDown		5.0		Process1		10.0	
ViceForwBk		5.0		Reversed2		10.0	
OpenF ●	SafeD ●			ClosE ●		Thimb ●	

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

09:00 2013/01/01							
Stop		CurrM	20	Y	0.0 mm	Z	0.0 mm
TravAxis		Servo		ViceForw		Not Use	
MainDown		Not Use		ViceBack		Not Use	
MainForw		Not Use		FreqDecel		DecT	
MainBack		Not Use		FBPulse		NoFeed	
ViceDown		Not Use		ZSignale		Not Use	
OpenF ●	SafeD ●			ClosE ●		Thimb ●	

1. Trav Axis: Define the traverse axis style: servo/invert/pneumatic.
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
- 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 decelerating style in invert/pneumatic 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. Check M.Fix select. PP/RP 3. Wire connection.
6. Vice arm clamp limit ON	Vice arm clamp signal on.	1. Signal is on. 2. Check V.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	1. Check traversing out

	safety gate area.	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. Mold-opened 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 ON	After main arm go backward, backward limit is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.

limit OFF		
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.

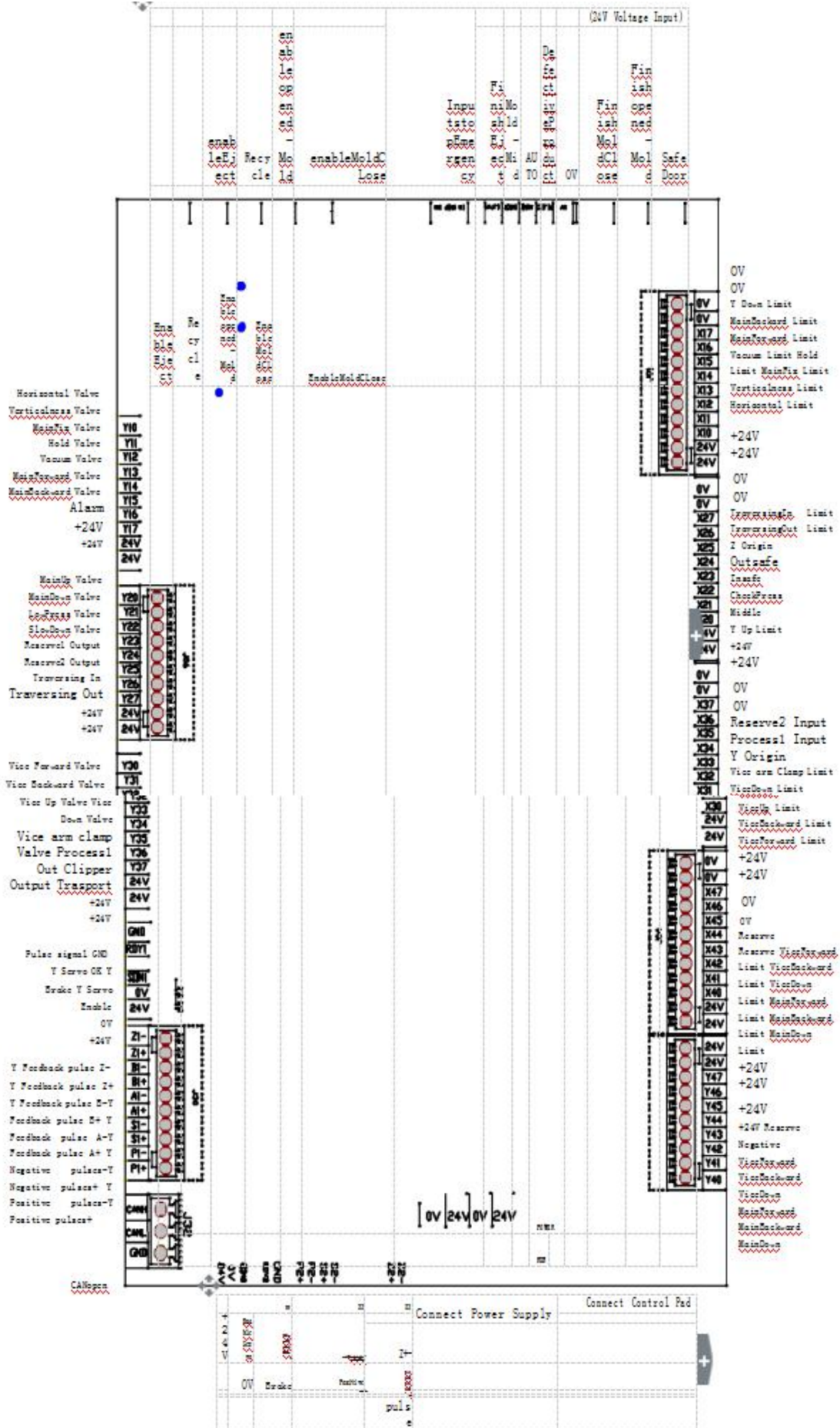
		3. Check the time limit.
62. Pose Horizontal Valve ON , Pose Horizontal limit OFF	After pose horizontal, confirm limit signal is still off.	1. Check signal. 2. Check the time limit. 3. Check the Valve.
63. Pose vertical Valve ON, Pose vertical limit OFF	After pose vertical, confirm limit signal is still 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 cycle, must return to the start. 2. A clip/suck on action need a off action. 3. Traverse 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. Increase 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	Mold-opened 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	Putting down position less than safety gate position in	1. Set it correctly.

Safety Door point	Z direction.	
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. In Down Safe Pt Low Than Ori	Inside down safe position is lower than start position.	1. Reset inside down safe position, make sure it's larger than start position
87. In Down Safe Pt High Than Ori	Inside down safe position is higher than start position.	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 in safe position.	
89. TravPos Lower than Origin	Transverse position is lower than start position.	1. Reset transverse position, make sure it's smaller than start position

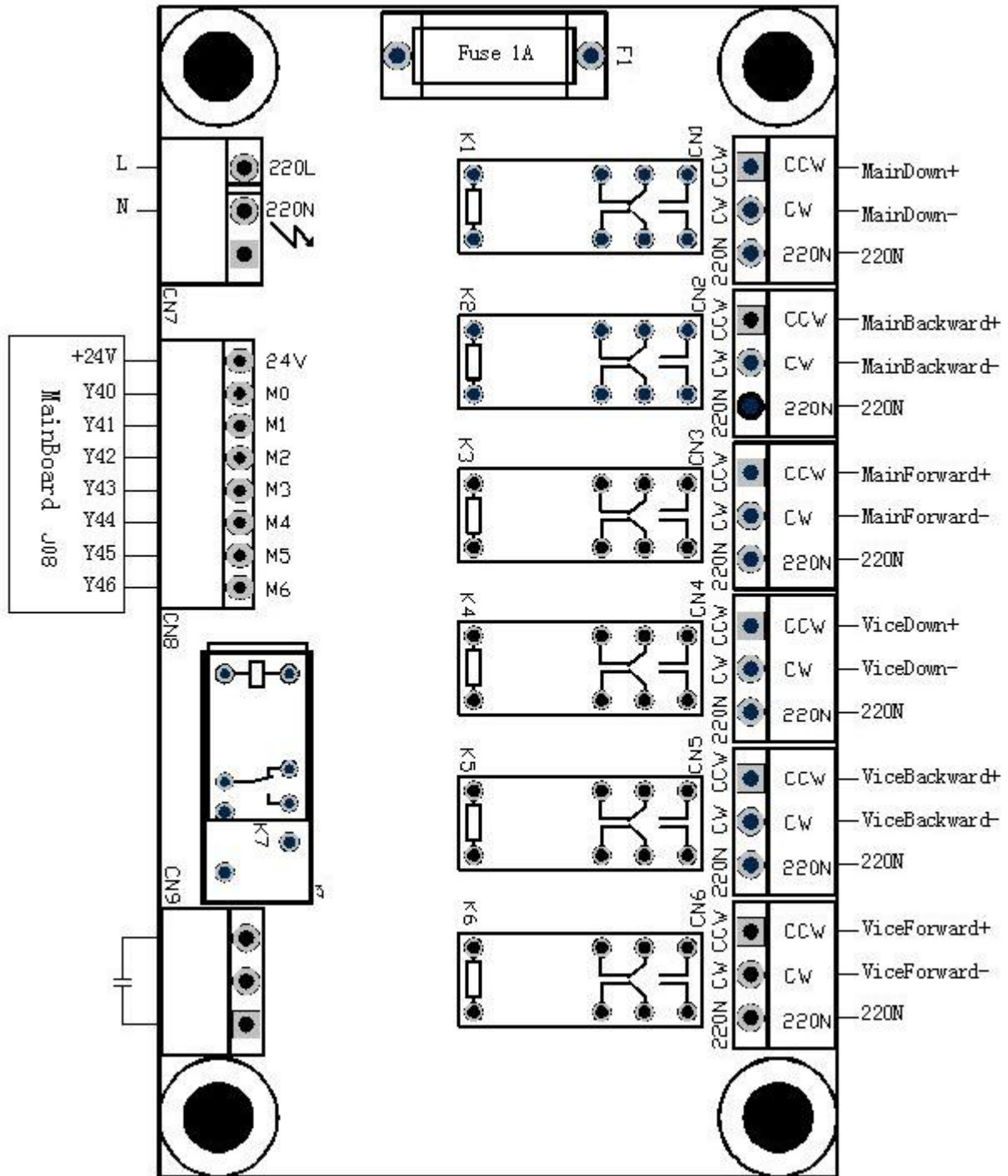
90. Traversing out position exceed the Z.maximum.		
91. Can not descend in outside unsafe area.	Arms need outside safe signal when descending outside.	1. Check the signal.
92. Can not descend in inside unsafe area.	Arms need inside safe signal when descending inside.	1. Check the signal.
93 Trial version limit		
94. Before Traverse out , pose need horizontal.	When traversing, pose is not same as function defined(horizontal).	
95. Before Traverse, pose need horizontal.	When traversing, pose is not same as function defined(vertical).	
96 Before Traverse in, pose need vertical.	When traversing, pose is not same as function defined(horizontal).	
97. Before Traverse , pose need horizontal.	When traversing, 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 horizontally, can not vertical without mold opened signal.	Need mold opened signal to pose vertically.	
103 Outside safe limit off before pose changing.	Pose vertical/horizon, 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.Main VPPoleOn,Main Down PoleOn	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 nearly 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 nearly 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 descending.	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.

9.Interface 9.1 The Main Control



9.2 Adjust the position of board



9.3 Servo wiring and parameter setting

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

9.3.1 Panasonic A5

Panasonic servo drive parameter setting A5

No.	Description	Value
Pr0.01	Control mold	0
Pr0.05	Pulse input port	1
Pr0.06	Pulse polarity	0
Pr0.07	Input pulse style	1
Pr0.08	Pulses per cycle	10000
Pr0.11	Output Pulses per cycle	2500

Panasonic servo drives wiring A5

System		A5 servo		
Signal	Description	Pin	Signal	Description
P+	pulse output	3	PULSH1	Pulse Input1
P-		4	PULSH2	
S+	Direction output	5	SIGNH1	Pulse Input2
S-		6	SIGNH2	
GND	GND	13	GND	Logical GND
+24V	+24V	7	COM+	Power+
0V	24VG	41	COM-	Power-
		29	SRV-ON	Servo enable
		36	BRKOFF-	Brakes(Up and down the shaft)
		36	ALM-	
SRDY	Servo ready	37	ALM+	Servo Alarm

Note:Up and down the Shaft drive BRKOFF + (11) terminal and COM + (7) terminal control brake relay.

9.3.2 Mitsubishi MR-E

Mitsubishi MR-E servo drive parameter settings

(Servomotor resolution of 131072 pulses / rev)

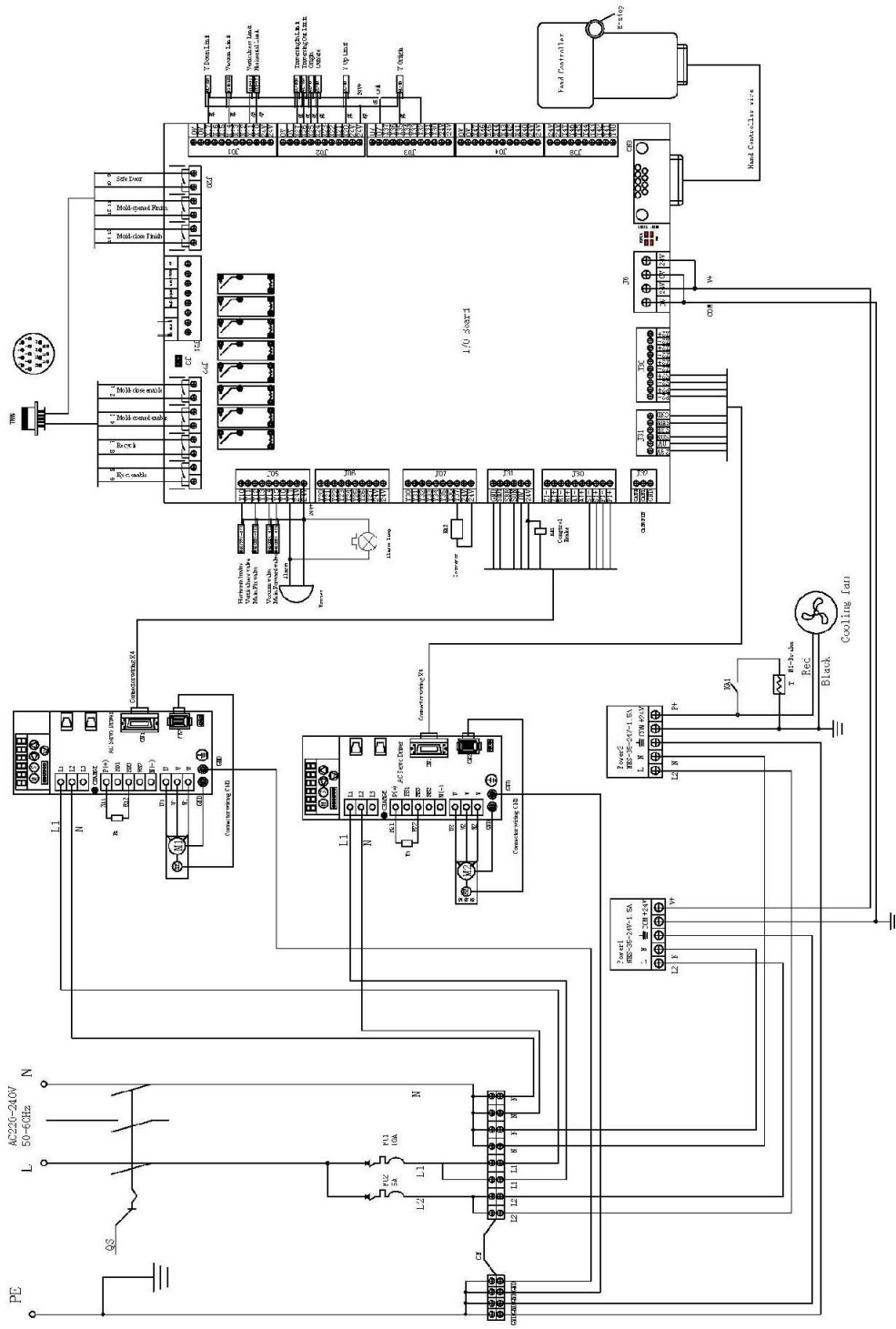
No.	Description	Value
No.0	Control mode	***0
No.1	功 Function Select a brake signal (CN1-12)	0012
No.3	Numerator of Electronic Gear	14
No.4	Denominator of Electronic Gear	1
No.21	Input pulse style	0001
No.27	Encoder output pulse rate	14
No.54	Function Select 9 (output pulse rate)	1***

Mitsubishi MR-E servo drives Wiring

System		MR-E Servo		
Signal	Description	Pin	Signal	Description
P+	Pulse output	23	PP	Command pulse input 1
P-		22	PG	
S+	Direction output	25	NP	Command pulse input 2
S-		24	NG	
GND	GND	14	LG	Control common
+24V	+24V	1	VIN	Signal Power+
OV	+24VG	13	SG	Signal Power-
SRDY	Servo ready	9	ALM	Alarm

Mitsubishi servo drive terminal CN1: 6 (LSP), 7 (LSN), 4 (SON), 8 (EMG) required and 13 (SG) shorting Note: Up and down the shaft to use servo drive MBR (12) signals and VIN (1) terminal control brake relay

10. Electric principle diagram



Specifications subject to change without notice!