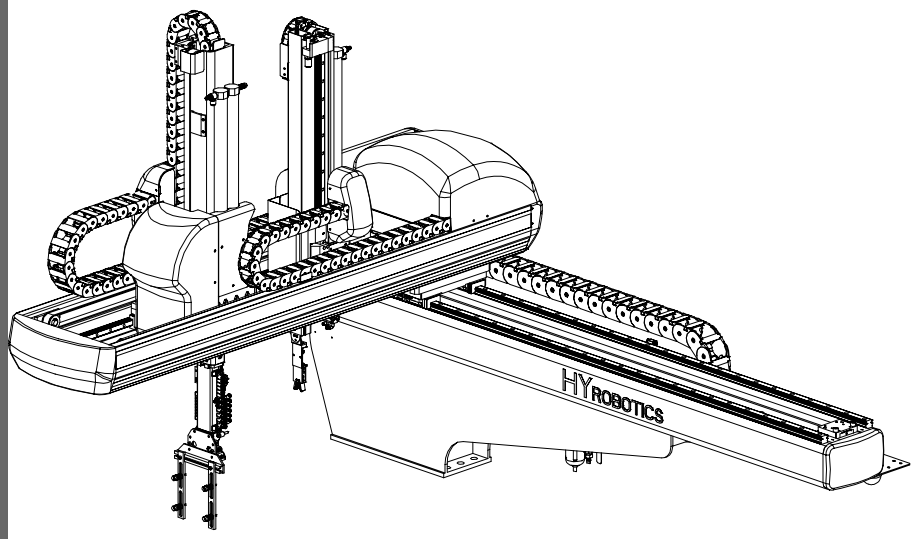
User Manual

VECT Take-out Robot

- VECT-100S/D
- VECT-200S/D
- VECT-400S/D
- VECT-800S/D
- VECT-2000S
- VECT -300SI/DI
- VECT -600SI/DI
- VECT -1300S/D
- VECT -3000S



Read this manual completely prior to installing, operating or performing maintenance on this equipment

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HYROBOTICS

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- Any recommendation about manual amendment is always welcomed.
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VECT User Manual
Ver 1.0

Attention Marks

Danger, Warning, Caution, Notice

This document use following attention mark for the safety of operation

⚠DANGER	If the actions indicated in a “ DANGER” are not compiled with, death or serious damage of major equipment could results.
⚠WARNING	If the actions indicated in a “ WARNING” are not compiled with, serious injury or major equipment damage could results.
⚠CAUTION	If the actions indicated in a “ CAUTION” are not compiled with, some injury or damage could results.

NOTICE	A “ NOTICE “ provides supplementary information, emphasized a point or procedure, or gives a tip for easier operation.

OPERATIONAL WARNINGS

DANGER

- The robot must be installed in a safe and secure manner by professionals familiar with the structural engineering principles related to the installation of large industrial equipment. The information on the following pages can be used as a guide to help you install your robot. The customer must have the installation plan for the selected site verified to be adequate by a structural engineer or a similarly qualified professional. HY Robotics Co.Ltd can not accept any responsibility for damage due to improper installation

- The robot motion area is as follows, this area is the dangerous area of the robot. Be sure to operate the robot outside the safety fence. If you enter the robot motion area during Operation, a serious accident could result.

WANRING

- Do not enter robot motion area or inside the safety guard during robot operation. Do not touch or do not allow other objects interfere with the safety fence.

- Do not remove or open safety guard during robot operation. Do not operate robot inside of the safety guard .

- Do not place any cups or bottle that containing water or liquid on the top of robot or controller. It may cause of electric shock.

- Do not place any small metal (Clip, Screw, Tool, etc) on the robot body and control box. If such a piece of metals get in to the inside of robot body or controller, a electric short may occur and cause of fire.

- Do not place any heavy obstacle or object on the robot body and controller. It may damage the robot surface as well as deform the structure of robot and it may fall directly to the person.

- Do not use an extremely flammable spray near by the robot. It may cause a fire.

- If any air leakage is detected from robot , stop immediately the robot or activate E-Stop function. Lock out and Tag out until the problem fixed.
- When an error occur during operation, stop the robot immediately, find the cause of error and follow the step to re-start robot.

- Make sure following before turn on the power of robot
  - Confirm there in no person in the motion area of robot
  - Confirm the location of handy controller and tool is required place
  - Confirm there is no obstacle on the robot and in the area of robot motion

WANRING

- If any of the following cases should occur, stop the operation with E-Stop button immediately and turn off the power. If you continue the operation of machine under such conditions, a fire may result in the worst case.
  - When fume rises from the robot body or control box, or the outside surface of the robot emits abnormal heat.
  - When there is any abnormal noise from the robot.
  - When any water, or foreign obstacle is inside of the robot

- Stop the robot immediately when abnormal symptom happens during operation. When an error occurs during operation, the robot stops and alarm sounds and the error code displays on the handy controller. Press Stop button to silence the alarm. Check error table for a description of the error.

CAUTION

- If the following items are contained to the air, do not use it. Use only clean air.
  - Acid
  - Organic solvents
  - Chlorine gas
  - Sulfur dioxide
  - Compressor oil

- Do not drop or give any strong shock the the handy controller. It may be cause of malfunction.

- Handle with care with pneumatic line. It may be cause of leaks.

- Make sure the operation environment (Motion area, Safety Guard) should be proper for operation of machine equipments.

- Operate the robot with only healthy , good and normal body and mental condition.

- Do not use handy teach palm pendant (Controller) which contact with water or oil

- Make sure the operating environment is as follows
  Operation Temperature : 0℃ ~+ 40℃ (32°F ~+ 104°F)
  Storage Temperature : -25℃ ~+ 55℃ (-13°F ~ + 131°F)
  Humidity : 35 % RH ~85 % RH (without condensation).

CAUTION

- When setting up the robot arm in the mold area by manual operation, take really care that the robot arm does not contact with the mold or tie bar. Make sure to operate the robot outside the safety guard or the place that is not reaching by robot motion.

- Do not use an operation fluid other than clean compressed air

- Regulate the air pressure as specified.

- If don't operate the robot for several days or long period of the time due to plant shutoff or vacation, Turn OFF the control power.

- Proper working clothes, helmet and protective shoes required for operating and setting up the robot (Personal protective Equipment)
  - Do not operator robot without safety helmet or shoes.
  - Do not wear necktie and necklace, bracelet etc

MAINTENANCE WARNINGS

WARNING

- Before cleaning, inspecting, repairing, adjusting, or performing maintenance on the take-out, be sure to turn OFF the control power and pull out the plug and follow Lock out / Tagout Procedure. If you attempt to perform the cleaning without turning OFF the control power, electric shock. may happen.

- Only a qualified person is allowed to open the cover or panel of the take-out robot.

- Assign one qualified person who will control safety of the robot. and need to be trained by the manufacturing company or agency how to control robot and about safety

- Be sure to release pneumatic pressure before replacing a filter bowl.

- Before handling ROM, turn off the control power. Use ROM Remover to pull the ROM out. Do not drop the ROM and expose it to strong shock.

POWER RELATED WARNINGS

WARNING

- Handle with care with power cable, do not pull and bend. Do not place heavy object on the cable (No folk lift passing on the power cable). Use cable tie to organize power cable for safety. (Damaged cable could be the cause of fire or electric shock.

- Using unspecified Extension cable cause abnormal symptoms including heat and fire.

- Only qualified personal should try to install Electrical power and ground to the robot.

- Connect the earth terminal of the plug to the earth terminal of the plug socket

WARNING

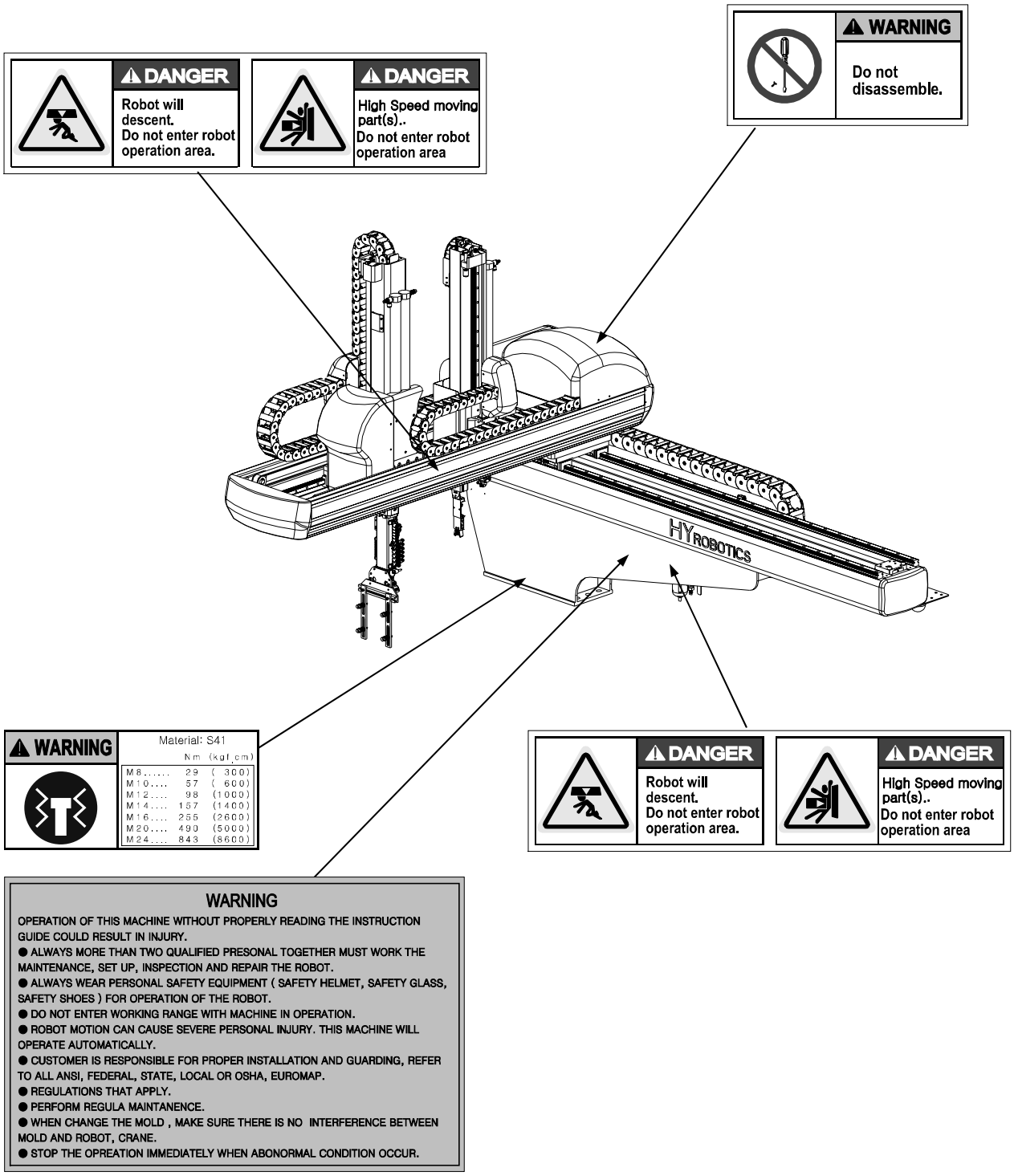
- Power off when connect or disconnect any connector of robot

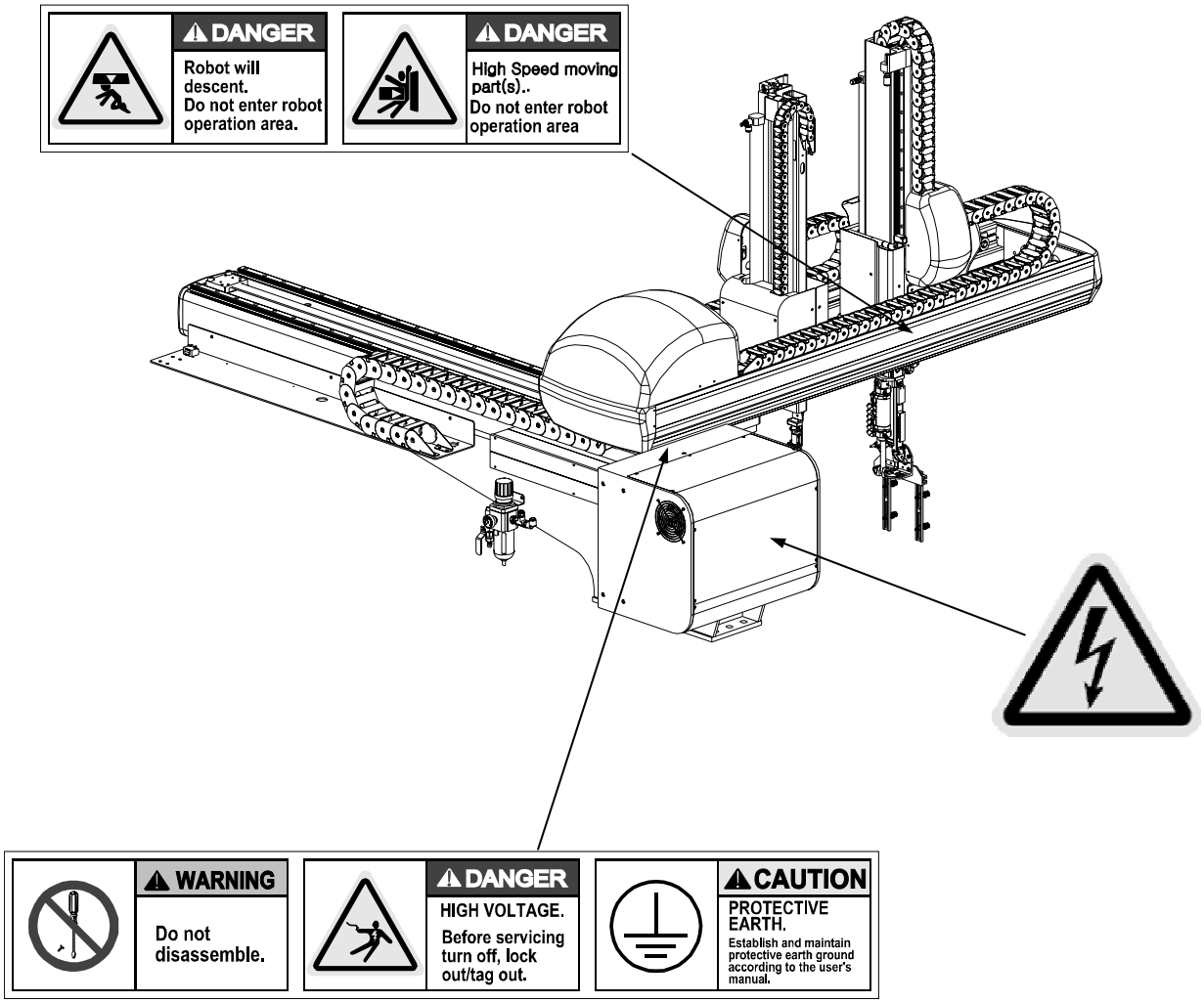
- Lockout / Tagout Injection Molding Machine , Robot before opening the control box

- Connect the earth terminal of the plug to a class D grounding terminal

Safety Signs

There are safety signs on the robot like below figures. Respect and follow the messages on these signs when operating or performing maintenance on the robot. Do not remove these labels or signs




DANGER
Robot will descent.
Do not enter robot operation area.
DANGER
High Speed moving part(s)..
Do not enter robot operation area
WARNING
Do not disassemble.
DANGER
HIGH VOLTAGE.
Before servicing turn off, lock out/tag out.
CAUTION
PROTECTIVE EARTH.
Establish and maintain protective earth ground according to the user's manual.

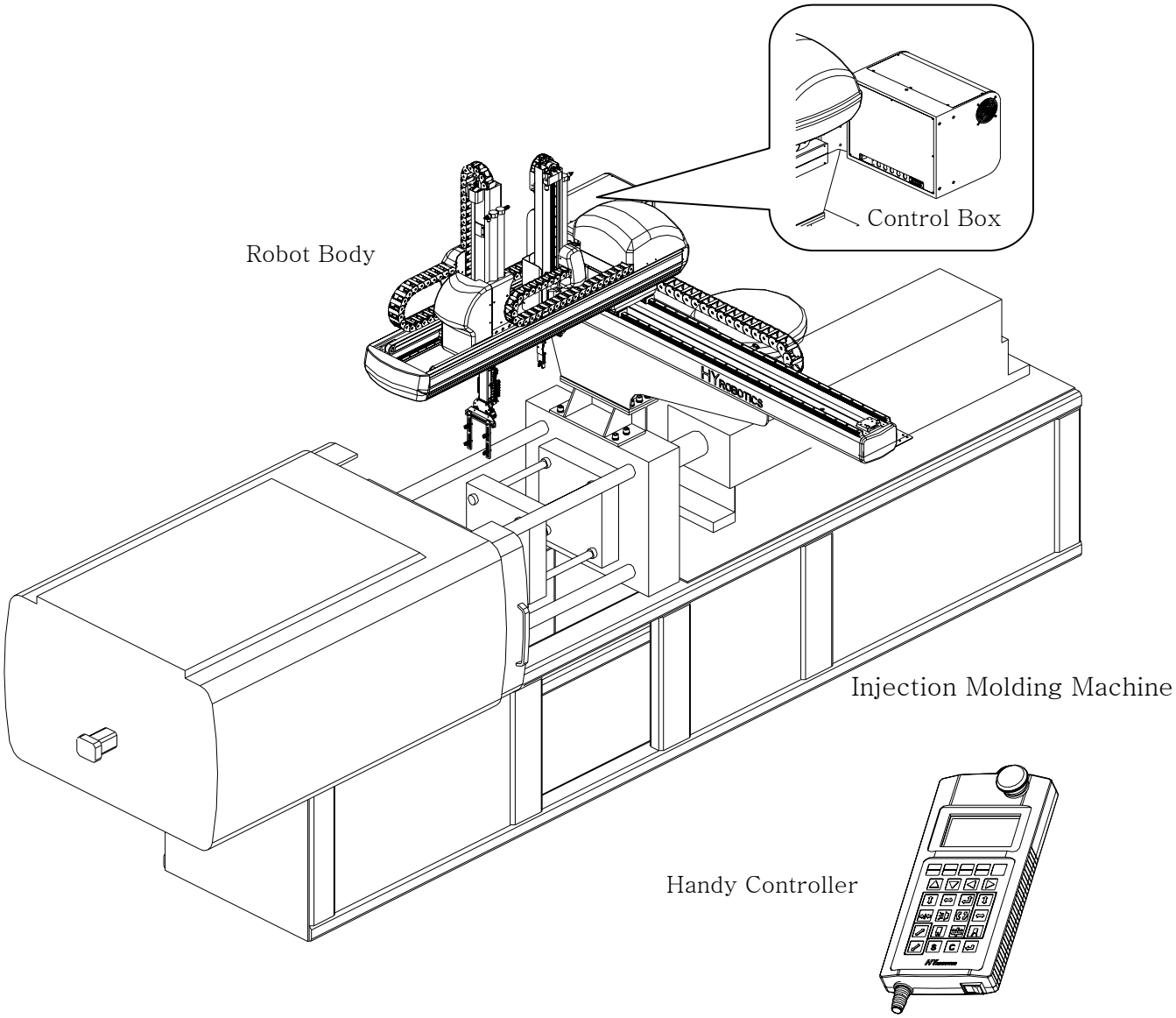
CONTENTS

1.Introduction

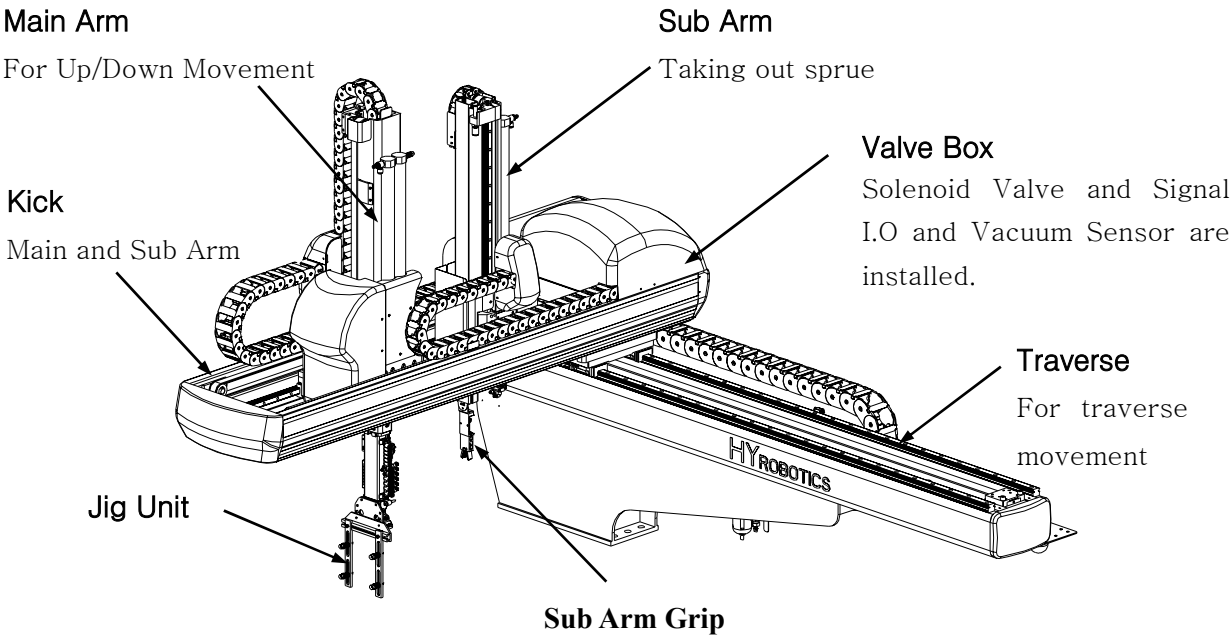
1.1 Robot Assembly

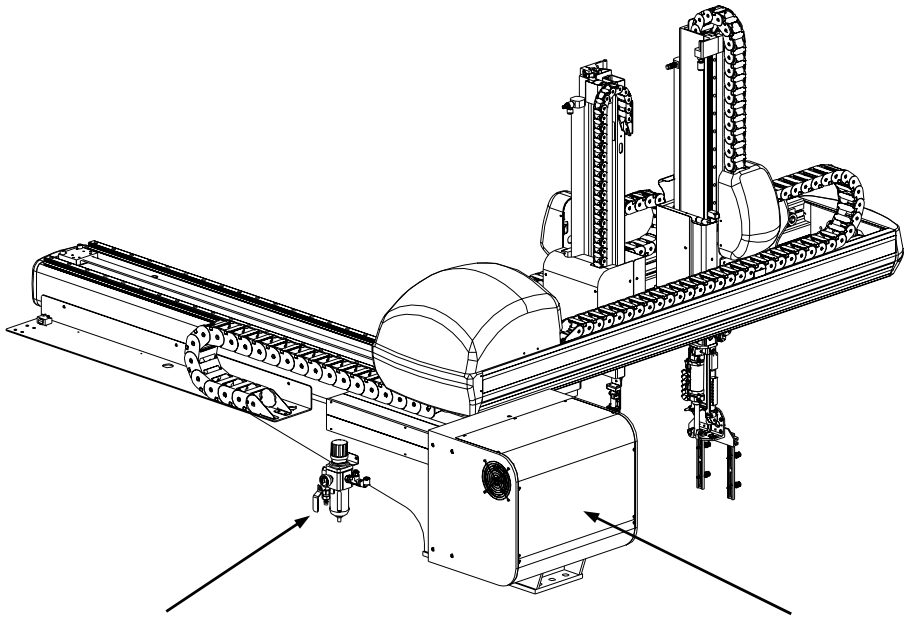
This Robot is consisted of

- Robot Body
- Interlock and Control Box
- Handy Controller

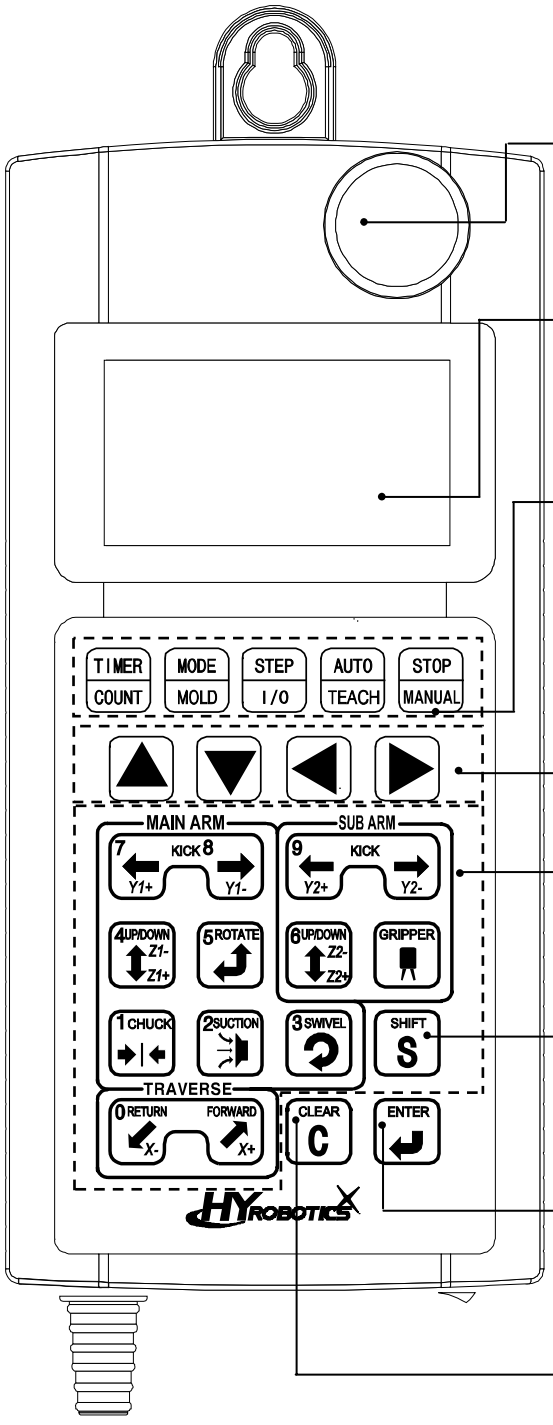


1.2 Robot Body





1.3 Handy Controller Function



● ROBOT EMO Button

Press ROBOT EMO Stop will stop operation of Robot and Activate IMM EMO Stop (Emergency)

● LED Display

Display current operation status, error message, initial settings

● Function Keys

These keys are used to access each setting screen and to switch between Auto and Manual Mode.
To use the function on the bottom half of a key,
Hold down the S(Shift) key and then press the function key

● Arrow Key (Up / Down, Left /Right)

Up / Down key move cursor to each item. Left/Right key select each mode.

● Manual Operation Key (Also Numeric Key Pad)

Operate each axis or robot in manual mode
For Timer setting, Search mold number and Input Numeric number.

● S(Shift) Key

S key will use for upper case commend

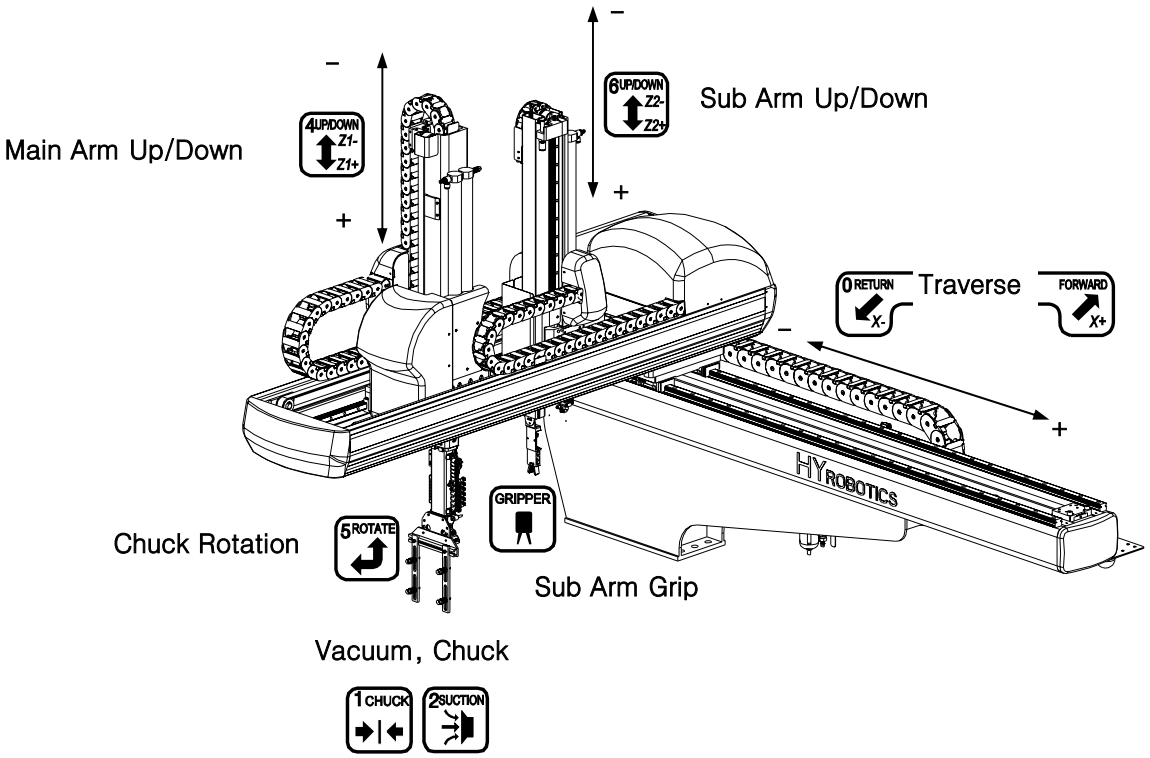
● Enter Key

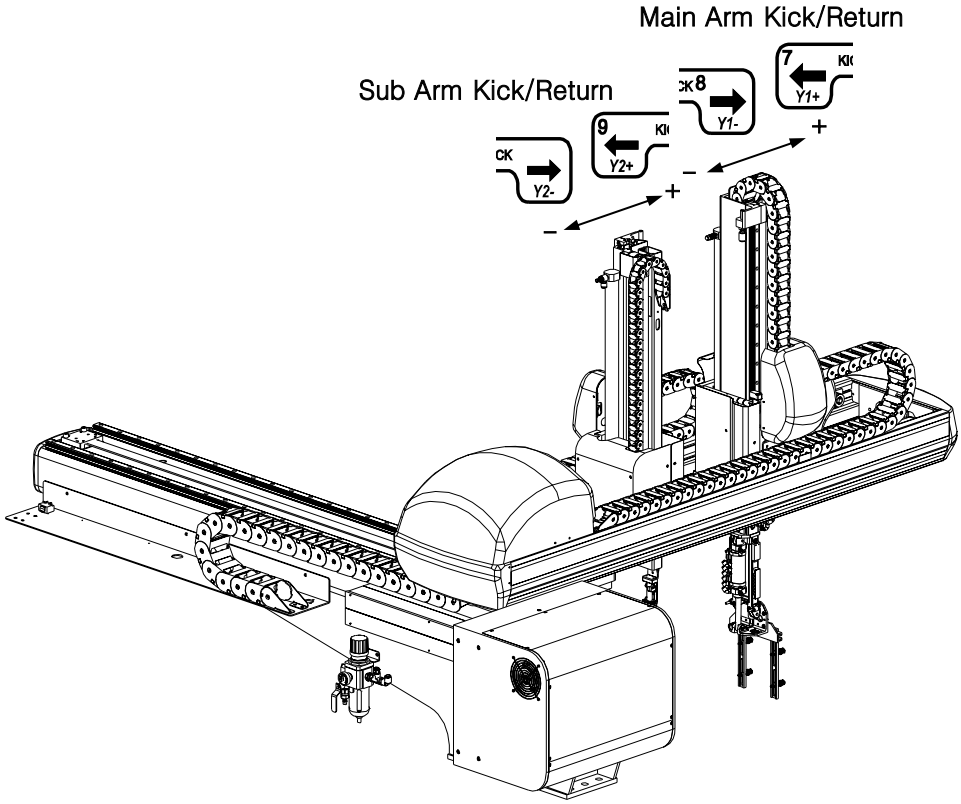
Store the number and selected mode

● C Key

Clear Error, Clear text or Cancel

1.4 Each Axis

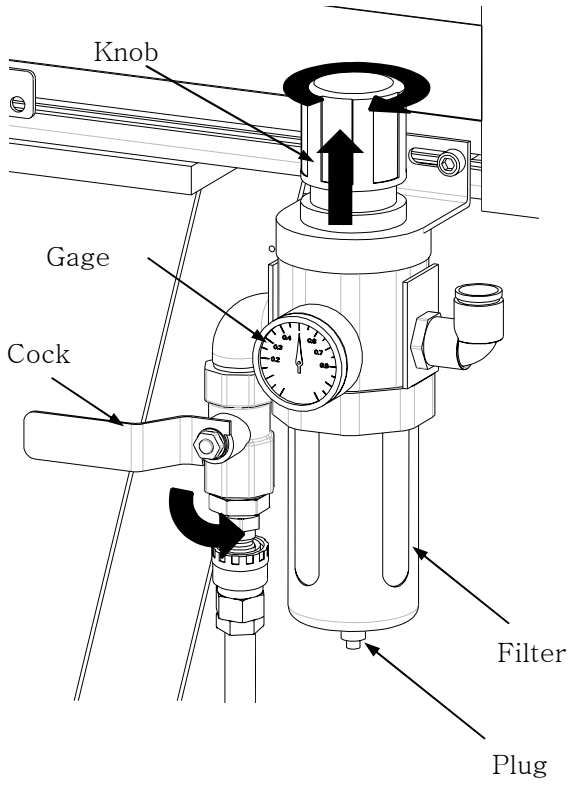

Main Arm Up/Down
4UP/DOWN Z1- Z1+
Sub Arm Up/Down
6UP/DOWN Z2- Z2+
0 RETURN X-
Traverse
FORWARD X+
HYROBOTICS
Chuck Rotation
5ROTATE
GRIPPER
Sub Arm Grip
Vacuum, Chuck
1 CHUCK
2SUCTION


Main Arm Kick/Return
Sub Arm Kick/Return
7 Y1+
8 Y1-
9 Y2+
Y2-

2.Before Operation

2.1Before Operation

2.1.1 Air regulator



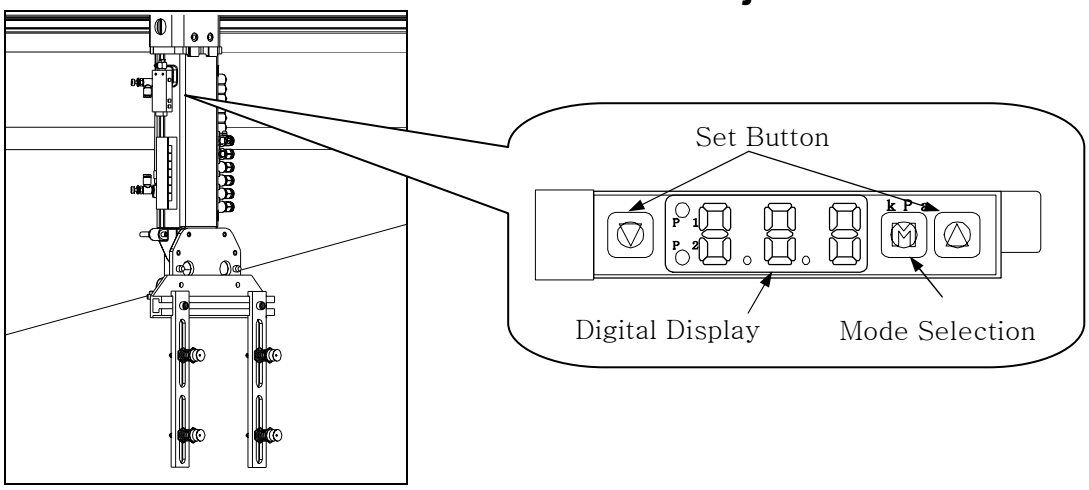
Make sure the robot arm is retracted
Beware that the robot may move suddenly as the system is pressurized.

2. Turn Cock counterclockwise

3. Pull Up the adjusting knob and adjust the pressure to [5.9 × 10^5 Pa(Gauge) or 6 kg/cm^2] and Push down to set

* Remove water from air regulator regularly if required.

2.1.2 Vacuum Verification Sensor Adjustment

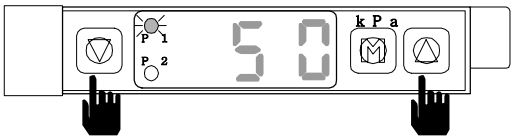


[Main Arm Up/Down]

Vacuum Sensitivity Adjustment (Normally not required)

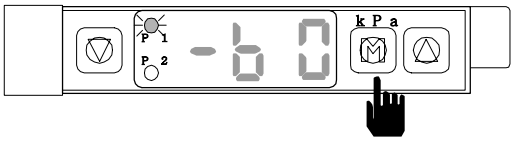
- **STEP 1**

Press [M] and [△] at the same time
P1 will blink.



- **STEP 2**

Press [▽] or [△] , set pressure -60(kpa) .

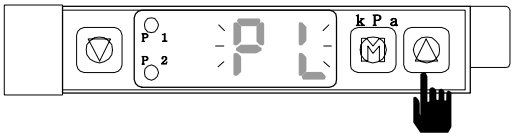


- **STEP 3**

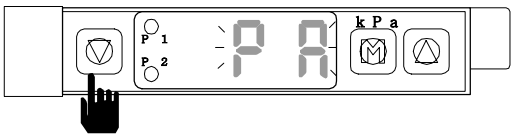
Press [M] more than 1 seconds.
Set up finished, and LED will display current Vacuum pressure.

Lock and Unlock for Vacuum Sensor value

Locking Vacuum Sensor Value will prevent setup value from changing by any mistake



Press [△] more than 3 seconds. “PL” will blink twice and Sensor will lock.



Press [▽] more than 3 seconds “PA” will blink twice and sensor will unlock.

2.2 Before Starting (Preventative Maintenance Schedule)

Before you start daily operation of the robot, perform preventive maintenance.

- Daily

- Check air Pressure is 5~6.5 kg/cm^2 or 5 ~ 7 × 10^5 Pa(Gauge)]
- Inspecting filter regulator unit : Check the bowl for water and contamination and for correct pressure.
- Check Hoses and Cables : Check for kinks, cuts and tears. Replace as needed.
- Inspecting Shock absorbers and cushions. : Make sure the are operating smoothly
- Checking Gripper return spring : Check that the gripper return spring is operating properly
- Checking residue buildup: Inspect the shafts and gripper for buildup of plastic residue. Clean as necessary.
- Checking Interlock functions. : Make sure the interlock functions are working properly.
- Checking part verification: Check that the parts verification is working properly.
- Check Suction cups

- Weekly or as often as needed.

- Check EOAT mounting screw including gripper : Check EOAT screw for tightness . Tighten as required.
- Inspecting fittings and mounting hardware : Check all fittings, screws, and component mounting hardware for tightness. Tighten as needed.
- Check the safety latch cylinder for Down. : Make sure the safety latch cylinder is working properly
- Testing the Emergency Stop Button. : Verify that the emergency stop works properly.

- Monthly

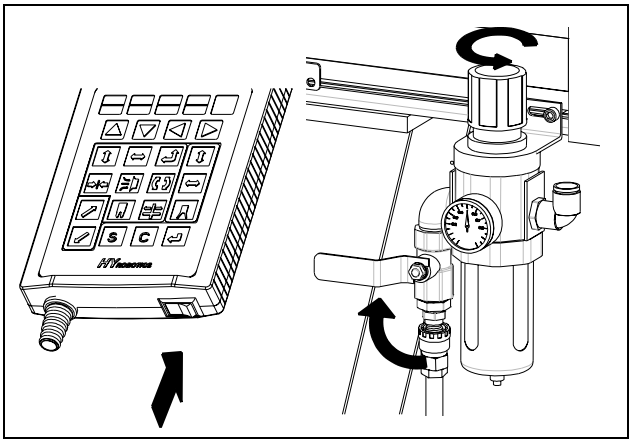
- Inspecting the filter regulator : Check that the filter regulator is set at the correct pressure. Check the filter and clean or replace it as needed.
- Checking the solenoid valves : Check that the solenoid Valves are working properly. Replace as needed.
- Checking all electrical cables : Inspect all electrical cables for cuts, burns and replace as required
- Checking the exhaust filter.
- Inspecting electrical terminal : Check all electrical terminals for tightness, adjust as required.

- Inspect each axis cylinder, make sure operation and the cushion is working properly
- Inspect body for any damage during mold set up or other operation

2.3 Down Stroke Adjustment. (Factory Set)

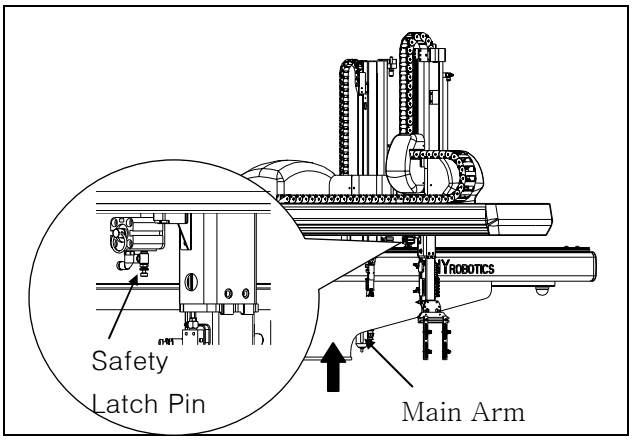
Adjust the Down Position with Stopper (This requires only one time when install the robot with HYRobotics Installation Engineer. Do not adjust this position by your self, contact factory first)

NOTICE This information is designed for main arm. Follow same step for sub arm as described below. (Up to 300 Tons IMM)



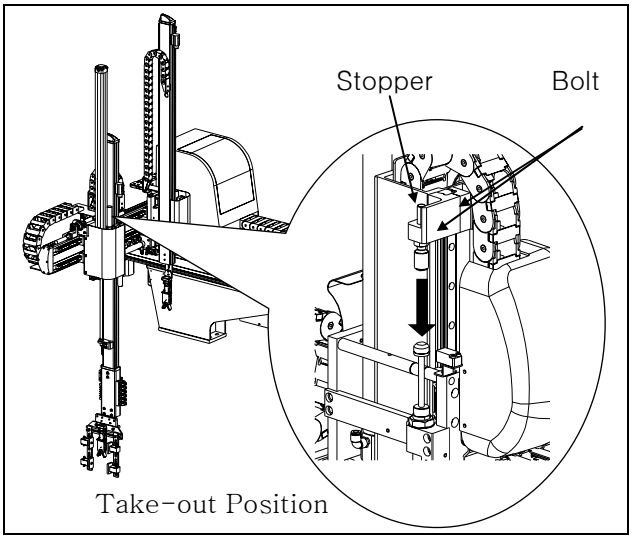
● STEP 1

Lock out / Tag Out Injection Molding Machine.
Turn off Power and depressurized system with air regulator or disconnect air. (Do not use this method for over 300 IMM Tons Robots.)



● STEP 2

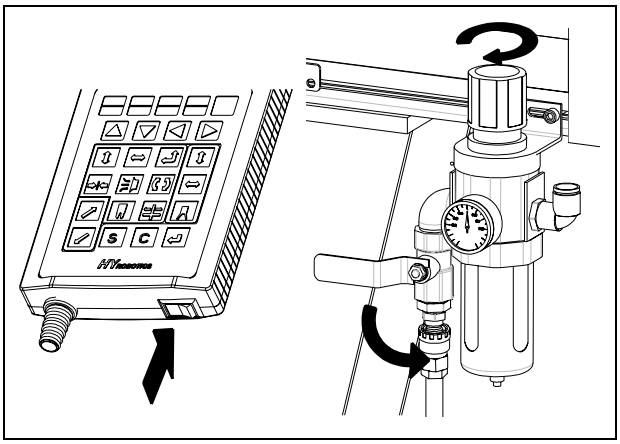
Slowly lift Arm up and Pull Safety Latch Pin.
Release Arm will allow it Down by gravity.
(Danger : Do not use this method for over 300 IMM Tons Robots.)



● STEP 3

Loosen the bolt and find proper location of EOAT for parts with pushing Shock absorber with Stopper. And Tighten the bolt
Precision positioning for finding suction cups position is required in EOAT location adjustment.
Warning : Might not required to change after 1 time set up. Contact factory to change VECT 400 ~ 1300 Series Descent Complete Position. Do not use above method to change VECT 400 ~ 1300 series. Arm will be very heavy with Gravity)

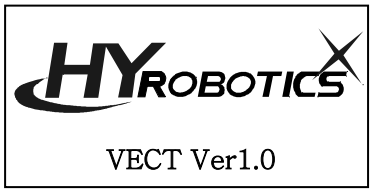
2.4 Speed Control for Down



● STEP 1

Normally it is not necessary to adjust speeds because they are factory set.

Power On and pressurized system with air regulator or connect air.

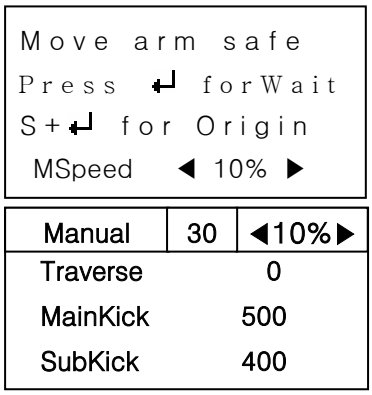


● STEP 2

HY Logo will displays and move to Servo Origin scree.

⚠DANGER

Before operate Servo Origin, make sure the robot arm is in safe location. If robot arm is not if safe location, move robot arm manually to safe location with manual button.

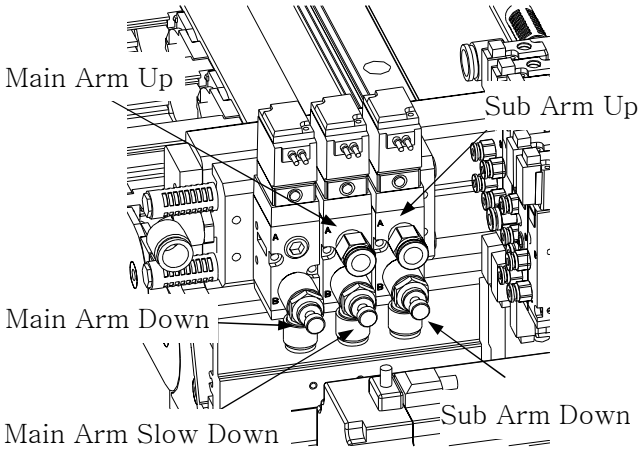


● STEP 3

Press ENTER, it will activate origin, Robot arm will go to origin point and displays manual model. If robot is in operation, Robot arm will move to the origin point with the order of Kick Return, Ascent, Chuck Rotation, Traverse.

NOTICE Set ascent and descent speed of main arm and sub arm with speed setting.

Speed Control for Down/Up



● STEP 4

There are two different speed setting. One is in mold (High Speed), the other one is outside of mold (Low Speed : Parts Protection Feature when robot unloading parts after mold). We call it Slow down, or 2nd down. Adjust each speed with thumb screw.

● STEP 5

Make sure there is no interference with robot motion area.

Press 

for main arm descent(down),

press 

for sub arm, check the speed.

NOTICE

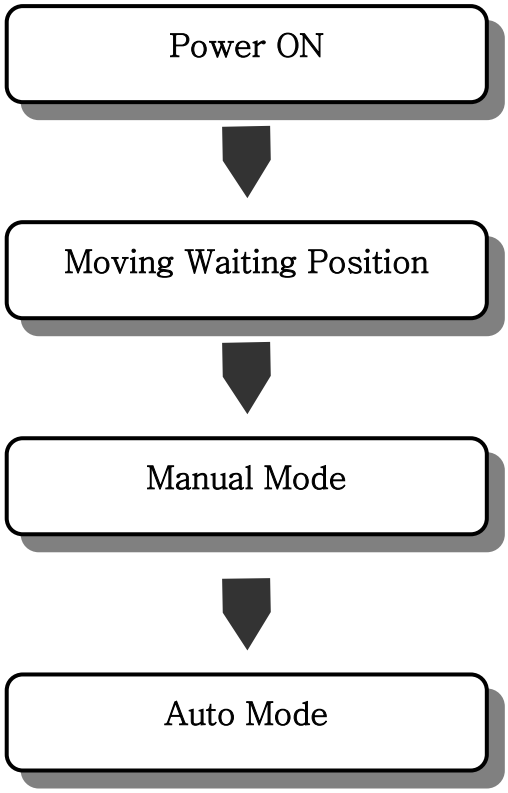
** Set Slow Down Speed first and then set down speed.

Order of Setting	Description
Main Arm Slow Down	Outside of Mold Descent Speed (Slow Down)
Main Arm Down	In Mold Main arm descent Speed
Sub Arm Down	Sub arm descent Speed

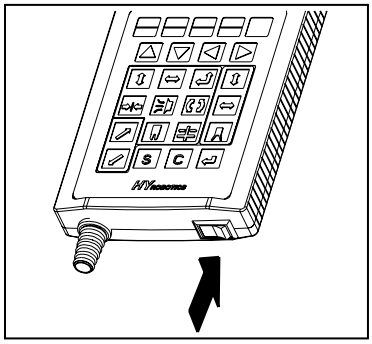
3. START UP / STOP

3.1 STEP FOR START-UP

Follow step for Auto Operation

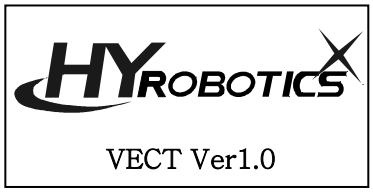


3.2 Start Up



● **STEP 1**

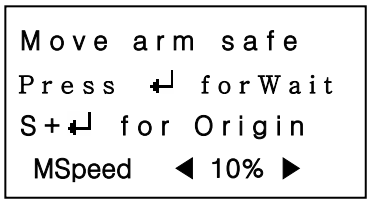
Turn On Power..



● **STEP 2**

It will display System Version. And move to origin screen.

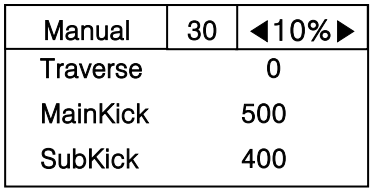
⚠DANGER Before move to waiting position, make sure the robot arm is in safe location. If robot arm is not if safe location, move robot arm manually to safe location with manual button.



● **STEP 3**

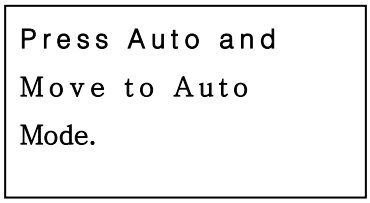
Press ENTER for origin point of robot motion.

And then screen will display manual operation screen.



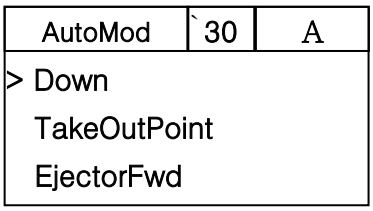
● **STEP 4**

Press AUTO TEACH and move to Auto Message Screen.



● **STEP 5**

Press AUTO TEACH and move to Auto Message Screen.



● **STEP 6**

Robot arm will move initial position and start Auto Operation

3.3 Stop Operation

> **⚠ WARNING** Follow the next step to stop the robot. Power off and Disconnect air

AutoMod	30	A
> Down		
TakeOutPoint		
EjectorFwd		

● STEP 1

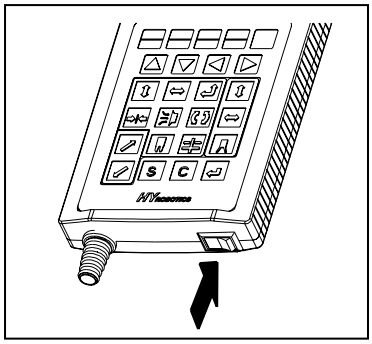
Press STOP MANUAL for Auto Mode

It will stop the operation after finish to run last step. And moves to manual mode.

Manual	30	◀10%▶
Traverse		0
MainKick		500
SubKick		400

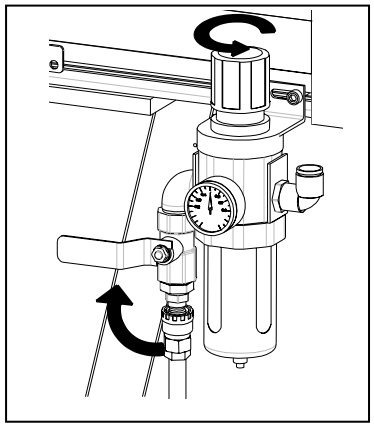
It will not stop in the middle of step . If robot runs any step, it will finish the step and stop before next step. (Due to Pneumatic Operation Pressure)

> **⚠ WARNING** Turn Off Handy Controller, Power off Molding Machine.



● STEP 2

Turn Off Power.

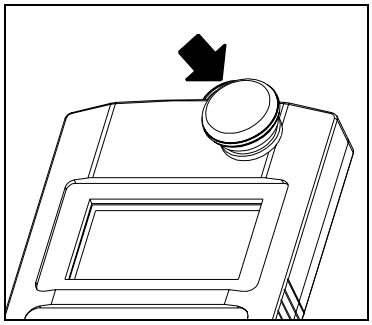


● STEP 3

Disconnect Air Pressure.

3.4 Emergency Stop (EMO Stop)

Press ROBOT EMO button in any dangerous situation (Protect People, Robot, Mold Etc)



- **STEP 1**

Pressing ROBOT EMO button.

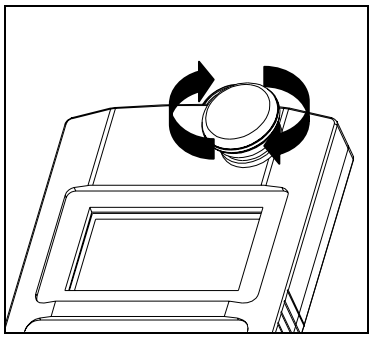
Robot arm will go to waiting position and stop Operation.

Error
097 ROBOT EMO Restore ROBOT EMO Button

Alarm and buzzer will be on and Error message will appear in the handy controller.

3.5 Restoring Emergency Stop

⚠ WARNING Eliminate Emergency Environment before restoring ROBOT EMO button.



- **STEP 1**

Eliminate Emergency Stop Situation.

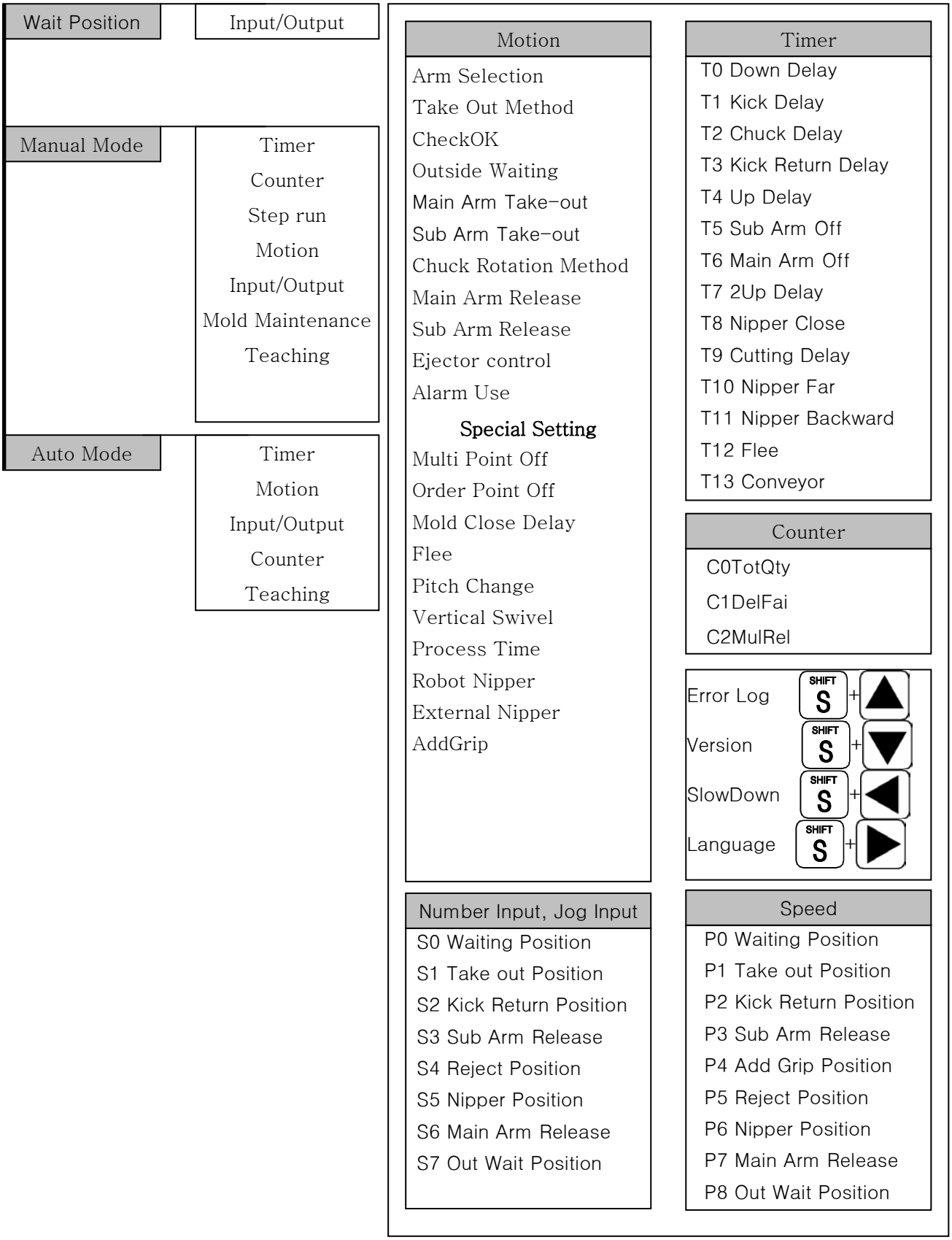
Rotate ROBOT EMO button to Clock Wise

- **STEP 2**

Press CLEAR C and stop Alarm and Buzzer, moves to orgin.

4 OPERATION

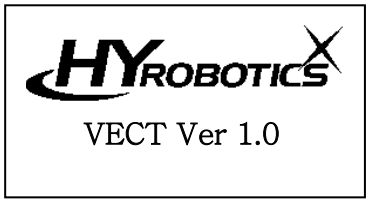
4.1 Screen Structure



4.2Initial Screen

Power on displays Logo and Robot Name/type , Robot Initiation and Move Origin Point

NOTICE	Selecting Outside Waiting Option will initiate Robot move to the selected location (Outside of Mold)

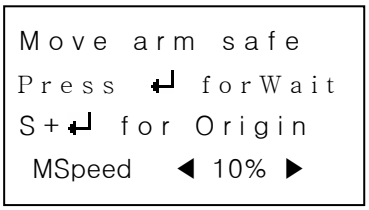


4.3 Move to Waiting Position

(1) Description

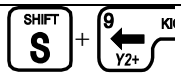
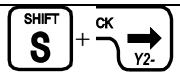
Selecting Outside Waiting Option will initiate Robot move to the selected location (Outside of Mold) . Handy controller screen displays manual operation after finish origin point searching

NOTICE Before move Robot arm to Origin Point, make sure the robot arm is in safe location. If robot arm is not if safe location, move robot arm manually to safe



(2) Button Function

NO	Button	Description
1	ENTER	Save the setting or move origin point or valve will be initial setting.
2	STEP / I/O	Display input / output signal screen
3	FORWARD X+	Operate Robot arm moves Traverse X+
4	0 RETURN X-	Operate Robot arm moves Traverse X-
5	7 KI Y1+	Pressing 1 Times for this key will move main robot arm to Y1+ direction with the value of Takeout or Take out return position. When Parts Array release, pressing this key activate to Robot arm to move to Kick Return Postion value when Clamp side take out parts, If take out is from Nozzle side, Robot arm moves the value of Take out Position value.
6	SHIFT S + 7 KI Y1+	Move main arm to Y1+ direction
7	K 8 Y1-	Pressing 1 Times for this key will move main robot arm to Y1- direction with the value of Takeout or Take out return position. See No. 5 for Parts Array release.
8	SHIFT S + K 8 Y1-	Move main arm to Y1- direction
9	9 KI Y2+	Pressing 1 Times for this key will move Sub robot arm to Y2 + direction with the value of Takeout or Take out return position. See No. 5 for Parts Array release.

NO	Button	Description
10		Move Sub arm to Y2+ direction
11		Pressing 1 Times for this key will move Sub robot arm to Y2- direction with the value of Takeout or Take out return position. See No. 5 for Parts Array release.
12		Move Sub arm to Y2 - direction
13		Press Descent Button Move Main Arm Down, Press again, Move Main Arm up
14		Press Descent Button Move Sub Arm Down, Press again, Move Main Arm up
15		Press Rotate. Rotate Chuck, Press again, Chuck rotate return.
16		Press Chuck Chuck , Press again, Chuck Off
17		Press Suction Suction, Press again, Suction Off
18		Press Swivel. Swing Chuck, Press again, Chuck swing return. (Option)
19		Press Gripper Grip and Grip Off

4.4Manual Operation

(1) Description

In the manual operation mode , robot can be operated with manual operation button

Selecting Outside Waiting Option will initiate Robot to move to the selected location (Outside)

⚠DANGER CLEARING ROBOT MOTION AREA : It is the responsible of the operator to verify that the robot motion area is clear before any robot operation.

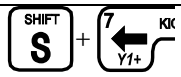
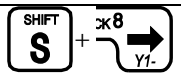
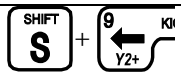
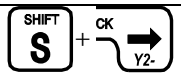
Manual	30	◀10%▶
Traverse		0
MainKick		500
SubKick		400

(2) Button Function

⚠DANGER Do not enter robot motion area. If anyone enter the robot motion area during Auto operation or Manual Operation, serious accident could results.

NOTICE Robot arm will not descent if mold is not open with safety door closed

NO	Button	Description
1	TIMER / COUNT	Press Timer button, LCD displays timer mode for delay time settings.
2	SHIFT S + TIMER / COUNT	Press Timer button with Shift button. (Counter) LCD displays Counter screen, Counter screens display Total Q'ty, Detection Fail, Mult Point Release.
3	MODE / MOLD	Press Mode button, LCD displays Mode screen (Current Motion Mode).
4	SHIFT S + MODE / MOLD	Press Mode Button with Shift button, (Mold) LCD displays Mold Maintenance screen. (Search Mold Number, Open and Create, Delete Mold File : Creating new mold)
5	STEP / I/O	Press Step Button LCD displays Step Motion Mode screen (Robot can operate Step by Step Operation with Down arrow key)
6	SHIFT S + STEP / I/O	Press Step Button with Shift Button, (I/O) LCD display Input / Output Signal. (Right arrow will show Output)
7	AUTO / TEACH	Press Auto Button. LCD displays Auto Mode screen.
8	SHIFT S + AUTO / TEACH	Press Auto Button with Shift LCD display Number input screen to set speed and position with numeric number input.
9	SHIFT S + ▲	Press Up Arrow with Shift Button. LCD displays Error History Screen

NO	Button	Description
10		Press Up Arrow with Shift Button. LCD displays Version Info.
11		Press Shift and Left Arrow button LCD displays Descent (Down) Slow Speed Control Screen
12		Press Right Arrow with Shift Button. LCD displays the commend with changed Language.
13		Operate Robot arm moves Traverse X+
14		Operate Robot arm moves Traverse X-
15		Pressing 1 Times for this key will move main robot arm to Y1+ direction with the value of Takeout or Take out return position. When Parts Array release, pressing this key activate to Robot arm to move to Kick Return Postion value when Clamp side take out parts, If take out is from Nozzle side, Robot arm moves the value of Take out Position value.
16		Move main arm to Y1+ direction
17		Pressing 1 Times for this key will move main robot arm to Y1- direction with the value of Takeout or Take out return position. See No. 5 for Parts Array release.
18		Move main arm to Y1- direction
19		Pressing 1 Times for this key will move Sub robot arm to Y2 + direction with the value of Takeout or Take out return position. See No. 5 for Parts Array release.
20		Move Sub arm to Y2+ direction
21		Pressing 1 Times for this key will move Sub robot arm to Y2- direction with the value of Takeout or Take out return position. See No. 5 for Parts Array release.
22		Move Sub arm to Y2 - direction
23		Press Descent Button Move Main Arm Down, Press again, Move Main Arm up
24		Press Descent Button Move Sub Arm Down, Press again, Move Main Arm up
25		Press Rotate. Rotate Chuck, Press again, Chuck rotate return.

26		Press Chuck Chuck , Press again Chuck Off
27		Press Suction Suction, Press again, Suction Off
28		Press Swivel. Swing Chuck, Press again, Chuck swing return. (Option)
29		Press Gripper Grip and Grip Off

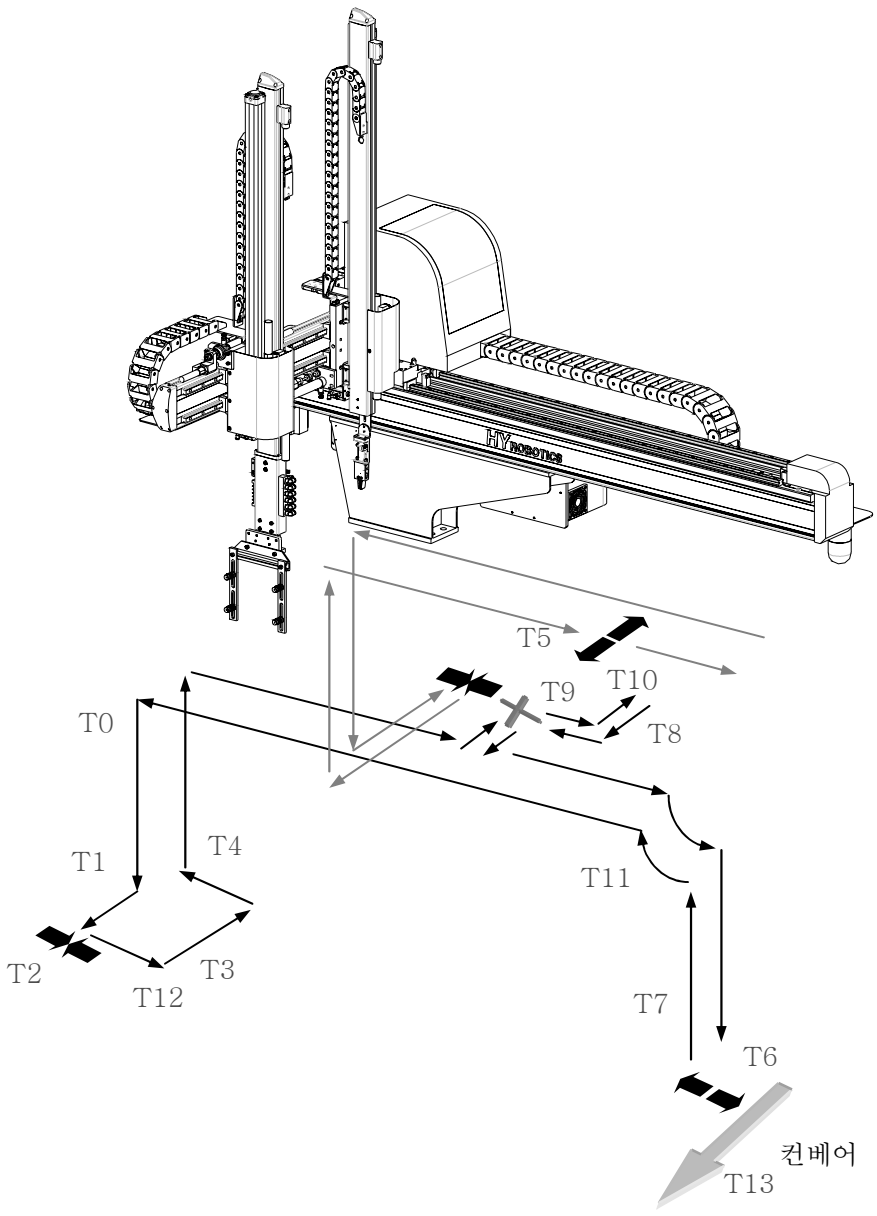
4.1.1 Timer Set Up

(1) Description

Timer setup will control the Robot motion properly with Injection Molding Machine Operation.

> **⚠ DANGER** Timers will not be saved separately with Mold Files. For examples setting T0 as a 0.2 Seconds will make all other mold file use T0 as 0.2 Seconds

Timer	30	A
T0 Down	0.0	0.0
T1 Kick	0.3 <	0.3
T2 Chuck	0.0	0.0



NO	Default(sec)	Display	Description
T0	0	Down	Delay time for Robot arm go in to mold after Mold open
T1	0	Kick	After starting Down, Delay time for Kick Movement
T2	0	Chuck	Chuck Delay
T3	0	KicRt	Delay time to move Main and Sub arm to Kick Return Position.
T4	0	Up	Ascent(Up) Delay
T5	0.5	SOpen	Sub Arm Release
T6	0.3	MOpen	Main Arm Release
T7	0.3	2Up	Delay 2nd Ascent(Up) Delay
T8	0.5	NiCls	Nipper Close
T9	0.5	CutDl	Cutting Delay – Robot Nipper, External Nipper
T10	0.5	NiFar	Nipper Far – Robot Nipper, External Nipper
T11	0.5	NiBwd	Nipper Backward
T12	0.3	Flee	Flee
T13	5.0	Conve	After 2nd Up, Delay time for Conveyor Operation.

(2) Button Function in Timer Setting Mode

NO	Button	Description
1		'<' key moves up and down to select each Timer.
2	Numeric Key	Displays Delay Time.
3		Press the Enter Button to save the change
4		Cancel the Input
5		Stop Auto Operation and Back to Manual Mode
6		Pressing Auto Button will back to Auto Operation Mode

(3) Programming Timer Settings

Timer settings can be viewed and changed using the handy controller under two conditions.

1. When the robot is in Timer Setting Mode. 2. During Auto Mode (While Robot is running)

> **NOTICE**
>
> Timer can be changed during Auto Mode, but cannot be changed during 1 Cycle and Step Operation.
>
> Press the Timer button to move Timer Mode while in Auto Mode

Setting T1 (Kick Delay) to 0.3 Seconds

Timer	30	VX400
T0 Down	0.0 <	0.0
T1 Kick	0.0	0.0
T2 Chuck	0.0	0.0

- **STEP 1**

Press [TIMER / COUNT] move to Timer Mode in Manual Mode

Timer	30	VX400
T0 Down	0.0	0.0
T1 Kick	0.0	0.0
T2 Chuck	0.0 <	0.0

- **STEP 2**

Press [▼], Move < to the T2 (Chuck)

Timer	30	VX400
T0 Down	0.0	0.0
T1 Kick	0.0	0.0
T2 Chuck	0.0 <	0.3

- **STEP 3**

Press [3 SWIVEL], input 0.3

Timer	30	VX400
T0 Down	0.0	0.0
T1 Kick	0.3 <	0.3
T2 Chuck	0.0	0.0

- **STEP 4**

Press the [ENTER] to save the change to 0.3 Seconds

Manual	30	◀10%▶
Travers	0	
MainKick	500	
SubKick	400	

Press [STOP / MANUAL], Move to Manual Mode

4.1.2 Counter

(1) Description

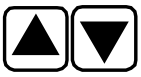
Counter can be viewed and changed using handy controller.

Counter Mode displays Total Production Quantity , Detection Failure Quantity, Multi Point Release.

Counter	30	A
>C0 TotQty	10000	
C1 DetFai	3	
C2 MulRel	2/4	

NO	Name	Description
C0	TotQty	Total Operation (Production) Q'ty : Robot Operation Cycle after Reset
C1	DetFai	Detection Failure Q'ty
C2	MulRel	Current Multi Release(Off) number and Total Multi Release(Off) number

(2) Button Function in Counter Mode

NO	Button	Description
1		Pressing arrow key scroll the > key through the list.
2		Press Clear Key will Reset the item on > key. Press more than 2 seconds..
3		Press Stop button to change Manual Operation mode..
4		Press Auto button to back to Auto Operation Mode

(3) Counter Reset Method

NOTICE Counter can be changed during Auto Mode, but can not be changed during Step Operation.

Resetting C0 to 0

Manual	30	◀10%▶
Traverse		0
MainKick		500
SubKick		400

- **STEP 1**

Press, [SHIFT S] with [TIMER COUNT] key , it displays Counter Screen.

Counter	30	0
>C0 TotQty		10000
C1 DetFai		3
C2 MulRel		2 / 4

- **STEP 2**

Press [SHIFT S] for 2 seconds, Total will be 0 (Reset).

Manual	30	◀10%▶
Traverse		0
MainKick		500
SubKick		400

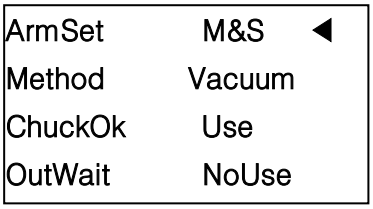
- **STEP 3**

Press [STOP MANUAL] displays manual mode

4.1.3 Motion Mode

(1) description

Robot motion pattern can be decided by selecting of Each Motion Mode.



NOTICE

The below icons uses for robot motion in this book

Origin

Chuck

Chuck Off

Vacuum

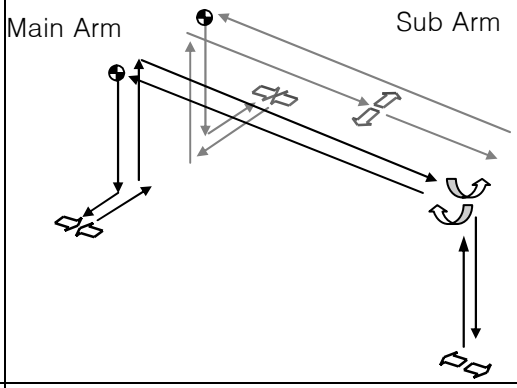
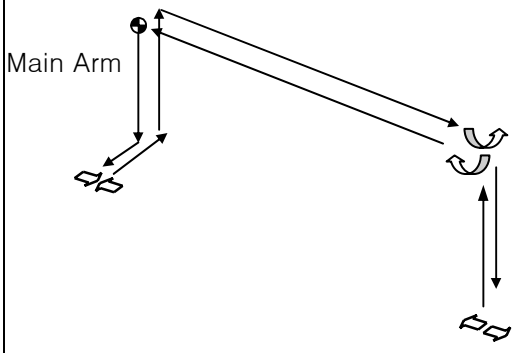
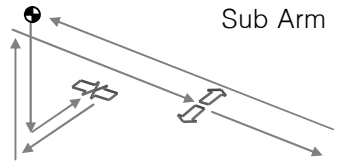
Vacuum

Cutting

① Robot Arm Setting

Setting for Take-Out Motion Arm. Default setting is “M&S”.

ArmSet	M&S	◀
Method	Vacuum	
ChuckOk	Use	
OutWait	NoUse	

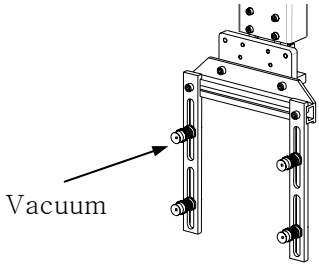
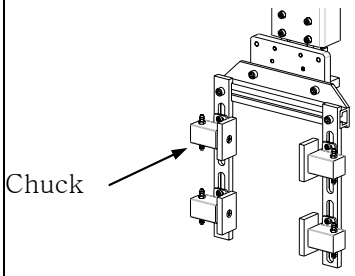
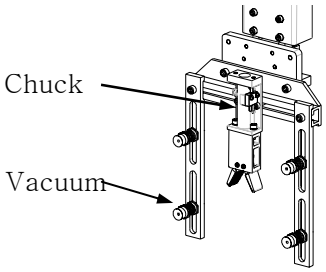
Name	Description	Motion
M&S (=Default)	Select Main and Sub for Both Arm opeartion	
M-Arm	Select Main for Main Arm Operation (Taking Out Parts)	
S-Arm	Select Sub for Sub Arm Operation (Sprue or Gate Picking)	

② Method

Setting take out method, Vacuum, Chucking.

Default setting is “Vacuum”.

ArmSet	M&S	
Method	Vacuum	◀
ChuckOk	NoUse	
OutWait	NoUse	

Name	Description	Motion
Vacuum (=Default)	Take out Parts with Vacuum Operation.	
Chuck	Take out Parts with Chuck (Gripper) Operation.	
Vac+ Chu	Take out Parts with Vacuum and Chuck Operation.	

③ Chuck Confirm

When use Suction and Vacuum function at the same time for take out method, need to select use or no-use for Chuck confirmation sensor. Factory set is “Use”

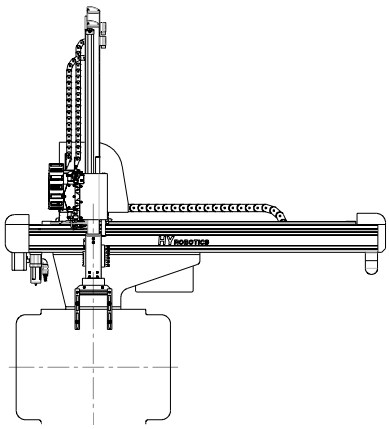
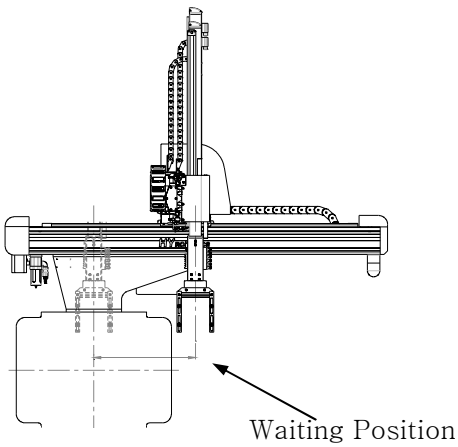
ArmSet	M&S	
Method	Vacuum	
ChuckOk	Use	◀
OutWait	NoUse	

④ Outside Waiting

When many other auxiliary products are attached on the top of the mold, robot might not able to wait on the top of the mold until the mold is completely open. Robot has function to wait outside of IMM, and robot will move to IMM after mold is completely open. (This is for minimizing crash with Robot EOAT and Attachments of Mold (Like Hose, Cylinder, Core etc).

Need to set waiting position outside of the range of Descent (Down) Area. Default setting is “NoUse”.

ArmSet	M&S	
Method	Vacuum	
ChuckOk	Use	
OutWait	NoUse	◀

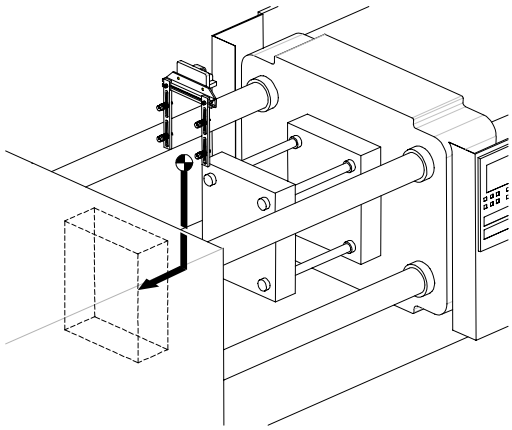
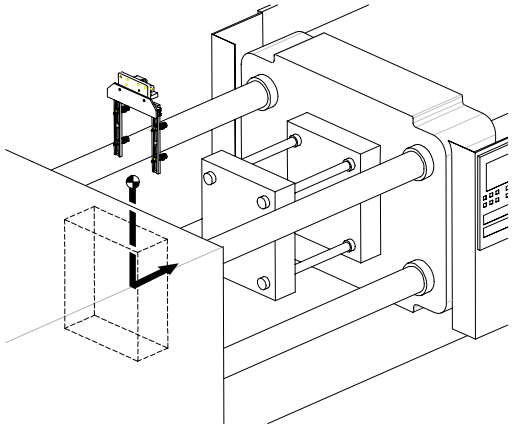
Name	Description	Motion
NoUse (=Default)	Robot wait on the top of the mold until mold is completely open.	
0 mm	Robot wait outside of mold until mold is open. (Outside Waiting Distance is mm) Need to set waiting position outside of the range of Descent (Down) Area	

⑤ Main Arm Take-out

Main Arm Take-out position can be set up at either nozzle side and clamp side.

Default setting is “Clamp”

MArmTk	Clamp ◀
SArmTk	Nozzle
EOATRot	BefoT
MArmOff	Off

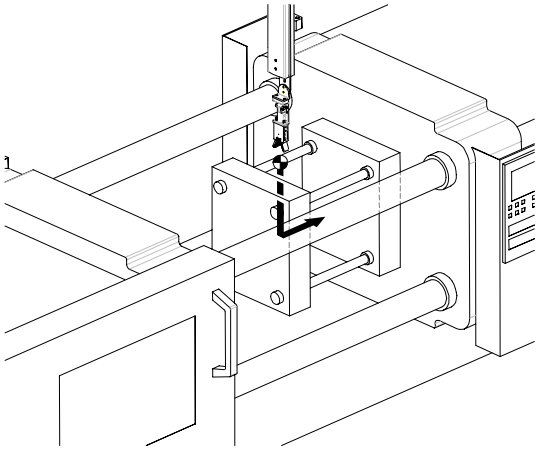
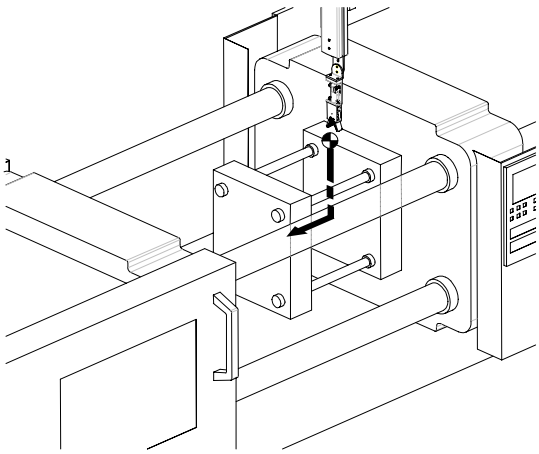
Name	Description	Motion
Clamp (=Default)	Main arm take out at clamp side	
Nozzle	Main arm take out at nozzle side	

⑥ Sub Arm Take-out

Sub Arm Take-out position can be set up at either nozzle side and clamp side.

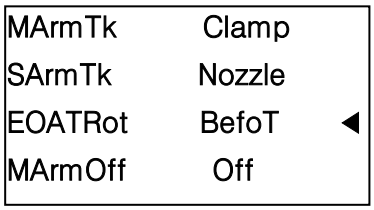
Default setting is “Nozzle”.

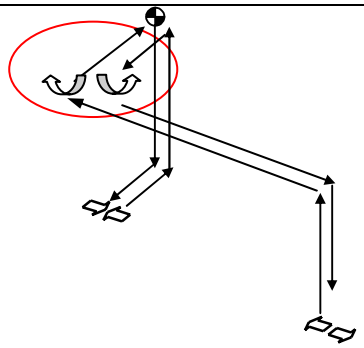
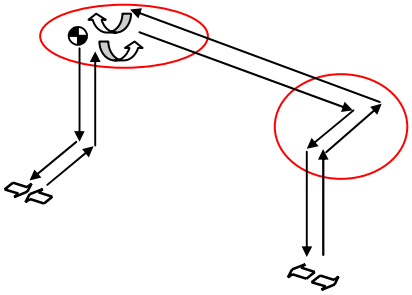
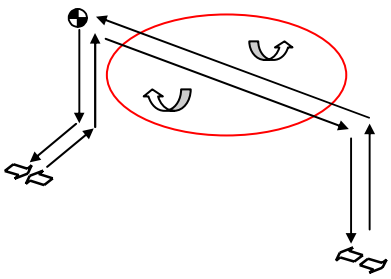
MArmTk	Clamp	
SArmTk	Nozzle	◀
EOATRot	BefoT	
MArmOff	Off	

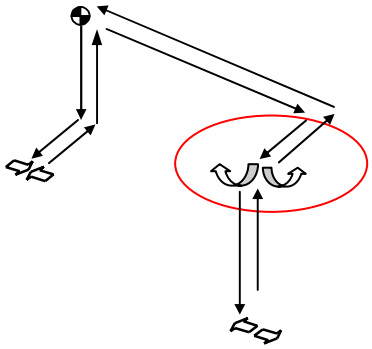
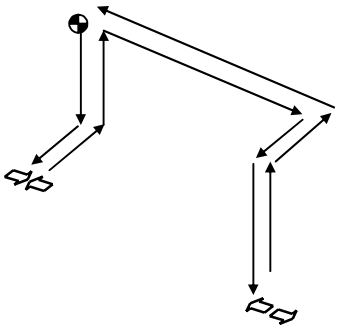
Name	Description	Motion
Nozzle (=Default)	Sub arm take out at nozzle side	
Clamp	Sub arm take out at clamp side	

⑦ EOATRot

EOATRot means EOAT rotation time setting
Default setting is “BeforeT”. (Before Traverse)



Name	Description	Motion
BeforeT (=Default)	Before T : Before Traverse Movement. Chuck (EOAT) unit rotates before traverse movement to prevent EOAT unit from crash with Safety Door. (After Kick)	
NoKick	No Kick : No Kick , Before Traverse Movement. Chuck (EOAT) unit rotates before Kick motion and traverse movement to prevent EOAT unit from crash with Safety Door. (After Kick) and Core of the Mold (Some Mold has core)	
WhileT	Operate Traverse, Kick, Chuck(EOAT) Rotation simultaneously. (High Speed).	

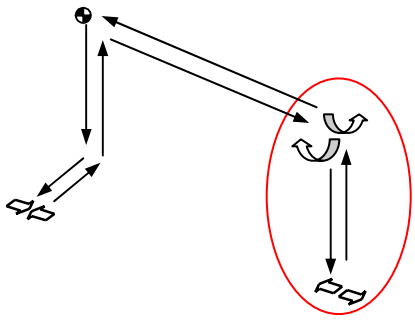
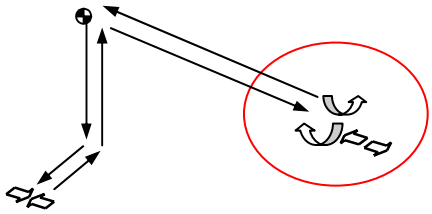
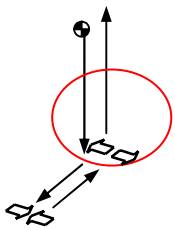
AfterT	After T : After Traverse, After Traverse and Kick, EOAT Chuck Rotate.	
NoRot	No Chuck(EOAT) Rotation	

⑧ Main Arm Release(Off)

MArmOff : Main Arm Release(Off), Set Main Arm Off(Parts Release) Timing

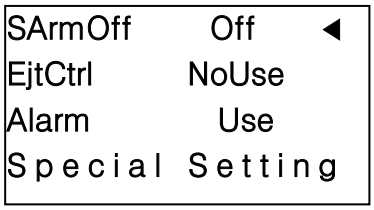
Default setting is “Off”.

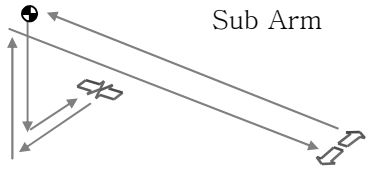
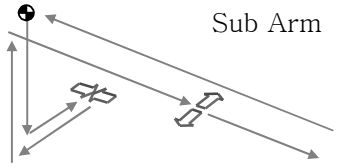
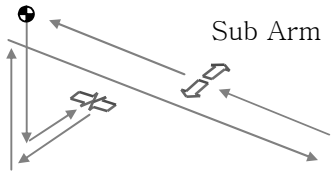
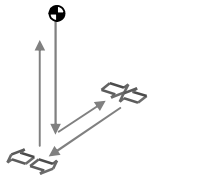
MArmTk	Clamp
SArmTk	Nozzle
EOATRot	BefoT
MArmOff	Off ◀

Name	Description	Motion
Off (=Default)	Traverse and Descent (Down) and Main Arm Release (Off) the Products. (Default)	Main Arm 
NoDown	Traverse and Release Products without Descent(Down)	Main Arm 
InMold	Products Arm Release(Off) the products in Mold (Drop In the IMM)	Main Arm 

⑨ Sub Arm Release(Off)

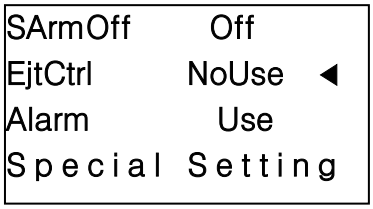
SArmOff : Sub Arm Release(Off), Set Sub Arm Off(Parts Release) Timing Default setting is “Off”.

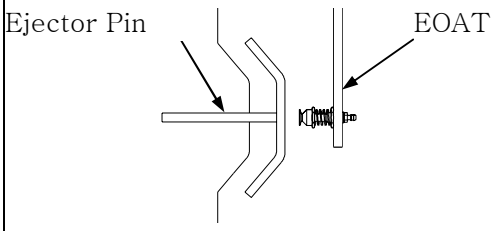
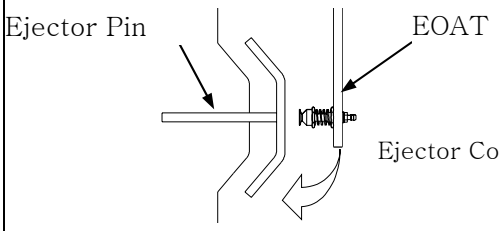


Name	Description	Motion
Off (=Default)	Traverse and Release(Off) the Runner (Sub Arm)	
TrvOff	Sub Arm Release (Off) while traversing.	
ReOff	Sub Arm Release (Off) while traversing return .	
InMold	Sub Arm Release (Off) in Mold.	

⑩ Ejector Control

When Automate Thin Plate Molded Products or Products can be drop with Ejector Kick Operation easily, Robot can control IMM Ejector. Default setting is “NoUse”.

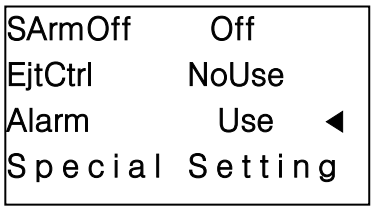


Name	Description	Motion
NoUse (=Default)	Ejector is controlled by IMM (Default)	
Use	Ejector Kick operation can be controlled by Robot. Ejector Kick operation number can be changed. Default Number is 1 time,	

⑩ Alarm (Buzzer)Use

Set Alarm (Buzzer) function in Use or Not in Use

Default setting is “Use”.

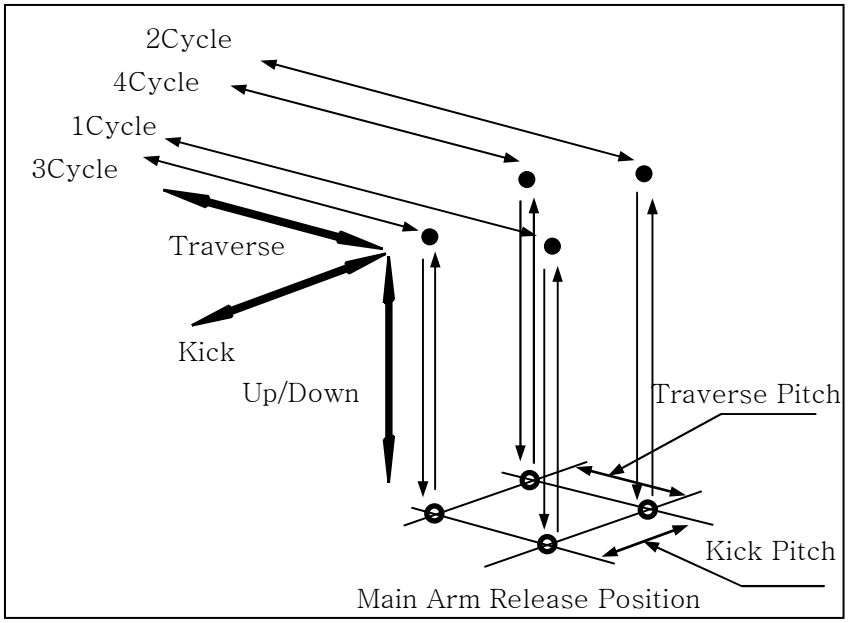


Name	Description
Use (=Default)	When Error occurs, Alarm will make a Buzzer (Siren Noise)
NoUse	When Error occurs, Alarm will not make a Buzzer (No Siren Noise)

⑪ Multi Point Off (Array Release)

Each cycle can release (Off) part in a different location (Position) with specified distance with Multi Point Off Function. Default setting is “NoUse”. If “USE” , Default number of point is “ 1 “.

MulOff	NoUse ◀	
	Pitch	Cycle
Trav	0	1
Kick	0	1



NOTICE

Arry release allow to release multi location for horizontal staking.

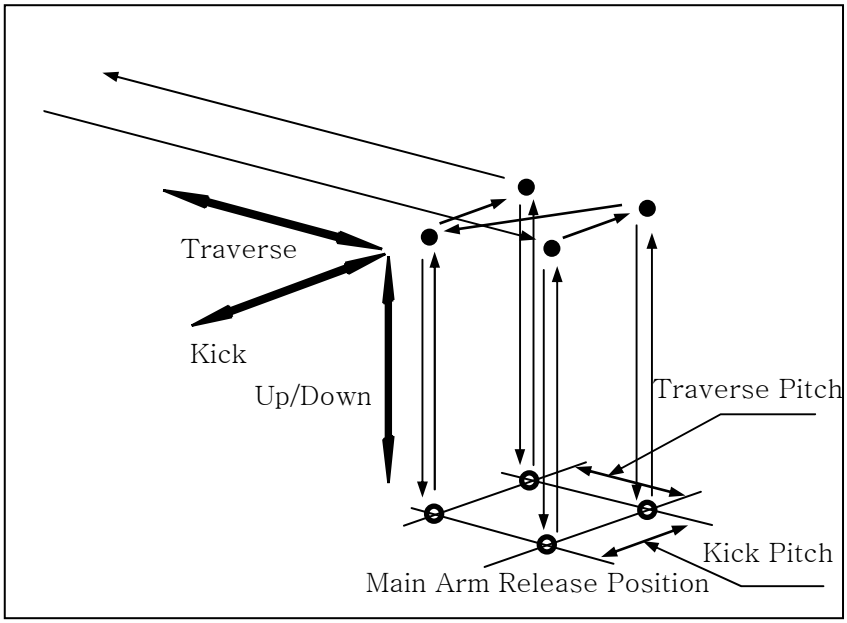
Set Traverse array release (Pitch x Cycle) to the inside of Parts off position – Traverse origin, and need to set kick array release (Pitch x Cycle) to the inside of Kick and Return position.

⑫ Order Point Off (Option)

When there are more than 2 cavity products in the mold, each cavity part can be released different position with Order Point Off Option.

Default setting is “NoUse”. If “USE” , Number of Cavity is “ 1 “

OrdOff	NoUse ◀	
	Pitch	Cycle
Trav	0	0 1
Kick	0	0 1



NOTICE

With additional suction or gripper circuit, robot can do multiple position for multiple cavity products (mold). (Order Point Off position)

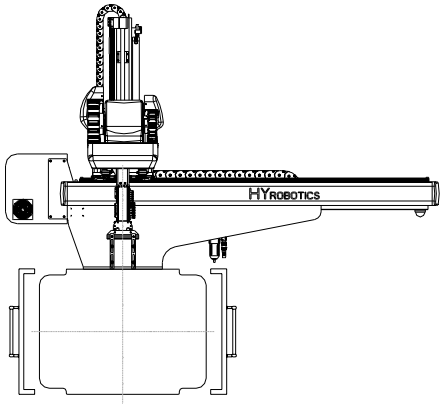
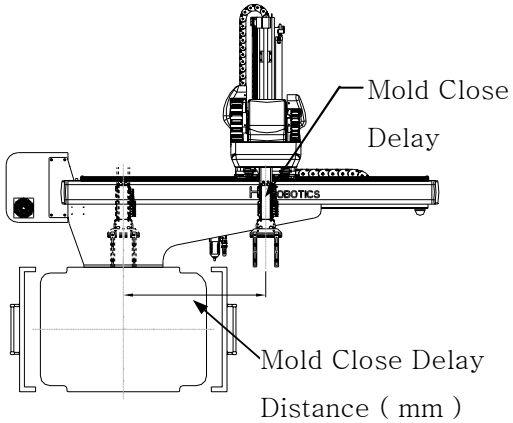
Order point off position (Pitch x Cycle) should smaller than Multi Point Array (Pitch x cycle), same as kick order point.

NOTICE This is optional feature, Please contact factory.

⑬ Mold Close Delay

Robot can delay the mold close, after taking out the parts from the mold, ascent, until traverse movement to set position . Default setting is “NoUse”. Position can be set in the range of Robot descent range

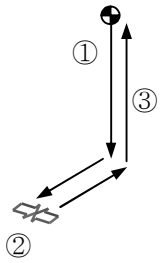
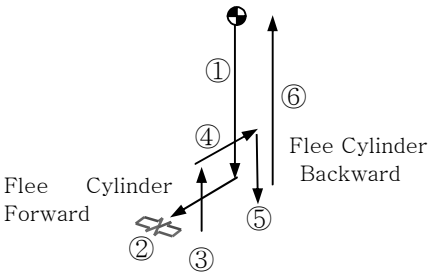
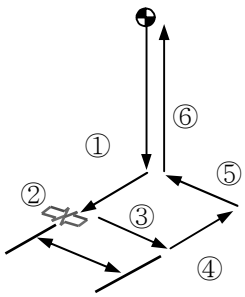
MdClose	NoUse	◀
Flee	NoUse	
Pitch	NoUse	
Swivel	NoUse	

Name	Description	Motion
NoUse (=Default)	No mold close Delay function. Mold will close after robot arm ascent.	
Use	Mold will not close until the robot move to traverse position (mm)	

⑯ Flee (Option for Cylinder) : Some other robot company says this feature as Undercut
After Chuck or Suction the parts in mold, robot can move traverse axis (-X+) or up in mold so that parts can escape from core and Ejector attachments to take out from the mold.
Default setting is “NoUse”.

NOTICE This is optional feature, Contact factory to add this feature.

MdClose	NoUse	
Flee	NoUse	◀
Pitch	NoUse	
Swivel	NoUse	

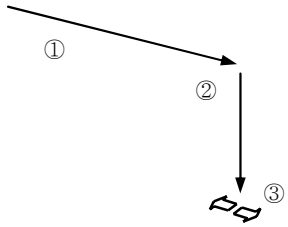
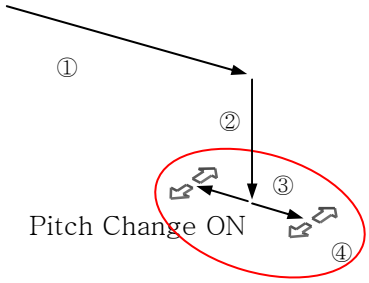
Name	Description	Motion
NoUse (=Default)	Not in Use	
Cylin (Option)	After Chuck or Suction the parts, operate cylinder and move to up or down position and take out parts from mold * Need special Cylinder attachment	
0 mm (Traverse)	After Chuck or Suction the parts, Robot can move to traverse axis with set distance.(mm)	 Flee Distance

⑰ Pitch Change(Option)

When robot release (off) parts with different pitch of the part's pitch of the mold, additional EOAT can be added with cylinder to change the pitch distance of the release (off) Default setting is "NoUse".

NOTICE This is optional feature, Contact factory to add this feature.

MdClose	NoUse
Flee	NoUse
Pitch	NoUse ◀
Swivel	NoUse

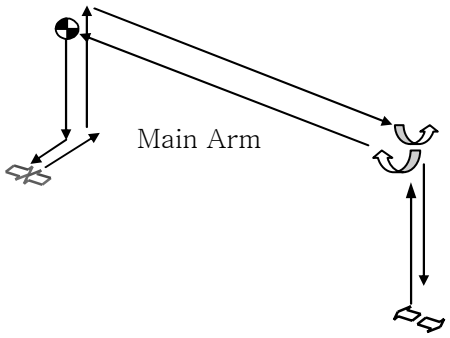
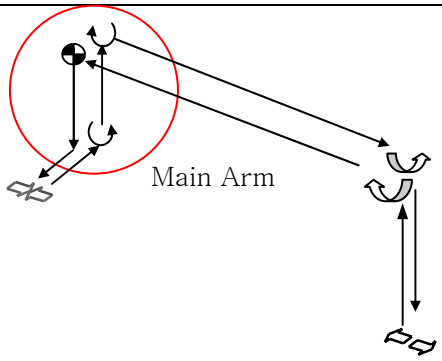
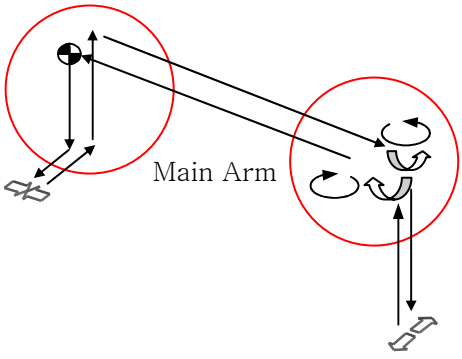
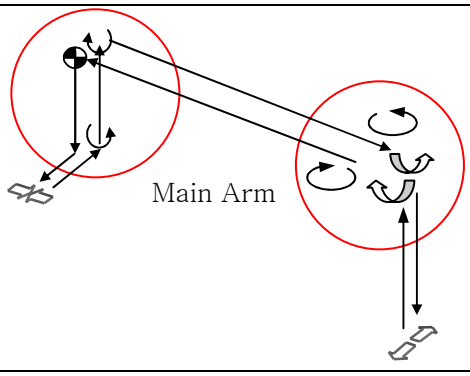
Name	Description	Motion
NoUse (=Default)	No Use	
Use	Installed EOAT cylinder can change pitch distance of the parts (Optional Feature)	

⑱ Vertical Swivel (Option)

Set the Swivel operation timing. (Robot EOAT can Rotate with Vertical Axis)

Default setting is “NoUse”

MdClos	NoUse
Flee	NoUse
Pitch	NoUse
Swivel	Swivel ◀

Name	Description	Motion
NoUse (=Default)	Not in Use	
Swivel	Robot EOAT swivel in mold and Ascent (Up) and Swivel Return. (This feature can be added when the parts is too parallel too long so that Part can not move up because of tie bar distance. Like Car Bumper)	
RoAfT	Robot EOAT swivel after traverse	
InTrv	Robot EOAT swivel in Mold and swivel return after traverse. .	

⑲ Process Time (Production Time)

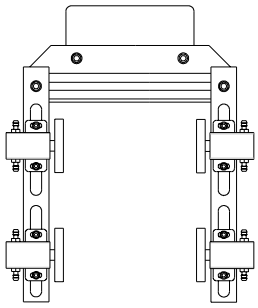
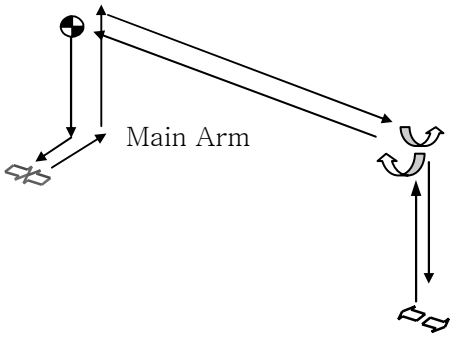
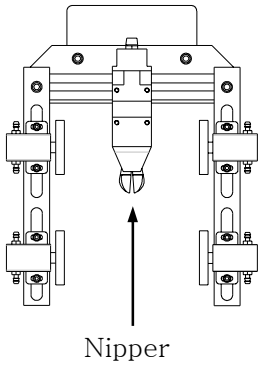
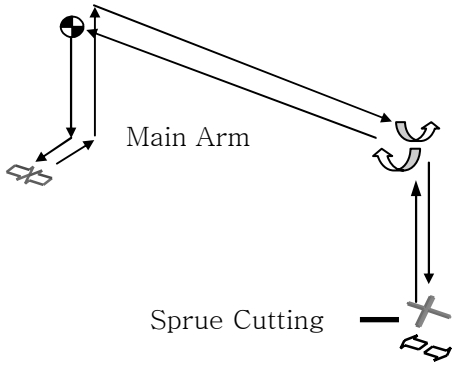
This time is for 1 total cycle of the production. If exceed error this time, it occur Process Time Error. Set time as “0” second will not occur any error. Default setting is 0 sec..

Ptime	0s	◀
RoNipp	NoUse	
ExNipp	NoUse	
AddGrip	NoUse	

⑳ Robot Nipper (Option : Nipper, Valve required)

Robot cut sprue or runner with attached nipper on EOAT

Ptime	0s	
RoNipp	NoUse	◀
ExNipp	NoUse	
AddGrip	NoUse	

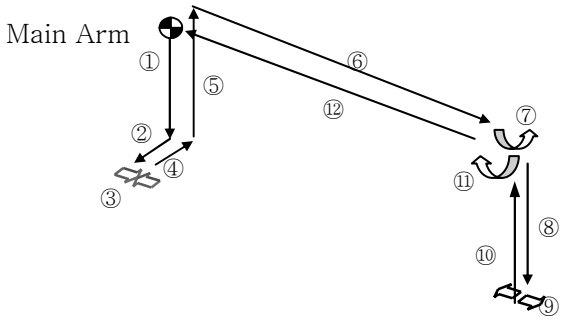
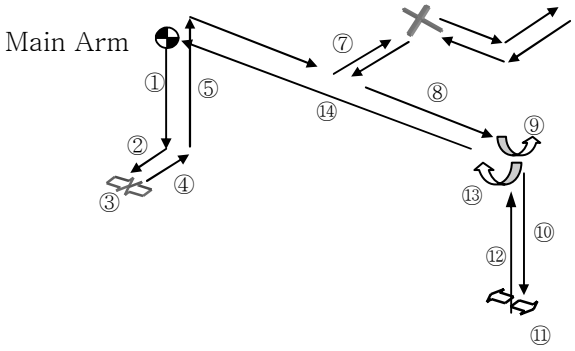
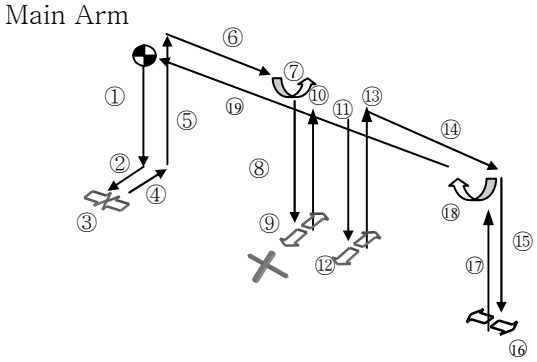
Name	Description	Jig	Motion
NoUse (=Default)	Not in Use		
Use	Robot operate cutting sprue or runner with attached nipper		

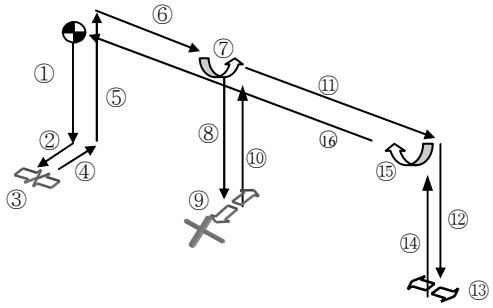
㉑ External Nipper (Need Nipper Cutting Attachement Required)

Robot can send signal of cutting sprue or nipper operating to Nipper Cutting machine

Default setting is “NoUse”.

Ptime	0s	
RoNipp	NoUse	
ExNipp	NoUse	◀
AddGrip	NoUse	

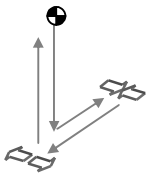
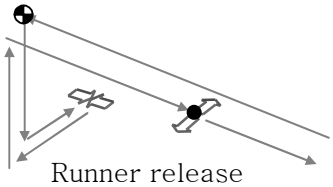
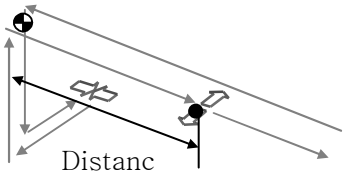
Name	Description	Motion
NoUse (=Default)	Not In Use	
InCut	Nipper attached in Traverse Axis cut sprue and runner. (Need Nipper Cutting Attachments)	
ExCut1	Nipper cutting equipment built in, out side of mold to cut sprue and runner. (Need Nipper Cutting Machine)	

Name	Description	Motion
ExCut2	Nipper cutting equipment built in, out side of mold to cut sprue and runner. (Need Nipper Cutting Machine)	

㉒ Additional Gripper

In two color molding application, required to use additional gripper for gripping another sprue or runner.(Can't not use additional gripper when runner release is standard and return release.)

Ptime	0s	
RoNipp	NoUse	
ExNipp	NoUse	
AddGrip	NoUse	◀

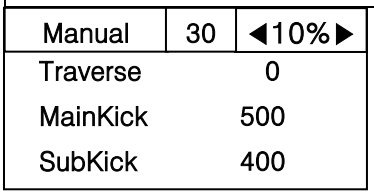
Name	Description	Motion
No Use (=Default)	No use Additional Gripper	
In Mold	Additional gripper release in mold	
RunRele	Additional gripper release in runner release position	 Runner release
Position	Release in set position * Set over runner release position and traverse limit.	 Distanc

(2) Button Function

NO	Button	Description
1	▲ ▼	Pressing Up and Down arrow key will scroll '◀' icon and select line
2	◀ ▶	Press Right and Left arrow key will change Mode / Setting and Blink '◀' icon
3	Numeric Key	For Input Numeric Number
4	ENTER	Pressing Enter key will stop Blinking of the '◀' icon and save input data.
5	CLEAR C	Cancel the Input.
6	STOP MANUAL	Press Stop Button to change to Manual Mode.
7	AUTO TEACH	Press Stop Button to change to Manual Mode.

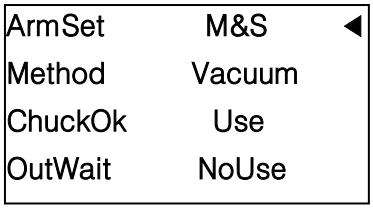
(3) Mode Confirmation

Example) Change from the suction to Chuck for TakeOut Method



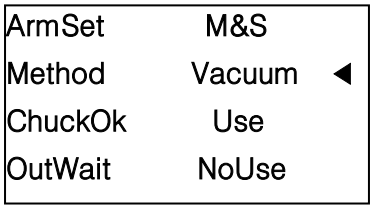
● **STEP 1**

In manual Molde, Press MODE/MOLD , move to mode screen



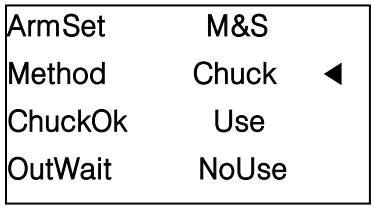
● **STEP 2**

Press ▼ , moves "▶" to Method Item.



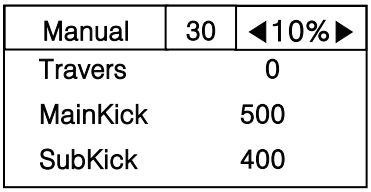
● **STEP 3**

Press ▶ , changes the mode from Vacuum to Chuck



● **STEP 4**

Press ENTER , saves selected mode.



● **STEP 4**

Press, STOP/MANUAL, finish setting the mode and move to manual mode.

4.1.4 Creating Mold File

(1) Description

Press Shift and Mode Key at the same time.

Search Mold Number

MoldNo	30
Input Mold number ↵ 0	

(2) Button Function

NO	Button	Description
1	Numeric Key	Input Mold Number
2	STOP MANUAL	Change to Manual Mode
3	CLEAR C	Cancel the Input Number
4	ENTER ↵	Change to Mold Maintenance Screen with selected Number

(3) Mold Manager

Press Shift and Mode Key at the same time and Press Enter ..

Select , Create and Delete Mold File.

MoldMgr	30
> 0 NEW MOLD	
01 RUN_L	
02 RUN_U	

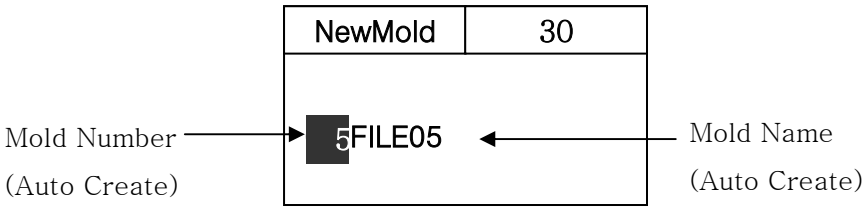
(4) Each Button Function

NO	Button	Description
1	STOP MANUAL	Move to Manual Operation Mode.
2	CLEAR C	Move to Delete Screen for file with '>'
3	ENTER	Open Mold File. Select 0 file can create any motion pattern and mode which can be created by user and move to New Mold Screen and save with Mold Number and name. 1~99: User can create motion pattern.

NOTICE Mold Number can use only 2 Number, Mold Name can use 6 Character with Number

(5) New Mold

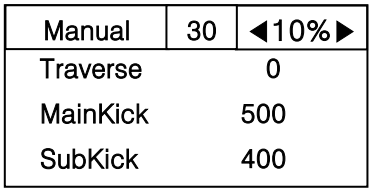
Save the motion pattern in the mode with new mold number and name.



(6) Button Function

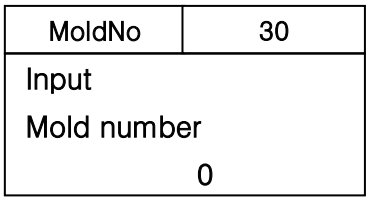
NO	Button	Description
1	Numeric Key	Pressing the numeric key while blinking Mold Number will Input Number
2		Pressing Enter to save Mold Number and Name
3		Press  to scroll the cursor on the mold number.
4		Selecting Mold Name Character.
5		Change to Manual Mode

(7) Creating Mold File



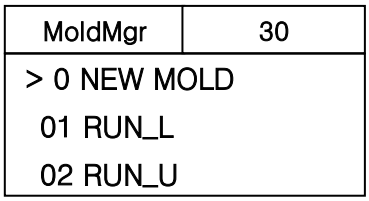
● STEP 1

Press [SHIFT S] + [MODE MOLD] and move to mold search Screen



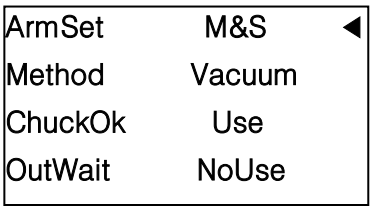
● STEP 2

Press [ENTER] to change mold maintenance mode..



● STEP3

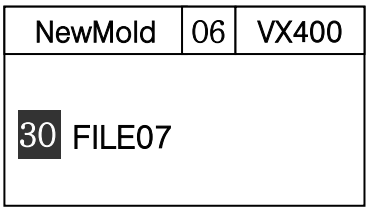
Move cursor ">" to 00 and press [ENTER].



● STEP 4

Press [▲] or [▼] move "◀" icon to the mode to select. ,

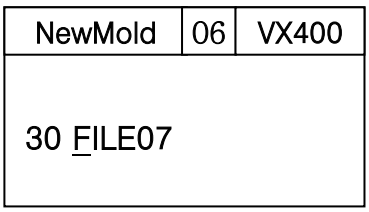
Press [▶] to change mode and press [ENTER] to set



● STEP 5

[Set Mold Number to 30]

Press [CLEAR C], clear the mold number, press [3 SWIVEL] and press [0 RETURN X-] to input 30, Press [ENTER] to save. It will stop the blinking of the mold number.

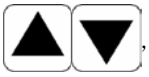


● STEP 6

Press [▶] button will move cursor to first character of Mold Name.

NewMold	06	VX400
30 A		

● **STEP 7**

Press  , select Character

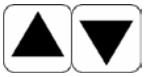
It will displays A~Z, 0~9, _, -,

NewModl	06	VX400
30 A		

● **STEP 8**

Press  to save data

NOTICE

Press  will move cursor to left side and, Change the text with pressing  button.

Manual	30	◀10%▶
Traverse		0
MainKick		500
SubKick		400

● **STEP 9**

Press  will create mold name, save and move to manual mode.

4.1.5 Delete Mold File

(1) Delete Mold File

Delete Mold File that created before.

NOTICE Currently open mold file can not be deleted.

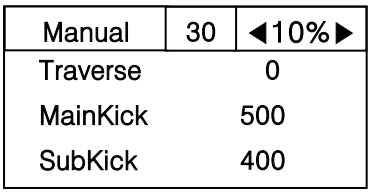
Selected Mold File →

MoldDel	30
01 SONATA	
D e l e t e ?	
[Y(↵) / N (Stop)]	

(2) Button function

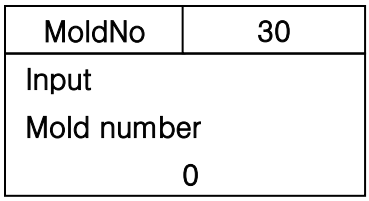
NO	Button	Description
1	ENTER	Delete Mold Selected file and move to manual mode.
2	STOP / MANUAL	Cancel operation and Move to manual mode

(3) Delete Mold File



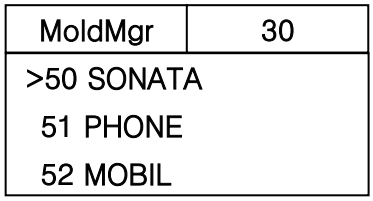
● STEP 1

Press [SHIFT S] + [MODE MOLD] move to mold search screen.



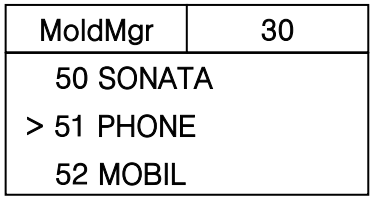
● STEP 2

Press [ENTER] and move to mold maintenance screen



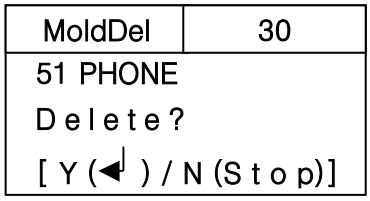
● STEP 3

Select mold file to delete with pressing [▲] or [▼]



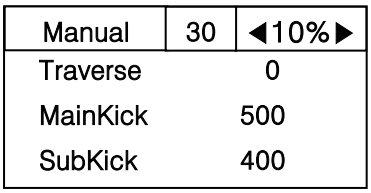
● STEP 4

Press [CLEAR C] displays "<Mold Number><Name> Delete?.



● STEP 5

Press [ENTER] will delete selected file and moves to manual mode



4.1.6 Step Run

(1) Description of Step Run

Step operation will operate the robot step by step of each motion.

After origin, will not displays “>” cursor, pressing ▼ will displays “>” at the first step.

StepRun	30	A
>D o w n		
T a k e O u t P o i n t		
E j e c t o r F w d		

(2) Button Function

NO	Button	Description
1	▼	Press Down Arrow Key will Operate Step Operation. Press and hole 2~3 second operate 1 cycle
2	STOP / MANUAL	Move to Manual Mode.

(3) Step Operation

Manual	30	◀10%▶
Traverse		0
MainKick		400
SubKick		300

StepRun	30	A
>D o w n		
T a k e O u t P o i n t		
E j e c t o r F w d		

- **STEP 1**

Press STEP / I/O moves to Step Operation Screen.

- **STEP 2**

Pressing ▼ button will operate on step.

Press STOP / MANUAL will move to manual mode.

4.1.7 Input and Output signal check

(1) Description

Press Shift and I.O,

Confirm Input, Output, Interlock

Input(Out▶)	30
X000 VacuumOk	○
X001	
X002 ChuckOk	○

<Input screen>

Output(In◀)	30
Y000 Vacuum	○
Y001 Flee	○
Y002	○

<Output screen>

Input			Output		
X000	VacuumOk	Vacuum Confirm	Y000	Vacuum	Vacuum & Multi Release1
X001			Y001	Flee	Traverse (Flee) in Mold
X002	ChuckOk	Chuck Confirm	Y002	MArmKick	Main Arm Kick
X003			Y003		
X004	SArmGripOk	Sub Arm Grip Confirm	Y004	Nipper	Nipper (Internal. External)
X005	AddGripOK	Add Gripper Comfirm	Y005	MArmGrip	Main Arm Grip
X006	MSftCylBw	Main Arm Safety Cylinder Backward	Y006	SArmGrip	Sub Arm Grip
X007	SSftCylBw	Sub Arm Safety Cylinder Backward	Y007	AddGripper	Add Gripper
X008	SpareIn1	Spare Input 1	Y008	PitchChg	Pitch Change
X009	SpareIn2	Spare Input 2	Y009	NipFwd	Nipper Forward
X010	MArmDownOk	Main Arm Down Complete	Y010	ExNipCls	External Nipper Close
X011			Y011	SArmDown	Sub Arm Up/Down
X012	SArmDownOk	Sub Arm Down Confirm	Y012		
X013			Y013	ChkRotate	Chuck Rotation
X014	RotateOk	Rotation Complete	Y014	RotReturn	Chuck Rotation Return
X015	SwivelOk	Swivel Complete	Y015	Swivel	Swivel
X016	TrvRtOk	Traverse Return Complete	Y016	SvlReturn	Chuck Swivel Return
X017	SafetyDown	Safety Down	Y017	SSftCylBw	Sub Safety Cylinder Backward
X018	M-KickOk	Main Arm Kick Complete	Y018	SSftCylFw	Sub Safety Cylinder Forward
X019	MArmUpOk	Main Arm Up Complete	Y019	MSftCylBw	Main Safety Cylinder Backward
X020	SArmKickOk	Sub Kick Confirm	Y020	MSftCylFw	Main Safety Cylinder Forward
X021	SArmUpOk	Sub Arm Up Confirm	Y021	MulOff2	Multi Release(Off)2
X022	RotRetOk	Rotation Return Complete	Y022	MulOff3	Multi Release(Off)3
X023	SvlReOk	Swivel Return Complete	Y023	MulOff4	Multi Release(Off)4
X024	Obstacle	Obstacle Detection	Y024	MArmDown	Main Arm Down
			Y025	MArmUp	Main Arm Up
			Y028	MSlowDown	Main Arm Slow Descent
			Y029	SSlowDown	Sub Arm Slow Descent(Down)

Input			Output		
No	Display	Description	No	Display	Description
X100	ReadyCut	Ready to Cutting	Y100	CutStart	Cutting Start
X101	RdyStack	Ready to Stacking	Y101	StackingOK	Stacking Complete
X102	Reject	Part Reject	Y102	TKOFailSig	Take out Fail Signal
X104	UserIn1	User Input1	Y104	UserOut1	User Output1
X105	UserIn2	User Input2	Y105	UserOut2	User Output2

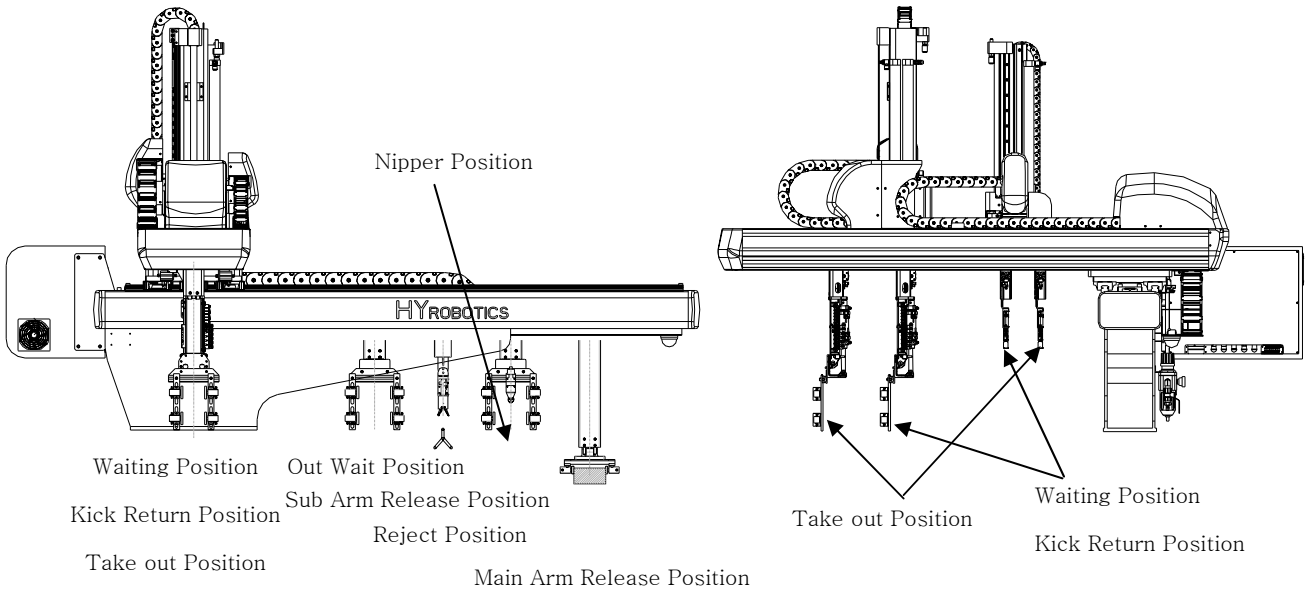
Interlock Input			Interlock Output		
No	Display	Description	No	Display	Description
X300	AutoInject	Auto Injection	Y300	ConveyOn	Conveyor On
X301	MoldOpen	Mold Open Complete	Y301	TakeoutOk	Take Out Complete
X302	SafeDoor	Safety Door Open	Y302	MoldOpen	Mold Open
X303	FullAuto	Fully Automatic	Y303	MoldClose	Mold Close
X304	EjtBwdOk	Ejector backward Complete	Y304	EjectorSig	Ejector Signal
X305	EjtFwdOk	Ejector Forward Complete	Y305	Robot Emg	Robot Emergency
X306	ImmEmg	IMM Emergency			

(2) Button Function

NO	Button	Description
1		Displays 3 information in one page and move to next page.
2		Change Input Information screen to Output Information screen.
3		Change Output Information screen to Input Information screen.
4		Press Stop Button to change to Manual Mode.
5		Press Stop Button to change to Manual Mode.

4.1.8 Position Set with Number Input

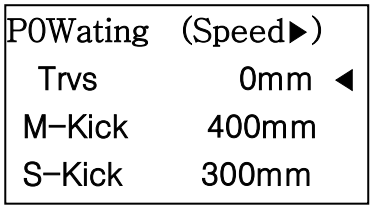
(1) Position



NO	Basic Position	Description
P0	Waiting Position	Position to wait until mold is completely open, in the manual mode there is no obstable in this position (For robot arm down)
P1	Take out Position	Take out position for parts and sprue
P2	Kick Return Position	The arm move back position after pick the parts and sprue.
P3	Sub Arm Release Position	Release(Off) position for Sprue or Runner
P4	Add Grip Position	Sprue Release position with additional gripper (Option) for 2 color molding.
P5	Reject Position	Defective Parts Release (Off) Position (Signal Required from IMM)
P6	Nipper ON	Sprue or Runner cutting position in Traverse Axis
P7	Main Arm Release Position	Release(Off) position for Parts
P8	Out Wait Position	This position is for waiting outside of the mold until mold is completely open. If Core and other special attachments have added on the top of mold, this feature may required to prevent EOAT from crash.

(2) Description

In the auto operation, each position can change within ±100mm, The robot will have only one of Each position value . Origin and Take out position is 0 mm, do not required to set. (Factory set, if required to change, contact factory)



(3) Button Function

NO	Button	Description
1		Pressing Up and Down arrow key scroll the > key and line.
2		Change Number Input screen to Speed Input screen.
3	Numeric Key	Input Position Number
4		Cancel the Input.
5		Press the Enter Button to save the Input.
6		When only move from Manual Operation Mode to Number Input mode, can move to Jog Input screen.
7		Press Stop Button to change to Manual Mode.

(4) Example

Set Waiting Position, Traverse 0mm, Main Arm Kick 400mm, Sub Arm Kick 300mm

Manual	30	◀10%▶
Traverse	0	
MainKick	0	
SubKick	0	

● STEP 1

Hold [SHIFT S] and press [AUTO TEACH], move to Number Input Screen.

P0Wating	(Speed▶)	
Trvs	0mm	◀
M-Kick	0mm	
S-Kick	0mm	

● STEP 2

Press [▼] to select Main Arm Kick, Press [4 UP/DOWN Z1- Z1+] [0 RETURN X-] [0 RETURN X-] to input 400, Press [ENTER] to save Position data.

P0Wating	(Speed▶)	
Trvs	0mm	◀
M-Kick	400mm	
S-Kick	0mm	

● STEP 3

Press [▼] to select Sub Arm Kick, [3 SWIVEL] [0 RETURN X-] [0 RETURN X-] to input 300, Press [ENTER] to save Position data.

P0Wating	(Speed▶)	
Trvs	0mm	◀
M-Kick	400mm	
S-Kick	300mm	

● STEP 4

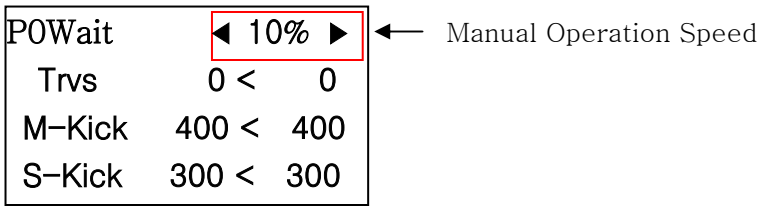
press [STOP MANUAL] to move Manual Mode Screen.

Manual	30	◀10%▶
Traverse	0	
MainKick	0	
SubKick	0	

4.1.9 Position Setting with Jog Input

(1) Description

Press FORWARD X+ or 0 RETURN X- set each position value.

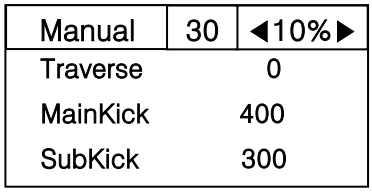


(2) Button Function

NO	Button	Description	
1	◀	Reduce Speed	30%, 20%, 10%, 5% 10mm, 1mm
2	▶	Increase Speed	
3	▲ ▼	Move cursor to up or down item	
4	FORWARD X+	Traverse Movement (X+)	
5	0 RETURN X-	Traverse Return Movement (X-)	
6	SHIFT S + 7 Y1+	Main Arm Kick Movement (Y1+)	
7	SHIFT S + 8 Y1-	Main Arm Kick Return Movement (Y1-)	
8	SHIFT S + 9 Y2+	Sub Arm Kick Movement (Y2+)	
9	SHIFT S + CK Y2-	Sub Arm Kick Return Movement (Y2-)	
10	ENTER	Save the input value and Current and set value synchronized.	
11	STOP MANUAL	Press Stop Button to change to Manual Mode.	
12	SHIFT S + AUTO TEACH	Press Auto Button with Shift Button, move to Number Input Screen.	

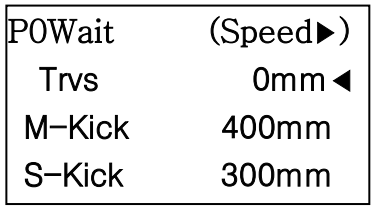
(3) Position setting with Jog Key

To Set take out position to 0 and, Main Kick position to 500, Sub arm position to 200.



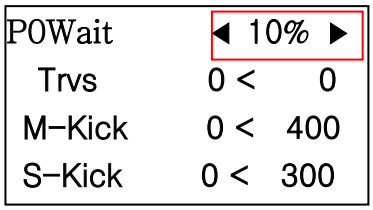
● **STEP 1**

Hold [SHIFT S] and press [AUTO TEACH], move to Number Input Screen.



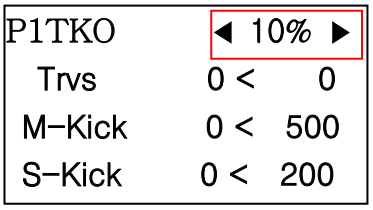
● **STEP 2**

Hold [SHIFT S] and press [AUTO TEACH] again, move to Jog Input Screen.



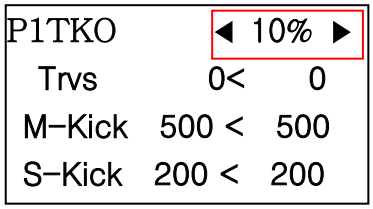
● **STEP 3**

Press [▼] to select Take-out Position.



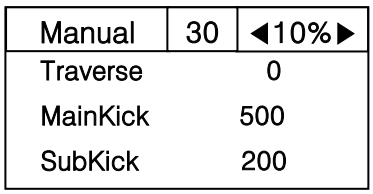
● **STEP 4**

Press [SHIFT S] + [7 Y1+] or [SHIFT S] + [8 Y1-] for Main arm Kick Position, Press [SHIFT S] + [9 Y2+] or [SHIFT S] + [Y2-] for Sub Arm Kick Position.



● **STEP 5**

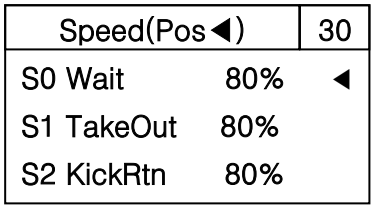
Press [ENTER] to save position data, press [STOP MANUAL] to move Manual Mode Screen.



4.1.10 Speed Setting

(1) Description

Setting Robot Movement (-X+) Speed in Auto Operation Mode



NO	Display	Default	Description
S0	Wait	80%	Speed (When Robot moves to Waiting Position)
S1	TakeOut	80%	Speed (When robot moves to Take-out Position (Chuck or Vacuum in Mold .)
S2	KickRtn	80%	Speed (When Robot move to Kick Return Position)
S3	SArmOff	80%	Speed (When Robot moves to Sub Arm Release(Off) Position.)
S4	Reject	80%	Speed (When Robot moves to Reject Position)
S5	NipPoint	80%	Speed (When Robot moves to Nipper Position)
S6	MArmOff	80%	Speed (When robot moves to Main Arm Release(Off) Position.)
S7	OutWait	80%	Speed (When Robot moves to Out Wait Position)

(2) Button Function in Speed Setting

NO	Button	Description
1		Scroll the cursor to select item.
2		Move and display “number input screen”
3	Numeric Key	Input the speed value
4		Cancel the input.
5		Save input value
6		Press Stop Button to change to Manual Mode.
7		Press Auto Button to change to Auto Mode.

(3) Example

Set Waiting Position to 100%.

Manual	30	◀10%▶
Traverse	0	
MainKick	400	
SubKick	300	

● **STEP 1**

Hold [SHIFT / S] and press [AUTO / TEACH], move to Number Input Screen.

P0Wait	(Speed▶)
Trvs	0mm◀
M-Kick	400mm
S-Kick	300mm

● **STEP 2**

Pressing [▶] changes Speed Input Screen.

Speed(Pos◀)	30	
S0 Wait	80%	◀
S1 TakeOut	80%	
S2 KickRtn	80%	

● **STEP 3**

Press [1 FORWARD] [0 RETURN] [0 RETURN] to input 100, Press [ENTER] to save speed data.

Speed(Pos◀)	30	
S0 Wait	100%	◀
S1 TakeOut	80%	
S2 KickRtn	80%	

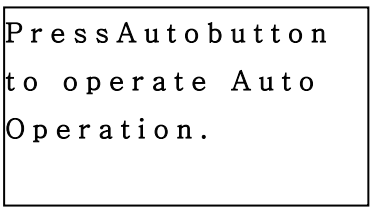
● **STEP 4**

Press [STOP / MANUAL] to move to manual mode.

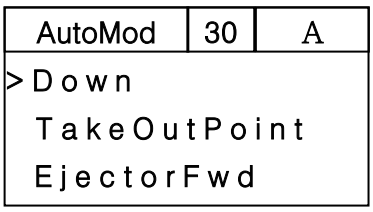
Manual	30	◀10%▶
Traverse	0	
MainKick	400	
SubKick	300	

4.5 Auto Operation

(1) Description



[Auto Message]



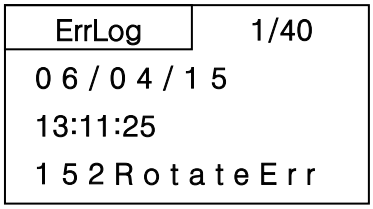
[Auto Mode Screen]

(2) Button Function

NO	Button	Description
1	AUTO / TEACH	Stop Auto Operation and move to Manual Mode.
2	MODE / MOLD	Move to Mode Screen.
3	SHIFT S + STEP I/O	Move to Input Screen.
4	TIMER / COUNT	Move to Timer Screen.
5	SHIFT S + TIMER COUNT	Move to Counter Screen.
6	SHIFT S + AUTO TEACH	Move to Number Input Screen.

4.6 Error Log

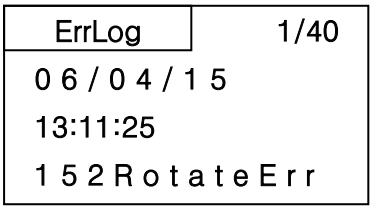
(1) Description

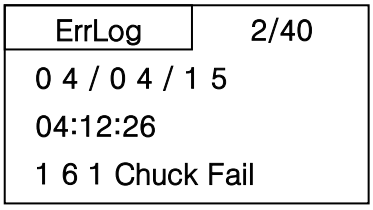


(2) Each Button Function

NO	Button	Description
1	▲ ▼	Move the cursor to different error log.
2	STOP / MANUAL	Change to the Manual Mode
3	AUTO / TEACH	Change to the Auto Mode

(3) Checking Error Log





- **STEP 1**

Press SHIFT / S and ▲ at the same time, displays Error Log screen.

- **STEP 2**

Find eror with pressing ▲ or ▼ button.

- **STEP 3**

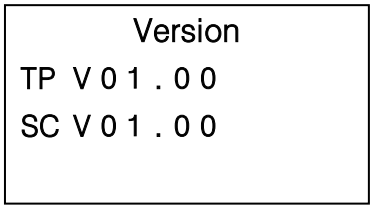
To move to Manual Mode, press STOP / MANUAL.

To move to Auto Mode, press AUTO / TEACH.

4.7 Version Information

(1) Description

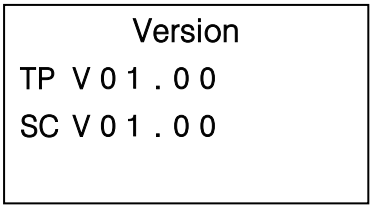
Check Version Information



(2) Each Button Function

NO	Button	Description
1	STOP / MANUAL	Change to the Manual Mode
2	AUTO / TEACH	Change to the Auto Mode

(3) Checking Version Information



- **STEP 1**

Press SHIFT S and ▼ at the same time, displays version.

- **STEP 2**

To move to Manual Mode, press STOP / MANUAL.

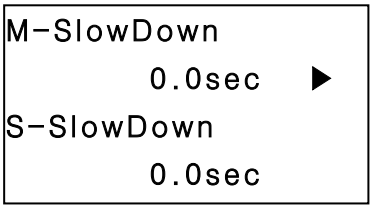
To move to Auto Mode, Press AUTO / TEACH.

4.8 Timer setting for Arm Slow Down

(1) Description

Factory Set, Normally not required to change default setting.

Operation of Robot arm descent operated by two solenoid valve for optimized speed operation. One of these two valve can change the off timing so that robot can minimze shock in the structure and increase life cycle time. This time is between descent on and descent off.



(2) Button Function

NO	Button	Description
1		Pressing Up and Down arrow key scroll '▶'icon and select line.
2	Numeric Key	Input Time for Arm Slow Down.
3		Cancel the input.
4		Press the Enter Button to save to change.
5		Press Stop Button to change to Manual Mode..
6		Press Stop Button to change to Auto Mode.

4.9 Error Recovery

(1) Error Description

Displays error recovery method

Error	30
152 ChuckRotate Check Chuck Rotate X014	

(2) Each Button Function

NO	Button	Description
1	CLEAR C	Press Clear button, Stop Alarm and Buzzer , Press again Clear button error message.

(3) Error Recovery

Error	30
152 ChuckRotate Check Chuck Rotate X014	

- **STEP 1**

Pressing CLEAR C, Stop Buzzer.

- **STEP2**

Pressing CLEAR C again will close message screen.

4.10 Change Language

Press 

and  at the same time, change Korean, English.

4.11 Robot and Program maintenance Screen

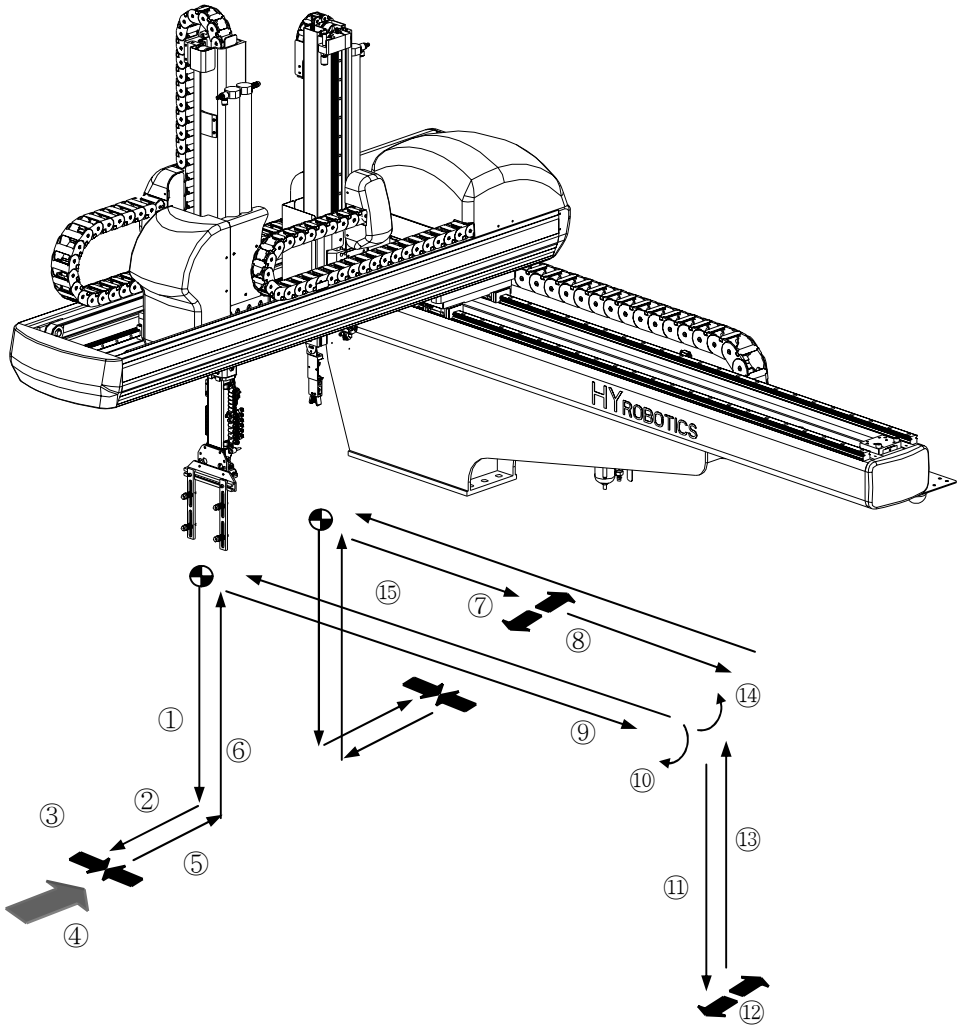
Turn power on with pressing 

NO	Screen	Mode	Order	Default/Setting	Description	Etc
1		Limit for Traverse			- Traverse Limit Range	
					+ Traverse Limit Range	
2	TrvsLimit -0Cmm ◀ 000Cmm M-KickLim 000Cmm S-KickLim 000Cmm	M-KickLim			Set Main arm Kick / Return area with + Value (- direction is 0)	
3		S-KickLim			Set Sub arm Kick / Return area with + Value (- direction is 0)	
4		FleeLimit			Traverse Limit in Mold	
5		Traverse Origin			Distance between origin to Traverse 0mm Postion	
6	FleeLimit ±0Cmm ◀ Trvs Org 000Cmm MKick Org 000Cmm SKick Org 000Cmm	Main Arm Origin			Distance between origin to Main Kick/Return 0mm Postion	
7		Sub Arm Origin			Distance between origin to Sub Kick/Return 0 mm Postion	
8		Safety	①	NoUse(=default)	Not In Usa	
			②	Use	Ultra Sound Safety	
9		Auto Input	①	NoUse (=default)	Auto Input Signal from IMM is not required	
			②	Use	Auto Input Signal from IMM is required for Auto Operation.	
10	Safety NoUse ◀ AutoInp NoUse TKOFail NoUse IMAlarm NoUse	Take Out Fail	①	Use (=default)	Not sending Take Out Fail signal to IMM	
			②	NoUse	Send Signal to IMM when robot can take out the part or sprue	
11		IMM Alarm	①	NoUse (=default)	IMM E-stop Input don't activate Robot E-Stop	
			②	Use	IMM E-Stop activate Robot E-Stop	

12	IMRejec NoUse ◀ AllDelMold Nc DelErrLog Nc Time 0C:0C:0C	IMM Reject	①	NoUse (=default)	IMM defective Input don't separate reject part by robot	
			②	Use	IMM defective Input activate Robot to separate reject part to set position	
13		Total Mold Delete	①	No (=default)	Enter will not delete mold file	
			②	Yes	Enter will delete All mold file	
15		Time			Set Robot time by Hour, Minute, Seconds.	
16	Date 0C/0C/0C ◀ FindError 0C.0s EjectFwd NoUse CutTime 0.0s	Date			Set Robot time by Year, Month, Date	
17		Find Error			Finding Error Time	##.#sec
18		Eject Forward	①	NoUse (=default)	No Confirmation for Ejector Kick Complete Signal	
19			②	Use	Confirm for Ejector Kick Complete Signal	
		Cutting Time			Cutting time can set from 0.1 sec to 9.9 Sec.	

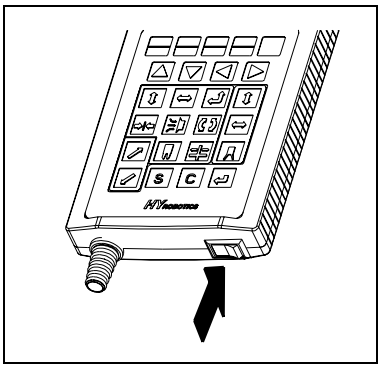
5 Follow Up

5.1 Motion Pattern Selection



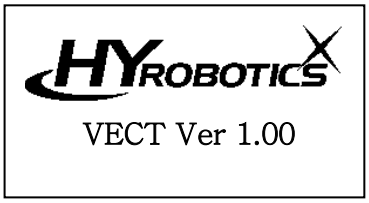
①. Down
②. Take-out Position
③. Chuck ON
④. Ejector Forward
⑤. Kick Return Position
⑥. Up
⑦. Sub Off Position
⑧. Sub Arm Off
⑨. Main Arm Off Position
⑩. Chuck Rotation
⑪. 2nd Descent
⑫. Main Arm Off
⑬. 2nd Ascent
⑭. Chuck Rotation Return
⑮. Waiting Position

5.2 Start up



● **STEP 1**

Turn On Power.

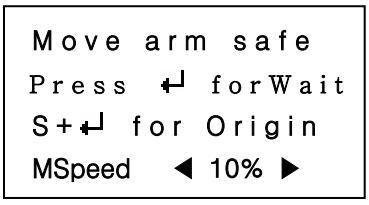


● **STEP 2**

Displays Logo and moves to Origin screen.

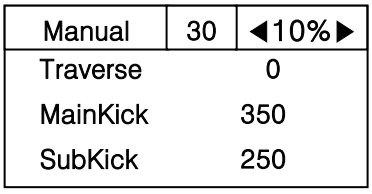
5.3 Move to Waiting Position

⚠DANGER Confirm there is no obstacle in the robot motion area before moving robot arm. If not, use manual opreation button to move robot arm to safe places.



● **STEP 3**

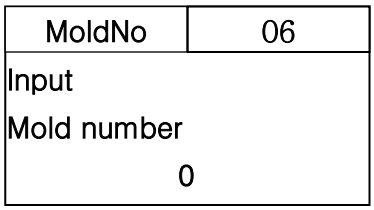
Press ENTER move each robot arm to origin point and display manual model (Kick return, Ascent, Chuck Rotation, Traverse)



● **STEP 4**

Press SHIFT S and MODE MOLD will move to Mold Maintenace screen.

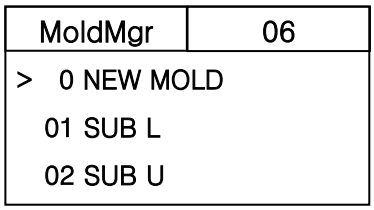
5.4 Mold Create



● **STEP 5**

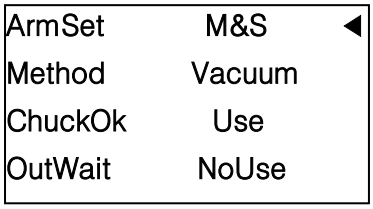
Hold SHIFT S and Press MODE MOLD, displays Mold search mode.

Press ENTER moves to mold manager screen and cursor will be on 0.



● **STEP 6**

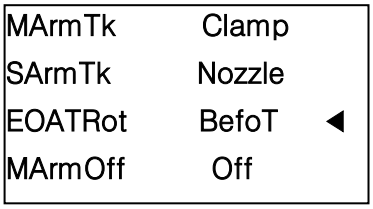
Press ENTER moves to mold manager screen and cursor will be on 0.



● **STEP 7**

[To set Chuck(EOAT) after traverse]

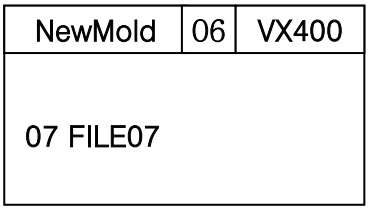
Press ▼ until cursor move to Chuck Rot.



● **STEP 8**

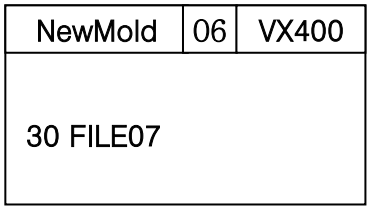
Press ▶ until display AfterT,

Press ENTER to save it..



● **STEP 9**

Press STOP MANUAL.



● **STEP 10**

[Set Mold Number to 30]

Press CLEAR C to cancel Mold Number, Press 3 WAITPOS 0 RETURN to input 30.

Press ENTER to save data.

NewMold	
30 A	

● **STEP 11**

[Set Mold Name to A]

Press ▶, cursor will move to first character and blinking.

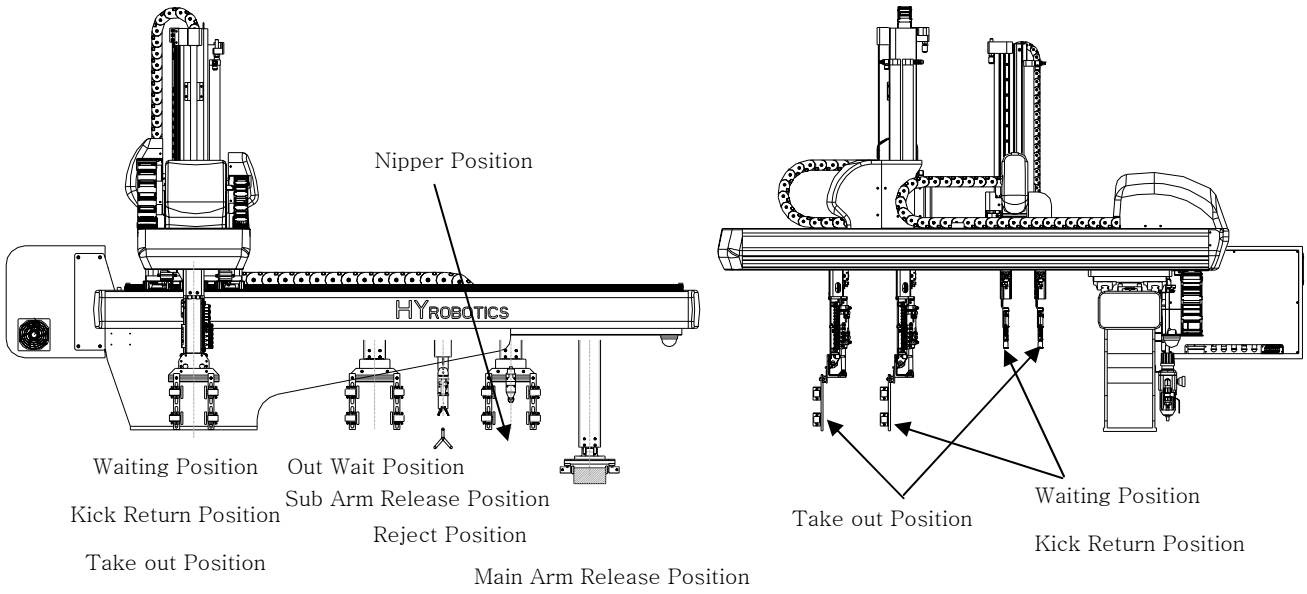
Press Clear C, select A with pressing ▲ ▼, pressing ▶ move to next character space, press ▲ ▼ select "A", and

Press ENTER to save data

Press STOP MANUAL will create Mold File and moves to Manual Mode.

Manual	30	◀10%▶
Traverse	0	
MainKick	350	
SubKick	250	

5.5 Set Position



Manual	30	◀10%▶
Traverse	0	
MainKick	350	
SubKick	250	

● **STEP 12**

[Move to Number Input screen]

Press SHIFT S and AUTO TEACH, moves to Number Input screen.

P0Wating	(Speed▶)	
Trvs	0mm	◀
M-Kick	0mm	
S-Kick	0mm	

● **STEP 13**

[Move to Jog Input screen.]

To set up Each position with Actual Robot movement, moves to Jog Input Screen with pressing SHIFT S and AUTO TEACH at the same time

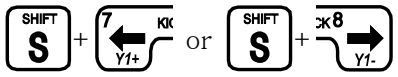
P0Wait	◀ 10% ▶
Trvs	0 < 0
M-Kick	0 < 350
S-Kick	0 < 250

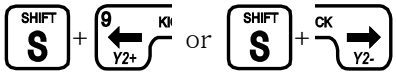
● STEP 14

[Set Waiting Position]

This is the position to wait until mold is completely open

In the manual mode, robot arm will go down in the mold in this position.

Press  or to set main arm

Prsess  or to set sub arm

And then press  to save

* Press  or  to adjust manual mode speed. Can set up 30%, 20%, 10%, 5% of Normal Speed. Distance can be set 10mm, or 1mm.

P0Wait	◀ 10% ▶
Trvs	0 < 0
M-Kick	400 < 400
S-Kick	300 < 300

● STEP 15

Press  , move to screen for setting of the <u>Take-out position</u>

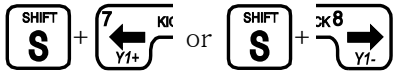
P1TKO	◀ 10% ▶
Trvs	0 < 0
M-Kick	450 < 400
S-Kick	250 < 300

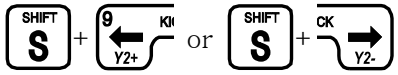
● STEP 16

[Set Take-out Position]

Make sure there is no obstable in the robot arm down motion in P0

Press  or  to operate robot arm down.

Press  or for main arm kick position

Press  or for sub amr kick position

Press  to save current value to setting value.

P1TKO	◀ 10% ▶
Trvs	0 < 0
M-Kick	500 < 500
S-Kick	200 < 200

● STEP 17

Press  , move to screen to set Kick Return Position.

P2KickRt	◀ 10% ▶
Trvs	0 < 0
M-Kick	350 < 500
S-Kick	250 < 200

● STEP 18

[Set Kick Return Position]

This position is robot arm will move back to pull out parts or sprue after take out parts or sprue in the mold,

Press SHIFT + S + 7 KI Y1+ or SHIFT + S + CK 8 Y1- for Main Arm Kick Return

Press SHIFT + S + 9 KI Y2+ 나 SHIFT + S + CK Y2- for Sub Arm Kick Return

Press Enter to save current value to setting value.

P2KickRt	◀ 10% ▶
Trvs	0 < 0
M-Kick	400 < 400
S-Kick	300 < 300

● STEP 19

Press ▼, move to screen to set Sub Arm Release Position.

P3SArmOf	◀ 10% ▶
Trvs	1000< 0
M-Kick	350 < 400
S-Kick	250 < 300

● STEP 20

[Set Sub Arm Release Position] : SubArm Off position

This position is for Sub Arm sprue Release position for

Press 4 UP/DOWN Z1- Z1+ and 6 UP/DOWN Z2- Z2+ , move robot arm to up position

Press 0 RETURN X- or FORWARD X+ to move robot arm to out side of mold area

to drop sprue. Press Enter to save current value to setting value.

P3SArmOf	◀ 10% ▶
Trvs	1200 <1200
M-Kick	400 < 400
S-Kick	300 < 300

● STEP 21

Press ▼, move to Main arm release (Off) setting screen.

P7MArmOf	◀ 10% ▶
Trvs	1600 <1600
M-Kick	600 <600
S-Kick	100 <100

● STEP 22

[Set Main Arm Release Position] : MArm Off Positon

This position is for Main Arm parts Release position for

Press 0 RETURN X- or FORWARD X+ to move robot arm to release positon

Press SHIFT + S + 7 KI Y1+ or SHIFT + S + CK 8 Y1- to move main arm kick

Press SHIFT + S + 9 KI Y2+ or SHIFT + S + CK Y2- to move sub arm kick.

Press ENTER, save current value to set , Press STOP MANUAL, move to manual operation mode.

5.6 Speed Setting

Manual	30	◀10%▶
Traverse	1600	
MainKick	600	
SubKick	100	

● **STEP 23**

[Set Take-out Speed to 100%]

Press AUTO TEACH with SHIFT S at the same time, move to the number input screen.

P0Waiting	(Speed▶)
Trvs	0mm◀
M-Kick	400mm
S-Kick	300mm

● **STEP 24**

Press ▶, move to speed input screen.

Speed (Pos◀)	30	
S0 Wait	80%	◀
S1 TakeOut	80%	
S2 KickRtn	80%	

● **STEP 25**

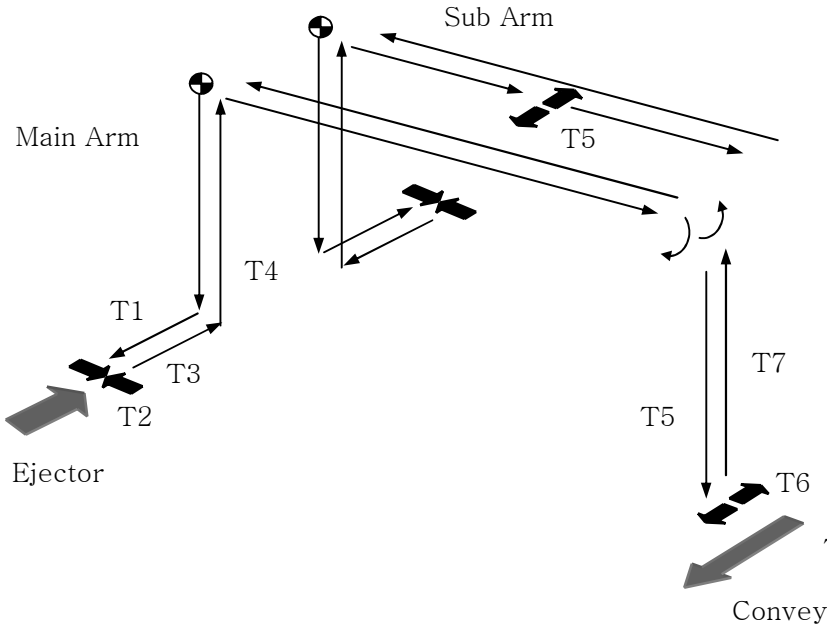
Press ▼ to move cursor '◀' to TakeOut.

Speed (Pos◀)	30	
S0 Wait	80%	
S1 TakeOut	100%	◀
S2 KickRtn	80%	

● **STEP 26**

Press 1 CHUCK, 0 RETURN, 0 RETURN to input take out speed, Press ENTER, save current value to set, Press STOP MANUAL, move to manual operation mode.

5.7 Timer Setting



NO	Default	Name
T1	0Sec	Kick Delay
T2	0 Sec	Chuck Delay
T3	0 Sec	Kick Delay
T4	0 Sec	Up Delay
T5	0.5 Sec	Sub Arm Off Delay
T6	0.3 Sec	Main Arm Off Delay
T7	0.3 Sec	2Up Delay
T13	5 Sec	Conveyor

Manual	30	◀10%▶
Traverse		1600
MainKick		600
SubKick		100

● **STEP 27**

[Move to timer screen, set T0 Kick delay 0.3 sec]

Press TIMER/COUNT, move to timer screen.

Timer	30	A
>T0 Down	0.0 <	0.0
T1 Kick	0.0	0.0
T2 Chuck	0.0	0.0

● **STEP 28**

Press ▼, move cursor '>'to Kick.

Timer	30	A
T0 Down	0.0	0.0
>T1 Kick	0.0 <	0.0
T2 Chuck	0.0	0.0

● **STEP 29**

Press 3 SWIVEL and input 0.3 sec, Press ENTER to save data.

Timer	30	A
T0 Down	0.0	0.0
>T1 Kick	0.3 <	0.3
T2 Chuck	0.0	0.0

● **STEP 30**

Press STOP/MANUAL, move to manual mode.

5.8 Step Run

Manual	30	◀10%▶
Traverse		1600
MainKick		600
SubKick		100

● **STEP 31**

Run Step motion STEP/I/O to confirm all the motion pattern and position

StepRun	30	0
Down		
Kick		
ChuckON		

● **STEP 32**

Press ▼, run each step and confirm position and motion, Press STOP/MANUAL to move manual mode

5.9 Auto Operation

Manual	30	◀10%▶
Traverse		1600
MainKick		600
SubKick		100

- **STEP 33**

Press AUTO/TEACH change to Auto Message screen.

Press Auto
Button to
Operate Auto
Mode.

- **STEP 34**

Press AUTO/TEACH again will start Auto Operation.

Auto	30	0
>Decent		
Kick		
ChkON		

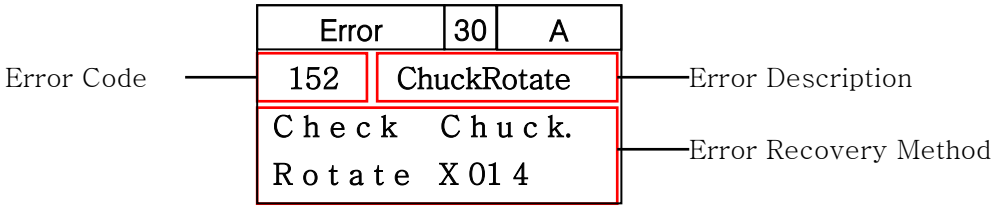
- **STEP 35**

To Stop Operation press STOP/MANUAL.

6 Error

6.1 Error Screen

This Chapter describes Error Code and Error recovery method.



Error cause Alarm and Buzzer, display the error message.

Press CLEAR C Stop Alarm and Buzzer, Press again CLEAR C clear error messages.

6.2 Error List

6.2.1 Motor Related

NO	Description	Cause	Recovery Method
48	TrvsCWLimt	Traverse Movement stop by touching CW Limit Proximity Sensor.	Operate robot arm to other direction (End of Stroke)
49	MKickCWLimit	Main Kick Movement stop by CW Limit.	
50	SKickCWLimit	Sub Kick Movement stop by CW Limit.	
55	TrvsCCWLimt	Traverse Movement stop by CCW Limit.	
56	MKickCCWLimi	Main Kick Movement stop by CCW Limit.	
57	SKickCCWLimi	Sub Kick Movement stop by CCW Limit.	
64	TraverOrigin	Error for searching Origin Point	Confirm Touch Plate or Sensor
71	NoTrvServoOn	Servo Motor and Driver is not on the Traverse Side	1. Press C and Turn off and turn on the Power 2. Confirm the connection between servo driver and controller connection (Cable)

72	NoMKickServoOn	Servo Motor and Driver is not on the Main Arm Kick/Return Side	1. Press C and Turn off and turn on the Power 2. Confirm the connection between servo driver and controller connection (Cable)

73	NoSKickServoOn	Servo Motor and Driver is not on the Sub Arm Kick/Return Side	1. Press C and Turn off and turn on the Power 2. Confirm the connection between servo driver and controller connection (Cable)
80	TrServoAlarm	1. Motor Overload 2. Motor Overpower 3. Bad Encorder Connector 4. Motor Power 5. Crash	1. Confirm Servo Motor Drive Alarm Code. 2. If motor overload error occur, robot may hit barrier or operate mistake crash. Restart robot after completely shutdown robot for more than 20 seconds.
81	MKServo Alarm		
82	SKServoAlarm		
97	ROBOT E-Stop	Stop by emergency switch	Remove cause of emergency stop and then cancel it by turning emergency stop button.
98	IMM E-Stop	Stop by Injection Molding Machine emergency switch	Remove cause of emergency stop and then cancel it by turning Injection Molding Machine emergency stop button.

6.2.2 Pneumatic

NO	Description	Cause	Recovery Method
130	SUpDnSame	Sub Arm Up and Down Sensor confirm(OK) at the same time	Check Sub Arm Up and Down Confirm Sensor
131	MUpDnSame	Main Arm Up / Down Sensor signal Confirm(OK)at the same time	Check Main Arm Up and Down Sensor
132	RotateSensor	Chuck Rotation and Rotation Return Sensor confirm(OK) at the same time.	Check Chuck Rotation and Rotation Return Sensor.

133	SwivelSensor	Chuck Swivel and Swivel Return Sensor confirm(OK) at the same time.	Check Swivel and Swivel Return Sensor Sensor.
134	SubArmUpOk	When Sub Arm Up ok signal should not be confirmed.	Check Sub Arm up Ok Sensor
135	MainArmUpOk	When Main Arm Up ok signal should not be confirmed.	Check Main Arm up Ok Sensor

148	SubArmUp	1. Air Pressure is Low 2. Sensor is not confirm position 3. Bad Sensor 4. Wire damaged	1. 1. Check Air Regulator 2. Check I/O 3. Check Sensor Touch Plate 4. Fix and Move Origin Point..
149	SubArmDown		
150	MainArmUp		
151	MainArmDown		
152	ChuckRotate		
153	RotateReturn		
154	Swivel		
155	SwivelReturn		
156	M-SafetyBwd		
157	S-SafetyBwd		

6.2.3 Sol valve

NO	Description	Cause	Recovery Method
160	VacuumFail	A. Vacuum Failure B. Check Suction Pad C. Leaking at Stem and Fitting D. Adjust Vacuum sensitivity	1. Open Safety Door and Fix Problem in Manual Mode 2. Replace Pad. 3. Tight Stem and Fitting Screw
161	ChuckFail	1. Chuck Motion Failure 2. Chuck Sensor Touch Failure 3. Bad Sensor	1. Open Safety Door and Fix Problem in Manual Mode 2. Adjust location of Sensor 3. Replace Sensor
163	MArmGripFail	1. Gripper Motion Failure 2. Wrong Sensor Location 3. Bad Sensor	1. Open Safety Door and Fix Problem in Manual Mode. 2. Adjust location of Sensor 3. Replace Sensor

164	SArmGripFail	4. Gripper Motion Failure 5. Wrong Sensor Location 6. Bad Sensor	4. Open Safety Door and Fix Problem in Manual Mode. 5. Adjust location of Sensor 6. Replace Sensor

6.2.4 Machine Abnormality

NO	Description	Cause	Recovery Method
176	SCInitiError	1. Noise 2. Program Failure	Reboot Contact Factory
178	OriginFail (Touch Plate : Origin Sensor Touch Plate)	1. Touch Plate Setting 2. Touch Plate Sensor Bad 3. Servo Motor Pulley loosened 4. Bad Belt	1. Reset Touch Plate 2. Change Touch Plate Sensor 3. Tighten motor Pully 4. Belt change
179	DownProhibit	1. Bad down Prohibit Sensor 2. Loosed Traverse Pulley 3. Damaged Traverse Belt	1. Change Down Prohibit Sensor 2. Tight Traverse Pulley 3. Change Traverse Belt

6.2.5 Interlock Related

202	MoldOpenOk	Rarely some Molding Machine lose Mold Open Complete Signal momentarily when Robot arm in Take-Out Position.	1. Reboot 2. Contact Factory

6.2.6 Operation Error

NO	Description	Cause	Recovery Method
208	ArmIsNotUp	Traverse Movement without Up (Ascent) Complete	Ascent Main and Sub Arm
209	NoMotionArea	When Robot can not move due to out of operation range	Move the robot arm to other direction
210	OverLimit	Pallet setting is wrong	Reset Number and Pitch
213	NoWorkArea	Someone approach in the working area	Move out of safety fence or working area
214	NoMoldOpen	In Manual Mode, activate Robot Arm Down without Mold Open Complete	Check Mold completely opened. (Check Mold Open Complete Sensor)
223	SafeDoorStop	In Automode, when safetydoor opened, robot will stop operation	Close Safety Door.

6.2.7 Internal Program Error

NO	Description	Cause	Recovery Method
231	OverFileNum	Mold file is full.	Delete old mold files.
236	SC InfoError	SC Wrong Version	Contact Factory

6.2.8 Etc

NO	Description	Cause	Recovery Method
224	SpeedError	Wrong Speed Input	Contact Factory
225	Origin Sensor	Origin looking without home sensor detection setting.	
226	EncorderFail	Origin looking without Encorder Z Phase	
227	KeypadFail	Key Pad Failure	
228	FileLoadFail	File Load Failure	
229	ComCodeFail	Communication Code Error	

Appendix

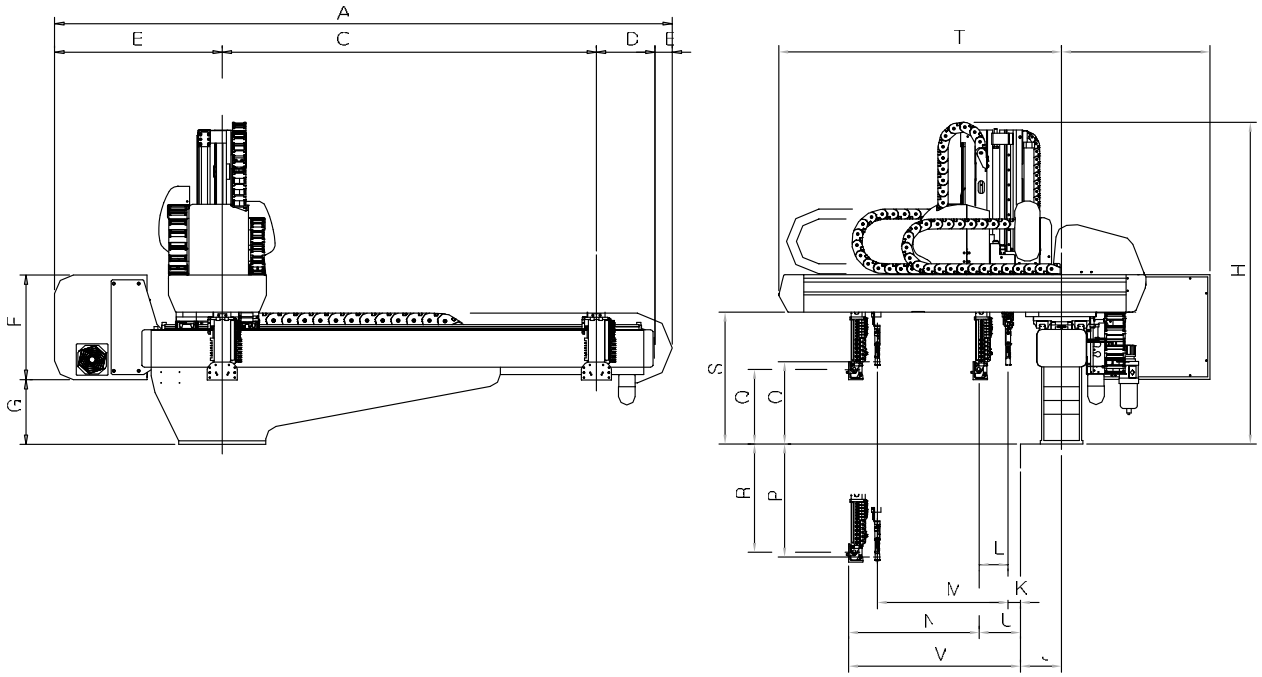
A. Specification

Power	Control Method	Pneumatic Pressure
1 phase AC220V 50/60Hz	Micro computer	0.5 to 0.6 Mpa

MODEL	Applicable injection molding machine	Traverse stroke (mm)		Kick stroke (mm)		Descent stroke (mm)		Pneumatic consumption (Nl/cycle)	Max. headling Capacity	Electric consumption
		standard	L Type	Main Arm	Sub Arm	Main Arm	Sub Arm			
VECT-400S	Down to 400 ton	1700	2000	951	-	1100	-	7	5	1 phase AC220V S:10A(Max.) D:13(Max.)
VECT-400D				825	825		1100			
VECT-600S	Down to 600 ton	2000	2500	1085	-	1300	-	16	10	1 phase AC220V S:10A(Max.) D:13(Max.)
VECT-600D				910	910		1300			
VECT-800S	Down to 800 ton	2500	3000	1218	-	1600	-	22	15	1 phase AC220V S:11A(Max.) D:15(Max.)
VECT-800D				1070	1070		1600			
VECT-1300S	Down to 1300 ton	3000	3500	1572	-	1800	-	35	20	1 phase AC220V S:12A(Max.) D:15(Max.)
VECT-1300D				1450	1450		1800			
VECT-2000S	Down to 2000 ton	3500	4000	1710	-	2100	-	56	30	1 phase AC220V S:16A(Max.)
VECT-3000S	Down to 3000 ton	4000	4500	2070	-	3000	-	152	40	1 phase AC220V S:26A(Max.)

B. External Dimension

B.1 VECT-V dimension



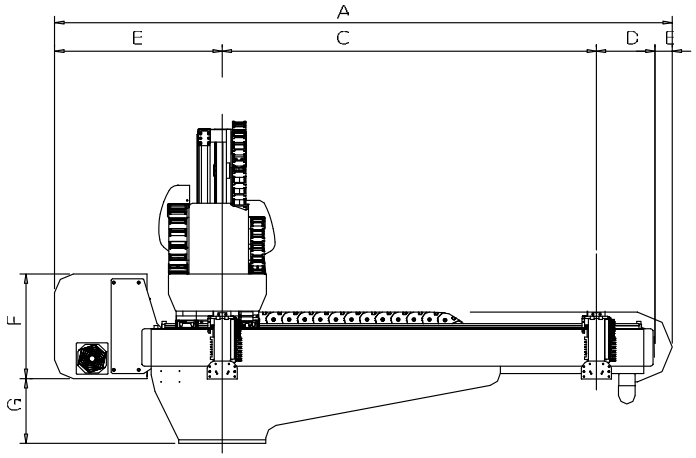
(Unit: mm)

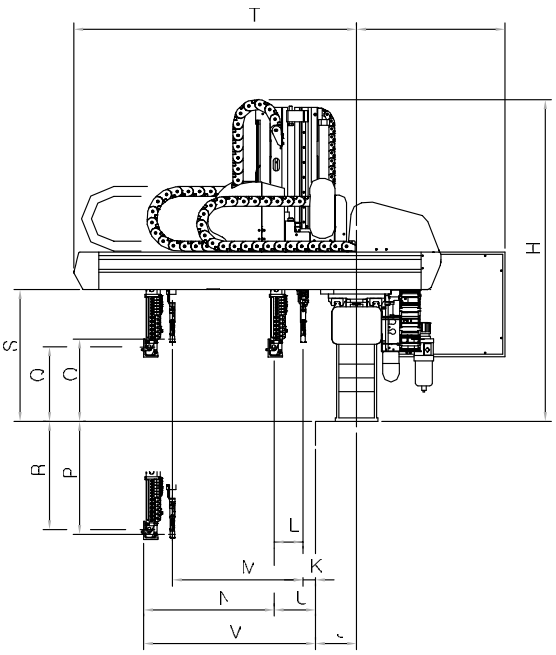
홈 스	A	B	C	D	E	F	G	H		J	K	L	M	N	O	P	Q	R	S	T	U	V
VECT-V-10CS	2207 (2407) [2607]	672	1300 (1500) [1700]	235	—	420	260	1232	596	165	—	—	—	650	—	—	300	400	530	1135	40	690
VECT-V-10CD											500	1160	525	525	330	420					166	
VECT-V-20CS	2407 (2607) [2807]	672	1500 (1700) [1900]	235	—		260	1292	596	165	—	—	—	650	—	—	300	500	530	1135	40	690
VECT-V-20CD											500	1160	525	525	330	520					166	
VECT-V-30CS	2407 (2607) [2807]	672	1500 (1700) [1900]	235	—		260	1367	596	165	—	—	—	830	—	—	300	650	530	1315	40	870
VECT-V-30CD											500	1160	705	705	330	620					166	
VECT-V-40CS	2687 (2987)	592	1700 (2000)	395	—		178	1620	636	205	—	—	—	1025	—	—	254	846	632	1567	70	1095
VECT-V-40CD											730	1720	850	850	340	760					245	
VECT-V-60CS	3082 (3582)	632	2000 (2500)	450	—		284	1930	656	223	—	—	—	1038	—	—	310	990	752	1703	145	1183
VECT-V-60CD											710	2220	890	890	346	954					293	
VECT-V-80CS	3812 (4312)	792	2500 (3000)	520	—		455	2320	680	255	—	—	—	1212	—	—	390	1210	927	1960	200	1412
VECT-V-80CD											490	2730	1090	1090	420	1180					322	
VECT-V-130CS	4460 (4960)	820	3000 (3500)	520	1230	—	—	2640	726	270	—	—	—	1590	—	—	375	1425	1092	2410	267	1857
VECT-V-200CS	5510 (6010)	1056	3500 (4000)	806	1490	—	—	3070	866	320	—	—	—	1750	—	—	420	1680	1197	2980	500	2250
VECT-V-250CS	6010 (6510)		4000 (4500)	786	1660	—	—	3250			—	—	—		—	—		2080				
VECT-V-300CS	5960 (6460)	1100		860	—	—	—	3875	890	340	—	—	—	2100	—	—	485	2515	1397	3355	492	2592

본 내용은 개량을 위해 예고없이 변경될 수 있습니다.

( )는 L TYPE [ ]는 LL TYPE 임

B.2 VECT dimension





(Unit: mm)

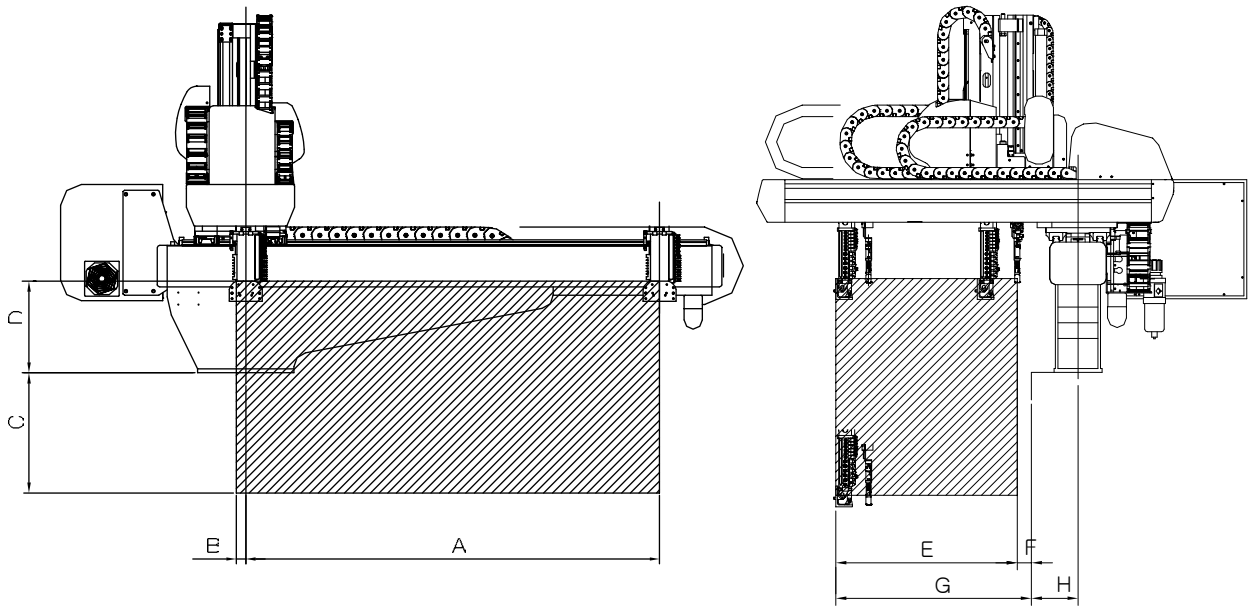
홈 스	A	B	C	D	E	F	G	H		J	K	L	M	N	O	P	Q	R	S	T	U	V
VECT-40CS	2587	672	170C	215	—	42C	26C	1472	59€	165	—	—	—	95'	—	—	30C	80C	53C	143E	4C	99'
VECT-40CD	(3087)		(200C)								5C	11€	82E	82E	33C	77C					16€	
VECT-60CS	3007	592	200C	41E	—		17S	174C	63€	20E	—	—	—	108E	—	—	254	104€	63Z	1627	7C	115E
VECT-60CD	(3507)		(250C)								7S	172	91C	91C	34C	96C					24E	
VECT-80CS	3562	632	250C	43C	—		284	211C	65E	22S	—	—	—	121E	—	—	31C	129C	75Z	188S	14E	136S
VECT-80CD	(4062)		(300C)								7'	222	107C	107C	34€	125Z					29S	
VECT-30CS	4292	792	300(	50C	—		45E	244C	68C	25E	—	—	—	157Z	—	—	39C	141C	927	232C	20C	177Z
VECT-30CD	(4792)		(350C)								4S	27S	145C	145C	42C	138C						
VECT-200CS	4988 (548E)	82C	350((400C)	54E	123	—	—	282C	72€	27C	—	—	—	171C	—	—	37E	172E	109Z	253C	267	1977
VECT-300CS	599((649C)	105E	400((450C)	78€	149	—	—	349C	86€	32C	—	—	—	207C	—	—	42C	258C	1197	330C	50C	257C

본 내용은 개량를 위하 예고없0 변경될 수 있습니다

(는 L TYPE 은

C. Safe guarded space

C.2 VECT-V

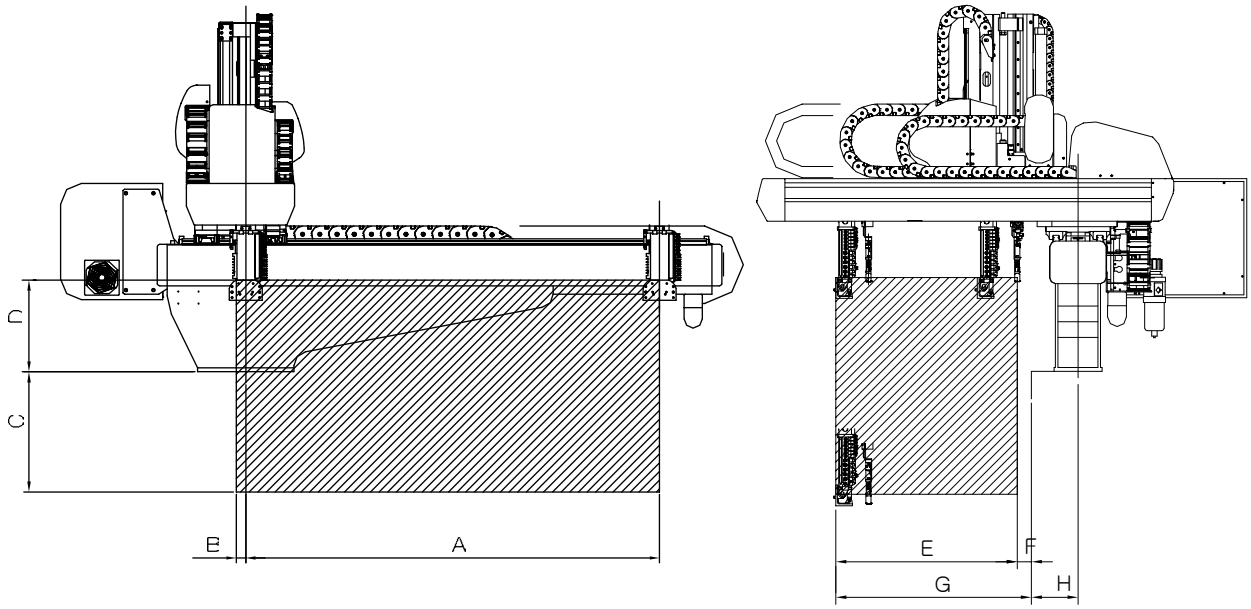


(Unit: mm)

형 식	A	B	C	D	E	F	G	H
VECT-V-100S	1300 (1500) [1700]	30	400	300	651	—	691	165
VECT-V-100D				330	641	50		
VECT-V-200S	1500 (1700) [1900]		500	300	651	—	691	165
VECT-V-200D				330	641	50		
VECT-V-300S	1500 (1700) [1900]		650	300	831	—	871	165
VECT-V-300D				330	821	50		
VECT-V-400S	1700 (2000)	50	846	254	1025	—	1095	205
VECT-V-400D				340	1022	73		
VECT-V-600S	2000 (2500)		990	310	1038	—	1183	223
VECT-V-600D				346	1112	71		
VECT-V-800S	2500 (3000)		1210	390	1212	—	1412	255
VECT-V-800D				420	1363	49		
VECT-V-1300S	3000 (3500)		1425	375	1590	—	1857	270
VECT-V-2000S	3500 (4000)		1680	420	1750	—	2250	320
VECT-V-2500S	4000 (4500)		2080	420		—		
VECT-V-3000S			2515	485	2100	—	2592	340

( ): L TYPE, [ ]: LL TYPE.

C.2 VECT

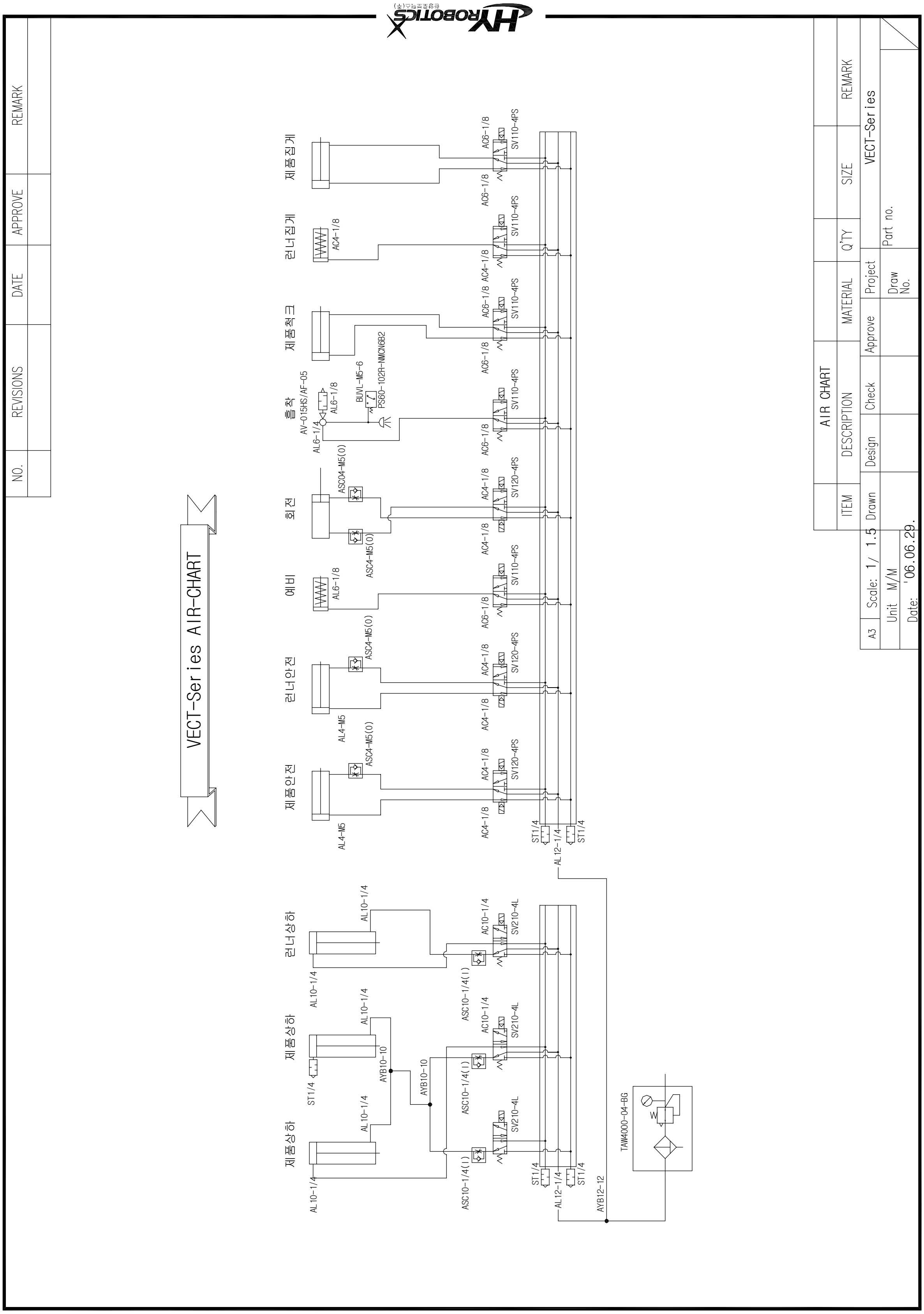


(Unit: mm)

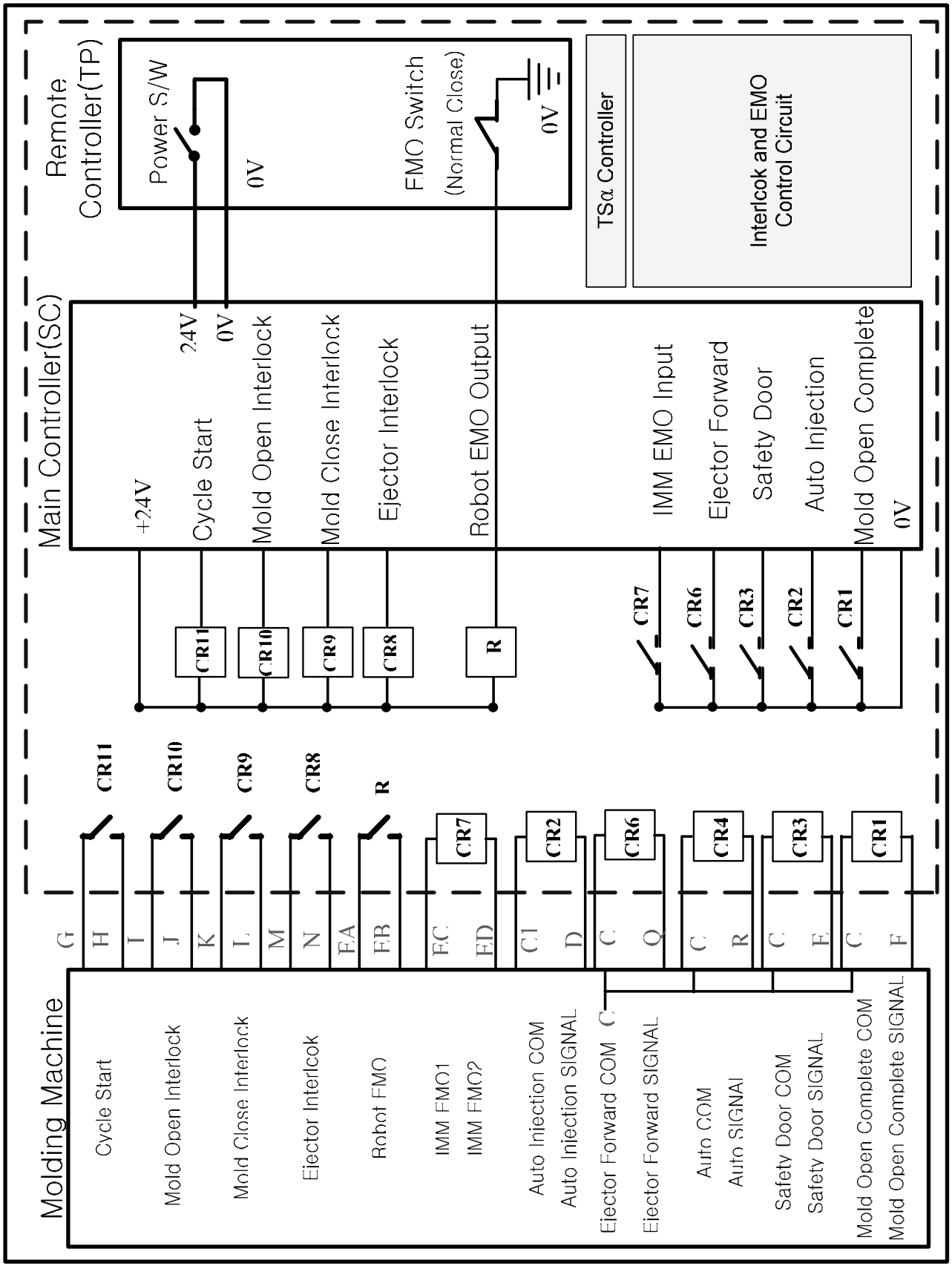
종 스	A	B	C	D	E	F	G	H
VECT-40CS	170C (200C)	5C	80C	30C	95·	—	99·	16E
VECT-40CD				33C	94·	5C		
VECT-60CS	200C (250C)		104E	254	108E	—	115E	20E
VECT-60CD				34C	1082	7E		
VECT-80CS	250C (300C)		129C	31C	121E	—	136E	22E
VECT-80CD				34E	1292	7·		
VECT-30CS	300C (350C)		141C	39C	157E	—	177E	25E
VECT-30CD				42C	172E	4E		
VECT-200CS	350C (400C)		172E	37E	171C	—	1977	27C
VECT-300CS	400C (450C)		258C	42C	207C	—	257C	32C

( ): L TYPE

D. Air Chart


VECT-Series AIR-CHART
AIR CHART
VECT-Series
NO.
REVISIONS
DATE
APPROVE
REMARK
ITEM
DESCRIPTION
MATERIAL
Q'TY
SIZE
Drawn
Design
Check
Approve
Project
Draw No.
Part no.
A3
Scale: 1/ 1.5
Unit M/M
Date: '06.06.29.
제품안전
런너안전
예비
회전
흡착
제품척크
런너집게
제품집게
제품상하
런너상하
TAW4000-04-BG

E. Interlock


Molding Machine
Cycle Start
Mold Open Interlock
Mold Close Interlock
Eiector Interlcok
Robot FMO
IMM FMO1
IMM FMO2
Auto Iniection COM
Auto Iniection SIGNAL
Eiector Forward COM
Eiector Forward SIGNAL
Auto COM
Auto SIGNAL
Safety Door COM
Safety Door SIGNAL
Mold Open Complete COM
Mold Open Complete SIGNAL
G
H
I
J
K
L
M
N
EA
EB
EC
ED
C1
D
C
Q
C
R
C
E
C
F
CR11
CR10
CR9
CR8
R
CR7
CR2
CR6
CR4
CR3
CR1
Main Controller(SC)
+24V
Cycle Start
Mold Open Interlock
Mold Close Interlock
Ejector Interlock
Robot EMO Output
IMM EMO Input
Ejector Forward
Safety Door
Auto Injection
Mold Open Complete
0V
24V
0V
CR11
CR10
CR9
CR8
R
CR7
CR6
CR3
CR2
CR1
Remote Controller(TP)
Power S/W
0V
EMO Switch
(Normal Close)
0V
TSα Controller
Interlcok and EMO Control Circuit

E. Inut/Output

Input			Output		
X000	VacuumOk	Vacuum Confirm	Y000	Vacuum	Vacuum & Multi Release1
X001			Y001	Flee	Traverse (Flee) in Mold
X002	ChuckOk	Chuck Confirm	Y002	MArmKick	Main Arm Kick
X003			Y003		
X004	SArmGripOk	Sub Arm Grip Confirm	Y004	Nipper	Nipper (Internal. External)
X005	AddGripOK	Add Gripper Comfirm	Y005	MArmGrip	Main Arm Grip
X006	MSftCylBw	Main Arm Safety Cylinder Backward	Y006	SArmGrip	Sub Arm Grip
X007	SSftCylBw	Sub Arm Safety Cylinder Backward	Y007	AddGripper	Add Gripper
X008	SpareIn1	Spare Input 1	Y008	PitchChg	Pitch Change
X009	SpareIn2	Spare Input 2	Y009	NipFwd	Nipper Forward
X010	MArmDownOk	Main Arm Down Complete	Y010	ExNipCls	External Nipper Close
X011			Y011	SArmDown	Sub Arm Up/Down
X012	SArmDownOk	Sub Arm Down Confirm	Y012		
X013			Y013	ChkRotate	Chuck Rotation
X014	RotateOk	Rotation Complete	Y014	RotReturn	Chuck Rotation Return
X015	SwivelOk	Swivel Complete	Y015	Swivel	Swivel
X016	TrvRtOk	Traverse Return Complete	Y016	SvlReturn	Chuck Swivel Return
X017	SafetyDown	Safety Down	Y017	SSftCylBw	Sub Safety Cylinder Backward
X018	M-KickOk	Main Arm Kick Complete	Y018	SSftCylFw	Sub Safety Cylinder Forward
X019	MArmUpOk	Main Arm Up Complete	Y019	MSftCylBw	Main Safety Cylinder Backward
X020	SArmKickOk	Sub Kick Confirm	Y020	MSftCylFw	Main Safety Cylinder Forward
X021	SArmUpOk	Sub Arm Up Confirm	Y021	MulOff2	Multi Release(Off)2
X022	RotRetOk	Rotation Return Complete	Y022	MulOff3	Multi Release(Off)3
X023	SvlReOk	Swivel Return Complete	Y023	MulOff4	Multi Release(Off)4
X024	Obstacle	Obstacle Detection	Y024	MArmDown	Main Arm Down
			Y025	MArmUp	Main Arm Up
			Y028	MSlowDown	Main Arm Slow Descent
			Y029	SSlowDown	Sub Arm Slow Descent(Down)
X100	ReadyCut	Ready to Cutting	Y100	CutStart	Cutting Start
X101	RdyStack	Ready to Stacking	Y101	StackingOK	Stacking Complete
X102	Reject	Part Reject	Y102	TKOFailSig	Take out Fail Signal
X104	UserIn1	User Input1	Y104	UserOut1	User Output1
X105	UserIn2	User Input2	Y105	UserOut2	User Output2

Interlock Input			Interlock Output		
No	Display	Description	No	Display	Description
X300	AutoInject	Auto Injection	Y300	ConveyOn	Conveyor On
X301	MoldOpen	Mold Open Complete	Y301	TakeoutOk	Take Out Complete
X302	SafeDoor	Safety Door Open	Y302	MoldOpen	Mold Open
X303	FullAuto	Fully Automatic	Y303	MoldClose	Mold Close
X304	EjtBwdOk	Ejector backward Complete	Y304	EjectorSig	Ejector Signal
X305	EjtFwdOk	Ejector Forward Complete	Y305	Robot Emg	Robot Emergency
X306	ImmEmg	IMM Emergency			

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