



Documents Title:		PROTON X70'S HEADLAMP ASSEMBLY				
		BVI 2125 FLEXIBLE MANUFACTURING SYSTEM				
Project:	COMMISSIONING REPORT	Documents number:	1	Date:	13/6	2024



TECHNICAL REPORT

PROTON X70'S HEADLAMP ASSEMBLY



Project Title:	PROTON X70'S HEADLAMP ASSEMBLY
Program Director:	SYAMSUL ARIFIN BIN AWI BOWO
Principal Investigator:	IR. MOHAMAD RAHIMI BIN MOHAMED RODZI
Date of Report:	13 JUNE 2024
Reporting Period:	[28 MAY 2024 – 13 JUNE 2024]

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1. Detail of End User

- Name : IR. MOHAMAD RAHIMI BIN MOHAMED RODZI
- Mobile : +60 17-421 0821
- Email : mohamadrahimi@umpsa.edu.my
- Position : Customer

2. Details of the Commissioning Engineer

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- II. Name : MUHAMMAD AMIRUL ADLY BIN MOHD RASHIDI
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- III. Name : AHMAD SYAHIDUL AMIN BIN MOHAMAD AZNAL
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Position : ROBOT PROGRAMMER

- IV. Name : MOHAMAD AQMAR HARITH BIN KAMAROLZAMAN
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Position : TECHNICAL REPORT AND DOCUMENTATION



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3. Commissioning Date

- 13 JUNE 2024

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4. Serial No. For all Equipment

No	Equipment	Unit	Serial No
1.	OMRON PLC CJ2M CPU 31-1PU	1 unit	6013-1-7
2.	AIRTAC CYLINDER	2 unit	TWQ32X20SC
3.	BRANCO MOTORI ELETTRICI-ITALY	1 unit	BA90L-4
4.	TM5-700 INDUSTRIAL ROBOT	1 unit	BA2151018
5.	JIG HEAD LAMP RIGHT	3 unit	CTMS1000-PB205(A)-211 0-006-00001
6.	JIG HEAD LAMP LEFT	3 unit	CTMS1000-PB205(A)-211 0-006-00001
7.	VFD SAKO	1 unit	SKI780-1D5G-1
8.	OMRON E35IC-TR11	1 unit	CTMS-1000-PB205(A)-21 10-0002-00002
9.	CYLINDER FESTO	1 unit	G7YT8Y3QCZI
10.	TM5 - 700 CONTROLLER	1 unit	BC2151018
11.	PNEUMATIC WORKSTATION	1 unit	CTMS1000-PB205(A)-220 1-0002-00003
12.	TRANSMITTER OMRON E3JK-TR11 -D	2 unit	07317HI/08420HI
13.	RECEIVER OMRON E3JK-TR12 -L	2 unit	01921HI/
14.	STOPPER 6	1 unit	CTMS-1000-PB205(A)- 2110-0002-00005
15.	STOPPER 7	1 unit	CTMS-1000-PB205(A)- 2110-0002-00002
16.	GEARBOX TRANSMAX	1 unit	5/90B5
17.	MOUSE	1 unit	09RRC7
19.	MONITOR HP	1 unit	3CQ0191ZBA
20.	PNEUMATIC SMC GRIPPERS TWO FINGERS	1 unit	MH720-25D

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21.	OMRON MY2N-GS 24VDC	7 unit	16221C3
22.	RCCB MA 2P	1 unit	IEC 61008-1
23.	MCB 1P	1 unit	SH20;L
24.	TUBE CYLINDER	5 meter	-
25.	PLC PA202 OMRON	1 unit	-
26.	PLC MAD42 OMRON	1 unit	-
27.	PLC OC211 OMRON	1 unit	-
28.	PLC ID211 OMRON	1 unit	-
29.	THE ROBOT MOUNTING FLOOR	1 unit	-

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5. Prestart Inspection

No	Image	Description
1.	 <p>TM5 - 700 CONTROLLER</p>	<ul style="list-style-type: none"> - Physical Inspection: Examine the controller for any visible damage or wear on the housing, display screen, buttons, and connectors. - Connection Check: Ensure all cables and connections to the controller are securely fastened and properly seated. - Functionality Test: Power up the controller and verify that it boots up correctly, displays information on the screen, and responds to user input (if applicable). Additionally, test its communication with other components or devices if it is part of a larger system.

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2.	 <p>Omron E35IC-TR11</p>	<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear - Connection Check: All connections secure with OMRON E3JK-TR12 and OMRON PLC CJ2M CPU 31-1PU - Functionality Test: All functions operate as expected and all joints are in good condition and can rotate 270 degrees
3.	 <p>VFD SAKO</p>	<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear - Connection Check: All connections secure with BRANCO MOTORI ELETTRICI-ITALY - Functionality Test: All functions operate as expected. Able to read waves from 0 to the highest level and able to operate the conveyor

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4.	 <p>OMRON PLC CJ2M CPU 31-1PU</p>	<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear - Connection Check: All connections secure with OMRON E3JK-TR12, relay, VFD SAKO, conveyor - Functionality Test: All functions operate as expected.
5.	 <p>Three-Phase Motor Model BA90L-4</p>	<ul style="list-style-type: none"> - Physical Inspection: There is no visible damage or wear. - Connection Check: All connections are secure. - Functionality Test: The motor runs smoothly at all speeds controlled by VFD SAKO.

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6.	 PLC PA202	<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear. - Connection Check: All connections are secure. - Functionality Test: All functions operate as expected.
7.	 PLC MAD42	<ul style="list-style-type: none"> - Physical Inspection: There is no visible damage or wear. - Connection Check: All connections are secure. - Functionality Test: All functions operate as expected.
8.	 PLC OC211	<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear - Connection Check: All connections secure - Functionality Test: All functions operate as expected

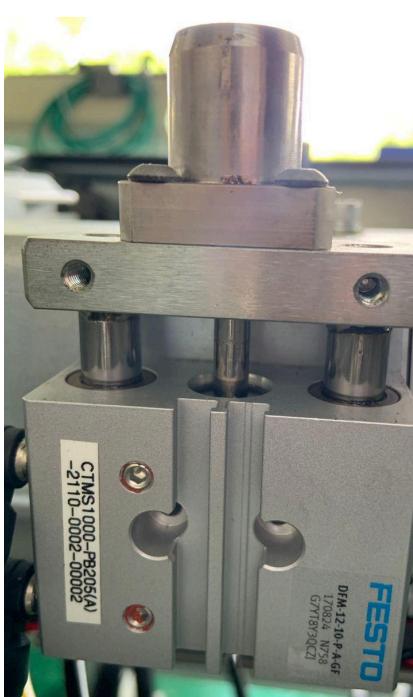
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9.	 PLC ID211	<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear. - Connection Check: All connections are secure. - Functionality Test: All functions operate as expected
10.	 RECEIVER OMRON E3JK-TR11 -D	<ul style="list-style-type: none"> - Physical Inspection: Ensure there is no visible damage or wear. - Connection Check: Verify that all connections are secure. - Functionality Test: Confirm that all functions operate as expected.

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11.	 <p>TRANSMITTER OMRON E3JK-TR12 -L</p>	<ul style="list-style-type: none"> - Physical Inspection: Ensure there is no visible damage or wear. - Connection Check: Verify that all connections are secure. - Functionality Test: Confirm that all functions operate as expected.
12.	 <p>CYLINDER FESTO</p>	<ul style="list-style-type: none"> - Physical Inspection: Ensure there is no visible damage or wear. - Connection Check: Verify that all connections are secure. - Functionality Test: Confirm that all functions operate as expected.

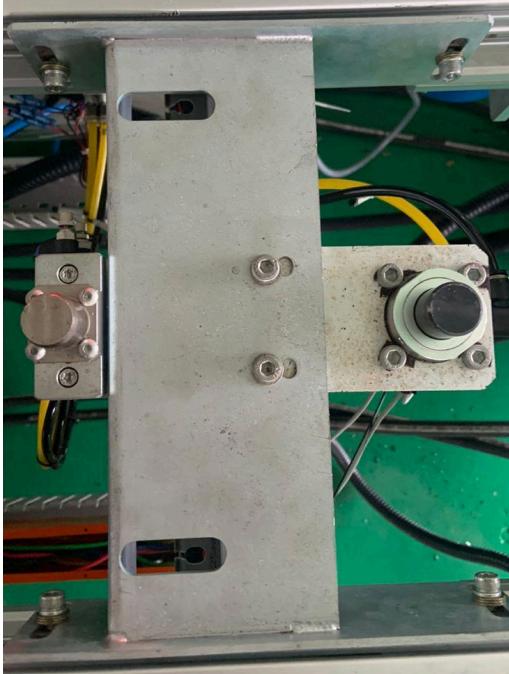
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13.	 AIRTAC CYLINDER	<ul style="list-style-type: none"> - Physical Inspection: Ensure there is no visible damage or wear. - Connection Check: Verify that all connections are secure. - Functionality Test: Confirm that all functions operate as expected.
14.	 STOPPER 6	<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear. - Connection Check: All connections are secure with valve to plc - Functionality Test: All functions operate as expected.

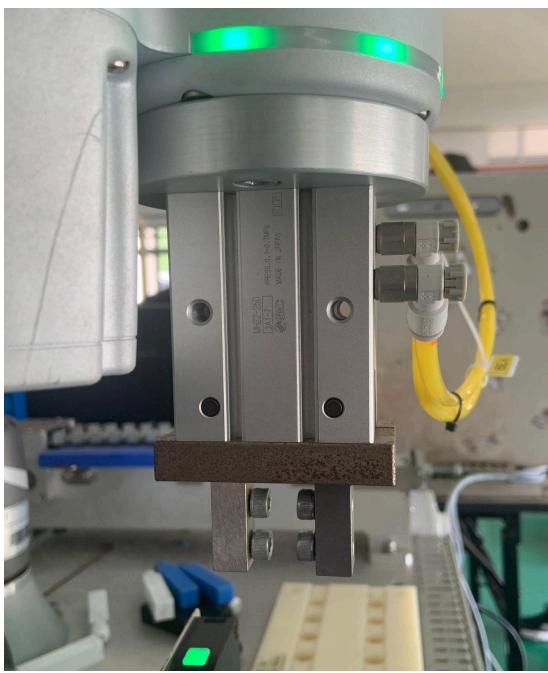
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15.		<ul style="list-style-type: none"> - Physical Inspection: No visible damage or wear. - Connection Check: All connections are secure with valves to plc. - Functionality Test: All functions operate as expected.
16.		<ul style="list-style-type: none"> - Physical Inspection: Verify no visible damage or wear is present. - Functionality Test: Confirm all functions are operating as expected.

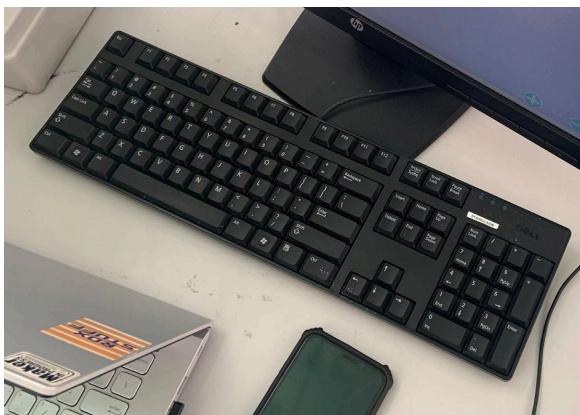
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17.	 JIG HEAD LAMP LEFT	<ul style="list-style-type: none"> - Physical Inspection: Verify no visible damage or wear is present. - Functionality Test: Confirm all functions are operating as expected.
18.	 PNEUMATIC SMC GRIPPERS TWO FINGERS	<ul style="list-style-type: none"> - Physical Inspection: Check for any visible damage or wear on the grippers. - Connection Check: Ensure all connections related to the grippers are securely fastened. - Functionality Test: Confirm that both fingers of the grippers operate correctly and grasp objects effectively.

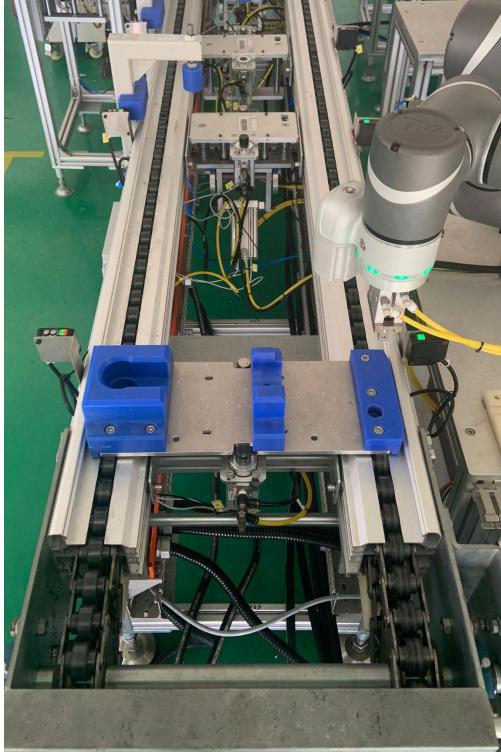
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19.	 MOUSE	<ul style="list-style-type: none"> - Physical Inspection: Check for any visible damage or wear on the mouse body, cable, and buttons. - Connection Check: Ensure the mouse is properly connected to the computer or device, and that the cable is secure. - Functionality Test: Verify that the mouse cursor moves smoothly and all buttons register clicks as expected.
20.	 Keyboard SK-8175:	<ul style="list-style-type: none"> - Physical Inspection: Examine the keyboard for any visible damage or wear, including keys, cables, and connectors. - Connection Check: Ensure the keyboard is securely connected to the computer or device, and that the cable is not damaged. - Functionality Test: Test all keys on the keyboard to ensure they register keystrokes properly, including modifier keys (such as Shift, Ctrl, Alt), function keys, and multimedia keys if present.

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21.	 PNEUMATIC WORKSTATION	<ul style="list-style-type: none"> - Physical Inspection: Check for any visible damage, leaks, or wear on pneumatic components, such as hoses, fittings, valves, and actuators. - Connection Check: Ensure all pneumatic connections are securely fastened and that there are no loose or disconnected parts. - Functionality Test: Test the pneumatic workstation's operation by activating various functions or processes to confirm proper functioning, such as cylinder movement, pressure regulation, and tool operation.
22.	 RCCB (Residual Current Circuit Breaker) MA 2P	<ul style="list-style-type: none"> - Physical Inspection: Check for any visible damage or wear on the RCCB housing, terminals, and reset button. - Connection Check: Ensure all electrical connections are securely fastened and there are no signs of loose wiring. - Functionality Test: Test the RCCB by tripping it manually (if applicable) or by simulating a fault to verify that it trips and disconnects the circuit reliably in the event of a residual current fault.

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23.	 <p>MCB (Miniature Circuit Breaker) 1P</p>	<ul style="list-style-type: none"> - Physical Inspection: Check for any visible damage or wear on the MCB housing, terminals, and toggle. - Connection Check: Ensure all electrical connections are securely fastened and there are no signs of loose wiring. - Functionality Test: Test the MCB by toggling it off and then on again to verify that it operates correctly and can effectively interrupt the circuit in case of an overload or short circuit.
24.	 <p>GEARBOX TRANSMAX</p>	<ul style="list-style-type: none"> - Physical Inspection: Examine the gear box for any visible damage, leaks, or signs of wear on the housing, gears, seals, and shafts. - Connection Check: Ensure all connections to the gear box, such as input and output shafts, are securely fastened and aligned properly. - Functionality Test: Test the gear box by engaging different gears or speeds to verify smooth operation and proper transmission of

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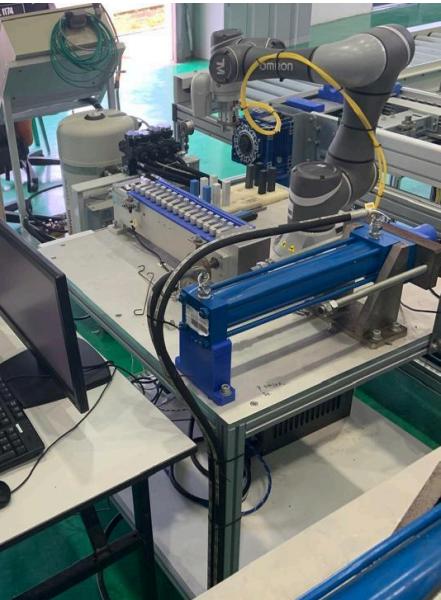
		power. Also, check for any unusual noises or vibrations during operation.
25.	 TUBE CYLINDER	<ul style="list-style-type: none"> - Physical Inspection: Inspect the tube cylinder for any visible damage, dents, or signs of wear on its body, end caps, and piston rod. - Connection Check: Verify that all connections, including fittings and hoses, are securely attached to the tube cylinder and properly sealed. - Functionality Test: Test the tube cylinder by pressurising it and ensuring it extends and retracts smoothly without any leaks or abnormal noises. Additionally, confirm that it operates within the specified pressure and speed parameters for its intended application.

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26.	 <p>Omron MY2N-GS 24VDC Relay</p>	<ul style="list-style-type: none"> - Physical Inspection: Check the relay for any visible damage or signs of wear on the housing, terminals, and indicators. - Connection Check: Ensure all electrical connections to the relay are securely fastened and that there are no loose wires or terminals. - Functionality Test: Test the relay by applying the appropriate voltage and activating the coil to verify that it switches reliably and the contacts operate as expected.
27.	 <p>Monitor HP</p>	<ul style="list-style-type: none"> - Physical Inspection: Check the monitor for any visible damage, such as cracks, scratches, or wear on the screen, bezel, and stand. - Connection Check: Ensure all cables (power, HDMI, DisplayPort, etc.) are securely connected to both the monitor and the computer or other devices. - Functionality Test: Power on the monitor and verify that it displays an image correctly, with no dead pixels, colour distortion, or flickering. Additionally, test the monitor's settings and

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		controls (brightness, contrast, etc.) to ensure they function properly.
28.	 <p>Robot Mounting Floor</p>	<ul style="list-style-type: none"> - Physical Inspection: Check the mounting floor for any visible damage, cracks, or wear on the surface and mounting points. - Connection Check: Ensure that all bolts, screws, and other fasteners securing the robot to the floor are tight and properly installed. - Functionality Test: Verify the stability of the mounted robot by performing basic movements or operations to ensure it remains securely attached and stable during use. Additionally, check for any vibrations or shifts in the mounting during operation.



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6. Mechanical Interface with Accept and Reject Status

*Instruction : Tick (/) on the Accept or Reject column provided.

NO	Mechanical Interface	Details	Accept	Reject
1.	PNEUMATIC SMC GRIPPERS TWO FINGERS	Meets all specifications and requirements for operation. The gripper is installed at the end of the OMRON E3JK-TR12 robot, and the air pressure is also set directly to 126 kgf/cm ² .	/	
2.	CYLINDER FESTO	For your specific requirement of 126 kgf/cm ² (which is approximately 12.36 MPa or 1792 psi), you will need to verify that the selected FESTO cylinder can handle this high pressure, as standard pneumatic cylinders typically operate at pressures up to 10 bar (145 psi). The cylinder is also connected to y22 and attached to stopper 7.	/	
3.	AIRTAC CYLINDER	The AIRTAC Cylinder is a type of pneumatic cylinder manufactured by AIRTAC International Group, renowned for its high-quality engineering and dependable performance. It's frequently employed across diverse industrial automation applications for controlling linear or rotary motion. There are two cylinders in this setup. The first one is situated at stopper 6 and is also connected to valve y19, installed on wiring s30. The second cylinder is located at stopper 7, following the Festo cylinder. It is also linked to valve y23 and directly wired to s36.	/	
4.	PLC PANEL (OMRON PANEL)	The plc panel houses the plc unit, I/O modules, power supply, and terminal blocks. The PLC Panel includes seven relays, one power supply, and the following Omron PLC components: CJ2M CPU 31-1PU, PA202, MAD42,	/	

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		OC211, and ID211, VFD, 3 LAMP,4 SUIS.		
5.	Robot Mounting Floor	The robot mounting floor is built from durable steel or aluminium to securely support the robot's weight. It features holes for easy attachment and an anti-corrosion coating for long-term protection. The design includes pathways for neat cable routing and is tailored to match the robot's specifications, ensuring perfect compatibility.		



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7. Electrical Interface with Accept and Reject Status

*Instruction : Tick (/) on the Accept or Reject column provided.

No	Parameter	Specification	Accept	Reject
1.	Power Voltage Rating	+ -243VAC		
2.	Control Voltage Rating	+ -23.7VDC		
3.	Frequency	5.26Hz		
4.	PLC Type	OMRON PLC CJ2M CPU 31-1PU		
6.	Motor Manufacturer	Branco Motori Elettrici-Italy		
7.	Relay Type	OMRON MY2N-GS 24VDC		
8.	VFD Type	Sako VFD ski780		
9.	Robot Arm Manufacturer	TM5-700 Industrial Robot		
10.	Robot Controller	TM5 - 700 Controller		
11.	Transmitter Photoelectric Sensor	Omron E3JK-TR11 -D		
12.	Receiver Photoelectric Sensor	Omron E3JK-TR12 -L		
13.	RCCB	MA 2P		
14.	MCB	SH20;L		
15.	PLC Module	OMRON PA202		
16.	PLC Module	OMRON MAD42		
17.	PLC Module	OMRON OC211		
18.	PLC Module	OMRON ID211		

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Detail Comments:

- Power Voltage Rating: The power supply is stable at +-243 VAC, within the acceptable range.
- Control Voltage Rating: The control voltage is consistently +-23.7VDC, meeting specifications.
- Frequency: The system operates at the recommended frequency of 5.26 Hz without fluctuations.
- PLC Type: The PLC type is confirmed as OMRON PLC CJ2M CPU 31-1PU, matching the design requirements
- Control System: The TM5 - 700 CONTROLLER control system is properly configured and operational.
- Motor Manufacturer: The motors from Branco Motori Elettrici-Italy are installed and functioning as expected.
- Relay Type: The Omron G2R-1 relays are installed and tested, performing within the expected parameters.
- VFD Type: The Sako VFDs are installed and tested, providing smooth control over the motor speeds.
- Robot Arm Manufacturer: The TM5-700 Industrial Robot is installed and functioning as expected.
- Robot Controller: The TM5-700 Controller is operational and integrated with the system.
- Transmitter Photoelectric Sensor: Omron E3JK-TR11 -D transmitters are installed and tested, functioning as expected.
- Receiver Photoelectric Sensor: Omron E3JK-TR12 -L transmitters are installed and held in reserve, functioning as expected.
- RCCB: The MA 2P RCCB is installed and provides necessary circuit protection.
- MCB: The SH20;L MCB is installed and operational.
- PLC Module: The OMRON PA202, MAD42, OC211, and ID211 PLC modules are installed and operational, integrated with the control system.

This revised section 7 includes only the electrical components relevant to the system, providing a clear status and specific comments on each aspect tested.



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8. Programming Sequence based on Full Function Test with Accept and Reject Status

*Instruction : Tick (/) on the Accept or Reject column provided.

No	Test Description	Accept	Reject
1.	Power on		
2.	Select Maintenance mode		
3.	Red lamp on (blinking)		
4.	Setting frekuensi vfd		
5.	Select Auto mode		
6.	Red lamp off/Green lamp on		
7.	Push button start		
8.	Green lamp blinking		
9.	Conveyor run		
10.	Sensor 29 detect		
11.	Stopper 6 Y19 retract and extract		
12.	Sensor 35 detect		
13.	Stopper 7 lock retract and extract		
14.	Conveyor stop		
15.	Buzzer beep 5 times		
16.	Robot puts workpieces in to the jig		
17.	Stopper 7 releases, retracts, and the conveyor starts running		
18.	Repeat the cycle		
19.	Push button stop(hold 2.5s)		
20.	Test 20 time		

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Detailed Comments:

- Power On : Turning on all systems that use electrical energy
- Select Maintenance mode: To change step up and step down frequency of VFD to motor
- Red lamp on (blinking): To indicate that the system is in maintenance mode
- Setting frequency VFD: Setting the motor speed
- Select Auto mode: To operate the entire system
- Red lamp off/Green lamp on: System standby mode
- Push button start: The conveyor system is running
- Green lamp blinking: The system is running
- Conveyor run: The jig is moved by the conveyor from one location to another
- Sensor 29 detect: It can detect the presence of the jig
- Stopper 6 Y19 retract and extract: After sensor S29 detects, the valve will retract and then extract after 1.4 second
- Sensor 35 detect: It can detect the presence of the jig
- Stopper 7 lock retract and extract: While in positive edge condition, stopper 7 retracts, then after the negative edge of the sensor, it extracts
- Conveyor stop: The conveyor has stopped moving
- Buzzer beep 5 times: The buzzer will sound five times before the robot starts moving
- Robot puts workpieces in to the jig: The robot is performing routine 1 and routine 2
- Stopper 7 releases, retracts, and the conveyor starts running: Valve Y23 will retract, and the conveyor will continue moving
- Repeat the cycle: Repeat all routine
- Push button stop(hold 2.5s): System reset and stop
- Test 20 time: Repeat all routine 20 time and observe the result :

No	Step Test	Past	Fail	Remark
1.	Cycle 1	/		
2.	Cycle 2	/		
3.	Cycle 3	/		
4.	Cycle 4	/		
5.	Cycle 5	/		
6.	Cycle 6	/		
7.	Cycle 7	/		
8.	Cycle 8	/		
9.	Cycle 9	/		

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10.	Cycle 10	/		
11.	Cycle 11	/		
12.	Cycle 12	/		
13.	Cycle 13	/		
14.	Cycle 14	/		
15.	Cycle 15	/		
16.	Cycle 16	/		
17.	Cycle 17	/		
18.	Cycle 18	/		
19.	Cycle 19	/		
20.	Cycle 20	/		

This section outlines the programming sequence based on the full function test to provide a clear visual representation, with detailed comments on each step tested. 1 w



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9. Deviation List

Deviation List for VAC Car Headlamp Installation

a. Introduction

This document provides a list of deviations observed in the bottle inspection system. Each deviation is categorised, described, and provided with a suggested corrective action to ensure the system operates within the specified parameters.

b. Deviation Summary

Deviation ID	Date	Description	Proposed action
DEV001	6/6/24	Sequence no 10 in question project skipped	Pass or skip sequence no 10 in question project
DEV002	6/6/24	Conveyor stop and system not function properly if the Jig are rebound on Stopper 7 Lock (Y22)	Add a some action for delaying the signal or change the speed to avoid false detection

c. Detailed Deviation Descriptions

DEV001: Incomplete sequence from the control system requirement

- Description: System cycle will repeat automatically based on the numbers of Raw material available in the raw material Jig. Number of Raw Material shall be input in Maintenance Mode.
- Category: Replaced
- Severity: High
- Reason: Customer request
- Corrective Action: Pass or skip sequence no 10 in question project.



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DEV002: Jig rebound on stopper 7 cause system not working like regularly

- Description: Conveyor stop and system not function properly if the Jig are rebound on Stopper 7 Lock (Y22)
- Category: Weight Issue
- Severity: High
- Reason: Commissioning Engineer
- Corrective Action: Use suggested speed to run the sequence smoothly without any hiccup or foolproof. Delay time also can be added to avoid false detection.

d. Tips for Managing a Deviation List

- **Regular Updates:** Keep the list updated regularly to ensure all deviations are documented and addressed promptly.
- **Assign Responsibility:** Clearly assign who is responsible for each deviation to ensure accountability.
- **Investigate Causes:** For each deviation, investigate the root cause to prevent recurrence.
- **Communicate:** Ensure all relevant stakeholders are informed about deviations and corrective actions.

e. Conclusion

The deviations listed above highlight areas where the whole system requires improvements. Addressing these deviations promptly will help ensure the system operates efficiently and maintains high-quality standards.



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Prepared by

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10. Punch list

Punch list for VAC Car Headlamp Installation

a. Introduction

In project management, particularly in construction and manufacturing, a punch list is an essential tool used to identify and document tasks that need to be completed, corrected, or inspected before a project can be considered fully complete. A well-maintained punch list ensures quality control, helps achieve project completion, satisfies stakeholder requirements, and provides thorough documentation of the project's status. Below is an example of a detailed and effective punch list.

ID	Task Description	Date identified	Responsible party	Due date	Comment
001	Sequence no 10 in question project skipped	6/6/24	Commissioning team	9/6/24	Eliminate sequence no 10
002	Jig rebound on stopper 7 cause system not working properly	6/6/24	Commissioning engineer	10/6/24	Add delay time or find suitable speed from the parameter setting provided

b. Detailed Punch Descriptions

001: Sequence no 10 in question project skipped

- Description: System cycle will repeat automatically based on the numbers of Raw material available in the raw material Jig. Number of Raw Material shall be input in Maintenance Mode.
- Category: Replaced
- Corrective Action: Eliminate sequence no 10 in system requirement

002: Jig rebound on stopper 7 cause system not working properly

- Description: Jig rebound on stopper 7 (Y22) and the conveyor stop because of the S35 using positive edge on Y22
- Corrective Action: Add a delay time between DIFD signal and conveyor sequence on programme or use an ideal speed recommended from Functional manual. The

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suitable speed must be found according to the current operational condition of the motor.

c. Tips for Managing a Punch List

- **Clear Descriptions:** Ensure each task description is clear and specific to avoid misunderstandings.
- **Regular Updates:** Regularly update the punch list to reflect the current status of each task.
- **Assign Responsibility:** Clearly assign each task to a responsible party to ensure accountability.
- **Set Deadlines:** Establish realistic deadlines for each task to keep the project on track.
- **Follow-Up:** Conduct regular follow-up inspections to verify that completed tasks meet the required standards.

d. Conclusion

A punch list is a crucial tool in project management, ensuring all tasks and quality standards are met before project completion. It enhances quality control, ensures efficient completion, satisfies stakeholders, clarifies accountability, and provides comprehensive documentation. Regularly updating the punch list helps project managers address all issues promptly, ensuring a thorough and high-quality project outcome.