

WPS3800

User Manual

Wafer Packer/Unpacker System



Specifications and Installation Requirements

Standard System Specifications:

Equipment Country of Origin	Malaysia
Manufacturer	QES MECHATRONIC SDN. BHD.
Power Voltage	220 VAC ± 10% 50/60 Hz Single Phase
Vacuum Supply	-80kpa or -0.8bar
Compressed Air	4-6 Bar
Loading Stage Quantity	2 – FOUP/FOSB 2 – Canister/Jar Load port 1 – Paper Port
Wafer Size	8" and 12" Wafer.

Environmental Requirements:

Temperature Range	Operating Temperature Range: 20°C - 28°C Maximum Exposure (Storage): 50°C Maximum Exposure (Transportation): 50°C
Operating Altitude Range	Maximum Operating Altitude: 2000 meters above sea level
Humidity	35% - 40% RH (relative, non-condensing)
Lighting	Standard lighting provided in the clean room environment where the system is installed is sufficient for proper operation and maintenance.

WPS3800 License Agreement

This is a legal agreement between you (either an individual or an entity) and QES. By installing this package and / or by using the software, you agree to be bound by the terms of this agreement. If you do not agree to the term of this agreement, do not open and use this software. Return the original software packet(s) and the accompanying items to the place where you obtained them.

1. **Grant of License.** QES grants you the right to use one copy of WPS3800 (the "SOFTWARE") on a single computer. The SOFTWARE is in "use" on a computer when it is loaded into temporary memory (i.e., RAM) or installed into permanent memory (e.g., hard disk or other storage device) of that computer. However, installation on a network server for the sole purpose of internal distribution shall not constitute "use" for which a separate license is required, provided you have a separate license for each computer to which the software is distributed.
2. **Copyright.** The SOFTWARE and accompanying written material are owned by QES and protected by copyright laws and international treaty provisions. Therefore, you must treat the SOFTWARE like any other copyright materials except that you may either (a) make one copy of the SOFTWARE solely for backup or archival purposes, or (b) transfer the SOFTWARE to a single hard disk provided you keep the original solely for backup and archival purposes. You may not copy the written materials accompanying the SOFTWARE.
3. **Other Restrictions.** You may not rent or lease the SOFTWARE, but you may transfer the SOFTWARE and accompanying written materials on a permanent basis provided you retain no copies, and the recipient agrees to the terms of this agreement. However, the SOFTWARE licensed for special purpose including but not limited to demonstration, testing and use in show rooms cannot be transferred. You may not reverse engineer, disassemble, decompile, or in any way attempt to circumvent the protection system incorporated in the SOFTWARE. If the SOFTWARE is an update or has been updated, the transfer must include the most recently updated and all prior versions.
4. **Limited Warranty** QES or its suppliers warrant that the SOFTWARE will operate substantially in accordance with this manual for a period of one hundred eighty (180) days from the date of shipment. QES will, at its option, repair, replace or provide a work-around solution to any items that prove to be defective. QES or its suppliers do not warrant that the operation of the SOFTWARE will be uninterrupted or error-free. The information in this manual is subject to change without notice. These are your sole remedies for any breach of warranty, QES and its suppliers disclaim all other warranties, either express or implied, with respect to the SOFTWARE and the accompanying written materials, including but not limited to imply warranties of merchantability and fitness for a particular purpose.
5. **Limitation of Liabilities.** This warranty does not apply to defects resulting from customer-supplied or configured computer, equipment, operating systems or software, and any damages whatsoever. In no event will QES, or its suppliers are liable for any indirect, special, incidental, economic or consequential damages arising out of the use or inability to use the SOFTWARE, even if such party has been advised of the possibility of such damages. In no event will QES or its suppliers' liability exceed the amount paid by you for the SOFTWARE.

Contents

1 Safety Information	8
1.1 General Warnings and Precautions for Working	8
1.2 Alert Example and Definition	9
1.3 General Safety Guidelines	9
1.4 Illustration of Hazard Locations	11
1.5 Safety Interlock System.....	16
1.6 Emergency Shutdown (EMO)	16
1.7 Pneumatic System.....	16
1.8 Lockout/ Tagout (LOTO) Procedures.....	17
1.9 Electrical hazards.....	18
1.10 Mechanical Hazards.....	19
1.11 Environmental Considerations	19
1.11.1 Environmentally Friendly	19
1.11.2 Chemical Hazard	20
2 Installation.....	22
2.1 Overview	22
2.2 Installation Precaution	22
2.3 Unpacking and Inspection.....	22
2.4 Installation.....	22
2.4.1 Anchoring and Levelling.....	23
2.4.2 Light Tower	23
2.4.3 Facilities.....	23
2.5 Power Up.....	24
3 Operational Interface.....	25
3.1 Overview	25
3.1.1 User Account.....	25
3.1.2 Screen Shortcut Icon	26
4 Recipe Configuration.....	27
4.1 Recipe editor	27
4.2 Recipe Process.....	30
4.3 Sorting Process	31
4.4 Packing Process	32
4.5 Unpacking process	32
5 Option Setting	33

5.1	General	33
5.2	File Paths	34
5.3	Log	35
6	Diagnosis.....	36
7	SecsGem Control	41
7.1	SG Configurations.....	41
7.2	Equipment Data	42
7.3	Others.....	42
8	Utilities.....	43
8.1	Power and electrical components	43
8.1.1	With machine power ON:	43
8.2	Vacuum and CDA.....	43
9	Preventive Maintenance: Robot.....	44
9.1	Precautions for maintenance inspection	44
9.2	Daily Maintenance	44
9.2.1	Before stating the robot operation	44
9.2.2	During the operation	44
9.2.3	After the operation	44
9.3	Periodical Maintenance	44
9.3.1	Robot installation bolt	45
9.3.2	Lubrication to linear guide and ball screw.....	45
9.3.3	In-Line Filter	46
9.3.4	Z axis timing belt	47
9.3.5	W- Axis timing belt.....	49
9.3.6	Hand Fixing Bolt	50
10	Preventive Maintenance: Pre-aligner.....	52
10.1	Precautions for maintenance inspection	52
10.2	Daily Inspection	52
10.2.1	Before starting the pre-aligner	52
10.2.2	Immediately after starting	52
10.2.3	When the operation is finished	52
10.3	Periodic Inspection	53
10.3.1	Pre-aligner fixing bolts	53
10.3.2	Lubrication to ball screw and LM guide.....	54
10.3.3	Suction Air In-Line Filter.....	56

10.3.4	X-Axis Timing Belt Tension	56
10.3.5	Y-Axis Timing Belt Tension	57
11	Preventive Maintenance: Cartesian Robot	60
11.1	Precautions for maintenance inspection	60
11.2	Daily Inspection	60
11.2.1	Before starting the Cartesian.....	60
11.2.2	Immediately after starting	60
11.2.3	When the operation is finished	60
11.3	Periodical Maintenance.....	61
11.3.1	Lubrication to ball screw and LM guide.....	61
11.3.2	W-Axis gear injection.....	61
11.3.3	Cartesian Vacuum Pad Replacement.....	62
12	Preventive Maintenance: Ionizer.....	63
12.1	Precautions for Maintenance Inspection	63
12.2	Daily Inspection	63
12.2.1	Before starting the pre-aligner	63
12.2.2	During the operation	63
12.2.3	When the operation is finished	63
12.3	Periodical Maintenance.....	63
12.3.1	Electrode Probe Cleaning.....	64
12.3.2	Electrode Probe Replacement	64
13	Preventive Maintenance: FOUP	66
13.1	Precautions for maintenance inspection	66
13.2	Daily Maintenance.....	66
13.2.1	Before stating the robot operation	66
13.2.2	During the operation	66
13.2.3	After the operation	66
13.3	Periodical Maintenance.....	66
13.3.1	Main Unit Anchor Bolts.....	67
13.3.2	Lubrication	68
13.3.3	Absorption Air In-Line filter	68
13.3.4	Replacement of Clock Battery	69
13.3.5	Lubrication to the Worm Gear.....	70
14	Preventive Maintenance: Height & Vision Slider	72
14.1	Precautions for maintenance inspection	72

14.2	Daily Inspection	72
14.2.1	Before starting the Height & Vision Slider.....	72
14.2.2	Immediately after starting	72
14.2.3	When the operation is finished	72
14.3	Periodic Inspection	73
14.3.1	Lubrication to ball screw.....	73
15	Preventive Maintenance: Universal Load Port	74
15.1	Precautions for maintenance inspection	74
15.2	Daily Inspection	74
15.3	Periodic Inspection	74
15.3.1	Universal Load Port IO Connectivity	74
15.3.2	Lubrication to Linear Guide	74
16	Preventive Maintenance: Paper Port	76
16.1	Precautions for maintenance inspection	76
16.2	Daily Inspection	76
16.2.1	Before starting the Paper Port.....	76
16.2.2	Immediately after starting	76
16.2.3	When the operation is finished	76
16.3	Periodic Inspection	76
16.3.1	Lubrication to ball screw and LM guide.....	77
16.3.2	Paper Port timing belt.....	77
17	Preventive Maintenance Check List	78
18	Troubleshooting	80
18.1	Overview.....	80
18.2	Troubleshooting Observed Errors	80
18.2.1	Power	80
18.2.2	Motion.....	80
18.2.3	Operational Interlock.....	81
18.2.4	Repeatability	81
18.2.5	Vacuum	81
18.3	Error List.....	82
19	Spare Part List.....	87
20	Contact Us.....	90
21	Technical and Pneumatic Drawing	91

1 Safety Information

This machine is manufactured with full attention to safety. However, the machine could cause personal injury or equipment damage if you use it improperly or ignore the operating instruction.

Before using the machine, read this manual carefully to ensure proper usage. Also, do not throw away manuals, keep them handy for quick reference.

1.1 General Warnings and Precautions for Working

Although this product is designed and manufactured to be completely safe during use, however incorrect usage or failure to follow the safety instructions provided may cause personal injury or property damage.

Safety instructions in this manual are marked with the following symbols to indicate their importance. For your safety, always follow the instructions marked with these symbols.

In an effort to protect users from personal harm and machine damage, QES have adopted the use of **DANGER**, **WARNING** and **CAUTION** in this manual.



Caution: Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.

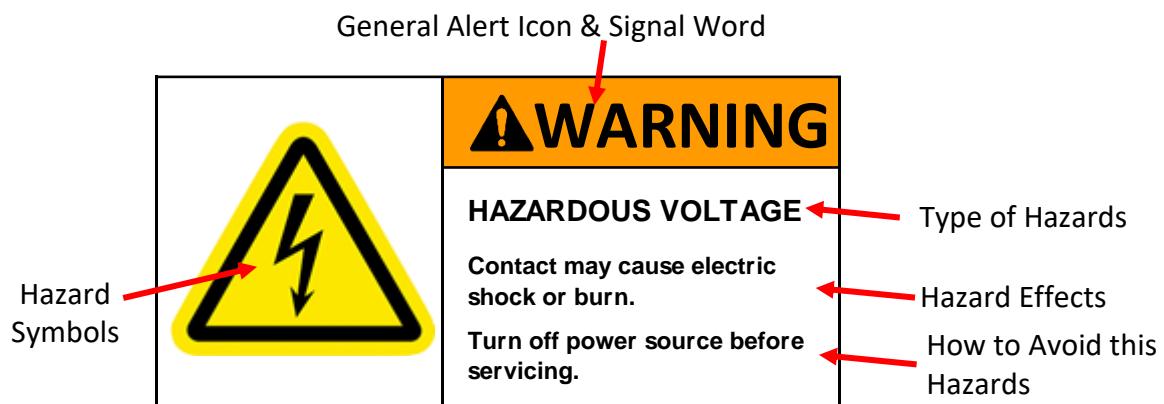


Warning: Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury.



Danger: Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury. The signal word "DANGER" is to be limited to the most extreme situations.

1.2 Alert Example and Definition



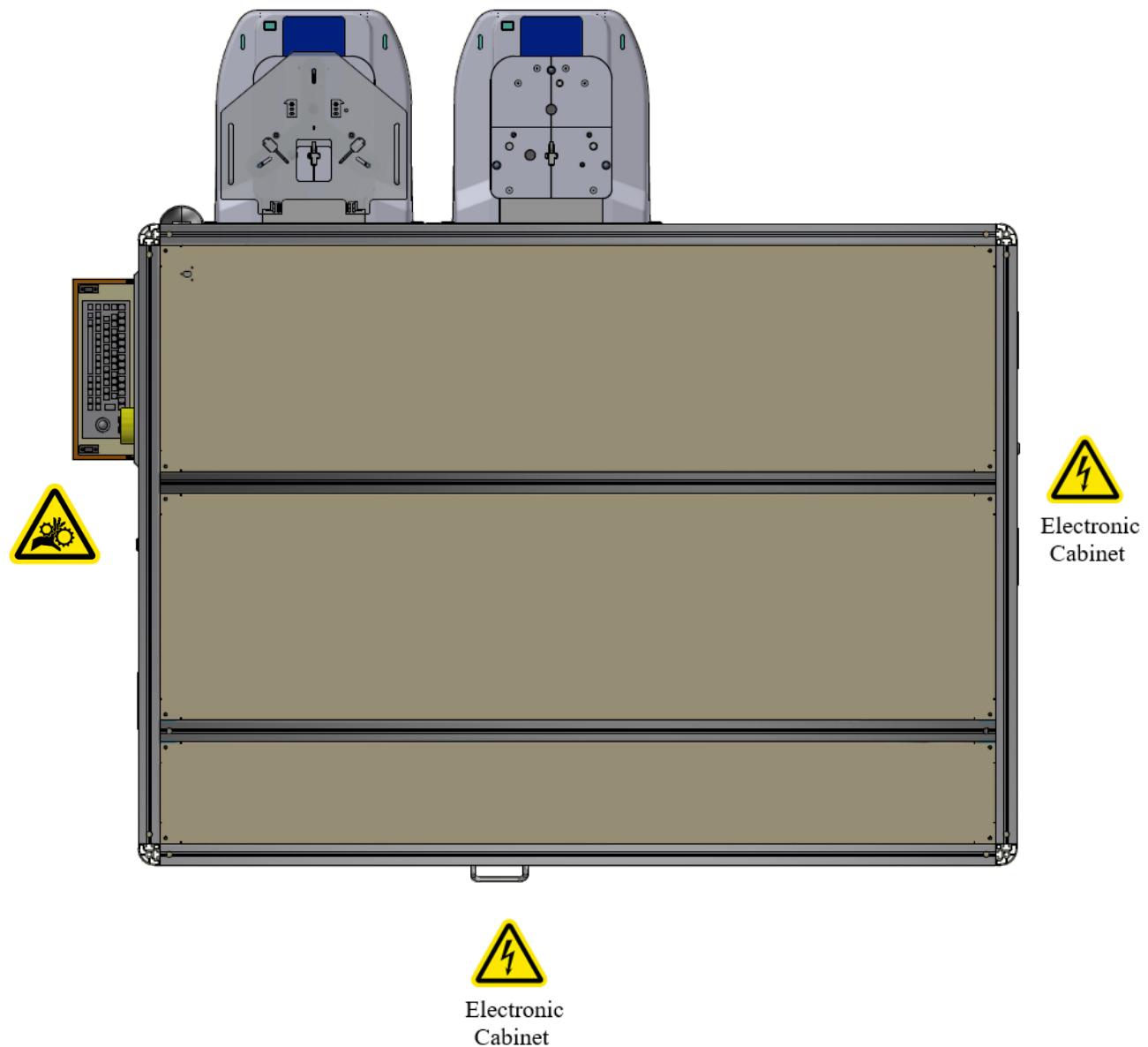
1.3 General Safety Guidelines

<u>CAUTIONS</u>
<p>1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.</p> <ul style="list-style-type: none">a) Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.b) The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.c) This person should also continuously review all products specifications through referring its latest catalogue information, with a view to give due consideration to any possibility of equipment failure when configuring the equipment.
<p>2. Only personnel with appropriate training should operate machinery and equipment.</p> <ul style="list-style-type: none">a) The product specified here may become unsafe if handled incorrectly.b) The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

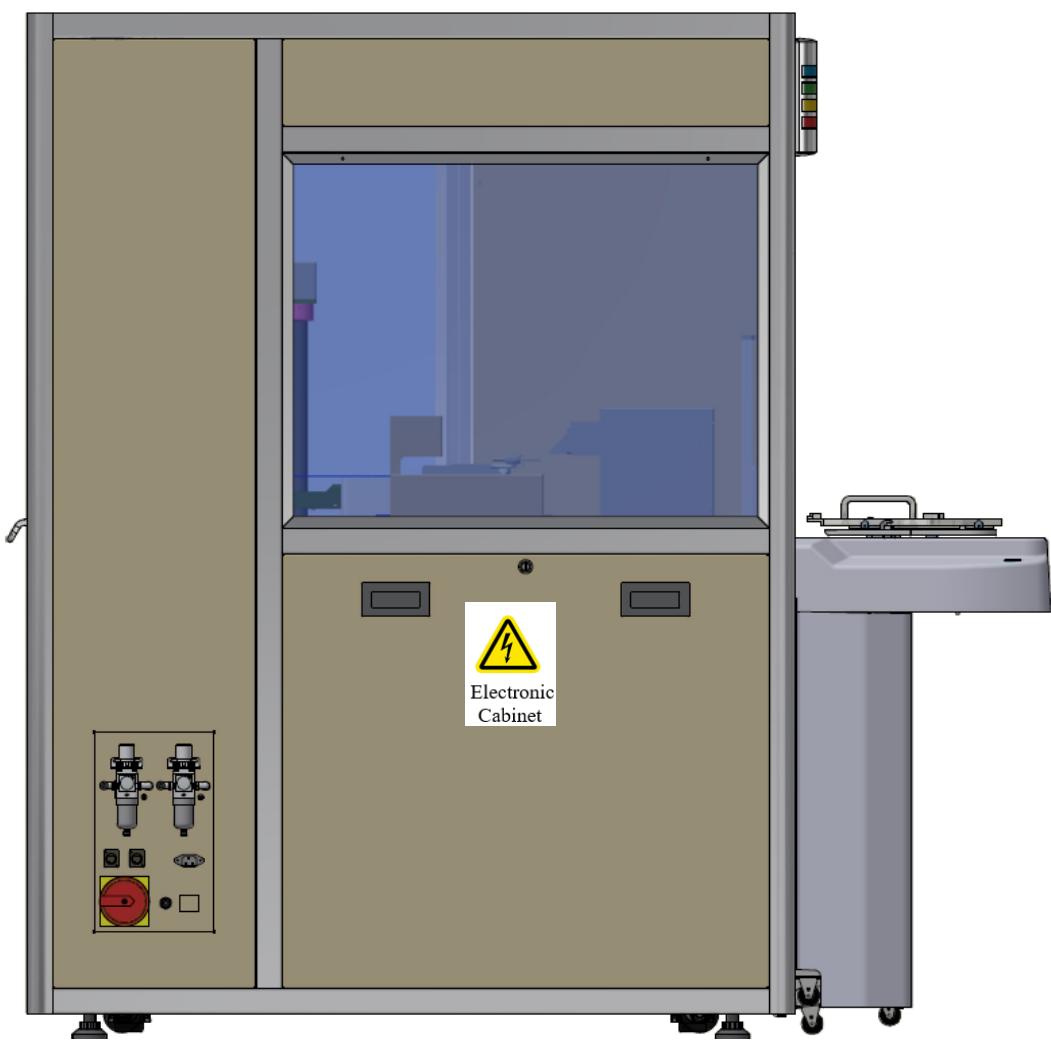
		 <p>CAUTION</p> <p>GENERAL WARNING</p> <p>Failure to follow operating instruction could result in injury.</p> <p>Read and understand user manual before servicing.</p>	
<p>3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.</p> <ul style="list-style-type: none"> a) The inspection and maintenance of the machinery/equipment should only be performed after measures to prevent failing or runaway of the driven objects have been confirmed. b) When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific precautions of all relevant products carefully. c) Before machinery/equipment restarts, take measures to prevent unexpected operation and malfunction. <p>4. Personal Protective Equipment</p> <ul style="list-style-type: none"> a) The machinery/equipment contains objects that may cause personal harm. b) Use proper PPE (such as safety shoes, gloves, safety helmet, safety goggles and etc.) when installing or maintaining the machine. 			
  			
<p>5. Damaged Components</p> <ul style="list-style-type: none"> a) Components or cables that appear to be damaged may cause personal harm or equipment malfunction. b) Do not use components or cables that appear to be damaged. 			

1.4 Illustration of Hazard Locations

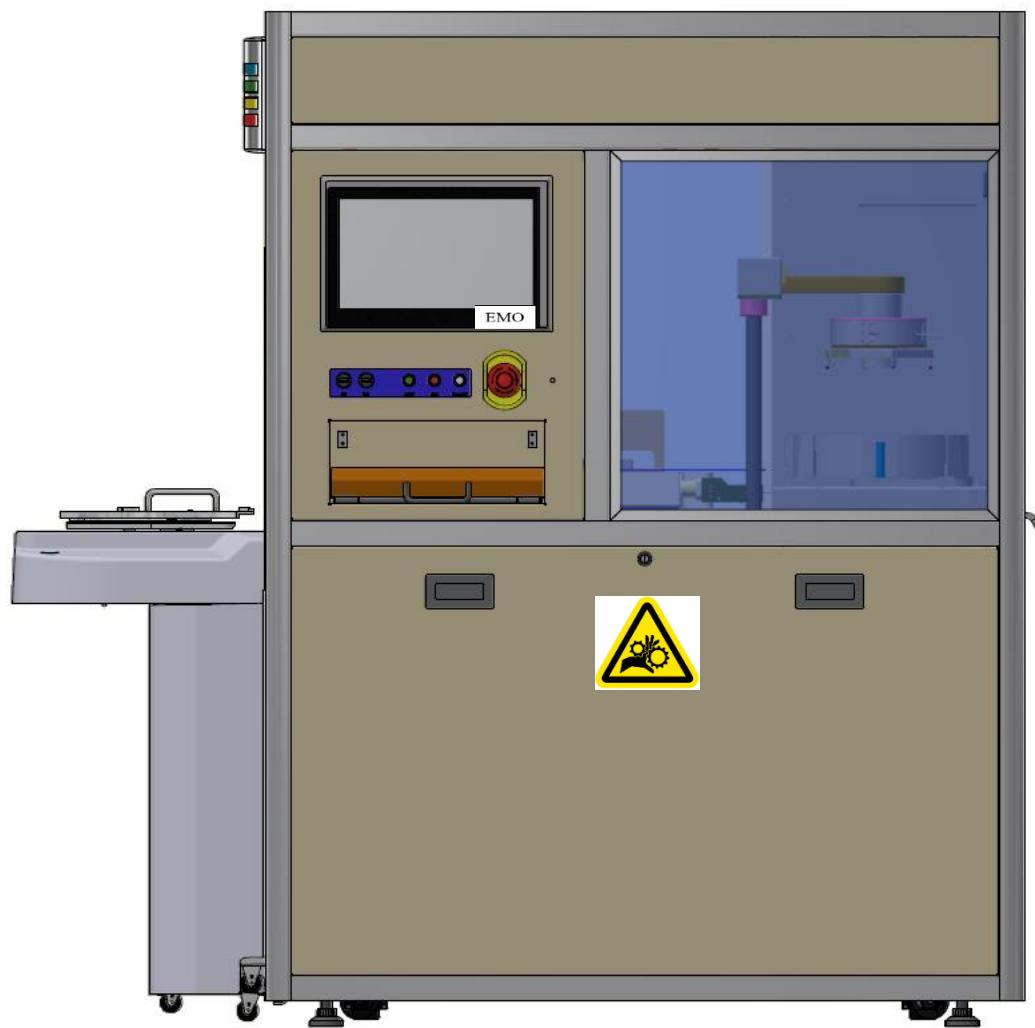
Machine Top View



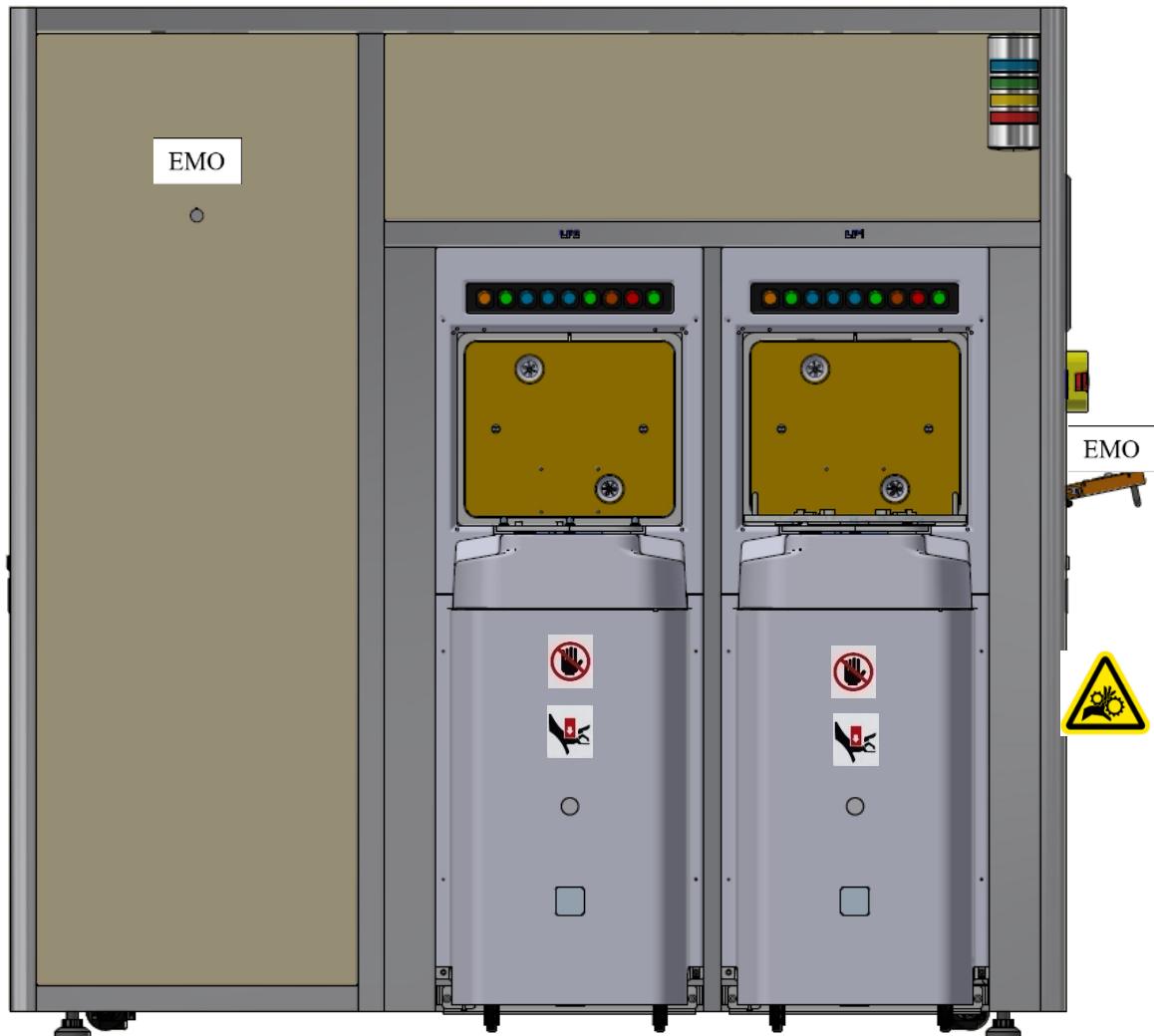
Machine Left View



Machine Right View

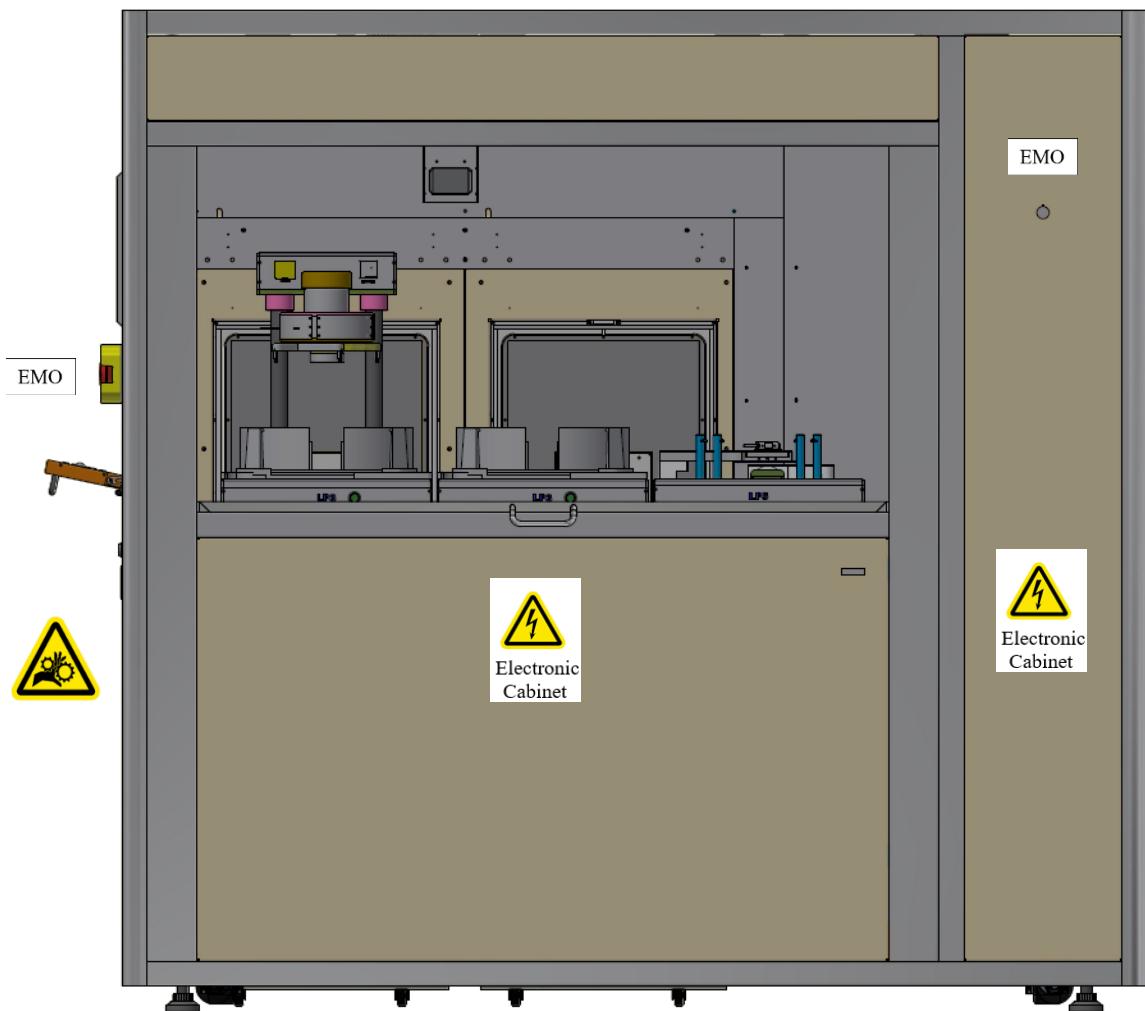


Machine Front View



Electronic Cabinet

Machine Back View



1.5 Safety Interlock System

The system enclosure is provided with door sensors to stop mechanical operation of the machine if the door panels are opened or removed.

When one of the sensors is tripped, the machine will de-energize all motorized parts to prevent mechanical damage and injury to personnel.

 WARNING	Do not attempt to modify or bypass the safety interlock.
--	---

1.6 Emergency Shutdown (EMO)

The machine is protected by an EMO system to de-energize motorized parts in the event of an emergency or for maintenance purposes. The EMO push button is located on the front operator control panel. The EMO push button is connected to the AC power circuit located at the bottom of the electronics cabinet.

 WARNING	With the EMO activated, there is still active line voltage present at the power panel. Trip all MCB and disconnect input power to the system before servicing.
--	---

1.7 Pneumatic System

 CAUTION	Pressure as high as 0.5 MPa may be presented in pressure line.
--	---

Pressure as high as 0.5 MPa may be presented in the pressure line of the machine in the event of system failure. Failure to release the air pressure and disconnect the main pressure supply to the machine before servicing may result in personnel injury and/or damage to equipment.

To safely release air pressure in the pneumatic system:

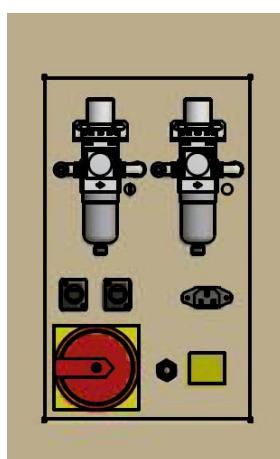
1. Press the OFF button. The OFF button will disable any I/O for triggering any of the solenoid valve in the machine.
2. Release the air pressure by pressure gauge and disconnect the main air pressure supply line to the machine.

1.8 Lockout/ Tagout (LOTO) Procedures

- a) Prepare for shutdown machine.
- b) Notify affected employees. Ensure that users in the affected area are fully aware of the impending lockout.
- c) Press the emergency button and STOP button on the control panel.
- d) Shut down PC in orderly manner.
- e) Release air pressure and disconnect the main air pressure supply line to the machine.
- f) Turn off and disconnect the power supply to the machine.
- g) Open the enclosure and turn off the ELCB and MCB.



- h) Disconnect the power cord cable and turn off the isolator switch behind the machine.



- i) Apply a safety padlock and tag to the isolator switch (Image below is for reference).



- j) Verify the lockout and ensure the machine is properly locked.
- k) Perform task.

Re-energized the machine

- a) Visual inspect the area and machine.
- b) Notify affected employees that power will be restored and ensure that employees in the affected area are fully aware.
- c) Remove the lock-out devices and tag.
- d) Connect the power cord and air pressure supply to the machine and turn on the isolator switch.
- e) Open the enclosure and turn on all ELCB and MCB.
- f) Power on the PC.
- g) Release the emergency switch (EMO) and press the Start button.
- h) Launch the WPS3800 software to initialize the machine.

1.9 Electrical hazards

	<p>WARNING</p> <p>HAZARDOUS VOLTAGE</p> <p>Contact may cause electric shock or burn.</p> <p>Turn off power source before servicing.</p>
<p>WARNING</p>	<p>High voltages are present inside the electronics cabinet and power panel.</p> <p>Failure to turn off these systems before servicing may lead to injury or machine damage.</p>

To safely de-energize the electrical system

- a) Press the EMO switch and OFF button.
- b) Go to the power panel and trip ALL MCBs to OFF position.
- c) Disconnect main input power to the machine to completely isolate machine from line voltage.

1.10 Mechanical Hazards

	WARNING ENTANGLEMENT HAZARD Entanglement of hand may result in severe injury. Keep hands away during operation.
	WARNING CRUSH HAZARD Moving parts can crush and result Keep hands away during operation.
	WARNING CUT HAZARD Moving parts can cut and result in severe injury. Keep hands away during operation.
WARNING	Moving mechanism do not detect items in their path and can cause severe injury.

1.11 Environmental Considerations

1.11.1 Environmentally Friendly

QES Mechatronic machines omitted no hazardous chemicals or gases in its operation. All assembled components have been selected to meet the RoHS standards to minimize environmental impact.

1.11.2 Chemical Hazard

Chemical hazard materials are limited to lubricants used in the arm bearings, linear guide, and ball screw of the machine; Isopropyl alcohol used for cleaning purposes.

If the parts are removed or replaced, it must be handled following government procedures for disposal of hazardous materials or servicing it may be necessary to clean portions of the cover, stage, or the optics.



NSK Grease LG2 Specification

Thus, grease was developed by NSK to exclusively used for linear guides, ball screws etc. in clean room. Compare to fluorine grease which is commonly used in clean room.

Range of use temperature

-20°C to 70°C

Properties

Thickener	Lithium soap base
Base oil	Mineral oil + synthetic hydrocarbon oil
Consistency	207
Dropping point	200°C
Volume of evaporation	1.40% (99°C, 22 hr)
Copper plate corrosion test	Satisfactory (Method B, 100°C, 24 hr)
Oil separation	0.8% (100°C, 24 hr)
Base oil kinematic viscosity	30 mm ² /s (40°C)

Hand Grease Pump unit



Easy operation

- Can be operated by one hand, yet there is no worry to make a mistake.

Inserting by high pressure

- Insert at 15 MPa.

No leaking

- Does not leak when held upside down.

Easy to change grease

- Simply attach grease in bellow tubes.

Prevents entry of foreign matter

- Foreign matter such as dust cannot enter since grease can be changed while in bellow tubes.

Remaining grease

- Can be confirmed through slit on pump.

2 Installation

2.1 Overview

The system is tested and calibrated fully before shipped out to customer's premises. Please inform the manufacturer of any physical damage to the crates upon receiving the system from the transporter.

2.2 Installation Precaution

 CAUTION	<p>The machine presents mechanical and electrical hazards which, if not properly handled, may result in severe injury.</p> <ul style="list-style-type: none">• Only trained and qualified personnel are allowed to perform the installation of the machine.• Read and understand Chapter 1: Safety Information before performing any procedure.
--	--

2.3 Unpacking and Inspection

The system is usually packed in one crate; please make sure all items listed in the packing list are in good physical condition. Make an immediate report to the manufacturer if any item listed in the packing list has disappeared or is physically damaged.

To minimize any risk of transportation damage to the components, some sensitive components will be detached from the machine, e.g. Barcode scanner, End-effector, and End-Effector unit. These components will be properly packed in a separate carton box.

All machine moving mechanisms will securely lock with a fixture in its safe position and wrapped with humid proof material. Unwrap the humid-proof material to check for physical damage. The locking fixtures shall remain locked until the machine is anchoring and well-aligned at its destination.

2.4 Installation

 CAUTION	<p>Only trained and qualified personnel are allowed to perform the installation of the machine.</p>
--	---

2.4.1 Anchoring and Levelling

After placing the machine in the desired location, turn the knob at the wheel to lock the wheel in place.

Using spirit level meter to align the machine levelness. The level of the machine (4 edge corners) need to be controlled not more than 0.1 mm/m.

2.4.2 Light Tower

Open the tower light panel at the top of the machine and install the tower light.



Light Color	Color	Condition
RED	Red	Failure conditions such as an emergency stop or machine fault.
YELLOW	Yellow	Idle condition such as material waiting or engineering setup.
GREEN	Green	Normal machine or process operation.
BLUE	Blue	Communication condition of machine and host.

2.4.3 Facilities

Connect the machine and compressed air supplies at the back of the machine and plug in the power cord.



2.5 Power Up

WARNING	<p>High voltages are present inside the electronics cabinet and power panel.</p> <p>Only trained and qualified personnel are allowed to perform the installation of the machine.</p>
----------------	--

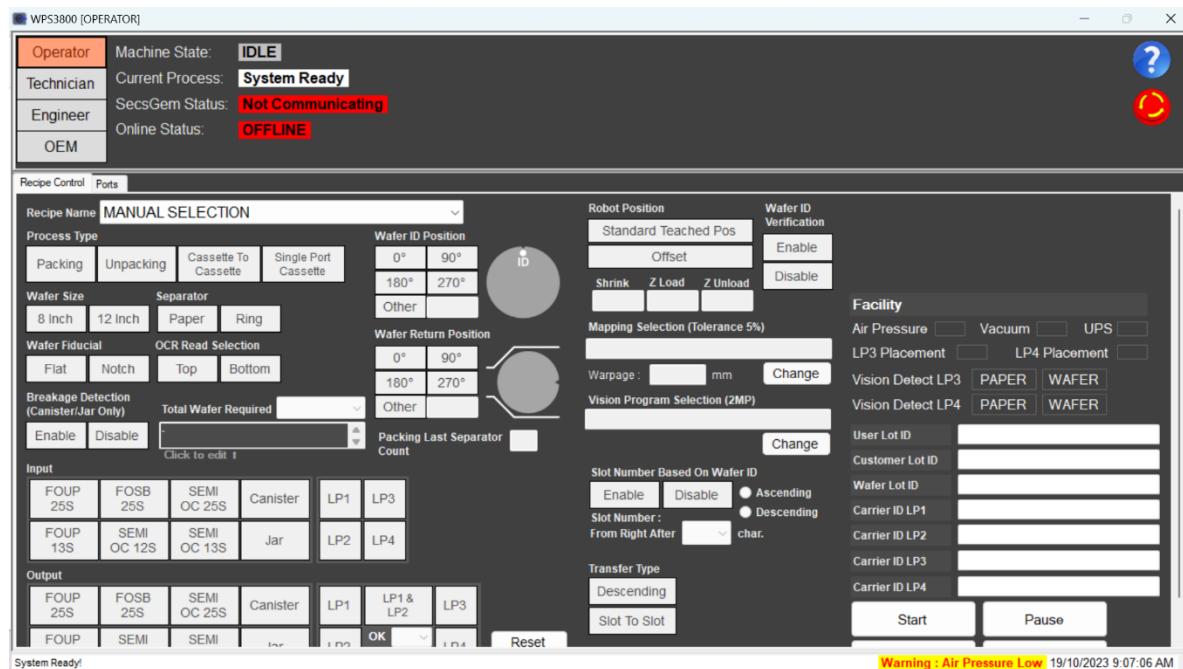
Once all the hardware has been properly setup,

1. Connect compressed air tubing to the inlet.
2. Turn on the isolator switch at the back of the machine.
3. Turn on all MCB, ELCB at the electrical cabinet.
4. Release the EMO push button.
5. Press the PC button to boot up the computer.
6. Upon the computer is booted up, the WPS3800 software will automatically execute. Users will need to click "OK" to initialize the machine.

3 Operational Interface

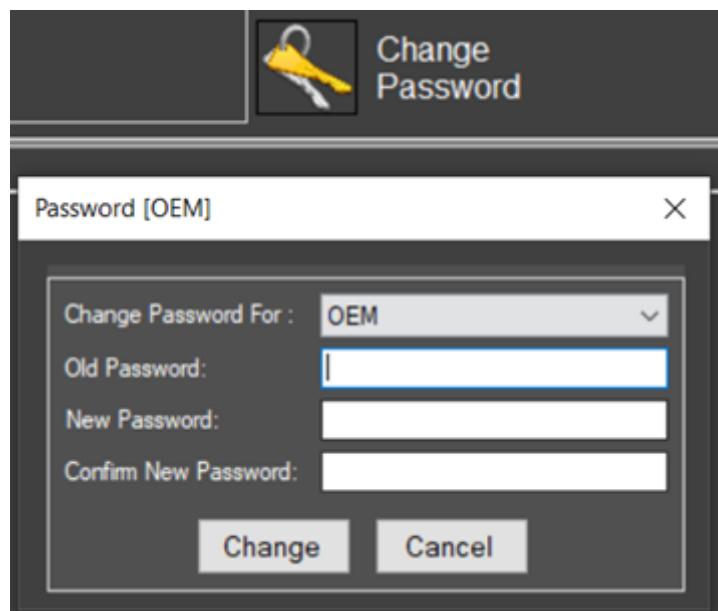
3.1 Overview

The WPS is a single PC with single monitor system that provides ease of automated packing and unpacking which compatible with wafer of 8-inch and 12-inch wafer with selection of process recipe for sorting.



3.1.1 User Account

The WPS3800 software has 4 levels of access that are assigned to the user account based on the role.



Level	Function
Operator	Basic operation access such as Start Lot.
Technician	Technician Troubleshooting.
Engineer	Engineering operation such as creating recipe, perform diagnosis check.
OEM*	Full access to the machine.

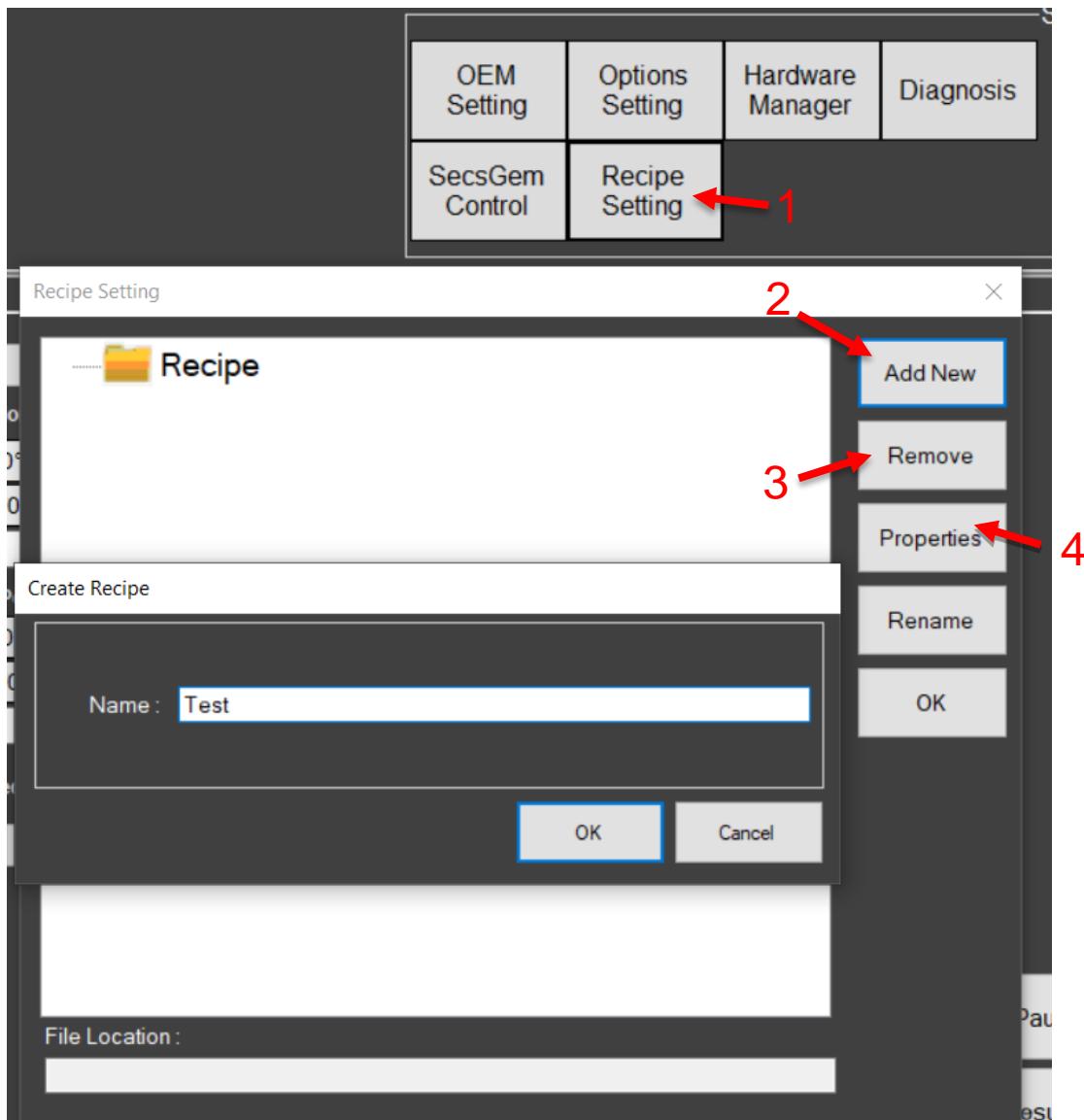
3.1.2 Screen Shortcut Icon

No.	Icon	Description
1		Shortcut Icon for Help <i>To view the version of the software</i>
2		Shortcut Icon for Reset System <i>Manually reset the whole system (Re-initialization) of all axis</i>
3		Shortcut Icon for Change Passwords <i>To create or change existing passwords</i>

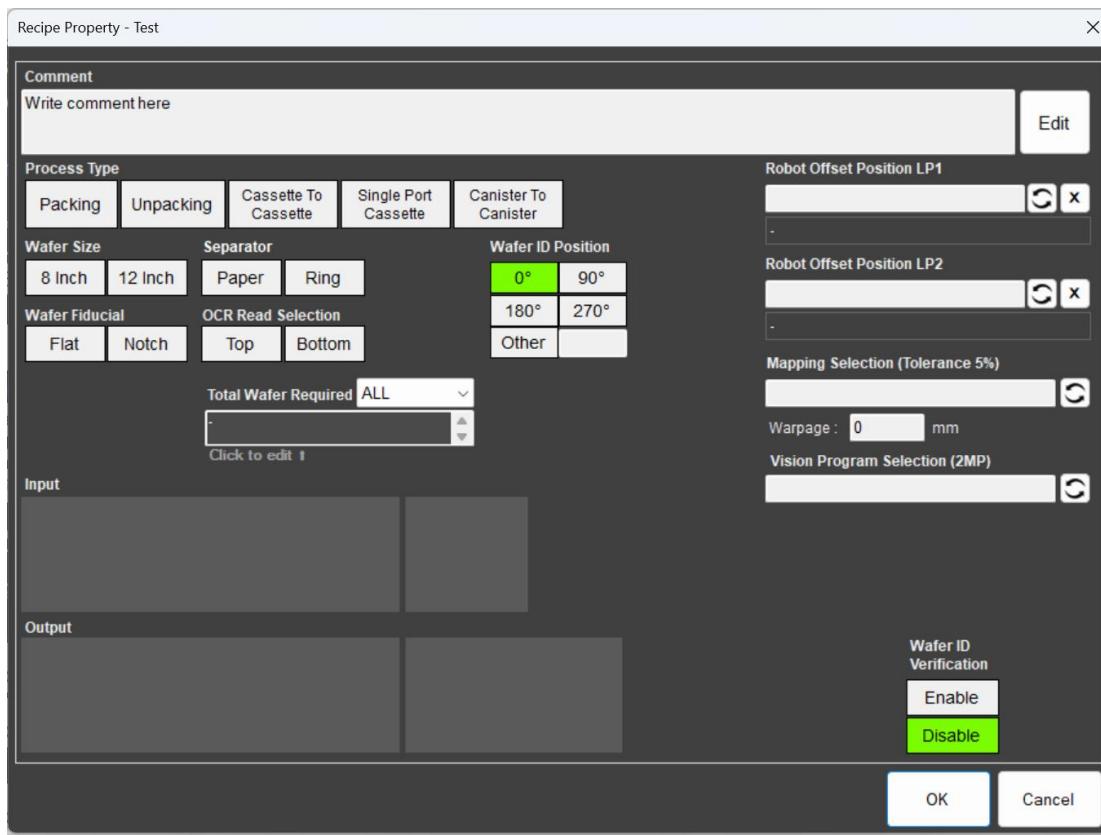
4 Recipe Configuration

4.1 Recipe editor

To add new recipe, remove or edit existing recipe, click “**Recipe Setting**” (Label 1) to proceed. Select recipe and click “**Remove**” (Label 3) to delete existing recipe; select recipe and click “**Properties**” (Label 4) to change the recipe setting. Click “**Add New**” (Label 2) to create new recipe.



When “**Properties**” (Label 4) is pressed, the following window will pop-up and allow users to change the setting for selected recipe.



Process Type

- Packing: Pack wafer to Canister/Jar.
- Unpacking: Unpack wafer to FOUP.
- Cassette: Sort wafer from input cassette to output cassette.
- Single Port Cassette: For Load Validation purpose only. Processed wafer will load from input cassette and unload in input cassette.
- Canister to Canister: Load wafer from input canister to output canister

Wafer Size

- 8 inch: To select 8-inch wafer for process.
- 12 inch: To select 12-inch wafer for process.

Wafer Fiducial

- Flat: To select wafer fiducial type as flat.
- Notch: To select wafer fiducial type as notch.

Separator

- To select paper or ring as interleaf between wafers.

OCR Read Selection

- To select top or bottom OCR reader for OCR reading.

Wafer ID Position

- To select the position where Wafer ID is located.
 - 0°
 - 90°
 - 180°
 - 270°
 - Other Degree

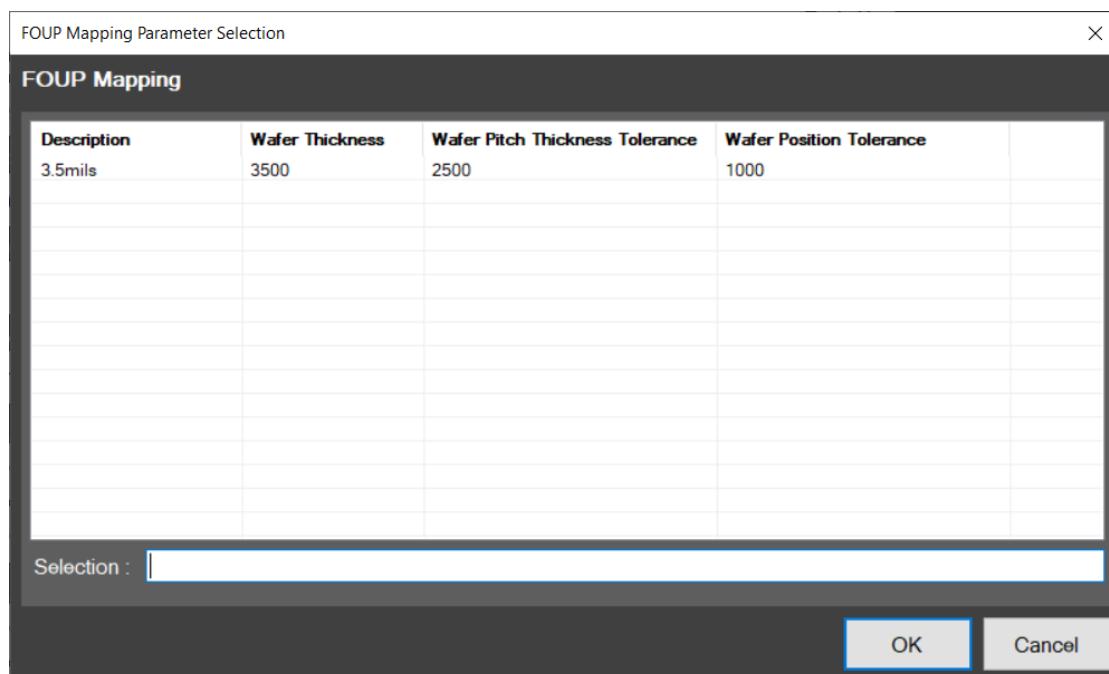
Total Wafer Required

- To select amount of wafer to be processed (Max: 25).

A screenshot of a dark-themed software interface showing a dropdown menu. The visible part of the menu is labeled "Total Wafer Required" with the value "25" next to it, followed by a small downward arrow indicating a dropdown list.

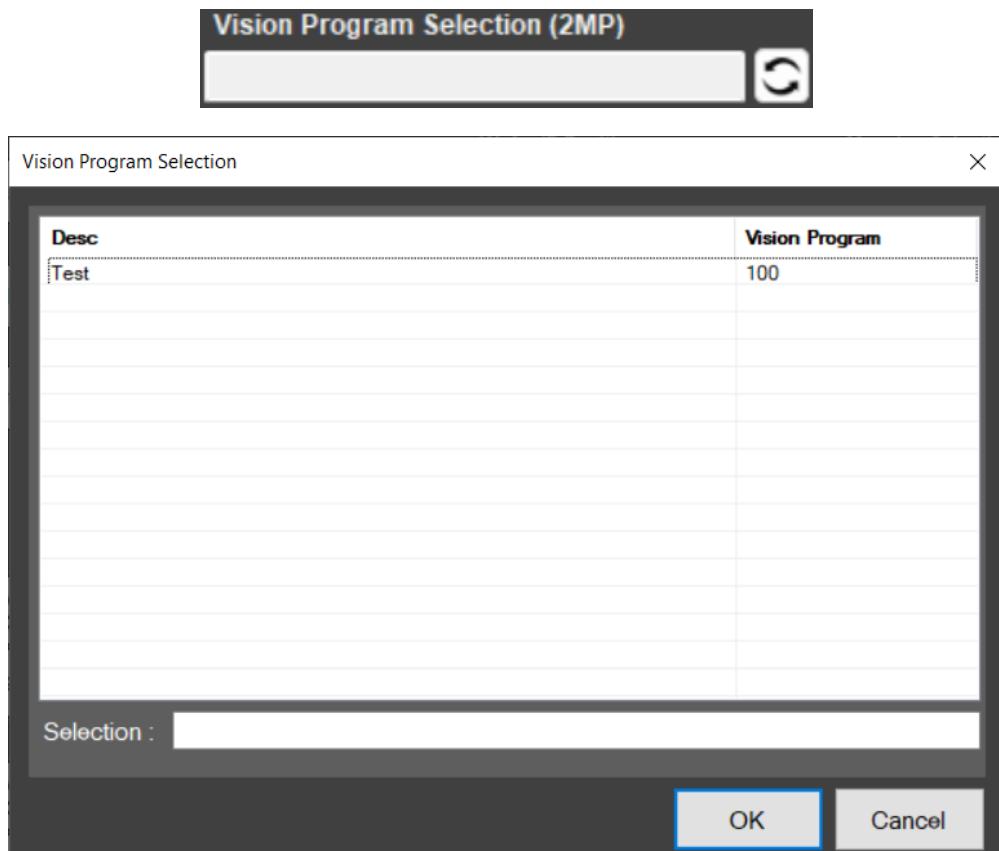
Mapping Selection (Tolerance 5%)

- Click on “Refresh” button to open the list of Mapping selection menu and select the Mapping profile of wafer.



Vision Program Selection(2MP)

- Click on “Refresh” button to open the list of Vision Program Selection menu and select Vision Program.



4.2 Recipe Process

The screenshot displays the "Recipe Control" software interface. The main window is titled "MANUAL SELECTION". It includes several sections: "Process Type" (Packing, Unpacking, Cassette To Cassette, Single Port Cassette), "Wafer Size" (8 Inch, 12 Inch, Paper, Ring), "Wafer Fiducial" (Flat, Notch, Top, Bottom), "Breakage Detection" (Canister/Jar Only), "Input" (FOUP 25S, FOSB 25S, SEMI OC 25S, Canister, LP1, LP3, LP2, LP4), and "Output" (FOUP 25S, FOSB 25S, SEMI OC 25S, Canister, LP1, LP2, LP3). On the right side, there are sections for "Robot Position" (Standard Taught Pos, Offset, Shrink, Z Load, Z Unload), "Wafer ID Verification" (Enable, Disable), "Facility" (Air Pressure, Vacuum, UPS, LP3 Placement, LP4 Placement), "Vision Program Selection (2MP)" (Change), "Slot Number Based On Wafer ID" (Enable, Disable, Ascending, Descending, Slot Number, From Right After), "Transfer Type" (Descending, Slot To Slot), and control buttons for "Start" and "Pause".

Recipe Name

- User will select created recipe here (For offline or local process).

User Lot ID

- User requires to input production lot ID here (or scan production Lot barcode).

Customer Lot ID

- Machine will read on cassette and input here.

Wafer Lot ID

- Machine will read on cassette and input here.

Carrier ID LP1

- User requires to input/scan barcode and input here.

Carrier ID LP2

- User requires to input/scan barcode and input here.

Carrier ID LP3

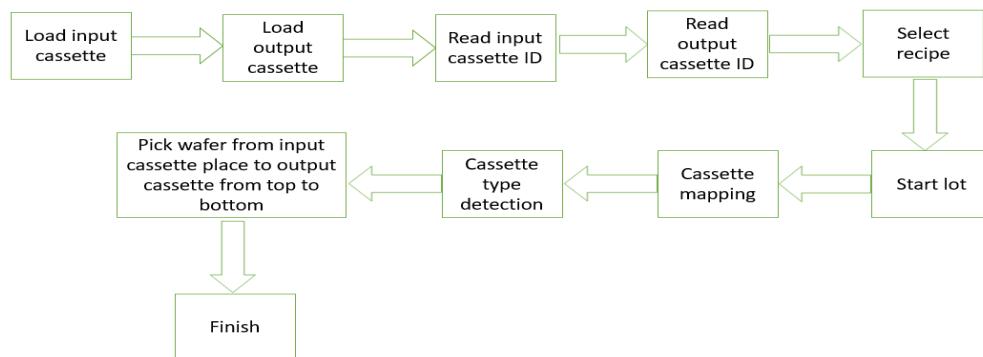
- User requires to input/scan barcode and input here.

Carrier ID LP4

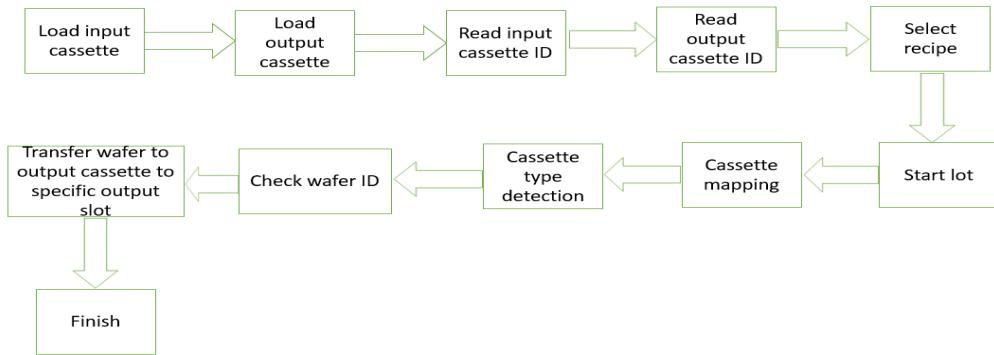
- User requires to input/scan barcode and input here.

4.3 Sorting Process

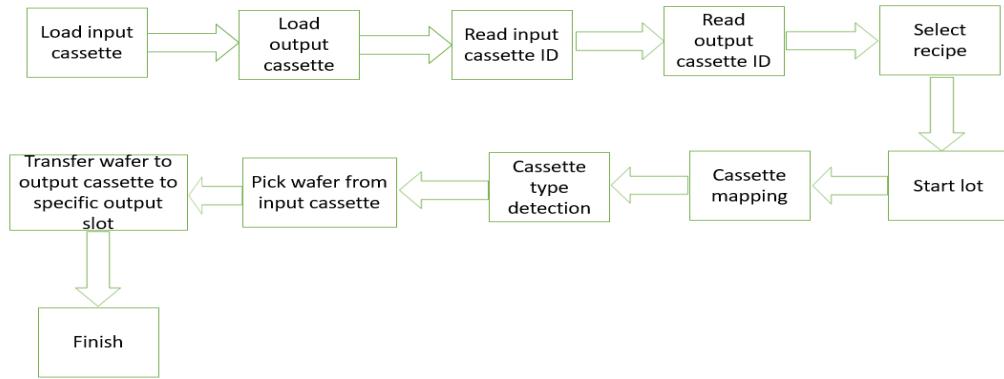
Descending



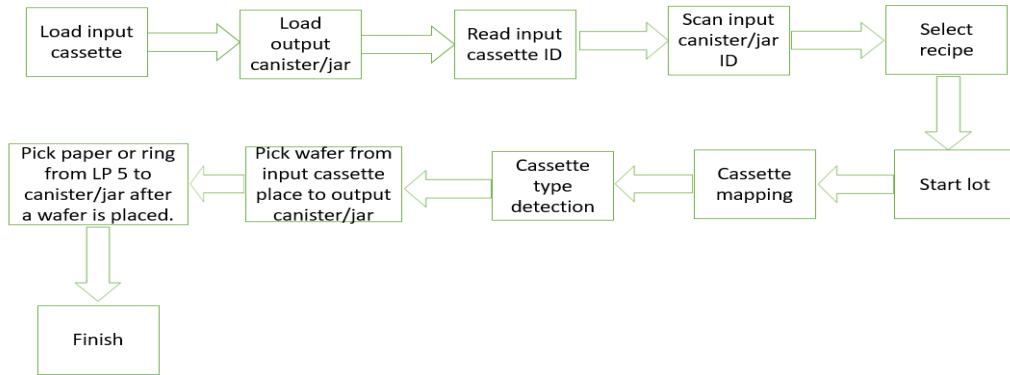
Sort by ID



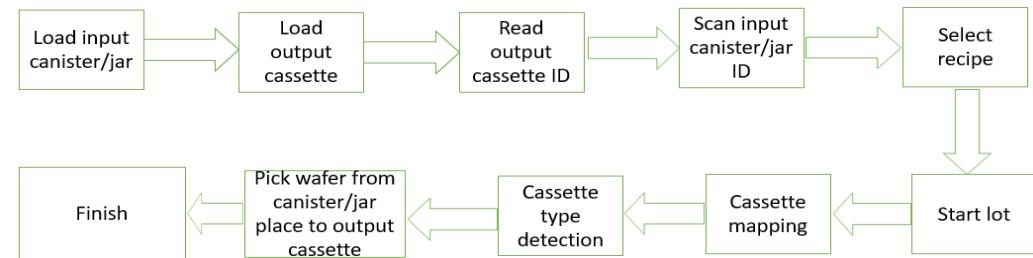
User defined



4.4 Packing Process

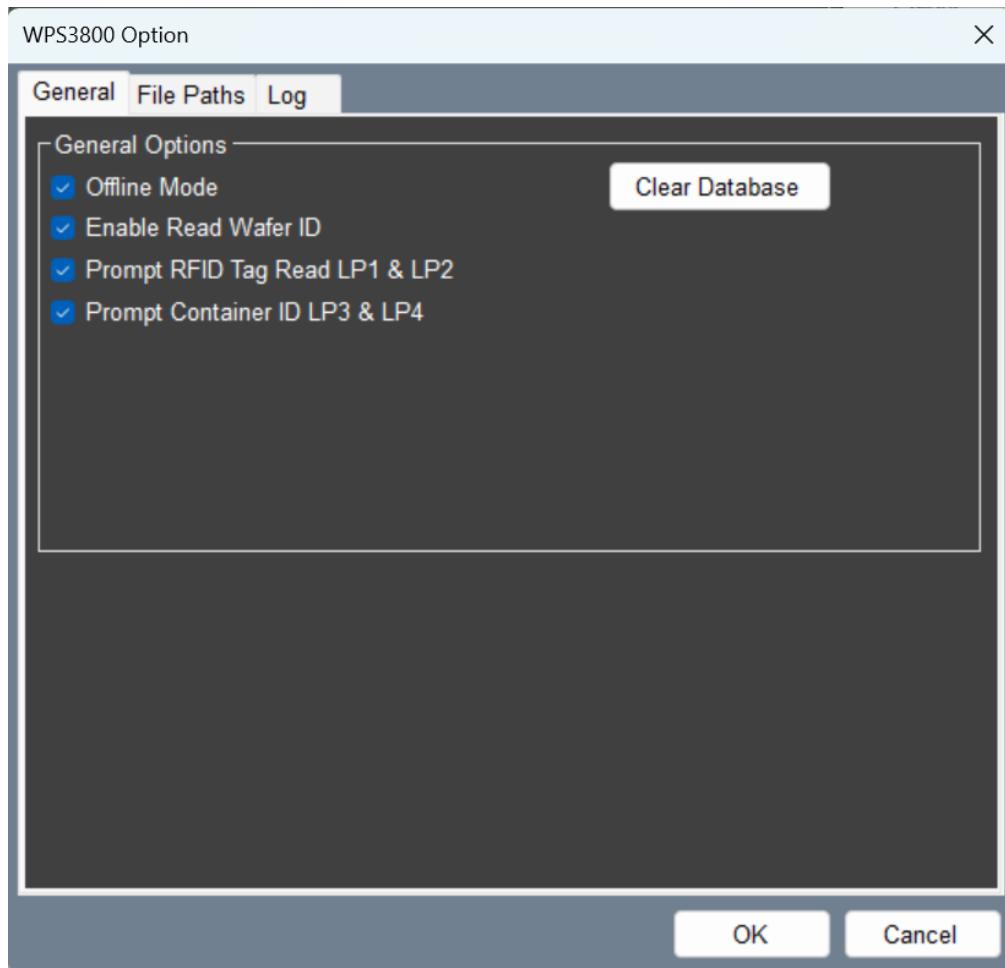


4.5 Unpacking process



5 Option Setting

5.1 General



Offline Mode

- If this setting is checked, the machine will run in simulation mode, only software will run but hardware will remain idle.

Enable Read Wafer ID

- This setting enables to read wafer ID during process.

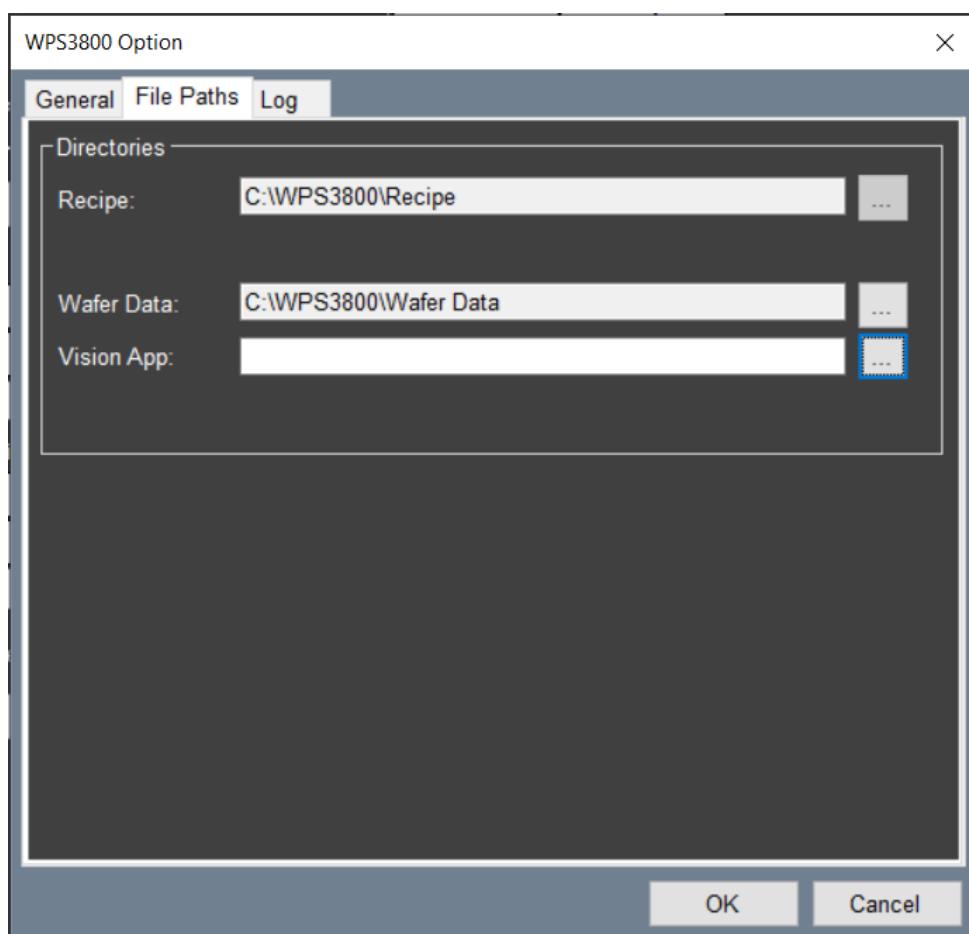
Prompt RFID Tag Read LP1 & LP2

- This setting enables to read RFID tag on Load Port 1&2.

Prompt Container ID LP3 & LP4

- This setting display Container ID on Load Port 3&4.

5.2 File Paths



Recipe

- Location to save recipe file.

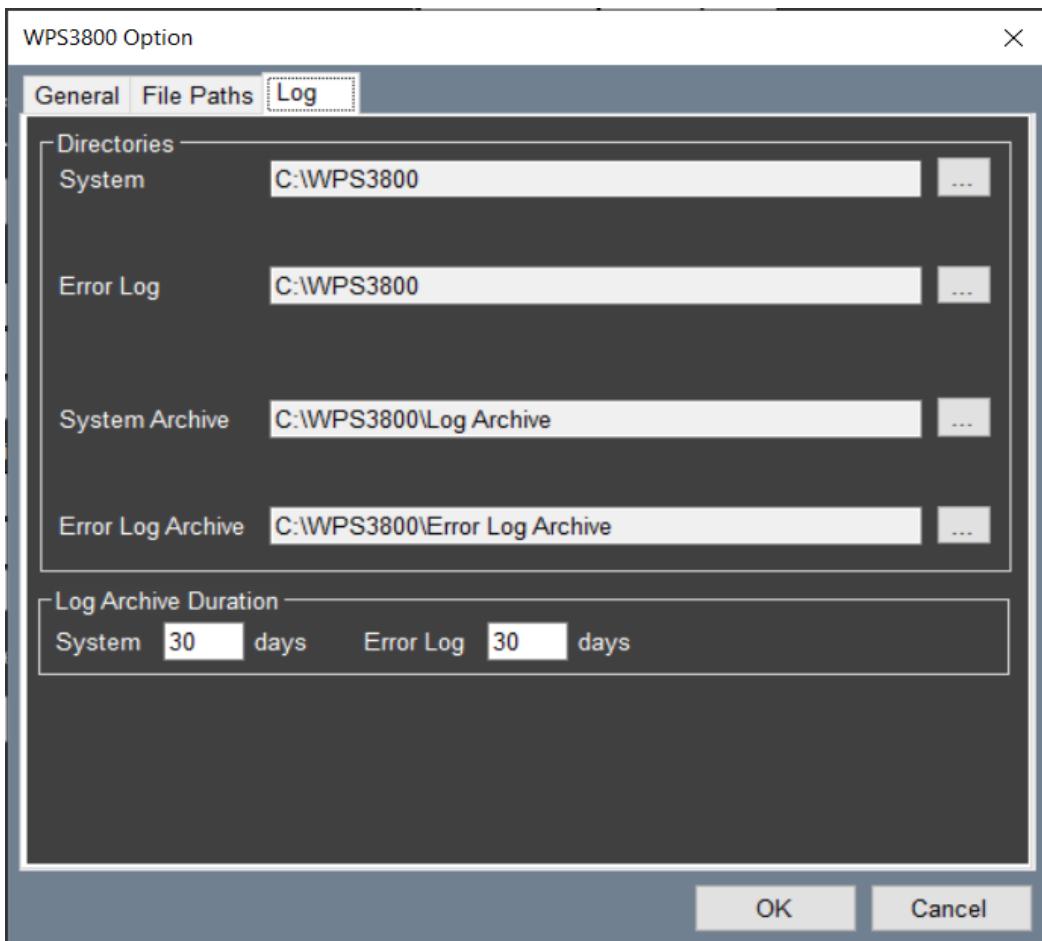
Wafer Data

- Location to save wafer data.

Vision App

- Vision App location.

5.3 Log



Directories

System

- Location to save system log file.

Error Log

- Location to save error log file.

System Archive

- Location to save system archive file.

Error Log Archive

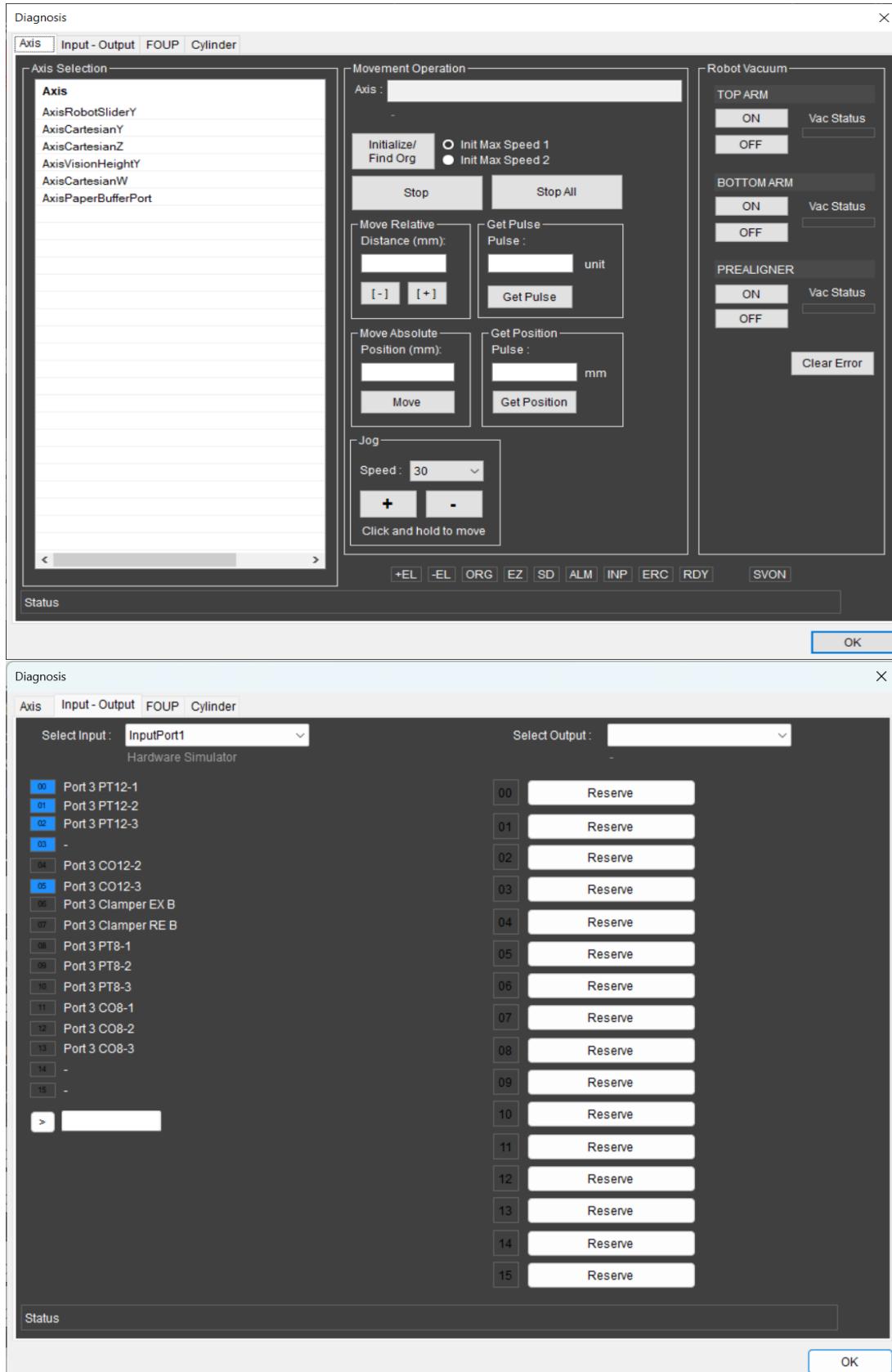
- Location to save Error Log Archive file.

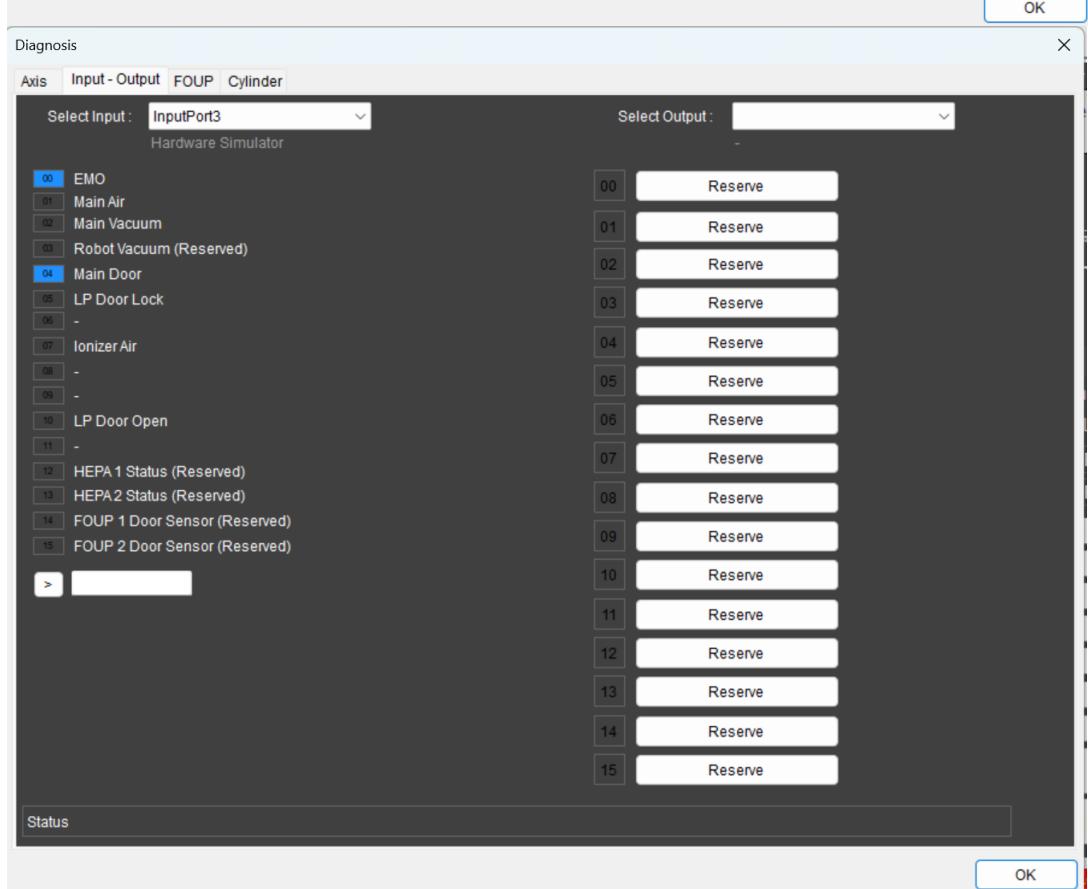
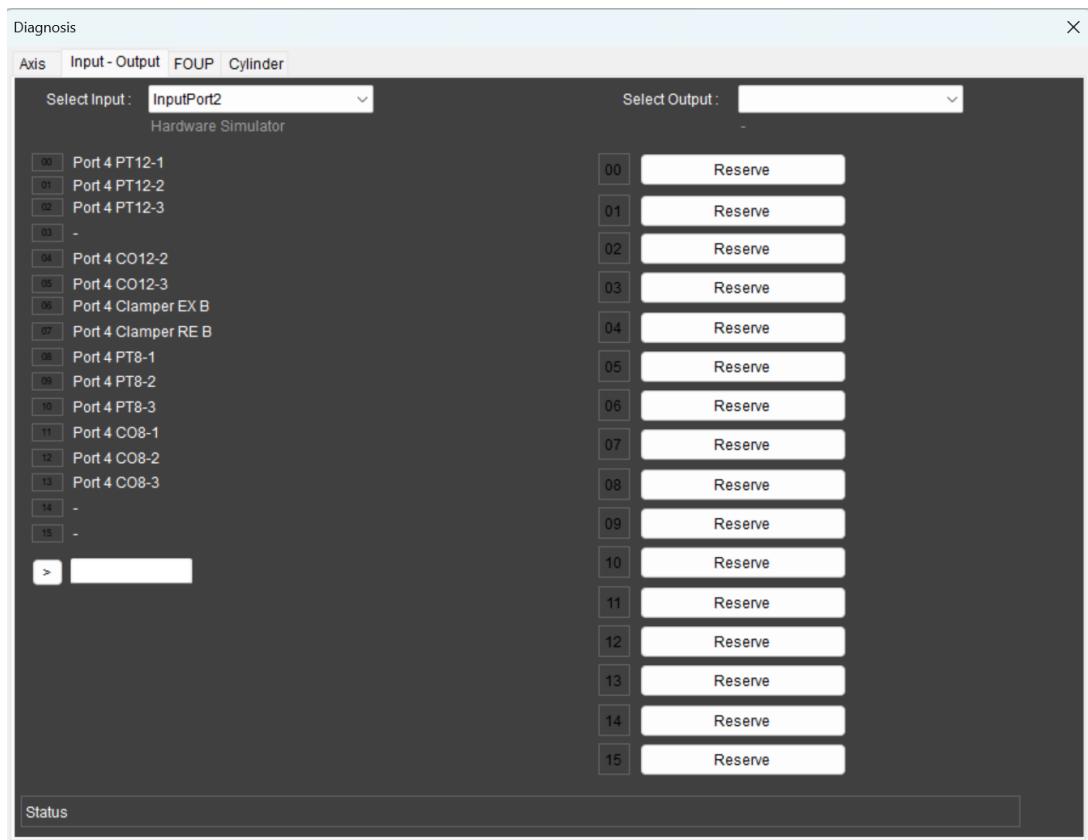
Log Archive Duration

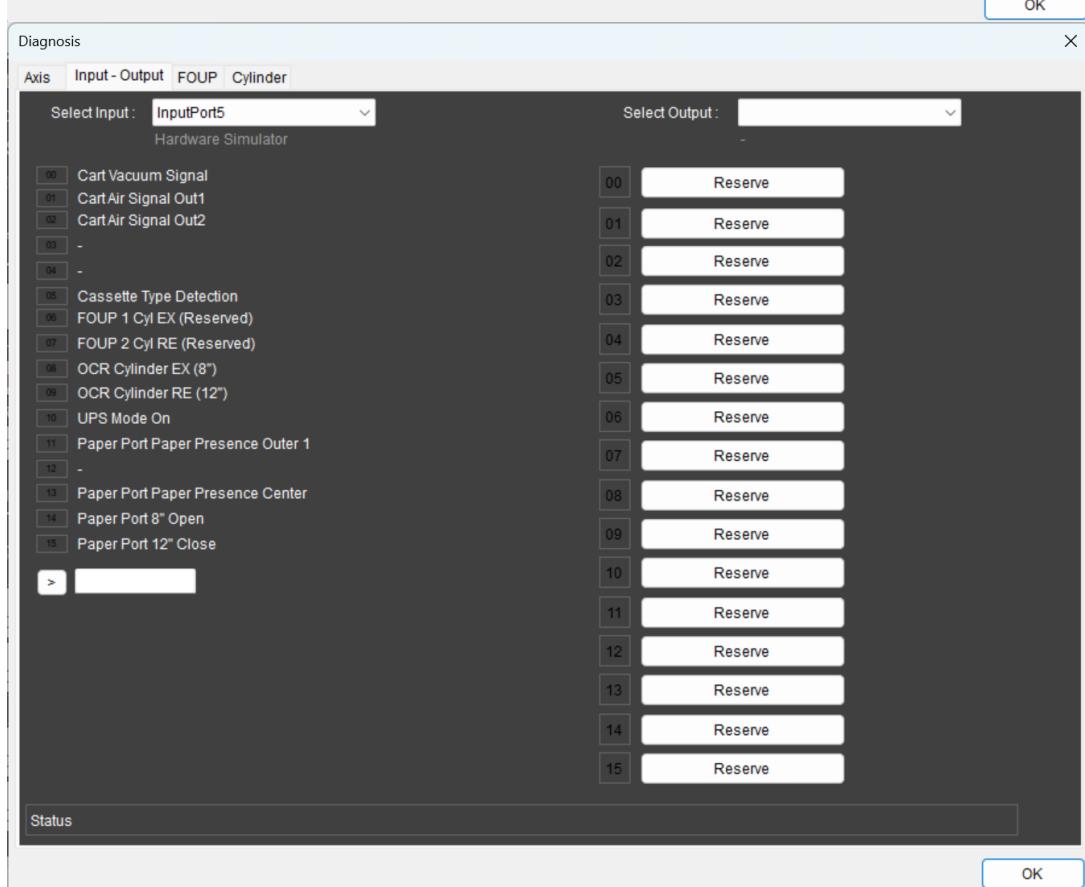
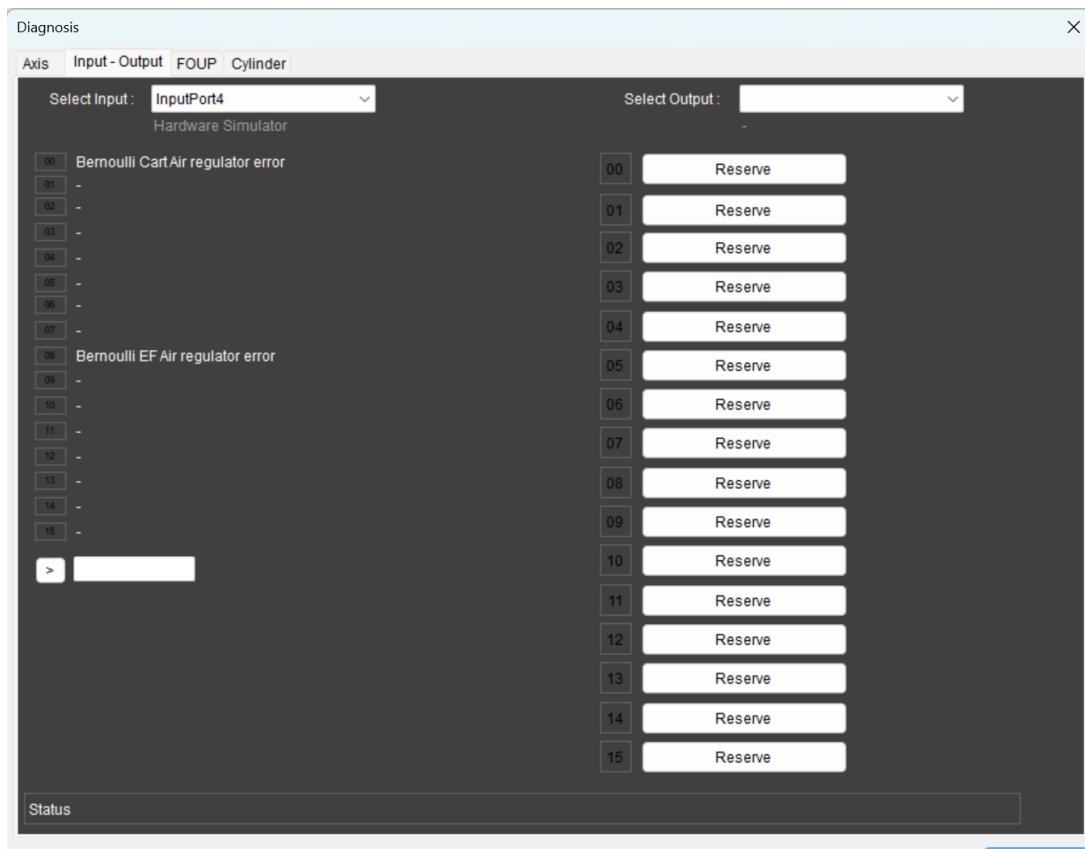
- The duration that user wants to save system log file and error log file. For example, log can save up to 30 days only. Only on the 31st day, software will move previous log into archive folder and create a new log file.

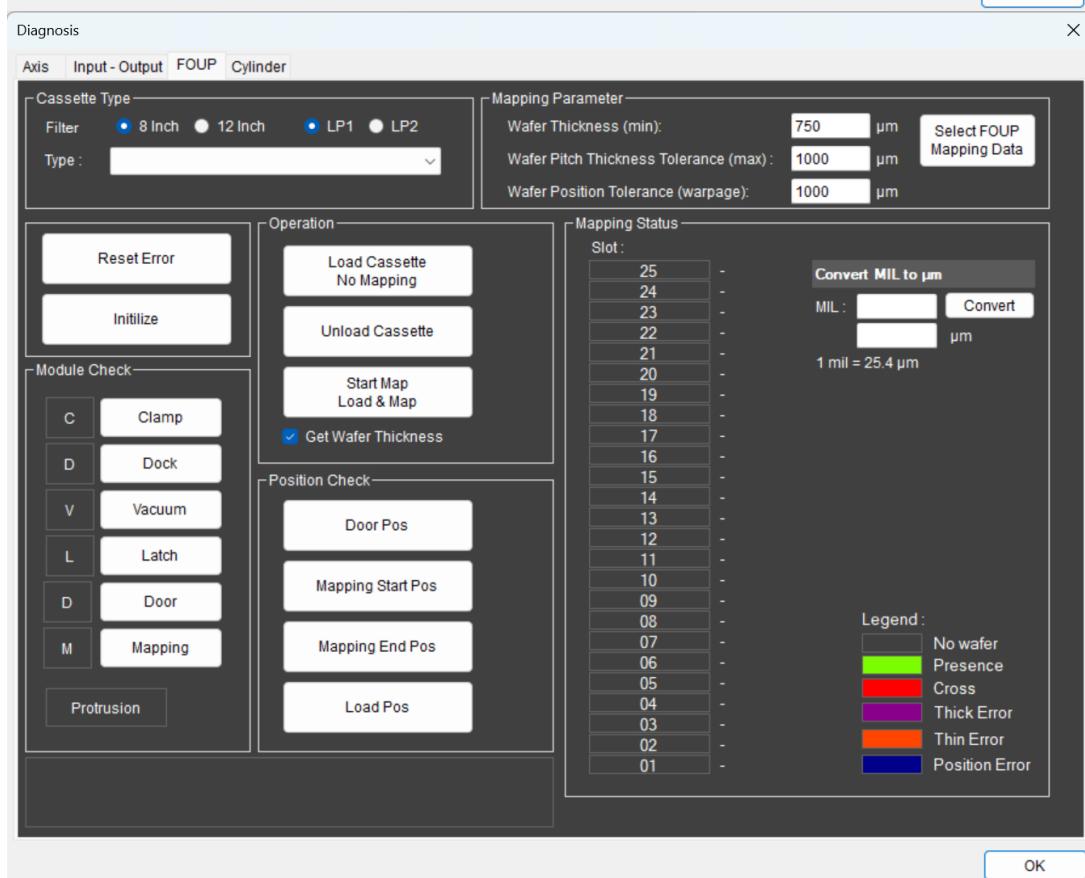
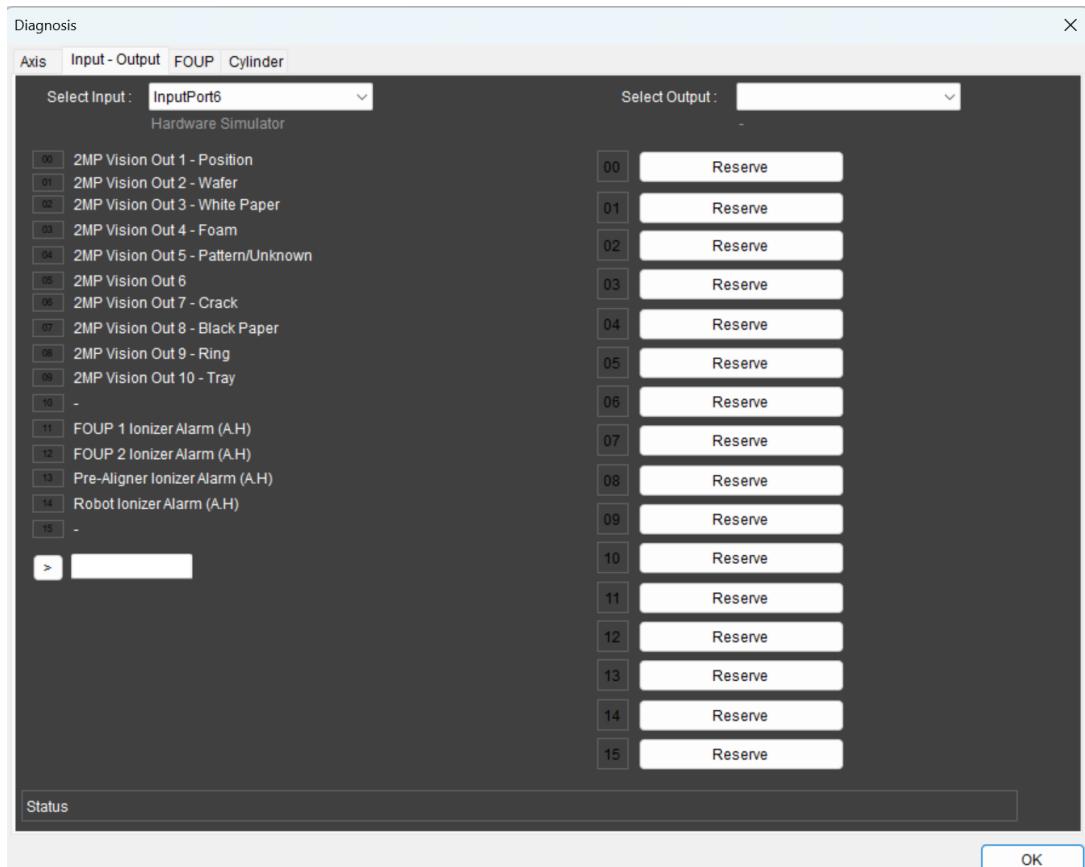
6 Diagnosis

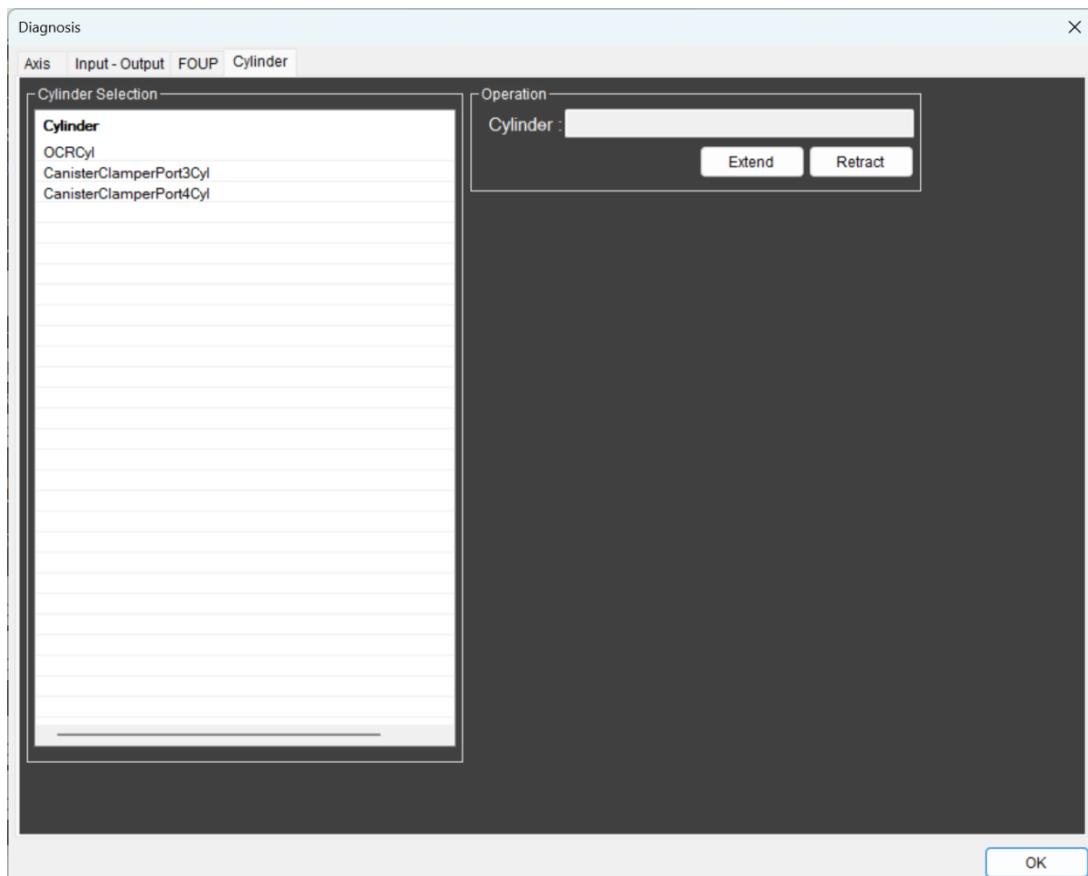
Diagnosis allows user to troubleshoot and trigger movement.







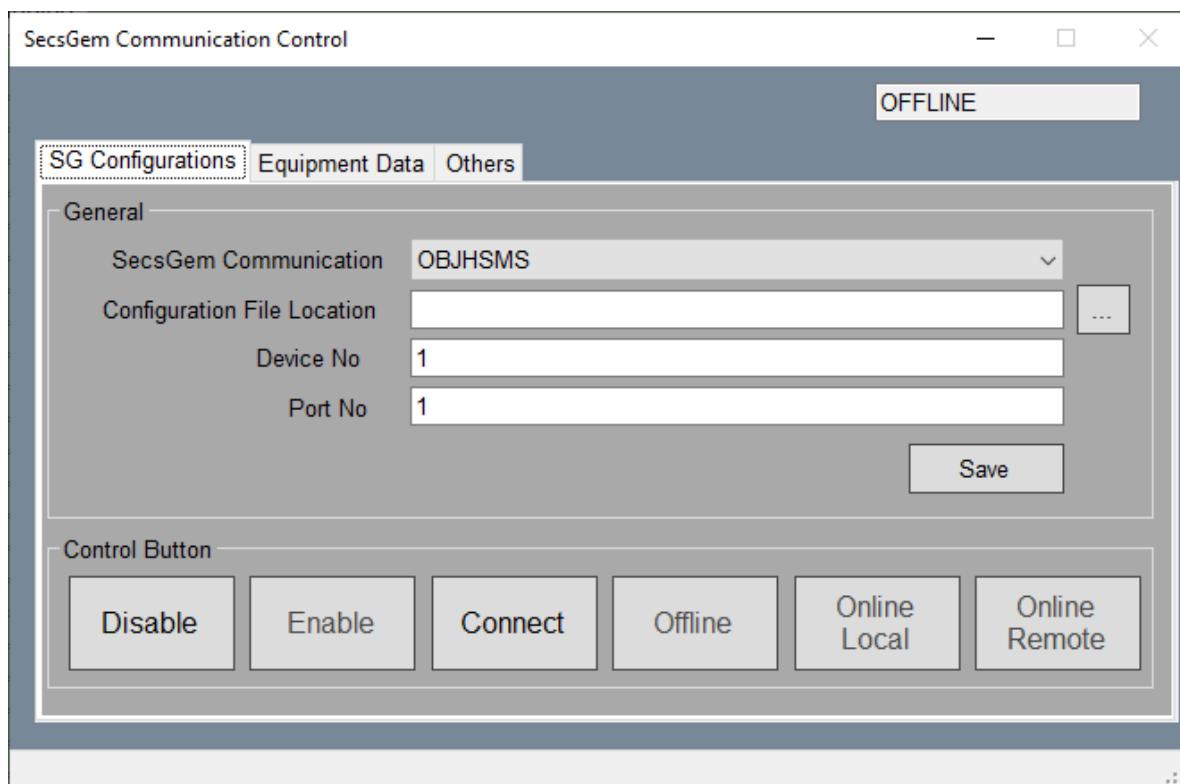




7 SecsGem Control

SecsGem setting will be set by IT Department for machine and host communication and data transferring system. All settings must be carefully set and verify by both parties.

7.1 SG Configurations



Disable – To disable Control Button.

Enable – To enable Control Button.

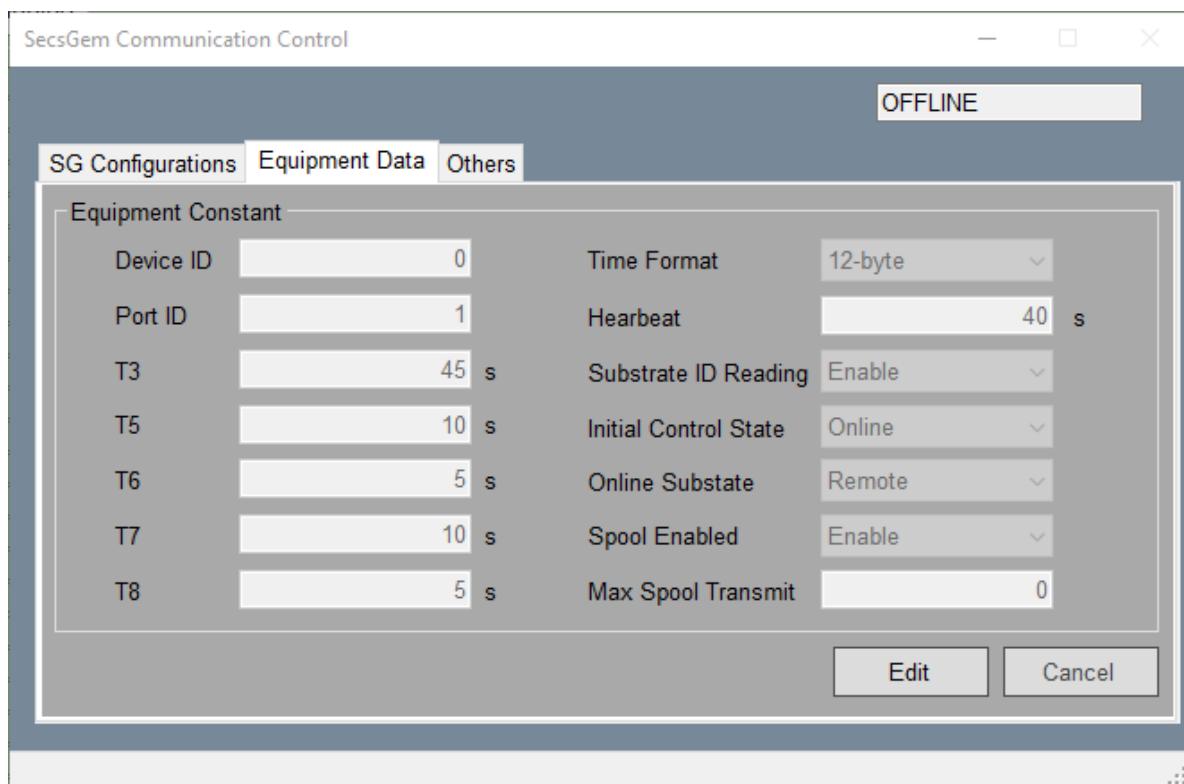
Connect – To connect to Host Control.

Offline – To change the connection to Offline.

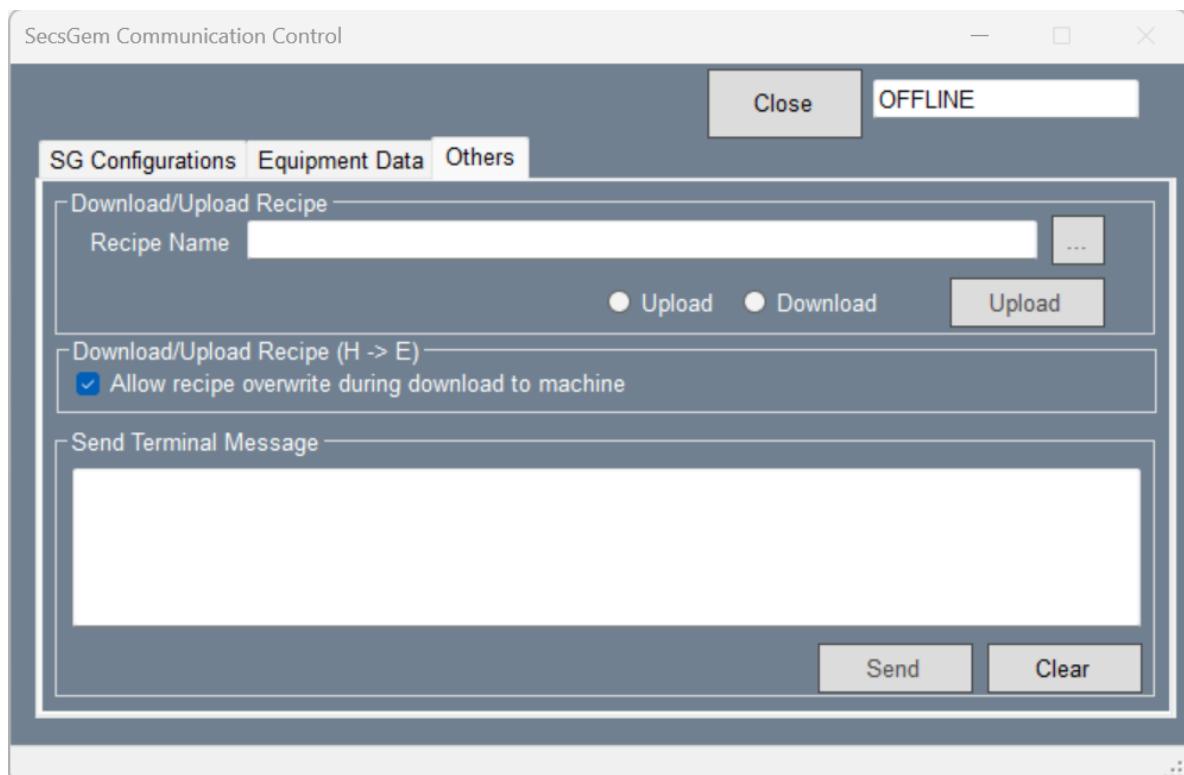
Online Local – To change the connection to Online Local.

Online Remote – To change the connection to Online Remote. This is requirement to run for production lot.

7.2 Equipment Data



7.3 Others



8 Utilities

8.1 Power and electrical components

1. Check incoming power supply of machine by measuring voltage of the isolator terminal using a voltmeter. Ensure that the isolator switch cuts off the main supply to the machine.
2. Manually push the Test button on the Earth leakage Circuit Breaker (ELCB) to ensure that unit can interrupt power supply to machine in the event of actual faults.
3. Manually toggle the switch on the Miniature Circuit Breaker (MCB) to ensure that unit can interrupt supply to the devices in event of over current faults.
4. Check and tighten all screws on terminal blocks which may loosen over time.
5. Check and secure any loose connectors/cable lugs which may be loosen.
6. Check for signs on any faults on the machine. Cable faults signs includes tension/stress mark on cable, disconnect mark or aging solder points.
7. Check for any burn marks on relay contacts due to electric arcing of relay contacts.

8.1.1 With machine power ON:

1. Ensure all 2 units of Emergency Push buttons are working by triggering each unit under diagnosis mode.
2. Ensure all operation Push buttons are working by triggering each button under diagnosis mode.
3. Ensure all 3 LED indicators & the buzzer of the Tower Light is functioning by triggering each LED/buzzer in diagnosis mode.
4. Ensure that all ventilation fans are functioning.

8.2 Vacuum and CDA

1. With machine is running and vacuum supply connected, ensure that the reading on the main vacuum sensor corresponds to the pressure level of the facility. Adjust it if necessary.

Main incoming vacuum (-80 kPa to -93 kPa).

	Switch	Normal Operation, kPa
1	Main Vacuum	-90
2	Main CDA	500 (5 bar)
3	Robot end effector (Vacuum)	-75 and below
4	Pre-aligner	-75 and below

9 Preventive Maintenance: Robot

9.1 Precautions for maintenance inspection

1. Main power of the robot must be turned **OFF** before any maintenance or servicing.
2. Clearly identify that you are in the working envelope when servicing.
3. Avoid the containment of any foreign object to the robot mechanism when replacing or reassembling.
4. Unplug the power connector of the controller when servicing inside of the controller.
5. All parts should be met manufacture's specification. Especially, use same rating fuse. Using different rating fuse may damage the controller enclosure or may cause a fire.
6. Confirm no one is inside of the working envelope before operating the robot. Also, initiate the operation in slow speed, and then back to normal speed after servicing.

9.2 Daily Maintenance

9.2.1 Before stating the robot operation

Check the following items:

1. Air pressure (if necessary).
2. Air leakage (if necessary).
3. Visible damage on the cables.
4. Disconnection or looseness of the sensor connectors.

9.2.2 During the operation

Check the following items:

1. Any abnormal sound or vibration.
2. Connection for the cable and the piping.
3. Any position drifted.

9.2.3 After the operation

Check the following items:

1. Excessive motor heating.
2. Visible damage on the cables and the mechanism.

9.3 Periodical Maintenance

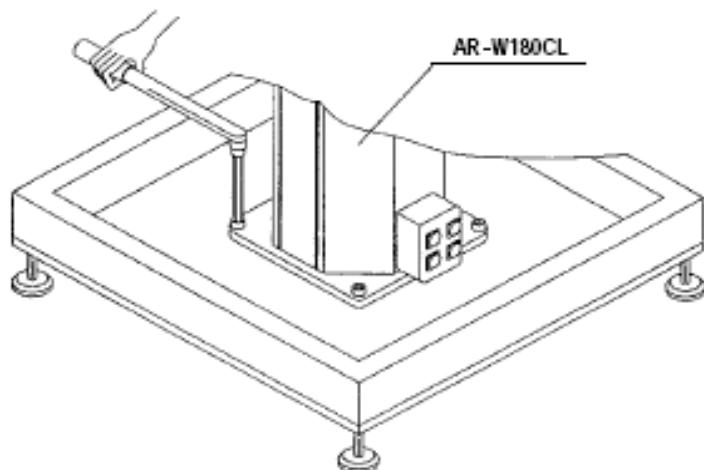
To ensure the full performance and the longer lifetime, periodical maintenance for the following item is highly recommended.

Part to inspect	Inspection item	Interval	Remarks	Refer to
Robot installation bolt	Tightening torque	6 months	Iron base: 37 Nm Aluminium base: 18 Nm	9.3.1
Linear guide	Lubrication	2 years	LG2 grease	9.3.2
Ball screw			NSK	

In-line filter	Vacuum switch air pressure display	2 months		9.3.3
Z-axis timing belt	Visual check on its condition	2 years		9.3.4
Θ-axis timing belt		2 years		9.3.5
Hand fixing bolt	Tightening torque	6 months		9.3.6

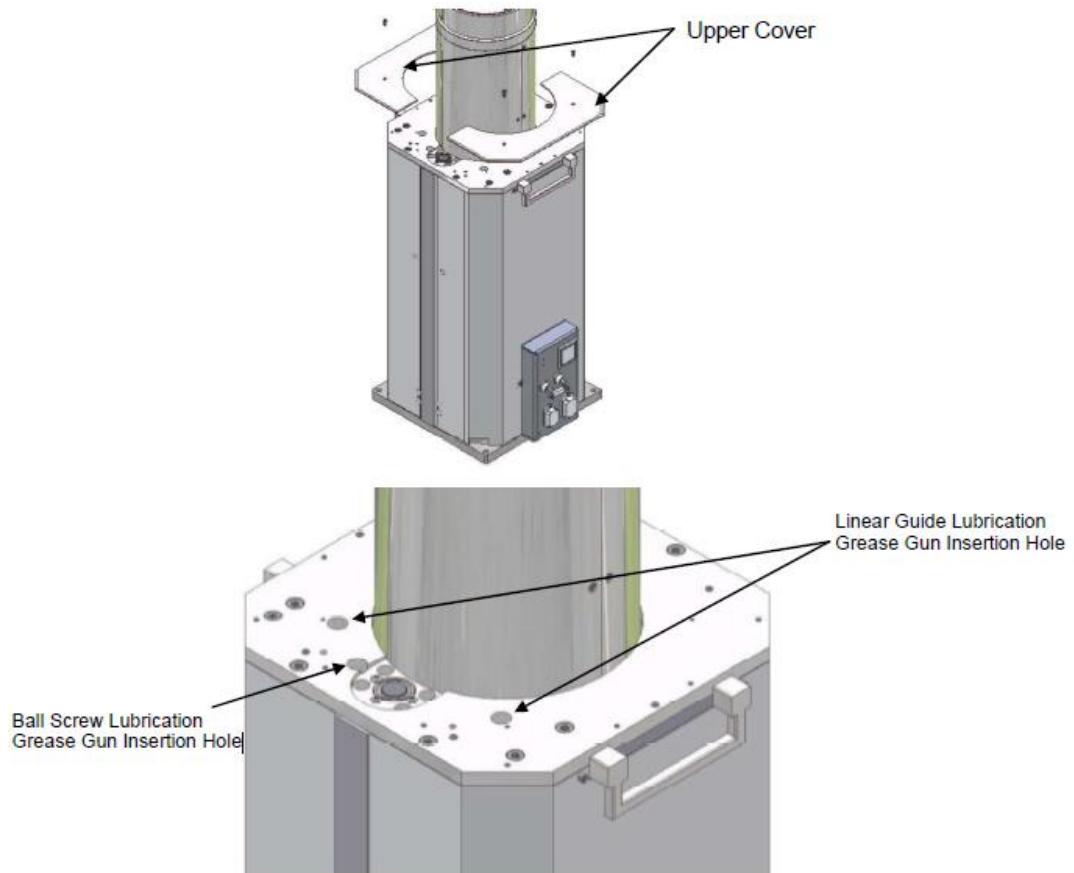
9.3.1 Robot installation bolt

- Tool:
Torque wrench
- Operating procedure:
1. Re-tighten the installation bolts by the torque wrench with recommended torque.
(Iron Base: 37 Nm, Aluminium base: 18 Nm)
- Estimated work time:
5 minutes
- Inspection interval:
6 months (Re-tighten the bolt one week after the initial operation.)



9.3.2 Lubrication to linear guide and ball screw

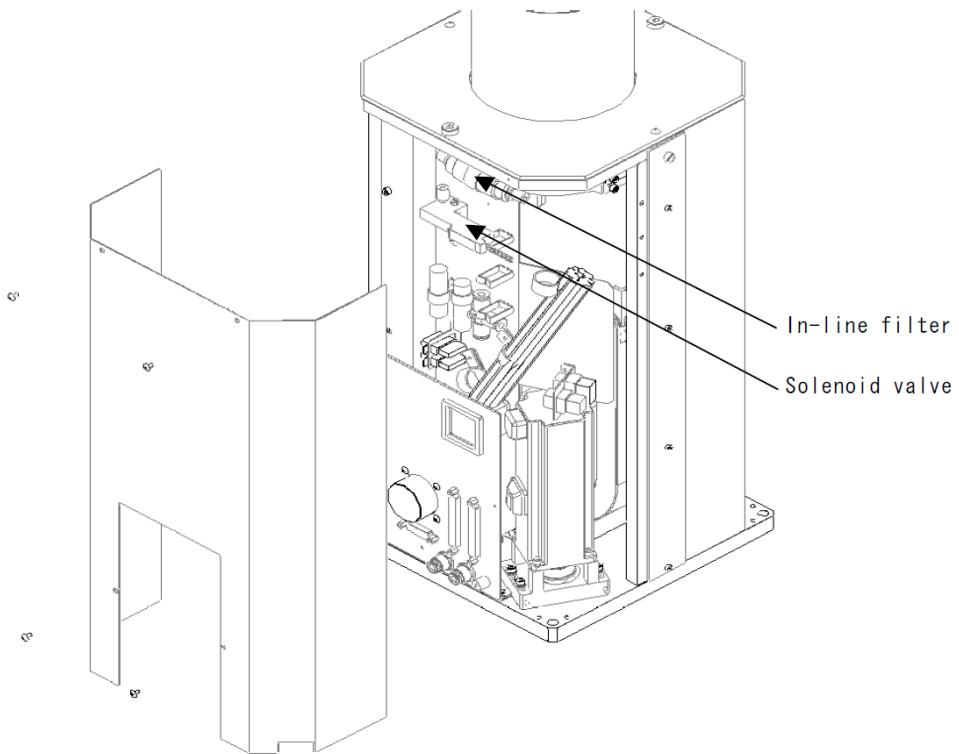
Lithium low dusting grease LG2 (NSK) is applied, at the production at the plant, to the guides and ball screws for the Z-Axis. Since these are rolling-sliding parts, insufficient lubrication causes abnormal wear and noise, and in some cases, it may eventually result in a failure. Excessive grease or unbalanced lubrication may cause an increase of the load to the motors or spattering of the grease. For this robot, lubrication is not necessary normally because the grease is lubricated automatically. However, the maintenance is required every two years by service engineer.



9.3.3 In-Line Filter

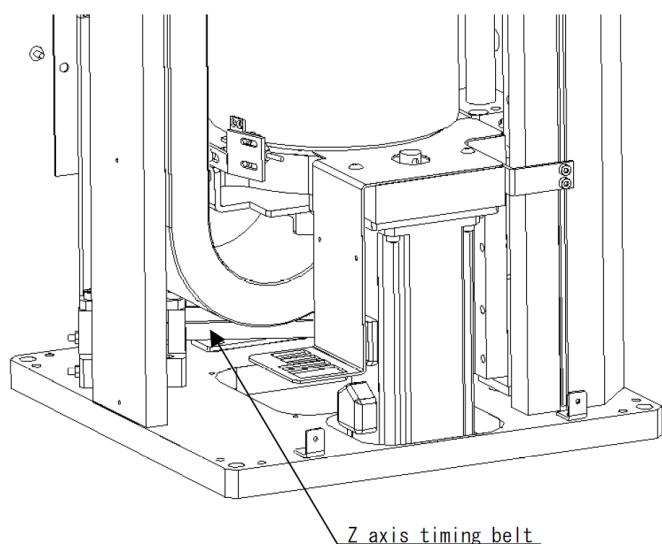
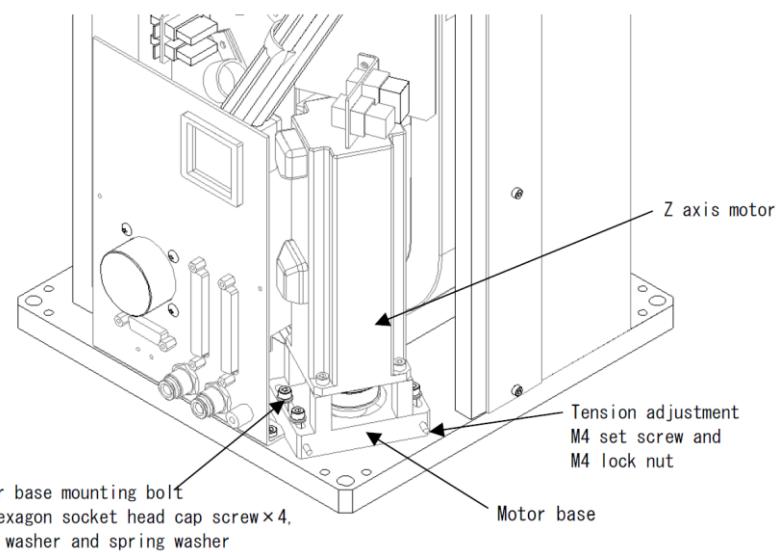
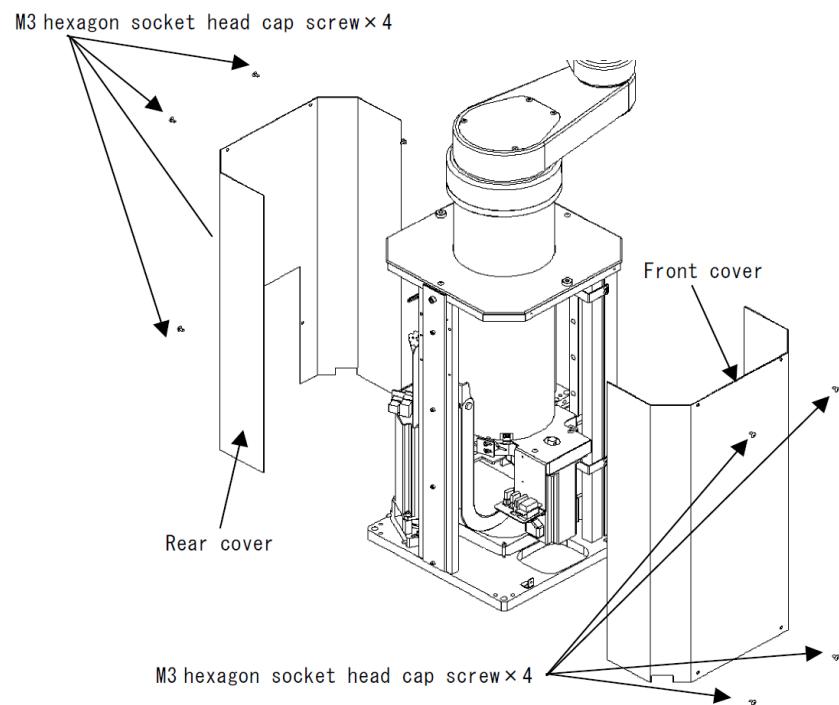
In-line filter (capture particle size $0.01\mu\text{m}$) attached inside of the robot may be clogged under the condition which varies depending on the usage and work time. If this filter is clogged, vacuum air switching, and wafer transportation will not be performed properly.

Every 2 months, check the vacuum switch display during the wafer transportation. If the value display is changed approximately 20% of the value at the initial operation, replace the filter. Also, it is recommended to replace it every two years.



9.3.4 Z axis timing belt

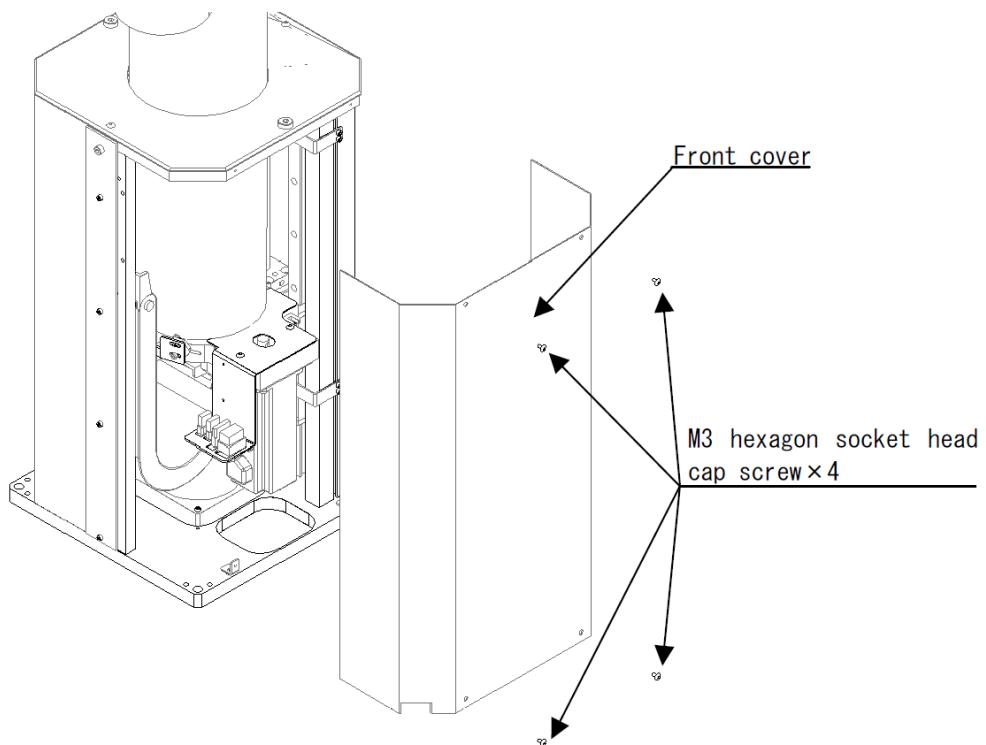
- Tool:
Hexagon wrench (across flats: 2.5mm, 3.0mm), cross head screwdriver, sonic tension meter, (Recommend type: U-507/Unitta), spanner (across flats: 5.5mm)
- Operating procedure:
 1. Move down the Z axis to the lower end where the axis touches the stopper.
 2. Turn OFF the power of controller.
 3. Remove the front cover. (M3 hexagon socket head cap screw x 4 x 2)
 4. Measure tension with the sonic tension meter from Z-axis belt check window.
 5. If the tension is not acceptable, loosen the motor base mounting screws (M4 hexagon socket head cap screw: 4 pcs.) and the tension screw fixing nut (M4 nut), and turn the tension adjusting nut (M4 set screw) to adjust the tension of timing belt.
 6. If the tension is acceptable, mount the covers in the reverse order.
- Estimated work time:
20 minutes
- Inspection interval:
2 Years

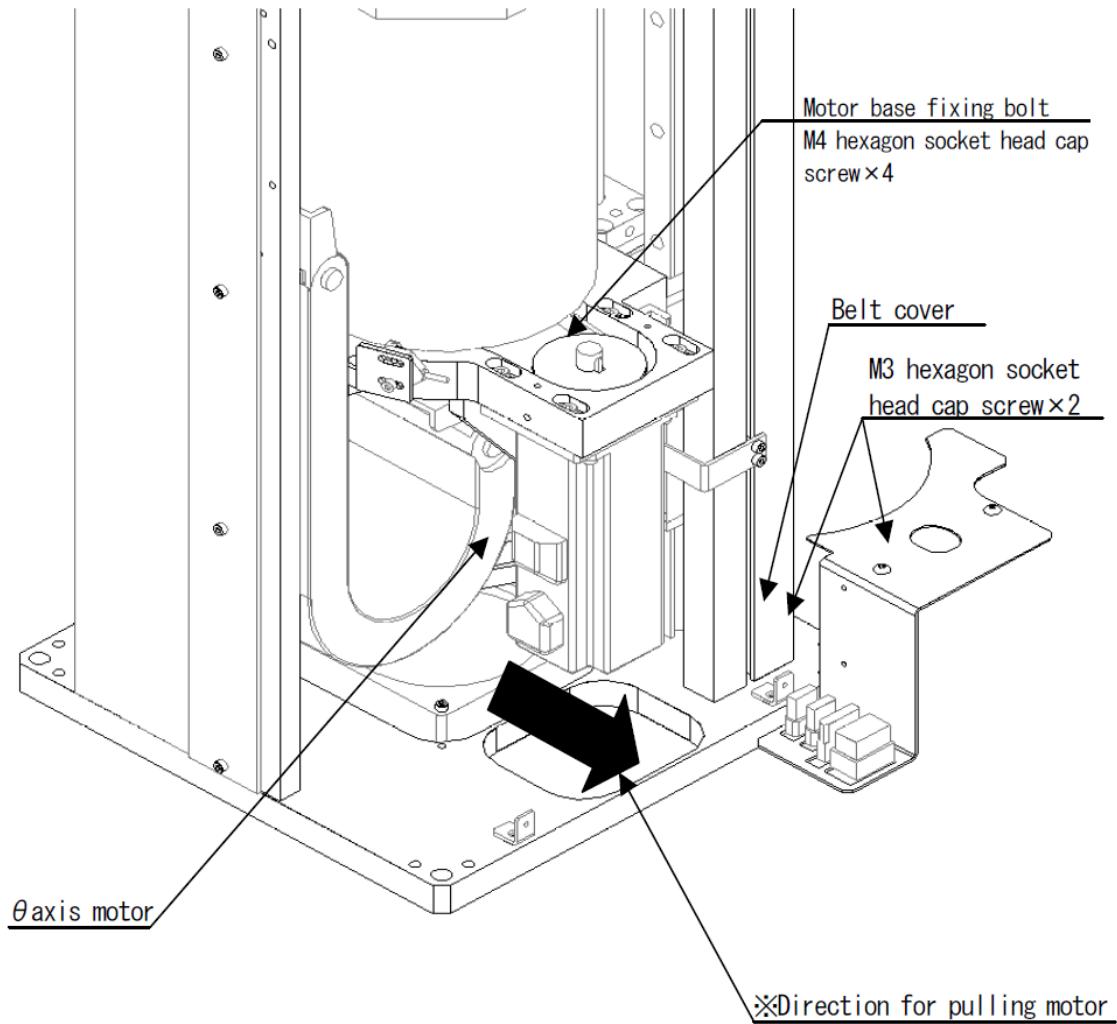


Model (manufacturer)	453-3GT-9 (UNITTA)
M: Weight	0.25 gf/cm ²
W: Belt width	9 mm
S: Span	178.5 mm
T: Tension	62~71 N·m (6.3~7.2 kgf·cm)

9.3.5 W-Axis timing belt

- Tool:
Hexagon wrench (across flats: 2.5 mm, 3.0 mm), cross head screwdriver, sonic tension meter (Recommend type: U-507/ Unitta), spanner (across flats: 5.5 mm)
- Operating procedure:
 1. Move down the Z-Axis to the lower end where the axis touches the stopper.
 2. Turn OFF the power of the controller.
 3. Remove the front cover. (M3 hexagon socket head cap screw × 4)
 4. Remove the belt cover. (M3 hexagon socket head cap screw × 2)
 5. Measure tension with the sonic tension meter.
 6. If the tension is not acceptable, loosen the motor base mounting screws (M4 hexagon socket head cap screw: 4 pcs.) and the tension screw fixing nut, and adjust the tension of timing belt with pulling the motor to specified direction as below.
 7. If the tension is acceptable, mount the covers in the reverse order.
- Estimated work time:
20 minutes
- Inspection interval:
2 years

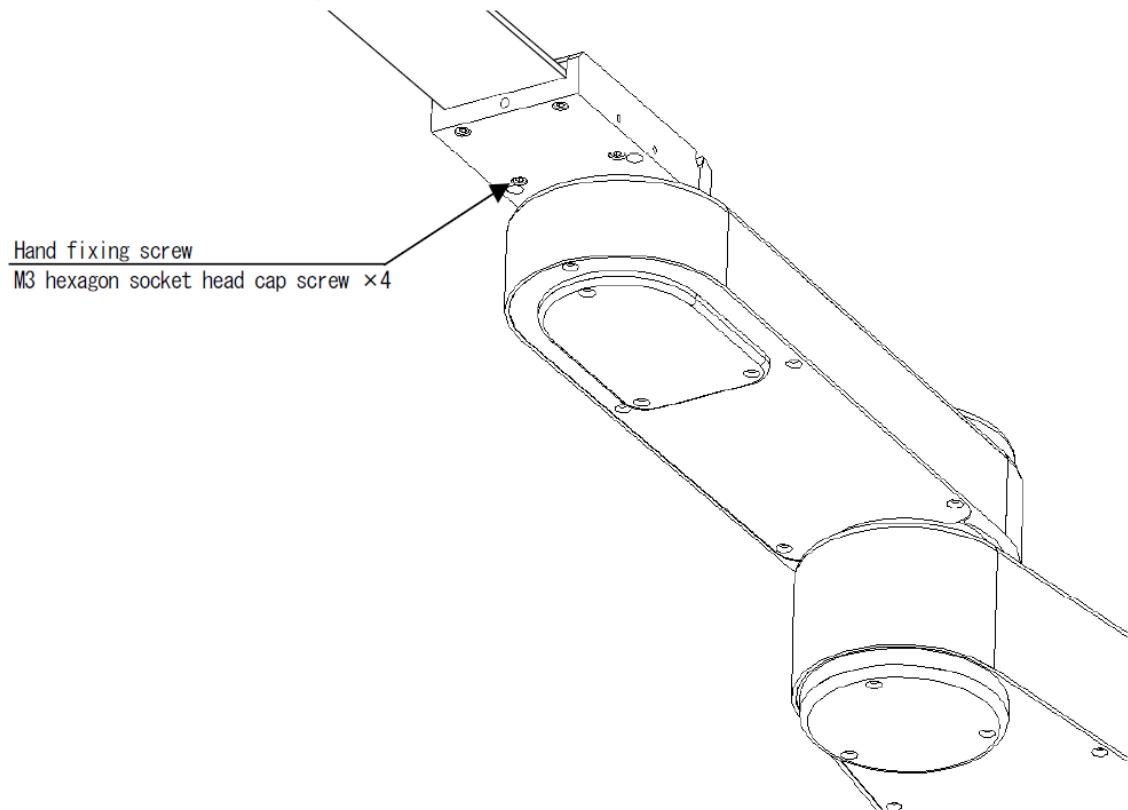




Model (manufacturer)	333-3GT-9 (UNITTA)
M: Weight	0.25 gf/cm ²
W: Belt width	9 mm
S: Span	87.5 mm
T: Tension	62~71 N·m (6.3~7.2 kgf·cm)

9.3.6 Hand Fixing Bolt

- Tool:
Torque wrench
- Operating procedure:
 1. Retighten the installation bolts by the torque wrench with recommended torque.
Bolt spec: M3 hexagon socket head cap screws: 4 pcs.
Tightening torque: 1Nm
- Estimated work time:
5 minutes
- Inspection interval:
6 months (Re-tighten the bolt one week after the initial operation.)



10 Preventive Maintenance: Pre-aligner

10.1 Precautions for maintenance inspection

1. Be sure to turn OFF the power before conducting a maintenance inspection of the pre-aligner main body.
2. During inspection, an "Inspection underway" sign should be placed in an easy-to-see location near the power switch.
3. When replacing parts and reassembling, take care so that foreign objects do not intrude into the pre-aligner main body.
4. Before inspecting the inside of the controller, remove the power plug of the controller from the outlet.
5. When replacing parts, be sure to use only the parts specified by Hirata. In particular, if fuses or other parts with rating indications are replaced with parts with different ratings, there is not only the risk of damage to the device, but also the risk of fire. Be certain to use parts with the specified ratings.
6. When turning on the power again after maintenance inspection, there is the possibility that the pre-aligner will move wildly due to errors in wiring or assembly. Be sure that there is nobody within the operating area.

10.2 Daily Inspection

10.2.1 Before starting the pre-aligner

Before starting the pre-aligner, while cleaning and maintaining each part, check for cracks and damage, and always check the below items.

1. Check the suction air pressure.
2. Check for dust adhesion or clouding of the linear sensor receiving surface.
3. Check for looseness of the linear sensor installation.
4. Check for looseness of the suction table installation.
5. Check for external damage to the cables.
6. Check for cracks, chipping, crazing, and other damage to the suction table.

10.2.2 Immediately after starting

Check the following items:

1. Check for abnormal noise or vibration when the pre-aligner operates.
2. Check for displacement or variation of the stop positions.

10.2.3 When the operation is finished

Check the following items:

1. Check for abnormal heat from the motor.
2. While cleaning and maintaining each part, check for cracks or damage.

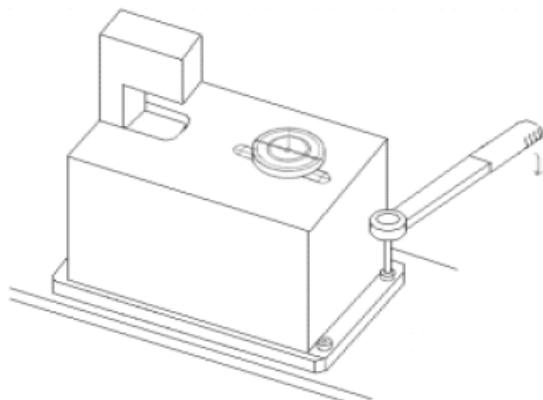
10.3 Periodic Inspection

In order to maintain the performance of the main body, conduct inspection and maintenance of the points below.

Part to inspect	Inspection item	Interval	Remarks	Refer to
Pre-aligner fixing bolt	Tightening torque	6 months (1 week after start of operation)	Steel Plate: 13.6 Nm Aluminium Plate: 5 Nm	10.3.1
Ball screw	Lubrication	6 months	LG2 grease (NSK)	10.3.2
LM guide				
Suction air in-line filter	Vacuum switch air pressure display	2 months	Replace once every 2 years	10.3.3
X-axis timing belt tension	Visual inspection and Tension	6 months	-	10.3.4
Y-axis timing belt tension	Visual inspection and Tension	6 months	-	10.3.5

10.3.1 Pre-aligner fixing bolts

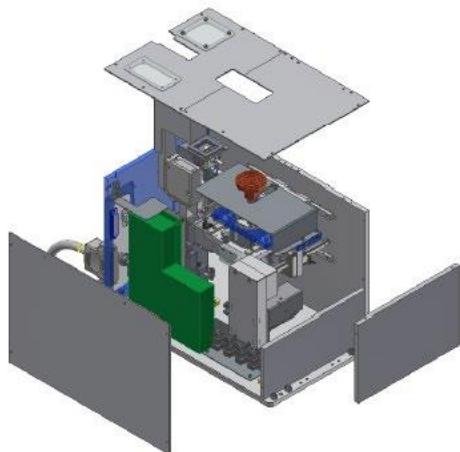
- Tool:
Torque wrench
- Operating procedure:
Tighten the arm base fixing bolts to the specified to recommended torque.
(Iron base: 13.6 Nm, Aluminium base: 5 Nm)
- Estimated work time:
5 minutes
- Inspection interval:
6 months (Re-tighten the bolt one week after the initial operation.)



10.3.2 Lubrication to ball screw and LM guide

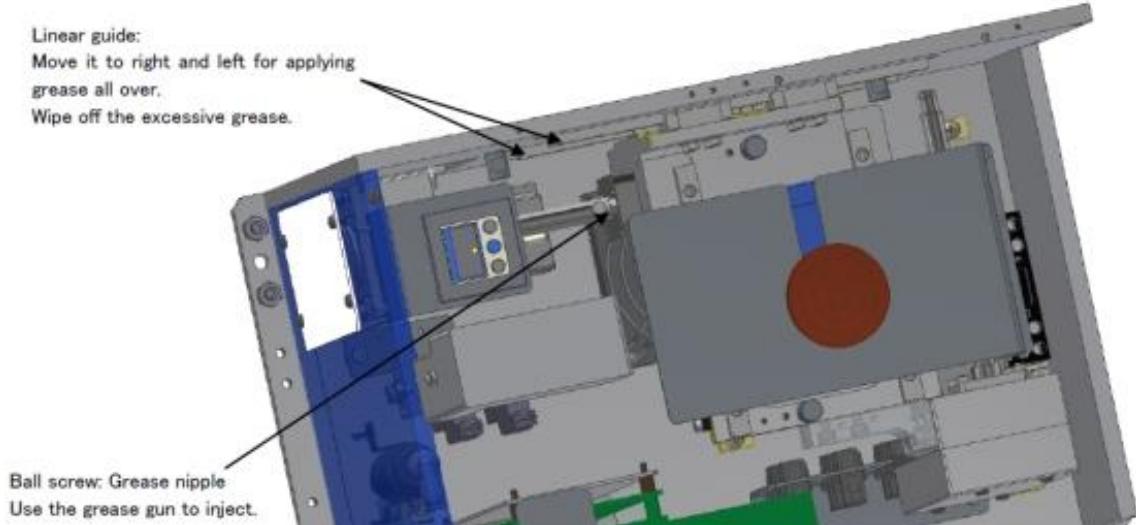
During factory production, LG2 (NSK), low-dusting lithium-based grease is used for the linear guide and ball screw. These parts roll and slide; insufficient lubrication may lead to abnormal wear and noise and ultimately to malfunction. Because the automatic lubricator is attached to the aligner, lubrication is unnecessary for 5 years after shipping. However, periodic maintenance once every 2 years is recommended as a guideline. If lubrication is necessary since 5 years have elapsed after shipping or other reasons, it is also possible to remove the outer cover of the aligner body and lubricate using a grease gun as shown below. Apply grease periodically, following the procedure below.

- (1) Remove the cover.



(X-axis: Linear guide ball screw)

Linear guide:
Move it to right and left for applying
grease all over.
Wipe off the excessive grease.



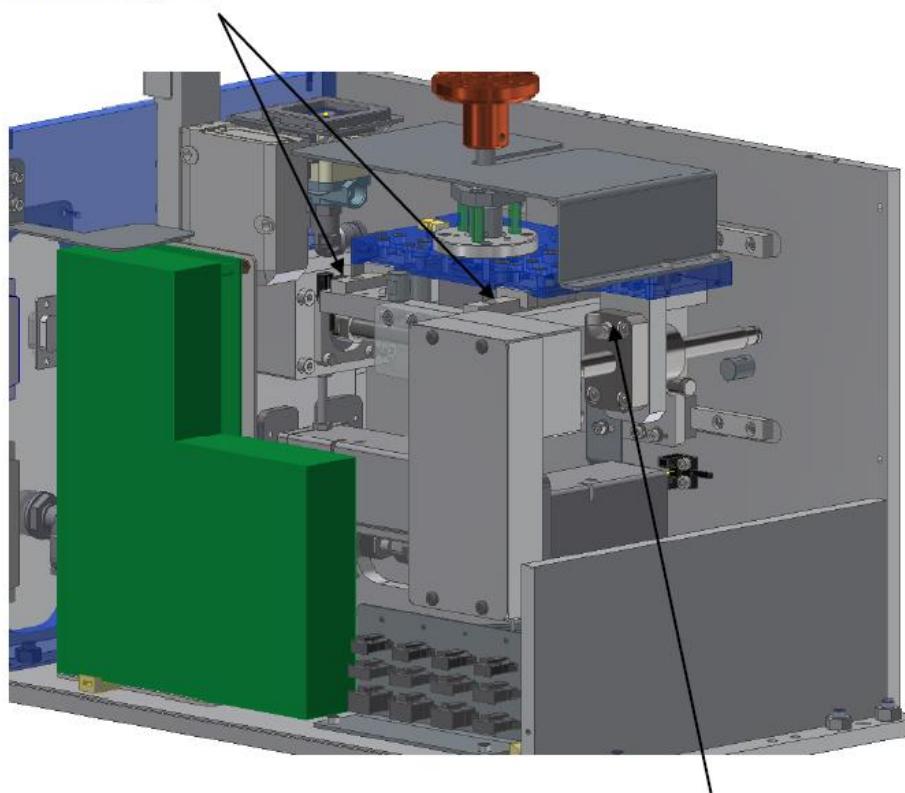
Ball screw: Grease nipple
Use the grease gun to inject.

(Y-axis: Linear guide ball screw)

Linear guide:

Move it to right and left for applying
grease all over.

Wipe off the excessive grease.

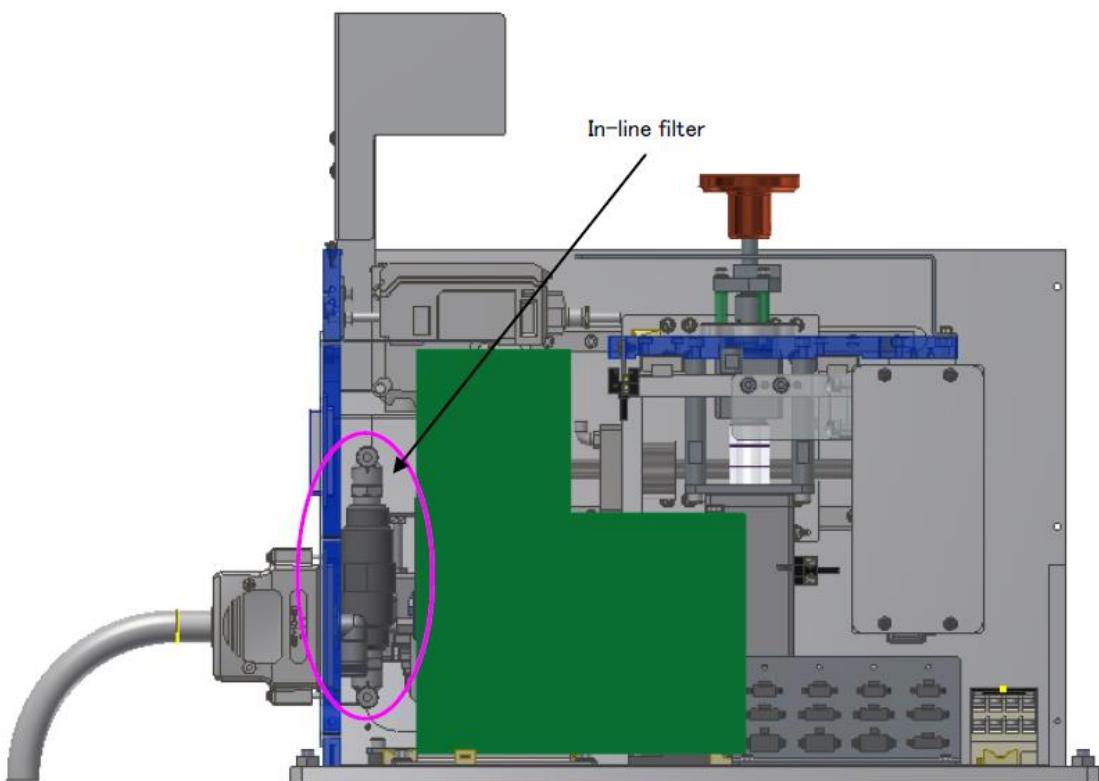


Ball screw: Grease nipple
Use the grease gun to inject.

10.3.3 Suction Air In-Line Filter

The in-line filter built into the main unit (capturing particle diameter $0.01\mu\text{m}$) may become clogged depending on usage conditions and length of time used. If the filter becomes clogged, the switching of vacuum air for suction will not be done properly, and the wafers will not be able to be transferred.

At intervals of approximately once every 3 months, check the value displayed at the vacuum switch when a wafer is attached by suction. If the change in the value compared to the initial value at the time of installation reaches 20%, replace the filter. At the least, the filter should be changed once every 2 years.

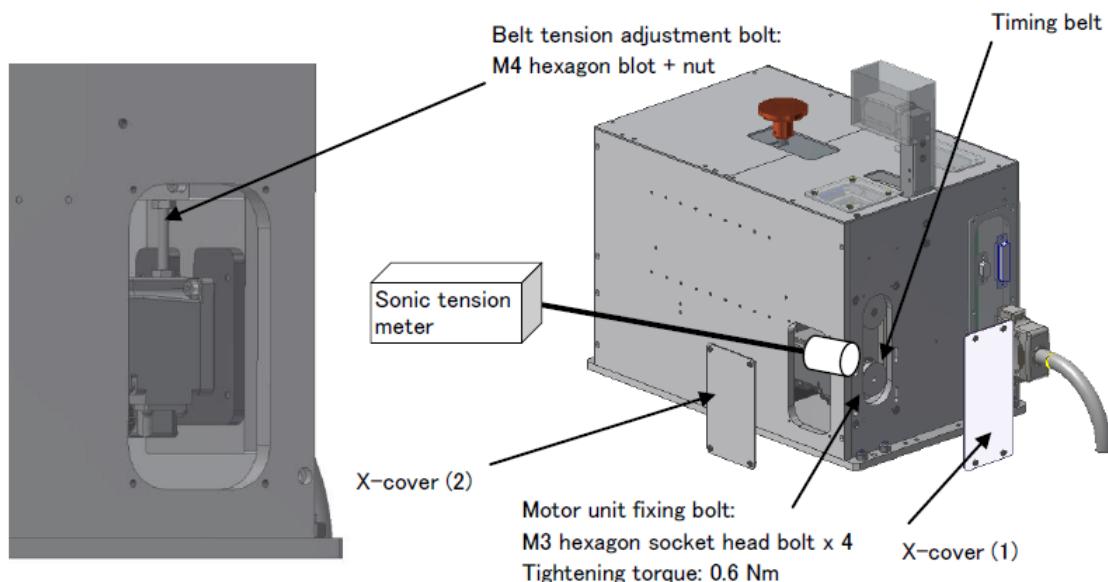


10.3.4 X-Axis Timing Belt Tension

The timing belt is adjusted at the time of shipment from the factory. However, the belt will stretch and wear with use. Install the timing belt with the appropriate tension. Excessive belt tension is one cause of reduced belt and bearing lifetimes and can cause noise. Insufficient belt tension is one cause of poor accuracy and can cause displacement when the belt skips from the pulley groove due to the starting torque or impact load. Follow the procedure below to conduct periodic adjustments.

- Tools:
Cross-head screwdriver, M3 hexagon wrench, M3 torque wrench, M4 Spanner, sonic tension meter (recommendation: U-507 by Gates Unitta Asia Company).
- Estimated work time:
20 minutes.
- Operating procedure:

1. Turn off the system power.
2. Remove the X-cover (1) and X-cover (2).
3. Measure the belt tension using the sonic tension meter.
4. If the values are below the specified values, adjust as follows.
5. Slightly loosen the motor unit fixing bolts (M3 hexagon socket head cap screw x4).
6. Gradually turn the belt tension adjustment bolt (M4 hexagon bolt +M4 nut) while measuring the tension.
7. When the measured value is within the specified values, tighten the motor unit fixing bolts.
8. Measure the tension again to check that it is within the specified value.
9. Install the removed covers.



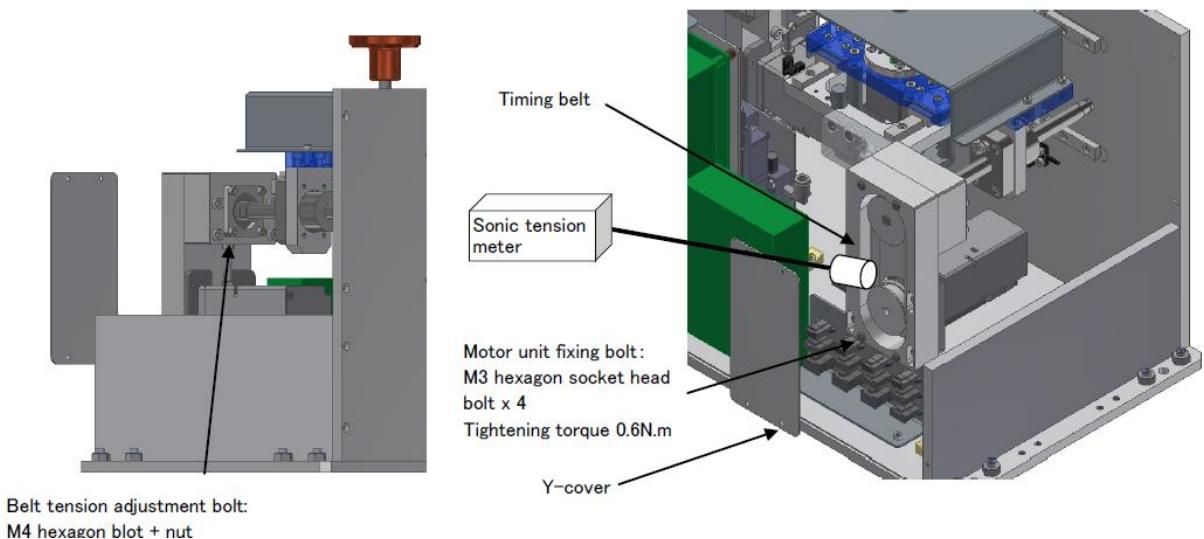
M: Unit mass (WEIGHT)	1.7 g/m
W: Belt width (WIDTH)	6.0 mm
S: Span (SPAN)	68 mm
T: Tension adjustment value	25 to 30 N

10.3.5 Y-Axis Timing Belt Tension

The timing belt is adjusted at the time of shipment from the factory. However, the belt will stretch and wear with use. Install the timing belt with the appropriate tension. Excessive belt tension is one cause of reduced belt and bearing lifetimes and can cause noise. Insufficient belt tension is one cause of poor accuracy and can cause displacement when the belt skips from the pulley groove due to the starting torque or impact load. Follow the procedure below to conduct periodic adjustments.

- Tools:
Cross-head screwdriver, M3 hexagon wrench, M3 torque wrench, M4 Spanner, sonic tension meter (recommendation: U-507 by Gates Unitta Asia Company).
- Estimated work time:
20 minutes.

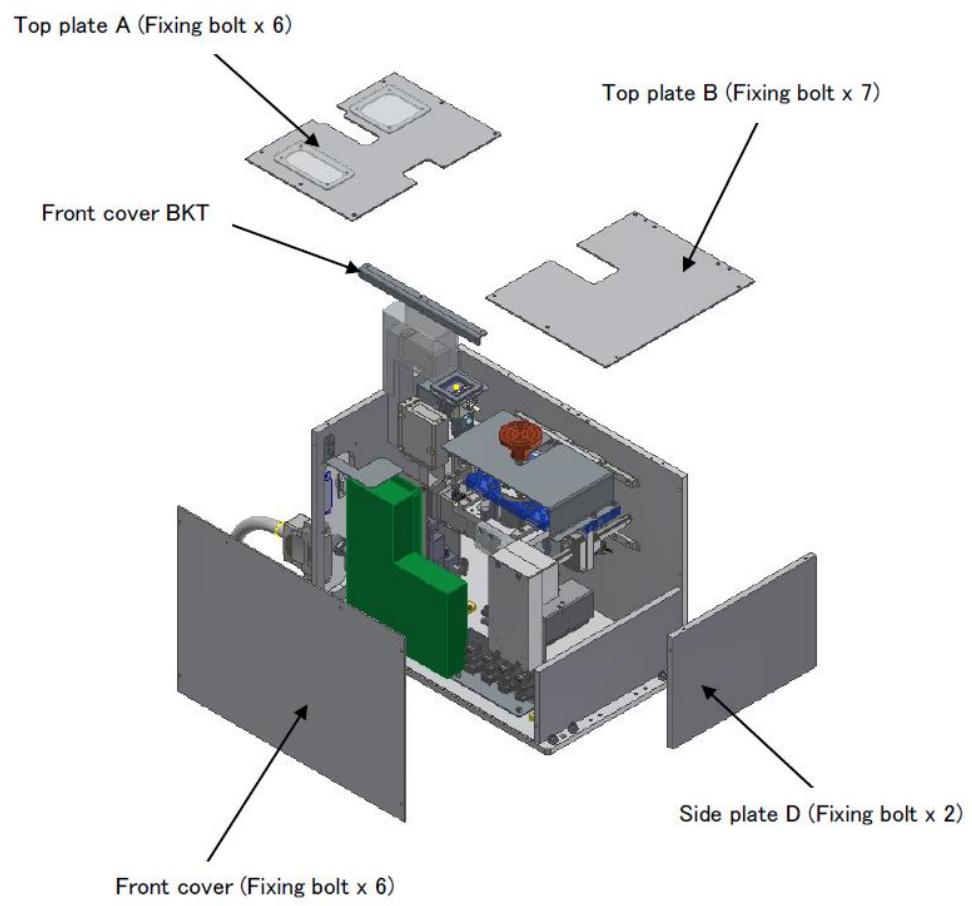
- Operating procedure:
 1. Turn off the system power.
 2. Remove the outer cover. Refer to → “10.3.5.1 Removing the outer cover”.
 3. Remove the Y-cover and side plate D.
 4. Measure the belt tension using the sonic tension meter.
 5. If the values are below the specified values, adjust as follows.
 6. Slightly loosen the motor unit fixing bolts (M3 hexagon socket head cap screw x4).
 7. Gradually turn the belt tension adjustment bolt (M4 hexagon bolt + M4 nut) while measuring the tension.
 8. When the measured value is within the specified values, tighten the motor unit fixing bolts.
 9. Measure the tension again to check that it is within the specified value.
 10. Install the removed covers.



M: Unit mass (WEIGHT)	1.7 g/m
W: Belt width (WIDTH)	6.0 mm
S: Span (SPAN)	68 mm
T: Tension adjustment value	25 to 30 N

10.3.5.1 Removing the outer cover

- Tools:
 - Cross-head screw driver, M3 hexagon wrench
- Operating procedure:
 1. Remove the outer covers in the sequence of “Front cover → Top plate B → Top plate A → Side Plate D”. (Note that the front cover BKT is prepared for fastening the top plate A, top plate B, and front cover.) In some cases of removing the control panel plate, cables are connected.
 2. Remove the control board plate without disconnecting the cables. The Board and others are attached. Be careful not to cause short circuit during work.



11 Preventive Maintenance: Cartesian Robot

11.1 Precautions for maintenance inspection

1. Be sure to turn OFF the power before conducting a maintenance inspection of the Cartesian main body.
2. During inspection, an “Inspection underway” sign should be placed in an easy-to-see location near the power switch.
3. When replacing parts and reassembling, take care so that foreign objects do not intrude into the cartesian main body.
4. Before inspecting the inside of the controller, remove the power plug of the controller from the outlet.
5. When turning on the power again after maintenance inspection, there is the possibility that the Cartesian will move wildly due to errors in wiring or assembly. Be sure that there is nobody within the operating area.

11.2 Daily Inspection

11.2.1 Before starting the Cartesian

Before starting the Cartesian, while cleaning and maintaining each part, check for cracks and damage, and always check the below items.

1. Check the suction air pressure.
2. Check for dust adhesion or clouding of the linear sensor receiving surface with cleanroom fabric.
3. Check for looseness of the linear sensor installation.
4. Check for looseness of the suction table installation.
5. Check for external damage to the cables.
6. Check for cracks, chipping, crazing, and other damage to the suction table.

11.2.2 Immediately after starting

Check the following items:

1. Check for abnormal noise or vibration when the cartesian operates.
2. Check for displacement or variation of the stop positions.

11.2.3 When the operation is finished

Check the following items:

1. Check for abnormal heat from the motor.
2. While cleaning and maintaining each part, check for cracks or damage.

11.3 Periodical Maintenance

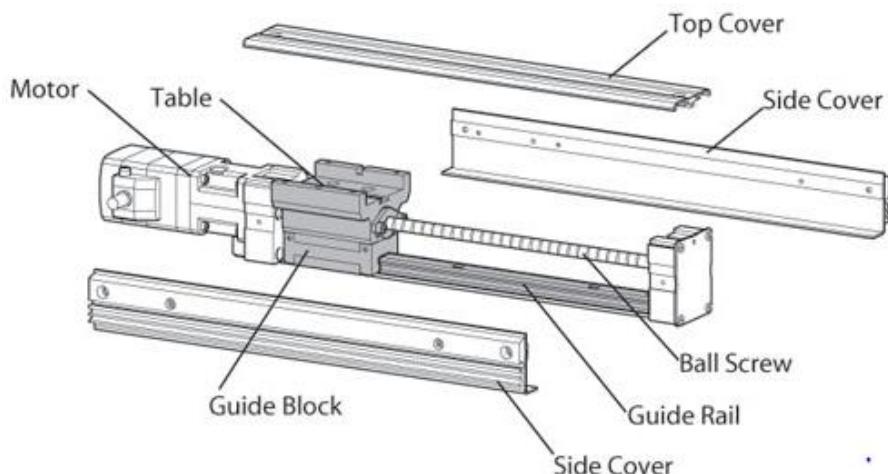
In order to maintain the performance of the main body, conduct inspection and maintenance of the points below.

Part to inspect	Inspection item	Interval	Remarks	Refer to
Ball screw	Lubrication	6 months	LG2 grease NSK	11.3.1
LM guide				
W-Axis gear	Visual check on its condition	12 months		11.3.2
Cartesian Vacuum Pad	Visual check on its condition	1 months		11.3.3

11.3.1 Lubrication to ball screw and LM guide

Low-dusting lithium-based grease (LG2) is used for the Y-axis and Z-axis linear guide and ball screw. These parts roll and slide; insufficient lubrication may lead to abnormal wear and noise and ultimately to malfunction. Apply grease periodically, following the procedure below.

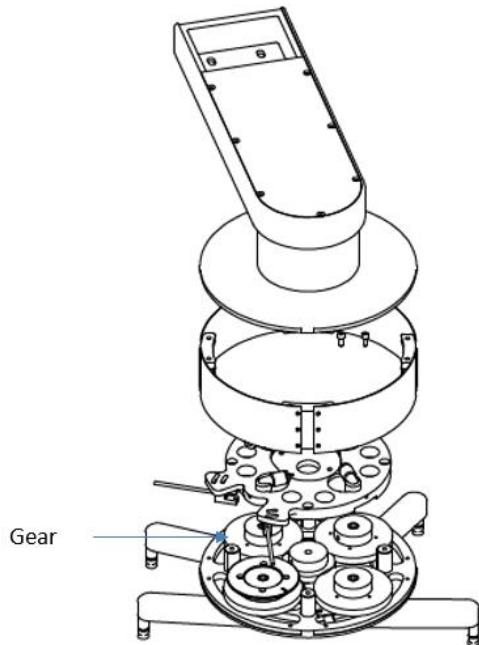
1. Remove the top cover.
2. Apply the grease on the ball screw and guide rail.



11.3.2 W-Axis gear inspection

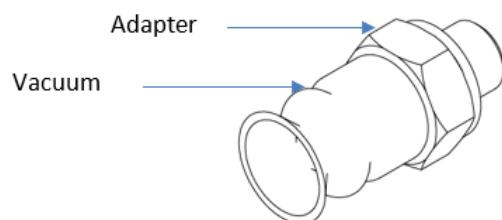
- Tool
 - Allen key
- Operating procedure
 1. Turn OFF the power of controller.
 2. Remove the side cover.
 3. Visual inspect the condition of the gear.
 4. If the gear condition no good, contact the manufacturer for replacement.
 5. If the gear condition is good, mount the cover in the reverse order.

- Estimated work time
15 minutes
- Inspection interval
12 months



11.3.3 Cartesian Vacuum Pad Replacement

- Tool
Vacuum Pad, Spanner
- Operating procedure
 1. Turn OFF the power of controller.
 2. Remove vacuum pad from it adapter.
 3. Visual inspect the condition of the adapter.
 4. If the adapter condition not good, open adapter for replacement.
 5. Install vacuum pad and check absorption condition of wafer.
- Estimated work time
30 minutes
- Inspection interval
1 months



12 Preventive Maintenance: Ionizer

12.1 Precautions for Maintenance Inspection

1. The EMO and OFF button must be pressed to turn off any power supply for the motor and other component that might cause harm.
2. Clearly identify the task and method to be apply of the part to be service.
3. Avoid the containment of any foreign object to the mechanism when replacing or reassembling.
4. All parts should be met by manufacture's specification. Such as item listed below:
 - a) Fuse rating (May burn if underrated the fuse rating)
 - b) Power supply (Component may be damaged due to over voltage)
 - c) Connector (The incompatible of the connection may cause short circuit)
 - d) Wire / cable (Smaller wire size may cause overheating of the wire)
5. During the maintenance, the service personnel must ensure no one is inside of the tools before operating the system. Initialize the tools with slow speed first and then set it back to original speed.

12.2 Daily Inspection

12.2.1 Before starting the pre-aligner

Before starting operation, check the following items:

1. Visible damage on the cables.
2. Disconnection or looseness of the sensor's connectors.
3. Visible material on the moving way of the component that may be blockage.

12.2.2 During the operation

Check the following items:

1. Any abnormal sound or vibration.
2. Connection for the cable and the piping.
3. Any position drifts.

12.2.3 When the operation is finished

Check the following items:

1. Excessive motor heating.
2. Visible damage on the cables and the mechanism.

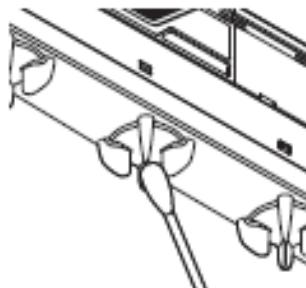
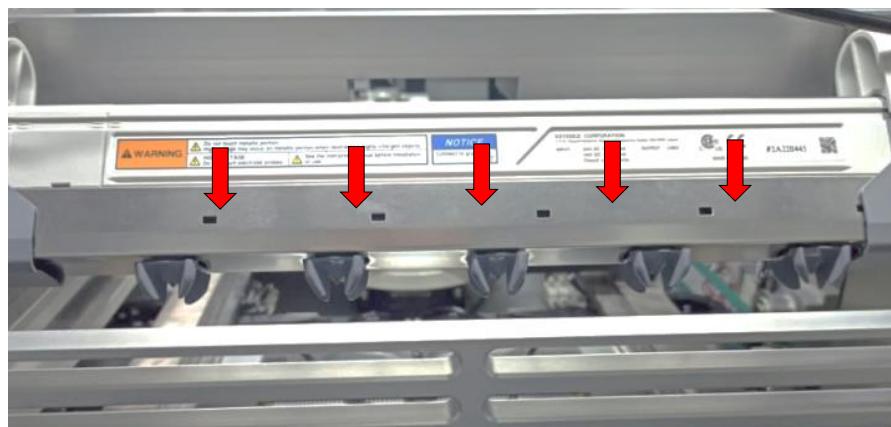
12.3 Periodical Maintenance

To ensure the full performance and the longer lifetime, periodical maintenance for the following item is highly recommended.

Part to inspect	Inspection item	Interval	Refer to
Electrode Probe	Cleaning	3 months	12.3.1
	Replacing	As require	12.3.2

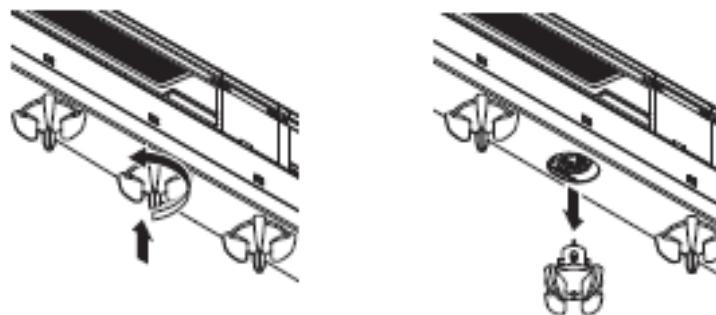
12.3.1 Electrode Probe Cleaning

- Tool:
Cotton swab, cleaning liquid (alcohol).
- Operating procedure:
Clean the electrode probe with a cotton swab moistened with alcohol (isopropyl alcohol or ethanol). Use any cloth, cotton swab or fine tissue and dap on cleaning liquid suggested to wipe.
- Estimated work time:
5 minutes.
- Inspection interval:
3 months.

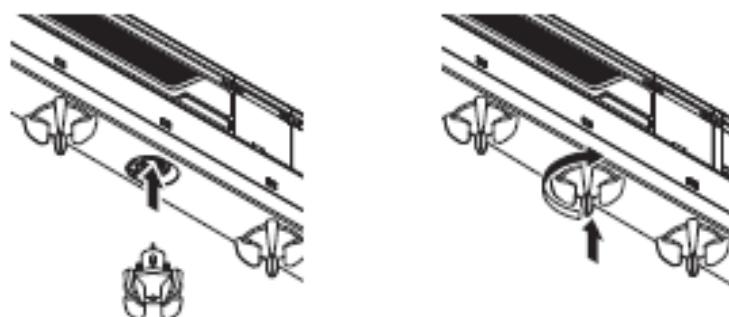


12.3.2 Electrode Probe Replacement

- Tool:
Pliers
- Operating procedure:
If the static elimination performance does not improve or the ion level warning indicator frequently lights even after cleaning, the electrode probe may have expired. Replace the electrode probe. Please replace all electrode probes at the same time.
 - a) Grip the electrode probe between your fingers and rotate it counter-clockwise while pushing toward the unit to remove it.



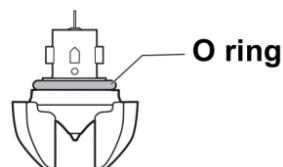
- b) To attach an electrode probe, line it up with and insert it into the hole, then rotate it clockwise while pushing toward the unit.



- c) When attaching electrode probes, attach them so that the direction of those protrusions as shown below.



- d) When attaching electron probes, ensure that the O ring is in place.



- Estimated work time:
15 minutes
- Inspection interval:
12 months

13 Preventive Maintenance: FOUP

13.1 Precautions for maintenance inspection

1. FOUP opener KWF-12F2-M has no circuit breaker. Prepare a main circuit breaker comforted to EN/IEC 60204-1, 5.3.2 at the host equipment.
2. When inspecting, turn off the power, lock the breaker, keep a start-up key off and place a sign reading "UNDER INSPECTION" in an easily seen location by following lockout/tag out procedure.
3. When assembling or when replacing parts, take care that no foreign objects enter the main body of the machine.
4. All parts should be met manufacture's specification. Especially, use same rating fuse. Using different rating fuse may damage the controller enclosure or may cause a fire.
5. After maintenance inspection, there is a possibility that miswiring, assembly error, or other cause may result in the machine operating out of control. Before turning the power ON, check thoroughly that there are no people in the machine's operating area.

13.2 Daily Maintenance

13.2.1 Before stating the robot operation

Check the following items:

1. Air pressure (if necessary).
2. Air leakage (if necessary).
3. Suction air.
4. No external damage the suction air.

13.2.2 During the operation

Check the following items:

1. Any abnormal sound or vibration.
2. Any position drifts.

13.2.3 After the operation

Check the following items:

1. Excessive motor heating.
2. Visible damage on the cables and the mechanism.

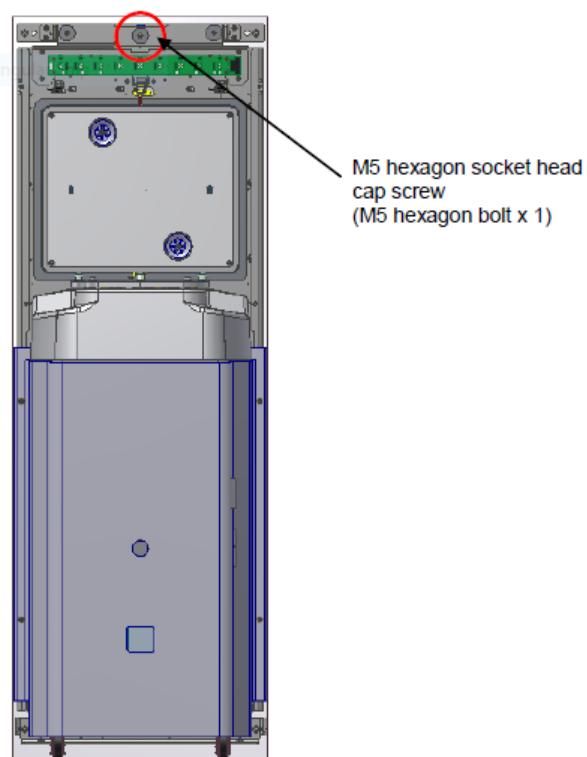
13.3 Periodical Maintenance

To ensure the full performance and the longer lifetime, periodical maintenance for the following item is highly recommended.

Part to inspect	Inspection item	Interval	Remarks	Refer to
Main unit anchor bolts	Tightening torque	6 months	Specified torque: 6.2 Nm	13.3.1
Linear way rail Cam follower	Lubrication	12 months	LG2 (NSK) AFF (THK)	13.3.2
Absorption Air In-Line Filter	Lubrication	12 months		13.3.3
Replacement of Clock Battery		As require		13.3.4
Worm Gear	Lubrication	12 months		13.3.5

13.3.1 Main Unit Anchor Bolts

- Tool
Torque wrench
- Operating procedure
Retighten the installation bolts by the torque wrench with recommended torque.
(Tightening torque: 6.2 Nm)
- Estimated work time
5 minutes
- Inspection interval
6 months (Re-tighten the bolt one week after the initial operation.)

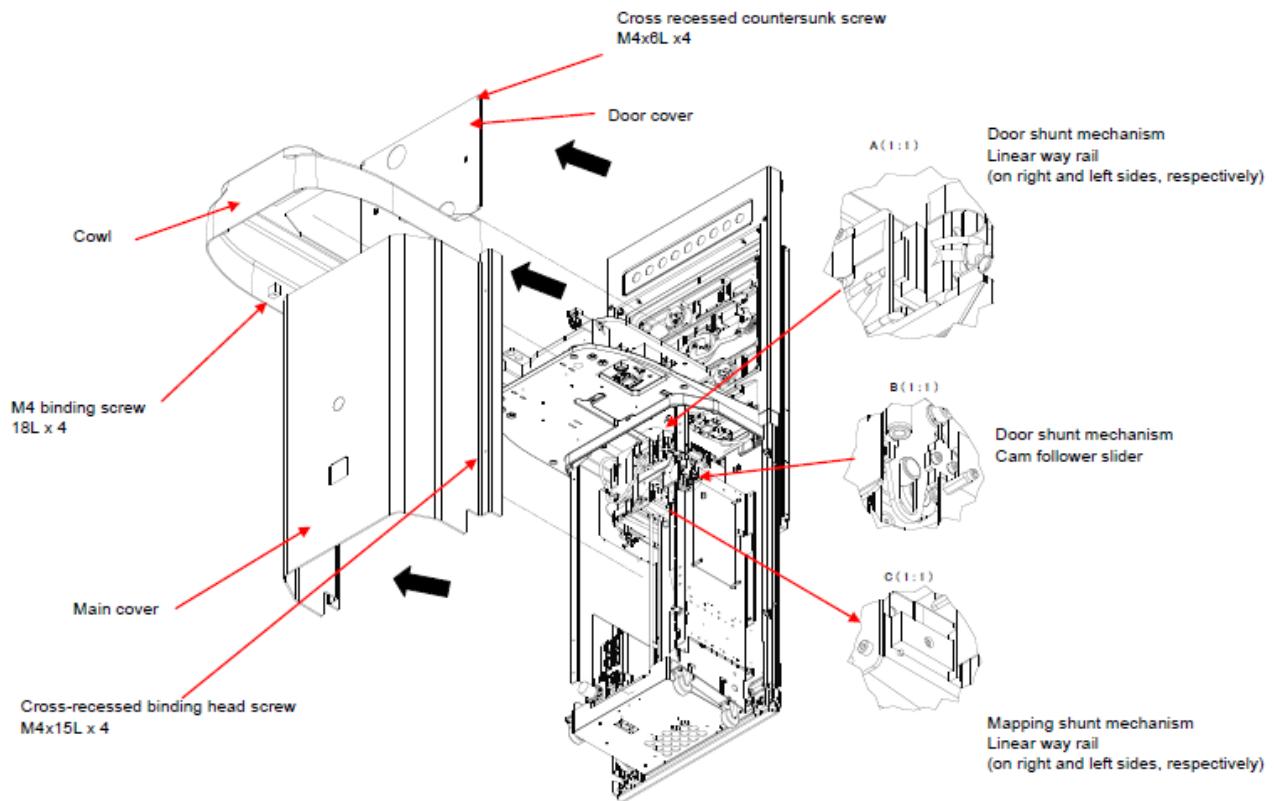


13.3.2 Lubrication

The linear way bearings and a ball screw use LG2 (NSK) lithium-based low-dust grease. Since these are rolling-sliding parts, insufficient lubrication causes abnormal wear and noise, and in some cases, it may eventually result in a failure. Excessive grease or unbalanced lubrication may cause an increase of the load to the motors or spattering of the grease. The maintenance is required every 12 months by service engineer.

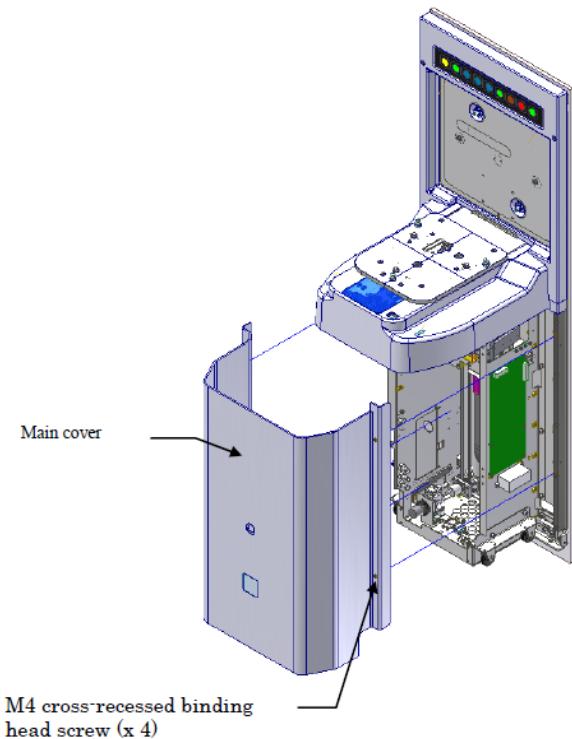
13.3.3 Absorption Air In-Line filter

- Tool
Cross head screwdriver
- Operating procedure
 1. Move all the axes to the stroke ends.
 2. Turn the machine power OFF
 3. Remove the front cover
 4. At the dock/slide mechanism, remove the cowl.
 5. Use a cotton cloth moistened with IPA to wipe off all the old grease.
 6. Directly apply new grease to the corresponding location of each axis.
 7. Turn the machine power ON and move the axes to the opposite stroke ends.
 8. Turn the machine power OFF
 9. Wipe off the grease from the spot that could not be cleaned.
 10. Apply grease to the spot to which it could not be applied.
 11. Turn the machine power ON. Repeat all movements several times to let the grease work its way in.
 12. Reattach the main cover
- Estimated work time
1 hour
- Inspection interval
12 months

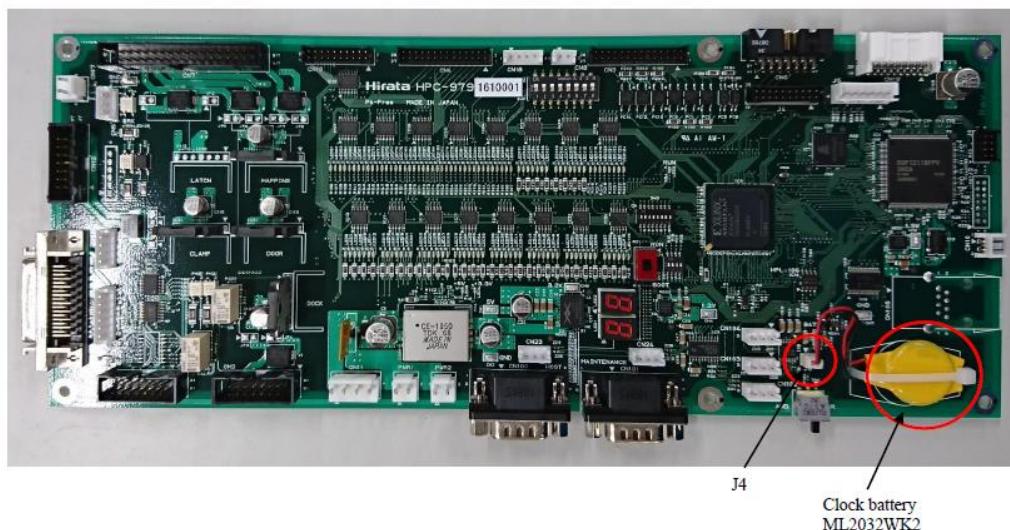


13.3.4 Replacement of Clock Battery

- **Tool**
Allen key, cross head screwdriver
- **Operating procedure**
 1. Turn the machine power OFF.
 2. Remove the main cover. (M4 cross-recessed binding head screw x 4)



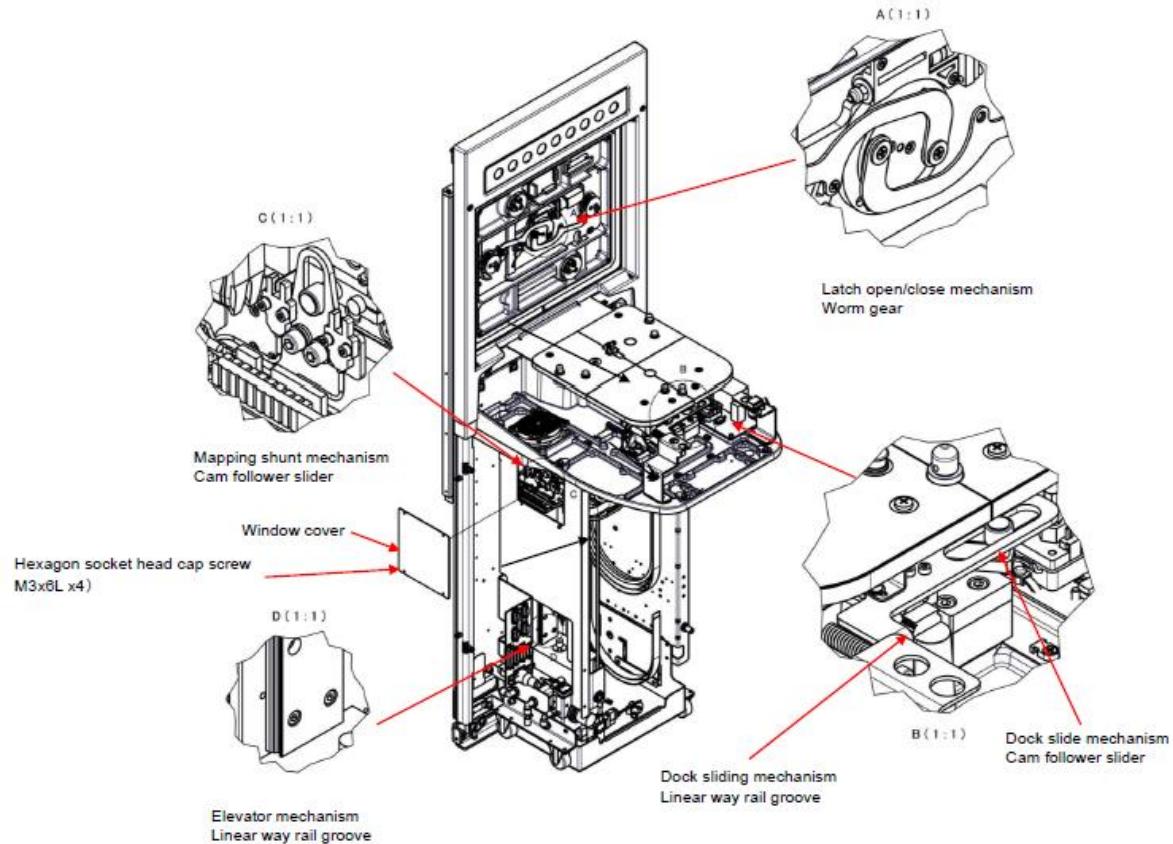
- Replace the clock battery connected to J4 on the CPU board (HPC-979).



- Estimated work time
10 minutes

13.3.5 Lubrication to the Worm Gear

- Tool
Cross head screwdriver
- Operating procedure
 - Turn the machine power OFF.
 - Remove the front cover.
 - Use a cotton cloth moistened with IPA to wipe off all the old grease.
 - Directly apply new grease to the worm gear
 - Turn the power ON. Open and close the latch a few times to allow the grease to work in
 - Put on the front cover back.
- Estimated work time
30 minutes
- Inspection interval
12 months



14 Preventive Maintenance: Height & Vision Slider

14.1 Precautions for maintenance inspection

1. Be sure to turn OFF the power before conducting a maintenance inspection of the Slider.
2. During inspection, an “Inspection underway” sign should be placed in an easy-to-see location near the power switch.
3. When replacing parts and reassembling, take care so that foreign objects do not intrude into the Slider main body.
4. Before inspecting the inside of the controller, remove the power plug of the controller from the outlet.

14.2 Daily Inspection

14.2.1 Before starting the Height & Vision Slider

Before starting the slider, while cleaning and maintaining each part, check for cracks and damage, and always check the below items.

1. Check the suction air pressure.
2. Check for dust adhesion or clouding of the linear sensor receiving surface with cleanroom fabric.
3. Check for looseness of the linear sensor installation.
4. Check for looseness of the suction table installation.
5. Check for external damage to the cables.
6. Check for cracks, chipping, crazing, and other damage to the suction table.

14.2.2 Immediately after starting

Check the following items:

1. Check for abnormal noise or vibration when the slider operates.
2. Check for displacement or variation of the stop positions.

14.2.3 When the operation is finished

Check the following items:

1. Check for abnormal heat from the motor.
2. While cleaning and maintaining each part, check for cracks or damage.

14.3 Periodic Inspection

In order to maintain the performance of the main body, conduct inspection and maintenance of the points below.

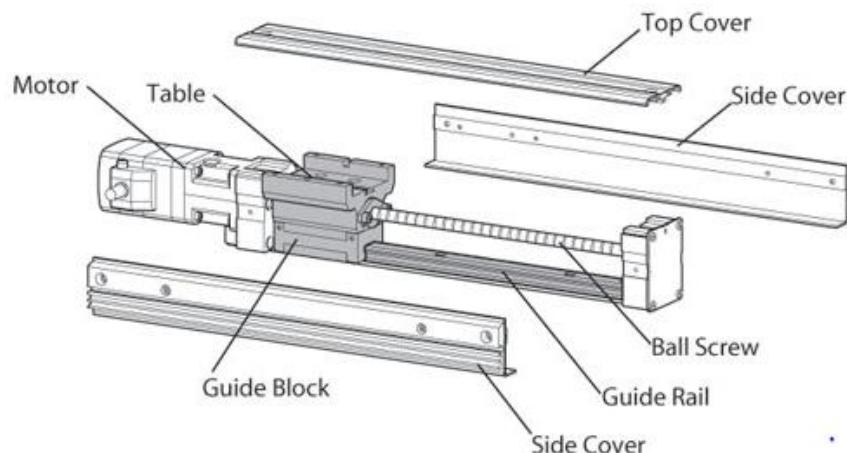
Part to inspect	Inspection item	Interval	Remarks	Refer to
Ball screw	Lubrication	6 months	LG2 grease NSK	14.3.1
LM guide				

14.3.1 Lubrication to ball screw

Low-dusting lithium-based grease (LG2) is used for the Y-axis linear guide and ball screw. These parts roll and slide; insufficient lubrication may lead to abnormal wear and noise and ultimately to malfunction.

Apply grease periodically, following the procedure below.

1. Remove the top cover.
2. Apply the grease on the ball screw and guide rail.



15 Preventive Maintenance: Universal Load Port

15.1 Precautions for maintenance inspection

During inspection, an “Inspection underway” sign should be placed in an easy-to-see location near the power switch.

15.2 Daily Inspection

Always check the below items.

1. Check the IO connectivity
2. Check for functionality, spring and other damage to the universal load port
3. Check for the universal port clamper

15.3 Periodic Inspection

In order to maintain the performance of the universal load port conduct inspection as mentioned below:

Part to inspect	Inspection item	Interval	Remarks	Refer to
IO Check	Present Sensor inspection	3 months		15.3.1
LM guide	Lubrication	6 months	LG2 grease NSK	15.3.2

15.3.1 Universal Load Port IO Connectivity

Test the Universal Load Port connectivity using Diagnosis.

Input-Output: To check the connectivity of each input and output I/O channel

Please follow the procedure below for inspection:

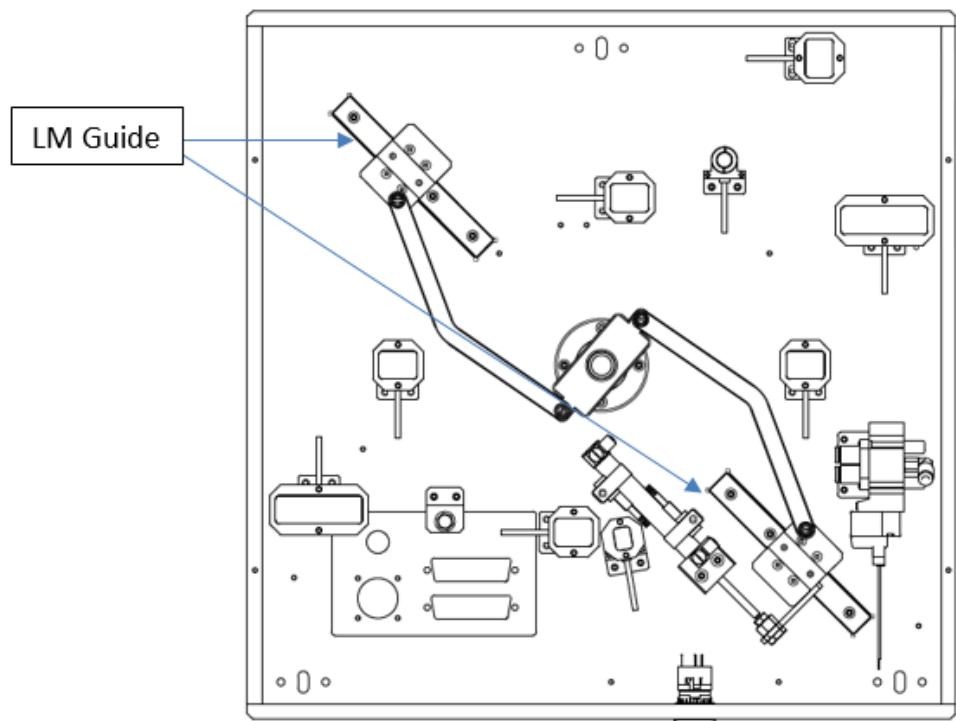
1. Open Diagnosis and click to Input-5 tab
2. Press or cover each of the sensor
3. Check the IO screen in the right will light up depends on which sensor is place.

15.3.2 Lubrication to Linear Guide

Low-dusting lithium-based grease (LG2) is used for linear guide. These parts roll and slide; insufficient lubrication may lead to abnormal wear and noise and ultimately to malfunction.

Apply grease periodically, following the procedure below.

1. Remove the top cover.
2. Apply the grease on the guide rail.



16 Preventive Maintenance: Paper Port

16.1 Precautions for maintenance inspection

During inspection, an "Inspection underway" sign should be placed in an easy-to-see location near the power switch

1. Be sure to turn OFF the power before conducting a maintenance inspection.
2. During inspection, an "Inspection underway" sign should be placed in an easy-to-see location near the power switch.
3. When replacing parts and reassembling, take care so that foreign objects do not intrude into inside.

16.2 Daily Inspection

16.2.1 Before starting the Paper Port

Before starting the maintenance, while cleaning and maintaining each part, check for cracks and damage, and always check the below items.

1. Check for dust adhesion or clouding of the linear sensor receiving surface with cleanroom fabric.
2. Check for looseness of the linear sensor installation.
3. Check for external damage to the cables.
4. Check for cracks, chipping, crazing, and other damage to the belting.

16.2.2 Immediately after starting

Check the following items:

1. Check for abnormal noise or vibration when the slider operates.
2. Check for displacement or variation of the stop positions.

16.2.3 When the operation is finished

Check the following items:

1. Check for abnormal heat from the motor.
2. While cleaning and maintaining each part, check for cracks or damage.

16.3 Periodic Inspection

In order to maintain the performance of the main body, conduct inspection and maintenance of the points below.

Part to inspect	Inspection item	Interval	Remarks	Refer to
Ball screw	Lubrication	6 months	LG2 grease NSK	16.3.1
LM guide				
Timing Belt	Visual check on it condition	12 months		16.3.2

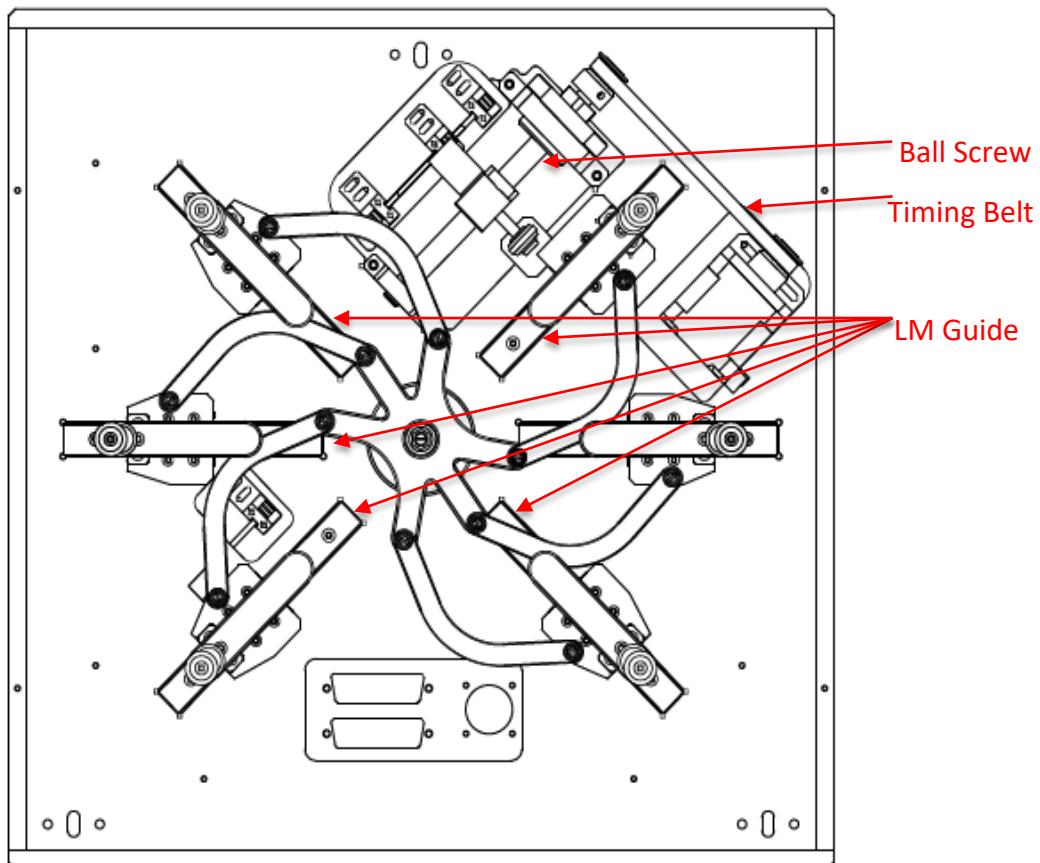
16.3.1 Lubrication to ball screw and LM guide

Low-dusting lithium-based grease (LG2) is used for the Y-axis and Z-axis linear guide and ball screw. These parts roll and slide; insufficient lubrication may lead to abnormal wear and noise and ultimately to malfunction. Apply grease periodically, following the procedure below.

1. Remove the top cover.
2. Apply the grease on the ball screw and guide rail.

16.3.2 Paper Port timing belt

- Tool
 - Allen key, cross head screwdriver
- Operating procedure
 1. OFF the power of controller.
 2. Remove the front cover.
 3. Remove the belt cover.
 4. Visual inspect the condition of the timing belt.
 5. If the belt condition no good, contact the manufacturer for replacement.
 6. If the belt condition is good, mount the cover in the reverse order.



17 Preventive Maintenance Check List

Part	Inspection Item	Interval	Verification	Remark
Vacuum and CDA				
Main Vacuum	Pressure: -70kPa and below	Weekly	Pass/Fail	
Main CDA	Pressure: 500kPa and above	Weekly	Pass/Fail	
Hirata Robot				
Robot	Movement with abnormal sound?	Daily	Pass/Fail	Pass = No Fail = Yes
Robot arm	Pressure: -75kPa and below	Weekly	Pass/Fail	
Z-axis timing belt	Visual inspection if any damages	Yearly	Pass/Fail	
W-axis timing belt	Visual inspection if any damages	Yearly	Pass/Fail	
Vacuum air filter	Trigger and check pressure display	2 Months	Pass/Fail	
Solenoid valve	Check functionality	6 Months	Pass/Fail	
Tubing	Visual inspection if any damages / bent	6 Months	Pass/Fail	
Slider	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Pre-aligner				
Pre-aligner vacuum	Pressure: -75kPa and below	Weekly	Pass/Fail	
Linear guide	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Ball Screw	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Vacuum in-line filter	Trigger and check pressure display	2 Months	Pass/Fail	Replace once every 2 years
X-axis timing belt	Visual inspection for damages	6 Months	Pass/Fail	
Y-axis timing belt	Visual inspection for damages	6 Months	Pass/Fail	
Cartesian Vacuum	Pressure: -75kPa and below	Weekly	Pass/Fail	
Cartesian Slider	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Load Port	Trigger and inspect motion	6 Months	Pass/Fail	

Cartesian Robot				
Linear guide	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Ball Screw	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
W-axis Gear	Visual inspection for damages	12 Months	Pass/Fail	
Cartesian Vacuum Pad	Visual inspection for damages	1 Month	Pass/Fail	
FOUP				
Main Unit Anchor Bolts	Tightening torque	6 Months	Pass/Fail	Specified torque: 6.2 Nm
Linear Way Rail	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Cam Follower Slider	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Worm Gear	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Height & Vision Slider				
Linear guide	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Ball Screw	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Universal Load Port				
IO Check	Presence Sensor inspection	3 Months	Pass/Fail	
LM Guide	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Paper Port				
Linear Guide	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Ball Screw	Lubricant, LG2 Grease (NSK)	6 Months	Pass/Fail	
Timing Belt	Visual inspection for damages	6 Months	Pass/Fail	
Ionizer				
Electrode Probe	Visual inspection for damages	12 Months	Pass/Fail	

18 Troubleshooting

18.1 Overview

This chapter explains the items to check when problems or errors occur during the machine operation.

 CAUTION	<p>The machine present mechanical and electrical hazards which, if not properly handled, may result in severe injury. Only trained and qualified personnel are allowed to perform the servicing of the machine. Read and understand Chapter 1: Safety Information before performing any procedure.</p>
--	--

18.2 Troubleshooting Observed Errors

Observed Error Type	Symptoms	Action
Power	Machine failure to operate No communication of machine and computer	See 18.2.1 Power
Motion	Actuators has jerky motion Actuators oscillates Actuators overshoots taught position	See 18.2.2 Motion
Operational Interlock	Operational is not functional	See 18.2.3 Operational Interlock
Repeatability	Wafer is not placed to the same position	See 18.2.4 Repeatability
Vacuum	Low vacuum pressure	See 18.2.5 Vacuum

18.2.1 Power

Symptoms

- Machine failure to operate
- No communication of machine and computer

Troubleshooting Process

- Check facilities power to the power supply.
- Check power cables for proper connection and continuity.
- Verify the correct Power Supply rating.
- Verify voltage output at the power supply.
- See [Contact QES Technical Support](#)

18.2.2 Motion

Symptoms

- Actuators has jerky motion
- Actuators oscillates

- Actuators overshoots taught position

Troubleshooting Process

- Check for physical obstruction. Remove obstruction to prevent interference.
- Verify system alignment has been taught properly.
- Verify actuator is installed correctly.
- Check for motor brake binding.
- Replace the motor driver.
- See [Contact QES Technical Support](#)

18.2.3 Operational Interlock

Symptoms

- Operational interlock is not functional

Troubleshooting Process

- Verify that the operational interlock is set to the appropriate pin of I/O connector per the machine requirements.
- Verify that the operational interlock state will toggle by polling the I/O while physically changing the operational interlock.
- Verify that power is supplied to I/O controller.
- See [Contact QES Technical Support](#)

18.2.4 Repeatability

Symptoms

- Workpiece is not placed to the same position

Troubleshooting Process

- Inspect for physical obstruction interfering with actuator and workpiece placement.
- Verify picking mechanism and workpiece are level.
- Verify the actuator position value are repeatable to the desired destination.
- See [Contact QES Technical Support](#)

18.2.5 Vacuum

Symptoms

- Vacuum does not hold workpiece

Troubleshooting Process

- Check the vacuum ejector is operating.
- Verify the picking mechanism is taught properly.
- Check the sensor setting.
- Check 24V DC voltage is toggling on I/O to the vacuum ejector.
- See [Contact QES Technical Support](#)

18.3 Error List

No	Message	What happen?	How to troubleshoot?
1	EMO is pressed! Please release EMO button then press Start button and perform System Initialize before continue.	EMO physical button pressed.	<ul style="list-style-type: none"> Release EMO button Push start button & wait for 15 sec Initialize
2	Robot move error.	Hirata robot controller give error when commanded to execute an address.	<ul style="list-style-type: none"> Robot parameter position out of its range Check robot parameter when robot stop
3	Pre-aligner move error.	Hirata robot controller give error when commanded to execute an address.	<ul style="list-style-type: none"> If happen during process, wafer position out of it tolerance. Correcting wafer position inside cassette by pushing all wafer inside to end of cassette If happen during initialize, switch off robot controller and turn on, wait for 15 sec and initialize
4	Failed to read current robot arm position.	Hirata robot controller give error when commanded to read data from address.	<ul style="list-style-type: none"> Robot parameter position out of its range Check robot parameter when robot stop

5	Internal software robot data error.	Software data corrupted.	<ul style="list-style-type: none"> • Recheck CSF and CREPos file
6	Failed to set vacuum off at pre-aligner.	IO card not responding when commanded to trigger to low.	<ul style="list-style-type: none"> • Recheck vacuum on & off at Diagnosis and see the vacuum indicator
7	Vacuum off timeout at pre-aligner.	Vacuum pressure did not drop to low within the time specified	<ul style="list-style-type: none"> • Recheck vacuum on & off at Diagnosis and see the vacuum indicator
8	Failed to set vacuum on at robot arm.	IO card not responding when commanded to trigger to high state.	<ul style="list-style-type: none"> • Recheck vacuum on & off at Diagnosis and see the vacuum indicator
9	Vacuum on timeout at robot arm.	Vacuum pressure did not escalate to high within the time specified.	<ul style="list-style-type: none"> • Recheck vacuum on & off at Diagnosis and see the vacuum indicator • Check robot arm flatness • Check robot arm position at this error occurs
10	Failed to write to robot controller.	Hirata robot controller give error writing data to an address.	<ul style="list-style-type: none"> • Make sure robot controller is on and all cable are perfectly connected
11	Failed to vacuum item on robot arm.	Vacuum pressure reading is lower than the set limit.	<ul style="list-style-type: none"> • Recheck set vacuum limit
12	Axis paper port move error.	Axis move error caused by motion card error or motor driver error.	<ul style="list-style-type: none"> • Push stop button wait for 15 sec and restart

			<ul style="list-style-type: none"> • Initialize
13	Failed to read vacuum status at robot arm.	Hirata robot controller give error when commanded to read vacuum status.	<ul style="list-style-type: none"> • Push stop button wait for 15 sec and restart • Initialize
14	Vacuum at robot arm already high.	Wafer already exist at robot arm when load operation about to start.	<ul style="list-style-type: none"> • Remove wafer manually and initialize
15	Failed to set vacuum off at robot arm.	IO card not responding when commanded to trigger to low state.	<ul style="list-style-type: none"> • Turn off and restart robot controller and wait for 15 sec • Initialize
16	Vacuum off timeout at robot arm.	Vacuum pressure did not escalate to low within the time specified.	<ul style="list-style-type: none"> • Recheck vacuum on & off at Diagnosis and see the vacuum indicator • Check robot arm flatness • Check robot arm position at this error occurs
17	Failed to set vacuum on at pre-aligner.	IO card not responding when commanded to trigger to high state.	<ul style="list-style-type: none"> • Push stop button wait for 15 sec and restart • Initialize
18	Vacuum on timeout at pre-aligner.	Vacuum pressure did not escalate to high within the time specified.	<ul style="list-style-type: none"> • Initialize • Re-run recipe
19	Vacuum at robot arm already low.	Wafer not exist when unload operation about to start.	<ul style="list-style-type: none"> • Initialize
20	Failed to clear error at robot controller.	Hirata robot controller give error when commanded to clear error.	<ul style="list-style-type: none"> • Turn off and restart robot controller and wait for 15 sec

			<ul style="list-style-type: none"> • Initialize
21	Failed to initialize pre-aligner.	Process to move pre-aligner to initial state failed.	<ul style="list-style-type: none"> • Turn off and restart robot controller and wait for 15 sec • Initialize
22	Failed to initialize robot arm.	Process to move robot arm to initial state failed.	<ul style="list-style-type: none"> • Turn off and restart robot controller and wait for 15 sec • Initialize
23	Could not move [AxisName] . [AxisErrorMsg]	Position error/ motion card error/ driver error.	<ul style="list-style-type: none"> • Push stop button wait for 15 sec and restart • Initialize
24	Slot out of range.	When load or unload process to the slot that is not within the cassette slot number.	<ul style="list-style-type: none"> • Reselect slot
25	Input parameter not valid.	Software internal function calling error.	<ul style="list-style-type: none"> • Recheck parameter
26	OEM parameter is not set properly.	OEM data is set to 0.	<ul style="list-style-type: none"> • Recheck robot position parameter
27	Failed to read value from height sensor 1.	Sensor hardware error.	<ul style="list-style-type: none"> • Height sensor fail to read height, check the object surface
28	Sensor 8 inch close at paper port not detected.	Sensor is not trigger when paper port moves to intended position.	<ul style="list-style-type: none"> • Recheck sensor position
29	Sensor 8 inch close at paper port not detected.	Sensor is not trigger when paper port moves to intended position.	<ul style="list-style-type: none"> • Recheck sensor position
30	Robot arm not safe to pick up item at canister.	Cartesian unit blocking robot movement path.	<ul style="list-style-type: none"> • Robot and Cartesian movement checking
31	Vacuum already high at cartesian vacuum rod.	Wafer/paper already exist at cartesian rod when load operation about to start.	<ul style="list-style-type: none"> • Manually remove object and initialize

32	Cartesian Y axis not safe to move due to robot arm at cartesian area.	Robot arm blocking cartesian movement path.	<ul style="list-style-type: none"> • Manually EMO and push robot arm to its center • Release EMO, push start button and initialize
33	Vacuum error. Please check vacuum pressure.	Failed to vacuum item at cartesian rod.	<ul style="list-style-type: none"> • Recheck vacuum on & off at Diagnosis and see the vacuum indicator
34	Paper not exist at paper port LP5.	Sensor at LP5 base did detect item.	<ul style="list-style-type: none"> • Put correct paper size on the paper port

19 Spare Part List

1 ST LEVEL SPARE PART			
MODULE / SECTION	DESCRIPTIONS	PART NUMBER	LEAD TIME
Robot	Bernoulli and Vacuum End Effector	BEMA0041	4 Weeks
Pre-aligner	Battery	H-3344	4 - 6 Weeks
Robot Controller	Battery	H-3339	4 - 6 Weeks
	Fuse	ABC-4R	4 - 6 Weeks
Cartesian	Suction Pad with Adapter (4unit/set)	FSGA 4 NBR-ESD-55 M3-AG	4 - 6 Weeks
FOUP Port	Clock Battery	ML2032WK2	4 - 6 Weeks

2 ND LEVEL SPARE PART			
MODULE / SECTION	DESCRIPTIONS	PART NUMBER	LEAD TIME
Robot	Z Sensor	EE-SX951-R	4 - 6 Weeks
	W Sensor	EE-SX952-R	4 - 6 Weeks
	A Sensor	EE-SX951-R	4 - 6 Weeks
	B Sensor	EE-SX951-R	4 - 6 Weeks
	R Sensor	EE-SX951-R	4 - 6 Weeks
	Z Motor	R2AA06020FC7FE	4 - 6 Weeks
	W Motor	R2AA06020FX7FE	4 - 6 Weeks
	A Motor	R2AA06010FX7EE	4 - 6 Weeks
	B Motor	R2AA06010FX7EE	4 - 6 Weeks
	R Motor	SGMMV-A3A2A21	4 - 6 Weeks
Pre-aligner	Solenoid Valve	SY3120-5LZD-C6	4 - 6 Weeks
	X Motor	R2FA04003FXW7D	4 - 6 Weeks
	W Motor	R2FA04003FXW7D	4 - 6 Weeks
	Y Motor	R2FA04003FXW7D	4 - 6 Weeks
	Linear Laser Sensor	IG-028+IG-1000	4 - 6 Weeks
	Solenoid Valve	PLC241B-M5-D24SP-N1	4 - 6 Weeks
	HS-Net Circuit Board	HPC-828	4 - 6 Weeks
Robot Controller	CPU Board	HPC-826	4 - 6 Weeks
	CPU Board	HPC-907C	4 - 6 Weeks
	I/O Board	HPC-916	4 - 6 Weeks
	Relay PCB	HPC-774	4 - 6 Weeks
	Power Unit	HPC-919B	4 - 6 Weeks
	CPU battery for a calendar	H3804	4 - 6 Weeks
	Power Switch	TLK25C1	4 - 6 Weeks
	Switching Power	ZWD100PAF-0524/JA	4 - 6 Weeks
	Fan	10909424G302	4 - 6 Weeks
	Key Switch	AH165-SJ2D11A	4 - 6 Weeks

2 ND LEVEL SPARE PART			
MODULE / SECTION	DESCRIPTIONS	PART NUMBER	LEAD TIME
Robot Controller	Key Switch	AH165-SJ2D11A	4 - 6 Weeks
	Contact	DILM7-19(24VDC)	4 - 6 Weeks
	Amplifier Unit	RR1A01AEBH0	4 - 6 Weeks
	Mother Board	HPC-920A	4 - 6 Weeks
	CC-Link I/F Board	HPC-913	4 - 6 Weeks
	Connector (CC-Link)	MSTB2.5/5-STF-5.08AY	4 - 6 Weeks
	Device Net I/F Board	HPC-914	4 - 6 Weeks
	Connector (Device Net)	MSTB2.5/5-STF-5.08AY	4 - 6 Weeks
OCR Reader	OCR Reader	WID120	4 Weeks
Ionizer	Static Eliminator	SJ-E036A	6 - 8 Weeks
	Electrode Probe	OP-87420	6 - 8 Weeks
RFID	RFID Antenna	HRF.A.HFX.R1519.LU.00	6 - 8 Weeks
	RFID Reader	HRF.R.HFM.6L.SA.10.20 A	6 - 8 Weeks
Load Port	Photoelectric Sensor	PM-K25	4 - 6 Weeks
	Sensor Presence Pin	BFMF0064	4 - 6 Weeks
QES Controller	IO Card	IO1616	2 - 4 Weeks
	Axis Card	AXC0040	2 - 4 Weeks
	Power Supply	LRS-35-24	2 - 4 Weeks
Electrical	ELCB	CE240B	2 Weeks
	HAGER MCB 10A 1P 4.5KA	MY-110E	2 Weeks
	HAGER MCB 6A 1P 4.5KA	MY-106E	2 Weeks
	RS232 to RS485 Converter	TCC-100	4 Weeks
	Power Supply	LRS-350-24	2 - 4 Weeks
Miscellaneous	Network Switch	DGS-108GL	2 - 4 Weeks
Vision Sensor	Vision Camera	CA-200C	6 - 8 Weeks
	Cartesian Z Motor	CTS-Z-MTR	6 - 8 Weeks
	Cartesian Y Motor	CTS-Y-MTR	6 - 8 Weeks
	Pressure Indicator	AP-C31W	6 - 8 Weeks
	Flow Indicator	CRT-FLW-IND	6 - 8 Weeks
Tool & Jig	Teach Pendant	H-3335	6 - 8 Weeks
	Target Wafer 12"	TW-300	6 - 8 Weeks
	Target Wafer 8"	TW-200	6 - 8 Weeks

3 RD LEVEL SPARE PART			
MODULE / SECTION	DESCRIPTIONS	PART NUMBER	LEAD TIME
Robot	Base Robot Module	AR-Wn180CL-3-S-330-2-X518	18 Weeks
Pre-aligner	Pre-aligner Module	KWA-06/08S-2-A076	18 Weeks

3 RD LEVEL SPARE PART			
MODULE / SECTION	DESCRIPTIONS	PART NUMBER	LEAD TIME
Robot Controller	Robot Controller Module	HNC-964-WS-200000-0-F-X518	18 Weeks
Pre-aligner Controller	Pre-aligner Controller Module	KWA-CN-06/08S-2-A076	18 Weeks
Load Port	Load Port Module	WP38-LP	18 Weeks
Computer	Intel Sky Lake Embedded Computer	IDF-R445/H110	2 - 4 Weeks
Monitor	FANLESS INDUSTRIAL DISPLAY PANEL	ARCDIS-116AP-04	2 - 4 Weeks

Please contact service team from QES to obtain the latest lead time and price for each spare part.

20 Contact Us

If you have any questions, need further assistance, or require technical support, please feel free to reach out to us. Our customer service team is available to help with any inquiries or issues related to this product..

To help us to assist you more efficiently, please provide the following information:

1. Provide name, e-mail address, and telephone number of the person to contact.
2. List any error codes received during the failure.
3. Prepare a detailed description of the events relating to the error
4. Time that the machine has been in operation
5. Function that the equipment was performing when the error occurred
6. Action taken after the error and the results of those actions

Contact of QES Mechatronic Sdn. Bhd. as below

Phone number:

+603-5882 1123(Ext:1133)

Email Address :

qmc.support@quesnet.com

Address :

QES Mechatronic Sdn. Bhd.

No. 2, Jalan Jururancang U1/21

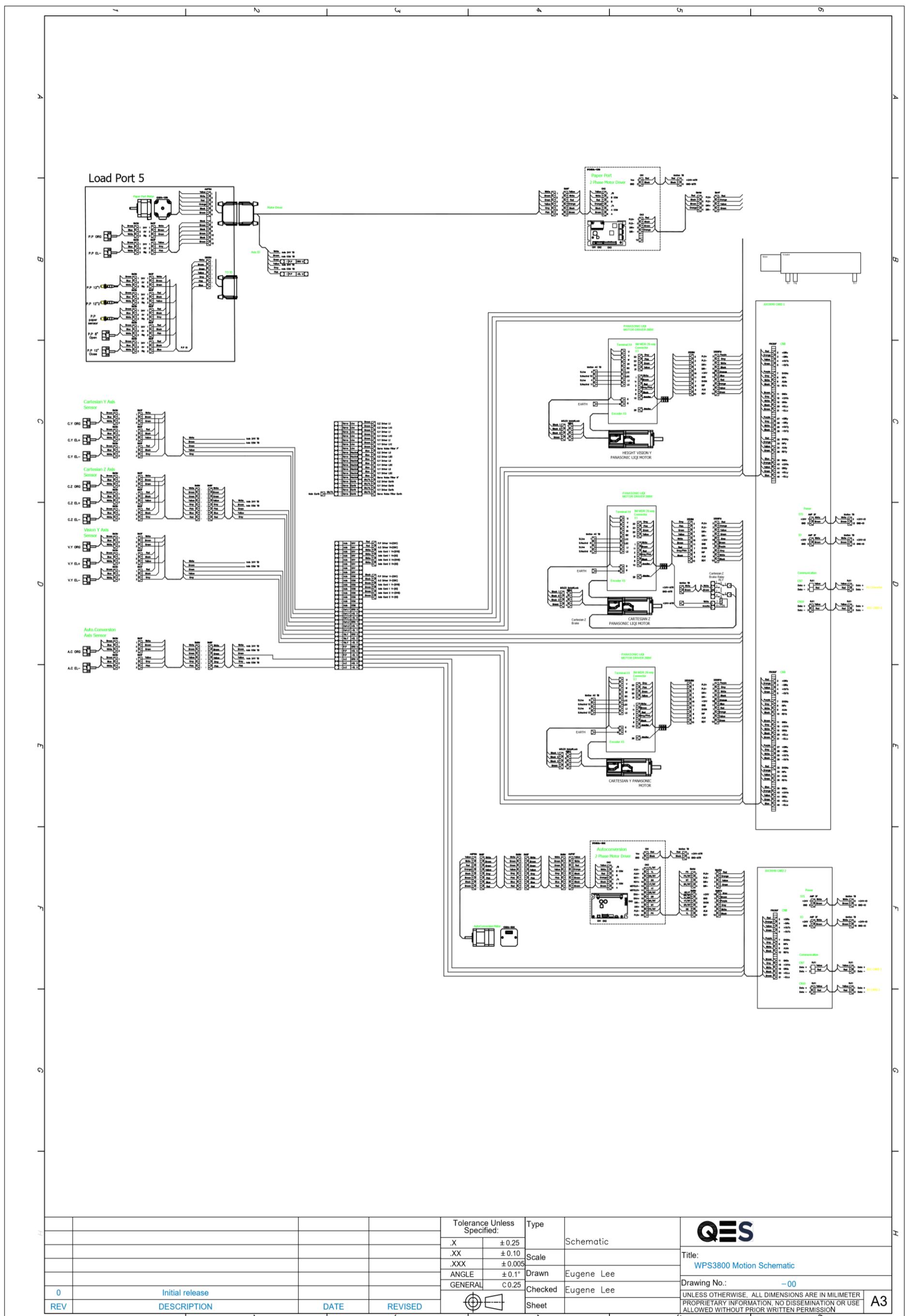
Hicom Glenmarie Industrial Park, Seksyen U1

40150 Shah Alam, Selangor Darul Ehsan, Malaysia.

Tel : +603-5882 6060 Fax : +603-5567 9078

21 Technical and Pneumatic Drawing

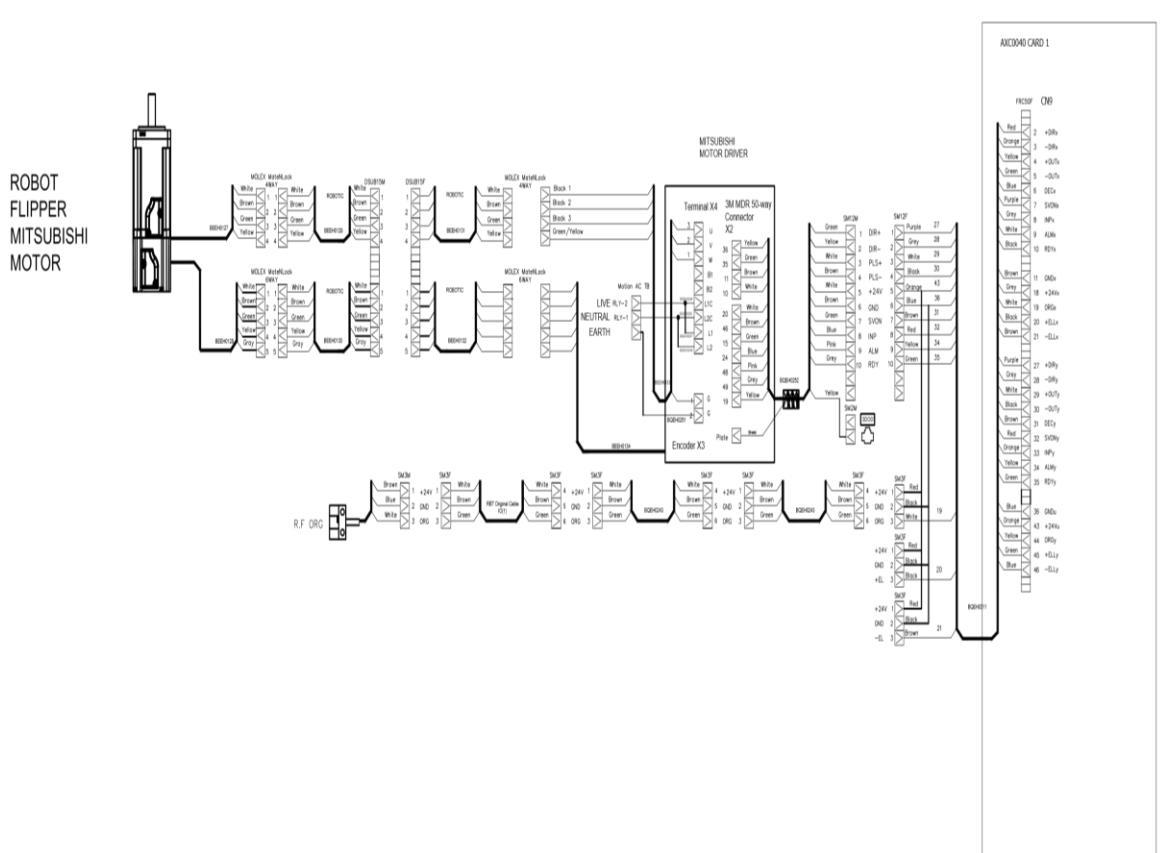
Technical and Pneumatic Drawing



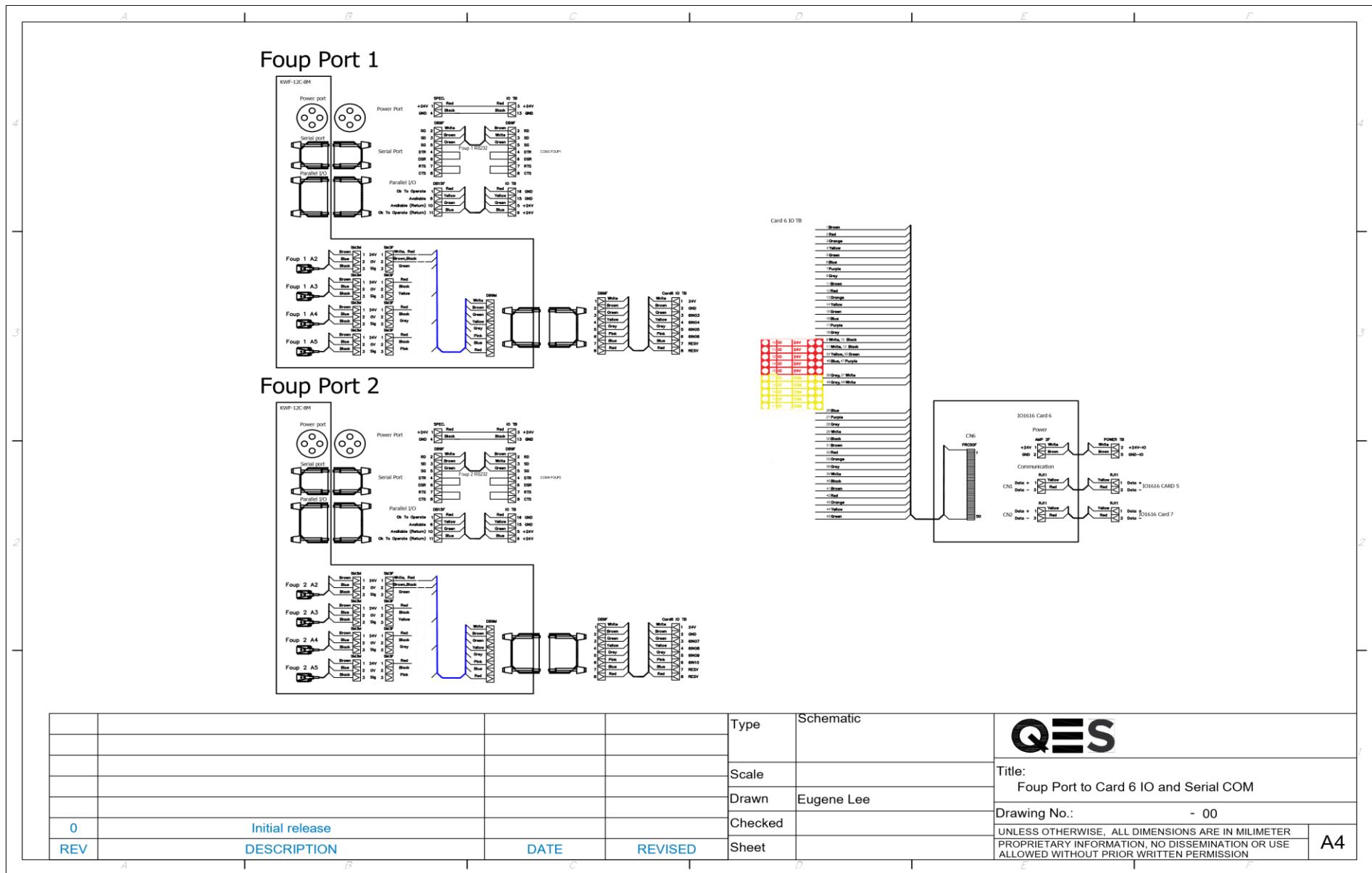
REV	DESCRIPTION	DATE	REVISED	Tolerance Unless Specified:		Type	Schematic	QES
				X	± 0.25			
XX					± 0.10	Scale		
XXX					± 0.005	Drawn	Eugene Lee	
ANGLE					$\pm 0.1^\circ$	Checked	Eugene Lee	
GENERAL				C0.25		Sheet		

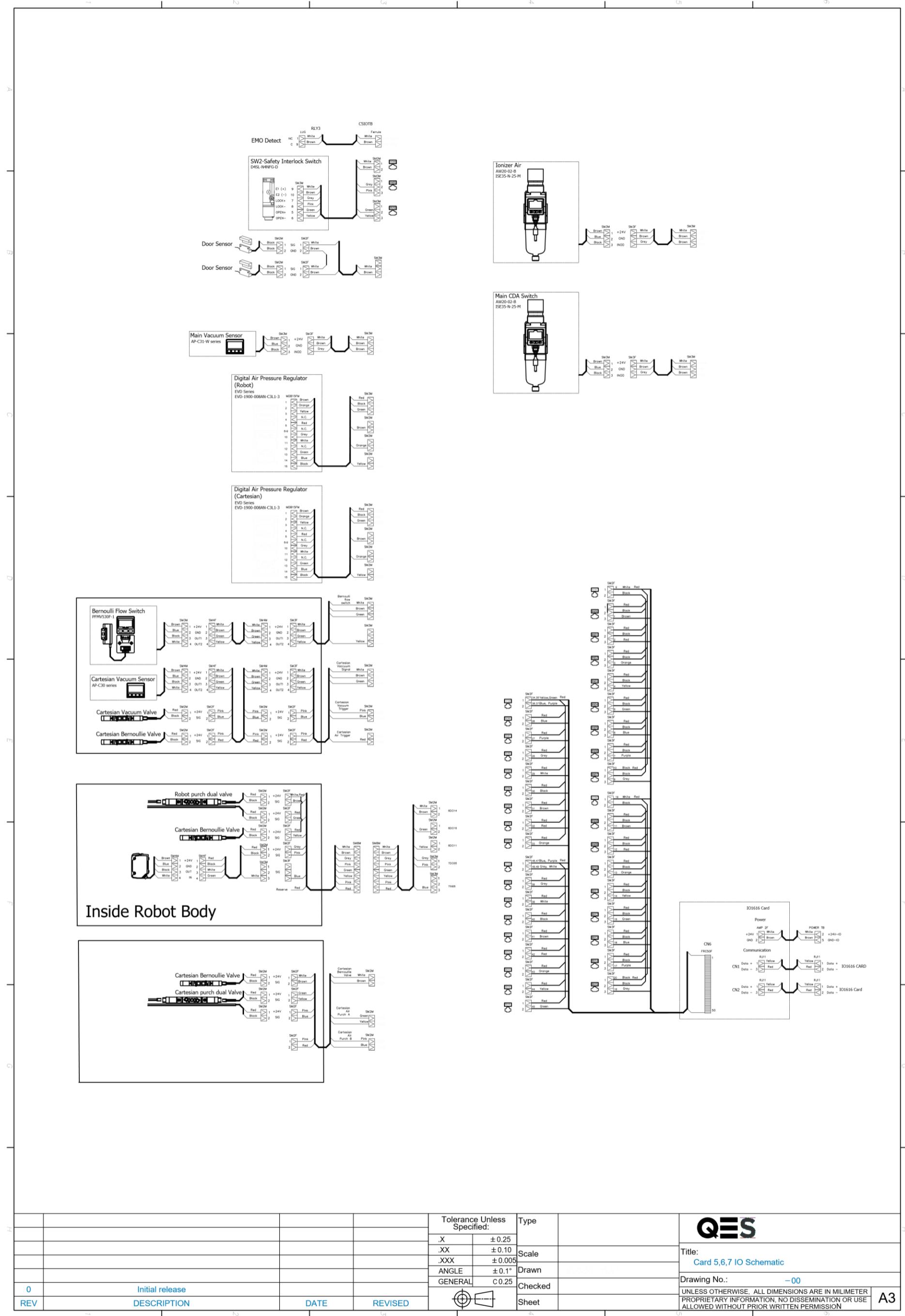
Title: [WPS3800 Motion Schematic](#)
Drawing No.: -00
UNLESS OTHERWISE, ALL DIMENSIONS ARE IN MILLIMETER
PROPRIETARY INFORMATION, NO DISSEMINATION OR USE
ALLOWED WITHOUT PRIOR WRITTEN PERMISSION

A3

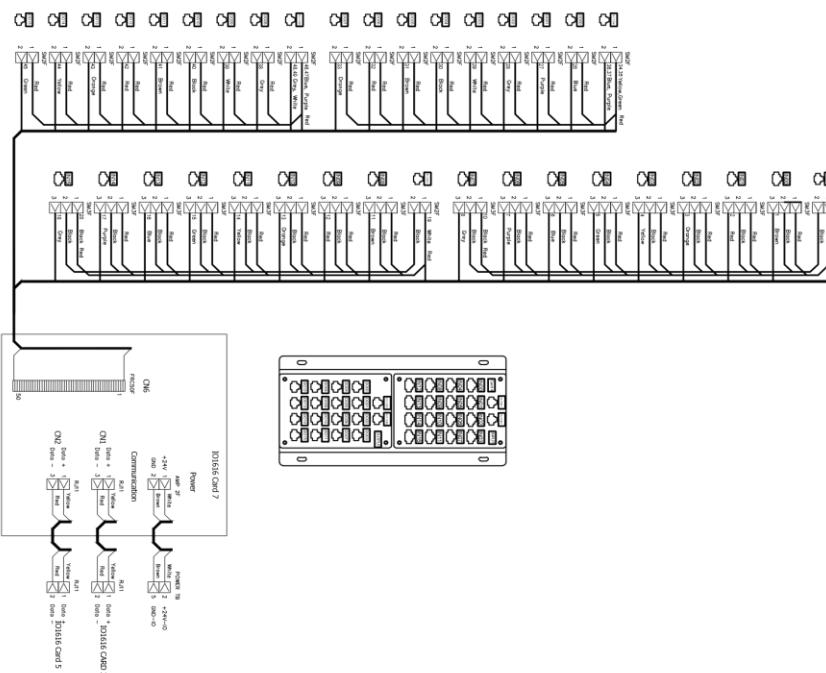
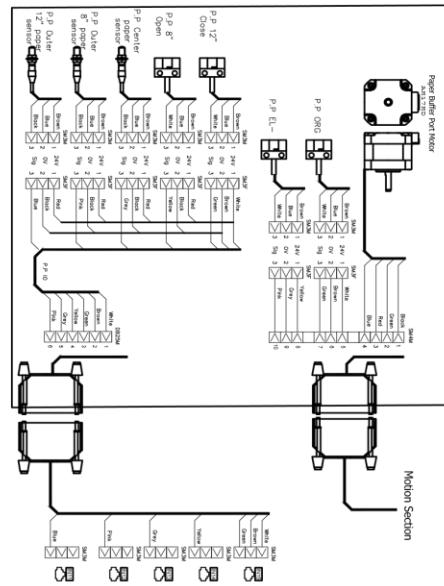


			Type	Schematic	QES
			Scale		Title: Robot Flipper Module
			Drawn	Eugene Yeap	Drawing No.: - 00
0	Initial release		Checked		UNLESS OTHERWISE, ALL DIMENSIONS ARE IN MILLIMETER
REV	DESCRIPTION	DATE	REVISED	Sheet	PROPRIETARY INFORMATION, NO DISSEMINATION OR USE ALLOWED WITHOUT PRIOR WRITTEN PERMISSION

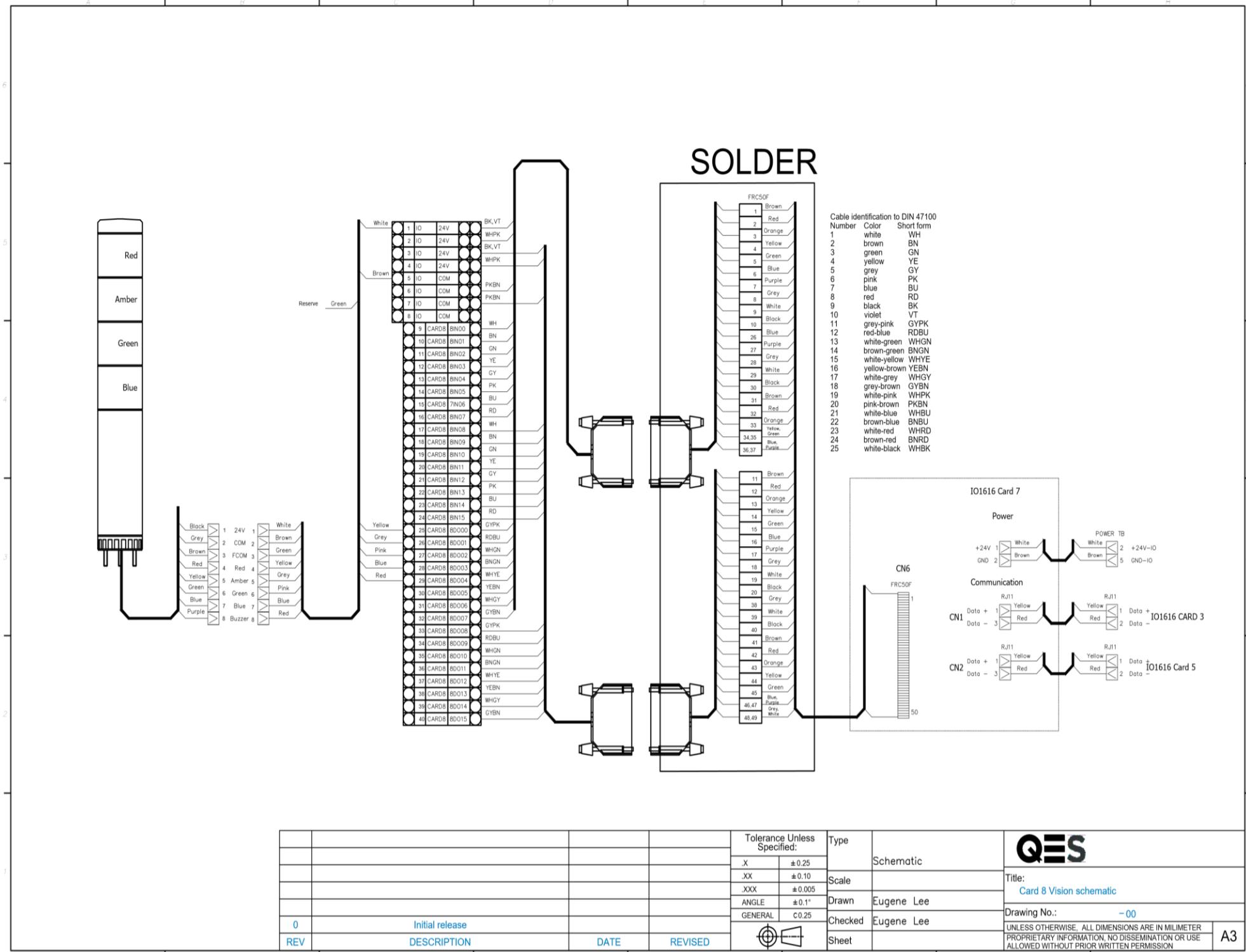




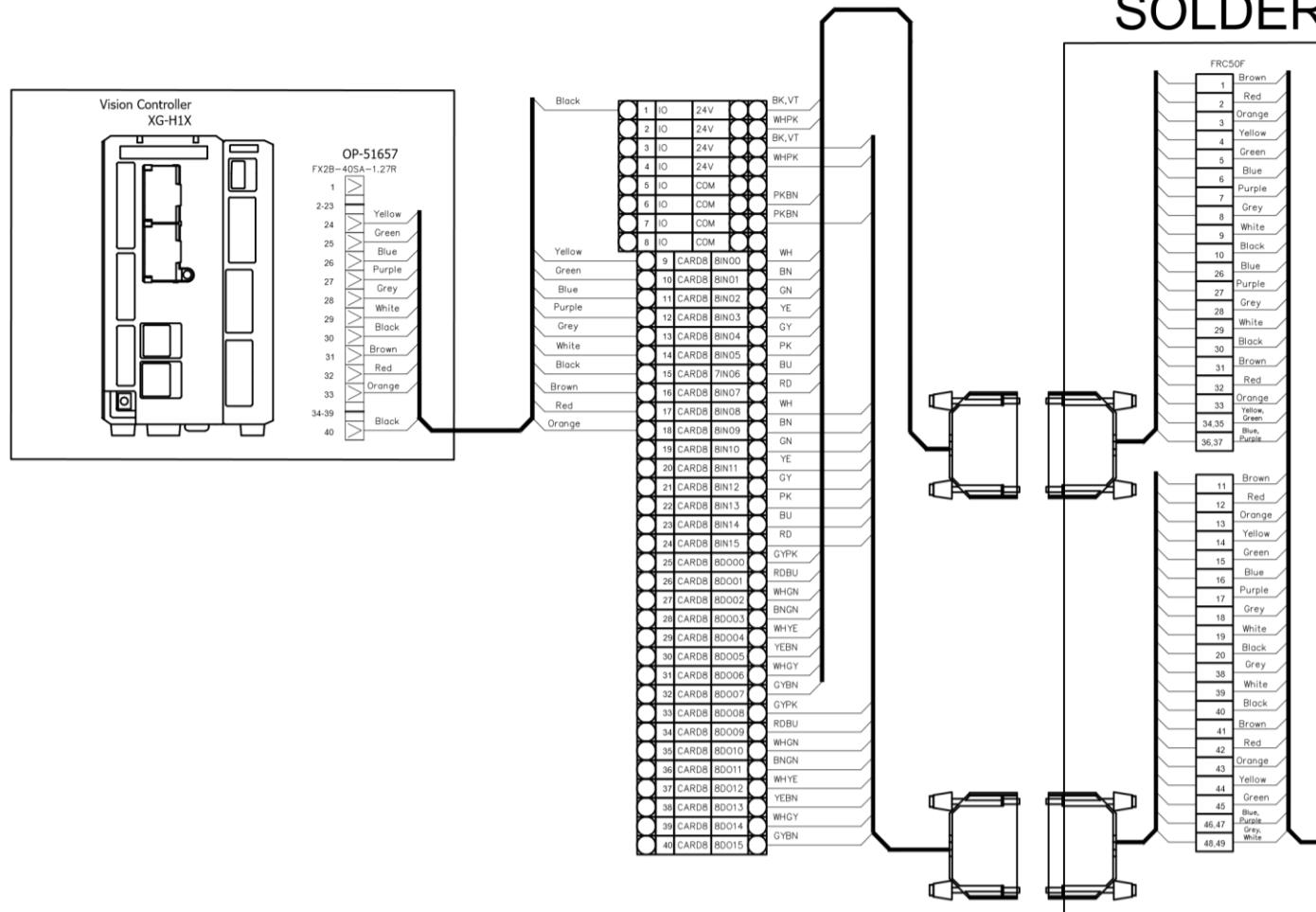
Paper Buffer Port



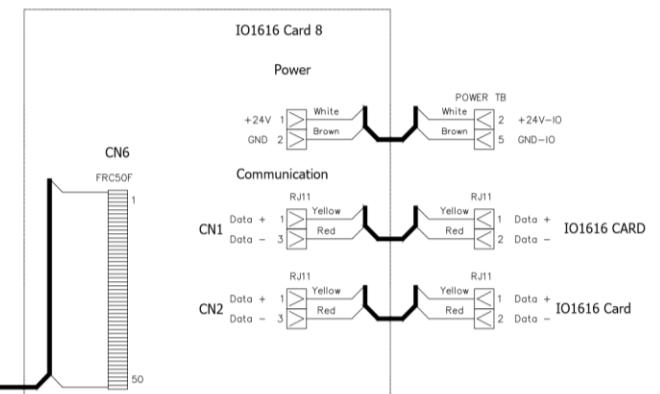
Type	Schematic
Scale	QES
Drawn	Eugene Lee
Checked	
Sheet	
DATE	
REV	
DESCRIPTION	



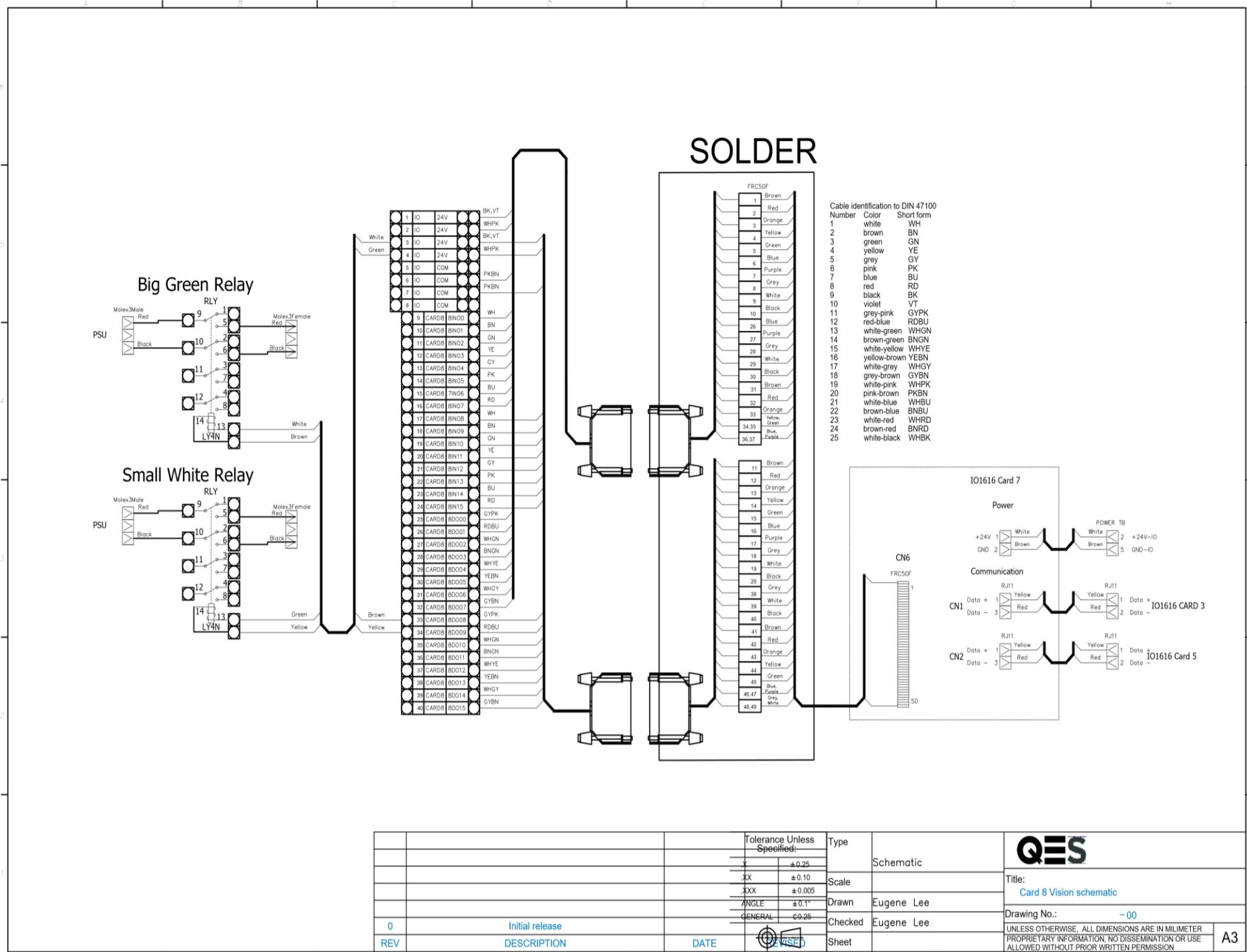
SOLDER

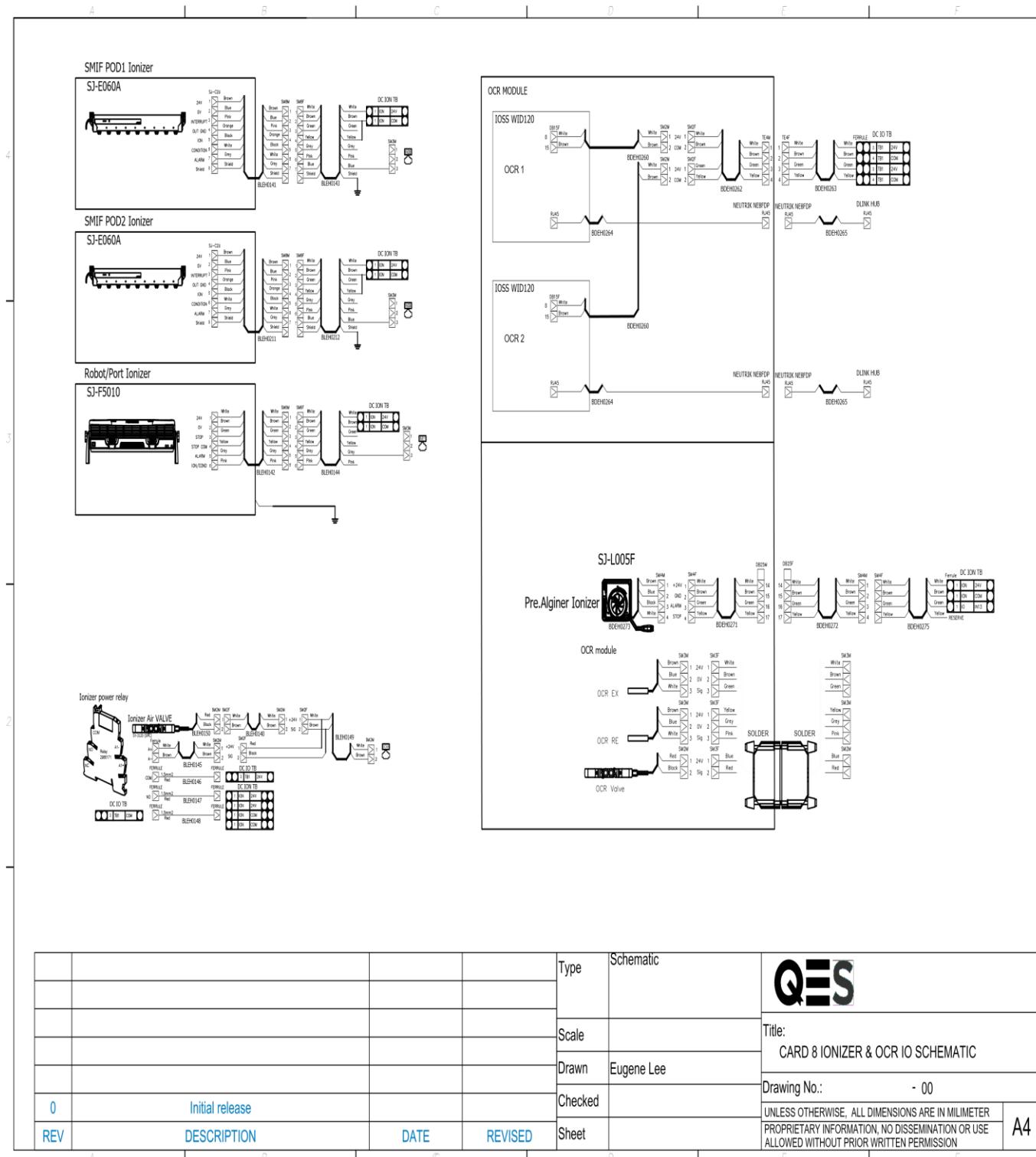


Cable identification to DIN 47100		
Number	Color	Short form
1	white	WH
2	brown	BN
3	green	GN
4	yellow	YE
5	grey	GY
6	pink	PK
7	blue	BU
8	red	RD
9	black	BK
10	violet	VT
11	grey-pink	GYPK
12	red-blue	RDBU
13	white-green	WHGN
14	brown-green	BNGN
15	white-yellow	WHEY
16	yellow-brown	YEBN
17	white-grey	WHGY
18	grey-brown	GYBN
19	white-pink	WHPK
20	pink-brown	PKBN
21	white-red	WRD
22	brown-blue	BNU
23	white-red	WHRD
24	brown-red	BNRD
25	white-black	WHBK

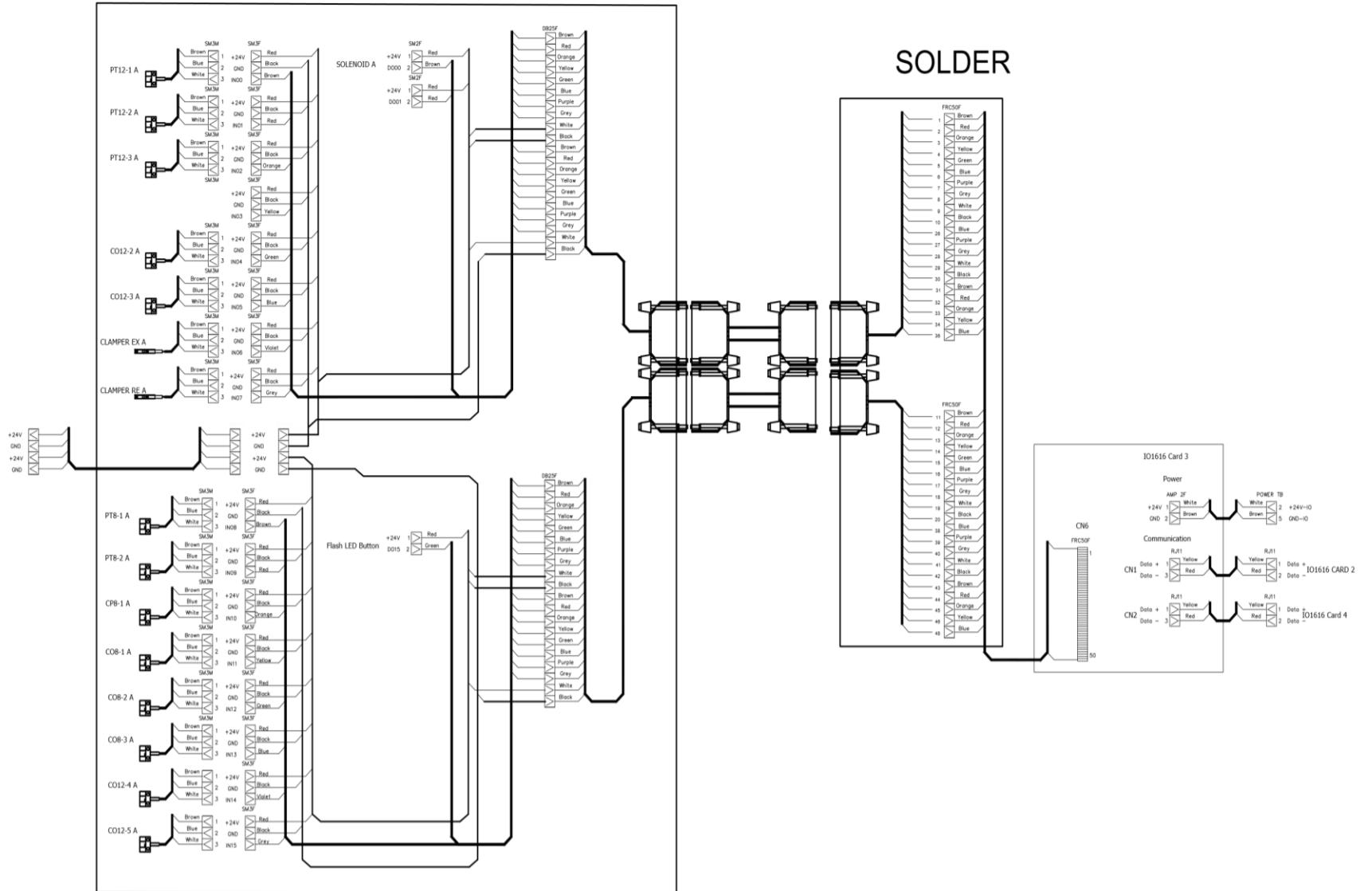


REV	DESCRIPTION	DATE	REVISED	Type	Schematic	QES
0	Initial release			Tolerance Unless Specified:		
				.X	± 0.25	
				.XX	± 0.10	
				.XXX	± 0.005	
				ANGLE	$\pm 0.1^\circ$	
				GENERAL	C0.25	
				Drawn	Eugene Lee	
				Checked	Eugene Lee	
				Sheet		A3
				Title: Card 8 Vision schematic		
				Drawing No.: -00		
				UNLESS OTHERWISE, ALL DIMENSIONS ARE IN MILLIMETER		
				PROPRIETARY INFORMATION, NO DISSEMINATION OR USE		
				ALLOWED WITHOUT PRIOR WRITTEN PERMISSION		



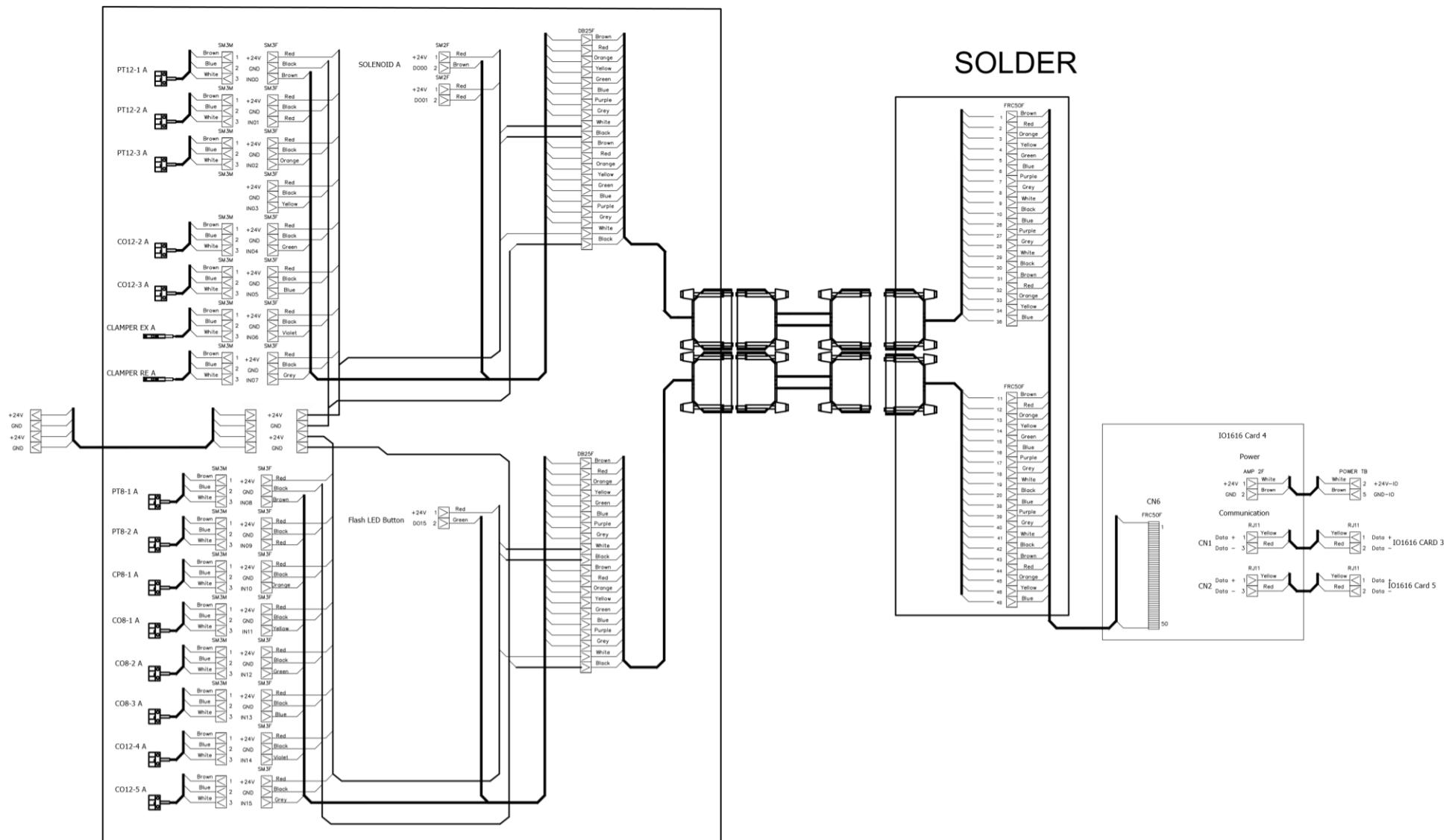


Load Port 3



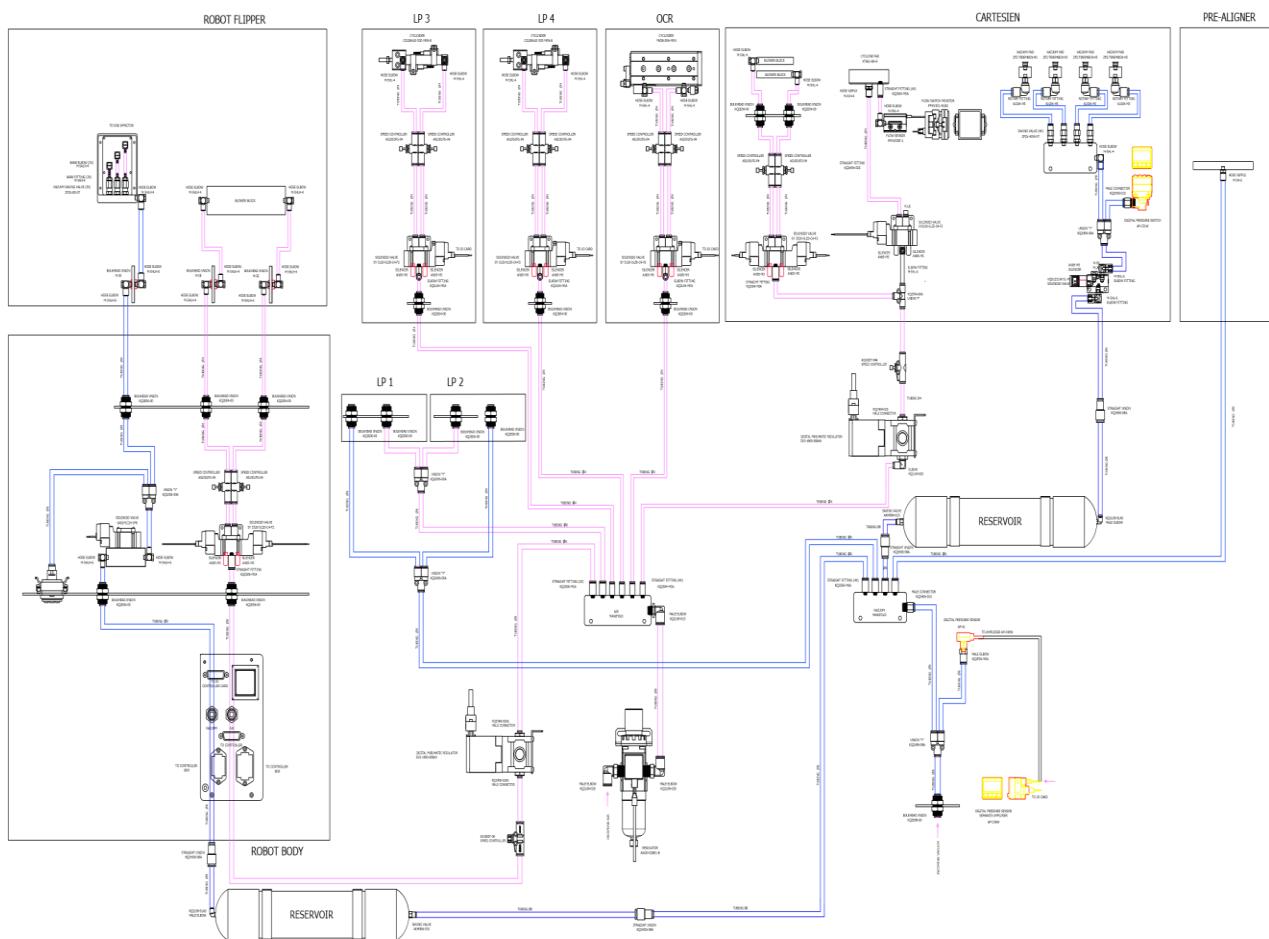
				Tolerance Unless Specified:	Type	Schematic		Title: Card 3 IO schematic
				X	± 0.25			
				XX	± 0.10	Scale		
				XXX	± 0.005	Drawn	Eugene Yeap	
				ANGLE	$\pm 0.1^\circ$	Checked	Eugene Yeap	Drawing No.: - 00
				GENERAL	C0.25	Sheet		UNLESS OTHERWISE, ALL DIMENSIONS ARE IN MILLIMETER PROPRIETARY INFORMATION, NO DISSEMINATION OR USE ALLOWED WITHOUT PRIOR WRITTEN PERMISSION
0	Initial release							A3
REV	DESCRIPTION	DATE	REVISED					

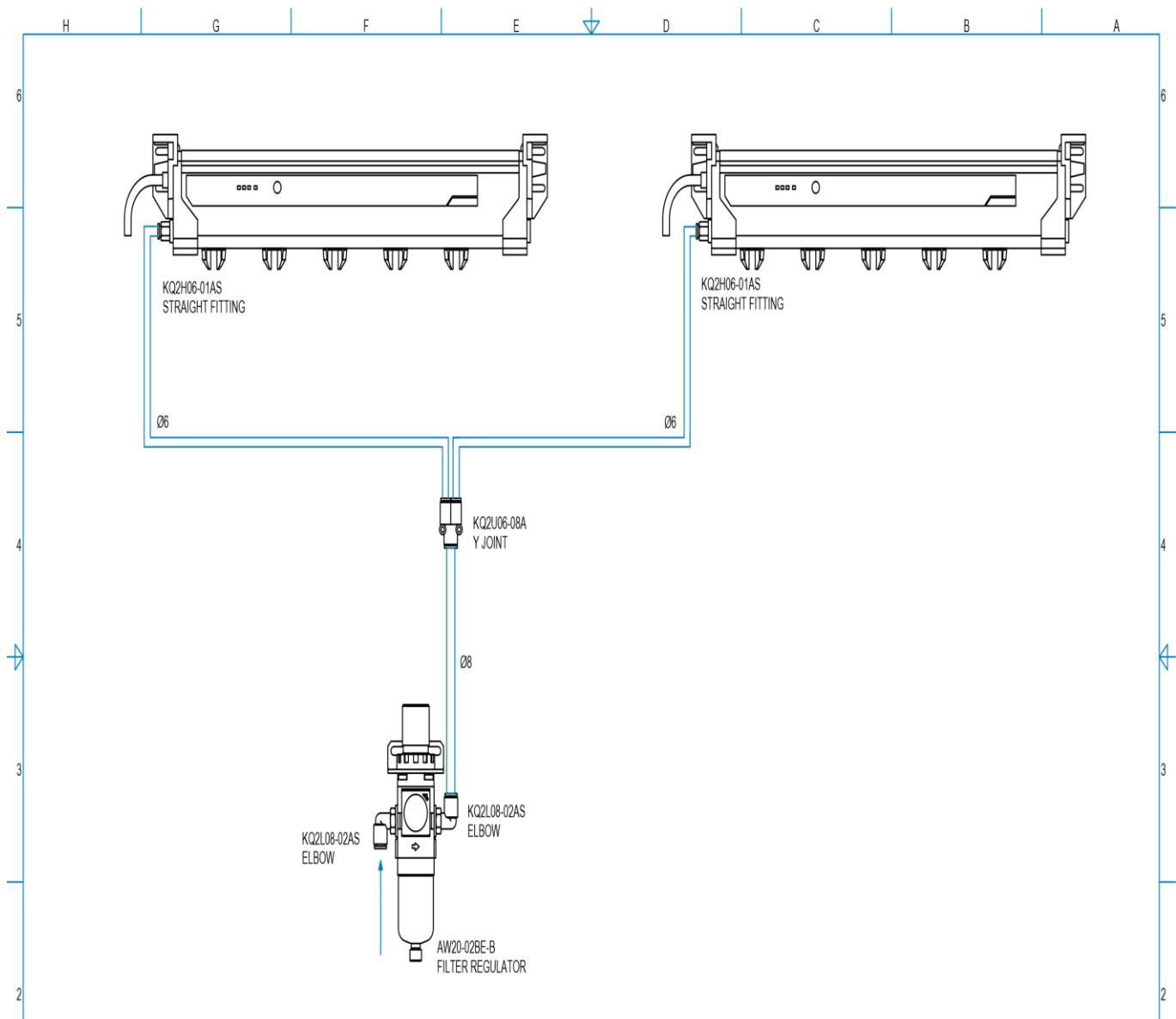
Load Port 4



					Tolerance Unless Specified:	Type	QES
					X ± 0.25	Schematic	
					XX ± 0.10	Scale	Title: Card 4 IO schematic
					XXX ± 0.005	Drawn	Drawing No.: -00
					ANGLE $\pm 0.1^\circ$	GENERAL	UNLESS OTHERWISE, ALL DIMENSIONS ARE IN MILLIMETER
					C0.25	Checked	PROPRIETARY INFORMATION, NO DISSEMINATION OR USE
0	Initial release						ALLOWED WITHOUT PRIOR WRITTEN PERMISSION
REV	DESCRIPTION	DATE	REVISED				A3

Pneumatic Drawing





				Tolerance Unless Specified:		MATERIAL			QES® TITLE : IONIZER ASSEMBLY PNEUMATIC DIAGRAM	
				X	±0.25	TREATMENT				
				XX	±0.10					
				XXX	±0.005	HARDNESS				
				ANGLE	±0.1°	DRAWN	SJ WONG			
				GENERAL	0.025	CHECKED		DRAWING No. : BLMP0001-00		
0	Initial release	28/10/2020	SJ WONG			SCALE	1:4	UNLESS OTHERWISE, ALL DIMENSIONS ARE IN MILLIMETER.		
REV	DESCRIPTION	DATE	AUTHOR			SHEET	1 OF 1	PROPRIETARY INFORMATION, NO DISSEMINATION OR USE ALLOWED WITHOUT PRIOR WRITTEN PERMISSION.	A4	