SVS-550/700

Vertical Molding Machine Swing-arm Robot

User Manual

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SHINI

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1. Safety

Before starting up the robot for the first time, please review this manual thoroughly and familiarize yourself with the operation of the robot. Improper use may injure personnel and/or damage the robot, mold or molding machine.

1.1 Safety Regulations

- Please review this manual thoroughly and familiarize yourself with the operation of the robot, before starting up the robot for the first time. Maintenance should be performed by qualified personnel only.
- The SVS series robot is designed for vertical molding machine **ONLY**.
- Any modification or change to the original design of the robot is forbidden.
- Any improper installation and operation may result in injury to personnel and/or damage to equipments.
- Please contact the manufacturer or local vender immediately if there is any operation problem with robot.
- Please not that our robot must be cooperated with safety device (i.e. safety door) in order to operate in normal condition.
- Ensure all installations are met with safety requirements before operating.
- Without the written consent of the manufacturer, any damage or lost caused by the modification or use beyond the user manual, the manufacturer will not have any responsibility.

1.2 Safety Concerns

- The maintenance, repair, etc, must be execute by professionally trained personnel.
- All electrical wiring must be completed by professionals, and in accordance with design of specifications and wiring instructions.
- Use safety fence to indicate working area while installation.
- The hand controller should be placed outside the robot working area.
- Ensure the bolts and nuts are tightened while installation.

- Ensure there are no following matters in the compressive air: phosphate-containing oil, organic solvents, sulfite gas, chlorine, acids and stale compressor oil.
- Keep the air pressure at 0.6MPa (tolerance 0.1MPa) while operation.
- Remove anything from the top of the robot to prevent failing due to vibration.
- Press **ENEGEBCY STOP** button immediately when accident occurs.
- Mustn't modify the design of robot body or control box. Please contact manufacturer or vendor if any change is required.
- Turn off the power supply and compressed air, set up the warning signs before maintenance and adjustment.
- Please use the SHINI parts if there is any replacement required.
- Our robot meet all of the safety standards.
- Please read this manual carefully as a safety guideline.
- Unauthorized personnel must inform the relative supervisor and understand all safety rules before entering robot working are.
- Please order a new user manual from the manufacturer or vendor if it is damaged.

Product owner has the responsibility to ensure the operators, maintenance staffs and relative staffs have read user manual thoroughly.

Any modifications or other applications to robot should obtain the written consent form the manufacturer, for safety purpose.

Abide by the safety guideline to avoid the electric shock.

The safeguarding required for operation of the robot is not including in our standard cope of supply (expect special equipment), since adaptation to specific site conditions is required. If such safeguarding is provided by you, please note that it must be installed prior to startup of the equipment in order to be included in the safety circuit of the system upon startup.

1.3 Emergency Stop

The emergency stop button is located on the hand controller.

When the emergency stop button is pressed, the power is turned off. The gripper, vacuum valves and the vacuum generator are not disconnected in order to avoid dropping parts from the gripper. In addition, the control system and the hand controller will remain under power to allow indication of error messages.

The emergency stop circuits of the robot and of the vertical molding machine are connected by the Euromap12 and Euromap67 interface. Therefore when the emergency stop button on the vertical molding machine is pressed the robot and peripheral equipment will also stop.

Any problem during using Shin robots, please contact our company or the local vendor.

Headquarters (Taipei Factory):	TEL: (02)26809119
China Service Hotline:	TEL: 800-999-3222
Dongguan Factory:	TEL: (0769)83313588
Ningbo Factory:	TEL: (0574)86719088

1.4 Transportation and Storage

Forbid underneath the robot during transportation.

If there is any need to remove or re-install the robot, please enquire for assistance from the manufacturer or local vendor. If you do not comply this mandatory requirement, results in personnel injure or damage the equipments; the manufacturer will not have any responsibility.

1.4.1 Transportation

1. The robot leave factory with crate package, please use forklift to transport the robot.
2. Before transporting, lock the arm falling-proof bolter to prevent arm out during transportation.
3. The arm may rotate, before transporting, turn the shock absorber on rotation cylinder to the limit position, and fix the arm, prevent damage to the arm.
4. During the transporting, please be warning of any collision to damage the robot.
5. In the long-distance transportation, please increase plastic bag, and if necessary vacuum pumping and put desiccant in.
6. Keep the temperature between -25℃ to 55℃, for short transportation (in 24 hours), the temperature can not higher than 70℃.

The robot you order before sending out the factory is confirmed in good working condition, please check whether there is any damage during carrying or transportation. Please be carefully, when remove of the crate and package, if the robot has been damaged, it can not be used again.

Any damage caused by transportation, please:

1) Feedback immediately to the shipping company and manufacturer.
2) Claim to the shipping company, fill in the file for compensation.
3) Retain the damaged items for testing. Do not return the damaged items until the testing is completed.

1.4.2 Storage

1. Cut off the power supply and air supply, if the robot is not use for a long time.
2. Keep in the dry room to against rust and damping.
3. If not use for a long time, anti-rust of the robot, and if necessary place film to prevent dust and water corrosion.

1.4.3 Transportation after Unpacking

Please use the special snatch strap to carry robot. This snatch strap not including machine parts, you can order it from manufacturer.

1.4.4 Operation Surroundings

1. Temperature: between +5℃ to +40℃.
2. Humidity: in +40℃, the humidity can not higher than 50%.
3. Elevation: under 1000 meters above sea level.
4. In order to ensure the robot operate normally, please stop using when:

① power wire is broken.
② air tube is broken.
③ air pressure is not enough or too high.
④ robot goes wrong, or adjusting and testing without professional.
⑤ there are organic solvent, acidic phospholipids, sulfurous acid, chlorine and flammable and explosive dangerous matter in the compressed air.

1.4.5 Scrapped

Scrap the robot when it goes to the end of the service life and cannot be maintenance. Take the equipments apart in different ways, according to component parts' nature. Entrust the authorized commission company as possible, and abide the local laws and regulations of solid industrial waste treatment.

2. Installation

2.1 Instruction

2.1.1 Safety Issue

1. Before installation, please read this chapter carefully.
2. Follow the installation guide to prevent accidents.
3. Fix the robot base before operating.
4. Set safety fence to indicate the robot operation area.
5. The hand controller should be placed outside of the safety fence.
6. Keep the air tube in good condition when installing.
7. The power connection should be performed only by an authorized electrician.
8. Cable connection and ground wire should obey the local regulations. The ground wire cannot attach to the water pipe, gas pipe, television cables or telephone lines.
9. Use the independent cable wire and power switch. The diameter of main power's wire cannot be smaller than the control box's wire.
10. The wiring should be fastening.

2.1.2 Compressed Air Connection

1. According to the filter specification to choose the suitable tube, then connect it between the gas source and the filter.

Note: before connecting tube, clean it by compressed air. Ensure there are no cuttings, seal tapes, and so on in the tube.

2. Check the pneumatic circuit in electric cabinet is in good conditions.
3. Turn on the air supply and adjust the air pressure to 5bar.

2.1.3 Electric Power Connection

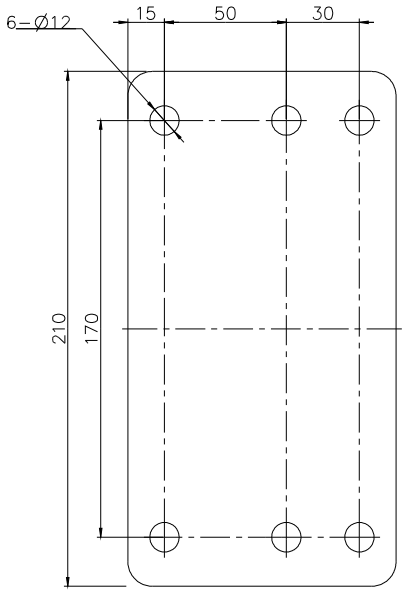
1. The power connection should be performed only by authorized electrician.
2. Before connecting, cut off the main power supply.
3. The informally power supply may destroy the control system. Please ensure the electric power is safety.
4. Before installation, wiring, operation and maintenance please familiar with installation guide as well as machinery, electronics and security attentions.

5. Safety connects the ground wire before operating.
6. The ground wire should connect on the metal and keep away from inflammable matter.

2.1.4 Safety Fence

1. Use safety fence indicate the robot operation area, after installation.
2. Place the hand controller outside of the safety fence.
3. Stick warning logos on the safety fence.

2.1.5 Mounting Preparation



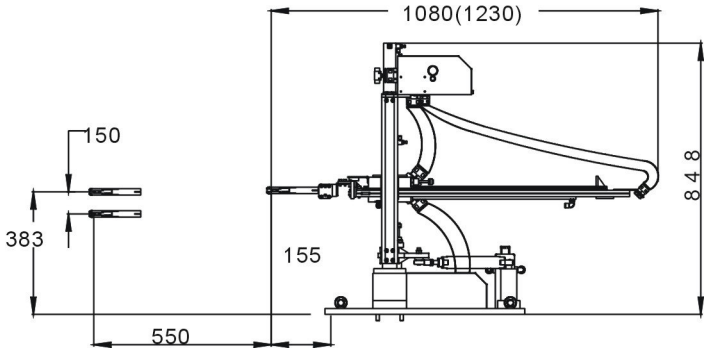
1. Before drilling, turn off the IMM power supply to prevent any damage to the mold.
2. Put the drilling sticker (see as the picture) on the IMM installation surface.
3. Use the center punch to fix the position.
4. Place electrical drill with magnet base on the fixing plate, useΦ10 drill bits to drill 6 holes (per hole about 30mm depth).
5. Use M12 tap to produce 6 internal screw threats about 25mm depth.

2.1.6 Mounting Instruction

1. Prevent sharp pounding, collision and falling when transit robot to the top of IMM.
2. After the robot has been fixed on the right position, adjust the spanner to 77Nm, tighten the hex socket bolt screws (M12×40)

2.2 Equipment Specification

2.2.1 Dimensions (unit: mm)



Picture 2-1：Vertical Molding Machine Swing-arm Robot

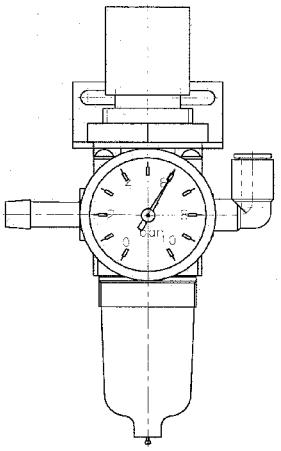
2.2.2 Model Specification

Chart 2-1：SVS Series Robot Specifications

Model	SVS-550	SVS-700
IMM (ton)	50--150	100--200
Vertical Stroke (mm)	0--150	0--150
Arm Stroke (mm)	0--550	0--700
Swing Angle (deg)	50--90	50--90
Wrist Angle (deg)	180	180
Max Load (kg)	0.5	0.5
Min Pick-out Time (sec)	0.8	0.9
Min Cycle Time (sec)	3	3.2
Max Air Consumption (L)	12	14.5
Power Rating (W)	30	30
Rated Current (A)	0.5	0.5
Air Pressure (bar)	4--6	4--6
Weight (kg)	55	57
Dimensions (W×D×H) (mm)	340×810×1080	340×810×1230
SVS-550/700-EM12(32pin)	○	○
SVS-550/700-EM67(50pin)	○	○

Note: “○”stands for options.

2.2.3 Pneumatic Source Requirement



Using 1/4—Φ10 tube feed compressed air to pressure gage. Adjust air pressure through the knob.

Required air pressure: 5 bar. If the air pressure is below than 4 bar, the robot will stop working and alarm.

2.3 Electrical Connection

2.3.1 Main Power Supply

The power requirements are given on the serial plate of the robot. The power connection is provided through a normal cord and a CEE grounded plug.

The power connection should be performed only by an authorized electrician according to applicable electric utility regulations.

2.3.2 Interface with the Vertical Molding Machine

SVS series robots are available with 2 different interface versions to communicate with the injection machine, Euromap12 and Euromap67.

The plug connection and signals testing should be done by a professional on IMM and robot. The optimal is robot engineers working with IMM engineers.

The interface signal should be carefully tested. Improper operation may cause malfunction or damage to the robot and mold.

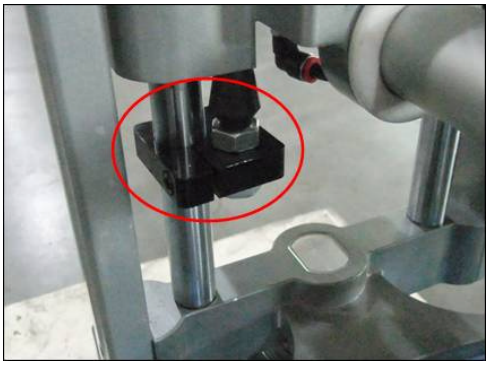
Testing signals with the help of safety device.

- IMM emergency stop signals.
- When the emergency stop button is activated on the hand controller, the error message emergency stop must also be indicated at the IMM. After acknowledging the error message, the emergency stop must be activated at the IMM. Emergency stop must also occur at the hand controller device and be indicated on the screen.

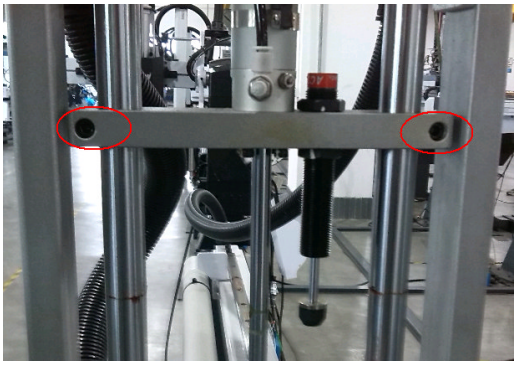
2.4 Axes Adjustment

While adjusting, make sure the robot arm is not run and the compressed air is shut off.

2.4.1 Adjusting the X-Position



a



b

The x-position is determined by tuning the position a and b.

Bracket “a” is for adjusting the end-position, and bracket “b” is for adjusting the stroke length and the 0-position.

Before running in to the mold range with the Y-axis for the first time, you must check whether the X-position can be reached without damaging the mode and the Y-axis.

First, the end position of X-axis must be adjusted.

Adjusting the end position

1) Run the X-axis to its end position
2) Release bracket “a”

3) Push the axis to the desired position manually
4) Fix the stop package

Adjusting the 0-position (stroke length)
5) Run the X-axis to 0-position
6) Release stop package “b”
7) Push the axis to the desired 0-position
8) Fix the stop package

2.4.2 Adjusting the Y-position

The upper position is given by the end position shock absorber. The withdraw position can be using the stop block.

Adjusting the Y-position
1) Run the Y-axis to its end position
2) Seal off the compressed air
3) Release the Y-axis stop package
4) Push the Y-axis to the desired position manually
5) Push the Y-stop to its lowest position
6) Fix the Y-stop package

If the Y-axis is shifted, also the withdraw position changes.

2.4.3 Adjusting the Z-Position

The Z-position is determined by adjusting the position of the shock absorber.

Before adjusting, seal off the compressed air.

1) Loosen the nuts on the shock absorber
2) Adjust the shock absorber to the desired position
3) Tighten the nuts in place

The Z-position must be adjusted so that the Y-axis must be run out to outside the mold area.
In the home position of Z-axis, the Y-axis must be run out to outside the mold area.

2.5 Gripper and the Vacuum Device Setting

2.5.1 Gripper Setting

When the gripper is open (not pick up parts), the light of the magnetic switch should be off. When the gripper picks up parts, the light of the magnetic switch should be on. When the gripper is close (not pick up parts), the light of magnetic switch should be off.

Adjusting the magnetic switch:

1. Loosen the fixing screw on the magnetic switch.
2. When gripper picks parts, the light of magnetic switch on, if gripper not picks parts, the light off.
3. Tighten the fixing screw after finishing adjustment.

During the operation, if the gripper not clamps the pats, the robot will stop and alarm.

夹具磁簧开关

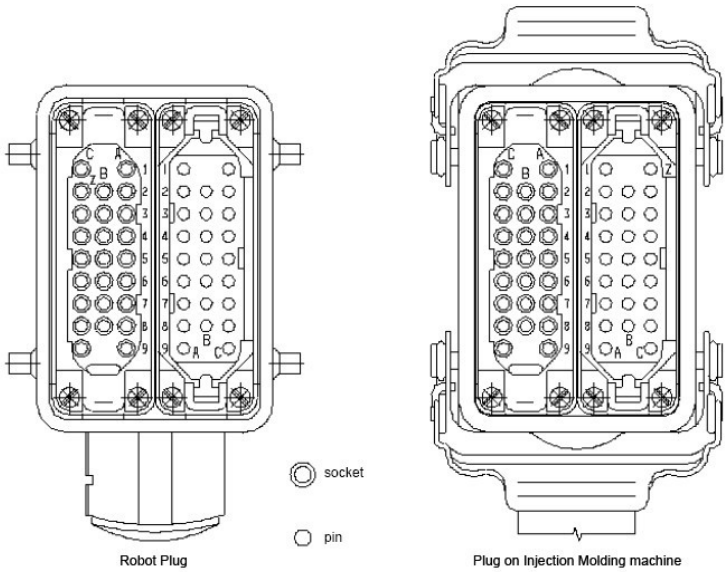
2.6 Robot and IMM Interface

SVS series robots are available with 2 different interface versions to communicate with the vertical molding machine.

●Euromap67
●Euromap12
Both versions are described in the following chapters.

2.6.1 Euromap67 Interface

Euromap67 interface defines the connection plug between the vertical molding machine and the robot.



The robot-vertical molding machine interface is designed according to the directives of Euromap67, which states:

Unless otherwise noted, the signals, which are maintained during the described function.

2.6.1.1 The Vertical Molding Machine Output Signals

Contact No.	Signals Designation and Function
ZA1 ZC1	**Emergency stop of machine channel 1** Opening the vertical molding machine emergency stop switch contact causes emergency stop of the robot.
ZA2 ZC2	**Emergency stop of machine channel 2** Opening the vertical molding machine emergency stop switch contact causes emergency stop of the robot.
ZA3 ZC3	**Safety devices of machine channel 1** The switch contact is closed when safety devices on the vertical molding machine are operative so that dangerous movements of the robot are possible.
ZA4 ZC4	**Safety devices of machine channel 2** The switch contact is closed when safety devices on the vertical molding machine are operative so that dangerous movements of the robot are possible.
ZA5 **optional**	**Reject** HIGH signal when the molding is a reject. HIGH signal when the mold is open and must remain HIGH at least until “Enable mold closure” (see contact No.A6).

ZA6	**Mould closed** HIGH signal when the mold closing is completed. The signal “Enable mold closure” is the no longer required (see contact No.A6).
ZA7	**Mold open position** HIGH signal when mold opening position is equal or more than required position. Inadvertent alteration to mold opening stroke smaller than that required for the robot to approach must be impossible.
ZA8 **optional**	**Intermediate mold opening position** HIGH signal when mold opening reaches a set position smaller than mold opening position. The signal remains HIGH to the end of the mold opening position. Two sequence are possible with this signal: 1) Mold opening stops on intermediate position and givers start signal to robot. Mold opening restarts with the signal “Enable full mold opening” (see contact No.A7). 2) Mold opening does not stop on intermediate position, however givers the signal to robot. LOW signal when intermediate mold opening position is not use.
ZA9	**Supply from robot** 24V DC
ZB2	**Enable operation with robot (Automatic)** HIGH signal when the vertical molding machine is able to be operated with robot.
ZB3	**Ejector back position** HIGH signal when the ejector has been finally retracted regardless of the moving platen position. The signal is the acknowledgement for the “Enable ejector retraction” signal, when the ejector sequence is selected (see contact No.B3).
ZB4	**Ejector forward position** HIGH signal when the ejector has been advanced. The signal is the acknowledgement for the “Enable ejector advance” (see contact No.B4).
ZB5	**Core pullers 1 free for robot to approach** HIGH signal when the core pullers 1 are in approach position (see contact No.B5).
ZB6	**Core pullers 1 in position to remove molding** HIGH signal when the core pullers 1 are in removal position (see contact No.B6).
ZB7 **optional**	**Core pullers 2 free for robot to approach** HIGH signal when the core pullers 2 are in approach position (see contact No.B7).
ZB8 **optional**	**Core pullers 2 in position to remove molding** HIGH signal when the core pullers 2 are in removal position (see contact No.B8).
ZC5/ZC6/ZC7	Reserved for future use of EUROMAP.
ZC8	Not fixed by EUROMAP, manufacturer dependent.
ZC9	**Supply from robot 0V**

2.6.1.2 Robot Output Signals

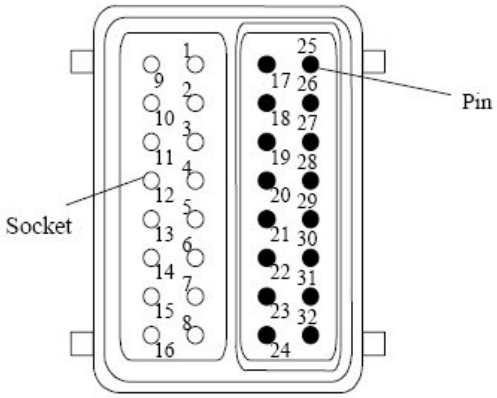
Contact No.	Signals Designation and Function
A1 C1	**Emergency stop of robot channel 1** Opening the vertical molding machine emergency stop switch contact causes emergency stop of the vertical molding machine.
A2 C2	**Emergency stop of robot channel 2** Opening the vertical molding machine emergency stop switch contact causes emergency stop of the vertical molding machine.

A3 C3	**Mold area free** The switch contact is closed when the robot outside the mold area and does not interfere with mold opening and closing movements. The switch contact must be opened when the robot leaves its start position. If the switch contact is open neither opening nor closing of the mold may occur. It is recommended to close the switch contact when the robot is unselected.
A4 C4	Reserved for future use of EUROMAP.
A5	Not fixed by EUROMAP, manufacturer dependent.
A6	**Enable mold closure** HIGH signal when the robot is retracted enough for start of mold closure. The signal must remain HIGH at least until “Mold closed” is available (see contact No.ZA6). If the signal is LOW as a result of a fault, mold closing must be interrupted.
A7 **optional**	**Enable full mold opening** HIGH signal when the robot has taken the part and allows to continue mold opening. The signal must remain HIGH until “Mold open” signal is given by the vertical molding machine (see contact No.ZA7).
A8	Reserved for future use of EUROMAP.
A9	**Supply from vertical molding machine 24V DC**
B2	**Robot operation mode** LOW signal when the robot mode switch is “Operation with vertical molding machine”. HIGH signal when the robot mode switch is “No operation with vertical molding machine”. HIGH signal when the robot is switch off.
B3	**Enable ejector back** HIGH signal when the robot enables the movement for ejector back. The signal must remain HIGH at least until “Ejector back” signal is given by vertical molding machine (see contact No.ZB3).
B4	**Enable ejector forward** HIGH signal when the robot enables the movement for ejector forward. The signal must remain HIGH at least until “Ejector forward” signal is given by vertical molding machine (see contact No.ZB4).
B5 **optional**	**Enable movement of core pullers 1 to position for robot to approach freely** HIGH signal when the robot is in position to enable the movement of the core pullers 1 to approach position. It is recommended that the signal remains HIGH at least until “Core pullers 1 in approach position” (see contact No.ZB5)
B6 **optional**	**Enable core pullers 1 to remove the molding** HIGH signal when the robot is in position to enable the movement of the core pullers 1 in remove molding position. It is recommended that the signal remains HIGH at least until “Core pullers 1 in remove molding position” signal is given by vertical molding machine (see contact No.ZB6).
B7 **optional**	**Enable movement of core pullers 2 to position for robot to approach freely** HIGH signal when the robot is in position to enable the movement of the core pullers 1 to approach position. It is recommended that the signal remains HIGH at least until “Core pullers 1 in approach position” (see contact No.ZB7)
B8 **optional**	**Enable core pullers 2 to remove the molding** HIGH signal when the robot is in position to enable the movement of the core pullers 2 in remove molding position. It is recommended that the signal remains HIGH at least until “Core pullers 1 in remove molding position” signal is given by vertical molding machine (see contact No.ZB8)
C5 C8	Not fixed by EUROMAP, manufacturer dependent.

C6 C7	Reserved for future use of EUROMAP.
C9	**Supply from vertical molding machine 0V**

2.6.2 Euromap12 Interface

The interface consists of the plug connection between the vertical molding machine and the robot.



The robot –vertical molding machine interface is designed according to Euromap12, which state:

Unless otherwise note, the signals are maintained during the described function.

2.6.2.1 Vertical Molding Machine Output Signals

Contact No.	Signals Designation and Function
1，9	**Emergency stop of machine** Opening the switch contact causes emergency stop of the robot.
2	**Mold open position** The switch (contact No.16) is closed when mold opening position is equal or more than required position. Inadvertent alteration to mold opening stroke smaller than that required for the robot to approach must be impossible.
3，11	**Safety devices of machine** The switch contact is closed when safety devices (e.g. safety guards, footboard safety, etc.) on the vertical molding machine are operative so that dangerous movements of the robot are possible. The signal is active in any operation mode.
4	**Ejector back position** The switch (contact No.16) is closed when the ejector has been retracted regardless of the moving platen position. The signal is the acknowledgement for the “Enable ejector retraction” signal (see contact No.21), when the ejector sequence is selected. It is recommended to close the switch contact (contact No.16) when the ejector sequence is not in use.

5	**Ejector forward position** The switch (contact No.16) is closed when the ejector has been advanced. The signal is the acknowledgement signal for the “Enable ejector advance” (see contact No.22). It is recommended to close the switch contact (contact No.16) when the ejector sequence is not in use.
6 **optional**	**Core pullers free for robot to approach** The switch (see contact No.16) contact is closed when the core pullers are in approach position.
7 **optional**	**Core pullers in position to remove molding** The switch (contact No.16) is closed when the core pullers are in removal position,
8 **optional**	**Reject** The switch (contact No.16) is closed when the molding is a reject. The switch contact (contact No.17) must be closed when the mold is open and must remain closed at least until “Enable mold closure”.
10	**Automatic (Enable operation with robot)** The switch (contact No.16) is closed when the vertical molding machine is set to semiautomatic or automatic mode.
12	**Mold closed** The switch (contact No.16) is closed when the molding is completed. The signal “Enable mold closure” is then no longer required (see contact No.17).
13 **optional**	Not fixed by EUROMAP, manufacturer dependent.
14 **optional**	**Intermediate mold opening position** The switch (contact No.16) is closed when the molding reaches a set position smaller than the mold opening position. The switch contact remains closed to the end of mold opening position. Two sequence are possible with this signal: 1) Mold opening stops on intermediate position and gives start signal to robot. Mold opening restarts with the signal “Enable full mold opening” (see contact No.A7). 2) Mold opening does not stop on intermediate position, however gives the signal to robot. The switch (contact No.16) is closed when intermediate mold opening position is not in use.
15 **optional**	Not fixed by EUROMAP, manufacturer dependent.
16	**Robot reference potential**

2.6.2.2 Robot Output Signals

Contact No.	Signals Designation and Function
17	**Enable mold closure** The switch (contact No.32) contact is closed when the robot is retracted enough for start of mold closure. The switch contact must remain closed at least until “Mold closed” (see contact No.12) is available. If the switch contact opens as a result of a fault, mold closing must be interrupted.
18，26	**Mold area free** The switch contact is closes when the robot is outside the mold area and does not interfere with mold opening and closing movements. The switch contact must be opened when the robot leaves its start position. If the switch contact is open neither opening nor closing of the mold may occur. It is recommended to close the switch contact when the robot is unselected.
19，27	**Emergency stop of robot** The switch contact opening causes emergency stop of the vertical molding machine.

20	**Robot operation mode** The switch (contact No.32) contact is open when the robot mode switch is “Operation with vertical molding machine”. The switch contact is closed when the robot mode switch is “No operation with vertical molding machine”. The switch (contact No.32) contact is closed when the robot is switched off.
21	**Enable ejector back** The switch (contact No.32) contact is closed when the robot enables the movement for ejector back. The switch contact must remain closed at least until “Ejector back” signal is given by vertical molding machine (see contact No.4).
22	**Enable ejector forward** The switch (contact No.32) contact is closed when the robot enables the movement for ejector forward. The switch contact must remain closed at least until “Ejector forward” signal is given by vertical molding machine (see contact No.5).
23 **optional**	**Enable core pullers to remove the molding** The switch (contact No.32) contact is closed when the robot is in position to enable the movement of the core pullers to remove position (see contact No.7).
24 **optional**	**Enable movement for robot to approach freely** The switch (contact No.32) contact is closed when the robot is in position to enable the movement of the core pullers to approach position. It is recommended that the switch contact remains closed at least until “Core pullers in approach position” (see contact No.6).
25	Reserved for future use of EUROMAP.
28 **optional**	**Enable full mold opening** The switch (contact No.32) contact is closed when the robot has taken the part and allows continuing mold opening. The switch contact must remain closed until “Mold open” signal is given by the vertical molding machine (see contact No.2). If the switch contact is not used it must be open.
29	Reserved for future use of EUROMAP.
30	Not fixed by EUROMAP, manufacturer dependent.
31	Not fixed by EUROMAP, manufacturer dependent.

3. General Description

3.1 SVS Series Robot Abstract

The SVS series robot is designed for rapid and precise removal of spure and runner form vertical molding machine, and place them into granulator for recycling. Simple product removal is applicable with optional vacuum generator and EOAT. SVS-550 and SVS-700 offer vertical arm displacements of 550mm and 700mm that are suitable for vertical molding machine with clamp forces of 150T and 250T respectively. Designed with compact structure, elegant appearance, smooth motion, user friendly interface, and imported pneumatic accessories.

Model：SVS Series Robot

3.2 Application

1. SVS-550 is suitable for the with plastics vertical molding machine under 150T.
2. SVS-700 is suitable for the with plastics vertical molding machine under 250T.

3.3 Features

1. The high quality alloy arm leaders through surface treatment, antic-friction and wearable.
2. The gripper designed with remove sensor and rotary chamfering device.
3. The wrist angle can be rotated 180 degree.
4. The special rotary cylinder with proximate sensor, rotate smoothly.
5. The cylinder with rubber buffer device and magnetic sensor, ensure the arm running smooth and anti-collision.
6. The displacements can be adjusted simply by changing the position limit blocks in easy directions.
7. Branded pneumatic accessories provide extensive use life. Removable electric circuit stands easy maintenance.
8. Air current can be adjusted by the speed control fitting which on the cylinder.
9. Dialogic hand controller provides Traditional Chinese, Simplified Chinese, English and Japanese. There are 8 standard programs and memory for up to 80 customized programs with self fault detection.
10. Extra 4 sets of I/O pins are available for other applications.
11. According to requirements choose the EUROMAP12, SPI or EUROMAP67 connector.

3.4 Functions

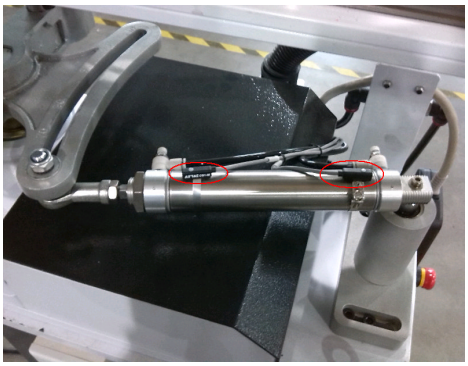
3.4.1 Function Description

The SVS series robots designed for rapid and precise removal of sprue and runner form vertical molding machine. Suitable for vertical molding machine under 205T clamp force.

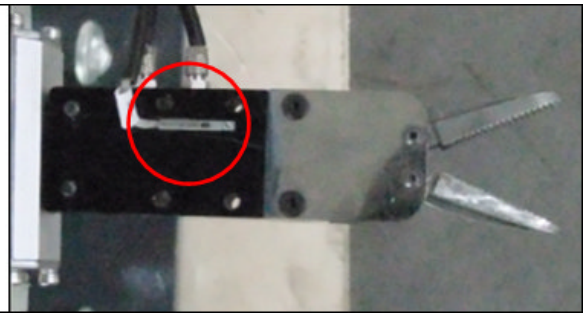
In order to ensure the robot works smoothly, there are shock absorbers and magnetic sensor switches on the main parts.

3.4.2 Stroke Measuring

Testing the cylinder displacement by the magnetic switches on the cylinder (front and back) (see picture 3-1) and proximity switch (see picture 3-2) on the arm. Use the magnetic switch (see picture 3-3) to detect whether the gripper picks up parts. Any errors the robot will stop and alarm till malfunction solved.

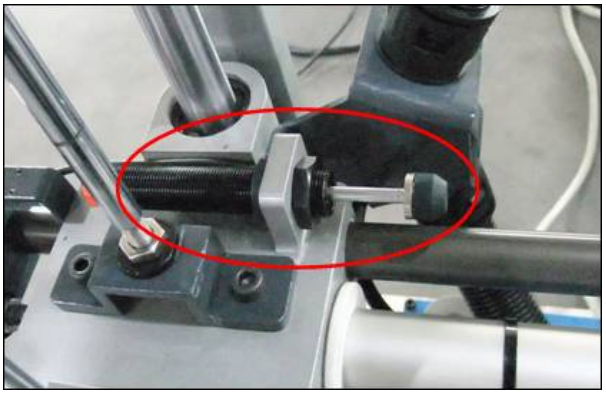


Picture 3-1：magnetic switches on the cylinder

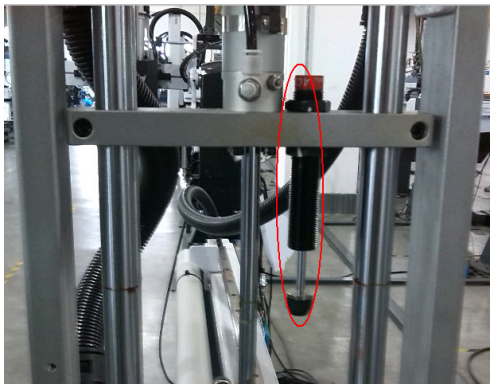


Picture3-2：proximity switch　Picture 3-3：magnetic switch on gripper

3.4.3 Shock Absorber



Picture 3-4：Shock Absorber on Arm



Picture 3-5：Vertical Stroke Buffer

3.5 Safety Function

3.5.1 Emergency Stop

There is emergency stop button on the hand controller. If robot goes wrong or need to maintenance, please press the emergency stop button to ensure operation safety. In addition, the hand controller will remain under power to allow indication of error messages.

Picture 3-6：Emergency Stop Button

3.6 Adjusting and Setting

3.6.1 Default Setting

When the robot sends out of the factory:

1. The arm rotate direction is right.
2. The pressure sensor is 4 bar. If the air pressure is less than 4 bar, the robot will stop working and alarm.
3. The filter regulator setting in 5 bar.

3.6.2 Adjusting the Height of the Gripper

1. Adjust the vertical stroke through the baffle plate to made gripper pick up parts in mold.
2. If the baffle plate is in limit position, the gripper still unable to pick up parts, loosen the fixed screw on arm, manually push the arm down to desired position. Note: the robot arm should not come up against any parts of IMM.

3.6.3 Adjusting the Arm Limit Position

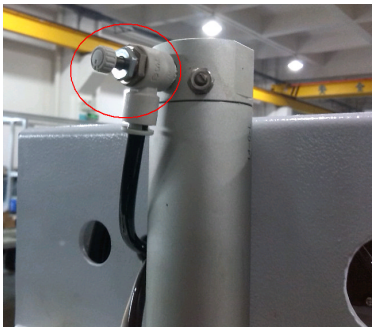
1. Adjust the crosswise stoke through the baffle plate to made arm picks out parts successfully.
2. Before adjusting the baffle plate loosen the fixed screw firstly, then manually push plate to desired position and fix the screw.

Note: after adjusting, please tighten the screw to prevent any damages.

Picture 3-7：Buffer Plate

3.6.4 Air Pressure Adjustment

1. After installation, adjust the air pressure to 5 bar (default setting) through air filter knob.
2. Adjust the cylinder speed easy through the speed control fitting.



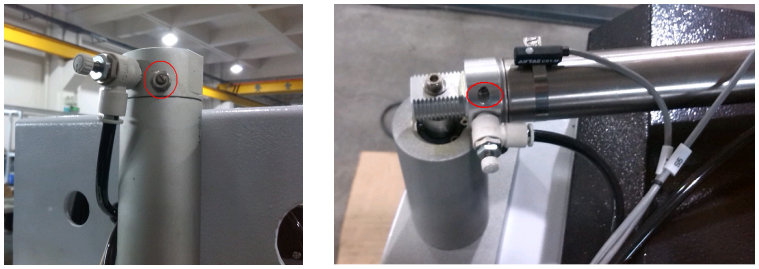
Picture3-8：Filter Knob

3.6.5 Shock Absorber Adjustment

The robot had been testing strictly before send out of factory, but in different working surroundings, its operation may not smoothly as expected. The shock absorber should be adjusted.

According to the customer requirements, adjust shock absorbers which on the arm, crosswise cylinders, and vertical cylinder.

Note: the different model cylinders with different regulation hole. Please choose the equal tools. In clockwise direction the buffering power is large, in counterclockwise is reverse.



Picture3-9：Buffer Regulation Hole

3.6.6 Swing Angle Adjustment

The SVS series robots swing angel is 50 degree to 90 degree. Adjust the piston rod position on the top of cylinder to change the swing angle. See as the flowing:

a. If robot arm swing in counterclockwise, push the piston rod to right then tighten the screw.

b. If robot arm swing in clockwise, push the piston rod to left then tighten the screw.

4. Operation Instructions

4.1 Hand Controller

4.1.1 The Panel of Hand Controller

Picture 4-1：Hand Controller

4.1.2 Keys

arm up/down

arm forward/backward

gripper on/off

arm swing in/out

wrist swing (including vacuum device)

spare for belt conveyor or vertical transporter

no use

no use

no use

mold close

4.2 Manually Operation

Press MANUAL key, toggle the display to the manual operation. Press the function keys once, the robot will run relevant movement.

Before manually operation, please confirm:

1. The robot has “mold open” signal.
2. Insure robot will not knock against surroundings subjects.

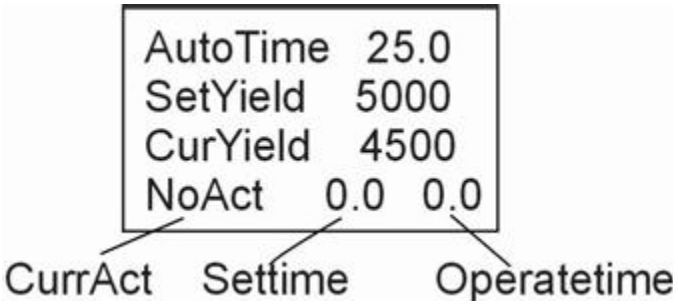
** Manual Input **
NoAct

4.3 Automatic Operation

Press AUTO key, enter into auto operation mode, see as the picture 4-3.

Auto time (AutoTime): record current automatic cycle time.
Set yield (SetYield): anticipate the production quantity of the enactment. When the current yield arrivers to the set yield quantity, the robot will alarm.
Current yield (CurYield): the quantities robot picks.
Current yield (CurAct): current action of robot.
Set time (Settime): the current time of the whole usage.
Operate time (Operatetime): the current action is physically time use.
Note: if molding machine or robot alarm, press AUTO can close alarm, robot

continues running. Press STOP, robot back to home position, stop auto running, press AUTO again will continue auto running.



4.4 System Operation

4.4.1 Stand-by Mode

After power on, the control system into self-examination function page, then enter to the stand-by page. When robot running normally, press STOP key, the robot will stop running and enter to stand-by page. Press FUNC keys to set the desired functions. After setting, press STOP key to save the setting and back to stand-by page.

4.4.2 Language

In stand-by page, press LANG key to set the language. Press the ENTER key to change simplified Chinese, traditional Chinese, English and Japanese.

4.4.3 Function Setting

In stand-by page, press FUNC key into function setting page. Press or on hand controller, move cursor to desire functions then press ENTER key to save the setting.

Eje.Use:Use
MainChck:Positv
SubCkeck:Positv
VacmChck:Use

1. Ejection relation (Eje.Use)
   NoUse: “Enable ejector forward” and “Enable ejector back”, the signals output all time.
   Use: After opening mold, output “enable ejector forward” signal.

2. Main gripper examination (MainChck):
   Positive: examine gripper in positive. If the gripper picks up parts successfully, the gripper outputs signal ON.
   Negative: examine gripper in negative. If the gripper picks up parts successfully, the gripper outputs signal OFF.
   NoUse: not examine gripper. Whether gripper picks up parts successfully or not, it is not test the signals.

3. Sub-gripper examination (SubCkeck):
   The same as the main gripper.

4. Vacuum examination (VacmCkck):
   NoUse: in auto operation, it is not test the vacuum signals.
   Use: in auto operation, if the vacuum suckers sucking parts successfully, it is output signal ON.

4.4.4 Special Function Seting

In stand-by page, press FUNC key twice, enter into the password setting page, input “5488”, then press ENTER key to enter the special function page. Press UP/DOWN key, use the cursor to move to desired function key, press ENTER key to save and acknowledge the setting.

PrerCnt:0	Stay:NoUse	DoorOpen:Orig
CycTime:60.0	Sound:ON	PressChk:Use
AlarmTime:12.0	ProdClr:OFF	AutoSignalNoUse

1. Spare counter (PrerCnt):
If the value is 0 for not using spare counter. If setting the value, the spare valve output counters according to movement of sub-interval mold.
If value is 1 stands for each mold output the spare valve, 2 stands for two molds output spare valve once only.

2. Cycle time (CycTime):
The cycle time is for robot monitors pick-out action. Means the maximum time from current cycle complete to the next Injection Machine mold opened limit. If waiting time exceed the set value, alarm raise.

3. Alarm time (AlarmTime):
Setting the alarming period time, exceed the time, the robot will stop alarm but the alarming page will still indicate on the screen.

4. Safety door (SafeDoor):
NoUse: not testing the signals of safety door.
Use: When arm down to pick up the parts, the safety door can test the signals.

5. Waiting outside of mold (Stay):
NoUse: robot operates in auto mode, the arms wait inside for next cycle, as the module program action.
Use: robot operates in auto mode, the arms wait outside for next cycle, and then rotate inside before the module program action.

6. Key sound (Sound):
Off: No sound while pressing.
On: Sound while pressing.

7. Products' number cleared (ProdClr):
Off: robot operates in auto mode, set the products' number, when reaching the setting number, the robot will stop and alarm.
On: In auto mode, not counter the products' number, the number always shows

"0".

8. Stop uses the safety door (StopSafe):

NoUse: The injection molding machine locks mold not controlled by the robot. The robot stop working and “open mold finished”, allow injection molding machine close mold for a long-term.

Use: When robot stops working and “open mold finished”, the door must open and close one time, then enable the IMM closed mold.

9. Door open (DoorOpen):

Reset: In robot auto operating mode, open the safety door and the arm will return to origin point.

Stop: In robot auto operating mode, open the safety door and arm stops working at once.

10. Air pressure checks (PressChk):

NoUse: not test air pressure signal.

Use: when the air pressure is not reach the setting, arm stop working. The hand controller will show air pressure is not enough.

11. Fully auto (AutoSignal):

NoUse: not test the fully auto operating signals.

Use: When having the fully auto operating signals, the robot can work in auto mode. When the signal cut off, the robot will stop when the action cycle finished.

4.4.5 Molds Select

In stand-by page, press SAVE key to enter into molds choice page (refer to the molds action pictures). Choice the desired molds and press ENTER key to save the setting.

MoldSele
Select:(0-99)?00

4.4.6 Mold Set

To copy the mold recipe, press SAVE key twice to enter into copy molds page. The user can choose one program from 0-99 to read it and then put it into 20-99 to memory as the code of the mold.

CopyMold
Read:(0-99)?00
Writ:(20-99)?20

4.4.7 Teach

In stand-by page, press TEACH Key to enter the TEACH page.

Prog
Read:(0-99)?00
Writ:(20-99)?20

Prog
2002Thim.Dly01
2003MainDown01
2004MoldEnd

Read the standard action program (0-19 set) or user defined program (20-99 set), save to the program contents change behind again 20-99 set.
After set "read" press ENTER key, the cursor move to "write", then set the "write" program, press ENTER key to enter the teach program.
In action area, press up/down key to correct step by step, after doing it, modification complete after press ENTER key and current recipe is saved. The robot will work and turn to next program.

2 0	0 3	arm down	0 1
Molds number	steps number	action	action time

INSERT: input one order without actions in the teach program.
DELETE: delete one order from teach program.
Note:
a. Must have “mode opened” signal from injection molding machine, then can enter into the TEACH page.
b. In teach mode, the robot will work according to the steps. Please pay special attention to the arm’s displacement to prevent collision.
c. All molds action begins from original point and at the end of the cycle back to

it, otherwise the action program is incomplete and robot cannot operate in auto mode.

Original point actions

Arm upgoing	Crosswise back	Rotation in	Chamfer wrist
Gripper open	Suction off	OFF Spare output/input off	

4.4.8 Time Setting

In stand-by page or auto page, press TIME key to enter into the time modification page. Press up/down key to move the cursor to proper step. Press ENTER key after modify.

Note:

1: The time of after the step-by-step action sequence is the working delay time, the delay time end, executing the current action.

2: If an action needs limit ON/OFF check, after time delay, the act starts and the next step action will wait until the limit signal arrived.

4.4.9 I/O Monitor

In stand-by or auto page, press WATCH key to enter into the I/O monitor page. Use the up/down key to move the cursor and monitor the input and output signals.

NO.	INPUT	NO.	OUTPUT
1	UpLmt	1	DownValve
2	DownLmt	2	ForwValve
3	MainGripsLmt	3	MainGripsValve
4	SuckLmt	4	SuckValve
5	MiddLmt	5	RotateInValve
6	PressLmt	6	RotateOutValve

7	RotateInLmt	7	SpareValve
8	RptateOutLmt	8	Alarm
9	ForwLmt	9	ClosePermit
10	BackLmt	10	UrgentStopOut
11	UrgentStopIn	11	Eje.BackPermit
12	OpenCmpl	12	Eje.ForwPermit
13	SafeDoor		
14	Eje.BackLmt		
15	Eje.ForwLmt		
16	AutoSignal		
17	CloseFinsh		

4.5 Standard Action Program

Program 0: Clip the moving side

0000 produce quantity 0001 mold open delay 0002 ejector delay
0003 arm down 0004 arm forward 0005 arm clip
0006 arm backward 0007 arm up 0008 rotate outside
0009 arm down 0010 arm put down 0011 arm up
0012 rotate inside

Program 1: Clip the fix side

0100 produce quantity 0101 mold open delay 0102 ejector delay
0103 arm forward 0104 arm down 0105 arm backward
0106 arm clip 0107 arm forward 0108 arm up
0109 rotate outside 0110 arm down 0111 arm put down
0112 arm up 0113 rotate inside

Program 2: Clip the fix side

0200 produce quantity 0201 mold open delay 0202 ejector delay
0203 arm down 0204 arm clip 0205 arm forward
0206 arm up 0207 arm backward 0208 rotate outside
0209 arm down 0210 arm put down 0211 arm up
0212 rotate inside

Program 3: Clip the moving side

0300 produce quantity	0301 mold open delay	0302 ejector delay
0303 arm forward	0304 arm down	0305 arm clip
0306 arm backward	0307 arm up	0308 arm forward
0309 rotate outside	0310 arm down	0311 arm put down
0312 arm up	0313 rotate inside	

Program 4: Suck the moving side

0400 produce quantity	0401 mold open delay	0402 ejector delay
0403 arm down	0404 arm forward	0405 vacuum absorb
0406 arm backward	0407 arm up	0408 rotate outside
0409 arm down	0410 vacuum off	0411 arm up
0412 rotate inside		

Program 5: Clip and suck the moving side

0500 produce quantity	0501 mold open delay	0502 ejector delay
0503 arm down	0504 arm forward	0505 vacuum absorb
0506 arm clip	0507 arm backward	0508 arm up
0509 rotate outside	0510 arm down	0511 vacuum off
0512 arm up	0513 arm down	0514 arm put down
0515 arm up	0516 rotate inside	

Program 6: Mold inside put down to the moving side

0600 produce quantity	0601 mold open delay	0602 ejector delay
0603 arm down	0604 arm forward	0605 arm clip
0606 arm backward	0607 arm put down	0608 arm up

Program 7: Mold inside put down to the fix side

0700 produce quantity	0701 mold open delay	0702 ejector delay
0703 arm forward	0704 arm down	0705 arm backward
0706 arm clip	0707 arm forward	0708 arm put down
0709 arm up		

5. Troubleshooting

Alarm	Caused	Troubleshooting
After power on, the hand controller display is not light.	1. Emergency Stop key on the hand controller was pressed. 2. 37P plug loosed or not connected. 3. Power wire error. 4. Fuse burning-off.	1. Loose the Emergency Stop key on the hand controller. 2. Check the 37P plugs. 3. Check the power wire. 4. Check and change the fuse.
The screen of hand Controller is gray, when power ON.	Under voltage	Adjusting the screw in lateral face of the controller until the display of hand controller clearly.
Alarm No.01 05 R.InLmt ON 06 R.OutLmt ON	05 rotate inside limit on, 06 rotate outside limit on. Both the rotate inside and outside limit having signal.	1. When the arm is swing in, check the light of rotate outside limit is lighting all the time. 2. When the arm is swing out, check the light of rotate inside limit is lighting all the time. 3. Check the I/O wirings. 4. Whether having troubles on power board.
Alarm No.02 01 rise lmt ON	Down valve worked already, having the signal of down valve .the motion of arm downing doesn't finish in set time.	1. Whether the air pressure is too low. 2. Whether the arm go down. 3. Whether having the signal of up limit. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.03 01 rise lmt OFF	Down valve no motion, and the up limit no signal, the motion of the arm up going don't finish in set time.	1. Whether the air pressure is too low. 2. Whether the arm go up. 3. Whether having the signal of up limit. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.04 05 Vacuum ON 04 Vacuum OFF	The sucker working and the vacuum suck no signal input.	1. Whether the air pressure is too low. 2. Check if sucker suck the products and liquid the air. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.05 04 arm clip ON 02 arm clip lmt OFF	Arm clip valve working, arm clip limit no input.	1. Whether the air pressure is too low. 2. Whether the arm clip testing function is right. 3. Check if the arm clip can clip the products. 4. Check the I/O wirings. 5. Whether having trouble on power board.

Alarm No.07 05 Vacuum OFF 04 Suck lmt ON	Suck valve no action, vacuum suck having signal	1. Whether the arm clip having signaled. 2. Whether the suck magnetic valve having trouble. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.08 04 Arm clip OFF 02 Arm clip lmt ON	Arm valve no working, but arm clip signal on.	1. Whether the arm clip having signaled. 2. Whether the suck magnetic valve having trouble. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.10 06 R.out ON 06 R.Out Lmt OFF	Rotation out valve working, rotation out limit off, the action didn't finish in the schedule time.	1. Whether the air pressure is too low. 2. Whether the robot rotating out. 3. Check Whether the rotation limit having signals 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.11 06 R.out OFF 05 R.Out Lmt OFF	Rotate out valve no action; rotate in limit doesn't input, the rotate in doesn't finish in the schedule time.	1. Whether the air pressure is too low. 2. Whether the robots rotating in. 3. Whether the rotating in limit having signal. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.12 04 Arm Clip ON 02 Clip lmt ON	Arm clip on, arm clip limit no input.	1. Whether arm clip valve testing function is reverse. 2. Whether the air pressure is too low. 3. Check whether the arm clip can clip the products. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.14 03 Arm forward valve ON 09 Arm backward lmt ON	Arm forward valve working, arm backward valve having signal.	1. Whether the air pressure is too low. 2. Whether the robot arm go forward. 3. Whether having the backward limit signal. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.15 03 arm forward valve Off 09 arm backward lmt Off	Arm forward valve no action, backward limit no input, the backward action didn't finished in the schedule time.	1. Whether the air pressure is too low. 2. Whether the robot arm go backward. 3. Whether having the backward limit signal. 4. Check the I/O wirings. 5. Whether having trouble on power board.

Alarm No.31 01 rise lmt OFF Not Origin	Up limit no signal, Robot not return in the waiting point.	1. Press stop key to reset. 2. Whether the air pressure is too low. 3. Check if the up limit having signal. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.32 05 R.In Lmt OFF Not Origin	Rotation in limit no signal input, Robot doesn't return the waiting point.	1. Press stop key to reset. 2 .Whether the air pressure is too low. 3. Check if the rotation in limit having signals. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.33 06 R.Out Lmt ON Not Origin	Rotation out limit no signal input, Robot not returns in the waiting point.	1. Press stop key to reset. 2. Whether the air pressure is too low. 3. Check if the rotation out limit having signals. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.34 07 Mid.Mold lmtOFF Not Origin	When manual or teach, middle mold limit no signal input.	1. Whether the indicator light of proximity switch on middle mold on. 2. Whether having the signal of middle mode in the monitor page. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.35 10 Mold Open Lmt OFF Not Origin	When manual or teach, the open mold limit no signal input.	1. Check the injection molding machine if open mold completely. 2. Check the computer of the injection molding machine if allows the robots to use. 3. Check the computer of the injection molding machine if having the open mold limit signal output. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.45 Before Rotate 02 ArmDown ON	Before the arm rotating, arm down valve working.	1. Before rotating, don't operate the main arm down motion, must close the down valve.
Alarm No.47 Before Rotate 01 uplimit OFF	Before Rotate the up limit has no signal input.	1. Whether arm in up condition. 2. Whether having the signal on up limit. 3. Check the I/O wirings. 4. Whether having trouble on power board.

Alarm No.50 10 mold open ON 07MidMold OFF	Mold open signal input, no middle mold signal.	1. Whether the indicator light of proximity switch on middle mold on. 2. Whether having the signal of middle mode in the monitor. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.51 06 R.Out LmtOFF 05 R.In LmtOFF	Out limit and in limit no signal input at the same time.	1. When rotating in, check the indicator light of the rotary switch on or not. 2. When rotating out, check the indicator light of the rotary switch on or not. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.52 Before descend 04 Clip ON	Before arm descending, arm grip valve working.	1. Whether having grip movement, before arm descending, arm grip off.
Alarm No.54 Before descend 05 Vacuum ON	Before arm descending, vacuum suck Valve working.	1. Whether operating the vacuum suck, before arm descends, vacuum suck Valve off.
Alarm No.55 Before descend 10 Mold Open OFF	Before arm descending, no mold open signal input.	1. Check the injection molding machine if open mold completely. 2. Check the computer of the injection molding machine if allows the robots to use. 3. Check the computer of the injection molding machine if having the open mold signal output. 4. Check the I/O wirings. 5. Whether having trouble on power board.
Alarm No.56 Before descend 07 MidMoldOff	Before arm descending, no middle mold signal.	1. Check if the indicator light of proximity switch on middle mold on. 2. Check the middle mold signal on or not. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.57 Before descend 08 Safety DoorOFF	Before arm descending, no safety door signal.	1. Check if the safety door of the injection molding machine off. 2. Check if having the safety door signal. 3. Check the I/O wirings. 4. Whether having trouble on power board.

Alarm No.58 10 mold openON 09 safety doorOFF	Safety door use, signal input when opened mold. No safety door signal.	1. Check if the safety door of the injection molding machine off. 2. Check if the safety door of electronic control having signaled. 3. Check the I/O wirings. 4. Whether having trouble on power board.
Alarm No.59 open wait overtime	Injection molding machine cycle open mold time too long.	1. Extending the cycle time of the robots, more than the cycle time of injection molding machine opening mold.
Alarm No.60 When descend 10 mold open OFF	Arm go down, mold open signal OFF.	1. Whether the open mold signal of the injection molding machine OFF. 2. Check I/O connecting wire if poor contact. 3. Whether having trouble on power board.
Alarm No.61 When descend 07 MidMold signal OFF	Arm go down, middle plate confirmation signal OFF.	1. The input signal of the middle mold if normal. 2. The light of sensor switches of the middle mold ON or not. 3. Check I/O' connecting wire if poor contact.
Alarm No.62 13 Emergency OFF Emergency Event	Injection molding machine carry out emergency stop.	1. Loose the emergency stop key of the electronic control. 2. Loose the emergency stop key of the injection molding machine. 3. Check the connection line of the emergency stop signal.
Alarm No.70 Not Right Program no use	The teach program is not complete.	1. Set the teach program again, robot should return in the waiting point at last.
Alarm No.71 Set Yield Arrive	Current yield reach to setting.	1. Increasing the number of the set yield. 2. Clearing current yield.
Alarm No.72 Act Not Exe.Mold	Controlled the arm up and down by hand, not according the auto program.	Controlled the arm up and down by hand, it must correspond the forward or backward position in auto program. Or will damage the mold.
Alarm No.73 when stay out Dais Out Lmt Off press stop key	Stay outside, rotate outside limit OFF.	1. Press STOP key to rotate out. 2. Check the rotating signal input or not. 3. Check I/O connecting wire if poor contact 4. Whether having trouble on power board.

Alarm No.74 Air pressure not enough	Air pressure of robots is not enough.	1. Check if the air pressure of robots is enough. 2. Whether the signal of air pressure is normal. 3. Check I/O connecting wire if poor contact. 4. Whether having trouble on power board.
Alarm No.75 Arm up lmt On Arm down lmt On	Both arm up limit and down limit having signals.	1. Arm up, down limit switch OFF or not. 2. Arm down, up limit switch OFF or not. 3. Check I/O connecting wire if poor contact. 4. Whether having trouble on power board.
Alarm No.76 Main Forw lmt ON Main back lmt ON	Both main arm go forward and backward limit having signal input.	1. Arm go forward, back limit switch OFF or not. 2. Arm go backward, forward limit switch OFF or not. 3. Check I/O connecting wire if poor contact. 4. Whether having trouble on power board.
Alarm No.77 Arm down On Arm down lmt Off	Descends valve, no input the down limit, the action didn't finished in schedule time.	1. Whether air pressure is too low. 2. Arms if down or not. 3. Whether having the signal when down limit. 4. Check I/O connecting wire if poor contact. 5. Whether having trouble on power board.
Alarm No.78 MainForw Off MainForw lmt On	Forward valve working, no input the signal; the action didn't finish in schedule time.	1. Down limit off or not. 2. Whether the magnetic valve having trouble. 3. Check I/O connecting wire if poor contact. 4. Whether having trouble on power board.
Alarm No.79 MainForw ON MainForw lmt OFF	Forward valve working, no input the signal; the action didn't finish in schedule time.	1. Whether the air pressure is too low. 2. Whether the arm having go forward action. 3. Whether having signal when forward limit. 4. Check I/O connecting wire if poor contact. 5. Whether having trouble on power board.

Alarm No.80 MainForw OFF MainForw lmt ON	Signal input, no forward valve action.	1. Whether having the forward limit signal. 2. Whether the forward magnetic valve having trouble. 3. Check I/O connecting wire if poor contact. 4. Whether having trouble on power board.
Alarm No.81 Robot working in auto,the injection molding machine has no signal.	When the robot working in auto, there is having no auto signal of injection molding machine on controller.	1. Whether the injection molding machine turn in fully automation. 2. Check if having the fully automatic signal. 3. Check I/O connecting wire if poor contact. 4. Whether having trouble on power board.

6. Maintenance

6.1 General

Please observe the prescribed maintenance intervals. Proper maintenance ensures trouble-free function of the robot. Proper maintenance is necessary in order that the warrantee be fully enforceable.

Maintenance should be performed by qualified personnel only.

Maintenance and responsibility for safety equipment becomes the responsibility of the system operator once he accepts the robot.

Please note, in particular that safety instructions marked with must be observed according to regulations so that fully functionality of this equipment can be guaranteed.

6.2 Lubrication Requirements

Remove the old grease form the guide shafts and scraper rings of the bearing using a cloth. Then apply the new grease to the guide shafts using a brush. Roller bearing greases according to DIN 51825.

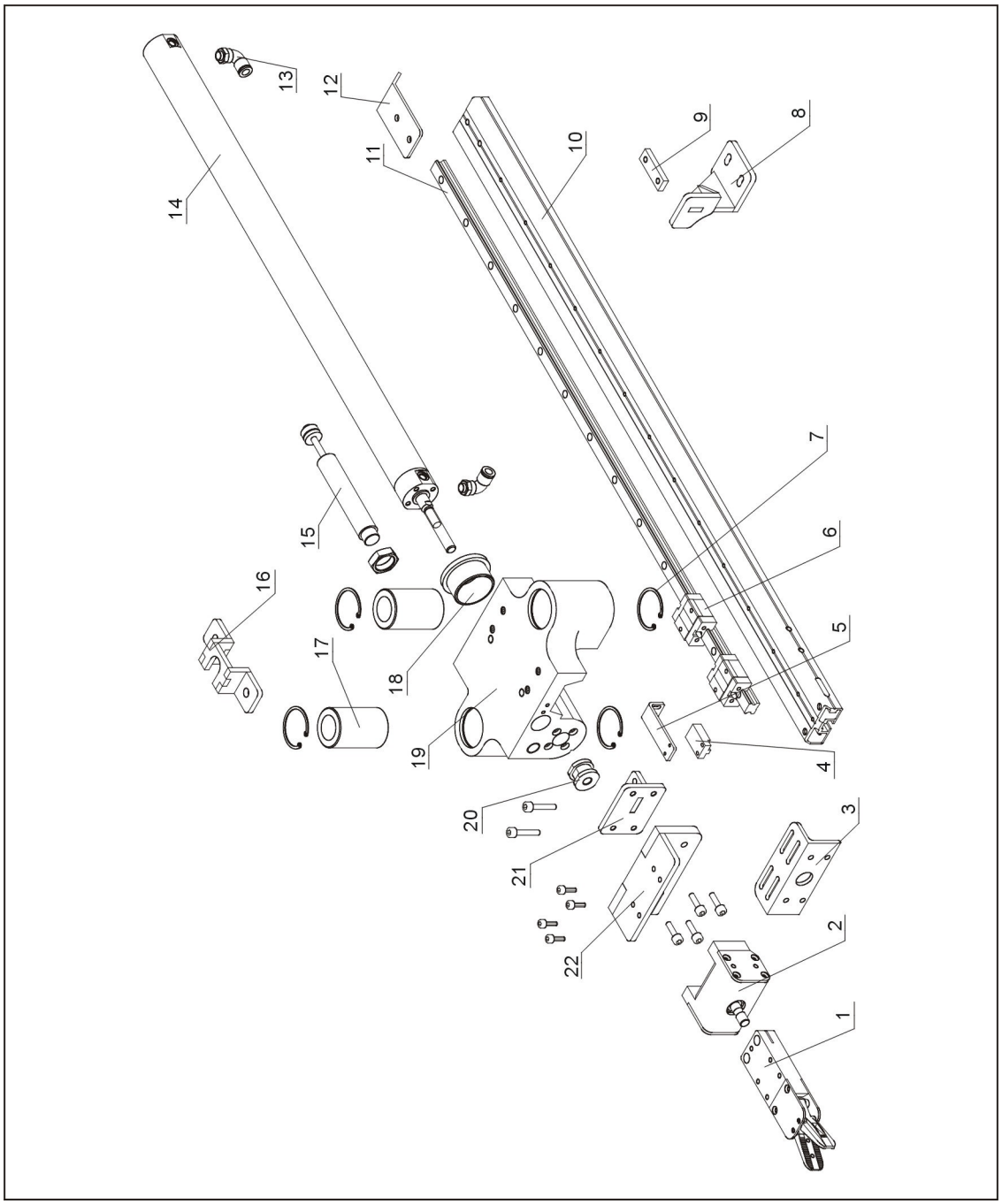
6.3 Maintenance Schedule

In accordance with the maintenance schedule, make robot operates in best way.

Daily Maintenance	Monthly Maintenance	Quarterly Maintenance
1. Swab. 2. Filter drainage. 3. Check the pressure of air supply. 4. Check the blots which connect the robot and vertical molding machine whether be tightened. 5. Check all block settings whether be tightened.	1. Use air gun to clean filter. 2. Check all screws whether be tightened. 3. Confirm whether the pipeline broken or loosed. 4. Check the speed of adjustment.	1. Brush grease to the guide shafts.

7. The Assembly Chart

7.1 Arm Chart

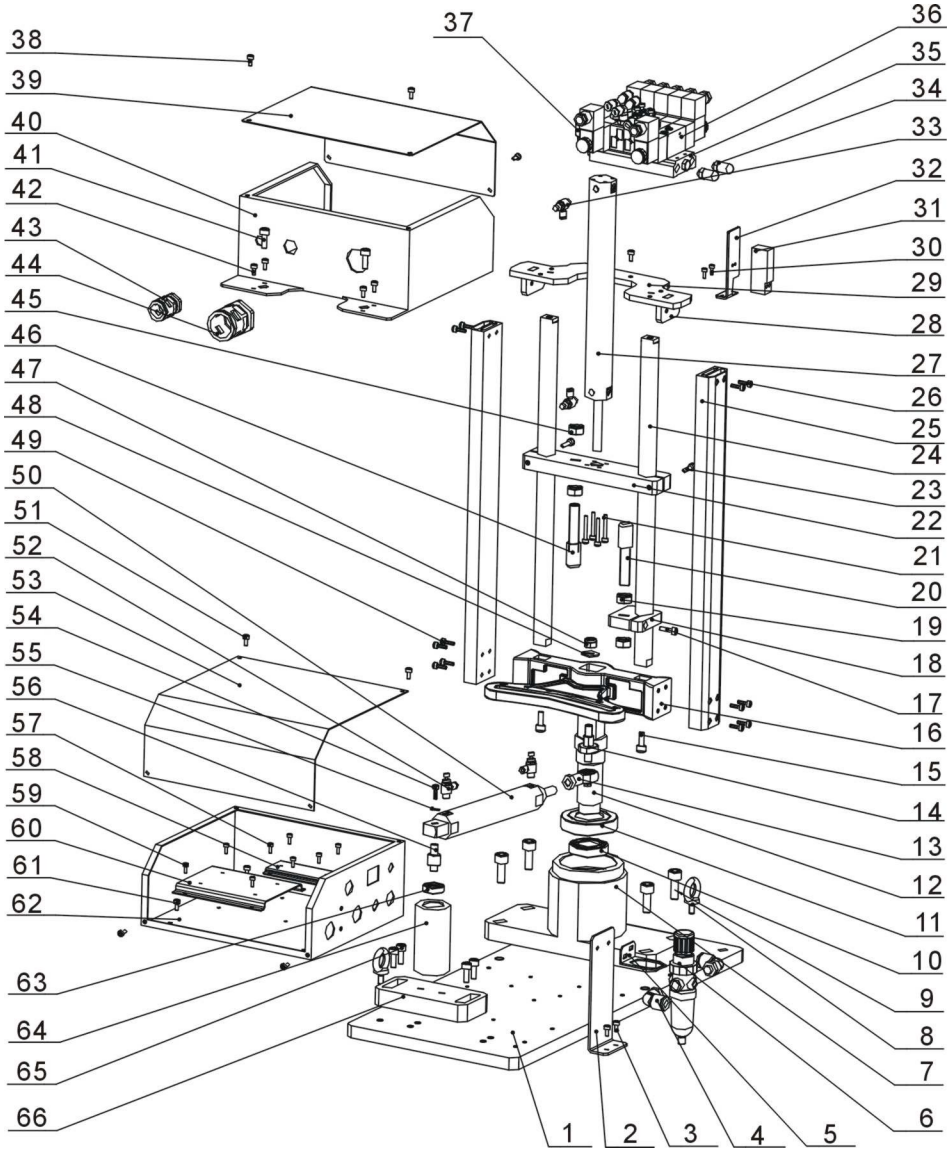


7.1.1 Parts List

Table 7-1：Arm Chart Parts List

No.	Name	Part Number	
		SVS-550	SVS-700
1	gripper	YE31055000300	YE31055000300
2	wrist cylinder	YE31321250000	YE31321250000
3	mounting plate for wrist cylinder	BH71550700110	BH71550700110
4	proximity sensor	YE15050000200	YE15050000200
5	proximity sensor mounting plate	BL70550300120	BL70550300120
6	slider	YW31157600000	YE31321250000
7	spacer	YW68001000500	YW68001000500
8	stopper	BL90055000420	BL90055000420
9	two-hole block	YW31001500500	YW31001500500
10	arm profile	BH90055000010	BH90070000010
11	linear guideway	YW31157600000	YW31157600000
12	supporting frame for sylphon bellows	BL70551900020	BL70551900020
13	fitting for cylinder	YW80082800000	YW80082800000
14	cylinder	YE30325500000	YE31132113700
15	shock absorber	YW10203010000	YW10203010000
16	fixed unit for cylinder	BL70550600240	BL70550600240
17	bearing	YW11002500000	YW11002500000
18	washer for cylinder	BR90552100010	BR90552100010
19	stand frame for arm	BH90055000040	BH90055000040
20	fixed unit for piston rod	BL70550800240	BL70550800240
21	buffer plate for arm down	BL90055000520	BL90055000520
22	gripper mounting plate	BH90055000140	BH90055000140

7.2 Base and Frame Chart

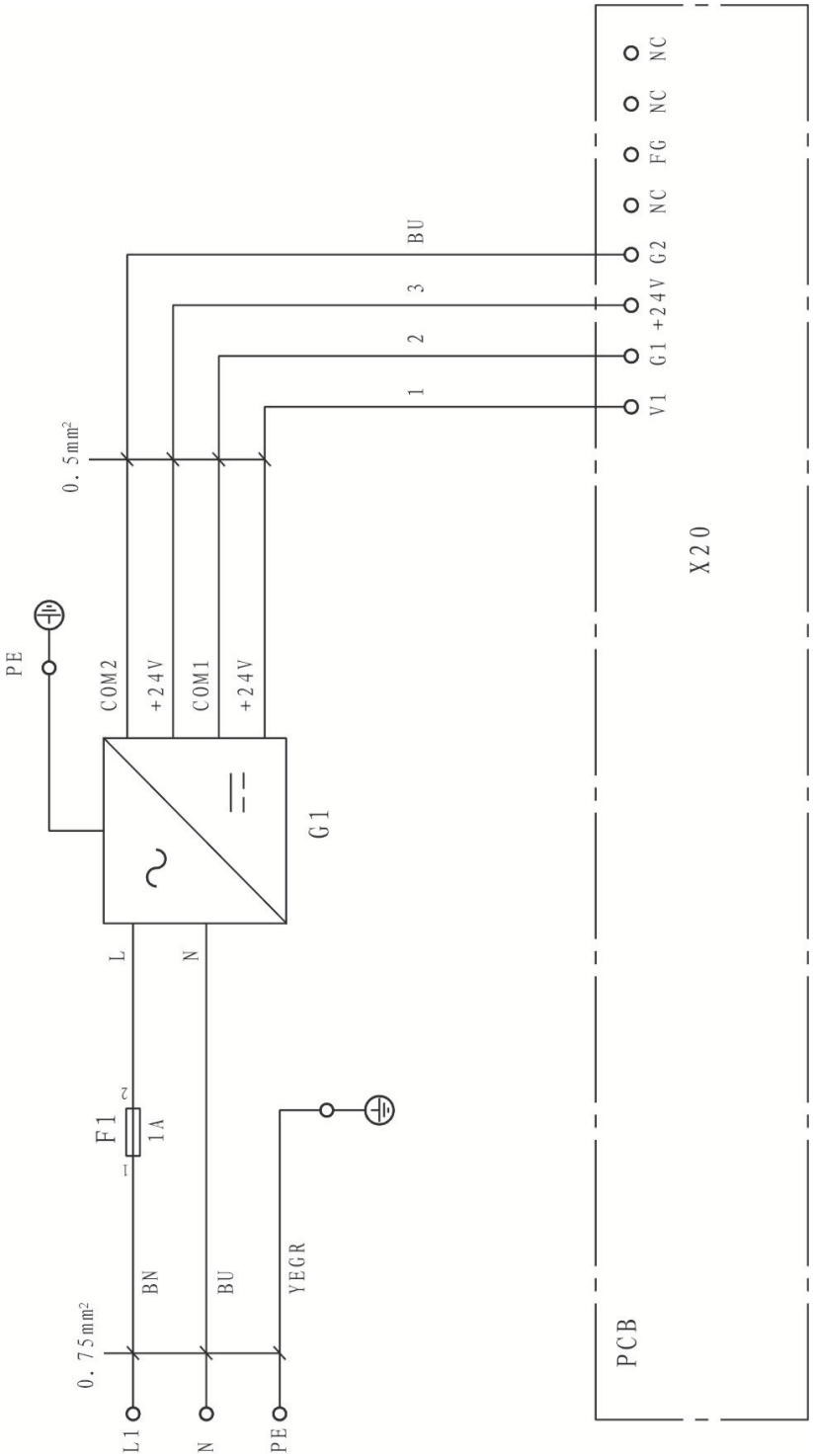


1. base mounting plate 2. stand for parts 3. M5×16 hexagon screw
4. 1/4 – Φ 10 composite push in fitting 5. stand for filter regulating valve
6. filter regulating valve 7. fixed base 8. M8 ring
9. M12×30 hexagon screw 10. 7208 deep groove ball bearing
11. 7210 deep groove ball bearing 12. rotary shaft 13. threaded rod oscillating bearing
14. angle adjustment shaft 15. M8×20 hexagon screw 16. columns bracket
17. M6×20 hexagon screw 18. buffer stop 19. M14 hex nut
20. rubber buffer stop 21. M5×35 hexagon screw 22. fixed plate for vertical stroke
23. M6×25 hexagon screw 24. chroming bar 25. aluminum profile for columns

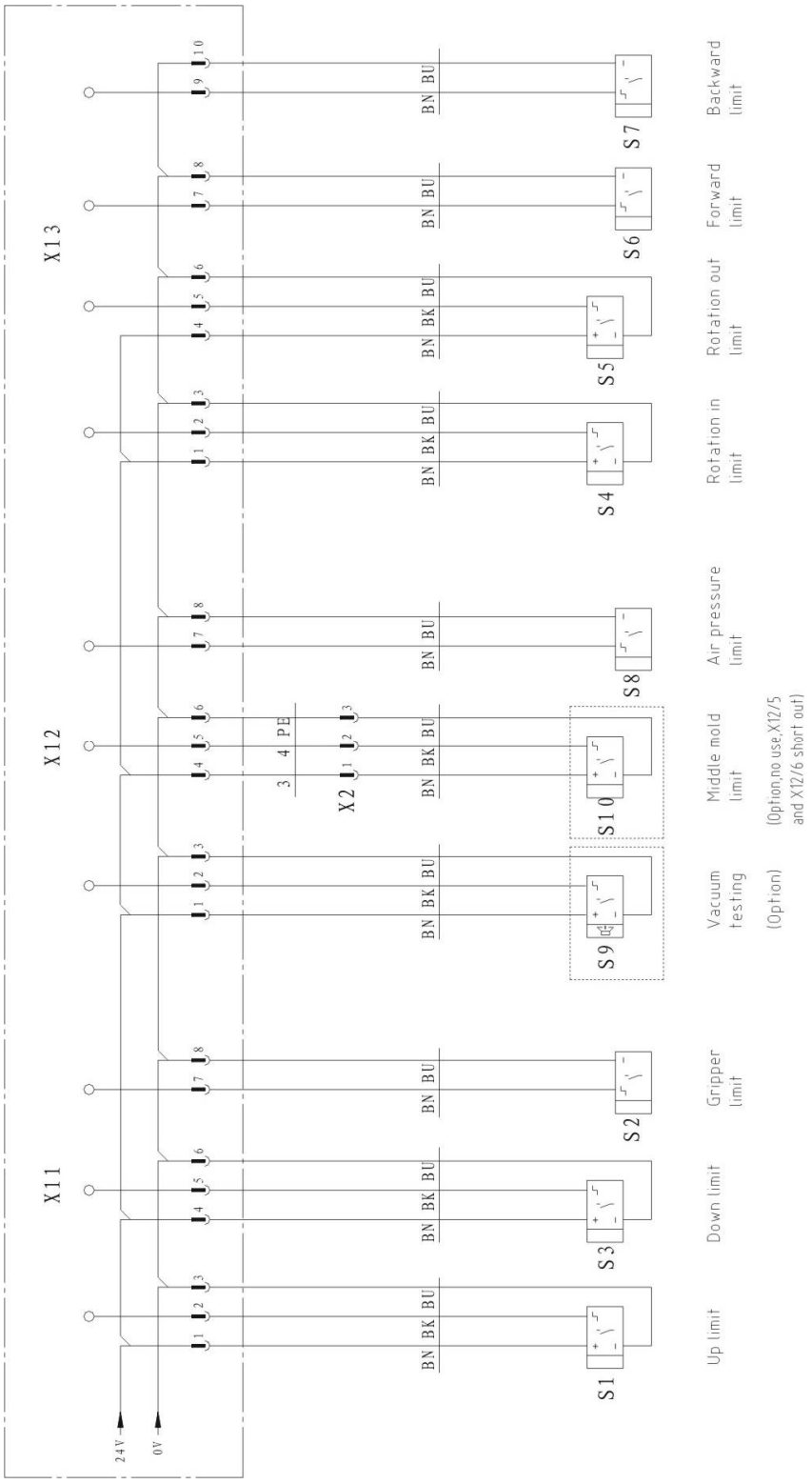
26. M5×15 hexagon screw 27. 32×150 cylinder 28. shaft fixed plate 2
29. shaft fixed plate 1 30. M5×10 hexagon screw 31. pressure sensor
32. pressure sensor mounting plate 33. 1/8 - Φ 6 speed control fitting
34. invisible green silencer 35. pneumatic distribution block
36. magnetic valve (single phase) 37. magnetic valve (two phase)
38. M5×8 hexagon screw 39. cover for control box 40. control box
41. M8×20 hexagon screw 42. M5×10 hexagon screw 43. pneumatic straight fitting
44. pneumatic straight fitting 45. M14 hex nut 46. buffer stop
47. M10 lock hex nut 48. M10 washer 49. M5×10 hexagon screw
50. 32×125 cylinder 51. M5×8 hexagon screw 52. 1/8 – Φ 6 speed control fitting
53. cover for control box 54. M5×20 hexagon screw 55. M5 washer
56. cylinder shaft 57. M4×12 hexagon screw 58. stand of power supply
59. circuit board mounting stand 60. M5×10 hexagon screw 61. control box
62. 6200 deep groove ball bearing 63. cylinder fixed ring
64. M8×20 hexagon screw 65. cylinder fixed plate 1

7.3 Electric Control Chart

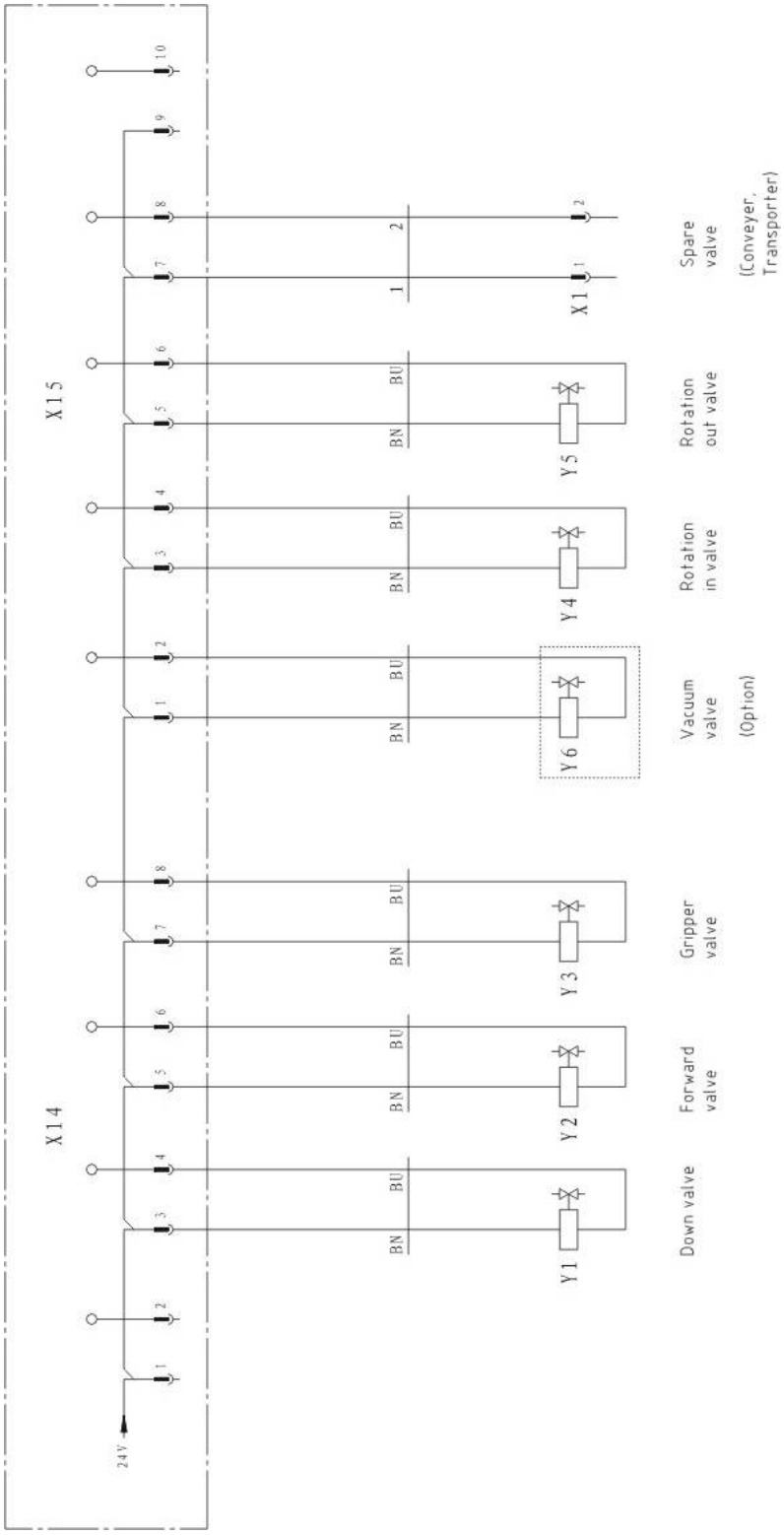
7.3.1 Control Power Diagram



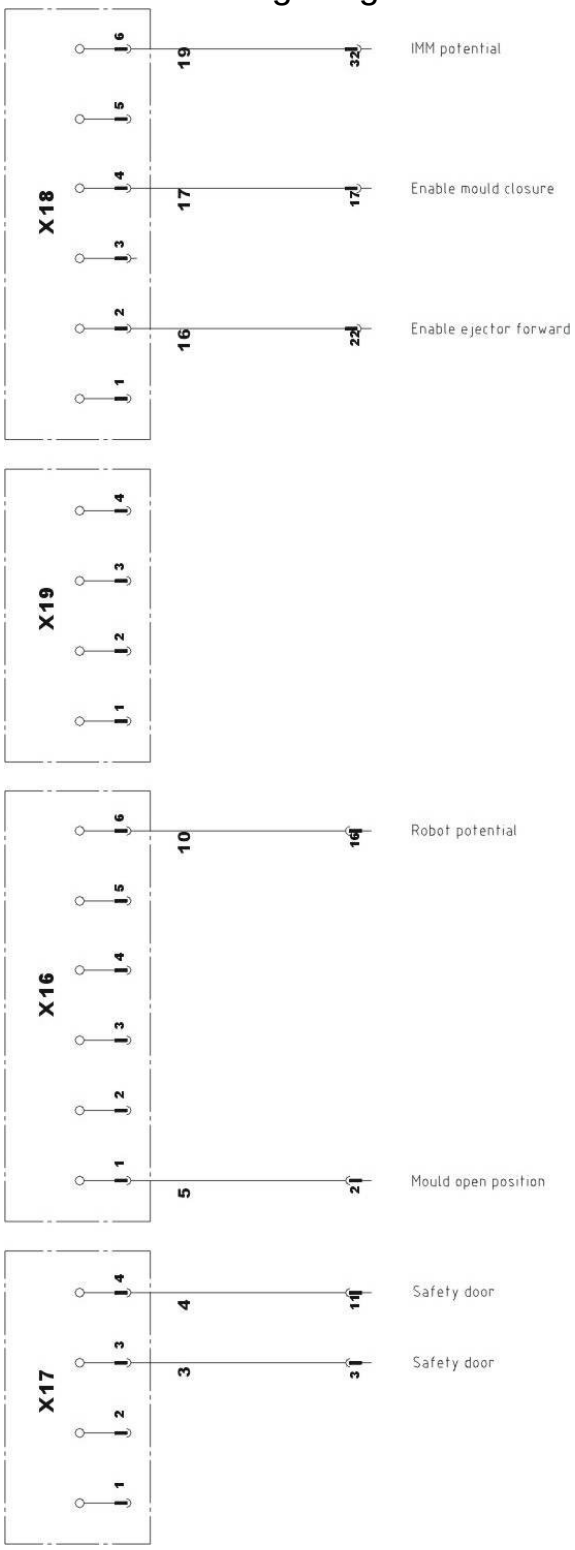
7.3.2 The Main Input Panel Wiring Diagram



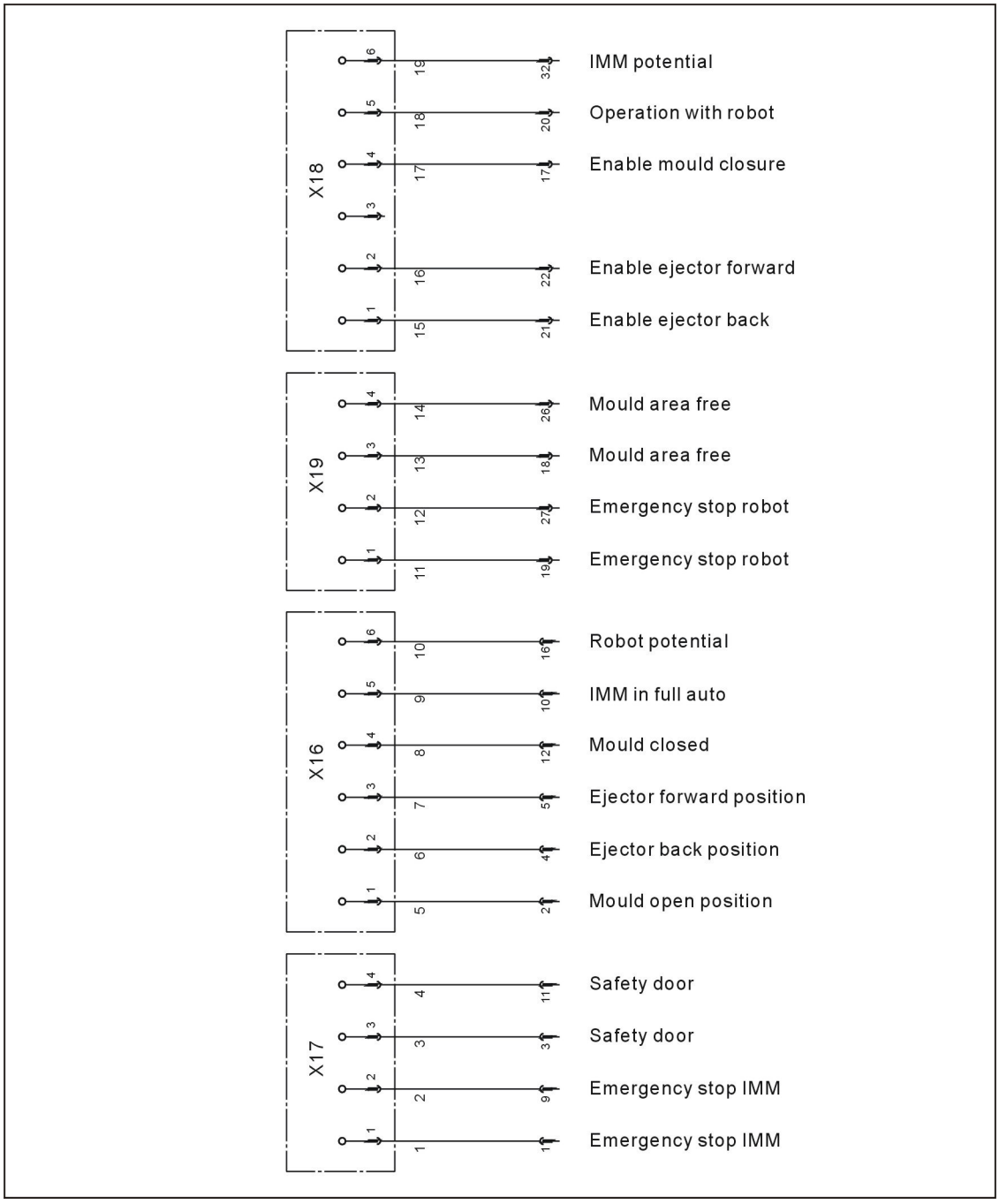
7.3.3 The Main Output Panel Wiring Diagram



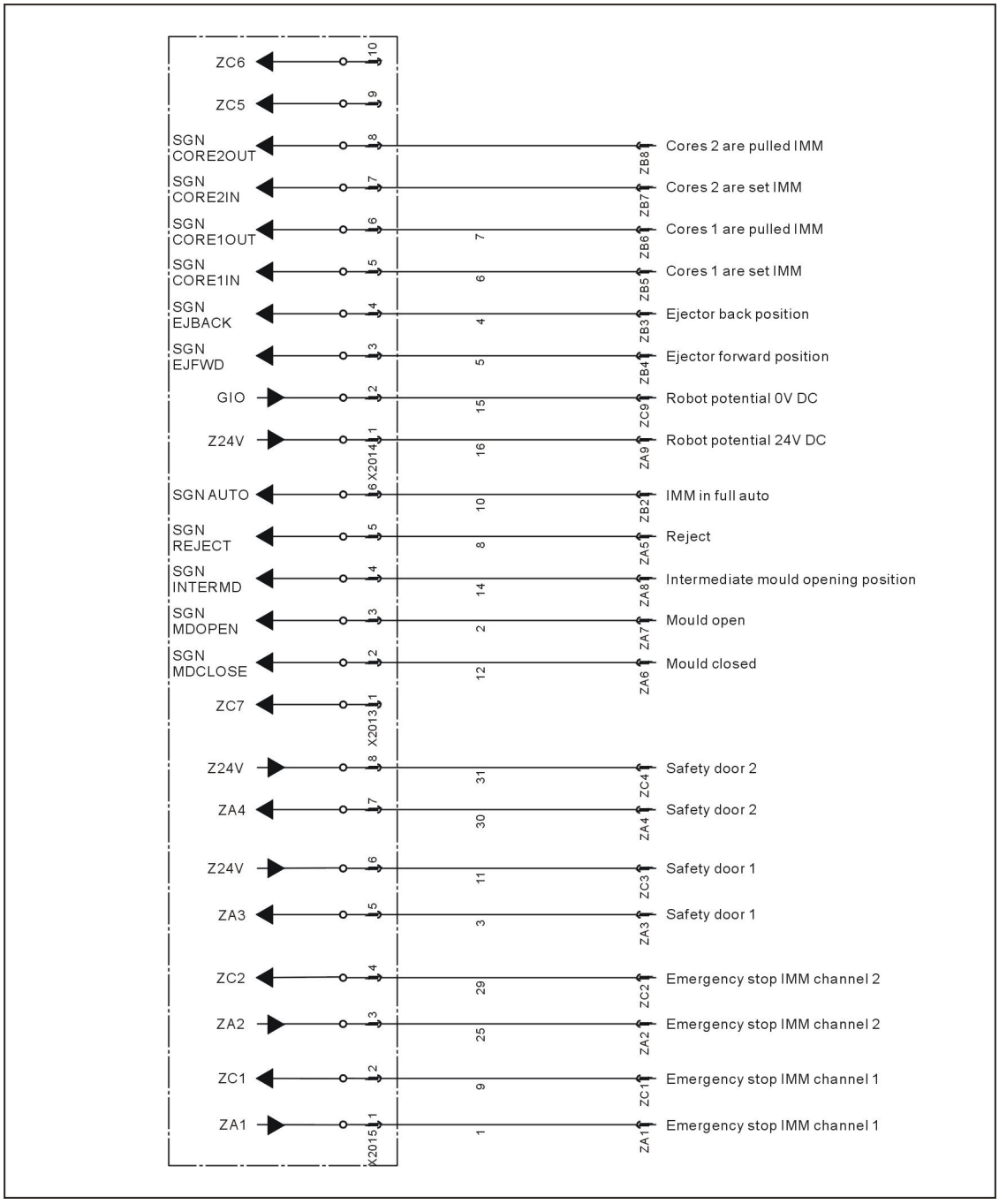
7.3.4 The Main Control Board Wiring Diagram



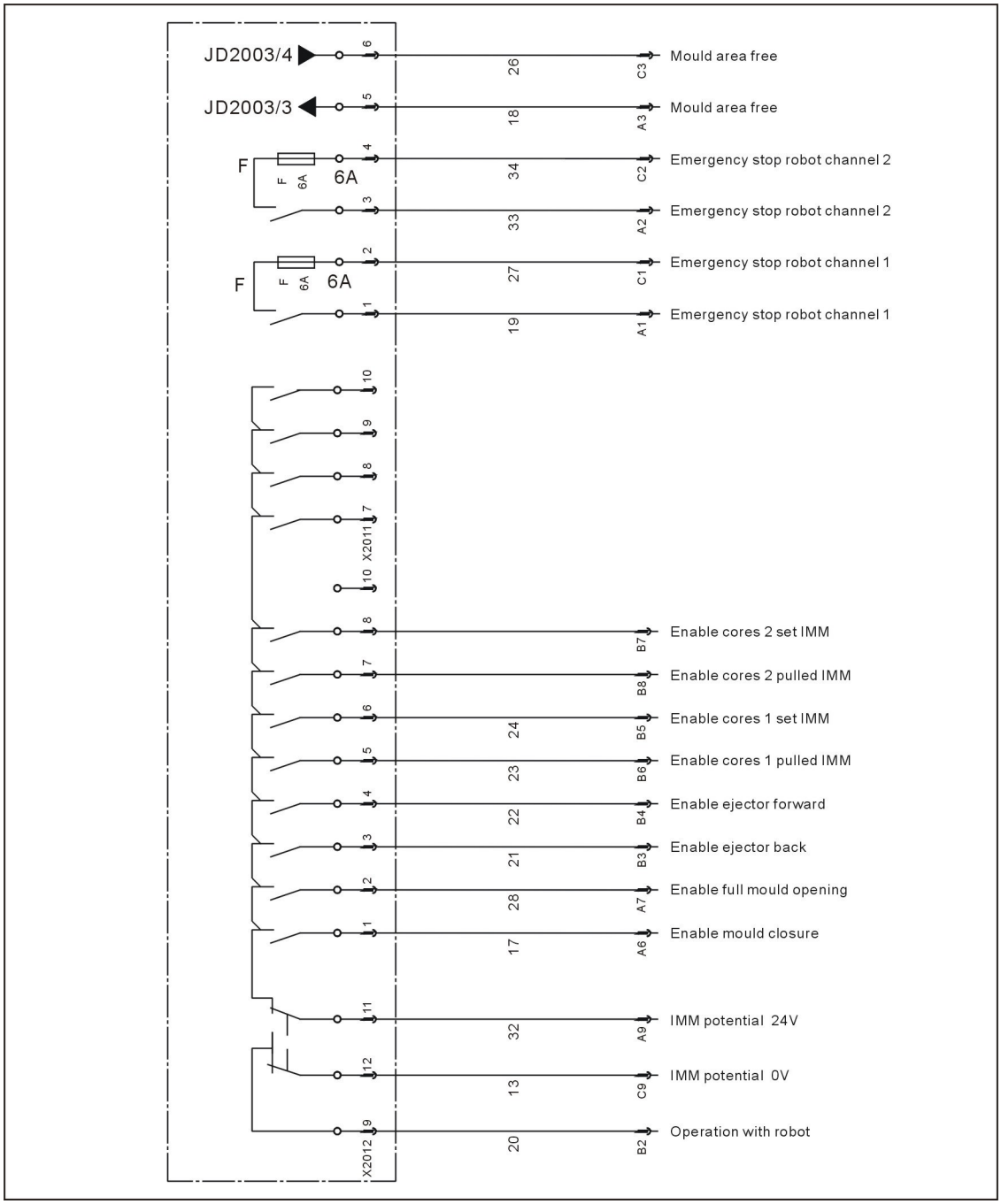
7.3.5 EM12 Signal Panel Wiring Diagram



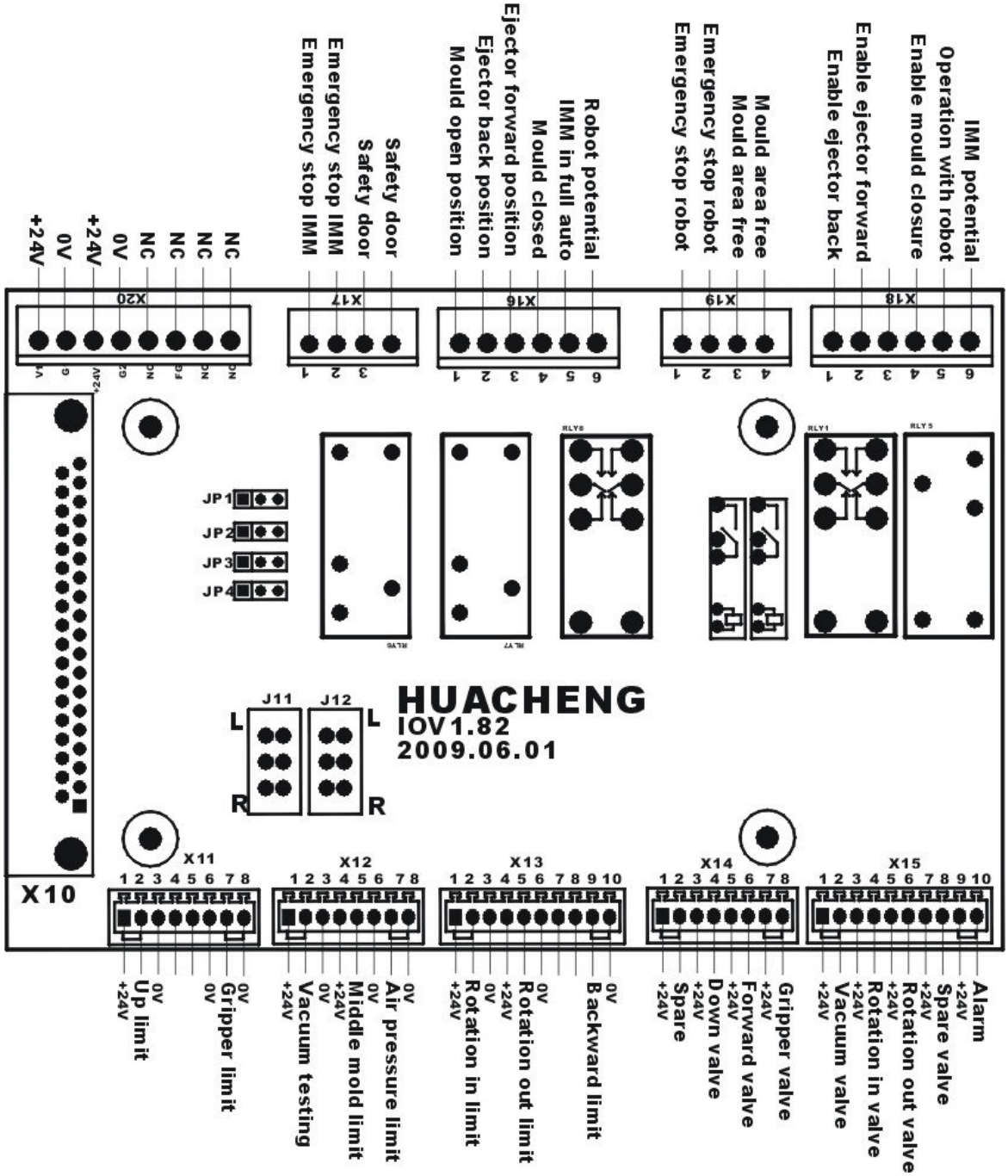
7.3.6 EM67 Signal Panel Wiring Diagram1



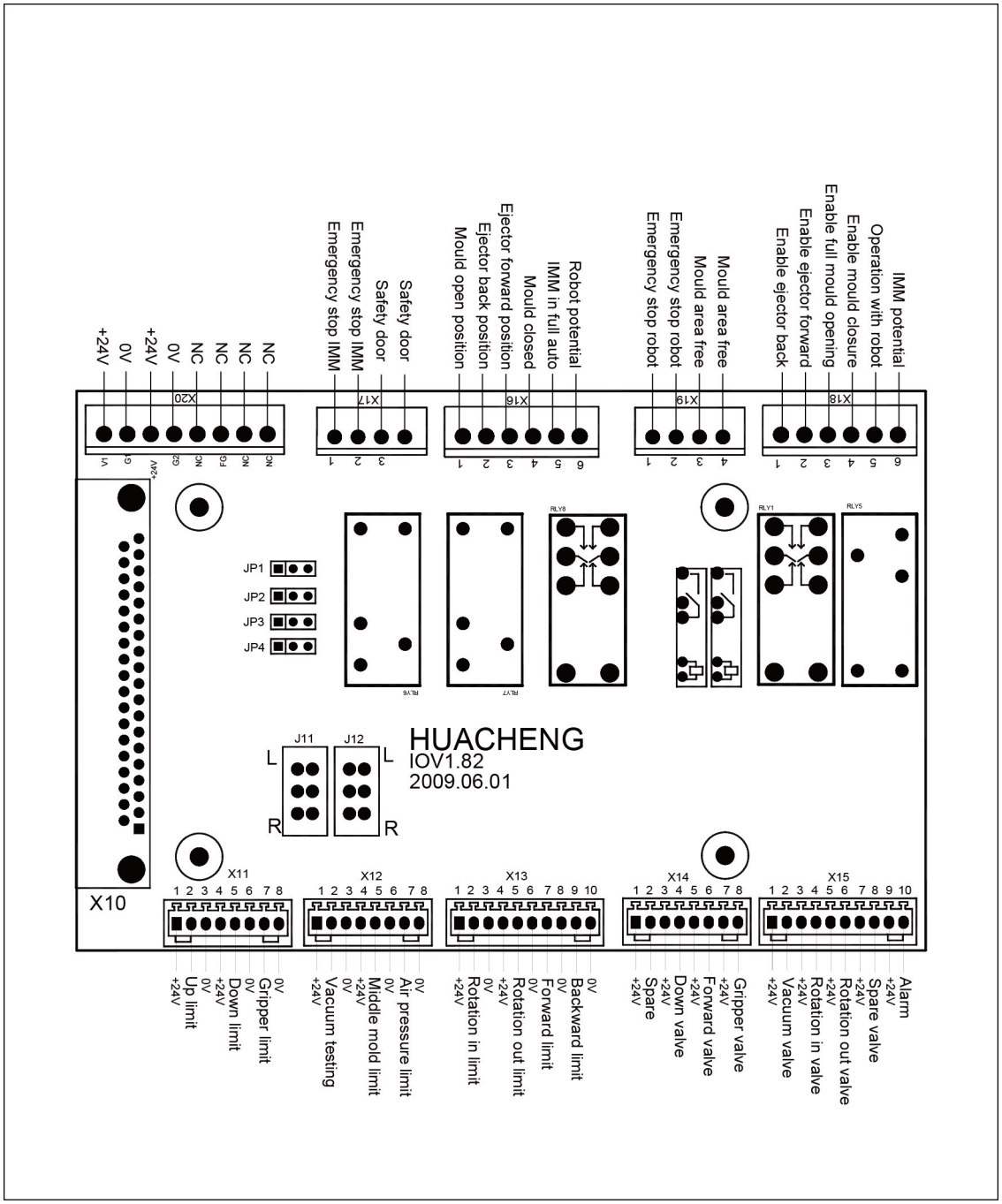
7.3.7 EM67 Signal Panel Wiring Diagram2



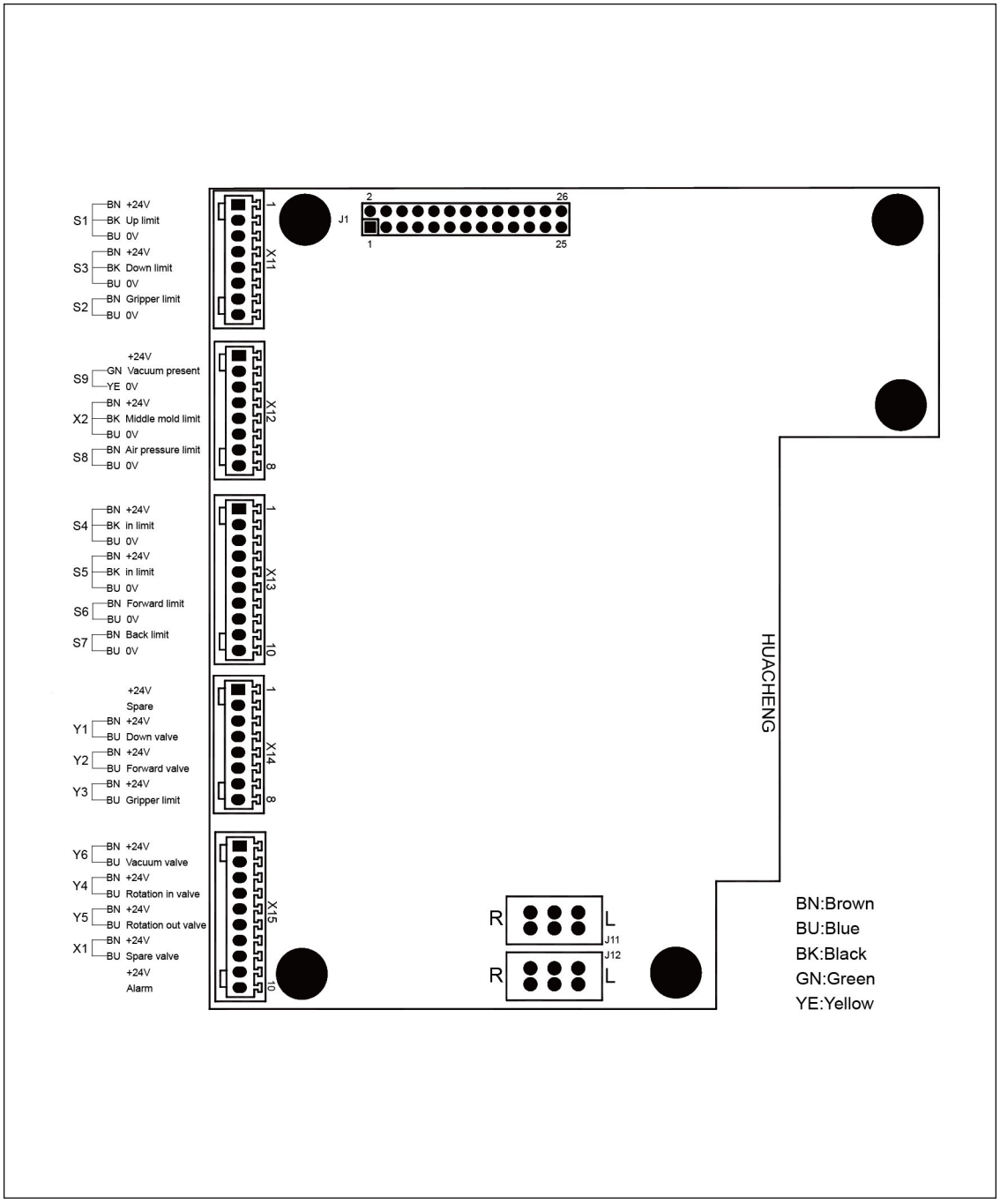
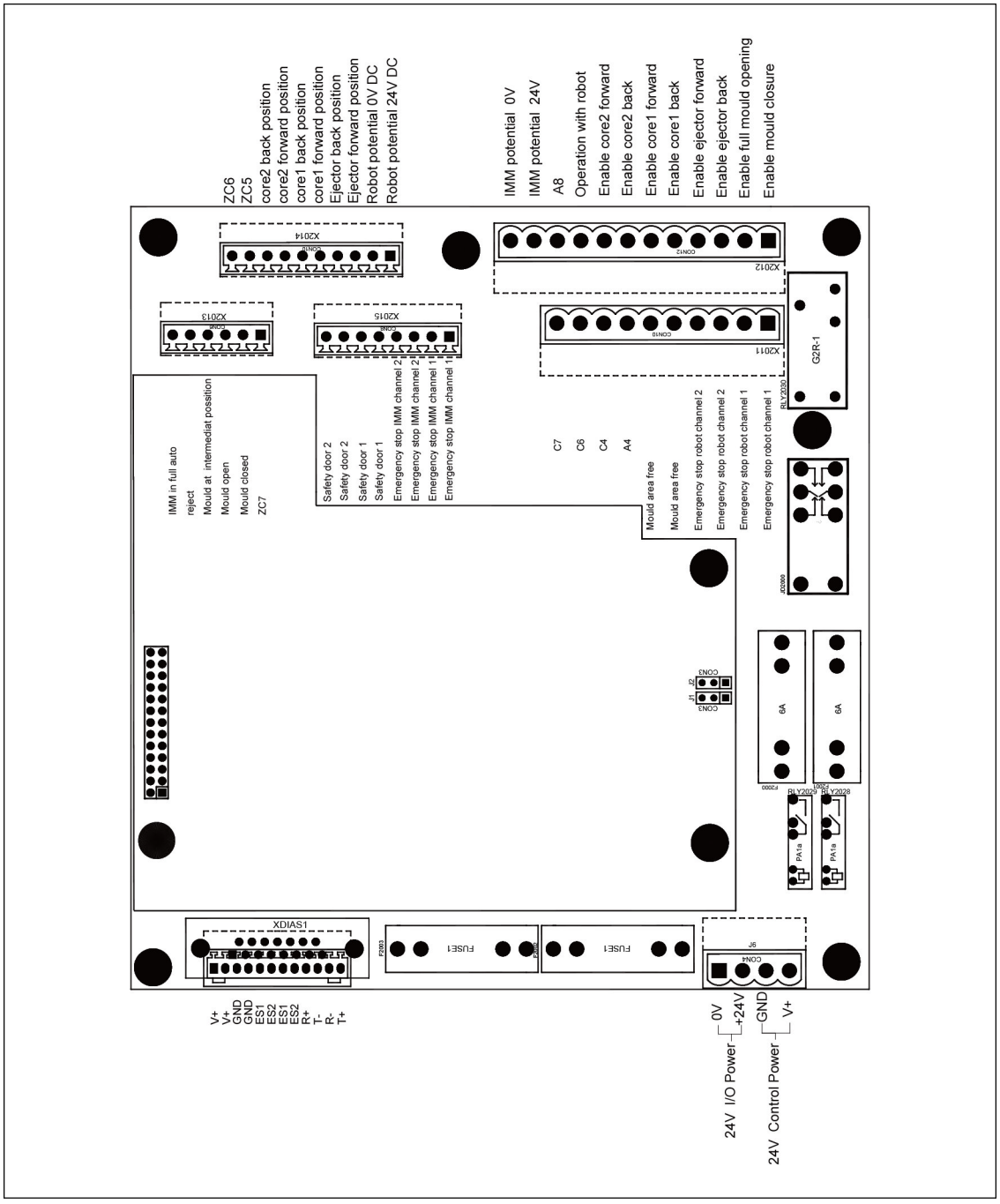
7.3.8 The Main Control Layout Chart



7.3.9 EM12 Main Control Layout Chart



7.3.10 EM67 Main Control Layout Chart 1



7.3.11 EM67 Main Control Layout Chart 2