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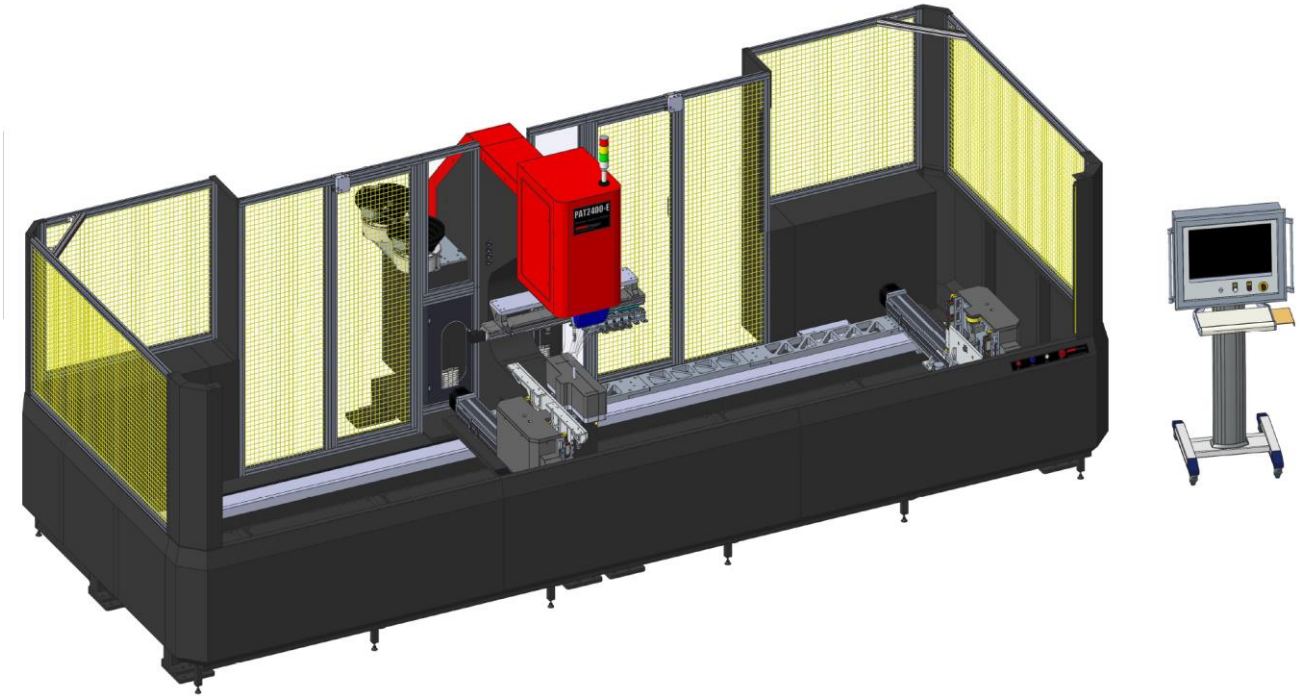

OPERATION AND MAINTENANCE MANUAL FOR PEMSERTER®
PAT2400-E Hardware insertion machine

OPERATION AND MAINTENANCE MANUAL

Hardware Insertion Machine

MODEL: PAT2400-E

SERIAL NUMBER: T24E240004

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Preface

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CONTENTS

SECTION 1 INTRODUCTION 1
SECTION 2 MAJOR COMPONENTS OF HARDWARE INSERTION MACHINE 8
SECTION 3 SAFETY SYSTEM OPERATION 19
SECTION 4 INSTALLATION OF HARDWARE INSERTION MANCHINE 24
SECTION 5 GENERAL FUNCTION DESCRIPTIONS 28
SECTION 6 TOUCH-SCREEN CONTROLS 30
SECTION 7 PNEUMATIC SYSTEM 52
SECTION 8 ELECTRICAL SYSTEM 54
SECTION 9 MAINTENANCE 56
SECTION 10 TROUBLESHOOTING 62
SECTION 11 SPARE PARTS 65
Appendix Electrical Schematic 68

Read Manual Before Operating Machine!

SECTION 1
INTRODUCTION

Use:

- This equipment is used for the riveting of some PEM screws, nuts and studs fastening products.
- This equipment is composed of a touch screen, a safety punch, a feeding system, a tooling fixture and an XYZ high speed mobile platform. The product to be riveted can be sent to the tooling fixture through the feeding system as required, and the product to be riveted can be riveted through the safety punch Press to the workpiece to complete the riveting process.
- According to different processes and workpieces, the tooling fixtures corresponding to different products can be replaced automaticly to achieve the purpose of riveting and connecting different products.

Features:

- Unique precise pressure riveting force and energy-saving riveting power consumption.
- Computer control system with touch screen interface.
- The riveting algorithm is intelligent, can display the pressure-position curve, and has the function of parameter memory and curve memory.
- Provide simple and precise control for operators. The design of the machine setting, operation, maintenance and fault diagnosis is simple and easy to use.

Specifications:

• Riveting Force	8~80kN (1798.5-17984lbs)
• Control System	Servo motor system
• Repeatability	±0.5% pressure accuracy ±0.02mm position accuracy
• Air requirements	6~7bar Φ12 mm dia. minimum line flow
• Depth	3100mm
• Width	6600mm
• Hight	2300mm
• Weight	6200kg
• Electrical	AC400V（+/- AC 23 V）, 50Hz
• Short-Circuit Rating	5kA
• Air Consumption	approx. 2 liters/sec air at 1 Atm (15 Scfm) 6 insertions per minute
• Electrical Power Consumption	13.5kW
• Ambient Temperature	5°C~40°C （41°F ~ 104°F）
• Transport/Storage Temperature	-13°F to +130°F (-25°C to +55°C) and for short periods not to exceed 24 hours up to 160°F (70°C)
• Ambient Humidity	30% ~ 95% (Not reflective of inlet air)
• Installation Altitude	Max 1000m

- Installation requires horizontal installation on load-bearing ground
- EMC requires Do not allow a lot of electromagnetic interference around
- Light requires adequate illumination at the operating points and areas

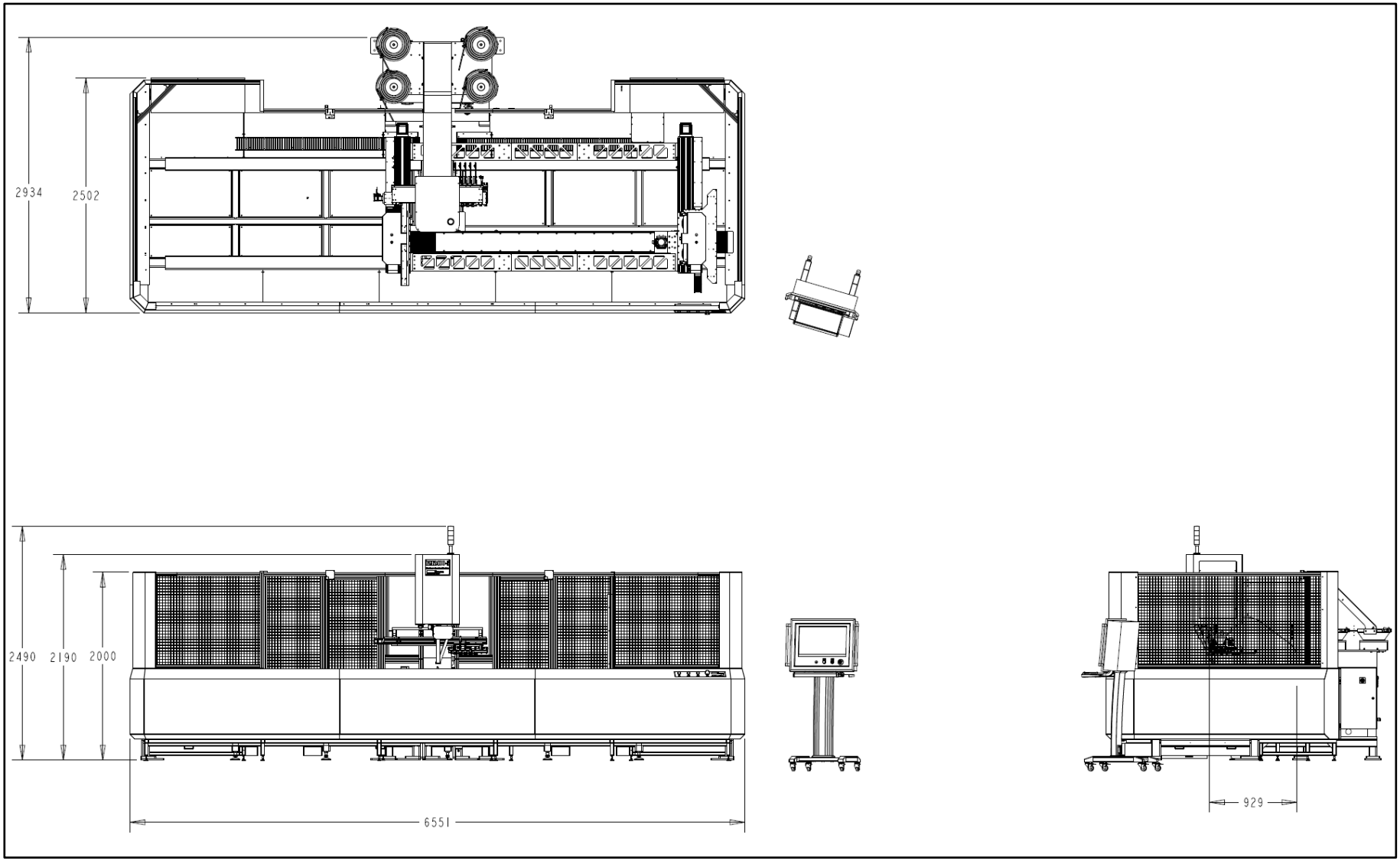


FIGURE 1-1

Dimensions of PAT2400-E Hardware insertion machine

SAFETY

The Rivet Installation Machine PAT12000-E was designed to conform to applicable ISO, ANSI, OSHA, CEN and CSA safety standards.
The Rivet Installation Machine PAT12000-E is compliant to applicable European Union (EU) directives and bears the CE Mark.
The Rivet Installation Machine PAT12000-E conforms to the essential requirements of the following directives:

Machinery Directive: 2006/42/EC
Electromagnetic Compatibility (EMC) Directive: 2014/30/EU
Low Voltage Directive: 2014/35/EU

MEASURES TO PREVENT MISOPERATION

• The equipment shall be provided with a permanent, clear and easily identifiable mark or signage. The signs or signs shall have the main characteristics required for safe use of equipment, such as rated parameters, connection mode, grounding mark, danger mark, special operation method and operation conditions, etc.

• Electrical control circuit with emergency stop button specified in safety requirements to prevent the occurrence of misoperation. At the same time, the device is equipped with interlock or limit protection device, safety grating, etc.

• Through the above safety device, if there is any wrong operation, the equipment will stop running in an emergency and send an alarm message the equipment can operate normally only after the warning information is processed.

• Riveting nuts approved by PEM shall be used in this equipment, and riveting workpiece on this equipment shall also be approved by PEM.PEM shall not be liable for any operation accident or loss caused using rivet and rivet pressure parts not approved by PEM.

Please read and follow the safety precautions listed as below.

SAFETY PRECAUTIONS

- Always use safety goggles when operating or maintaining the rivet installation machine.
- Ear Protection is recommended.
- Always shut off the electrical power and remove the power cord before servicing the Hardware insertion machine.
- Before using the Hardware insertion machine, make sure that a shutoff device has been fitted on the air supply line and the location is easily accessible, so that the air supply to the rivet installation machine can be shut off in an emergency. Make sure that surge protection is installed in the electrical supply to the rivet installation machine.
- Check the air hose and fittings regularly for wear.
- Use only approved parts for maintenance and repairs.
- Do not use chipped, cracked or damaged accessories and tools.
- Attach airline securely.
- Keep body parts away from moving parts.
- Never wear jewelry, loose clothing or anything that could get caught in moving parts.
- If a new user is operating the pull riveting machine, be sure these instructions are readily available.

- Do not use the Hardware insertion machine in any way, other than for its intended purposes.
- Do not modify the Hardware insertion machine in any way.
- Fasteners are blown at a high velocity. Tubing must always be secured before machine is operated. Check integrity of tubing before use.
- Non-professionals are prohibited from disassembling this equipment.
- All personnel operating this equipment must be trained and qualified before they can take up the post of operation.
- All personnel operating this equipment must be trained and qualified before they can take up the post of operation.

WARNING: Immediately upon receipt of your hardware insertion machine, establish a "Maintenance Code" for your supervisor/maintenance personnel only, as it is possible, however difficult, to operate the rivet installation machine without the standard safeguards in place in the Maintenance Mode. Only trained personnel should use the Maintenance Mode. PennEngineering is not responsible for improper maintenance mode procedures, which result in a loss of operation of the press or operator safety.

Label	Definition
	General Warning Label – There are items that require attention. These are specified in the operator's manual.
	Eye Protection Label – Eye protection must be worn when operating the press.
	Ear Protection Label – Ear protection must be worn when operating the pull riveting machine.
	Fastener Mandrel Point Label – Keep hands away from area.
	Electrical Shock/Electrocution Warning Label –Electrical shock hazard. Do not touch

WARRANTY

PennEngineering® warrants that this product, when correctly used according to directions and under normal operating conditions, will be free from defects in material and workmanship for a period of one (1) year from the date of purchase.

This warranty shall not apply to any product which has been altered, changed or repaired, normal maintenance excluded, except as authorized by PennEngineering®. This warranty shall not apply to any product that has been subject to misuse, negligence or accident.

The purchaser's exclusive and sole remedy shall be limited to repair, modification or replacement at the discretion of PennEngineering®. In no event shall PennEngineering® be liable for the cost of any indirect or consequential damage. In no case shall PennEngineering® liability exceed the purchase price of the product.

This warranty is exclusive and in lieu of all other warranties. No oral or written information by PennEngineering®, its employees, representatives, distributors or agents shall increase the scope of the above warranty or create any new warranty.

Should any questions or problems arise concerning your rivet installation machine, contact the PennEngineering® Service Department. Toll-free telephone number +86(512) 5726-9310.

Set-up, Training and Repair Service is available to you if you own your rivet installation machine. Free telephone instruction and Service is available for the lifetime of your rivet installation machine by calling the PennEngineering® Service Department.

SECTION 2
MAJOR COMPONENTS OF HARDWARE INSERTION MACHINE

Dentify the main components of the Hardware Insertion Machine.

This chapter introduces users to some of the main components of the Hardware Insertion Machine.

Main Frame

The frame is the structure of the hardware insertion machine. The main part of the frame consists of a solid steel structure with welded components forming the foundation, and other supporting parts. All components are directly or insightly installed on the frame.

Electric cylinder

The riveting force of the hardware insertion machine is applied by the electric cylinder, which is directly installed on the frame. The electric cylinder is equipped with a pressure sensor to determine whether the electric cylinder has reached the set pressure during the riveting process. The end of the piston rod of the electric cylinder relates to a safety punch assembly, which will be described in Chapter 3.W

XYZ high speed mobile platform

The three-axis platform drives the product to achieve precise movement in the three directions of X, Y, and Z. The XYZ platform mainly includes the X-axis moving part, the Y-axis moving part, and the Z-axis moving part. The movement of each axis is achieved by the servo motor driving the linear module, and there are high-precision guide rails to assist in guiding, with high repeatability and positioning accuracy.

Operator control

Except for the foot switch and the power switch on the electric cabinet, the operator's main operations are on the control panel on the **PMCS**. These control components include a touch screen, an emergency stop button, a power on button, and a spring reset button.

- **PMCS（PennEngineering machine control system）-**This is the main interface of the hardware insertion machine control system (Programmable Automation Controller (PAC)). The screen is used for system operation, control, parameter setting and automatic feeding adjustment and configuration, user feedback and fault diagnosis. The screen can display text and graphic information and aenables the operator to make selections by touching the buttons on different parts of the screen. The program has set the touch screen to automatically enter the screen saver mode when it is idle every 10 minutes and clear the content displayed on the screen. To resume the operation of the screen, just press any key on the keyboard. In Chapter 6 of this manual, the screen display in various situations is explained in detail.

- **Emergency stop button-**Press this button to disconnect the power supply to the quick exhaust/air supply valve (see the air supply input system on page 8). When the pressure is exhausted, all

pneumatic actions are stopped. In an emergency stop condition, all outputs are shut down. The control system remains online and detects the emergency stop signal.

- **Power ON/OFF knob switch**- This knob switch can be used to turn on/off the power to the press control system, if the press power is on, then the green light of the electrical cabinet is on. If the power is cut off, it will also cut off the power of all moving elements including the quick exhaust/air supply valve.

- **RESET button**- Initializes the press, including applying pressure to the press and moving the ram to its retracted "home" position.

- **Foot switch**-The foot switch is a switch used by the operator to control the working cycle of the riveting machine. It frees the hands of the operator and can be used for the operation of the workpiece.

Electrical cabinet

Including different types of electrical components and power distribution terminals. The power switch and the foot switch are connected with the electrical cabinet. Electrical cabinet door latch with a key, is an electrical switch cabinet side. The electrical switch must be turned on (ON) before the riveting machine can be started. Once this switch is turned off, all power to the riveting machine is cut off. The plug of the power cord is inserted next to the switch. By unplugging the power cord, all power supplies of the riveting machine can be shut off during maintenance.

Vibration feeding system

The vibrating feed system on the left side of the hardware insertion machine is used for the automatic feeding of fastened riveting parts. It is an electric drive device that can hold and move 8 different types of fastening products. Connected to the vibrating plate are various types of tools so that the fastening rivets sent out of the hopper have their own directions of movement.

• Vibrating feeding controller-the amplitude or frequency of the vibrating plate is controlled by the vibrating feeding controller. The adjustment of amplitude and frequency is used to control the feeding rate and carry out the automatic feeding process.

Upper mold changing mechanism

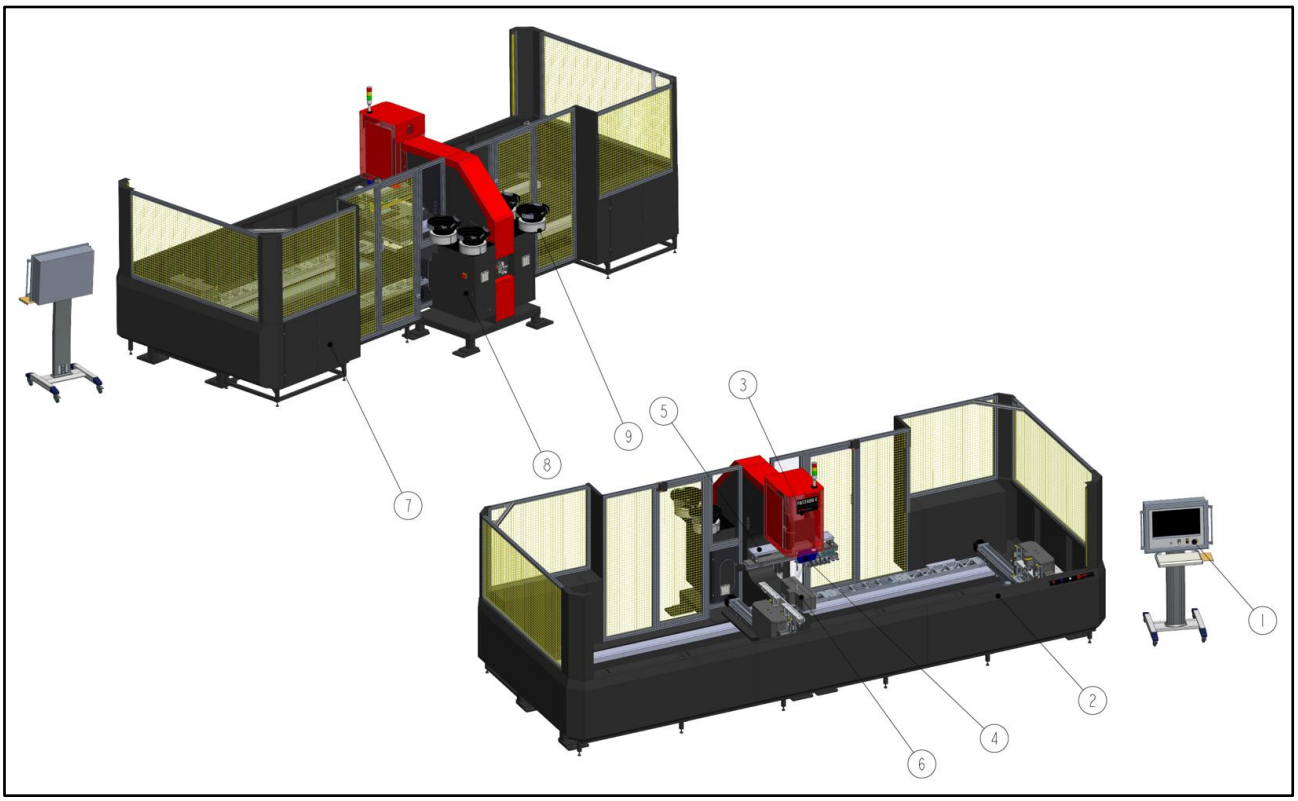
It consists of servo motor, linear module, slide cylinder, guide rail, buffer, material pipe, material pipe joint and carrier. Different types of PEM standard products correspond to different carrier platform tools. The upper mold change mechanism automatically switches to work with the corresponding feeding system and lower mold change mechanism.

Lower mold changing mechanism

It is composed of servo motor, screw module, pen-shaped cylinder, guide rail, buffer, and lower mold. Different types of PEM standard products correspond to different lower mold tooling, and the lower mold change mechanism automatically switches to work with the corresponding feeding system and lower mold change mechanism.

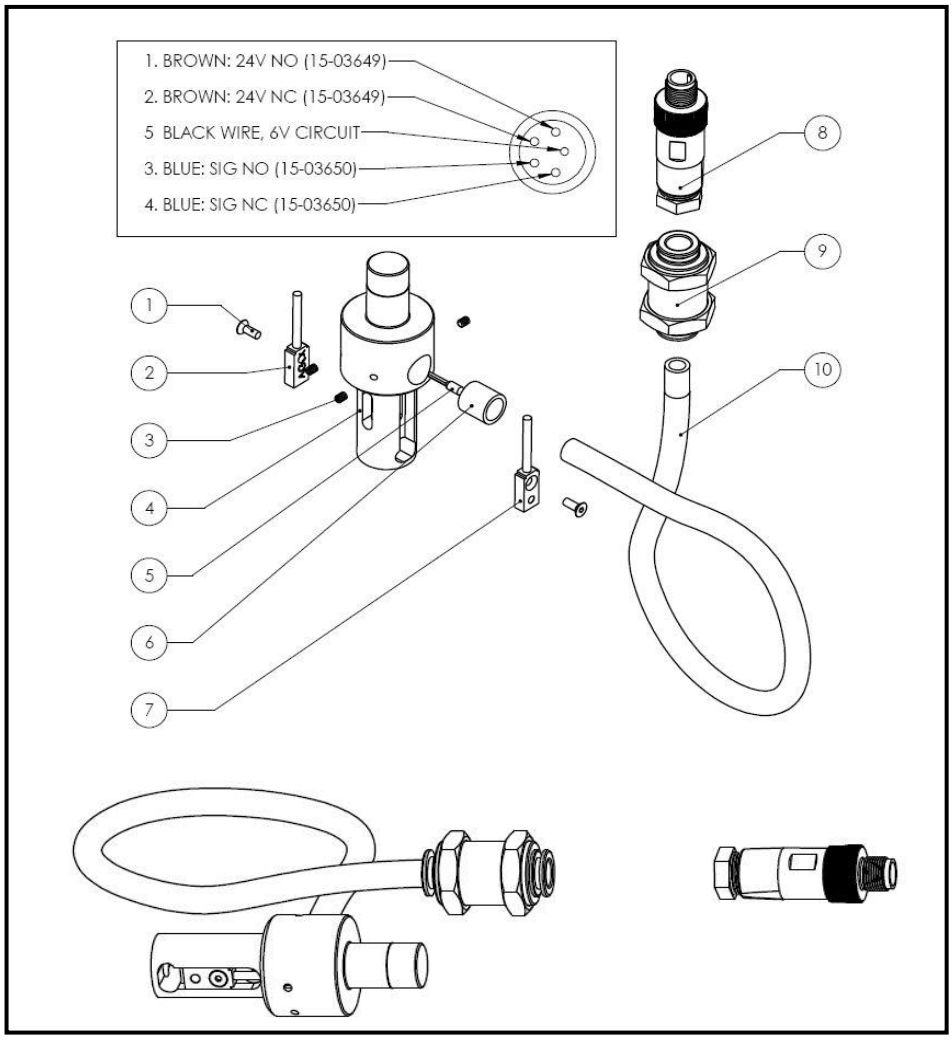
Binocular vision guidance system

The binocular vision system is mainly composed of two sets of camera lenses, light sources, and image processing industrial computers. It uses binocular vision technology to achieve precise positioning of workpieces and guide the XYZ mobile platform to move the product to the exact position where riveting is required.



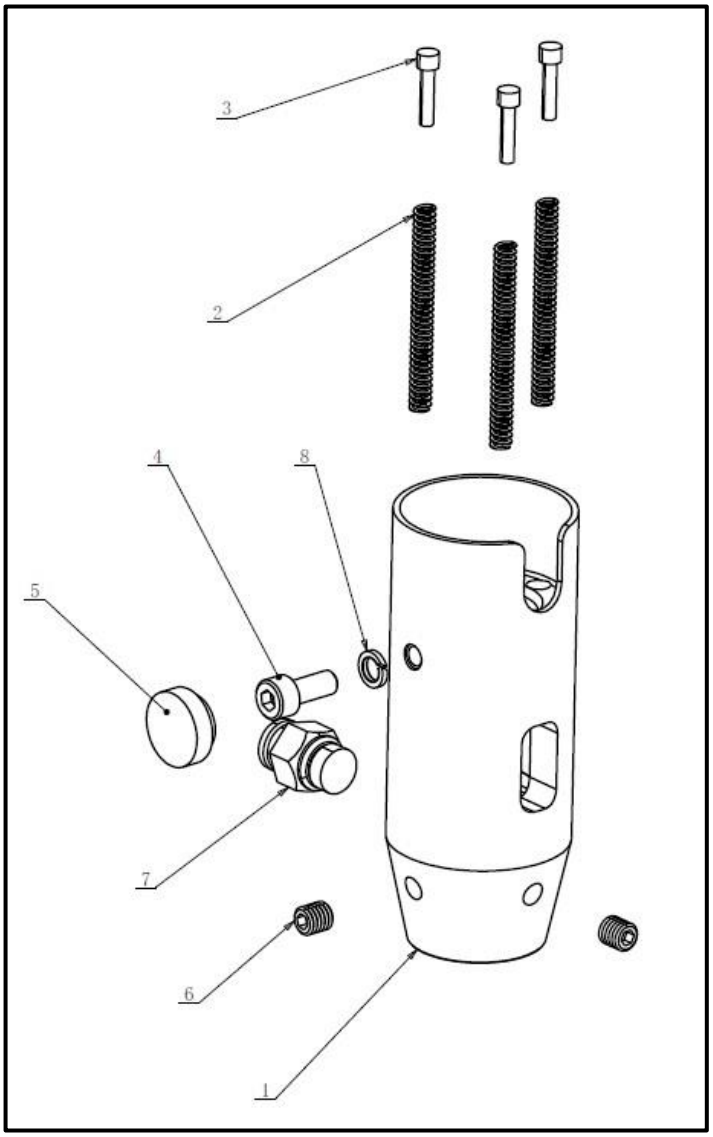
NO.	PARTS NUMBER	DESCRIPTION
1	MDS100220001	Mobile ConsoleZ
2	MDS183720006	three-axis platform assembly
3	MDS012330002	80KN Electric Cylinder
4	MDS026430007	Structured light 3D camera
5	MDS180420020	upper mold change mechanism components
6	MDS181520007	lower mold change assembly
7	MDS180130154	Platform Electrical Cabinet Components
8	MDS184530054	Press Electrical Cabinet Assembly
9	15-40015	T series vibration plate assembly (MAS350)

FIGURE 2-1
The components of PAT2400-E Hardware insertion machine



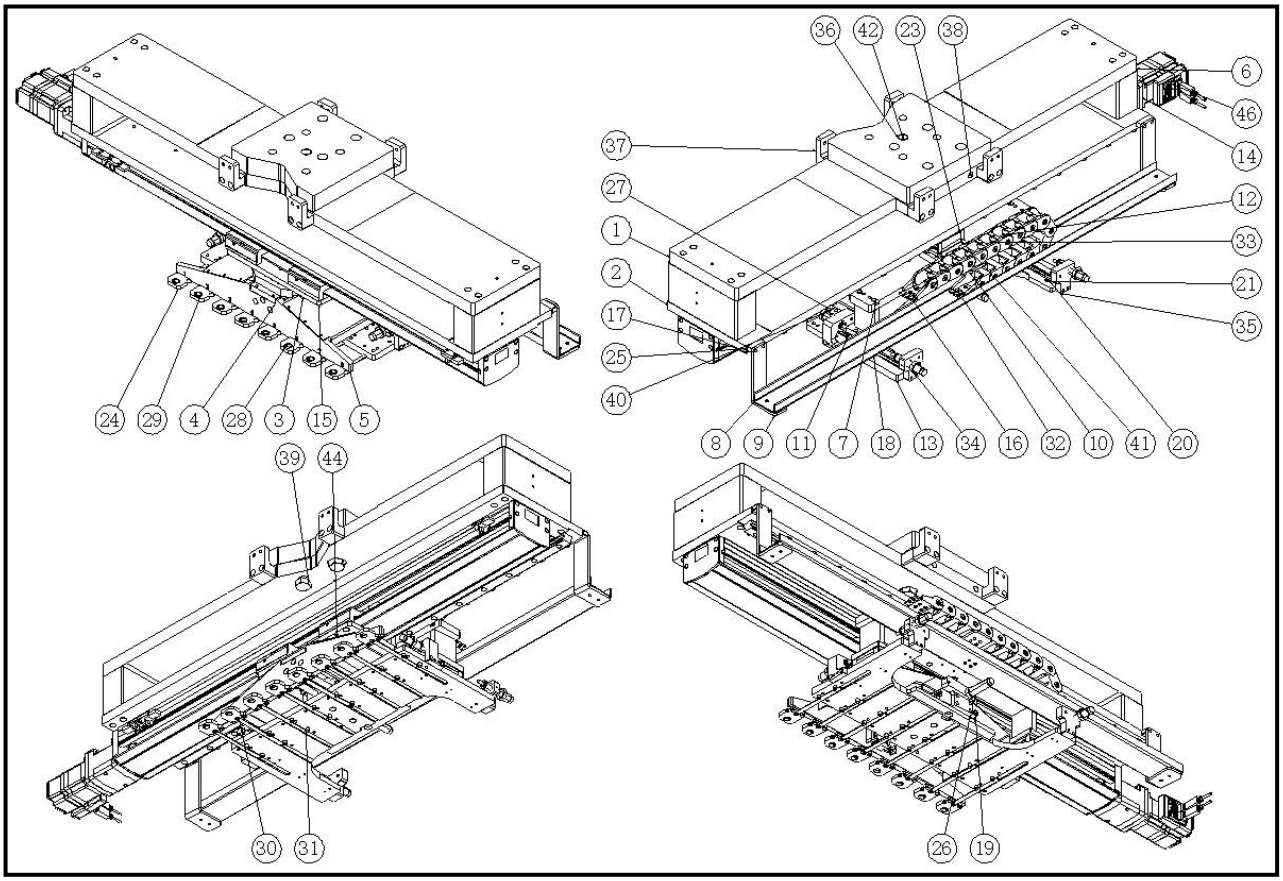
NO.	PARTS NUMBER	DESCRIPTION	QTY
1	15-01708	FHCS, M3×0.5×10MM	2
2	PS210815	SAFETY SENSOR of LEFT, TURCK, NO	1
3	H-3892	SHSS, M3×0.5×4MM, BLACK OXIDE	3
4	PS210799	RAM ADAPTER, SAFETY SENSOR, 2nd GEN	1
5	10-00765	FERRULE, 18 GA, YELLOW	1
6	PS210801	BUSHING, 3/8" ID×1/2" OD	1
7	PS210815	SAFETY SENSOR of RIGHT, TURCK, NO	1
8	15-01450	CONNECTOR, 5 PIN, MALE	1
9	15-03209	FITTING, 3/8", BULKHEAD UNION	1
10	15-03208	HOSE, 3/8", AIR	1

FIGURE 2-2
Dual Safety Sensor Assembly (MDS101220002)



NO.	PARTS NUMBER	DESCRIPTION	QTY
1	MDS101230003	BODY, UPPER TOOL HOLDER, SAFETY SENSOR	1
2	15-03206	CONTINUITY SPRING, 1 ¾" UNIVERSAL	1
3	11-00016	CONTINUITY GUIDE PIN	1
4	H-3738	SHCS, M5×0.8×12MM, BLACK OXIDE	1
5	11-00241	THUMB SCREW CAP	1
6	11-00242	SHSS, M6×1.0×6, BLACK OXIDE	1
7	MDS012030040	Quick-change connector	1
8	15-01392	Spring pad	1

FIGURE 2-3
Upper Tool Holder Assembly(MDS101220005)

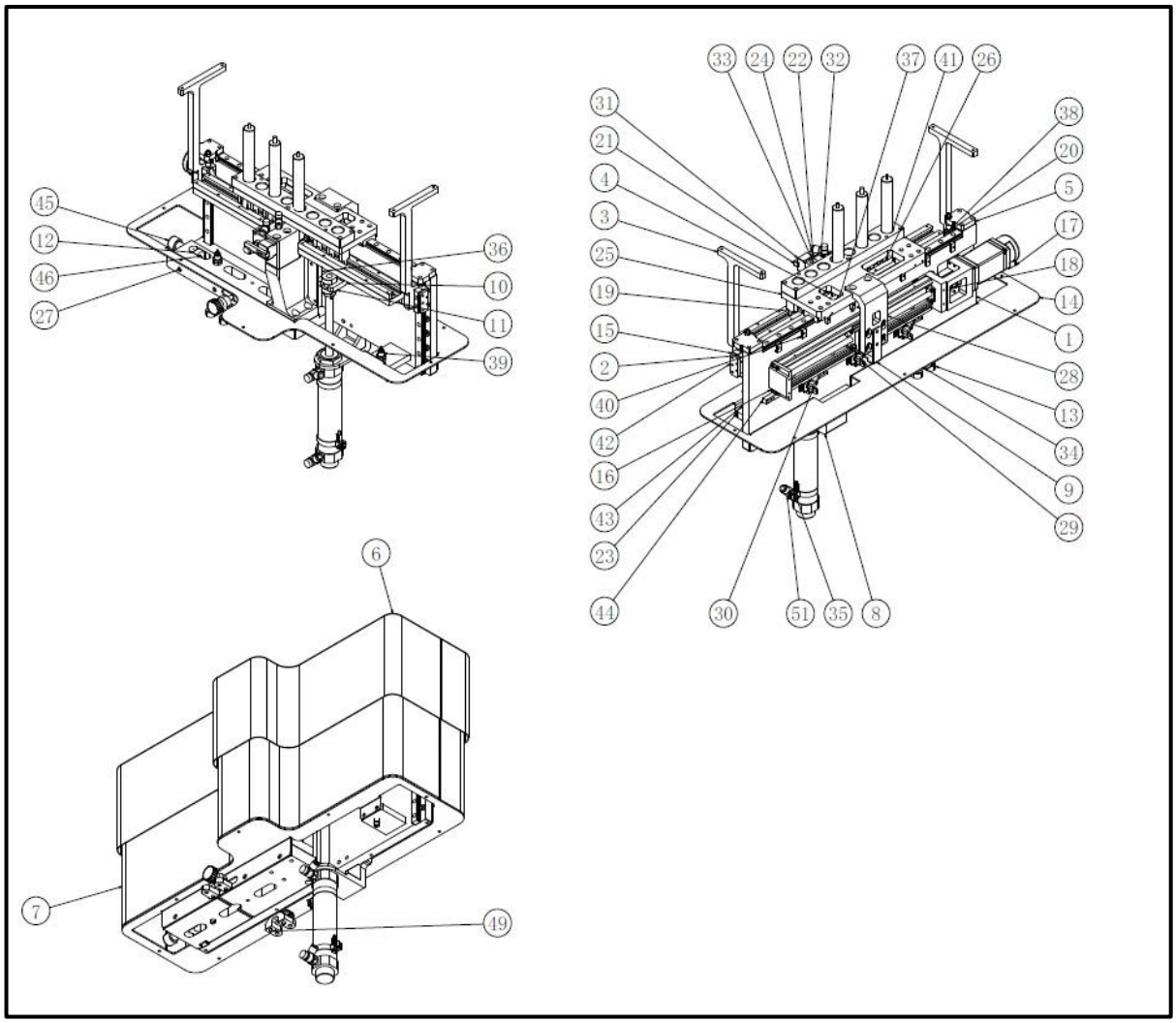


NO.	PARTS NUMBER	DESCRIPTION	QTY
1	MDS180430065	Upper module mounting base plate	1
2	MDS180430066	Linear module mounting plate	1
3	MDS180430067	Slider transition plate	1
4	MDS180430068	Air slide connection plate	1
5	MDS180430069	Air slide front mounting plate	1
6	MDS180430070	Module mounting base block	2
7	MDS180430071	Slide rail mounting plate	1
8	MDS180430072	Drag chain rolling groove	1
9	MDS180430073	Drag chain connection plate	2
10	MDS180430074	Drag chain moving mounting plate	1
11	MDS180430075	Guide rail slider mounting plate	2
12	MDS180430076	Guide rail mounting vertical plate	2
13	MDS180430078	Moving push plate	1
14	MDS183730012	Slide table module (SK8, S650)	1
15	MDS180430079	Slide table module upper connection plate	1
16	MDS012030167	Air Slide Table, 20×50	1
17	MDS012030168	Heavy load slide rail (MX28, S940)	1
18	MDS014630034	Heavy load slide rail (MX24, S160)	2
19	MDS011830082	FLOW CONTROL VALVE, METER OUT 6	2

20	MDS012930290	Straight rod locating pin 2.5-10	6
21	MDS012930291	Hexagon socket flat head bolt M3×8	6
22	PS191290	Straight rod locating pin	21
23	MDS012930292	Hexagon socket countersunk screw M5×12	16
24	MDS100430019	Mount, Tube Connector	8
25	MDS180430080	Drag chain mounting plate heightening pad	2
26	MDS180430081	Mounting Block, Backstop, Air Table	1
27	MDS180430040	LID, TUBE CONNECTOR, PA80SH	8
28	11-00238	SSS M5-0.8 x 6 LG	8
29	H-3681	Spring Plunger, #10 Steel	8
30	15-01709	FHSCS, M2 X 0.4 X 4MM, BLACK OXIDE	8
31	MDS012930178	PIN DOWEL 1/4" × 1/2", STEEL	16
32	MDS014630035	Drag chain	1
33	MDS180430082	Buffer connection block	2
34	MDS013130035	Hydraulic buffer	4
35	MDS180430083	Buffer rear connection plate	2
36	MDS180430084	Upper die set transition mounting plate	1
37	MDS180430085	Adjustment top plate	4
38	MDS180430086	Adjustment top plate pad	1
39	MDS012930293	Hexagonal head bolt M16×50	4
40	MDS180430088	GUARD, SHUTTLE, T1200, UPPER TOOL CHANGER ASSY	1
41	MDS180430087	Slider pad	1
42	MDS012930294	Locking pin Internal thread type	1
43	PS192916	Locking pin	22
44	MDS012930295	PIN DOWEL 6 × 12mm	7
45	8024048	Straight rod locating pin	8
46	MDS025330042	Integrated stepper servo motor	1

FIGURE 2-4

Upper mold changing mechanism components (MDS180420018)

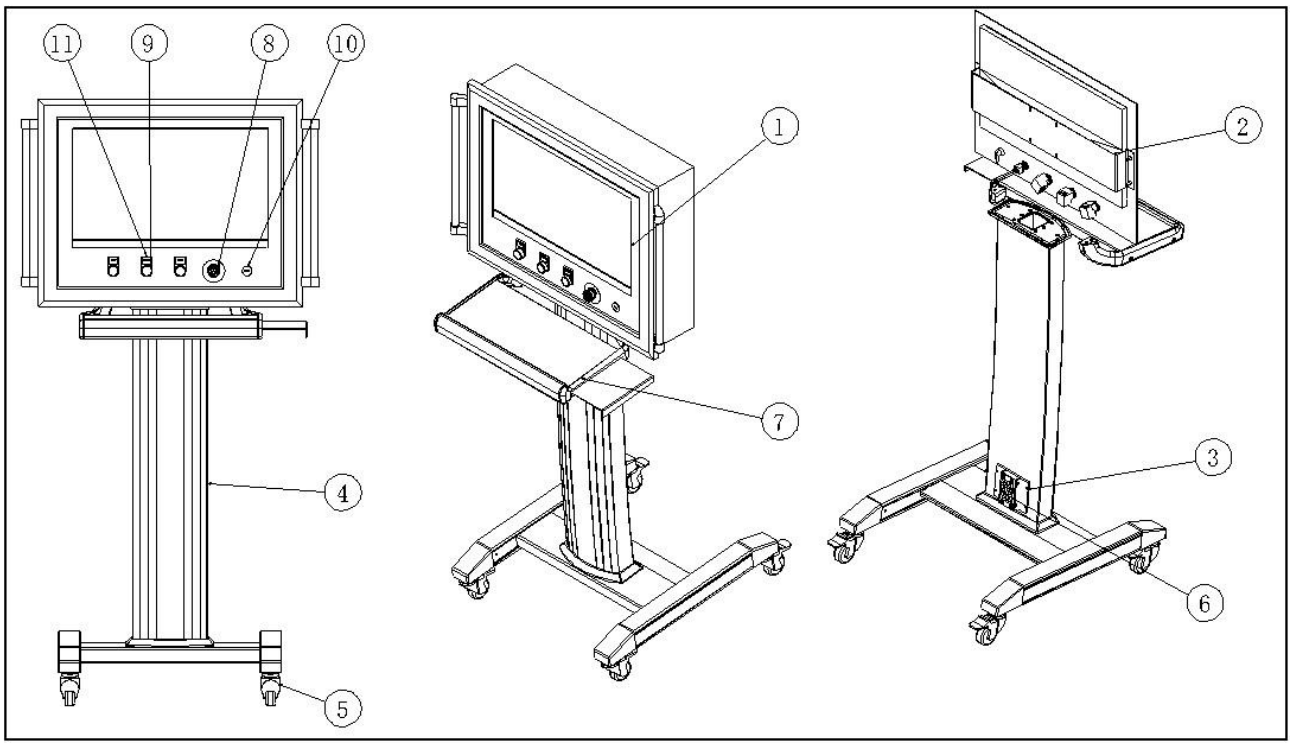


NO.	PARTS NUMBER	DESCRIPTION	QYT
1	MDS181530043	Lower die change base base plate	1
2	MDS014630025	Slide rail + slider	2
3	MDS181530044	Guard top plate	2
4	MDS181530045	Lower die pad	1
5	MDS181530046	Buffer mounting plate	2
6	MDS181530047	Lifting side plate	1
7	MDS181530048	Protective side plate	1
8	MDS181530049	Cylinder fixing plate	1
9	MDS181530050	Groove photoelectric sensor sheet	1
10	MDS101630086	Cylinder fixing block	1
11	MDS101630087	Cylinder floating joint	1
12	MDS181530051	Front and rear adjustment top block	1
13	MDS101630089	Left and right adjustment top block	2
14	MDS181530052	Protective bottom plate	1

15	MDS181530053	Lifting seat	1
16	MDS013730021	Linear module	1
17	MDS015330006	100w servo motor, no brake, with keyway	1
18	MDS013330011	Coupling	1
19	MDS014630012	Linear rail	1
20	MDS041630558	Limiting block	4
21	MDS041630561	Slider seat	1
22	MDS041630622	Slider head	1
23	MDS041630576	Buffer mounting plate	1
24	PS180676	Speed control valve	2
25	MDS181530054	Linear positioning block	1
26	MDS041630566	Push block	9
27	MDS181530055	Bottom connecting plate	1
28	MDS181530056	Power block	1
29	PS171252	Photoelectric switch	3
30	MDS101630077	Sensor bracket	3
31	MDS041630671	Square die change insert block	1
32	MDS012030139	Cylinder	1
33	MDS041630670	Square die change insert seat	1
34	10-00214	Plastic Black Knob	2
35	MDS012030151	Cylinder	1
36	MDS100130058	Reinforced support	1
37	MDS101630056	Clamping top block	1
38	PS100653	Buffer	2
39	PS192456	Buffer	2
40	MDS181530057	Linear guide positioning plate	8
41	MDS181530058	Circular positioning plate	1
42	MDS181530059	Rising linear guide positioning plate	1
43	PS140034	POSITION PIN	12
44	MDS181530060	Module positioning plate	2
45	MDS181530061	SHCS, M12 MODIFIED	1
46	MDS181530062	PIN, LOWER TOOL HOLDER, T1200	1
47	8024048	Straight rod locating pin	12
48	PS192916	Locking pin	4
49	PS191290	Straight rod locating pin	6
50	MDS012930295	PIN DOWEL 6 × 12mm	4
51	PS191528	Speed regulating valve	2
52	PS191291	Straight rod locating pin	2

FIGURE 2-5

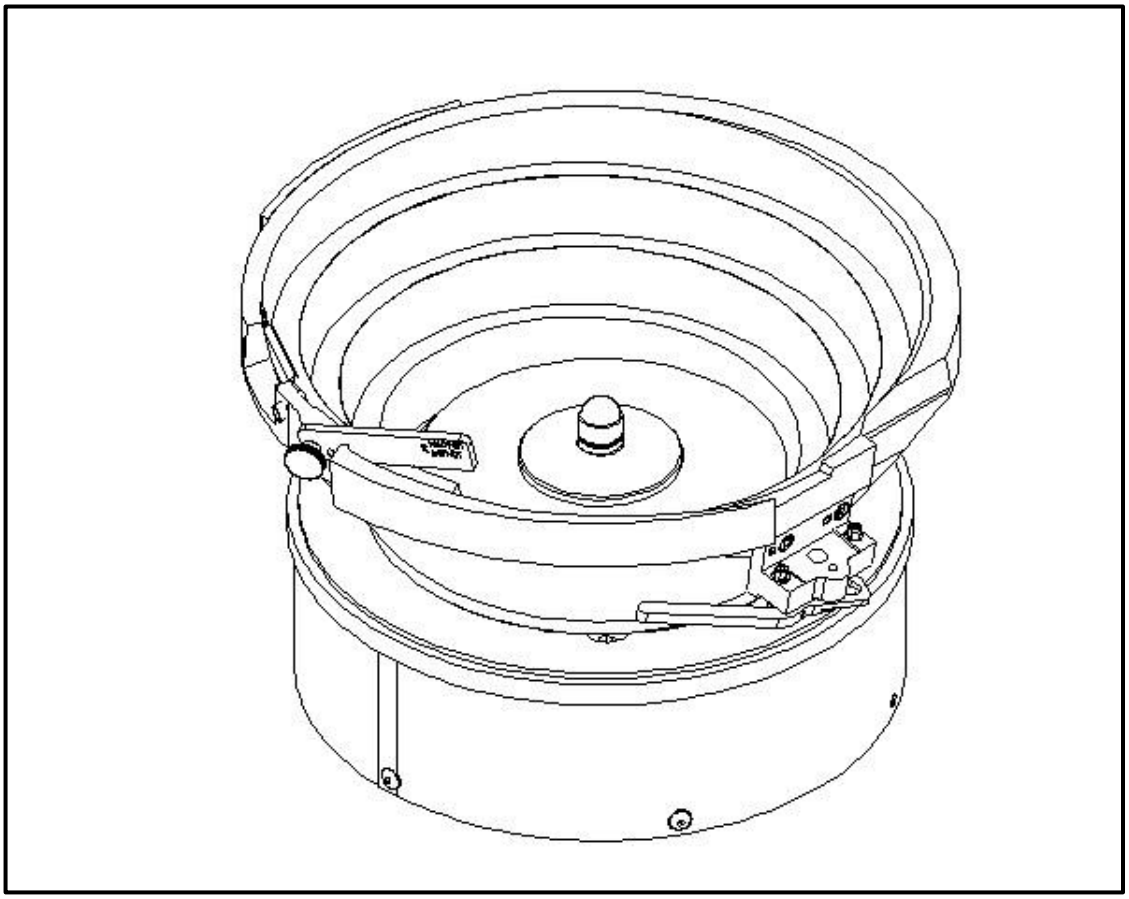
Lower mold assembly（MDS181520007）



NO.	PARTS NUMBER	DESCRIPTION	QTY
1	MDS100230003	T1200 control box	1
2	MDS100230004	monitor mounting plate	1
3	MDS100230005	adapter plate	1
4	PS160780	bracket	1
5	PS160781	casters	1
6	MDS026930094	54216 § KEL-U 10_6	1
7	MDS010230007	keyboard bracket	1
8	PS210477	3SB66JRR01 rotary reset emergency stop 1NC	1
9	PS210469	3SB66D3G10 green flat head with light 1NO	2
10	PS170066	panel mounted USB harness elbow type (1m)	1
11	PS210483	3SB69H18 25*18 label holder	2

FIGURE 2-6

Mobile console (MDS100220001)



NO.	PARTS NUMBER	DESCRIPTION	QTY
1	15-40015	ASSY, MAS 350 50 HZ	8

FIGURE 2-7

Vibration feeding assembly

SECTION 3
SAFETY SYSTEM OPERATION

WARNINGS - To avoid injury:

1. Always shut off the electrical power, and remove the power cord, before servicing this machine.
2. Only authorized and trained personnel should maintain, repair, setup, or operate this equipment.
3. Always use eye protection when operating or maintaining the pull riveting machine.

3.1 SYSTEM SAFETY FEATURES

1. Turning off the electrical power, with either the “OFF” push-button, the ON/OFF switch, or pushing the E-Stop button, will cause the electric quick exhaust/supply valve to exhaust all air pressure in the rivet installation machine. WITHOUT ANY CONTAINED PRESSURE, ALL PNEUMATIC MOTION STOPS.
2. The electrical cabinet has been locked with a key to prevent unauthorized personnel from opening it.
3. Has a first-level password protection measure for safe access.

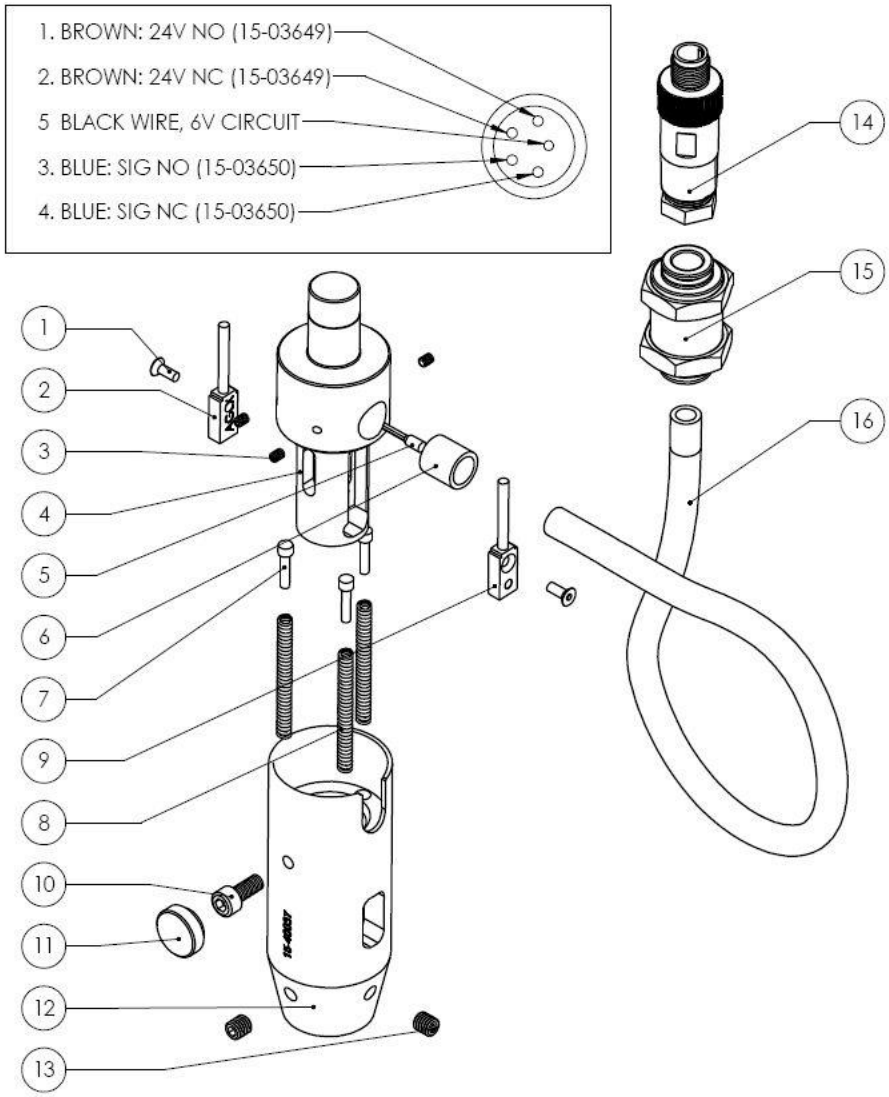
3.2 SECURITY OF USAGE MODE

The Safety System relies on the Dual Safety Sensor inside the Cylinder Ram Adapter, and position monitoring fulfilled by the Tooling Protection System (TPS). The Upper Tool Holder Retainer Screw secures the Upper Tool Holder to the Cylinder Rod. There is a black serrated knob on this Retainer Screw. It enables the Upper Tool Holder to move up on the Cylinder Ram Adapter .45 in/11.4 mm. To move up, the Upper Tool Holder must overcome the light force of the Continuity Spring.

If the Upper Tool Holder moves up .015 in/0.4 mm to 0.02 in/0.5 mm, the Safety Sensor will lose the target in the upper tool holder. Sensors should change state simultaneous otherwise the machine will bring the ram up.

Before each cycle the state of the 2 sensors in the ram adapter are monitored by the dedicated Safety Controller to ensure the upper tool holder is installed, and in released state.

In operation, when the Safety Sensors is actuated in Conductive Mode and a non-conductive material is between the Upper and Lower Tools, the Upper Tool Holder’s downward motion is reversed immediately and returns to its Up position. If the Safety Sensors is actuated and a conductive material is between the Upper and Lower Tools, the machine will continue the hardware insertion cycle if inside the TPS window. The machine will apply the set down force to the conductive material between the Upper and Lower Tools and then return to its Up position.



Risk of crushing-A high risk crushing hazard is created by the Upper Tool and Lower Tooling.

Warning-Safety of the operator in non- conductive access operation must remain accessible only to trained and authorized personnel that are experienced in appropriate machinery operating conduct.
Do not operate this machine while wearing any metal objects (i.e., rings, watches, bracelets, etc.) that may come into contact with the Upper Tool,Lower Tool or work piece.

WARNING: Immediately upon receipt of your hardware insertion machine., establish a "Maintenance Code" for your supervisor/maintenance personnel only, as it is possible, however difficult, to operate the press without the standard safeguards in place in the Maintenance Mode. Only trained personnel should use the Maintenance Mode the PennEngineering® is not responsible for improper maintenance mode procedures which result in a loss of operation of the rivet installation machine. or operator safety.

3.3 Safety System Tests

Step 1: Safety Switch Test Procedure

WARNING: Experience d personnel must test the Safety System at the beginning of each work shift. See the Safety System Test in this section of this manual. Depending on the ambient shop temperature, you may need to warm up your Hardware Insertion Machine before beginning any operations. To do this, turn it on and let it run for about ten minutes.

1. Turn the *Main Disconnect Switch to* the *On* position. The Main Disconnect Switch is located on the electrical cabinet to the right side of the machine.
2. Start the machine by pressing the On Switch on the touch screen control panel. The green light in the switch will be displayed and the motor will start. If the machine doesn't turn on, twist the Off/E-Stop Switch(s) clockwise until it pops out and try pressing the On Switch again. Using the touch screen controls, select the Conductive operation.

Except for the Down Footswitch and the *Off/E-Stop Switch*, all the other operating controls referred to in the rest of this procedure are on the Touchscreen Panel. The Touchscreen Panel is located on the front of the machine cover.

3. Set the Up Travel distance to 40% by touching the touch screen containing the Up Travel value and then choosing 40 from the entry screen. You can also use the +/- buttons.
4. Keep your hands away from the Tool Holder area. Use the Footswitches to lower or raise the Upper Tool Holder until it is about 4 in. /100 mm above the Lower Tool Holder. Remove your foot from the Footswitches and keep your feet away from it.
5. Carefully grasp the sides of the Upper Tool Holder and push it upwards. This upward movement should actuate the Safety Sensors and the Upper Tool Holder should move up. The movement will continue until the RAM reaches top of stroke. Remove your hand from the Upper Tool Holder as soon as the movement starts.
6. If the RAM moves up, the Safety System Sensors are operating.
7. If the Upper Tool Holder does not move up, the Safety System has failed!

Immediately turn the machine off by depressing the *E-Stop* button and turning the Main Disconnect Switch to the *Off* position. Contact your Supervisor. The machine's Main Disconnect Switch must be locked in the *Off* position until repairs are begun and follow Lock-out/Tag-out procedures. Do not operate this machine until qualified personnel have repaired the machine and the Safety System Sensors has been properly tested.

WARNING: There are two Steps in this testing procedure.
Do not skip or ignore any of them!

Step 2: Non-Conductive Mode Test

1. If you have just completed Step 2:

   a) The machine is On and the green light in the On Switch is still illuminated. If not, return to Step 1 Safety Sensors test procedure and restart the machine by following Instruction in Steps 1 and 2.
   b) The Conductive/Non-Conductive mode is displayed in the Conductive selection. Select Non-Conductive from the touchscreen display.
   c) The machine's Force has been set to deliver 13KN. If this has been changed, repeat the instructions in Step 2, Instruction 4.
   d) Verify the 1 in/25 mm Flat Anvils are installed in both the Upper and Lower Tool Holders.

2. Keep your hands away from the tooling area. Depress the Down Footswitch. The Upper Tool Holder should move down, the flat Anvils will contact, and the Upper Tool Holder should stop immediately. If this machine completes the above sequence correctly, go to Instruction 4.

WARNING: When operating this Hardware Insertion Machine in the Non-Conductive Mode, be very careful! Do not depress the Down Footswitch a second time after the Upper Tool Holder has stopped on the down stroke with any part of your body near the tooling area.

   a) If the machine does not complete the above sequence correctly, check the touch screen settings. If they are not correct, reset them and repeat the test. If the machine performs correctly, go to Instruction 3.
   b) If the machine does not complete the above sequence correctly, there is a failure in the machine's control circuit and it must be corrected by qualified personnel. Immediately turning the machine Off by pressing the red Off Switch and turn the Main Disconnect Switch to the Off position. The machine's Main Disconnect Switch must be locked in the Off position until repairs are begun. Do not operate this machine until qualified personnel have repaired the machine and the Non- Conductive Mode has been properly tested.

3. Remove your foot from the Foot pedal switch box.
4. Carefully grasp the sides of the Upper Tool Holder and raise it until a positive stop position is reached. With a calibrated measuring instrument (Digital calipers are best), measure the vertical distance between the upper and lower Anvils. If this measurement is **at least a minimum of** 1/4 in. /6 mm, go to Instruction 6.

   a) If this dimension is less than 1/4 in. /6 mm, **the Safety System has failed!**

      Immediately turn the machine off by pressing the red Off Switch and turning the Main Disconnect Switch to the Off position. The machine's Main Disconnect Switch must be locked in the Off position until repairs are begun and follow Lock-out/Tag-out procedures. Do not operate this machine until qualified personnel have repaired the machine and the Non-Conductive Mode has been properly tested.

5. Next keep your hands away from the tooling area. Turn machine back "ON" and depress the Down Foot pedal switch a second time. The machine should exert the pre-set 13KN force to both upper and lower Anvils and then return to its Up position.

If this machine completes the above sequence correctly, the test of the Safety Sensors and Safety System is complete and operating properly.

There are two Steps in this testing procedure.
Do not skip or ignore any of them!

SECTION 4
INSTALLATION OF HARDWARE INSERTION MANCHINE

Transportation of thehardware insertion manchine

- When using a forklift or pallet jack be sure that the forks are properly located between the fork guide tabs under the base of the hardware insertion machine. (See Fig 4-1)

WARNING: Unbalanced loading of the hardware insertion machine or sudden stops may lead to toppling of the hardware insertion machine.

Locating the Hardware Insertion Machine

- Select a well-lit clean area with a (relatively) level floor. The floor must be able to support the weight of the Hardware Insertion machine.

Leveling the Rivet Installation Machine

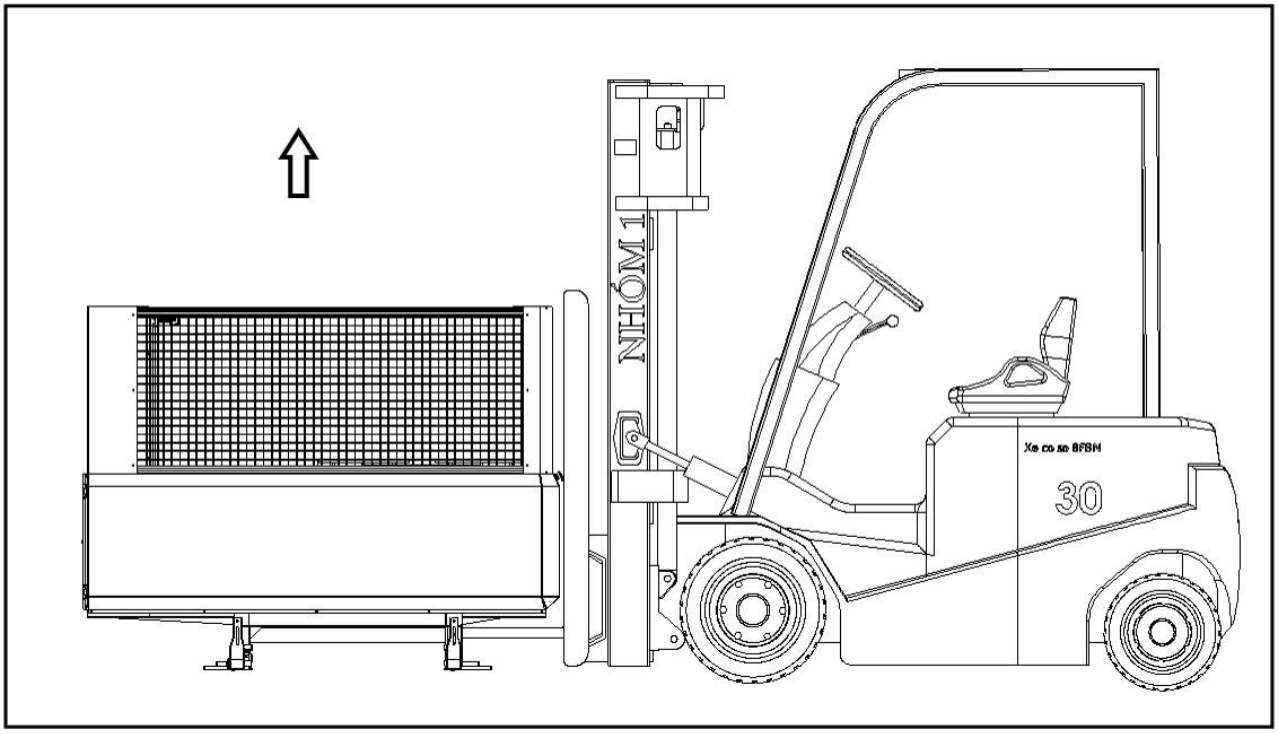
- The hardware insertion machine should be leveled and stabilized after it has been located. This is done by adjusting the height of each footpad then locking each footpad in position by tightening a jam nut. This task requires two 36mm wrenches (See Fig 4-2). An adjustable wrench may also be used. Adjust the foot pad while reading the level at the tooling nut gate adapter. The universal escapement adapter must sit level for proper functioning of the feed systems.

Open Space Requirements

- PennEngineering® has no specific requirements for providing open space around the perimeter of the hardware insertion machine. However, be sure to comply with any national or regional safety codes that may dictate otherwise. We do recommend that you at least leave enough space around the hardware insertion machine so the various storage and maintenance enclosures can be opened fully and so the largest workpieces can be accommodated.

Original Installation Requirements

- After the final installation of the hardware insertion machine verify the continuity of the protective bonding circuit (TN-System) in accordance with EN 60204-1 Clause 18.2.2 standards.



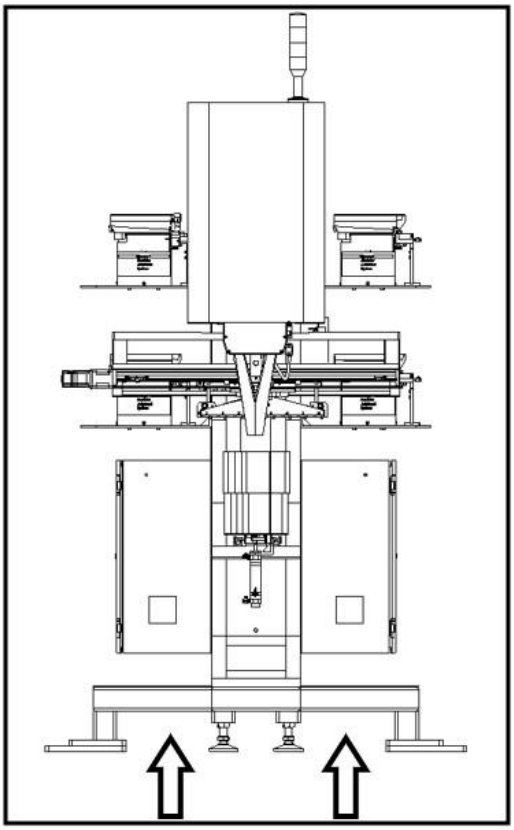


FIGURE 4-1
Move Location Diagram

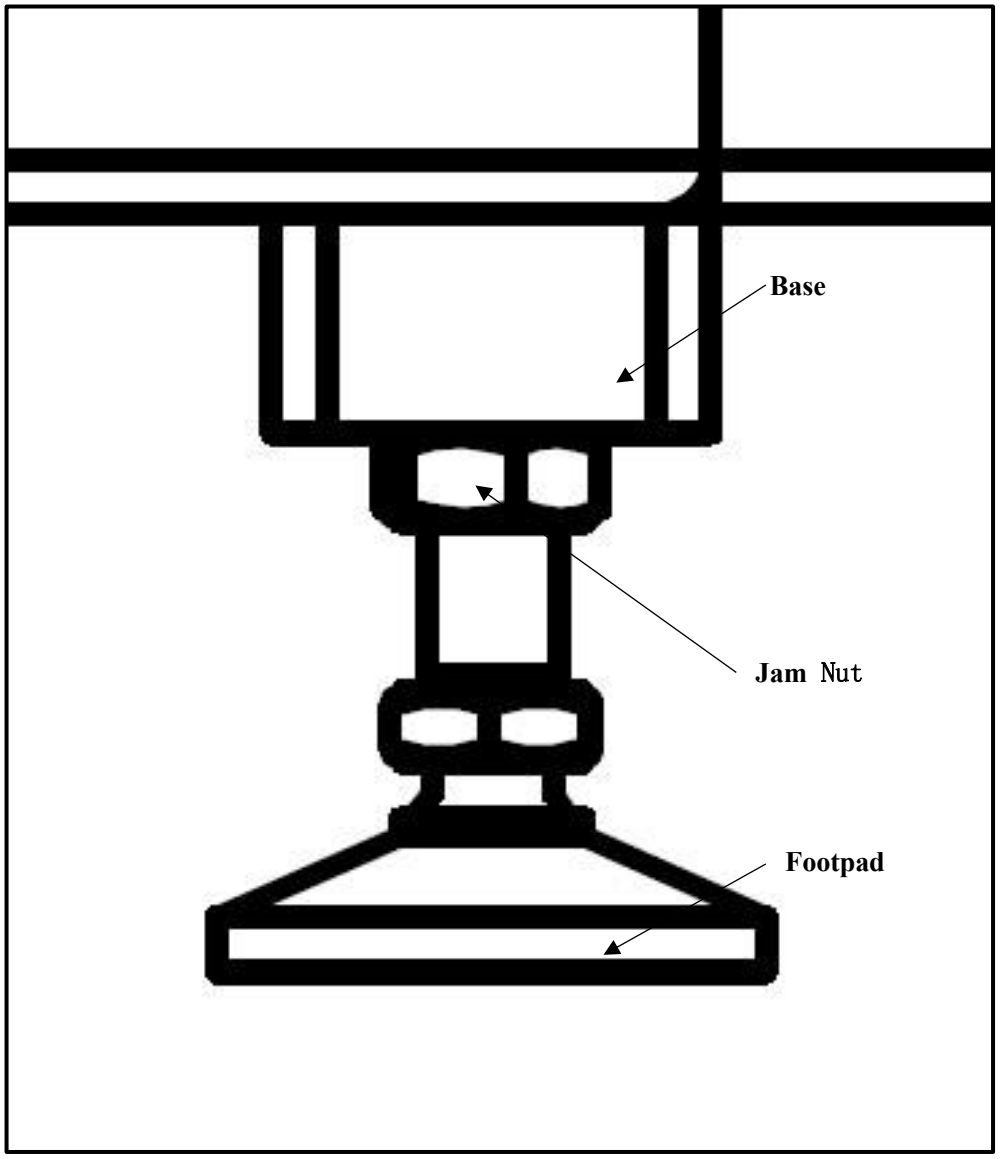


FIGURE 4-2
Adjustable Footpad

Recommended Air Supply Hook-Up Arrangement

Proper air supply is very important to the performance and maintenance of the hardware insertion machine. Following these simple guidelines will ensure good machine performance.

- **Air Quality** - The quality of the air supply is very important. The air must be clean and dry. Moisture and debris will contaminate the oil and valve systems and lead to machine performance and maintenance problems.
- **Air Supply Flow** - Use a minimum 12mm diameter line and fittings from the compressed air source to the rivet installation machine. Shop pressure ranging between 6 to 7 bar (90 psi to 100 psi) is acceptable. Inadequate air flow will affect machine performance.
- **Air Consumption -** Air consumption in automatic mode is about 2.5 liters of compressed air per cycle. Average air consumption running at 6 insertions per minute is about 0.3 liters/sec at 1 atm.
- **Piping Installation** – Proper piping hookup will help achieve the above requirements. See Figure 4-3 on the next page.

- Connect to your supply line with a pipe pointing upwards that curves over and down. This - arrangement will help prevent water and compressor oil from entering the machine.
- Connect to that drop with your supply fitting for a 12mm or larger hose.
- Continue the end of the drop to a drain valve. This will help collect additional water and oil and allow the system to be purged.
- If your factory air supply falls short of the above recommendations, an air reservoir tank of an appropriate size for your location can be used.
- An auxiliary filter/separator installed immediately outside the machine is recommended.

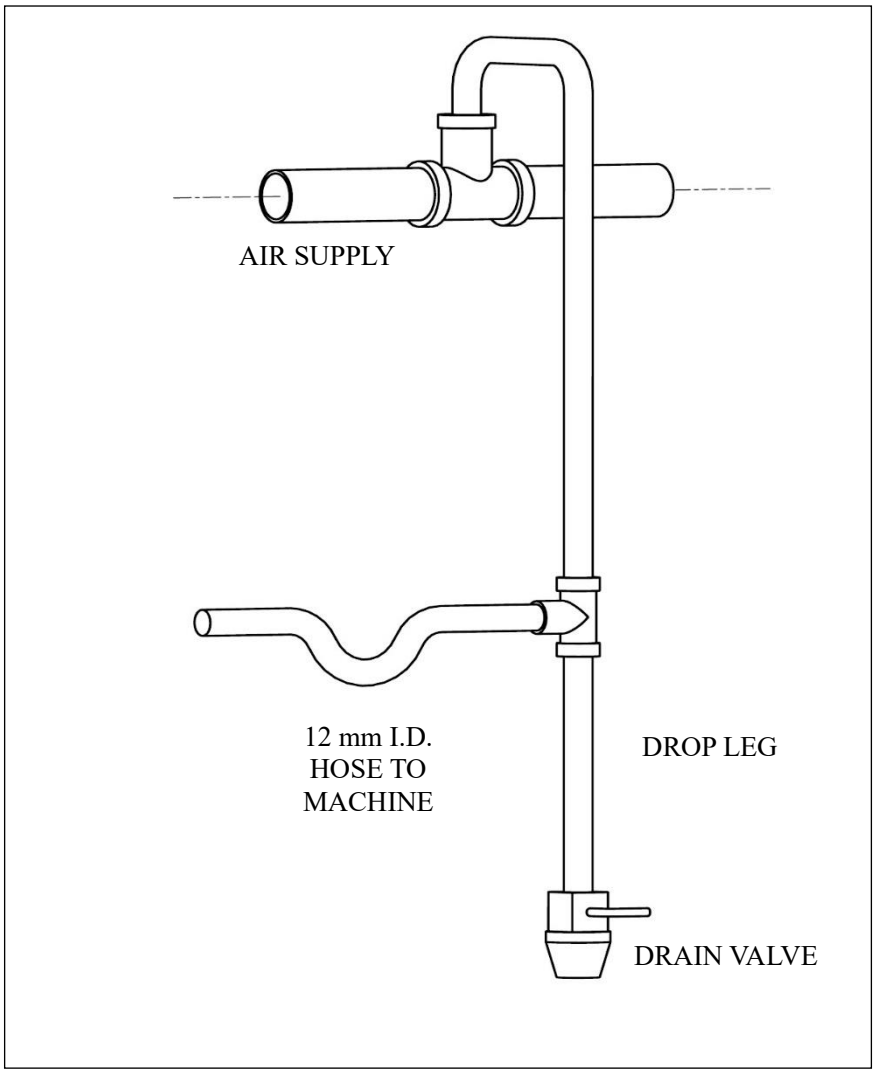


FIGURE 4-3
AIR SUPPLY

SECTION 5
GENERAL FUNCTION DESCRIPTIONS

System Function:

The function of **PEMSERTER® PAT1200-E Hardware Insertion Machine** is to safely, quickly and consistently install riveting screws, nuts or studs for various types of plates. In order to achieve this function, the riveting machine adopts the following technologies and devices:

- Precise computer-controlled pressure riveting force and pressure riveting position.
- The automatic feeding system and Multi-Shuttle platform tooling can be selected according to the needs, and the product to be riveted can be positioned on the Vacuum Anvil (upper die), so that the operator can be released and can operate the workpiece freely.
- The system supports up to 8 different types of PEM fasteners mounted on one panel.
- Installation process monitoring, support curves, optional internal or external stored process curves.
- Automatic replacement of upper and lower punches.
- The binocular vision guidance system supports high-precision positioning and installation.

Setting up the Hardware Insertion Machine:

The following section of the manual describes the setup process in general. For details on setting up and operating the Hardware Insertion Machine see the appropriate section in the manual.

Step 1: Choice of tooling

The selection of tooling includes selecting suitable tooling for the delivered products and workpieces to be pressure riveted, including the tooling used for pressure riveting tooling and feeding control. The specific tooling type can be inquired through the website https://www.haeger.com/ATW or Haeger Wizard APP or consult the PEMSerter technical department.

Step 2: Select the Setup for the Tooling and Riveting Fastener on the Touchscreen.

Once the tooling is installed, the next step is to setup the rivet installation machine by using the touchscreen. The touchscreen setup is simple and can be done one of three ways.

- **Choice of tooling**-Choose tooling mode, riveting fastener size and types
- **Call pre-stored pressure riveting parameters**- Select from a previously programmed Job stored in the rivet installation machine.
- **Call the parameters of the last pressure riveting**-Call the same operating program that the riveting machine just ran last time, even after the shift is selected, the Hardware Insertion Machine will automatically set the operating variables and continue to perform security settings.
- **Manually set the pressure riveting parameters**-according to the needs of the product, manually set the pressure riveting parameters

Step 3: Safety Setup

The next step is very quick and simple but very important.

In the step of security setting, the Hardware Insertion machine needs to set the trigger position of the "safety trigger point" in the "Tooling Protection System (TPS)". The operator places the workpiece and the product to be riveted, but the riveting machine does not perform the actual operation of the product to be riveted. Step on the foot switch to make the hydraulic cylinder move slowly down. When the safety punch assembly touches the workpiece to be riveted, press the riveting product and trigger the safety punch assembly. At this time, the machine will record the position. This contact point is the correct trigger position and pressure position obtained by the riveting machine. At this point, the riveting machine is ready for pressure riveting operation.

Riveting Automatic Feed Functions:

The automatic feeding function is completed by the vibrating feeding system and the storage system sending the products to be riveted into the multi-carrier platform tooling through the feeding tube. Take the following steps:

- The vibrating feed system moves the riveting product to the edge of the vibrating tray and transmits it to the Multi-Module.

- The direction of the riveting products is determined in the multi-module dislocation mechanism and sent to the Multi-Shuttle through the Tube. The riveting products to be riveted will be taken away by The Vacuum Anvil (Upper mold) through vacuum adsorption, and then be pressed into the workpiece. In the vibrating feeding system, the rest of the tightened riveting products with incorrect postures are blown out of the Multi-Module by compressed air and returned to the storage vibrating tray.

Pressure riveting process:

- When the riveting product contacts the workpiece, the riveting machine judges the position of the "safety trigger point". Only when the safety trigger point is within a certain deviation range, can the pressure riveting process continue.

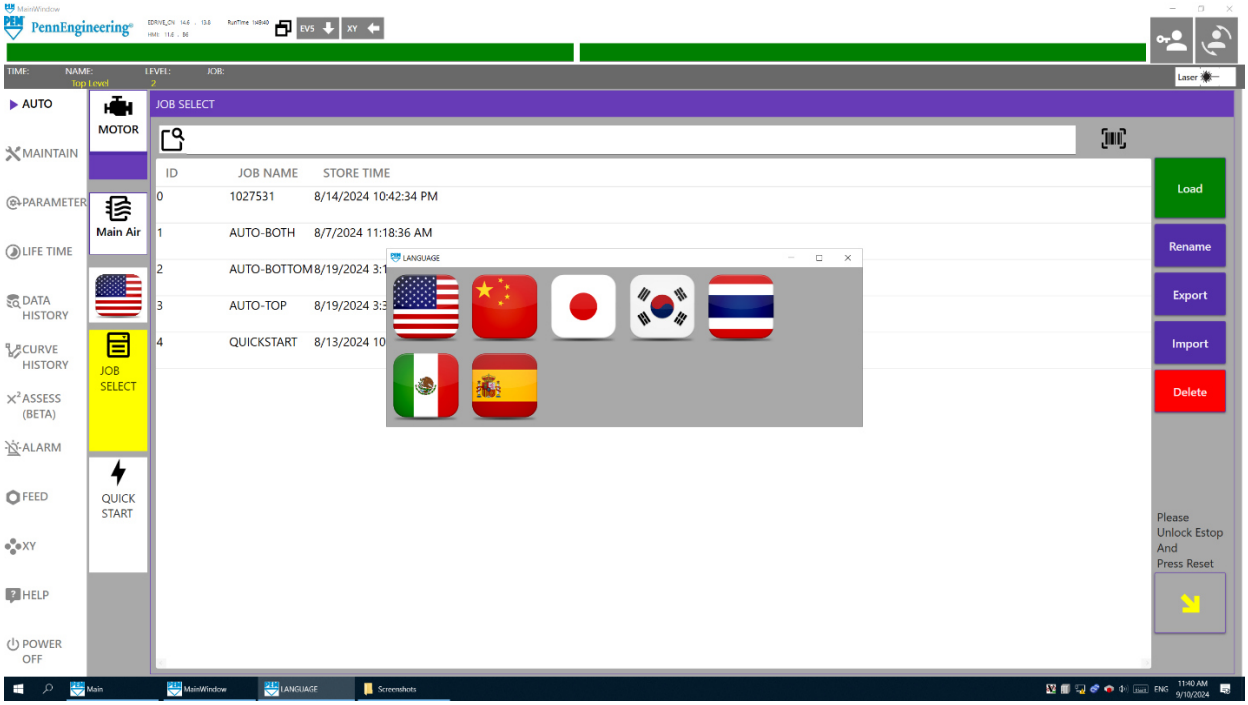
- If the safety trigger point is correct, apply pressure riveting force to the riveting product, and then the Anvil exits and returns to the origin.

SECTION 6
TOUCH-SCREEN CONTROLS

A programmable Automation Controller (PAC) controls the functions of the Device. The operator sends commands to the PAC and reads data from the PAC through a system of menus and information displayed on its touch screen. An operator need only touch the buttons displayed on the touch screen to make a selection.

The touch screen controls allow the operator to setup the Hardware Insertion Machine for operation, operate special functions and maintain and troubleshoot the machine.

6.1 Main Screen



When system finish loading software ‘Main Screen’ will show.

[

]: Login In and Login Out

→To→6.1.1 Login Page

[Load]: First select a job in list and load current selected job

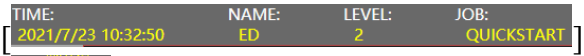
→To→6.1.2 Run Page

[Rename]: Select a job in list and rename current selected job

[Export]: Select a job in list and export a file that save in local.

[Import]: Choose a job file from local and import to system

[Delete]: Delete current selected job.

[

]: Load information show.

[

]: Moto power on. When power on moto system will init and check all sensors.
→To→6.1.3 Power On Check Page

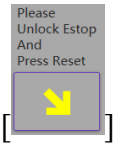
[

]: Main air supply

[
]: Language switch
→To→6.1.4 Language Switch Page

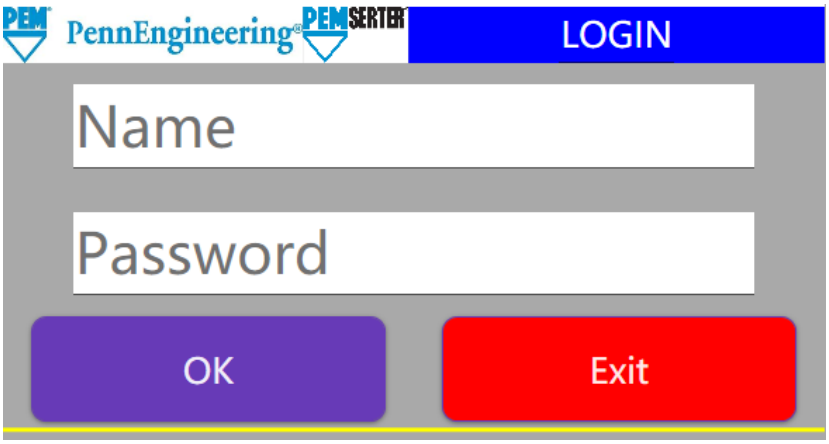
[JOB SELECT]: Load a job you have already saved in system.


[QUICK START]: Start to work with a new create job.
→To→6.1.5 Quick Start Page

[

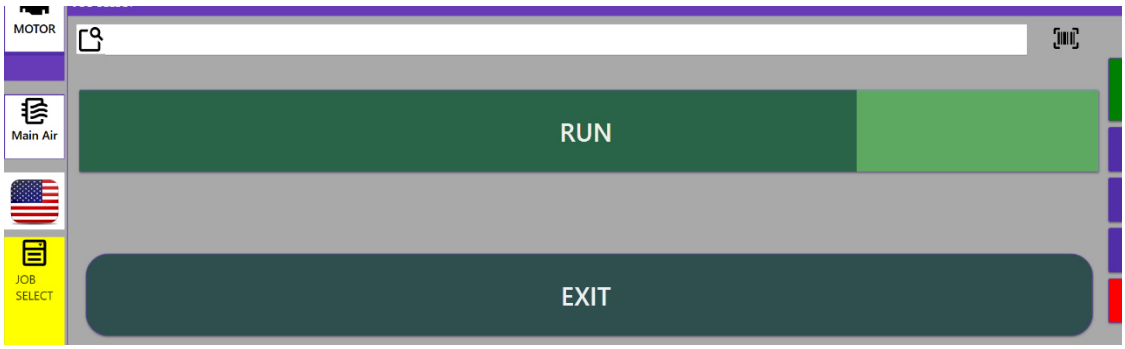
]: Remind you need to unlock estop and press ‘Reset’ button.

6.1.1 Login Page



[Name]: Login name
[Password]: Login password
[OK]: Enter
[Exit]: Exit page

6.1.2 Run Page



[Run]: Enter run mode
[Exit]: Load current job but not in run mode

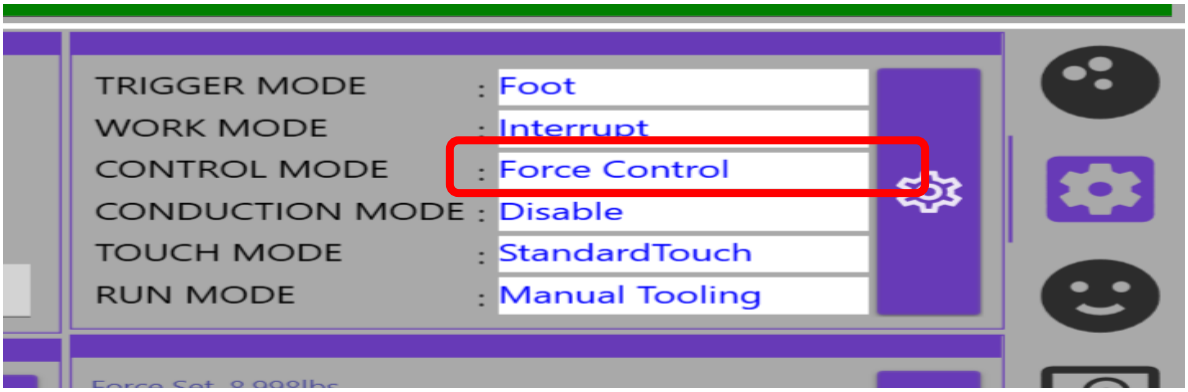
6.1.4 Language Switch

Select the language you need.

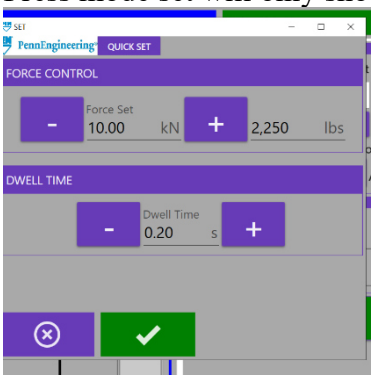
6.1.5 Quick Start

Inter the task

Choose force control



Press mode set will only show press parameters:

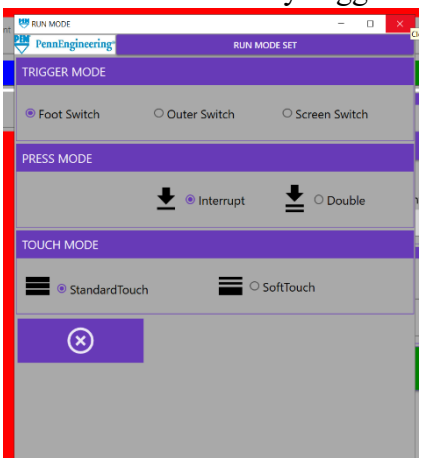


[2]: Choose feed mode

FOOT switch / Outer switch / Screen Switch

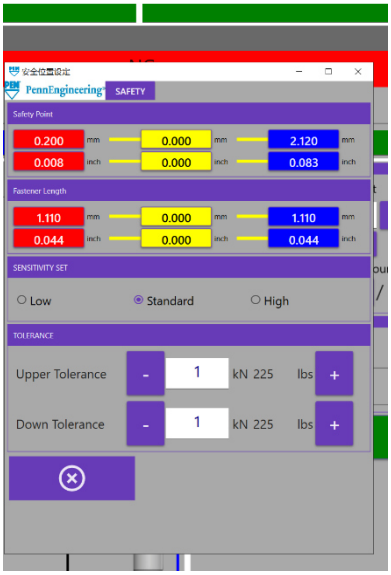
FOOT switch： Trigger with foot switch。

Outer switch： Usually triggered by external communication control signals。

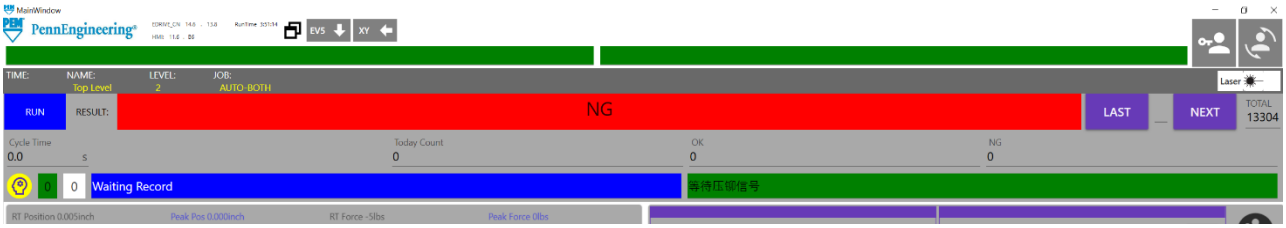


Press Position Page：

TPS can be set in different ranges， The same goes for pressure values， Pressure numerical tolerance



the page will show OK or NG：



6.2 MAINTAIN

[IO]
→To→6.2.1 IO Page

[SERVO]
→To→6.2.2 SERVO Page

[SIGNALS]
→To→6.2.3 SIGNAL Page

[LEVEL]
→To→6.2.4 LEVEL Page

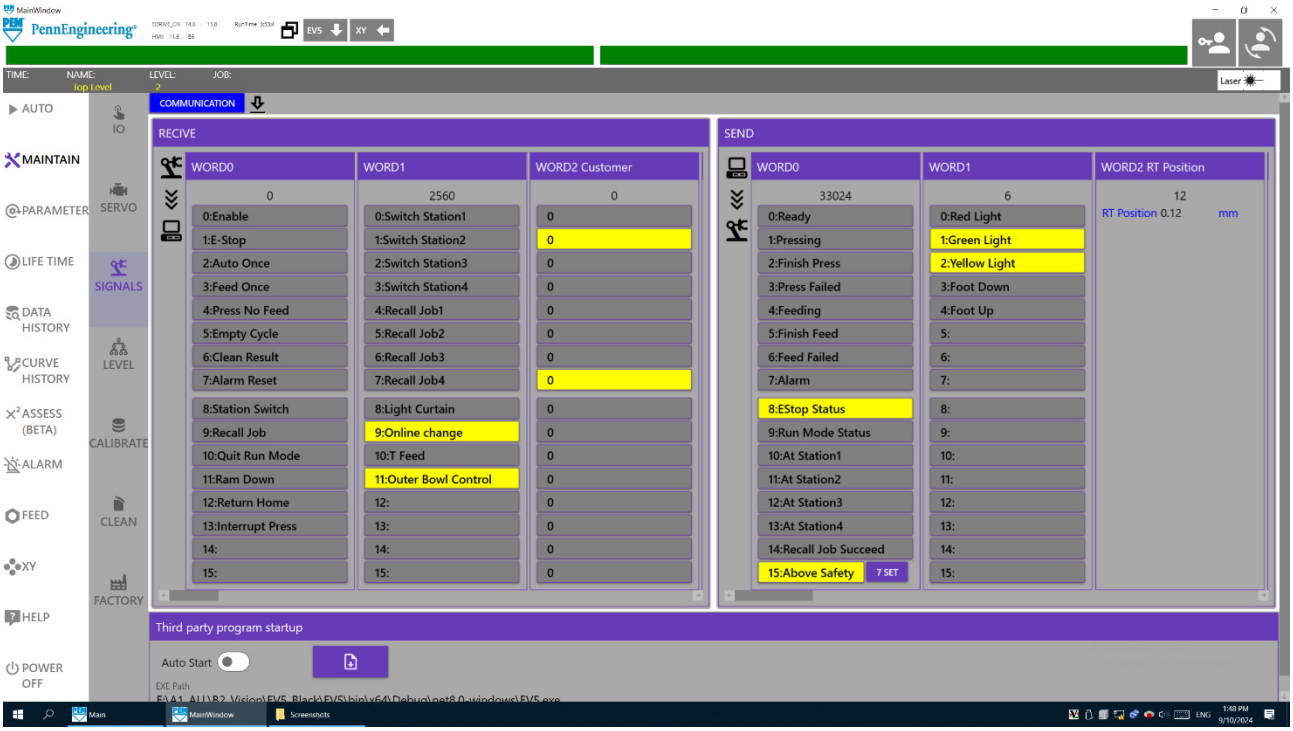
[CALIBRATE]
→To→6.2.5 CALIBRATE Page

[CLEAN]
→To→6.2.6 CLEAN Page

[FACTORY]
→To→6.2.7 FACTORY Page

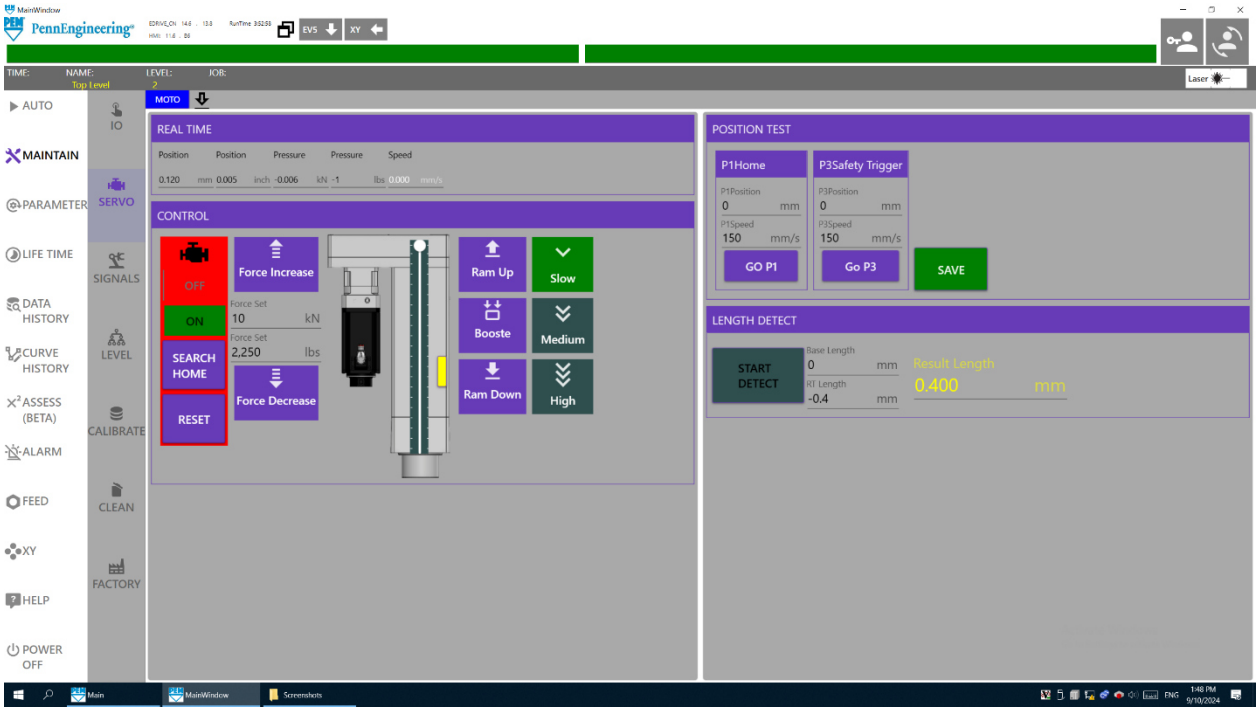
[EXIT]
→To→6.2.8 EXIT Page

6.2.1 IO



[IO]: Show Input and output in PLC modules

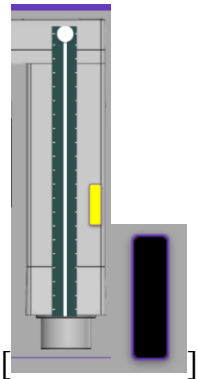
6.2.2 SERVO



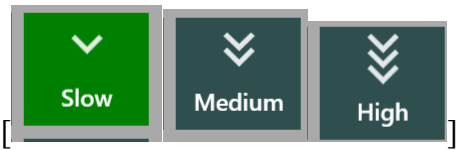
[REAL TIME]: Show all the sensors in ServeHydralic System

[ ]: Power on or power off the moto

[ ]: Set temporary force

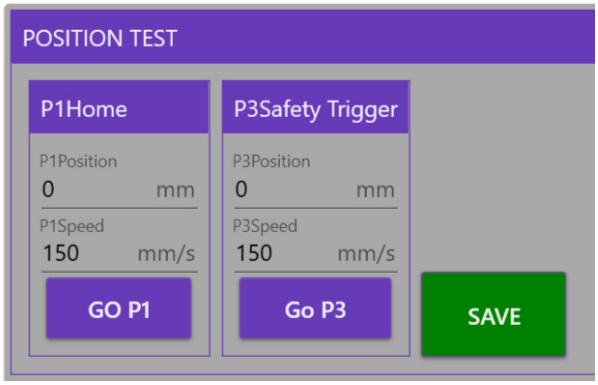

]: Monitor cylinder position and safety sensors status.

]: Control ram up and ram down



]: Set the speed of ram up and ram down

PS: Foot panel is enabled on this page. You can ram up and ram down with foot panel.



[P1Position]: The position of original

[P1Speed]: The Speed of going to P1

[P3Position]: The position of original

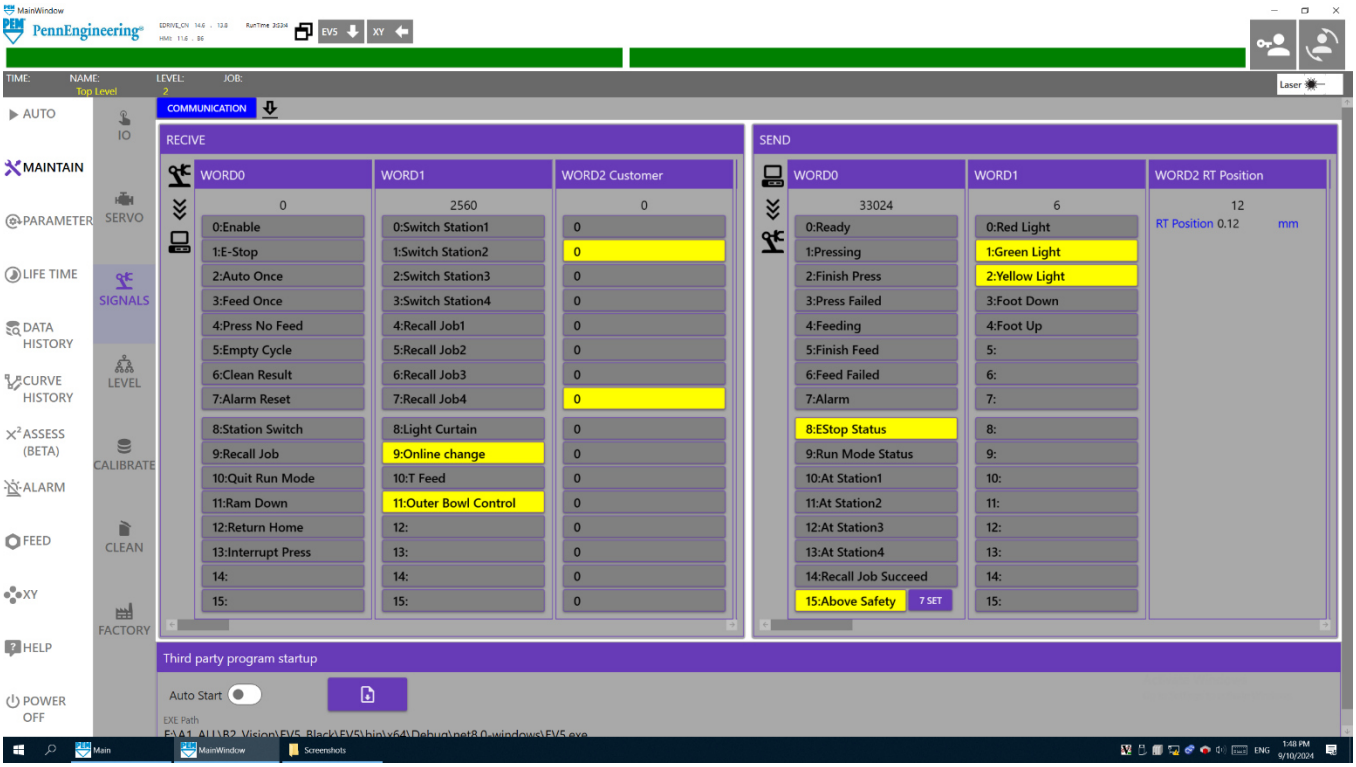
[P3Speed]: The Speed of going to P3

[GO P1] [GO P3]: Command to move to P1 or P3

[SAVE]: Save current parameters but won't save in job only use for temporary

[START DETECT]: Press this button then ram down to trigger the safety sensor. At now system will record the zero position. After this put a fastener under tooling. Repeat the operate. You will see the 'Result Length' on screen.

6.2.3 SIGNALS



[Recive]

Bit	WORD0	
0	Enable	ON Enable outer signals
1	E-Stop	ON Estop triggered,OFF release Estop
2	Auto Once	OFF-ON,Rising signal trigger once(Auto control feed or not)
3	Feed Once	OFF-ON,Rising signal trigger feed once
4	Press No Feed	OFF-ON,Rising signal trigger press without feed
5	Empty Cycle	ON,Feed will stop working and safety detect will stop checking
6	Clean Result	OFF-ON,Rising signal trigger will clean the last press result
7	Alarm Reset	OFF-ON,Rising signal trigger will reset the alarm
8	Station Switch	OFF-ON,Rising signal trigger station switch(only muti stations)
9	Recall Job	OFF-ON,Rising signal trigger will recall the job
10	Quit Run Mode	OFF-ON,Rising signal trigger will quit the run screen
11		
12		
13		
14		
15		

Bit	WORD1	
0	Switch Station1	Switch1,When ON is working
1	Switch Station2	Switch2,When ON is working
2	Switch Station3	Switch3,When ON is working

3	Switch Station4	Switch4,When ON is working
4	Recall Job1	Recall Job1,When ON is working
5	Recall Job2	Recall Job2,When ON is working
6	Recall Job3	Recall Job3,When ON is working
7	Recall Job4	Recall Job4,When ON is working
8		
9		
10		
11		
12		
13		
14		
15		

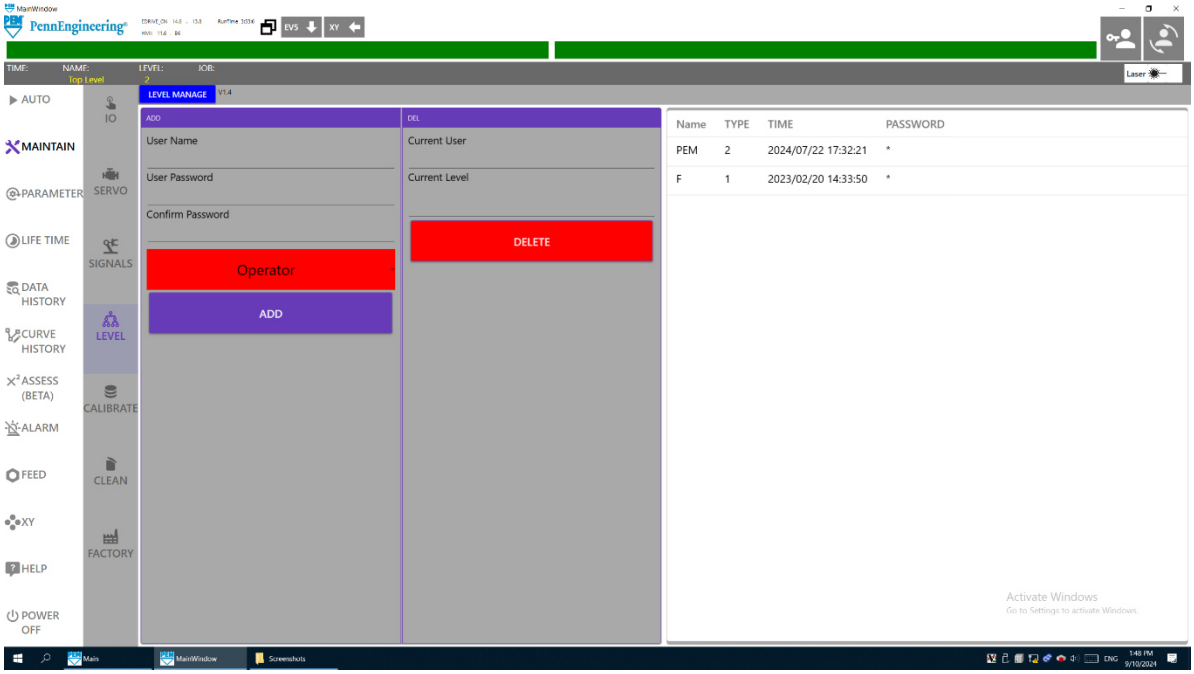
[Send]

Bit	WORD0	
0	Ready	ON,No alarm and ram at home under run screen mode
1	Pressing	ON,Ram is under going down or booste
2	Finish Press	ON,Press finished until next loop or manual reset status
3	Press Failed	ON,Press failed until next loop or manual reset status
4	Feeding	ON,Under feeding
5	Finish Feed	ON,Finish feed until ram move or next feed loop
6	Feed Failed	ON,Failed feed until ram move or next feed loop
7	Alarm	ON,Alarm until everything ok
8	Estop Status	ON,Estop status
9	Run Mode Status	ON,Only under run screen
10	At Station1	ON,At station1
11	At Station2	ON,At station2
12	At Station3	ON,At station3
13	At Station4	ON,At station4
14	Recall Job Succeed	ON,Succeed recall job and signal will keep for 2s
15	Above Safety	ON,Ram above safety position(That can set by customer)
Bit	WORD1	
0	Red	ON,No alarm and ram at home under run screen mode
1	Green	ON,Ram is under going down or booste
2	Yellow	ON,Press finished until next loop or manual reset status
3	Foot Down	ON,Press failed until next loop or manual reset status
4	Foot Up	ON,Under feeding
5		
6		
7		

Bit	WORD3	
	RT Position	Data/100=mm

Bit	WORD4	
	RT Force	Data/100=kN

6.2.4 LEVEL MANAGE



[User Name]: Operator name

[User Password]: Operator password

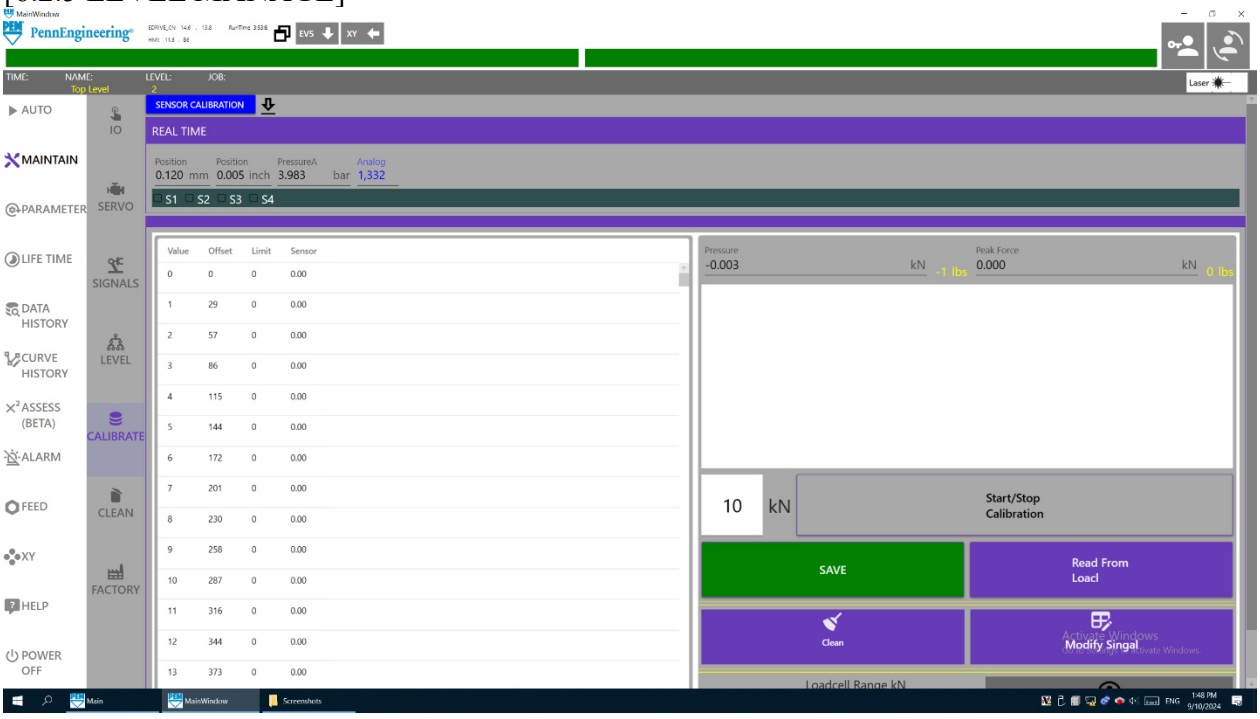
[Confirm Password]: Operator password confirm

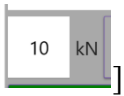
[SELECT LEVEL]:

→[SELECT LEVEL Top Level]:The top level allow modified everything

→[SELECT LEVEL Administrator]

[6.2.5 LEVEL MANAGE]



[

]: Set the loadcell range

Value	Offset	Limit	Sensor
0	0.022885561	386	0
1	0.08346033	416	0

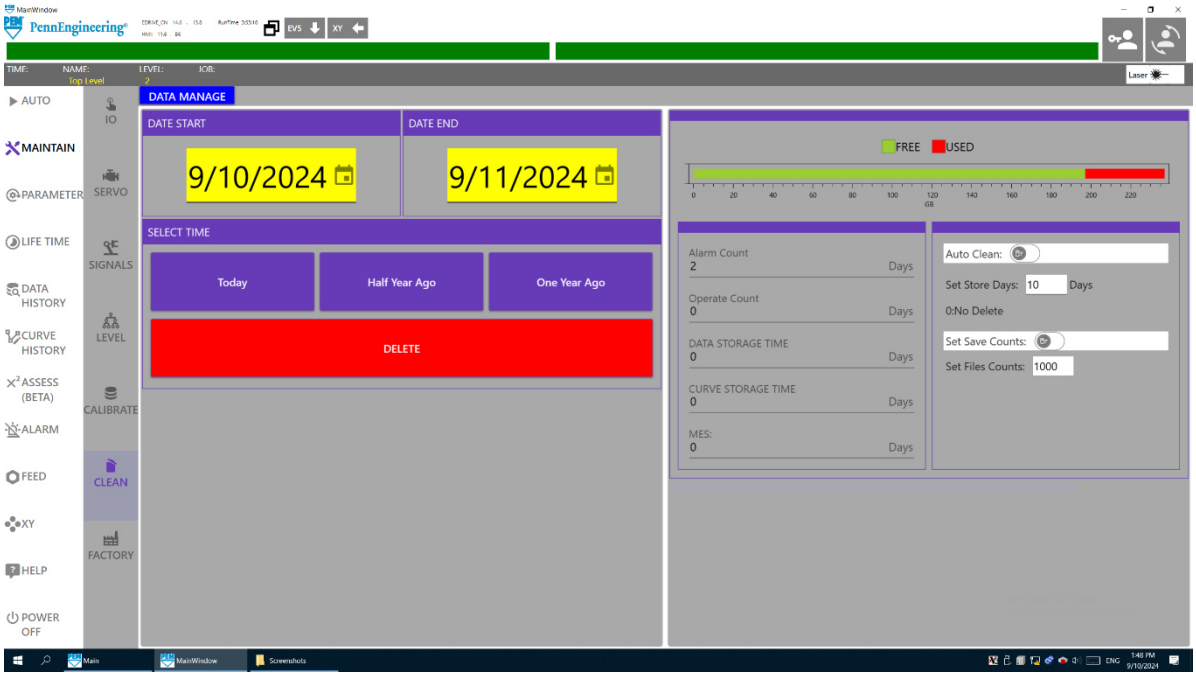
Use 4-20ma analog control(The range force scale the 4-20ma)
Sensoroffset between sensor and loadcell

[

]: Start/Stop calibration

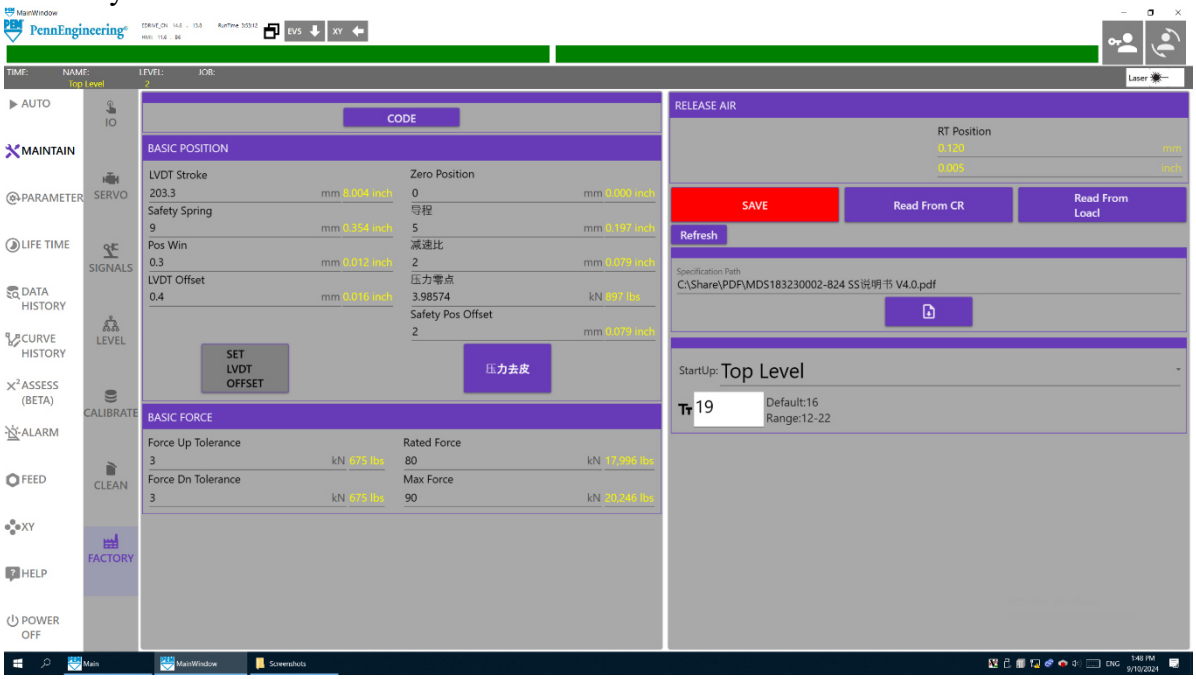
[Start/Stop Calibration]: Control start and stop calibrate from the set start force

6.2.6 CLEAN



You can choose the start and end dates of the clearance

6.2.7 Factory Set



Do not change anything ,Please contact the equipment manufacturer.

Feed system: 1, standard Feed.
2, Multiple Station Feed.
3,Web Operation.

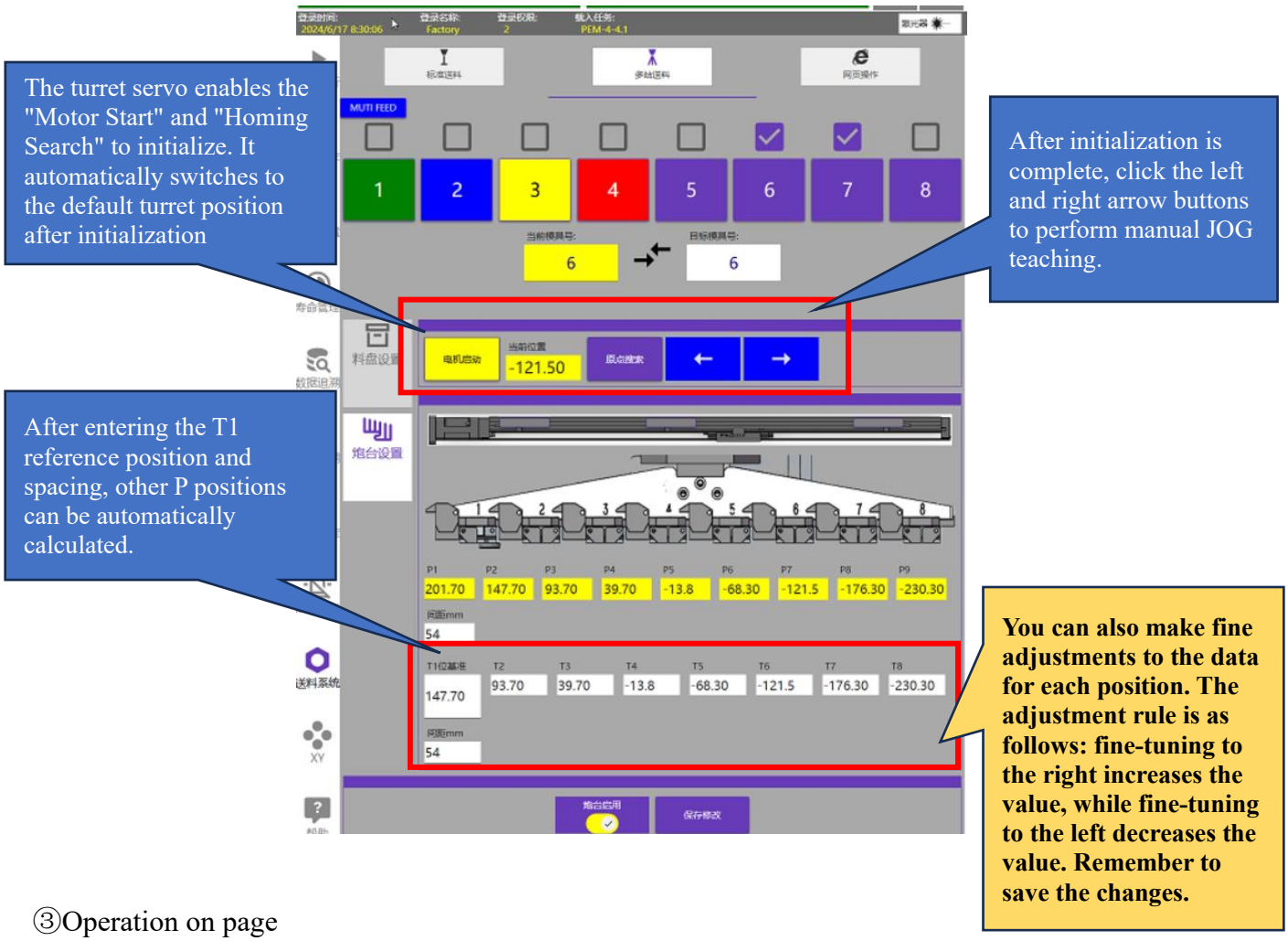
6.9.2 ②Multiple Feed System.

Feeder Plate Setup and Turret Setup

Turret Numbers 1-8, Click on any turret number to switch automatically. The switching sequence is as follows: first, the current mold is automatically unloaded, and then the target mold is loaded.

You can incrementally or decrementally select turret numbers 1-8#. The corresponding feeder operation parameters can be independently set, including: feeder voltage, frequency, vibration time, air blow time, vacuum threshold, and other parameters. After setting, you can either "Send to Controller" or "Save Changes.

You can set the position where the puncher picks up the nails (the pre-lowering position).



③Operation on page

Including all the operations about XY platform, instead of press machine.

Press machine and vision system as “peripheral equipment”.

JOG and teaching operation of XYZ axis

X axis parameter page

Y axis parameter page

Z axis parameter page

Base mold axis parameters pa

Enter avoidance mode.

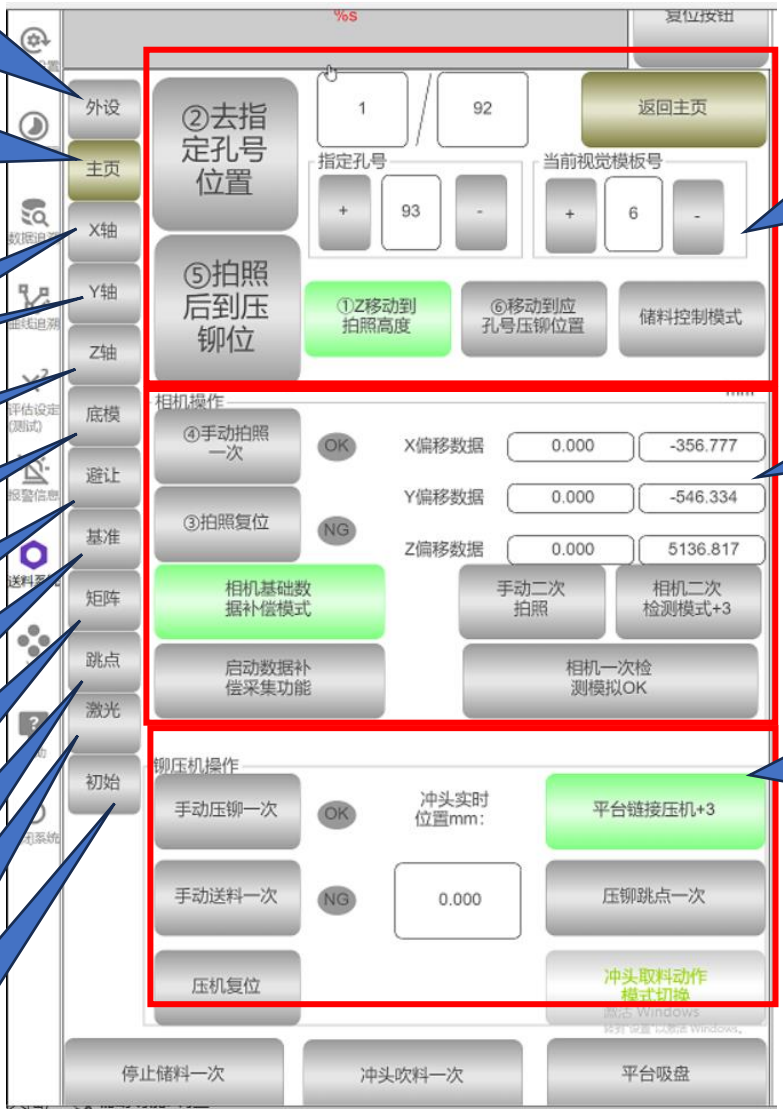
Z-axis reference calibration.

Matrix function Not available

"Point Jump" function.

Not available: Laser calibrati

Platform initialization available.



Adjustment operations for moving drawing coordinates and compensation after taking photos can be performed.

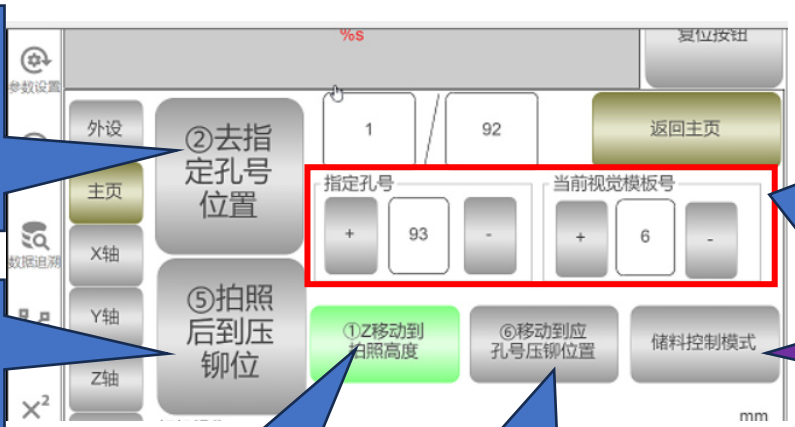
Operations such as camera photography and reset alarms can be performed.

Press machine riveting operations can be performed.

Note: Ensure that the platform is in a safe position or at the riveting position before performing

After selecting 'Specify Hole Number,' click '② Go to Specified Hole Number Position,' and the platform can be moved.

After moving to the specified hole number and taking an OK photo, the platform can be shifted to the riveting position.

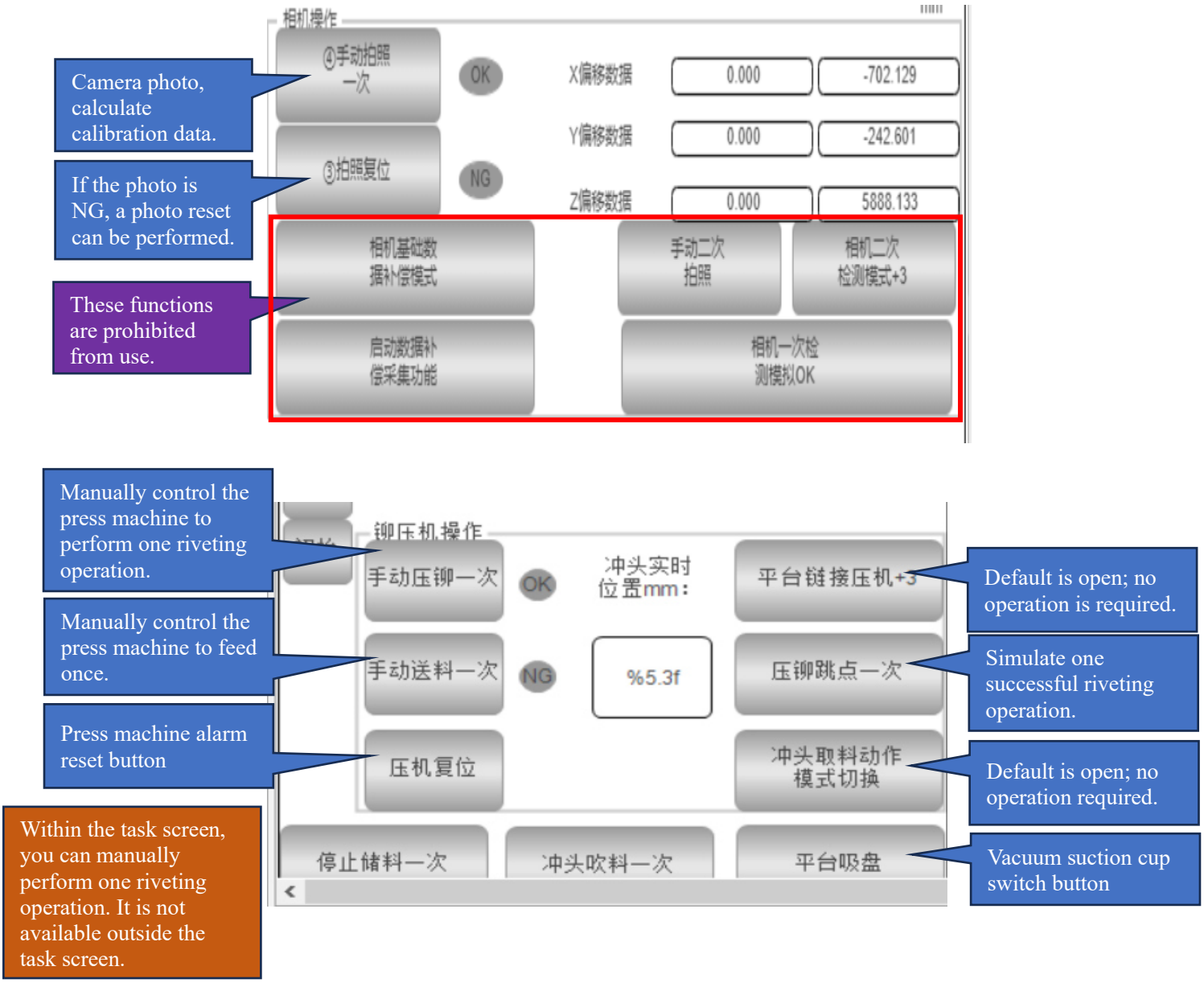


Manually specify a hole number to move directly to it. The corresponding 'Template Number' for the hole number will be displayed synchronously for camera photography use.

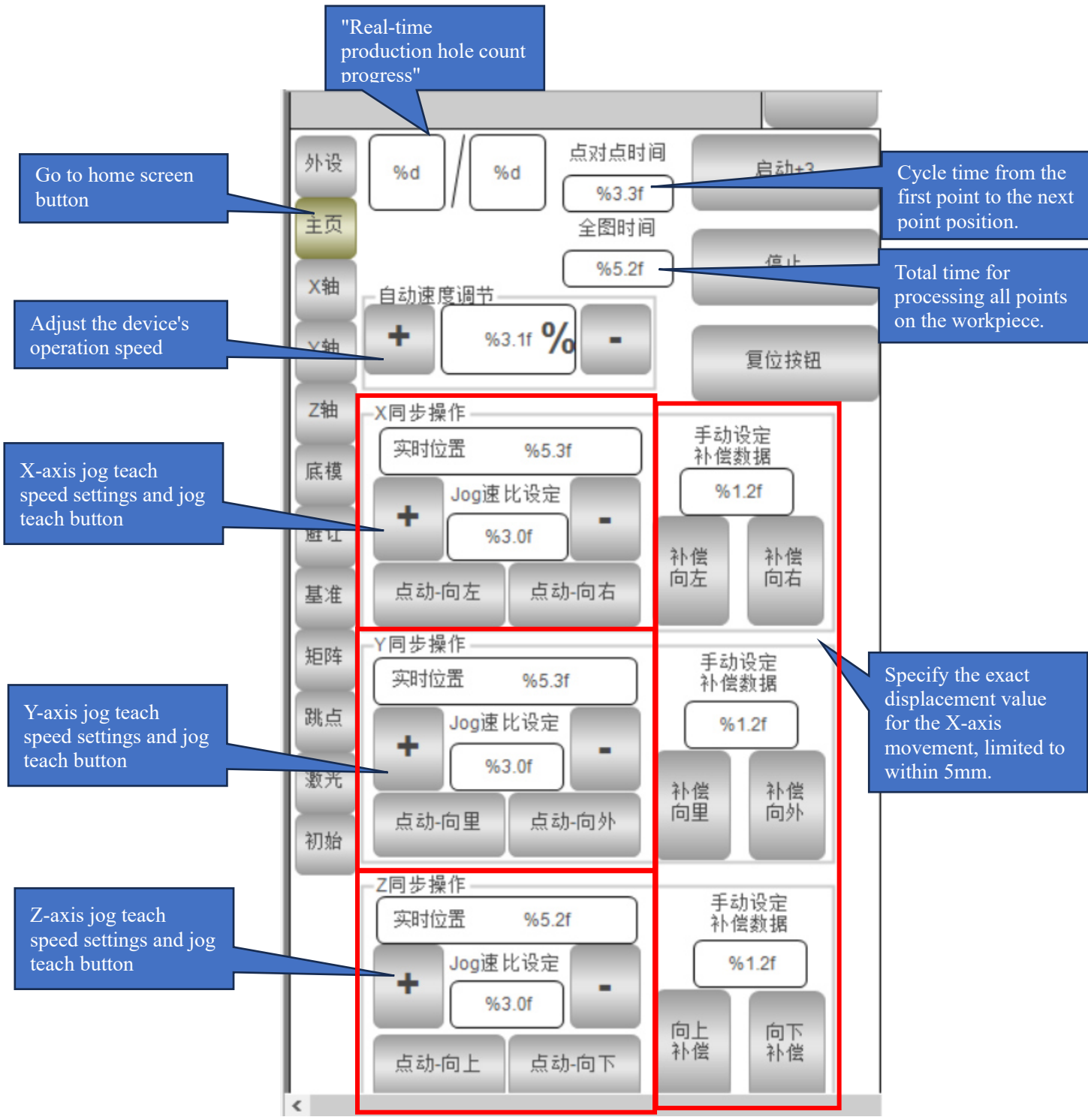
This mode function is disabled.

Before taking the photo, the platform needs to be raised to the photo-taking height.

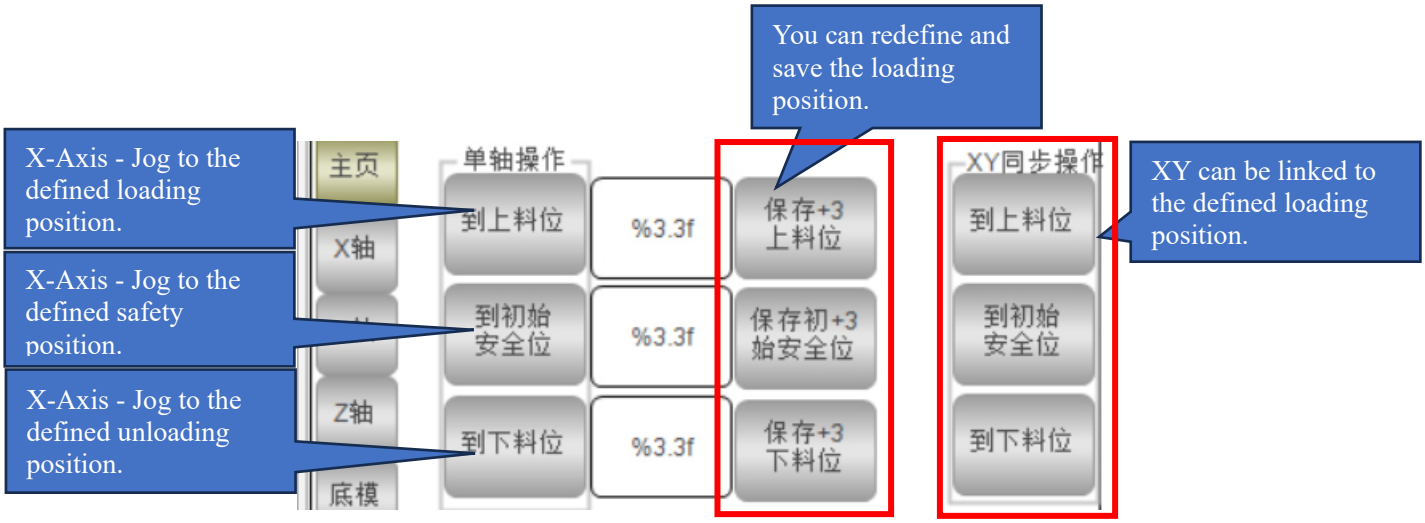
⑥ Move to Hole Number Riveting Position: After visual compensation of the XY platform, it can be lowered!"



6.9.3 Homepage Display Overview

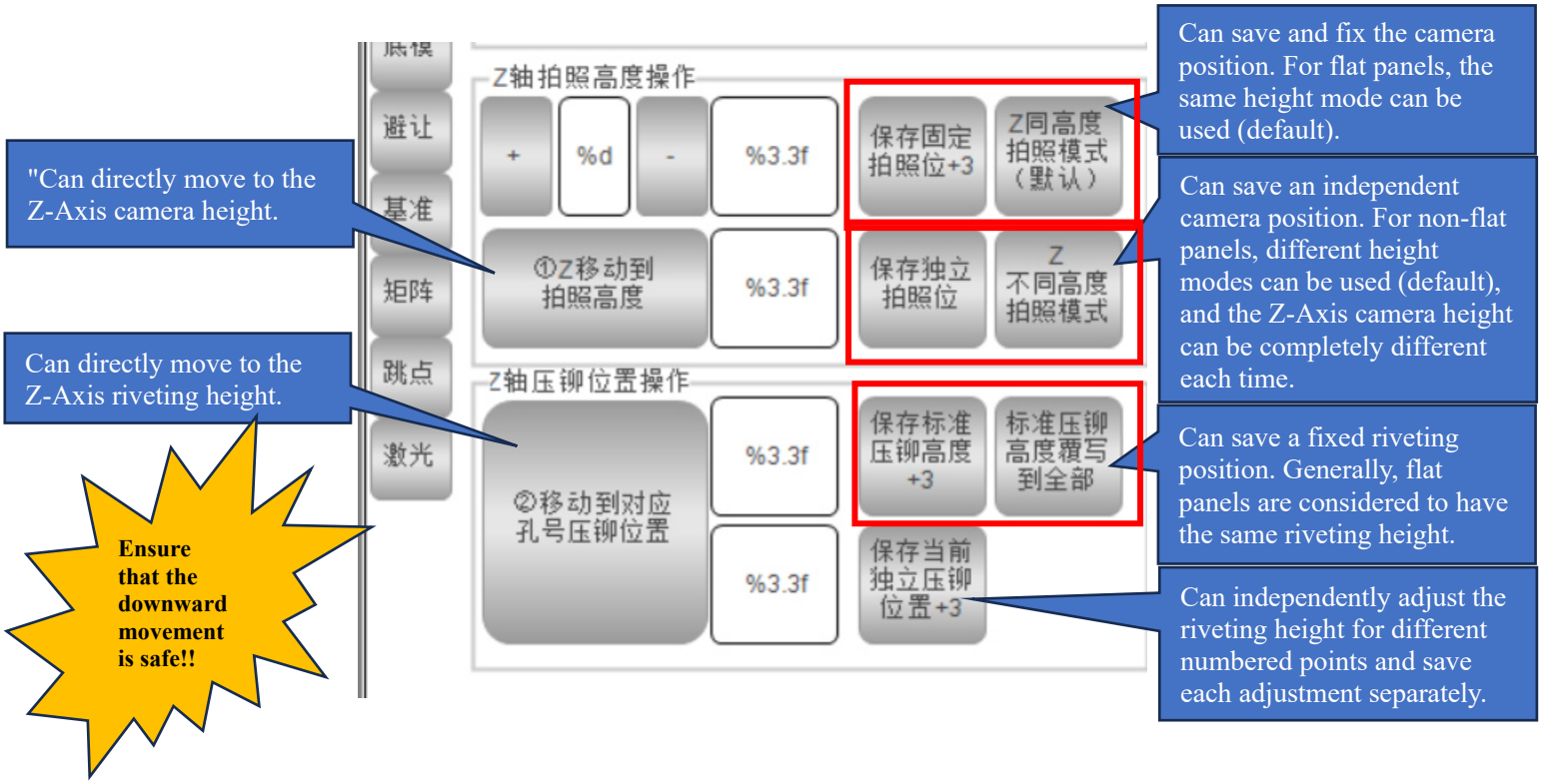


6.9.4 X-Axis Operation Page Overview

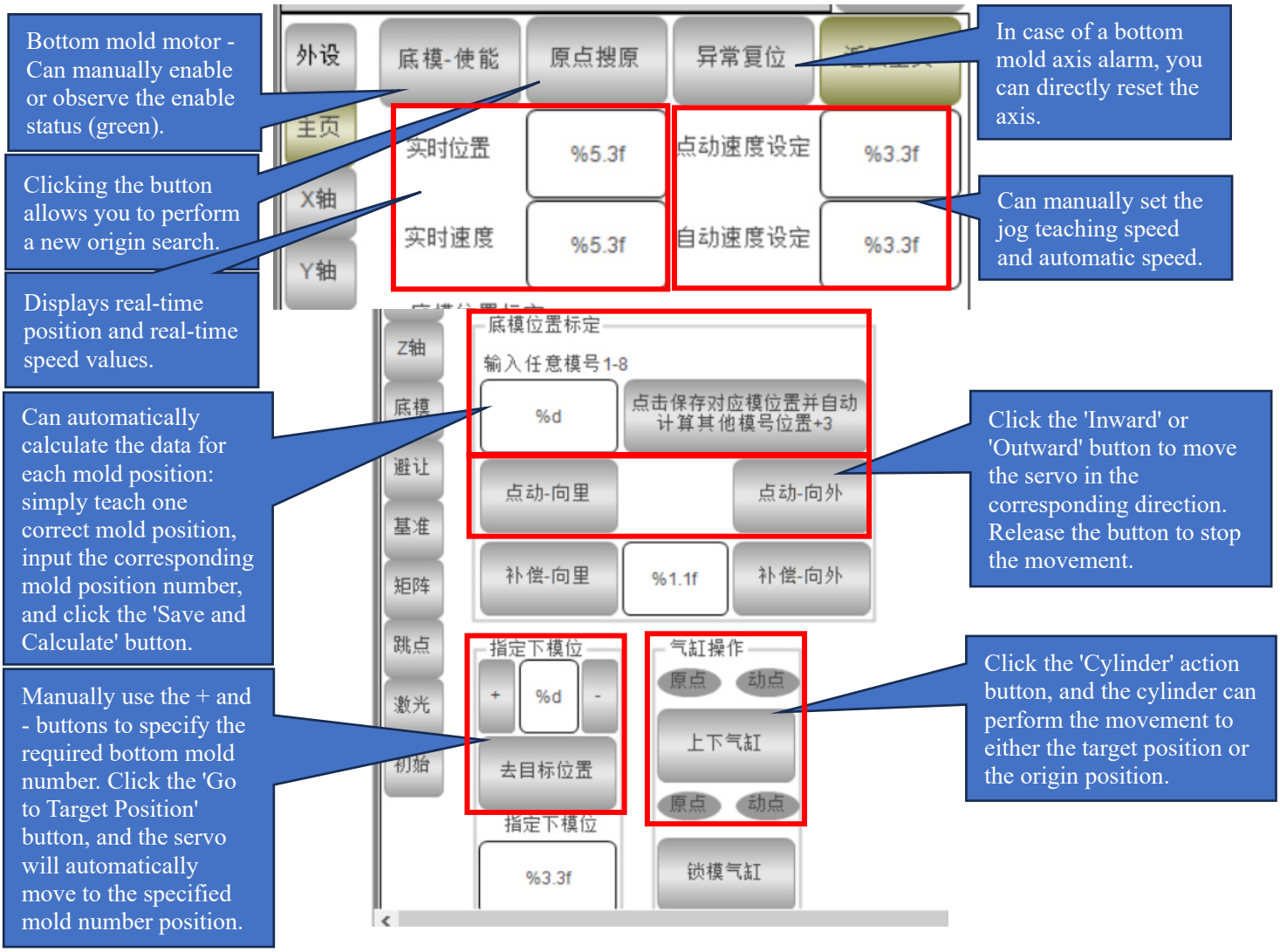


6.9.5 Y-Axis Operation Page Overview

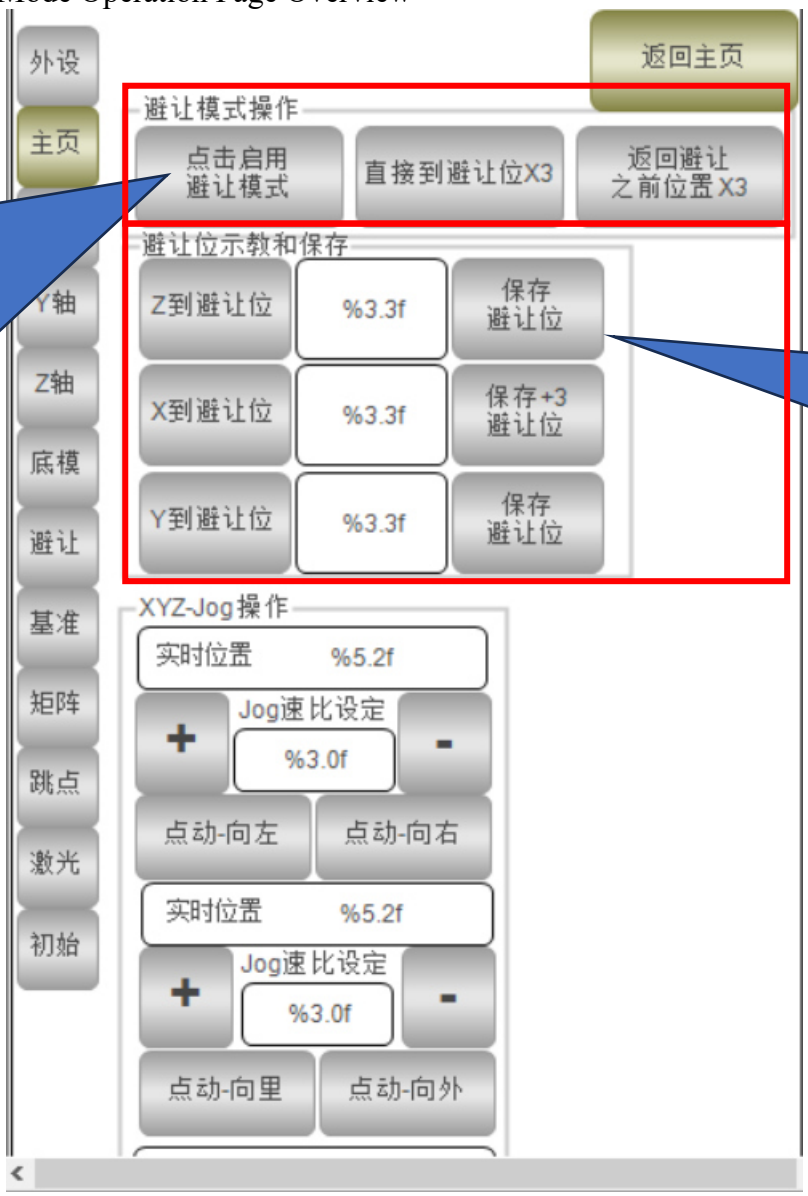
6.9.6 Z-Axis Operation Page Overview



6.9.7 Bottom Mold Operation Page Overview



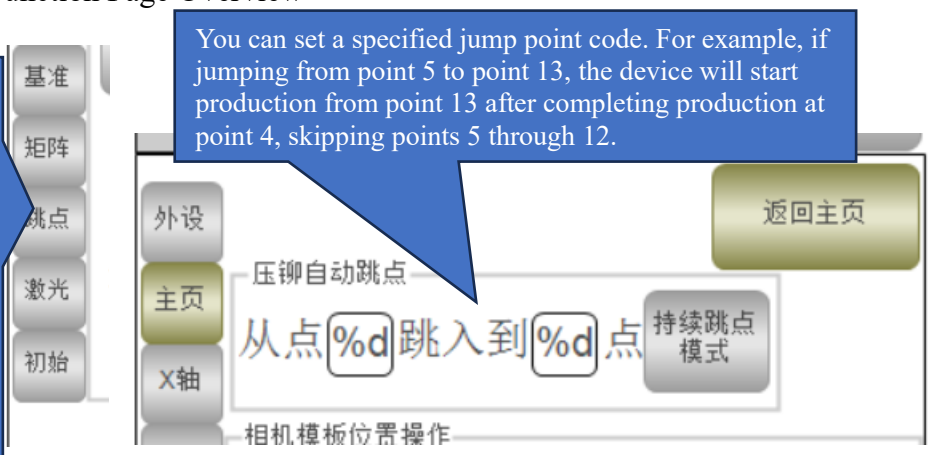
6.9.8 Avoidance Mode Operation Page Overview



In Avoidance Mode, the motor can automatically move to a pre-set avoidance position to facilitate maintenance on the turret and other locations.
① : Activate Avoidance Mode.
② : Press the button three times consecutively to move to the avoidance position.
③ : After three presses, return to the position before avoidance.

In non-avoidance mode, you can also operate the single axis to the corresponding position and re-save to record the new position.

6.9.8 Jump Point Function Page Overview



Enter the 'Jump Point' screen to activate the jump point function. If 'Continuous Jump Point Mode' is not activated, the device will automatically turn off the jump point mode after completing one production cycle. If 'Continuous Jump Point Mode' is activated, the specified jump point mode will be executed in each subsequent cycle until manually canceled.

You can set a specified jump point code. For example, if jumping from point 5 to point 13, the device will start production from point 13 after completing production at point 4, skipping points 5 through 12.

SECTION 7
PNEUMATIC SYSTEM

A. The initial pressure input of the pneumatic system

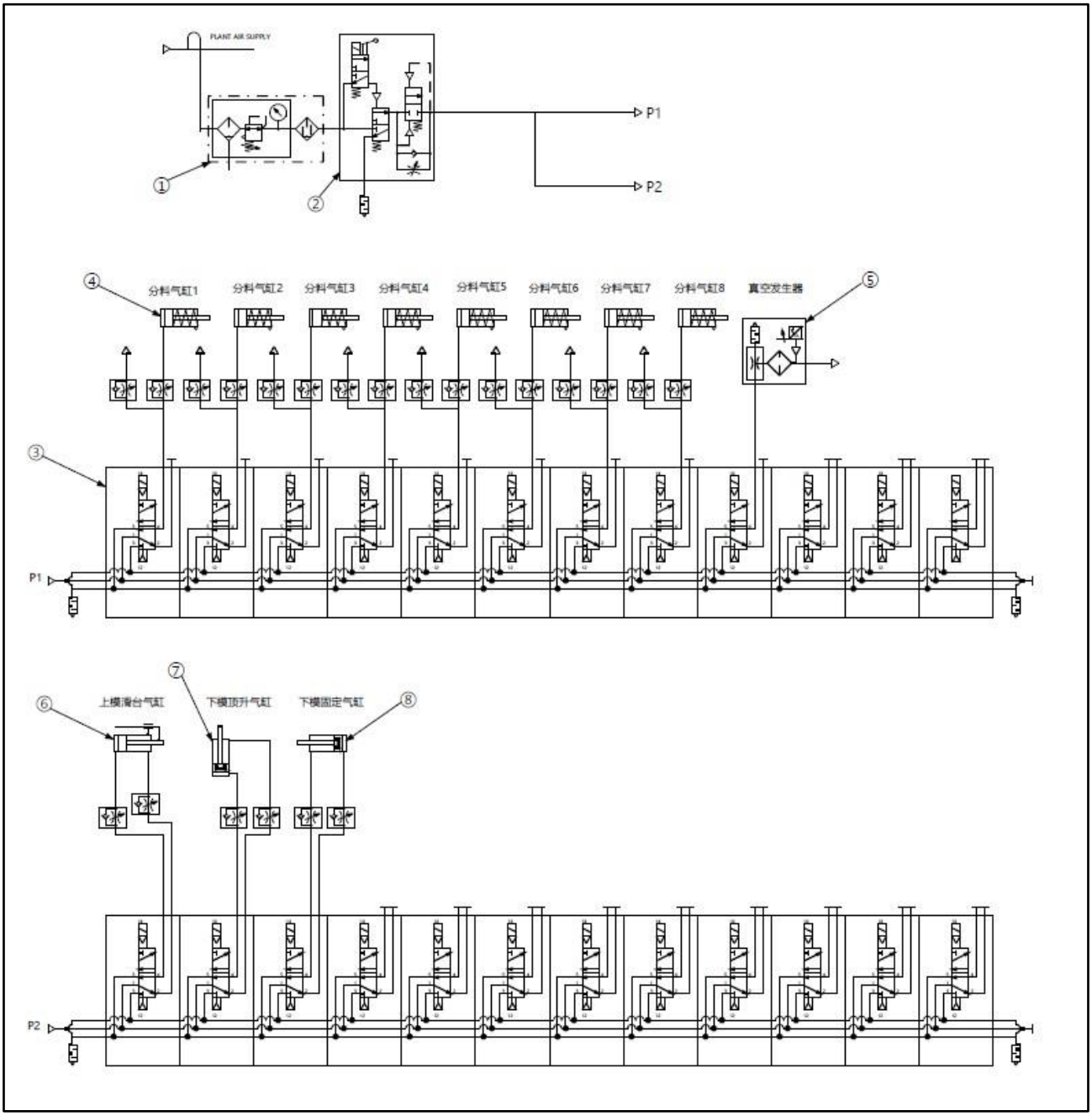
• Your factory air supply should be clean, dry and, ideally, have a high flow capability. Airline feeds smaller than 12mm (1/2”) will increase cycle time.

• Factory compressed air, set between 6 and 7 bar (90 to 100 psi), enters the system through a manually adjusted filter/regulator.

After flowing through the air filter pressure reducing valve, the air is connected to two valve islands through a Φ10 pipe, and the valve plates on the valve islands control each pneumatic actuator (see pneumatic principle diagram 7-1).

B. Air discharge

Both sides of the pneumatic valve assembly plate are equipped with exhaust holes and are equipped with silencers. According to the action logic needs, the air is discharged from this.



NO.	PARTS NUMBER	DESCRIPTION	QTY
1	MDS011830001	Modular F.R.L Units	**1**
2	MDS011830012	Soft Start-up Valve	**1**
3	MDS011820010	Valve Island	**2**
4	PS200272	Feeding cylinder	**8**
5	MDS182020001	Vacuum generator assembly	**1**
6	MDS012030167	Slide cylinder	**1**
7	MDS012030151	Lifting cylinder	**1**
8	MDS012030139	Fixed cylinder	**1**

FIGURE 7-1
Pneumatic Schematic

SECTION 8
ELECTRICAL SYSTEM

WARNING: Device uses high voltage electrical power. Only trained and authorized personnel may attempt to maintain, service, or repair its electrically powered subsystems, components or parts.

The electrical panel enclosure requires a special key to open. The purpose of this feature is to protect the machine from unauthorized persons tampering with the system and to help prevent unauthorized and untrained personnel from receiving an electrical shock. We suggest the key be kept by a manager/supervisor who will properly control its use.

Please refer to the drawing description for details.

AC Power Distribution:
The device is protected by a four-pole main circuit breaker. The orange line means there is still power after the power is off.

The inline AC power entering the device is routed to the following 2 areas:
- AC power supply
- Maintenance electricity.

DC Power Distribution:
- DC power supply from the main power supply for the programmable controller. Through different sub-circuits, it also supplies power to sensors and other input signals, touch screens, and programmable controllers that are used to control output drive cards for different load (output) switches.
- Light power.
- Motor, driver, Relay, Cylinder.

ELECTRICAL/ELECTRONIC IO

(Note: Most of the items mentioned below are illustrated in section two of this manual.)

INPUT		OUTPUT	
1K2 EL1018 DI-8bit 10us		1K4 EL2008 DQ-8bit	
0	TouchSurface	0	MainAir
1	Conduction	1	
2	EmergencyStop	2	Emptyload S1
3		3	Slowdown S2
4	CrossSensor1	4	Booste S3
5	CrossSensor2	5	EStopValve S4
6		6	Reset Light
7		7	Laser
1K3 EL1008 DI-8bit		1K12 EL2008 DQ-8bit	
0	SafetySensor1	0	
1	SafetySensor2	1	
2	VacuumSensor	2	
3		3	Shuttle
4	FootSwitchDn	4	Blower
5	FootSwitchUp	5	Slide
6	LifeDetect	6	Vacuum
7		7	BowlControl
1K9 EL3062 0-10MA 12bit			
0	Pressure Sensor A		
1	Pressure Sensor B		
1K10 EL3152 4-20ma 16bit			
0	Temperature Sensor		
1			
1K12 EL5001 SSI			
0	LVDT		

SECTION 9
MAINTENANCE

The most important element of maintaining your PEMSERTER® rivet installation machine is to ensure that the compressed air supply is clean and dry. Do not use lubricated air. It is necessary to ensure the cleanness of the liquid drawing oil, do not open the filling port, and check the fastness of each pipe joint regularly.

Following the maintenance schedule below will also help maintain your hardware insertion machine in good running order.

IMPORTANT: Only qualified individuals should perform maintenance pocedures. Unless otherwise specified, perform all maintenance with the hardware insertion machine disconnected from air and power. Follow safe practices and obey all local safety regulations.

Daily Inspection

• Safety punch system components.	• Perform safety system check procedures using “Testing the Safety System”.
• Upper Tool Holder.	• Replace Risk of Crushing label if peeling or damaged.
• Check the Multi-Module.	• Check whether there are impurities in the Multi-Module of the vibrating feeding system and whether it needs cleaning.
• Check air pressure.	• Check inlet pressure of 0.6MPa.
• Check the sound of the device working.	• Check the device is running without sound.

Weekly Inspection

• Check the Multi-Shuttle platform and its cylinder	• Correct and test the concentricity of the Multi-Shuttle platform with the upper and lower molds. • Check the smoothness of the sliding table cylinder.

Monthly Inspection

• Upper Tool Holder	• Upper Tool Holder. • Small amount of lithium grease (white) between upper tool holder & cylinder rod.

Six months Inspection

• Shuttle Jaws of Multi-Shuttle.	• Inspect Springs and change out if they appear weak.
• Flight Tubes	• Inspect and change out if damaged.
• Grease the cylinder	• Inject a certain amount of Shell Gadus S2 V2202 grease into the cylinder.

Annual Maintenance

• Clean Air Valves (optional)	• If contaminant build up occurs, clean the pneumatic valves annually. • If wear is serious, replace the pneumatic valve.
• Check the condition of the cylinder	• Make sure the connections are tight and the wires are not frayed or broken, which could affect the proper functioning of the electric cylinder.

3 Year Maintenance

• Check PAC status and clean the PAC. • Replace the button battery of touch screen PC.	• Checking the PAC and replacing the button battery of touch screen PC can avoid an accidental loss of the program. When clean the PAC and replace the button battery of touch screen PC, the machine should be powered off.

SECTION 10
TROUBLESHOOTING

Note: If an internal PAC problem should develop, call a PennEngineering® service technician, please call +86 (512) 5726-9310.		
SYMPTOMS	**DIAGNOSTICS & PROBABLE CAUSE(S)**	**PROBABLE SOLUTION(S)**
A. Whole System Malfunctions		
1. The machine will not start. (OFF light not lit) The machine will not start. (ON light is lit)	a. Electrical disconnect turned off. b. No power to the machine. c. DC Power Supply failure.	a. Turn on the power. b. Check main fuses. c. Check DC Power supply, replace if faulty.
	a. OFF button is "open". b. ON button is not closing. c. MCR (Main Control Relay) system failure.	a. Check button, replace if faulty. b. Check the wiring continuity, replace if faulty.
2. The machine will not cycle.	a. Safety sensor inputs are on. b. Start button is not making the proper PAC input.	a. Check the wiring of the sensor b. Check the wiring of the start button. If it is faulty, it should be replaced.

SYMPTOMS	DIAGNOSTICS & PROBABLE CAUSE(S)	PROBABLE SOLUTION(S)
B. Electrical/Electronic Malfunctions		
1. The touch screen will not work but the power button is lit.	a. The circuit breaker is open.	a. Analyze and repair the touch screen related circuitry then replace the fuse. b. Replace the touch screen if faulty.
2. The lights of the programmable controller are not on.	a. Check to see if the PAC power supply is receiving 24 volts. b. Check the fuse in the PAC power supply. c. Check to see if the PAC power supply has failed.	a. If not receiving power check breaker. b. Replace the breaker in the power supply. c. Replace the power supply.
3. The sensors are not functioning.	a. Check to see if breaker is open. b. Check all sensors to see if one has a "short." c. Check the DC input module.	a. If open, investigate the circuitry and replace fuse three. b. Repair the "short" problem and/or replace the sensor. c. If faulty, replace the DC input module.
4. The DC power supply is not functioning.	a. Check the main power breaker. b. Check for line voltage at the supply terminals.	a. Replace if blown. b. Check the wiring between the power inlet module and the supply. c. Replace the power supply.
5. The machine will not power-up.	a. Check to see if there is in-coming power. b. Check to see if the main disconnect is shut off. c. Check MCR's wiring.	a. Provide the power. b. Turn to the ON position.
7. The machine will not power-down.	a. Check to see if the OFF button is faulty. b. check MCR's /wiring.	a. Replace if faulty.
8. There is no voltage at the solenoid valve.	a. Check for a shorted coil. b. Check the related PAC output voltage.	a. Repair or replace. b. Replace the output card if faulty.

SYMPTOMS	DIAGNOSTICS & PROBABLE CAUSE(S)	PROBABLE SOLUTION(S)
C. Pneumatic System Malfunctions		
1. The air pressure does not reach the set value.	a. Check for leaks.	a. Repair any leaks.
D. Tooling Malfunctions		
1. The Multi-Module is jammed.	a. A fastener is jammed.	a. Clear the fastener.
2. Fastening and riveting products are not normally sucked out from the Multi-Shuttle tooling by the vacuum pressure rod.	a. Multi-Shuttle tooling uncalibrated center。	a. Recalibrate Multi-Shuttle tooling.
3. The long lengths of studs are jamming in the tube.	a. Bends in tube are too tight.	a. Redress tube to bend toward the frame and then through the tube clips on the frame.
E. Vibratory Bowl System Malfunction		
The bowl does not vibrate.	a. Check whether the circuit breaker of the vibrating plate drive controller is intact. b. Check whether the output signal light of the programmable controller is on. c. Check whether the internal circuit of the feeding drive controller is normal.	a. Check whether the solenoid coils at both ends are short-circuited. If there is a short-circuit, replace the coil, and then replace the circuit breaker of the feeding drive controller. b. If a failure occurs, replace and reprogram the programmable controller. c. If necessary, parts or controllers should be replaced.

SECTION 11
SPARE PARTS

PART DESCRIPTION	PFT PART NUMBER	QTY	MANUFACTURER	MANUFACTURER'S PART NUMBER
Level One Spare Parts **(Maintain this minimum inventory of parts for standard mechanical wear items on the machine.)**				
AC208-500V To AC220-4KVA Transformer	MDS025730006	1	Murr	86156
2KWServo driver	MDS025330063	1	OMRON	R88D-1SN20F-ECT
2KWServo motor	MDS015330003	1	OMRON	R88M_1L2K030C_S2-AC400
750WServo driver	MDS025330062	1	OMRON	R88D-1SN08H-ECT
100WServo driver	MDS025330060	1	OMRON	R88D-1SN01H-ECT
PAC_Codesys	MDS024830012	1	HCFA	Q1-1200-D3
structured light-3D-Camer	MDS026430007	1	Imalligent	VRH5-5050
industrial computer	MDS025020001	1	Imalligent	BP1000
1KWServo driver	MDS025330126	1	OMRON	R88D-1SN10H-ECT
1KWServo motor	MDS025330140	1	OMRON	R88M-1M1K020T-S2

PART DESCRIPTION	PFT PART NUMBER	QTY	MANUFACTURER	MANUFACTURER'S PART NUMBER
Level Two Spare Parts				
(Add these items to the spare parts in inventory when no downtime can be tolerated.)				
relay WITH TEST	PS193070	1	Phoenix	1032526
relay base	PS193071	1	Phoenix	2908341
Key switch	PS180473	1	Schneider	XB2BG41C
Rotary reset emergency stop	PS210477	1	SIEMENS	3SB6160-1HB20-1CA0
touchpoint - 1NC	PS210479	1	SIEMENS	3SB66400-1AA10-1CA0
Safety relay 3NO 1NC	PS180602	1	Phoenix	1046360
main switch 40A	MDS026030099	1	Schneider	VCF2
Transformer	MDS025730008	1	GBL	QZB-3KVA/3AC380-3AC220
Tricolor light	MDS026130030	1	SIEMENS	8WU4624-5GH06
Panel socket	PS201149	1	murr	4000-68713-8080001

AC208-500V To AC220-4KVA Transformer	MDS025730006	1	murr	86156
2KWServo driver	MDS025330063	1	OMRON	R88D-1SN20F-ECT
2KWServo motor	MDS015330003	1	OMRON	R88M_1L2K030C_S2-AC400
1KWServo driver	MDS025330126	1	OMRON	R88D-1SN10H-ECT
1KWServo motor	MDS025330140	1	OMRON	R88M-1M1K020T-S2/Omron-AC200
2KW Flexible power line	MDS025330123	1	OMRON	R88A-CA1C010SF
1-3KW Flexible coded cable	MDS025330124	1	OMRON	R88A-CR1B010NF
750W-Flexible power line-10M	MDS025330068	1	OMRON	R88A-CA1A010SF
750W-Flexible coded cable-10M	MDS025330065	1	OMRON	R88A-CR1A010CF
750W-Flexible break cable-10M	MDS025330070	1	OMRON	R88A-CA1A010BF
750WServo driver	MDS025330062	1	OMRON	R88D-1SN08H-ECT
100WServo driver	MDS025330060	1	OMRON	R88D-1SN01H-ECT
Servo motor-750W break , keyway	MDS025330097	1	OMRON	R88M-1M75030T-BS2
Servo motor-100W, No break , keyway	MDS015330006	1	OMRON	R88M-1M10030H-S2
Flexible power line-10M	MDS025330127	1	OMRON	R88A-CA1B010SF
Breaker -10A	PS211058	1	SIEMENS	5SY6310-7CC
filter	PS210329	1	SIEMENS	6SL3203-0BB21-BVA1
Electronic circuit Breaker -10A	PS181022	1	Phoenix	2906032
Green button	PS202215	1	SIEMENS	3SB6163-0DB40-1BA0
structured light-3D-Communication line-10M	MDS027030021	1	Imalligent	Ethernet Cable 10M
structured light-3D-POWER line-10M	MDS027330079	1	Imalligent	HTVR-I/O Cable
structured light-3D-Camer	MDS026430007	1	Imalligent	VRH5-5050
industrial computer	MDS025020001	1	Imalligent	BP1000

PAC_Codesys	MDS024830012	1	HCFA	Q1-1200-D3
Three-phase 240W power supply	MDS025630004	1	Meanwell	TDR-240-24
Main switch guide rod-330mm-25A panel-KCD1PZC	PS210579		Schneider	VCCD0C
22mmBuzzer red light	MDS026130004	1	Phoenix	1108842
Blue button with light 1NO	MDS026130002	1	SIEMENS	3SB6163-0DB50-1BA0
Green button with light 1NO	PS210469	1	SIEMENS	3SB6163-0DB40-1BA0
Breaker 2P_4A	PS201775	1	SIEMENS	5SY6204-7CC
Breaker 3P_10A	PS211058	1	SIEMENS	5SY6310-7CC
Breaker 3P_16A	PS211059	1	SIEMENS	5SY6316-7CC
Breaker 1P_10A	PS210495	1	SIEMENS	5SY6104-7CC
Breaker 1P_4A	MDS026030001	1	SIEMENS	5SY6106-7CC
EtherCat coupler	MDS024830013	1	ODOT	CN-8033
16 INPUT PNP	MDS024830014	1	ODOT	CT-121F
16DO-OUTPUT PNP	MDS024830015	1	ODOT	CT-222F
4-20ma 15bit	MDS024830016	1	ODOT	CT-3238
Solid State Relay	PS190445	1	Phoenix	RIF-0-OPT-24DC
M12_5Pin_A-code-Female10 米	MDS026930067	1	MURR	RKT_5-228/10M
switch module 8port	MDS025930004	1	Phoenix	1085256
DC 480W power supply	PS201751		Phoenix	ESSENTIAL-PS/1AC/24DC/480W/EE
4P-40A Breaker	MDS026030100		SIEMENS	5SY6440-7CC
2P-10A Breaker	MDS026030052		SIEMENS	5SY6210-7CC
2P Breaker 4A	PS201775		SIEMENS	5SY6204-7CC
M12 D-code M12-RJ45 10 米	PS210504		MURR	0985 342 104/10

Appendix
Electrical Schematic

XYP

IEC_tp1001

“已授权 “

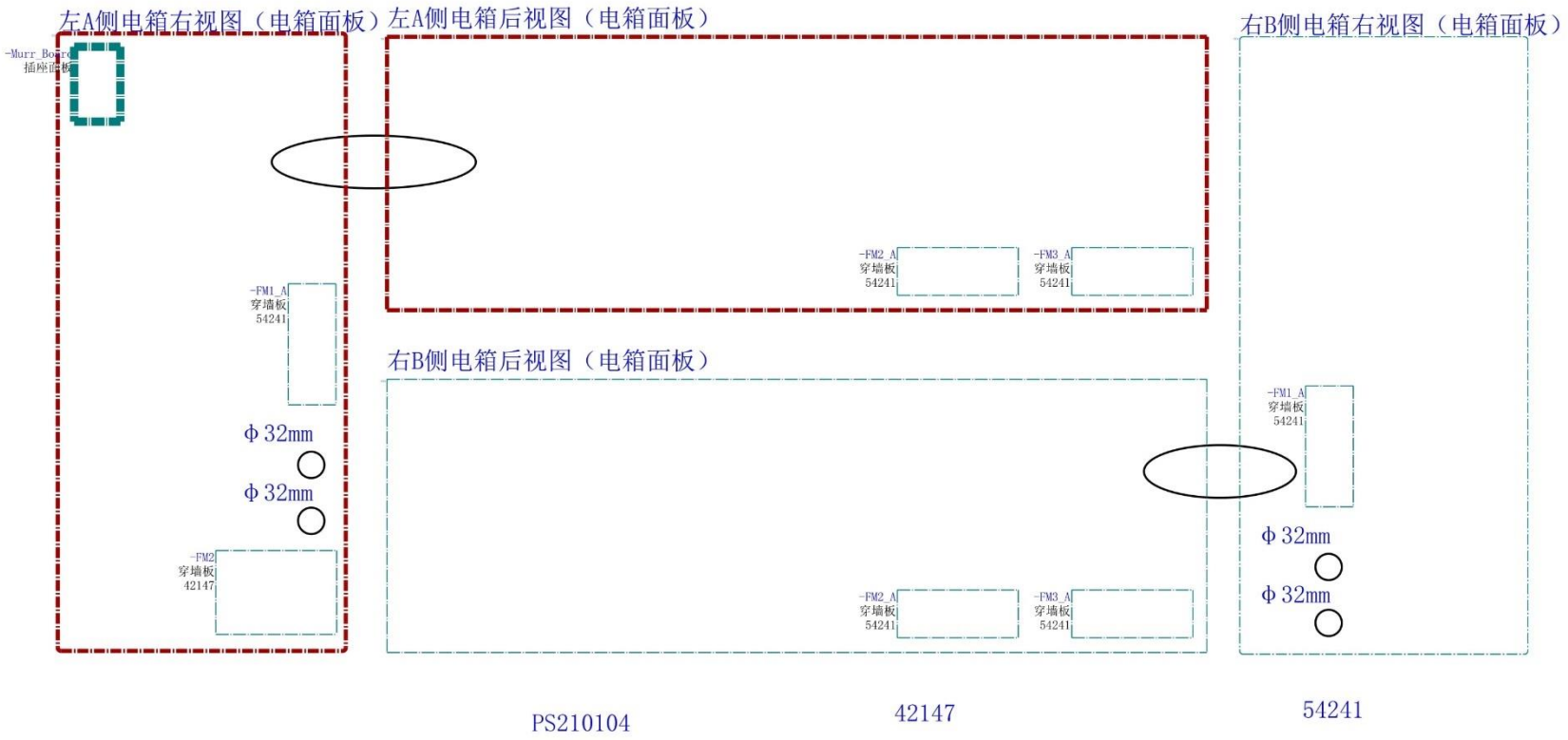
印章

2023/10/11

Inv. № Orig.	签名和日期	Ers. inv. №	Inv. № Dupl.	签名和日期

左侧A电箱和右侧B电箱***T1200

右侧电箱B镜像开孔



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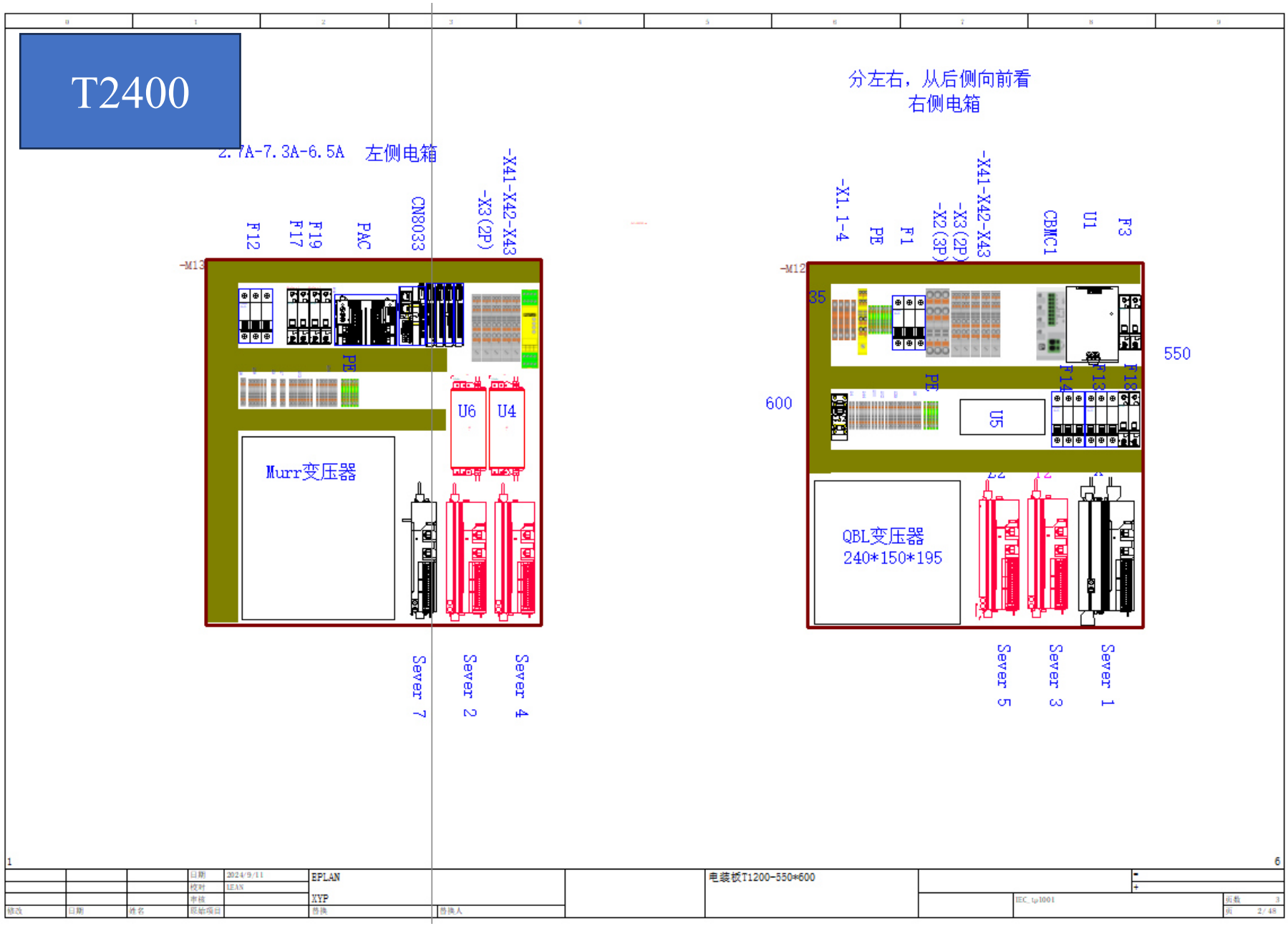
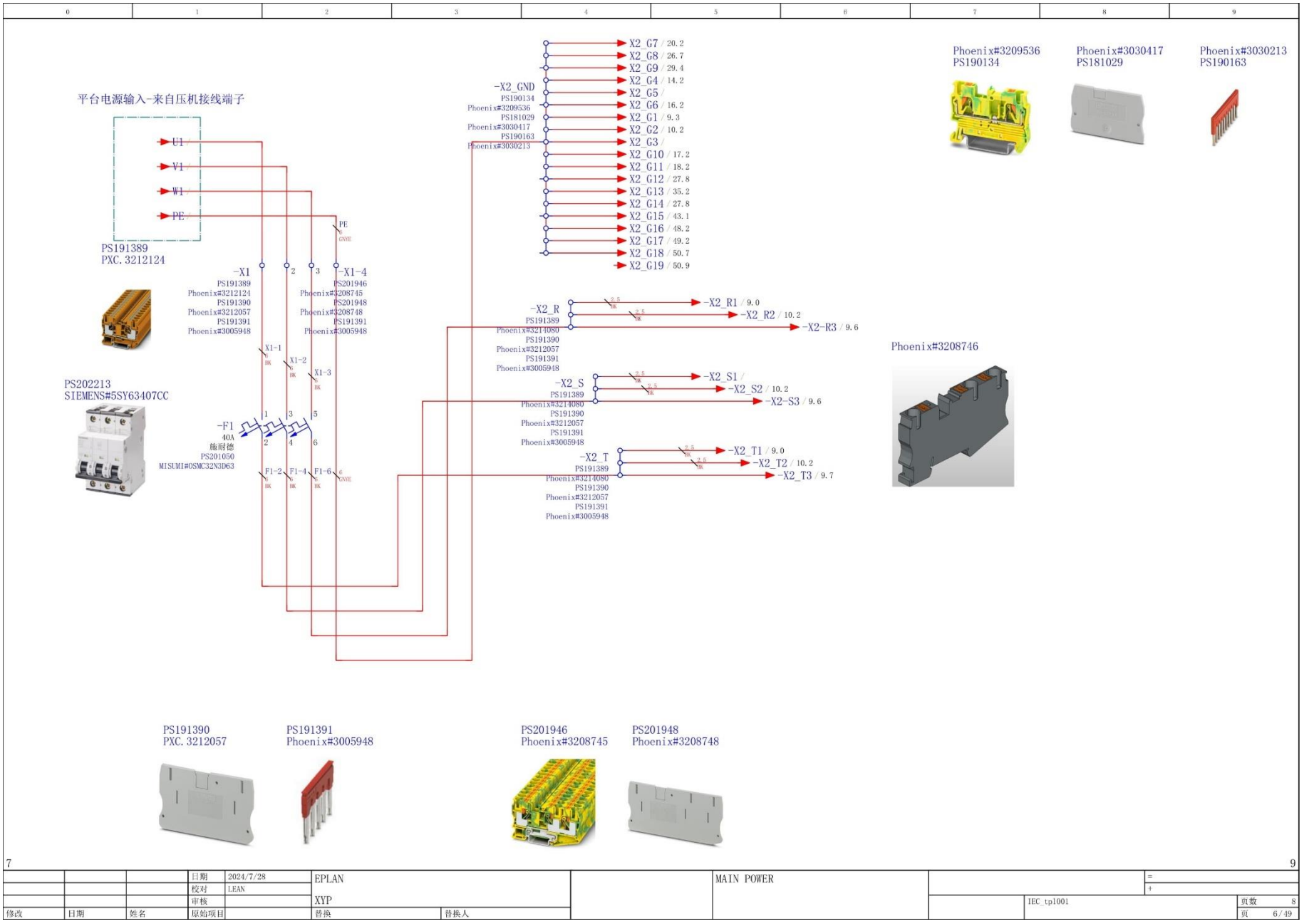
42147

54241

			日期	2024/7/10	EPLAN		T1200平台分体电箱开孔视图		=	
			校对	LEAN					+	
			审核		XYP			IEC_tp1001	页数	6
修改	日期	姓名	原始项目		替换	替换人			页	4/49

T2400


2.7A-7.3A-6.5A 左侧电箱
-X41-X42-X43
-X3(2P)
CN8033
PAC
F19
F17
F12
-M13
PE
U6
U4
Murr变压器
Sever 7
Sever 2
Sever 4
分左右，从后侧向前看
右侧电箱
-X1.1-4
PE
F1
-X2(3P)
-X3(2P)
-X41-X42-X43
CBMC1
U1
F3
-M12
35
550
600
PE
F14
F13
F18
U5
QBL变压器
240*150*195
Sever 5
Sever 3
Sever 1
1
6
EPLAN
XYP
电装板T1200-550*600
2024/9/11
LEAN



默认：输入AC380V-输出AC230V

	Un [V]	Clamps	Jumper	In [A]	Protection
Inp.	208	1-2	1+4/3+7	31,0	3RV1742-5FD10(35A)
	230*	5-7	1+4/3+7	28,0	3RV1742-5ED10(30A)
	380	1-6	2+5	17,0	3RV2821-4BD10(20A)
	400	1-6	2+4	16,1	3RV2821-4BD10(20A)
	420	1-6	3+5	15,4	3RV2821-4BD10(20A)
	440	1-6	3+4	14,7	3RV2811-4AD10(15A)
	460	1-7	2+4	14,0	3RV2811-4AD10(15A)
	480	1-7	3+5	13,4	3RV2811-4AD10(15A)
	500	1-7	3+4	12,9	3RV2811-4AD10(15A)
	525	1-8	3+5	12,3	3RV2811-1KD10(12,5A)
	550	1-8	3+4	11,7	3RV2811-1KD10(12,5A)
Out.	2x 115	9-11/10-12	-	27,4	3RV1742-5ED10(30A)
	115*	9-12	9+10/11+12	54,8	3RV1742-5LD10(60A)
	230	9-12	10+11	27,4	3RV1742-5ED10(30A)

*factory preset

T2400/T1200

AC380V

MURR#86156
MDS025730006

-TAC1

-TAC2

-T1 GBL#QZB 3AC380-3AC220 奇皮尔变压器

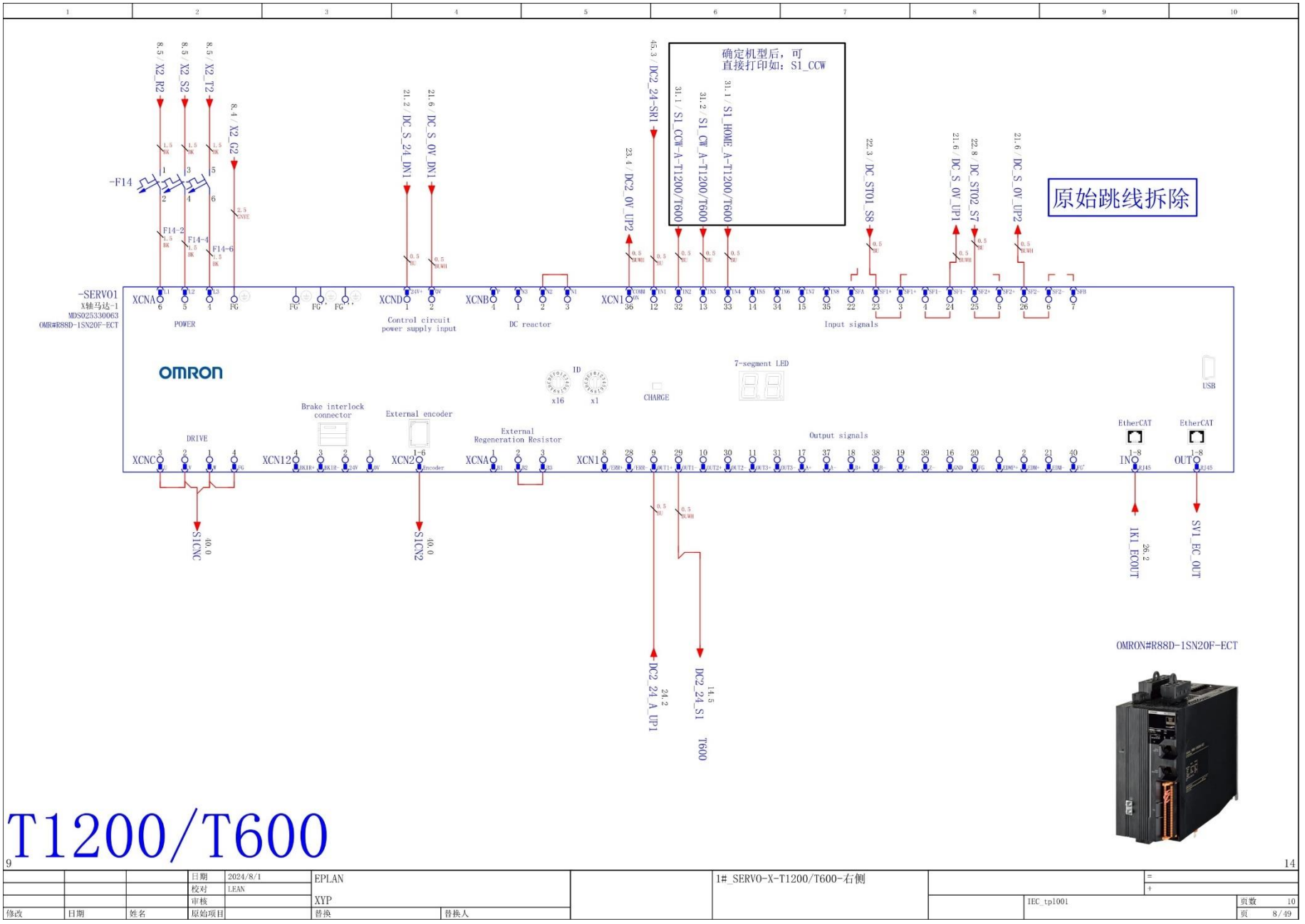
-X3_R PS201950 Phoenix#3212124

-X3_T PS201950 Phx. 3212124

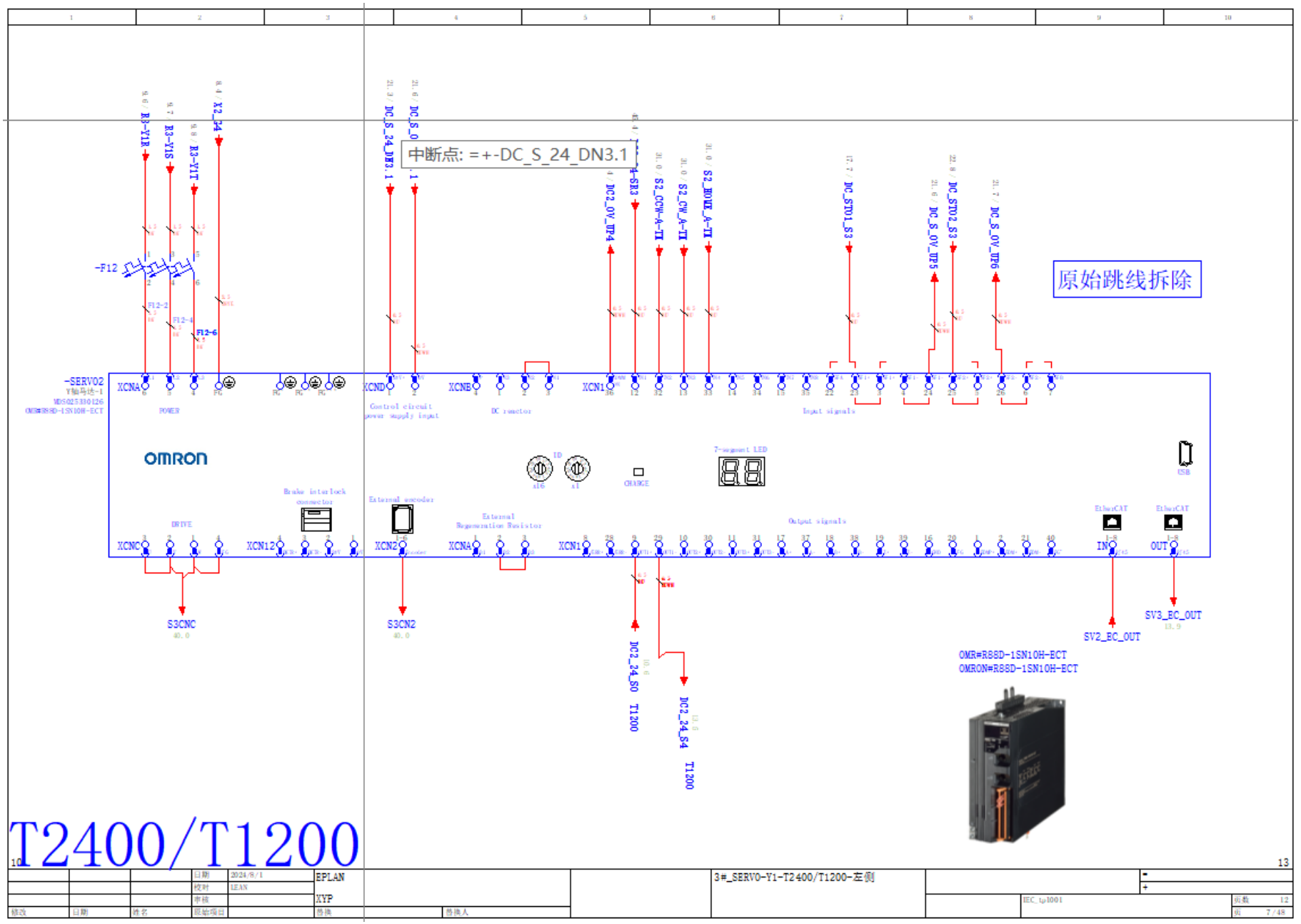
-X41 -X42 -X43 PS201950 Phoenix#3212124

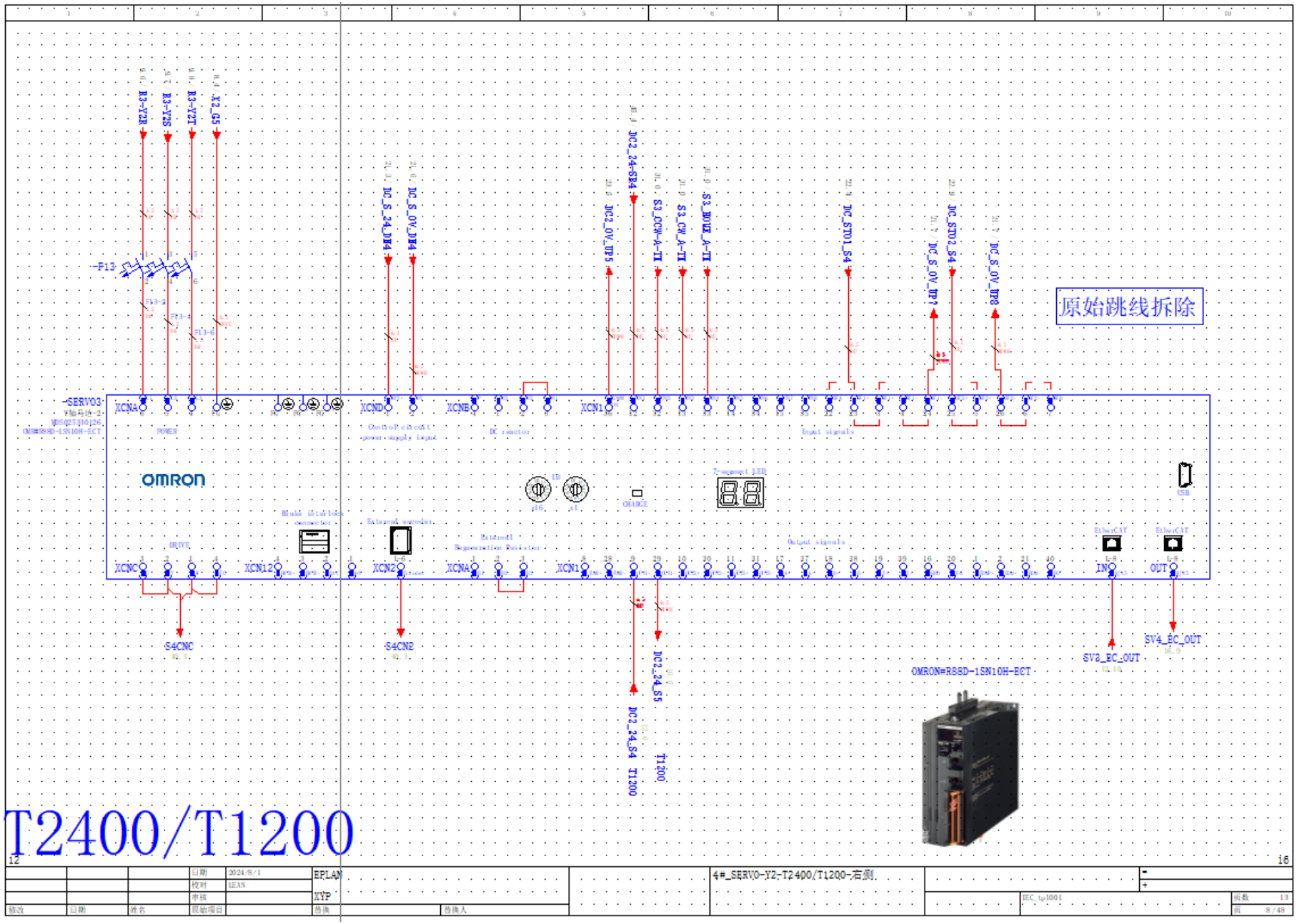
PS201950 Phoenix#3214080

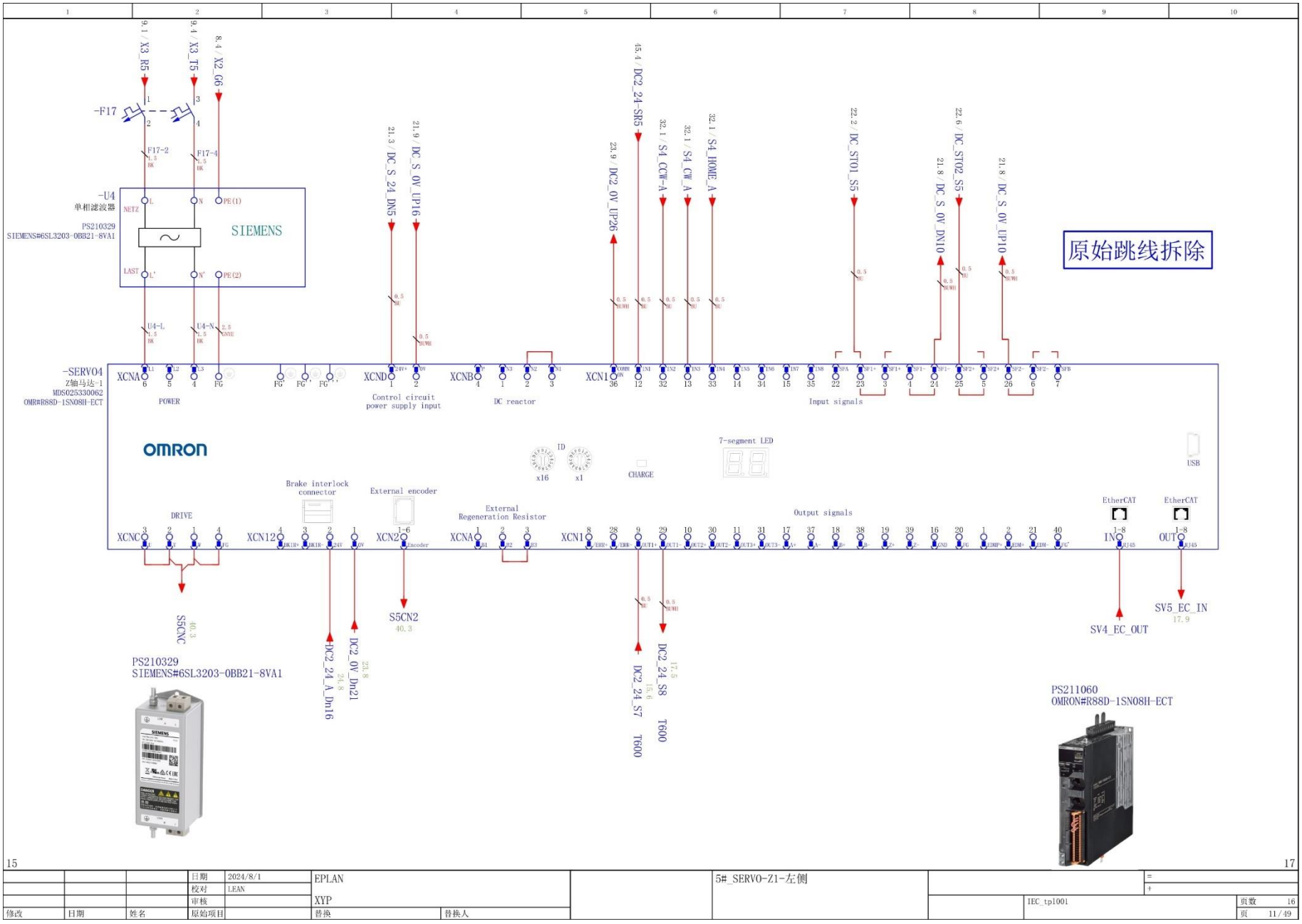
			日期	2024/7/11	EPLAN		AC_TRANS		=
			校对	LEAN					+
			审核		XYP			IEC_tp1001	页数 9
修改	日期	姓名	原始项目		替换	替换人			页 7/49

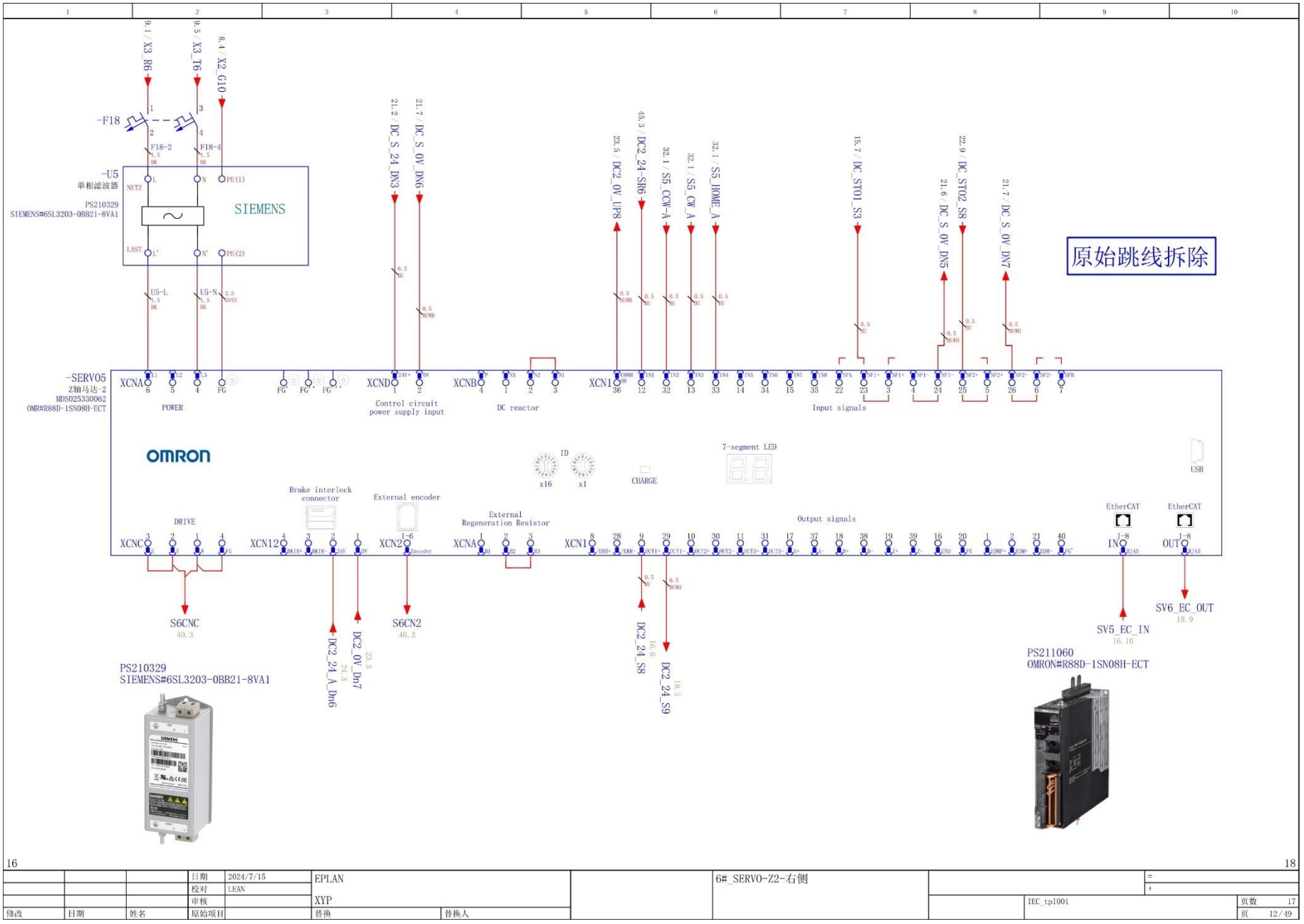


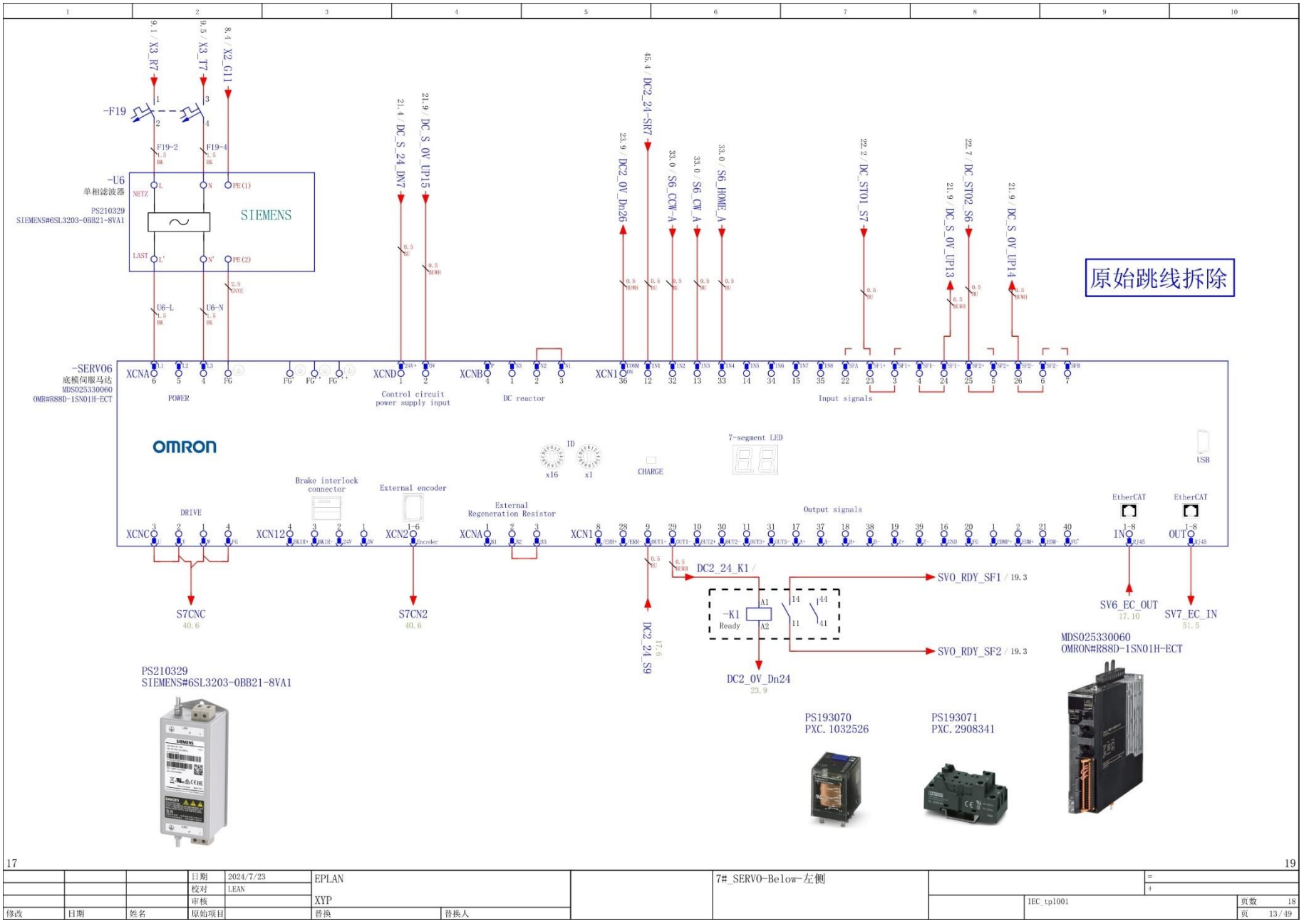
			日期	2024/8/1	EPLAN		1#_SERVO-X-T1200/T600-右侧	=	
			校对	LEAN				+	
			审核		XYP			IEC_tp1001	页数 10
修改	日期	姓名	原始项目		替换	替换人			页 8/49

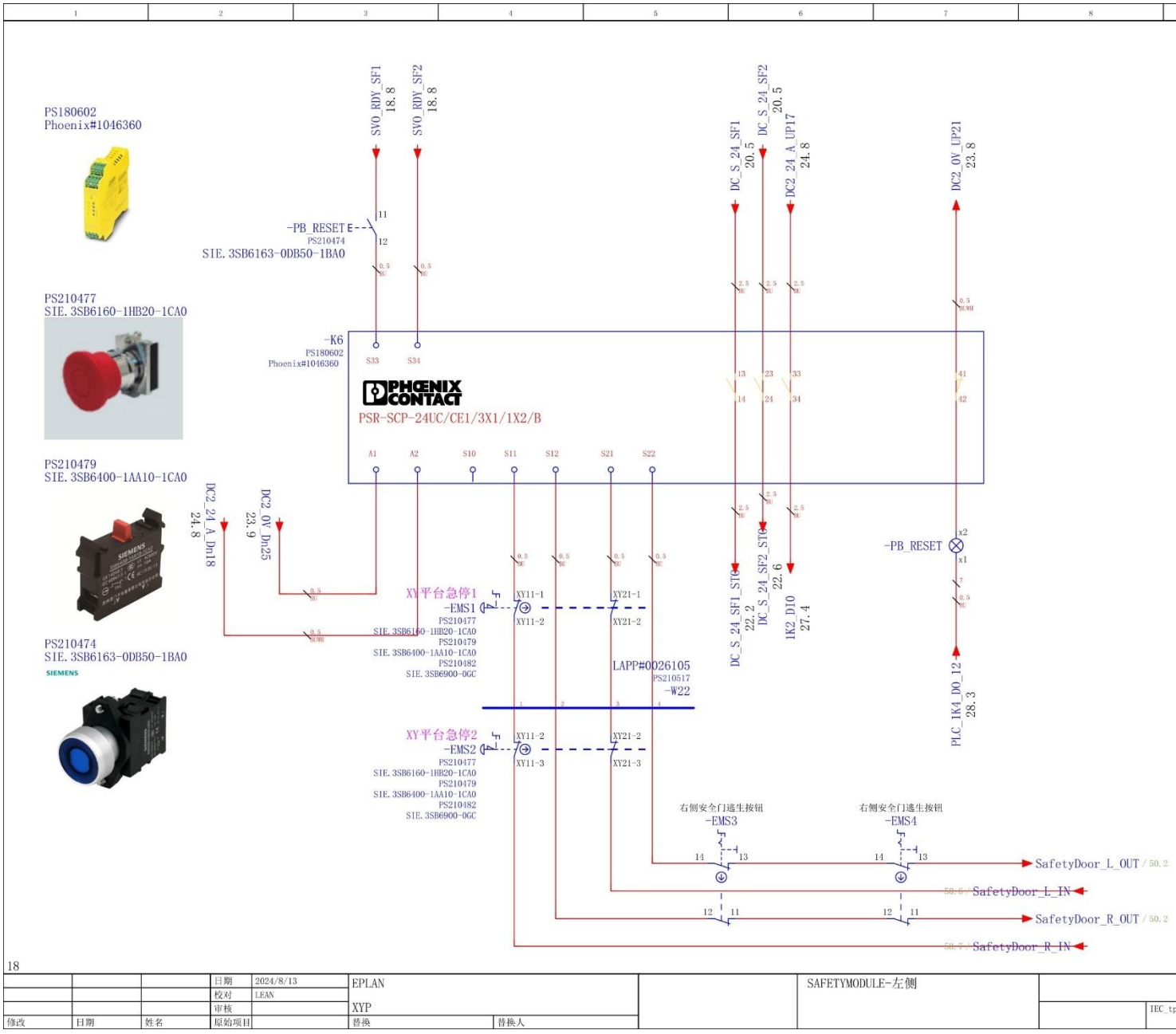

中断点: =+-DC_S_24_DN3.1
原始跳线拆除
-SERVO2
OMRON
XCNA
XCND
XCNE
XCN1
XCNC
XCN12
XCN2
XCNA
XCN1
IN
OUT
-F12
F12-2
F12-4
F12-6
R3-Y1R
R3-Y1S
R3-Y1T
X2_P4
DC_S_24_DN3.1
DC2_0V_DP4
S2_CCW-A-IN
S2_CW_A-IN
S2_BDUE_A-IN
DC_STO1_S3
DC_STO2_S3
DC_S_0V_DP5
DC_S_0V_DP6
S3CNC
S3CN2
DC2_24_S0
T1200
DC2_24_S4
T1200
SV2_EC_OUT
SV3_EC_OUT
OMR=R88D-1SN10H-ECT
OMRON=R88D-1SN10H-ECT
T2400/T1200
3#_SERVO-Y1-T2400/T1200-左侧
EPLAN
XYP

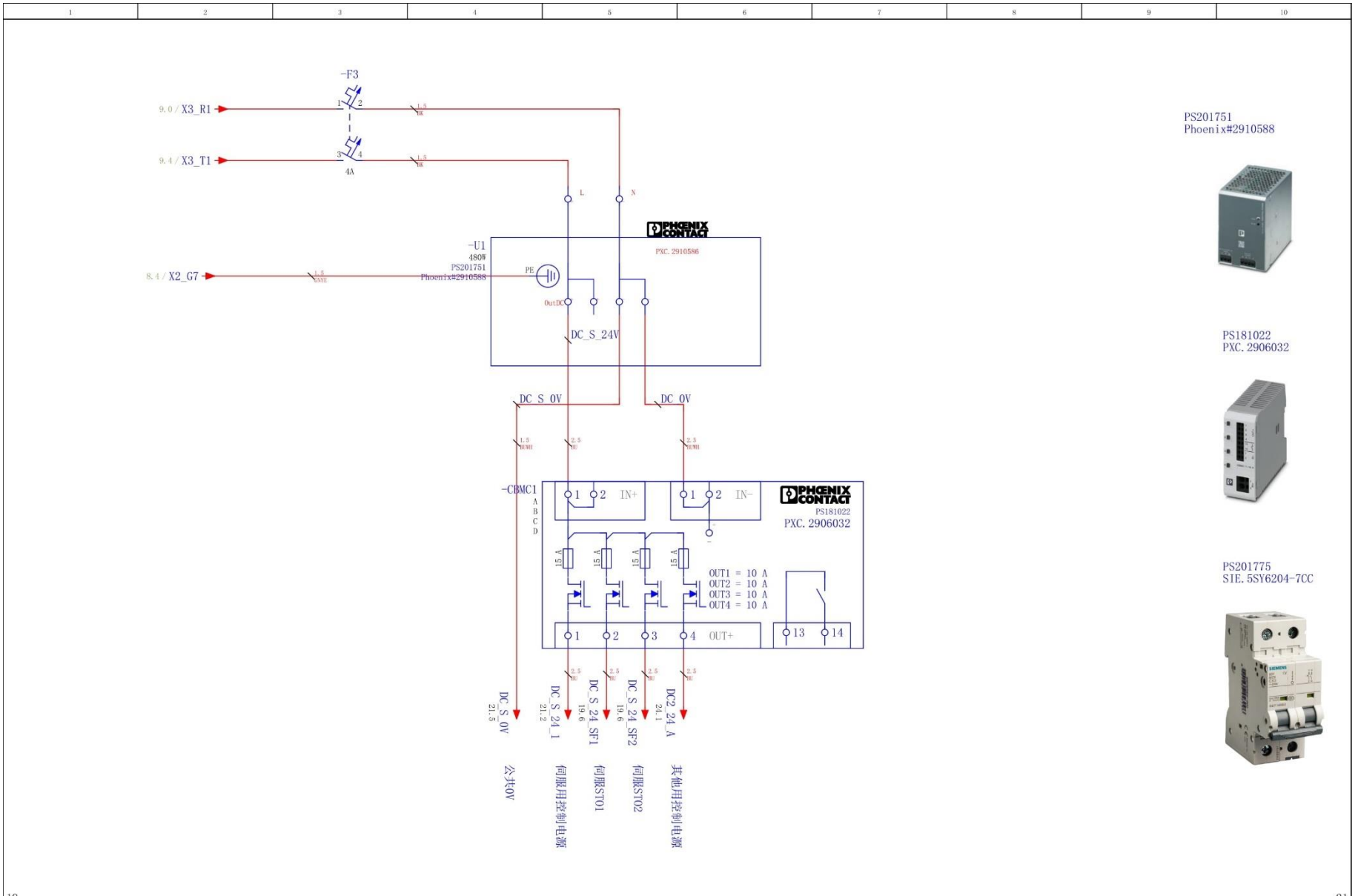

原始跳线拆除
T2400/T1200
OMRON
OMRON=R88D-1SN10H-ECT
4#_SERVO-Y2-T2400/T1200-右侧
EPLAN
XYP


原始跳线拆除
-F17
-U4
单相滤波器
PS210329
SIEMENS#6SL3203-0BB21-8VA1
SIEMENS
-SERVO4
Z轴马达-1
MDS0253300062
OMR#R88D-1SN08H-ECT
XCNA
XCND
XCNB
XCN1
POWER
Control circuit power supply input
DC reactor
Input signals
OMRON
ID
x16
x1
CHARGE
7-segment LED
USB
DRIVE
Brake interlock connector
External encoder
External Regeneration Resistor
XCNC
XCN12
XCN2
XCNA
Output signals
EtherCAT
IN
OUT
S5CN2
SV4_EC_OUT
SV5_EC_IN
PS210329
SIEMENS#6SL3203-0BB21-8VA1
PS211060
OMRON#R88D-1SN08H-ECT
DC2_24_A_Dn16
DC2_0V_Dn21
DC2_24_S7 T600
DC2_24_S8 T600
DC_S_24_DN5
DC_S_0V_UP16
DC2_0V_UP26
DC2_24-SR5
S4_CCW-A
S4_CW_A
S4_HOME_A
DC_STO1_S5
DC_S_0V_DN10
DC_STO2_S5
DC_S_0V_UP10
15
17
EPLAN
XYP
5#_SERVO-Z1-左侧
IEC_tp1001
2024/8/1
LEAN
日期
校对
审核
修改
日期
姓名
原始项目
替换
替换人
页数 16
页 11/49


9.1 / X3_R6
9.5 / X3_T6
8.4 / X2_G10
-F18
F18-2
F18-4
-U5
单相滤波器
PS210329
SIEMENS#6SL3203-0BB21-8VA1
SIEMENS
NETZ
LAST
PE(1)
PE(2)
U5-L
U5-N
21.2 / DC_S_24_DN3
21.7 / DC_S_0V_DN6
23.5 / DC2_0V_UP8
45.3 / DC2_24-SR6
32.1 / S5_CCW-A
32.1 / S5_CW_A
32.1 / S5_HOME_A
15.7 / DC_STO1_S3
22.9 / DC_STO2_S8
21.6 / DC_S_0V_DN5
21.7 / DC_S_0V_DN7
原始跳线拆除
-SERV05
Z轴马达-2
MDS025330062
OMR#R88D-1SN08H-ECT
XCNA
XCND
XCNB
XCN1
POWER
Control circuit power supply input
DC reactor
Input signals
OMRON
ID
x16
x1
CHARGE
7-segment LED
USB
DRIVE
Brake interlock connector
External encoder
External Regeneration Resistor
Output signals
EtherCAT
XCNC
XCN12
XCN2
IN
OUT
S6CNC
40.3
S6CN2
40.3
DC2_24_A_Dn6
24.3
DC2_0V_Dn7
23.5
DC2_24_S8
16.6
DC2_24_S9
18.5
SV5_EC_IN
16.10
SV6_EC_OUT
18.9
PS210329
SIEMENS#6SL3203-0BB21-8VA1
PS211060
OMRON#R88D-1SN08H-ECT
16
18
日期 2024/7/15
校对 LEAN
审核
EPLAN
XYP
6#_SERVO-Z2-右侧
修改 日期 姓名 原始项目 替换 替换人
IEC_tp1001
页数 17
页 12/49


9.1 / X3_R7
9.5 / X3_T7
8.4 / X2_G11
-F19
F19-2
F19-4
-U6
单相滤波器
PS210329
SIEMENS#6SL3203-0BB21-8VA1
SIEMENS
U6-L
U6-N
21.4 / DC_S_24_DN7
21.9 / DC_S_0V_UP15
45.4 / DC2_24-SR7
23.9 / DC2_0V_Dn26
33.0 / S6_CCW-A
33.0 / S6_CW_A
33.0 / S6_HOME_A
22.2 / DC_STO1_S7
21.9 / DC_S_0V_UP13
22.7 / DC_STO2_S6
21.9 / DC_S_0V_UP14
原始跳线拆除
-SERVO6
底模伺服马达
MDS025330060
OMR#R88D-1SN01H-ECT
XCNA
XCND
XCNB
XCN1
POWER
Control circuit power supply input
DC reactor
Input signals
OMRON
ID
7-segment LED
CHARGE
USB
Brake interlock connector
External encoder
External Regeneration Resistor
Output signals
EtherCAT
DRIVE
XCNC
XCN12
XCN2
XCNA
XCN1
IN
OUT
S7CNC
40.6
S7CN2
40.6
DC2_24_K1
-K1
Ready
SV0_RDY_SF1 / 19.3
SV0_RDY_SF2 / 19.3
DC2_0V_Dn24
23.9
DC2_24_S9
17.6
SV6_EC_OUT
17.10
SV7_EC_IN
51.5
MDS025330060
OMRON#R88D-1SN01H-ECT
PS210329
SIEMENS#6SL3203-0BB21-8VA1
PS193070
PXC. 1032526
PS193071
PXC. 2908341
17
19
EPLAN
XYP
7#_SERVO-Below-左側
IEC_tp1001
2024/7/23
LEAN
页数 18
页 13/49


PS180602
Phoenix#1046360
PS210477
SIE. 3SB6160-1HB20-1CA0
PS210479
SIE. 3SB6400-1AA10-1CA0
PS210474
SIE. 3SB6163-0DB50-1BA0
SVO_RDY_SF1 18.8
SVO_RDY_SF2 18.8
-PB_RESET
PS210474
SIE. 3SB6163-0DB50-1BA0
-K6
PS180602
Phoenix#1046360
PHOENIX CONTACT
PSR-SCP-24UC/CE1/3X1/1X2/B
DC_S_24_SF1 20.5
DC_S_24_SF2 20.5
DC2_24_A_UP17 24.8
DC2_0V_UP21 23.8
DC2_24_A_Dn18 24.8
DC2_0V_Dn25 23.9
XY平台急停1
-EMS1
PS210477
SIE. 3SB6160-1HB20-1CA0
PS210479
SIE. 3SB6400-1AA10-1CA0
PS210482
SIE. 3SB6900-0GC
LAPP#0026105
PS210517
-W22
XY平台急停2
-EMS2
PS210477
SIE. 3SB6160-1HB20-1CA0
PS210479
SIE. 3SB6400-1AA10-1CA0
PS210482
SIE. 3SB6900-0GC
DC_S_24_SF1_STO 22.2
DC_S_24_SF2_STO 22.6
1K2_D10 27.4
-PB_RESET
PLC_1K4_DO_12 28.3
右侧安全门逃生按钮
-EMS3
右侧安全门逃生按钮
-EMS4
SafetyDoor_L_OUT / 50.2
SafetyDoor_L_IN
SafetyDoor_R_OUT / 50.2
SafetyDoor_R_IN
18
20
日期 2024/8/13
校对 LEAN
审核
修改 日期 姓名 原始项目
EPLAN
XYP
替换 替换人
SAFETYMODULE-左侧
IEC_tp1001
页数 19
页 14/49



19 21

			日期	2024/7/10	EPLAN		DC_POWER-右侧	=	
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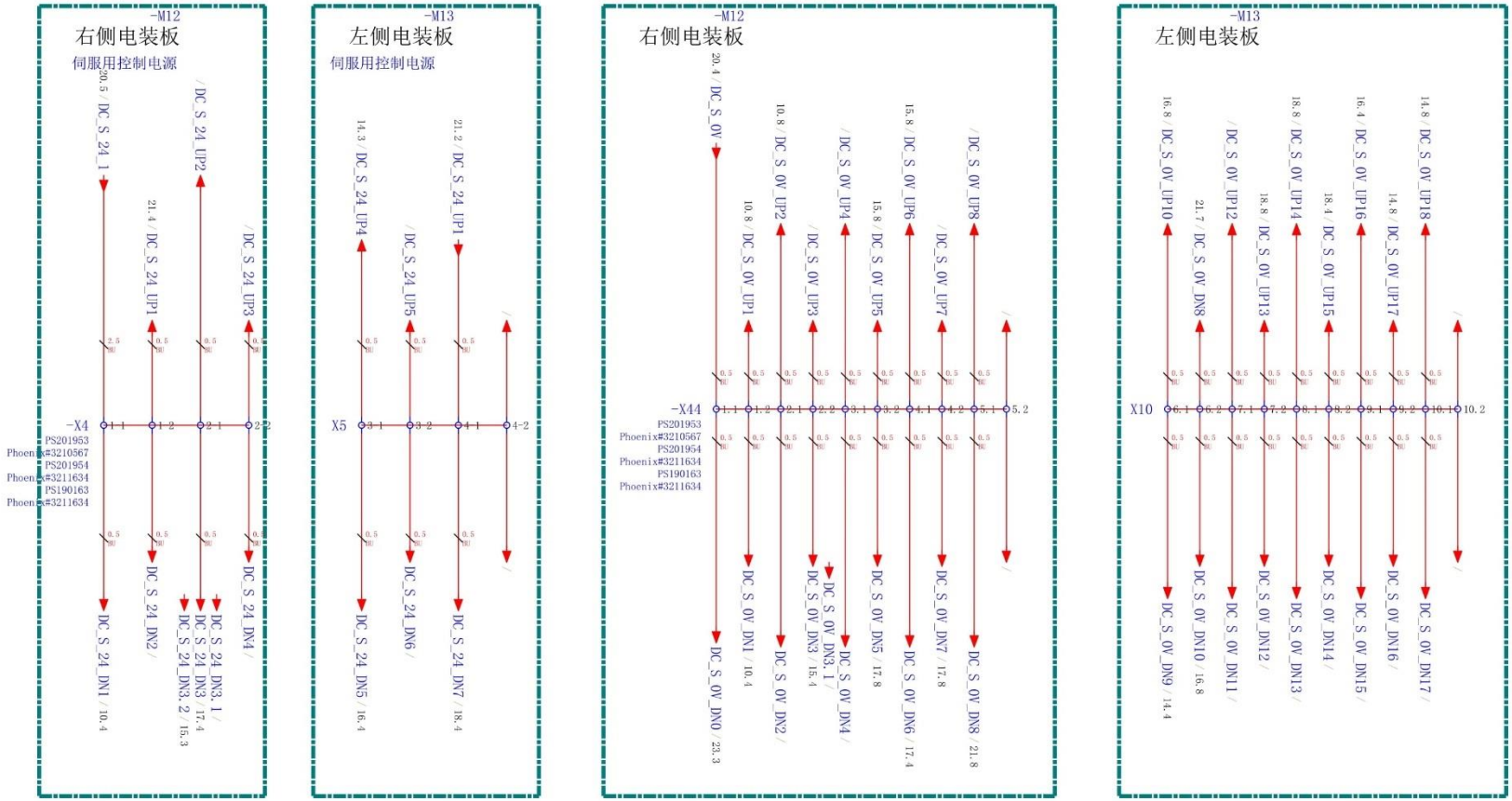
			审核		XYP			IEC_tp1001	页数 20
修改	日期	姓名	原始项目		替换	替换人			页 15/49



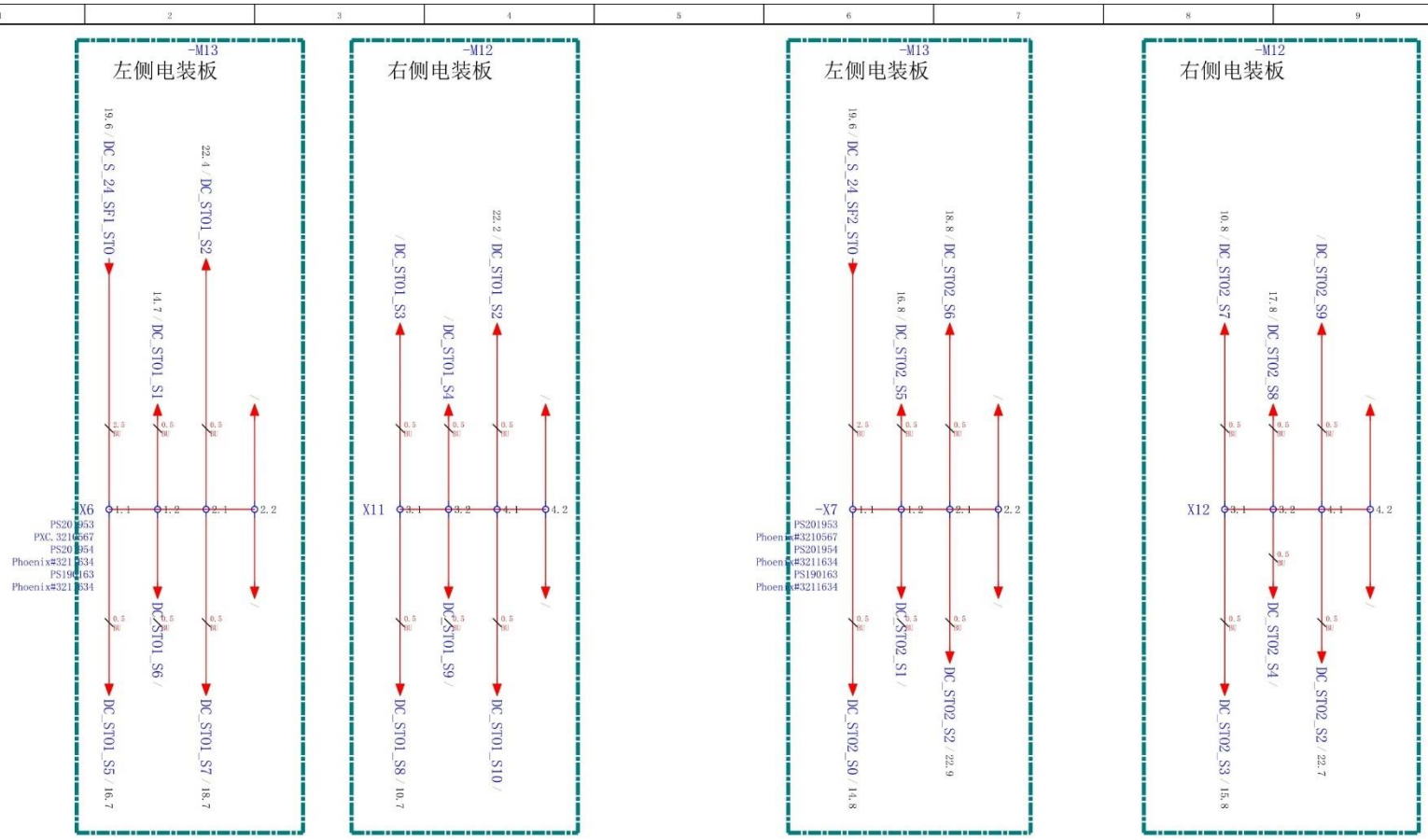
Phoenix#3210567
PS201953

Phoenix#3211634
PS201954

PS190163
Phoenix#3030213

20 22

			日期	2024/7/15	EPLAN		Servo DC24-0	=	
			校对	LEAN				+	
			审核		XYP			IEC_tp1001	页数 21
修改	日期	姓名	原始项目		替换	替换人			页 16/49



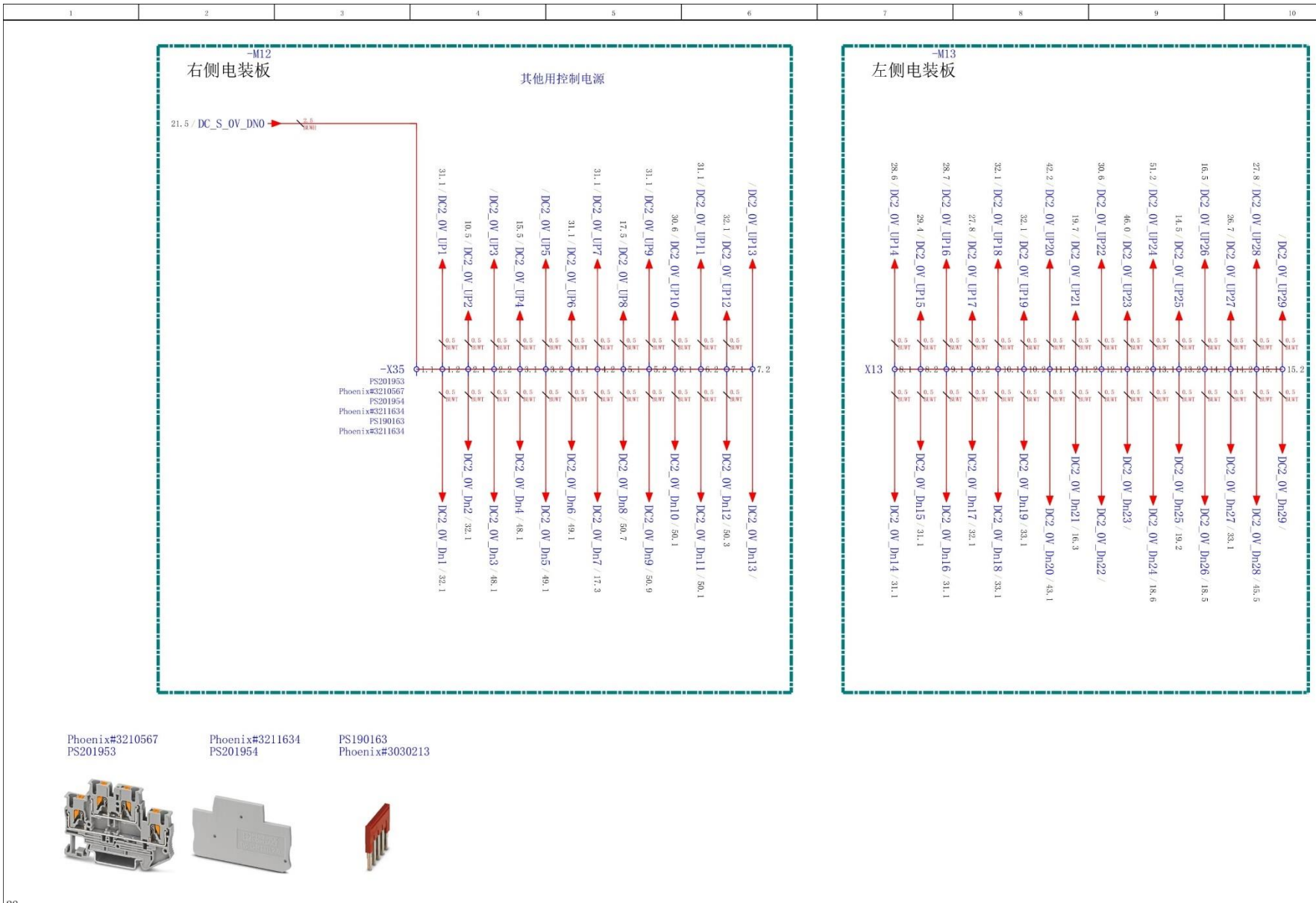
Phoenix#3210567
PS201953

Phoenix#3211634
PS201954

PS190163
Phoenix#3030213

21 23

			日期	2024/7/10	EPLAN		Servo ST0		=	
			校对	LEAN					+	
			审核		XYP			IEC_tp1001	页数	22
修改	日期	姓名	原始项目		替换	替换人			页	17/49



22 24

			日期	2024/8/13	EPLAN		DC2_0V COM		=	
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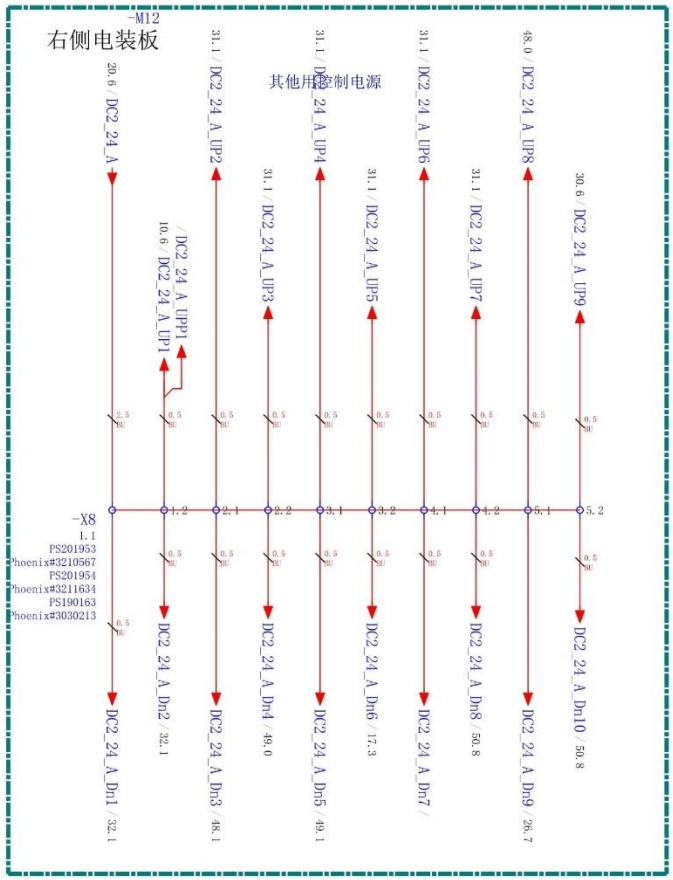
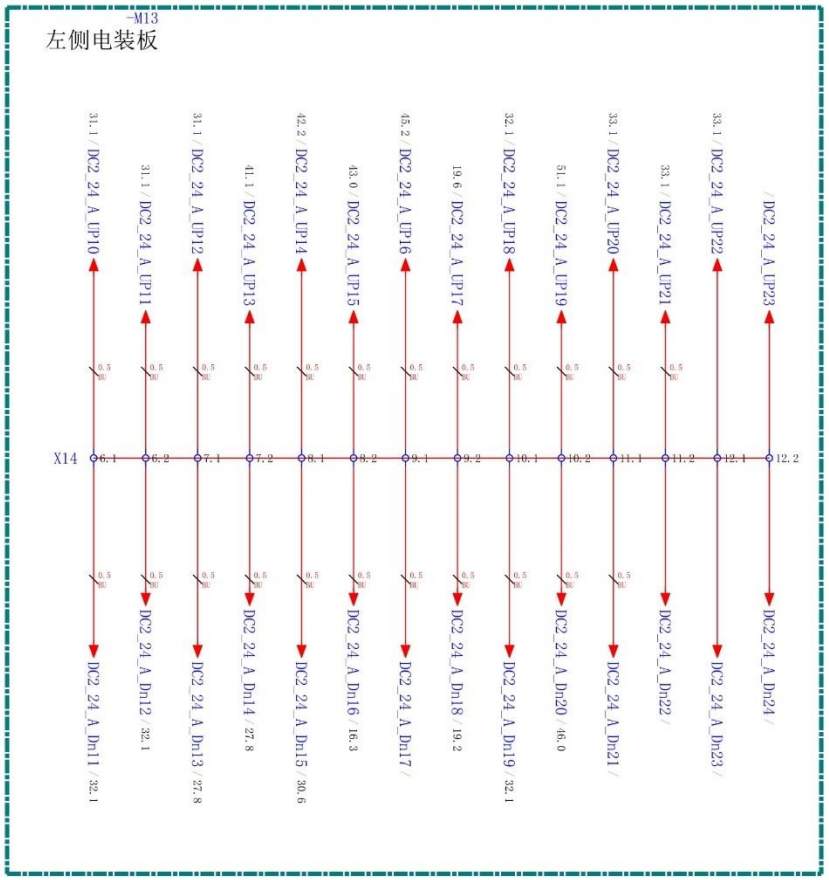
			审核		XYP			IEC_tp1001	页数	23
修改	日期	姓名	原始项目		替换	替换人			页	18/49





Phoenix#3210567
PS201953

Phoenix#3211634
PS201954

PS190163
Phoenix#3030213

23

25

			日期	2024/7/23	EPLAN		DC2_24V COM		=	
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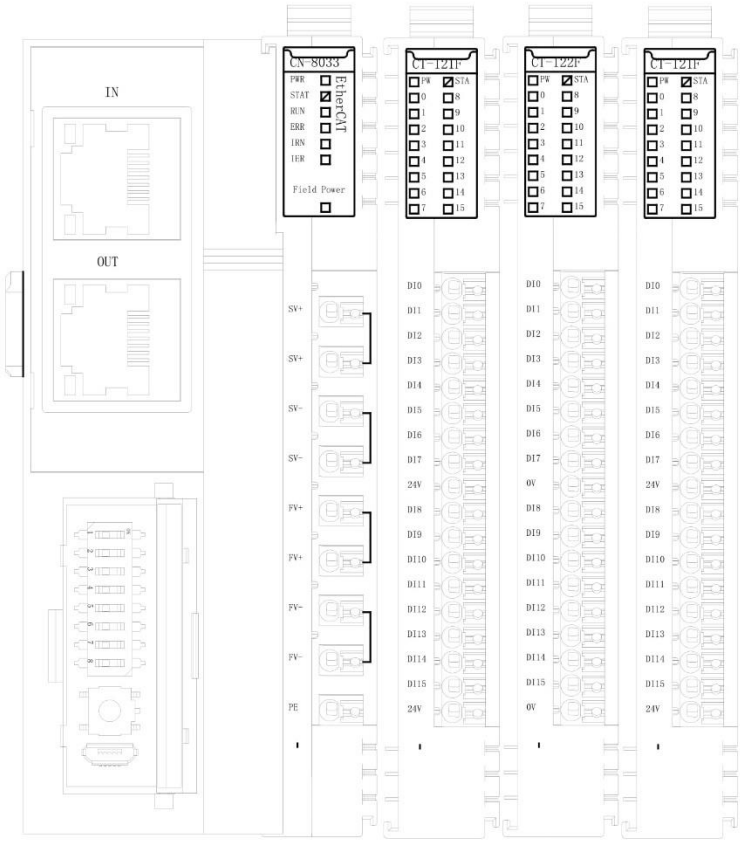
			审核		XYP			IEC_tp1001	页数	24
修改	日期	姓名	原始项目		替换	替换人			页	19/49



24 26

			日期	2024/7/8	EPLAN		PAC_LIST-左侧	=	
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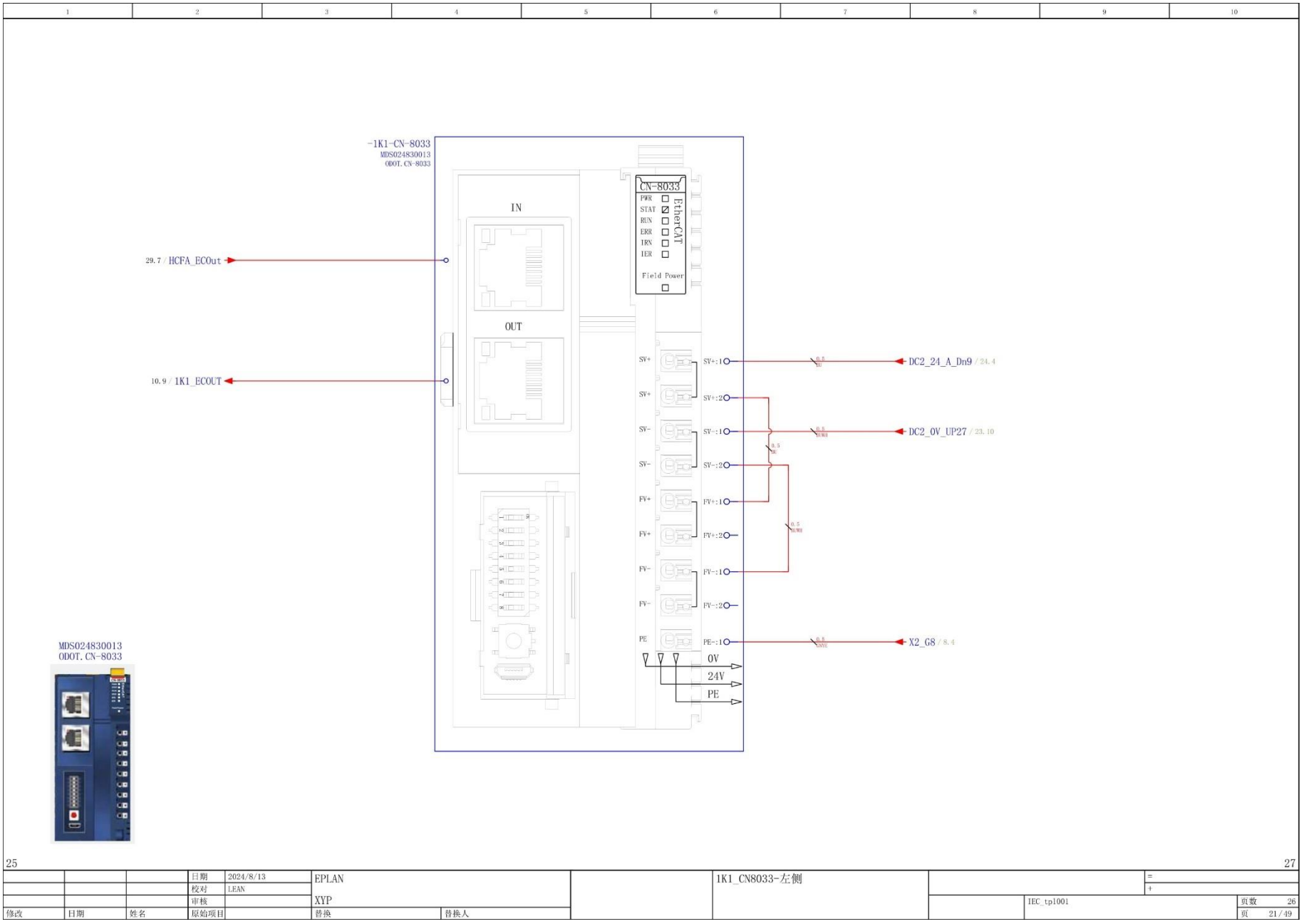
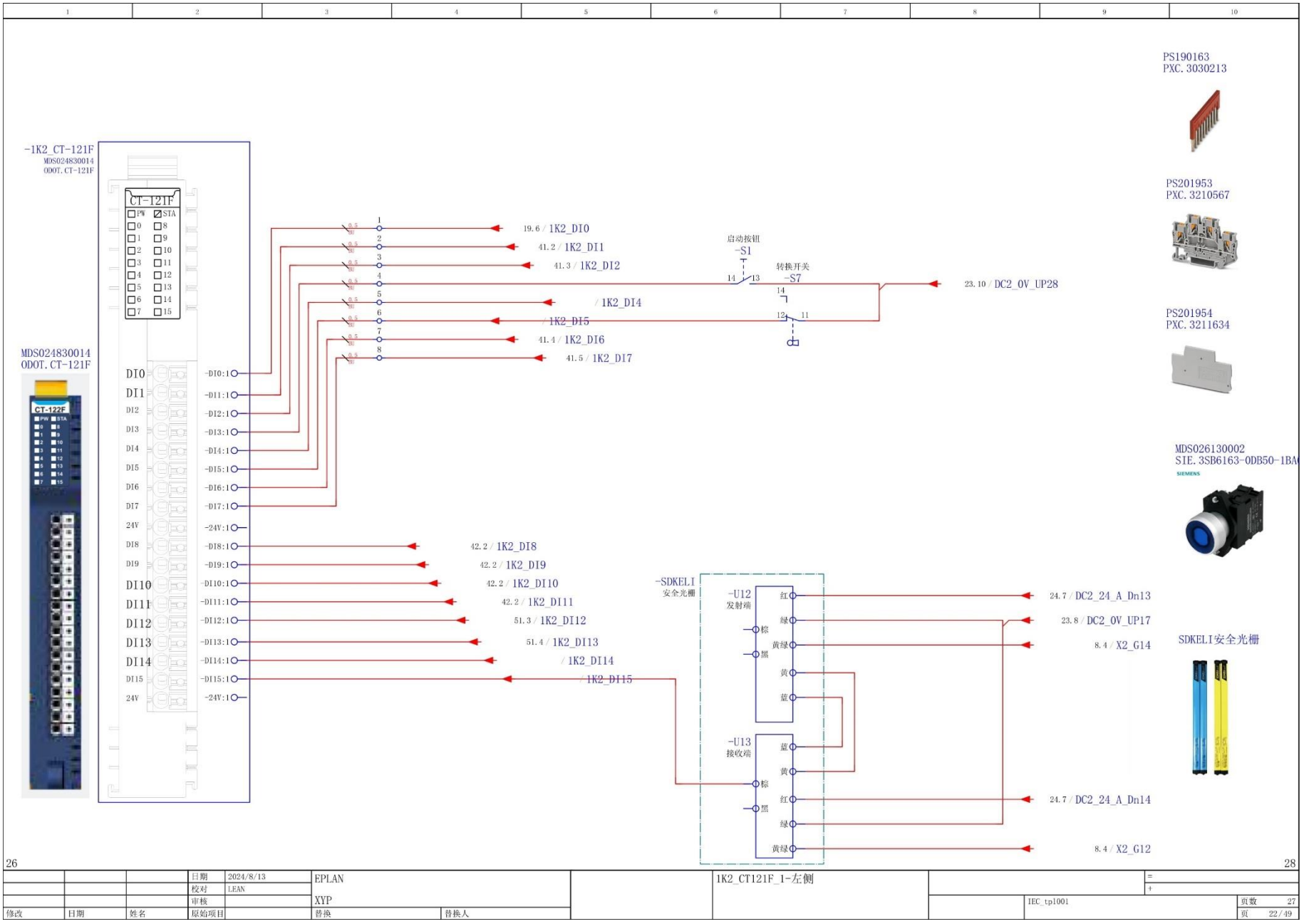
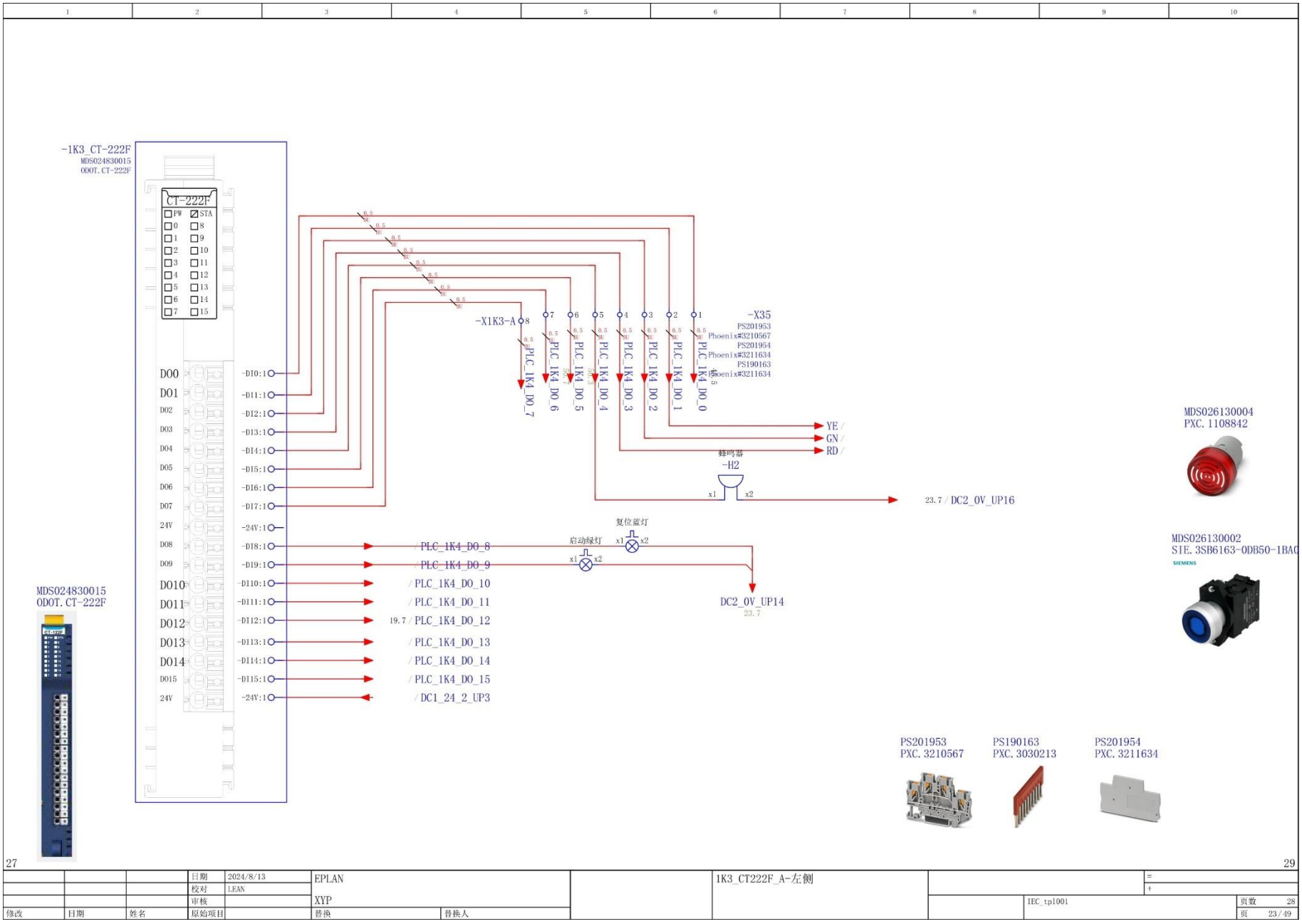
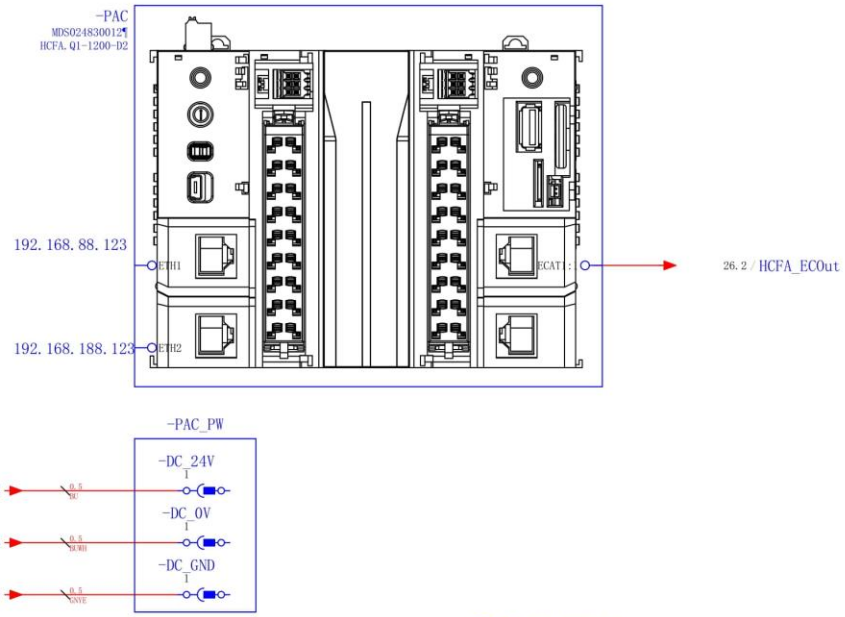
			审核		XYP			IEC_tp1001	页数 25
修改	日期	姓名	原始项目		替换	替换人			页 20/49


-1K1-CN-8033
MDS024830013
ODOT.CN-8033
CN-8033
PWR
STAT
RUN
ERR
TRN
IER
EtherCAT
Field Power
IN
OUT
29.7 / HCFA_ECOut
10.9 / 1K1_ECOUT
SV+
SV-
FV+
FV-
PE
SV+:1
SV+:2
SV-:1
SV-:2
FV+:1
FV+:2
FV-:1
FV-:2
PE-:1
DC2_24_A_Dn9 / 24.4
DC2_0V_UP27 / 23.10
X2_G8 / 8.4
0V
24V
PE
MDS024830013
ODOT.CN-8033
25
27
日期 2024/8/13
校对 LEAN
审核
EPLAN
XYP
1K1_CN8033-左侧
IEC_tp1001
页数 26
页 21/49
修改 日期 姓名 原始项目 替换 替换人


-1K2_CT-121F
MDS024830014
ODOT.CT-121F
CT-121F
PW STA
MDS024830014
ODOT.CT-121F
DI0
DI1
DI2
DI3
DI4
DI5
DI6
DI7
24V
DI8
DI9
DI10
DI11
DI12
DI13
DI14
DI15
24V
19.6 / 1K2_DI0
41.2 / 1K2_DI1
41.3 / 1K2_DI2
/ 1K2_DI4
/ 1K2_DI5
41.4 / 1K2_DI6
41.5 / 1K2_DI7
42.2 / 1K2_DI8
42.2 / 1K2_DI9
42.2 / 1K2_DI10
42.2 / 1K2_DI11
51.3 / 1K2_DI12
51.4 / 1K2_DI13
/ 1K2_DI14
/ 1K2_DI15
启动按钮
-S1
转换开关
-S7
23.10 / DC2_0V_UP28
-SDKELI
安全光栅
-U12
发射端
-U13
接收端
棕
黑
红
绿
黄绿
黄
蓝
24.7 / DC2_24_A_Dn13
23.8 / DC2_0V_UP17
8.4 / X2_G14
24.7 / DC2_24_A_Dn14
8.4 / X2_G12
PS190163
PXC.3030213
PS201953
PXC.3210567
PS201954
PXC.3211634
MDS026130002
SIE.3SB6163-0DB50-1BA
SIEMENS
SDKELI安全光栅
26
28
日期 2024/8/13
校对 LEAN
审核
EPLAN
XYP
1K2_CT121F_1-左侧
IEC_tp1001
页数 27
页 22/49
修改 日期 姓名 原始项目 替换 替换人

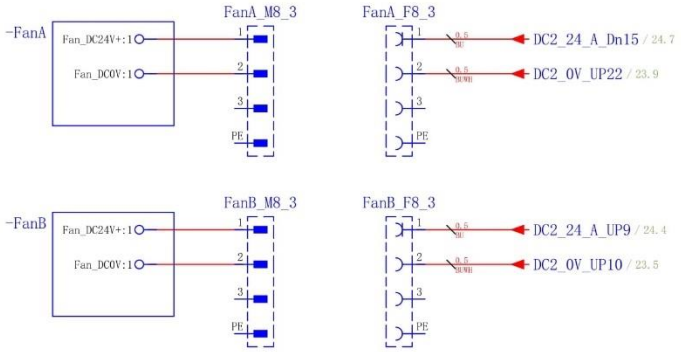

-1K3_CT-222F
MDS024830015
ODOT. CT-222F
CT-222F
PW
STA
D00
D01
D02
D03
D04
D05
D06
D07
24V
D08
D09
D010
D011
D012
D013
D014
D015
24V
-X1K3-A
-X35
PS201953
Phoenix#3210567
PS201954
Phoenix#3211634
PS190163
Phoenix#3211634
PLC_1K4_DO_7
PLC_1K4_DO_6
PLC_1K4_DO_5
PLC_1K4_DO_4
PLC_1K4_DO_3
PLC_1K4_DO_2
PLC_1K4_DO_1
PLC_1K4_DO_0
YE
GN
RD
蜂鸣器
-H2
23.7 / DC2_0V_UP16
复位蓝灯
启动绿灯
PLC_1K4_DO_8
PLC_1K4_DO_9
PLC_1K4_DO_10
PLC_1K4_DO_11
19.7 / PLC_1K4_DO_12
PLC_1K4_DO_13
PLC_1K4_DO_14
PLC_1K4_DO_15
/DC1_24_2_UP3
DC2_0V_UP14
23.7
MDS026130004
PXC. 1108842
MDS026130002
SIE. 3SB6163-0DB50-1BA0
SIEMENS
MDS024830015
ODOT. CT-222F
PS201953
PXC. 3210567
PS190163
PXC. 3030213
PS201954
PXC. 3211634
27
29
日期 2024/8/13
校对 LEAN
审核
修改 日期 姓名 原始项目
EPLAN
XYP
替换 替换人
1K3_CT222F_A-左侧
IEC_tp1001
页数 28
页 23/49



禾川#HC-Q1-1200-D2
MDS024830012

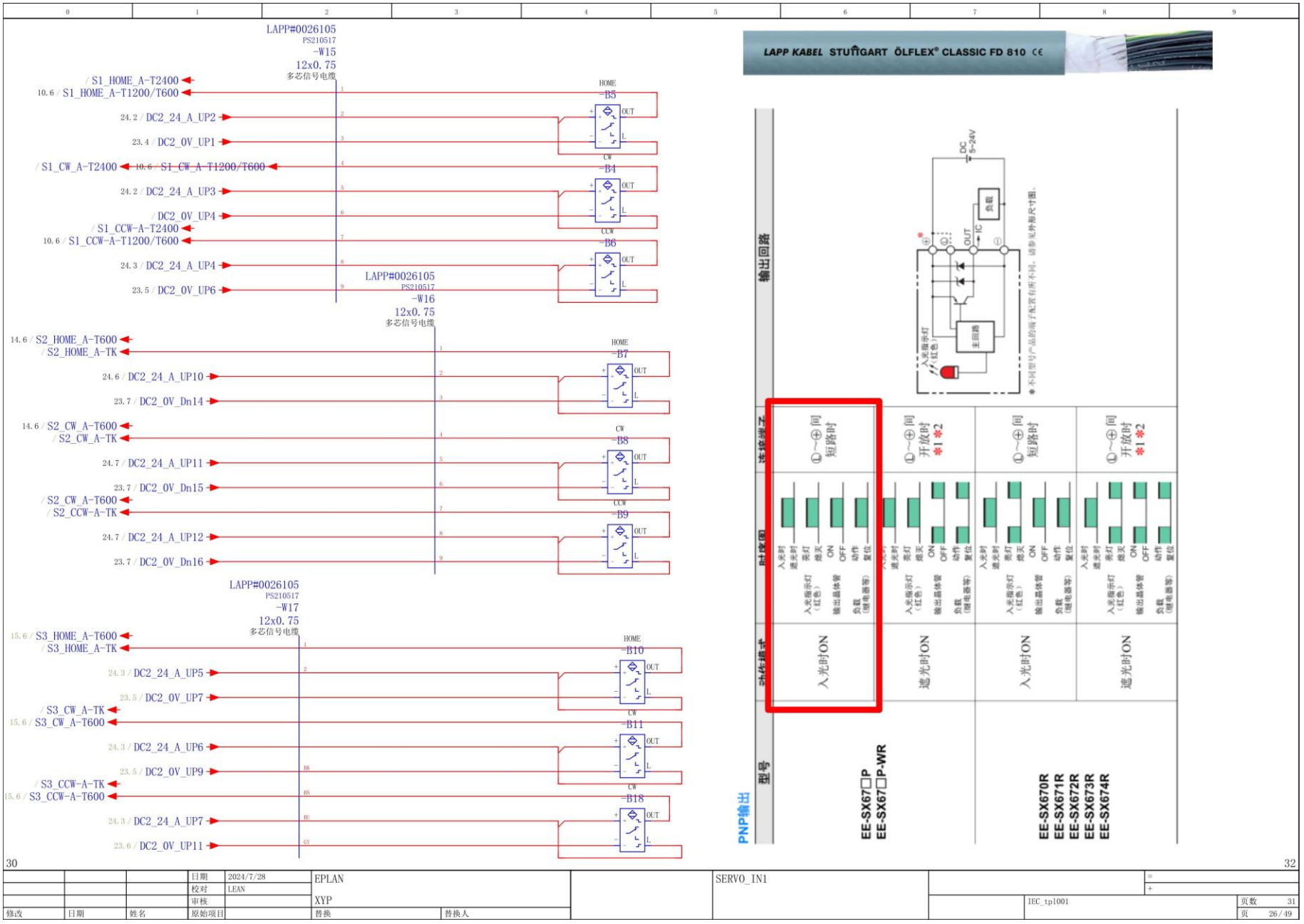
28 30

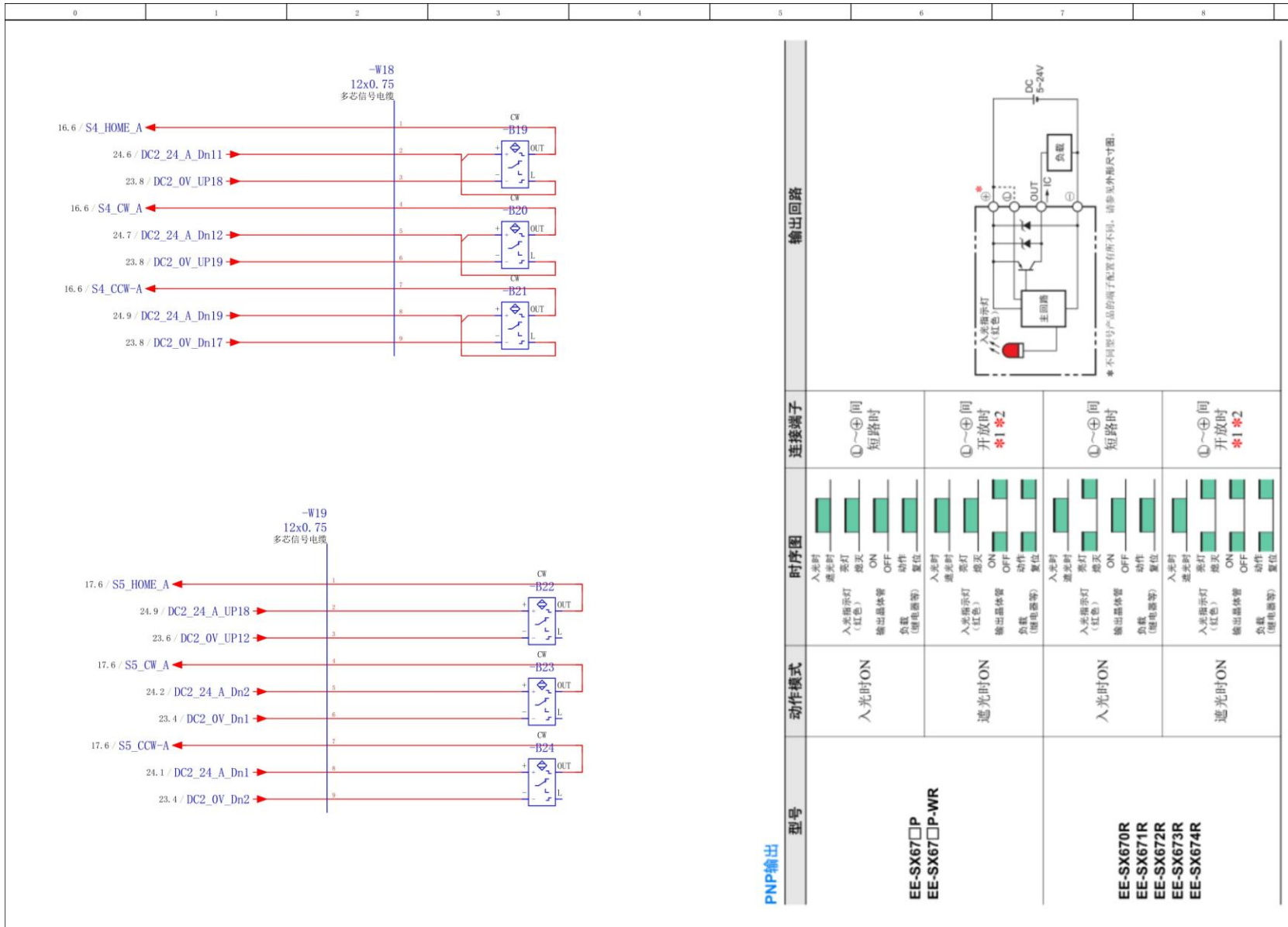
			日期	2024/7/10	EPLAN		PLC_HC-左侧		=	
			校对	LEAN					+	
			审核		XYP			IEC_tp1001	页数	29
修改	日期	姓名	原始项目		替换	替换人			页	24/49

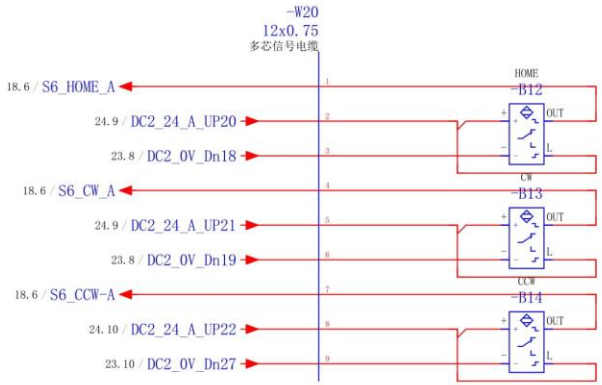


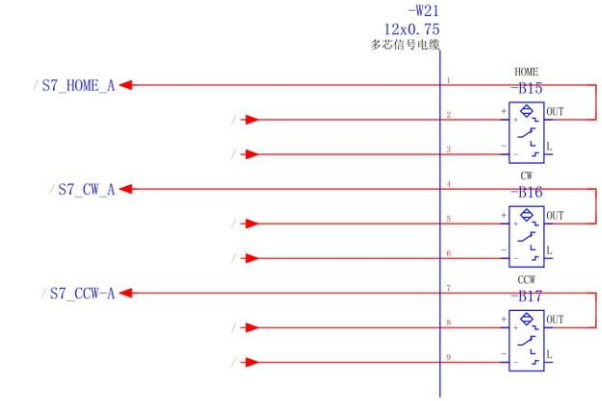
29 31

			日期	2024/7/10	EPLAN		FANS		=	
			校对	LEAN					+	
			审核		XYP			IEC_tp1001	页数	30
修改	日期	姓名	原始项目		替换	替换人			页	25/49




-W18
12x0.75
多芯信号电缆
16.6 / S4_HOME_A
24.6 / DC2_24_A_Dn11
23.8 / DC2_0V_UP18
16.6 / S4_CW_A
24.7 / DC2_24_A_Dn12
23.8 / DC2_0V_UP19
16.6 / S4_CCW-A
24.9 / DC2_24_A_Dn19
23.8 / DC2_0V_Dn17
-B19
-B20
-B21
OUT
L
-W19
12x0.75
多芯信号电缆
17.6 / S5_HOME_A
24.9 / DC2_24_A_UP18
23.6 / DC2_0V_UP12
17.6 / S5_CW_A
24.2 / DC2_24_A_Dn2
23.4 / DC2_0V_Dn1
17.6 / S5_CCW-A
24.1 / DC2_24_A_Dn1
23.4 / DC2_0V_Dn2
-B22
-B23
-B24
PNP输出
型号
动作模式
时序图
连接端子
输出回路
EE-SX67□P
EE-SX67□P-WR
入光时ON
遮光时ON
入光时ON
遮光时ON
EE-SX670R
EE-SX671R
EE-SX672R
EE-SX673R
EE-SX674R
入光时
遮光时
亮灯
熄灭
ON
OFF
动作
复位
入光指示灯（红色）
输出晶体管
负载（继电器等）
⊖～⊕间 短路时
⊖～⊕间 开放时 *1 *2
DC 5~24V
负载
OUT
IC
主回路
*不同型号产品的端子配置有所不同，请参见外形尺寸图。
31
33
日期 2024/7/23
校对 LEAN
审核
EPLAN
XYP
SERVO_IN2
IEC_tp1001
页数 32
页 27/49
修改 日期 姓名 原始项目 替换 替换人

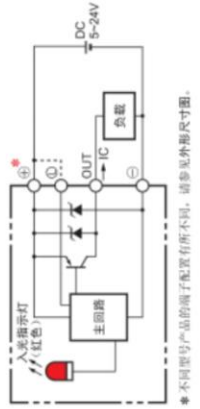




PNP输出

型号	动作模式	时序图	连接端子
EE-SX67□P EE-SX67□P-WR	入光时ON	入光时 遮光时 入光指示灯（红色） 亮灯 熄灭 输出晶体管 ON OFF 负载（继电器等） 动作 复位	①~④间 短路时
	遮光时ON	入光时 遮光时 入光指示灯（红色） 亮灯 熄灭 输出晶体管 ON OFF 负载（继电器等） 动作 复位	①~④间 开放时 ※1 ※2
EE-SX670R EE-SX671R EE-SX672R EE-SX673R EE-SX674R	入光时ON	入光时 遮光时 入光指示灯（红色） 亮灯 熄灭 输出晶体管 ON OFF 负载（继电器等） 动作 复位	①~④间 短路时
	遮光时ON	入光时 遮光时 入光指示灯（红色） 亮灯 熄灭 输出晶体管 ON OFF 负载（继电器等） 动作 复位	①~④间 开放时 ※1 ※2

输出回路



32

34

			日期	2024/7/23	EPLAN		SERVO_IN3		=	
			校对	LEAN					+	
			审核		XYP			IEC_tp1001	页数	33
修改	日期	姓名	原始项目		替换	替换人			页	28/49

PS193066
PXC. 1411325
PS210401
PXC. 1182093
-FM1_L

F1_FEMALE
PXC. 1424228
PS191684

F2_FEMALE
PXC. 1424228
PS191684

PS180571
PXC. 1411440
PS180570
PXC. 1411461
PS210400
PXC. 1182090
-M1_L

M1_MALE
PXC. 1424246
PS191683

M2_MALE
PXC. 1424246
PS191683

PS180571
PXC. 1411440
PS180570
PXC. 1411461
PS210400
PXC. 1182090
-?FM1

F1_FEMALE
PXC. 1424228
PS191684

F2_FEMALE
PXC. 1424228
PS191684

F3_FEMALE
PXC. 1424228
PS191684

F4_FEMALE
PXC. 1424220
MDS026930014

-M14

M1_MALE
PXC. 1424246
PS191683

M2_MALE
PXC. 1424246
PS191683

M3_MALE
PXC. 1424246
PS191683

F4_MALE
PXC. 1424221
MDS026930013

PS193066
1411325

PS180571
1411440

PS180570
1411461

PS210401
1182093

PS210400
1182090

PS191684
1424228

PS191683
1424246

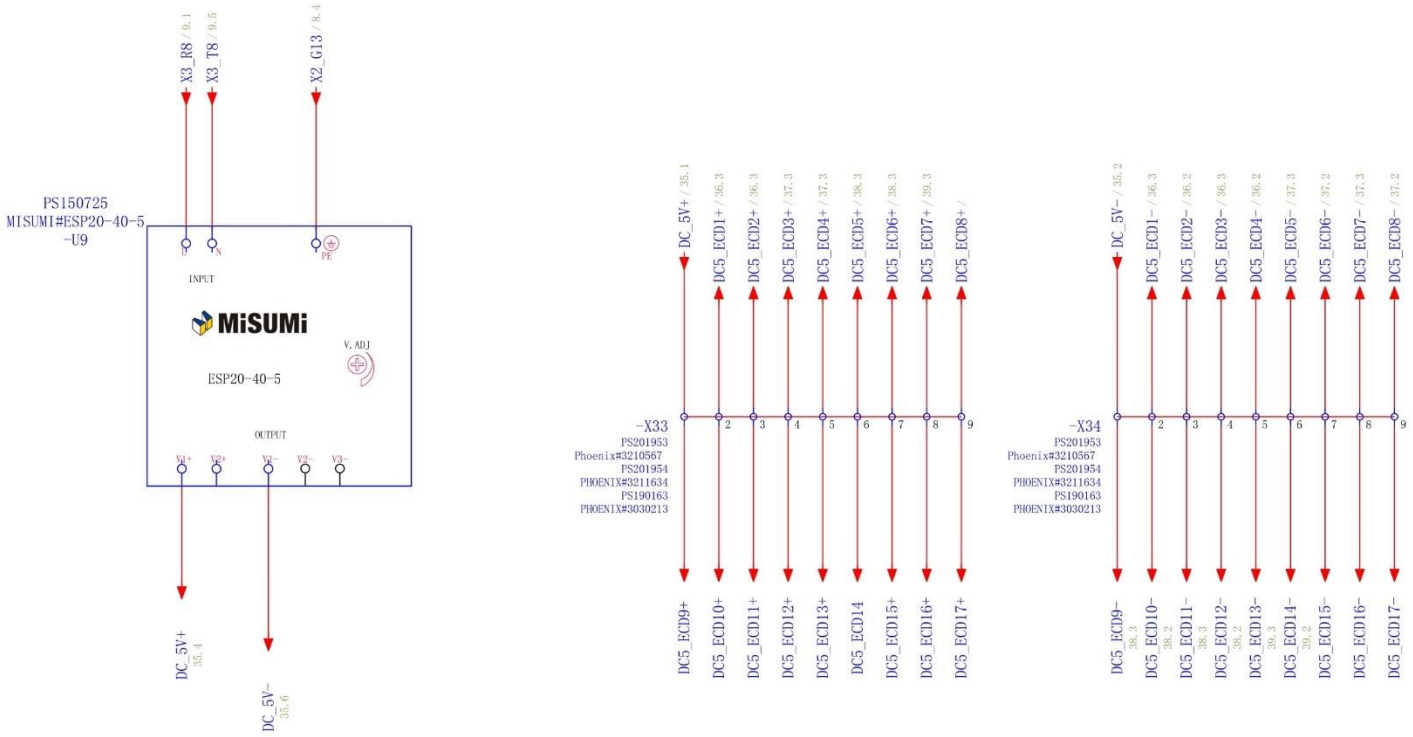
MDS026930014
1424220

MDS026930013
1424221

33

35

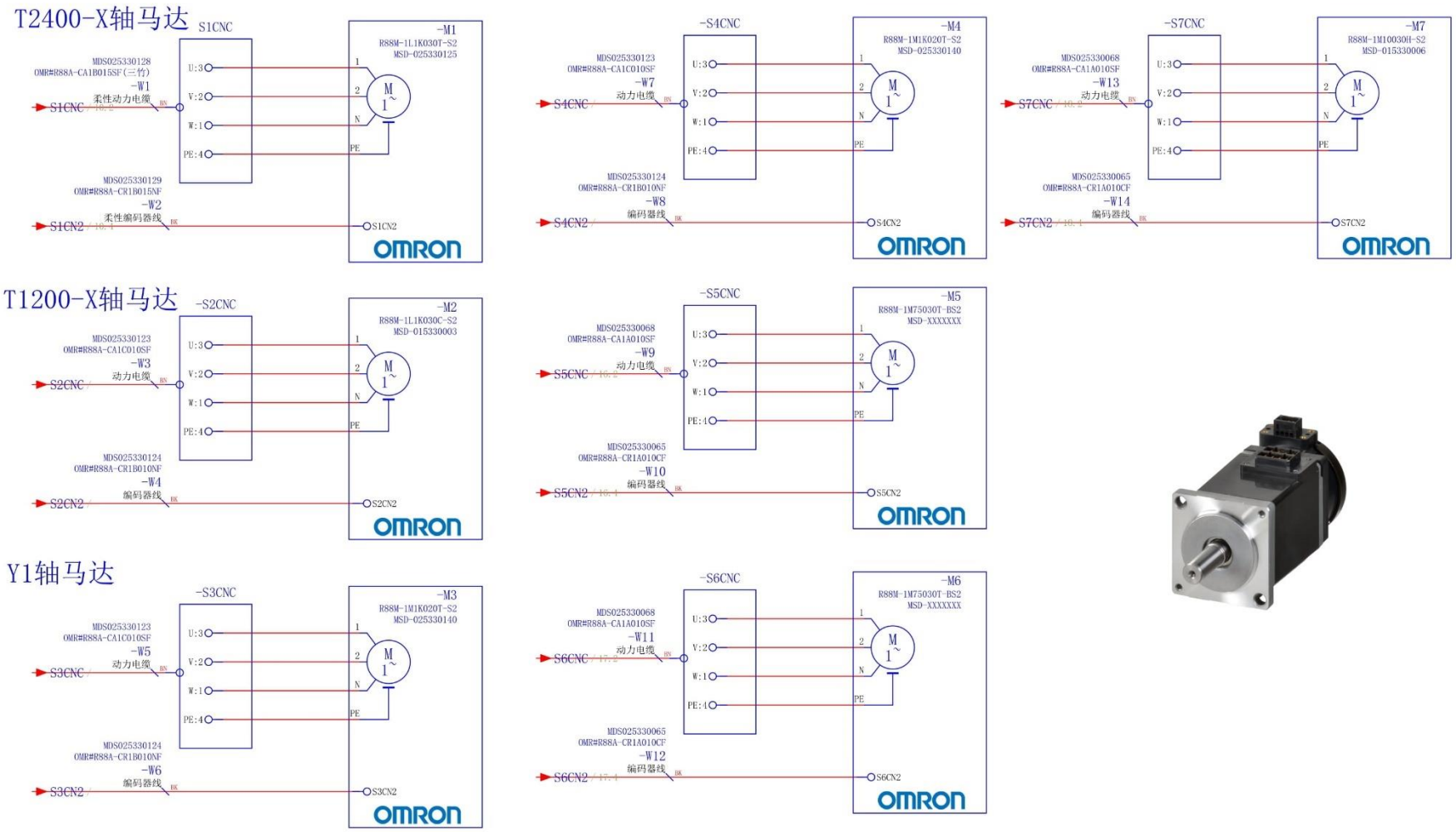
			日期	2024/7/8	EPLAN		SH_CONNECTOR	=	
			校对	LEAN				+	
			审核		XYP			IEC_tp1001	页数 34
修改	日期	姓名	原始项目		替换	替换人			页 29/49



34

36

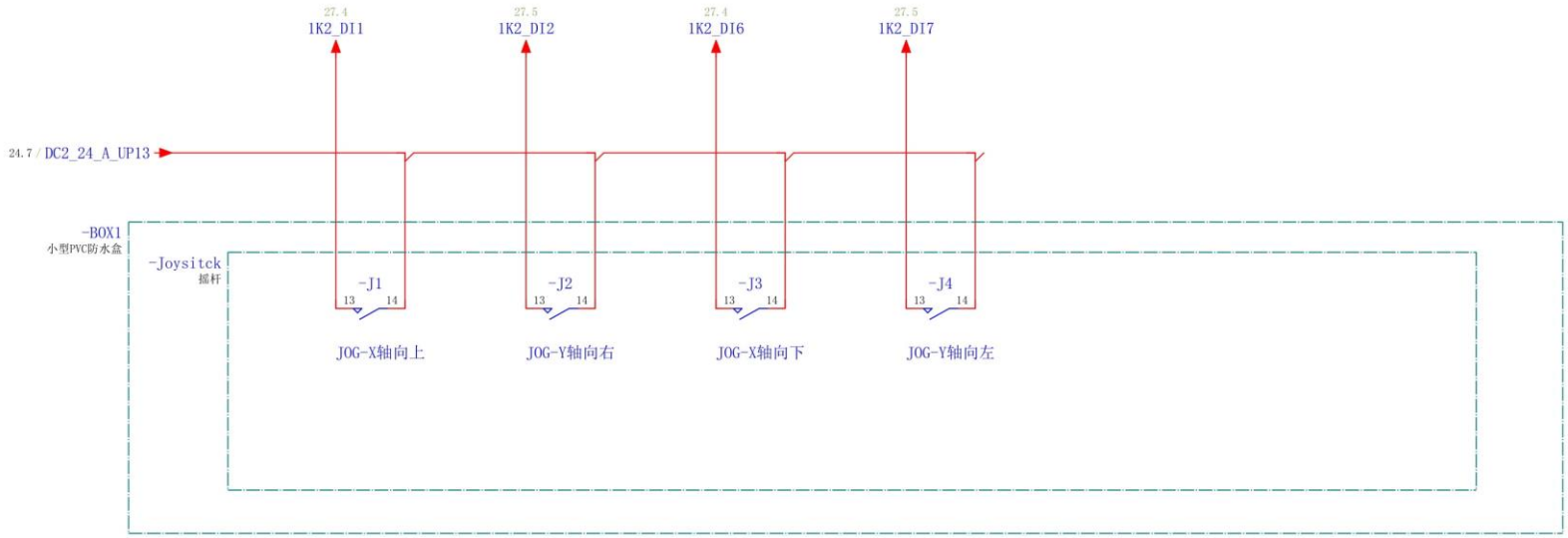
			日期	2024/7/8	EPLAN		DC5	=	
			校对	LEAN				+	
			审核		XYP			IEC_tp1001	页数 35
修改	日期	姓名	原始项目		替换	替换人			页 30/49



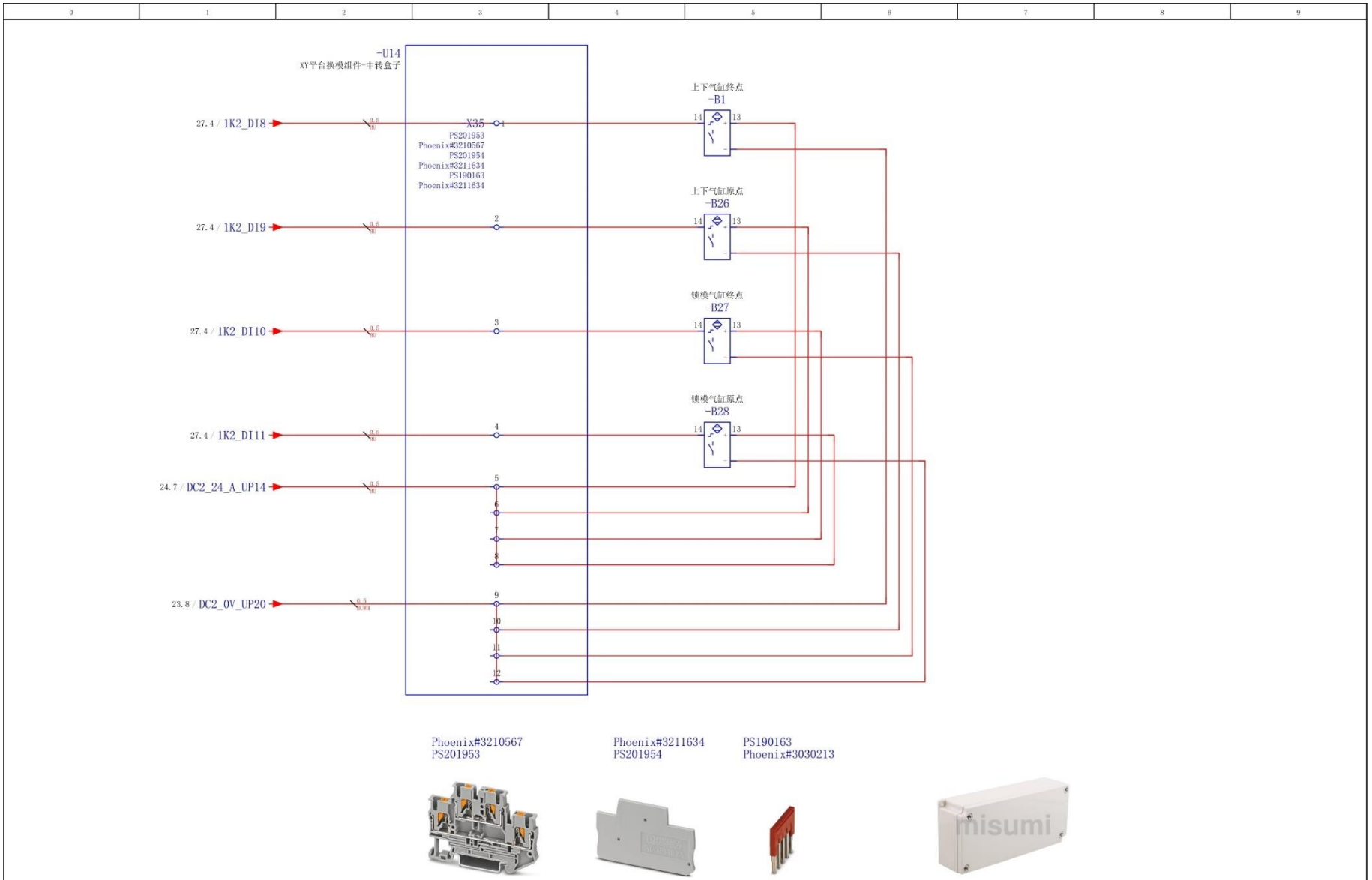
39

41

			日期	2024/7/9	EPLAN		MOTOR POWER		=	
			校对	LEAN					+	
			审核		XYP			IEC_tp1001	页数	40
修改	日期	姓名	原始项目		替换	替换人			页	35/49

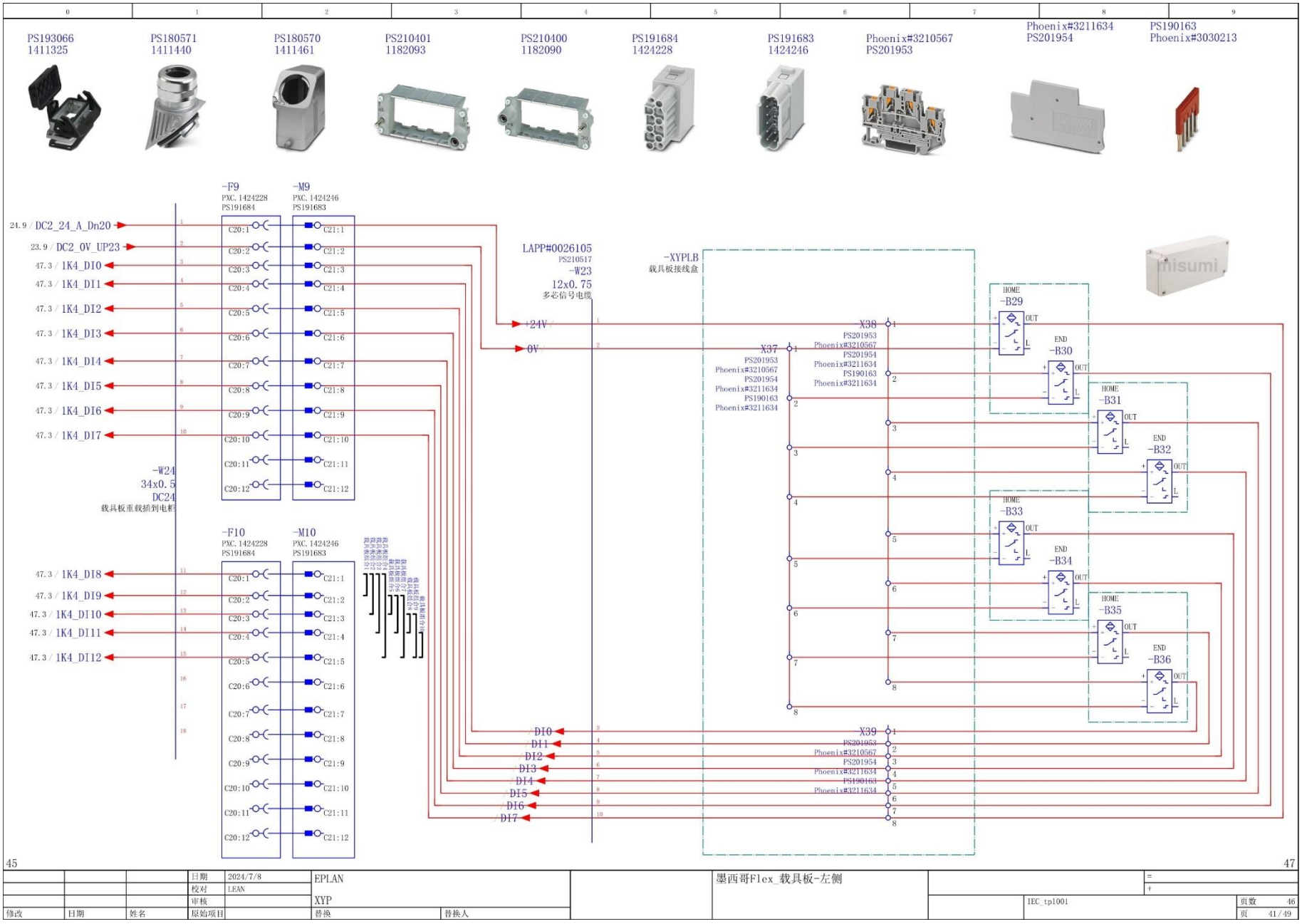


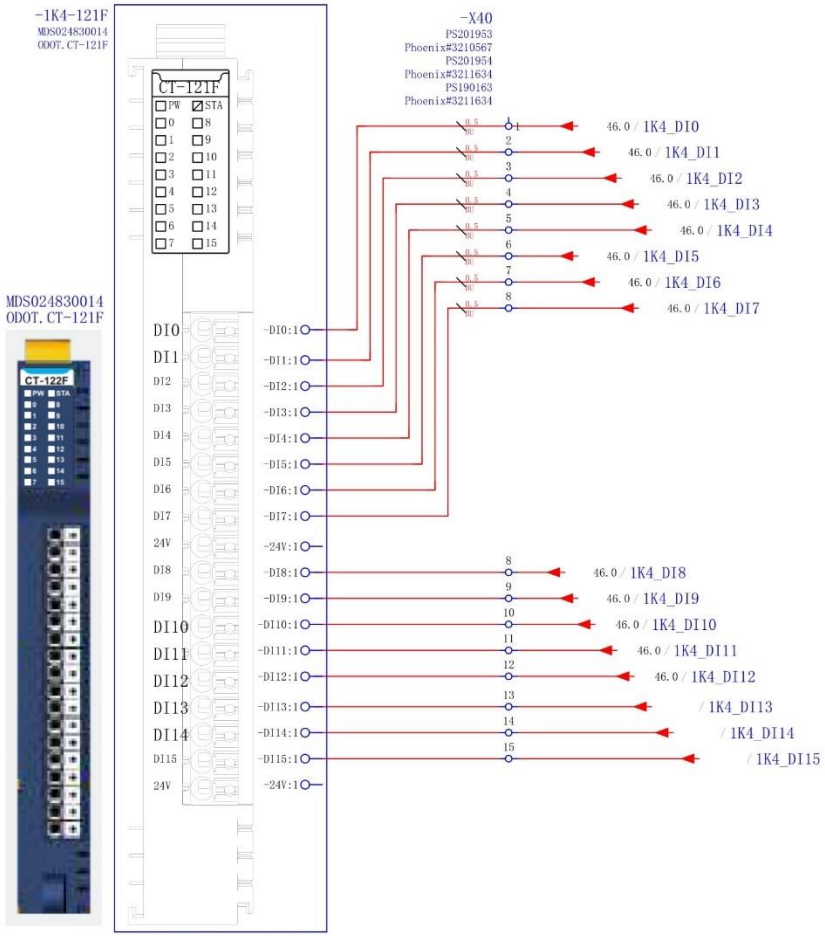
			日期	2024/7/8	EPLAN		JoyStick		=	
			校对	LEAN					+	
			审核		XYP			IEC_tp1001	页数	41
修改	日期	姓名	原始项目		替换	替换人			页	36/49



41 43

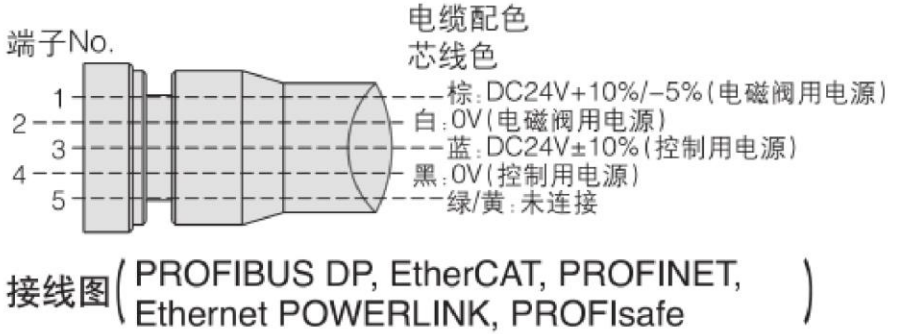
			日期	2024/7/10	EPLAN		Cylinder_Sensor左侧	=	
			校对	LEAN				+	
			审核		XYP			IEC_tp1001	页数 42
修改	日期	姓名	原始项目		替换	替换人			页 37 / 49



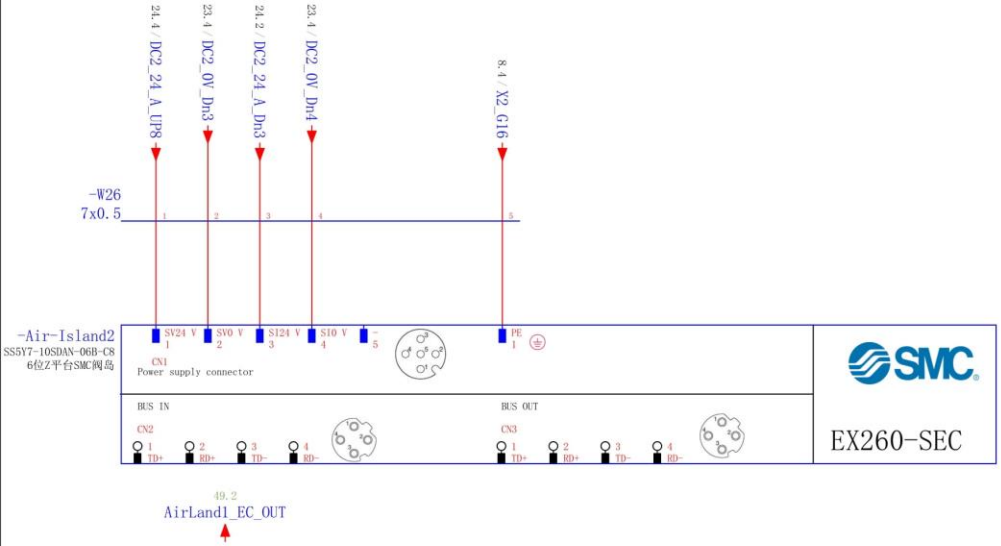


46 48

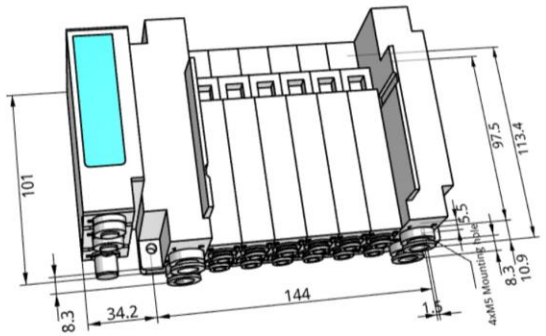
			日期	2024/8/13	EPLAN		1K4_CT121F_2载具板IO-左侧	=	
			校对	LEAN				+	
			审核		XYP			IEC_tp1001	页数 47
修改	日期	姓名	原始项目		替换	替换人			页 42/49



接线图（PROFIBUS DP, EtherCAT, PROFINET, Ethernet POWERLINK, PROFIsafe）

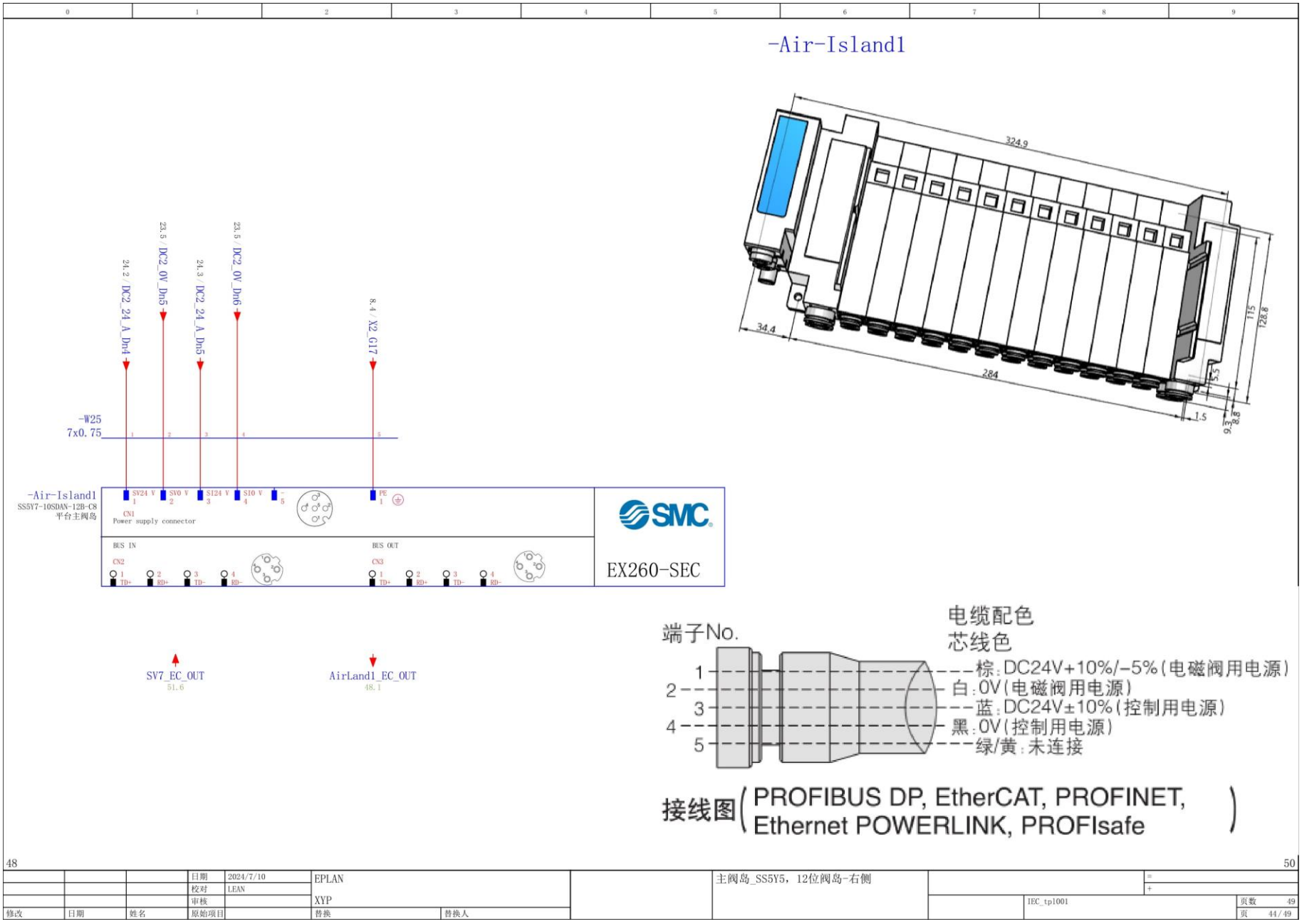


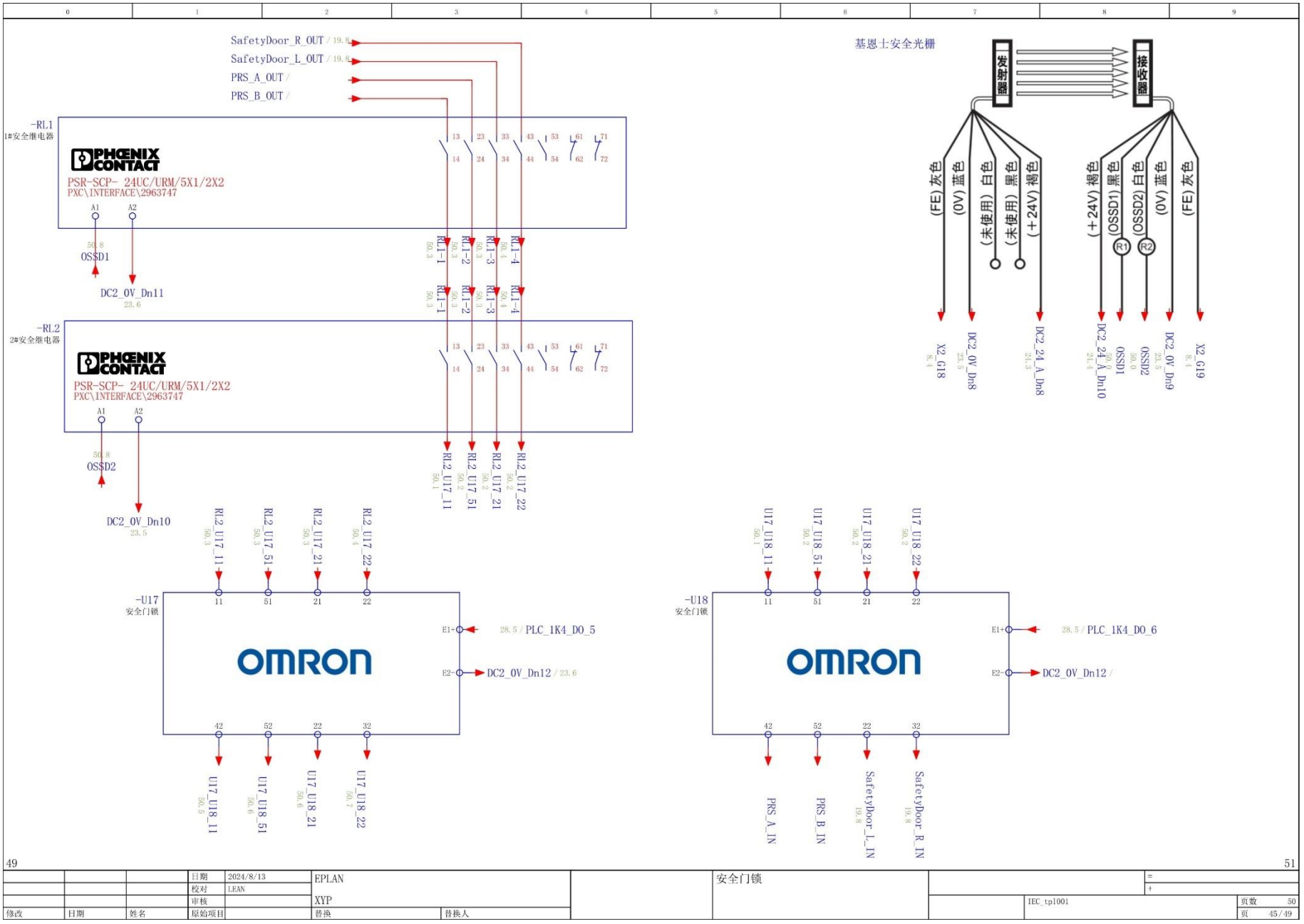
-Air-Island2

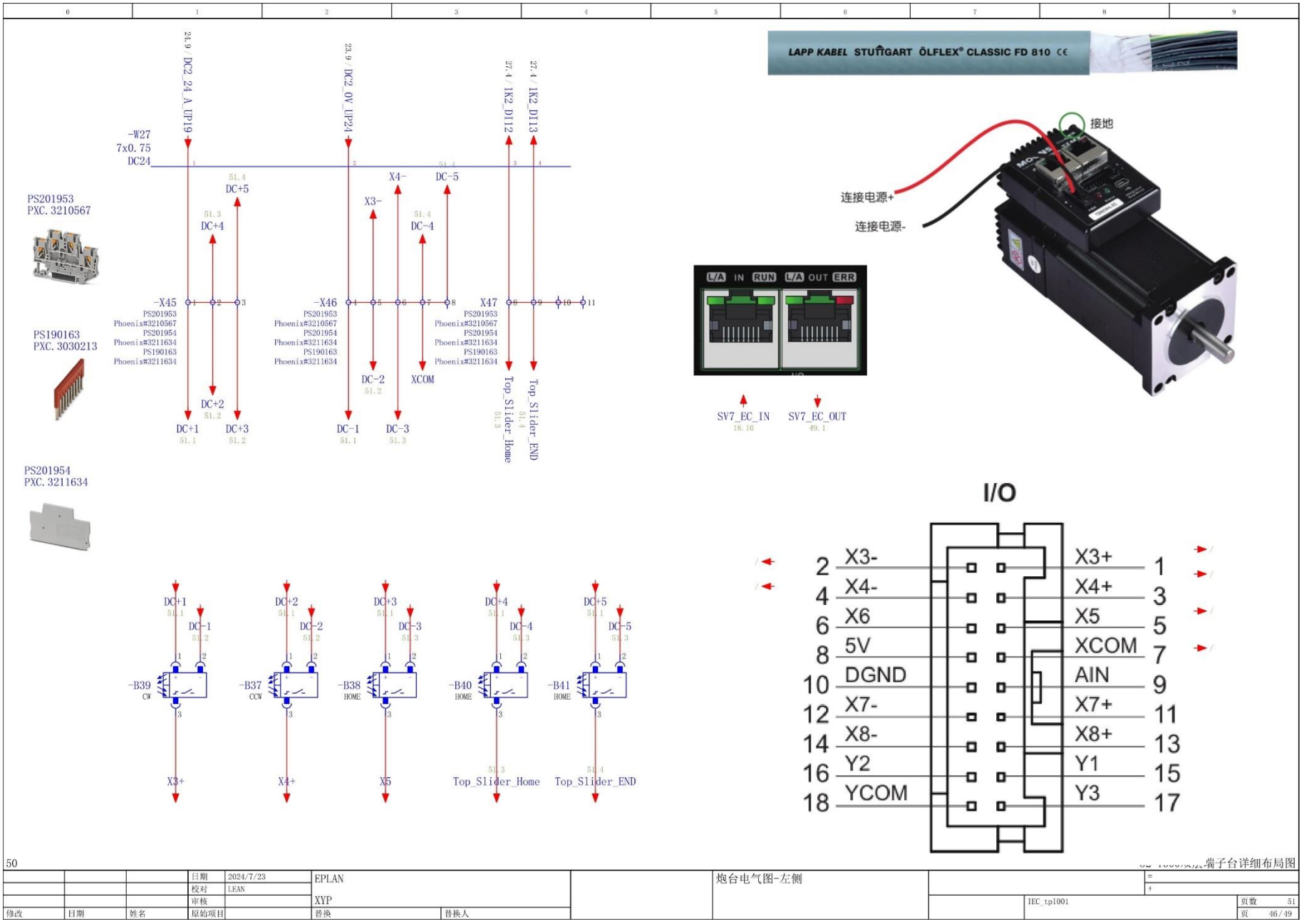


47 49

			日期	2024/7/10	EPLAN		Z轴_SS5Y5，6位阀岛-右侧		
			校对	LEAN					
			审核		XYP			IEC_tp1001	页数 48
修改	日期	姓名	原始项目		替换	替换人			页 43/49







50

			日期	2024/7/23	EPLAN		炮台电气图-左侧	=	
			校对	LEAN				+	
			审核		XYP			IEC_tp1001	页数 51
修改	日期	姓名	原始项目		替换	替换人			页 46/49

DC-S-0V(10P)-X44

DC_S_0V_DN0(15P)-X35

DC2_24_A(12P)-X8

DC_S_24_SF2(4P)-X7

DC_S_24_SF1(4P)-X6

DC_S_24_1(4P)-X4

DO 0-15 (8P)

DI 0-15 (8P)

51

54 T2400端子台布局图

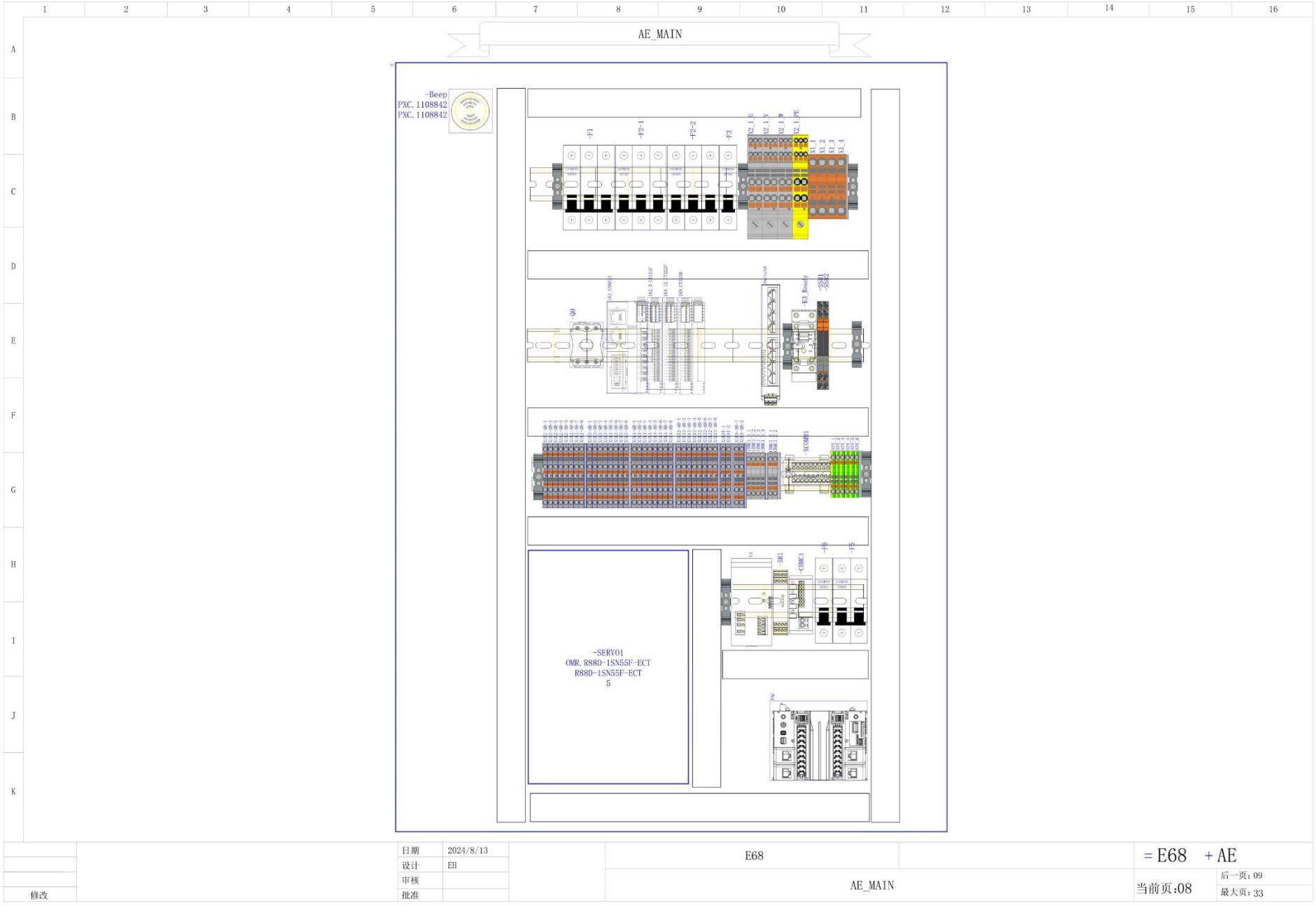
			日期	2024/7/9	EPLAN				=	
			校对	LEAN					+	
			审核		XYP					
修改	日期	姓名	原始项目		替换	替换人		IEC_tp1001	52 T600双层端子台详细布局图	
									页	47/49

公司/客户		AE
项目描述	E68	
项目编号		
代理		

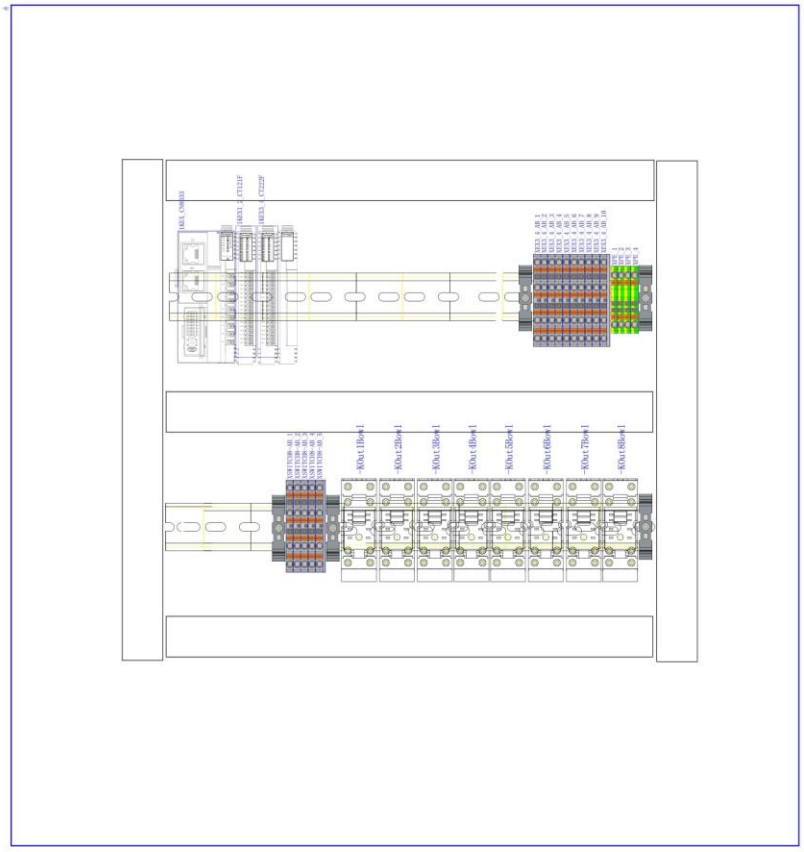
制造商(公司)

路径	CN E-DRIVE V5.2
项目名称	E68_V5_CN
制作	Edison
类型	
安装地点	
项目负责人	
部件特点	

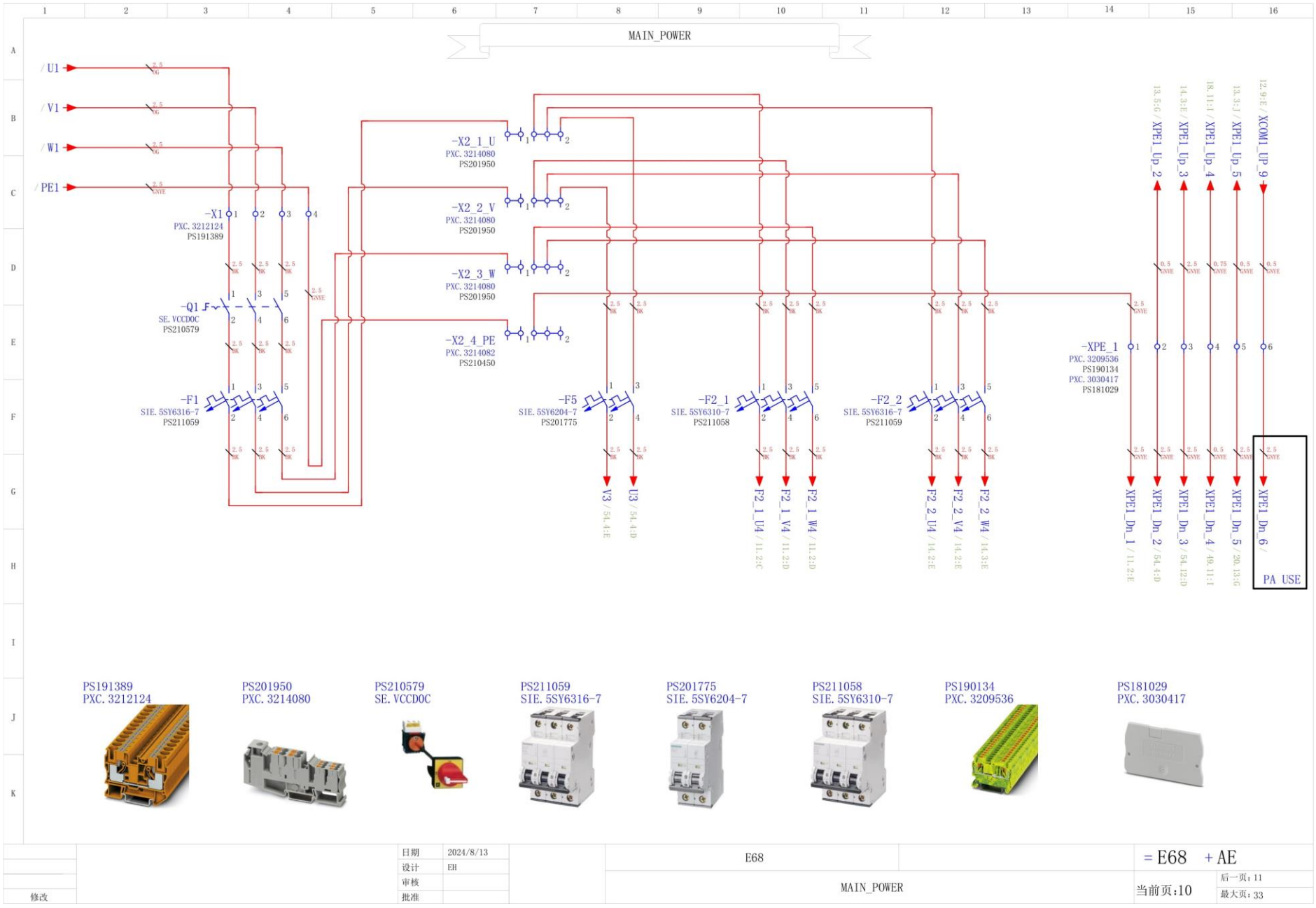
创建日期	2020/8/27		
编辑日期	2024/8/13	源自(缩写) LEAN	页数 34

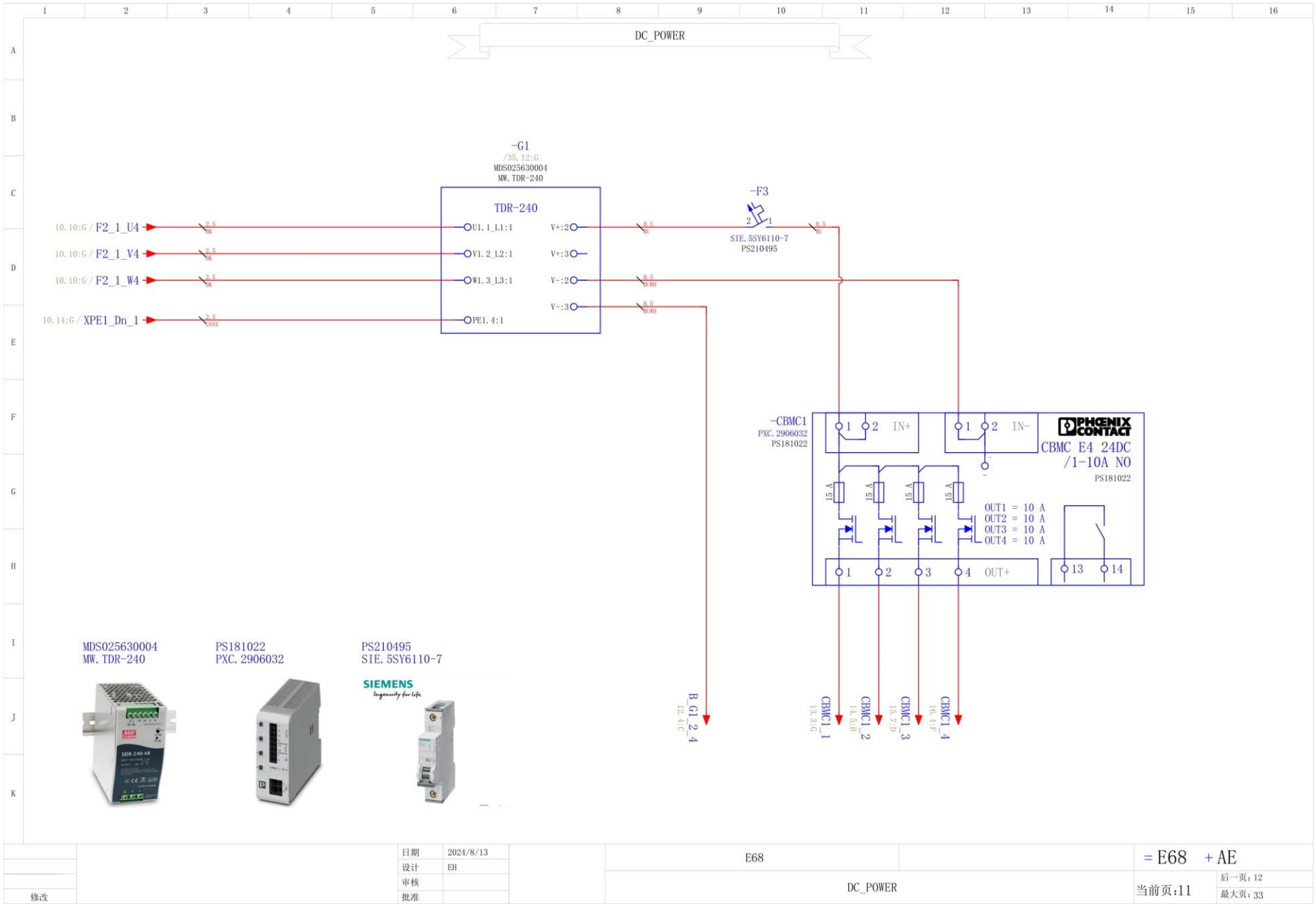

AE_MAIN
-Beep
PXC. 1108842
PXC. 1108842
-F1
-F2-1
-F2-2
-F3
-Q0
-SERV01
OMR. R88D-1SN55F-ECT
R88D-1SN55F-ECT
5
日期 2024/8/13
设计 EH
审核
批准
修改
E68
AE_MAIN
= E68 + AE
当前页:08
后一页: 09
最大页: 33

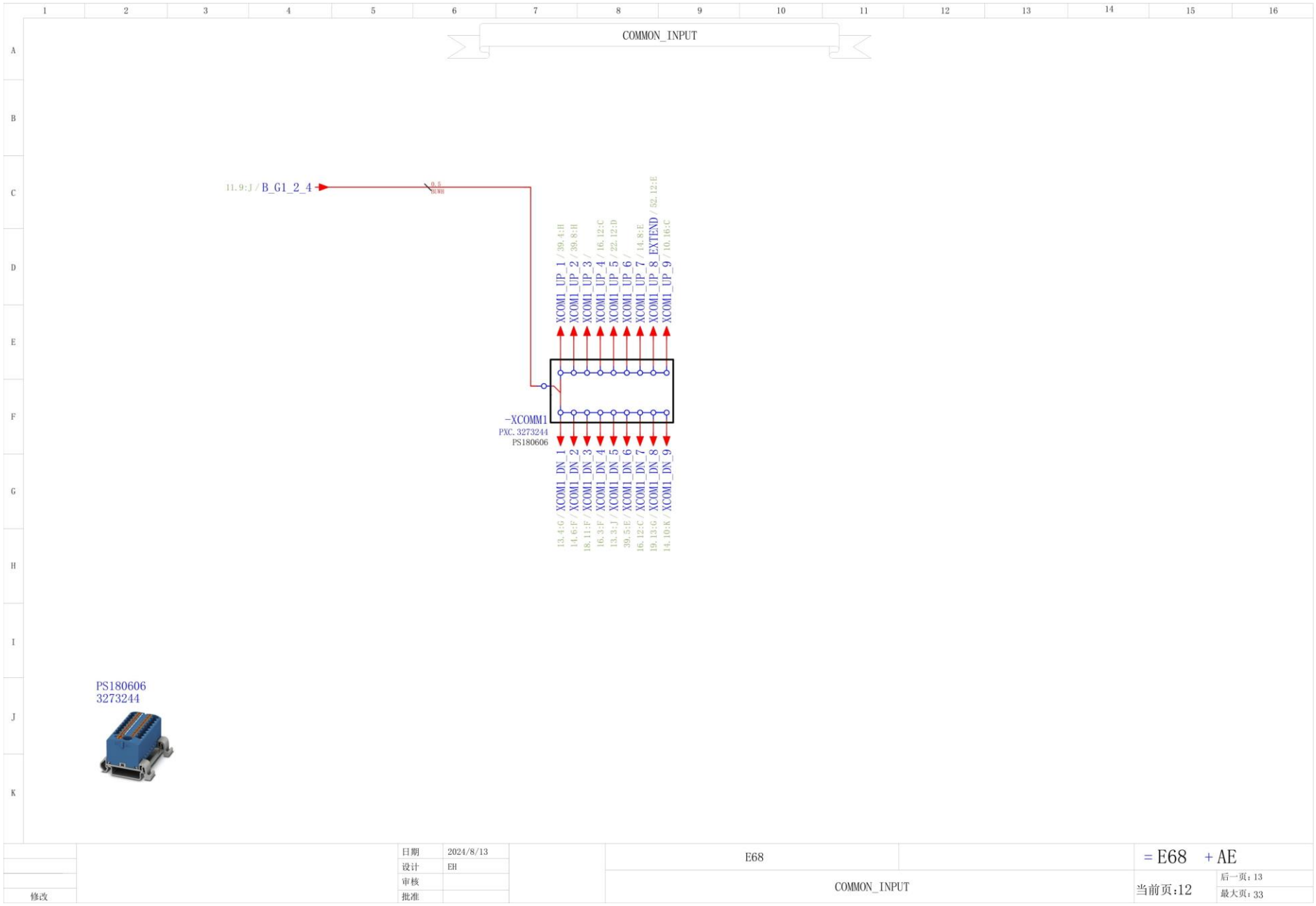
AE_SECOND

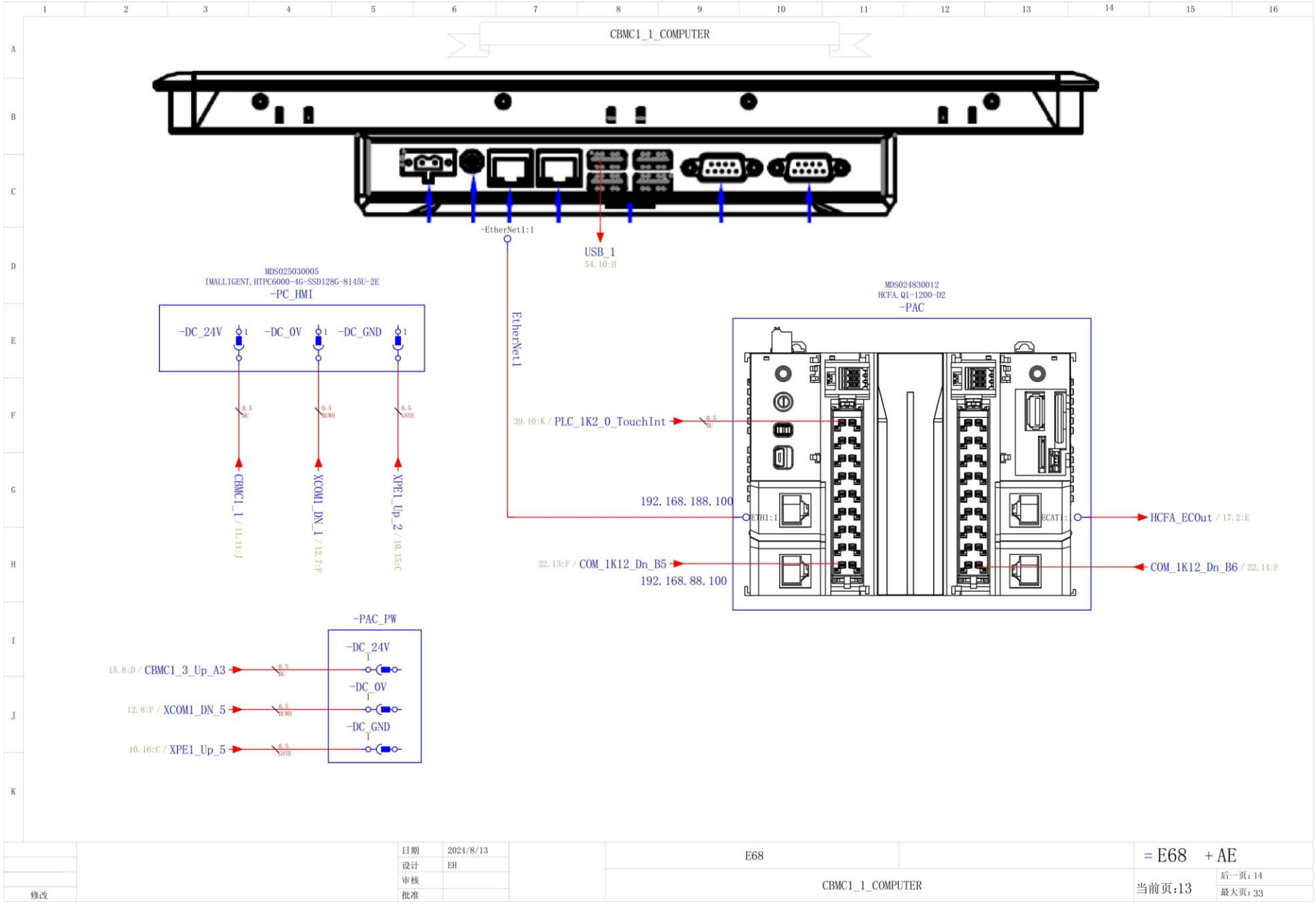


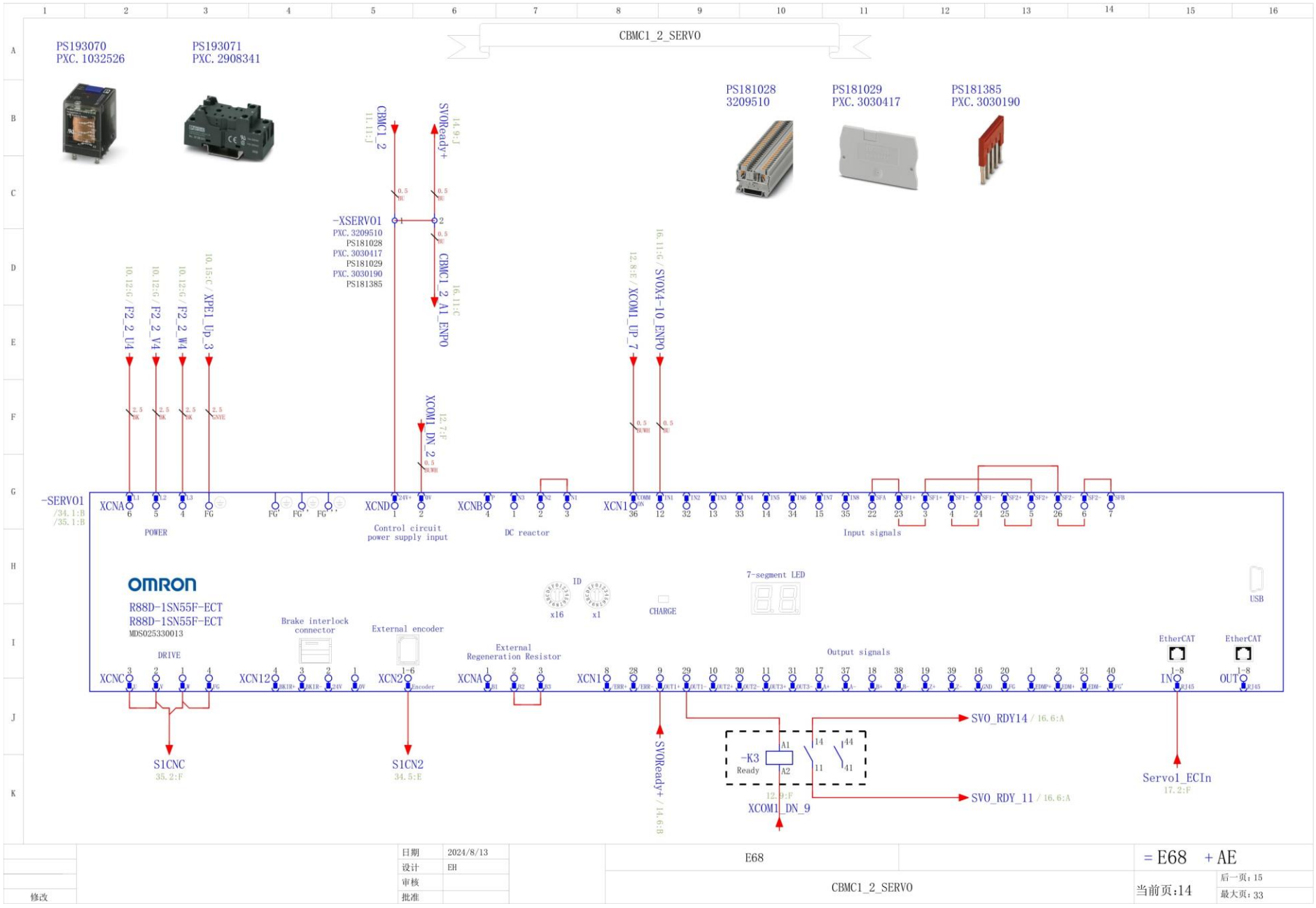
	日期	2024/8/13	E68	= E68	+ AE
	设计	EH			
	审核				
修改	批准		AE_SECOND	当前页:09	后一页: 10 最大页: 33

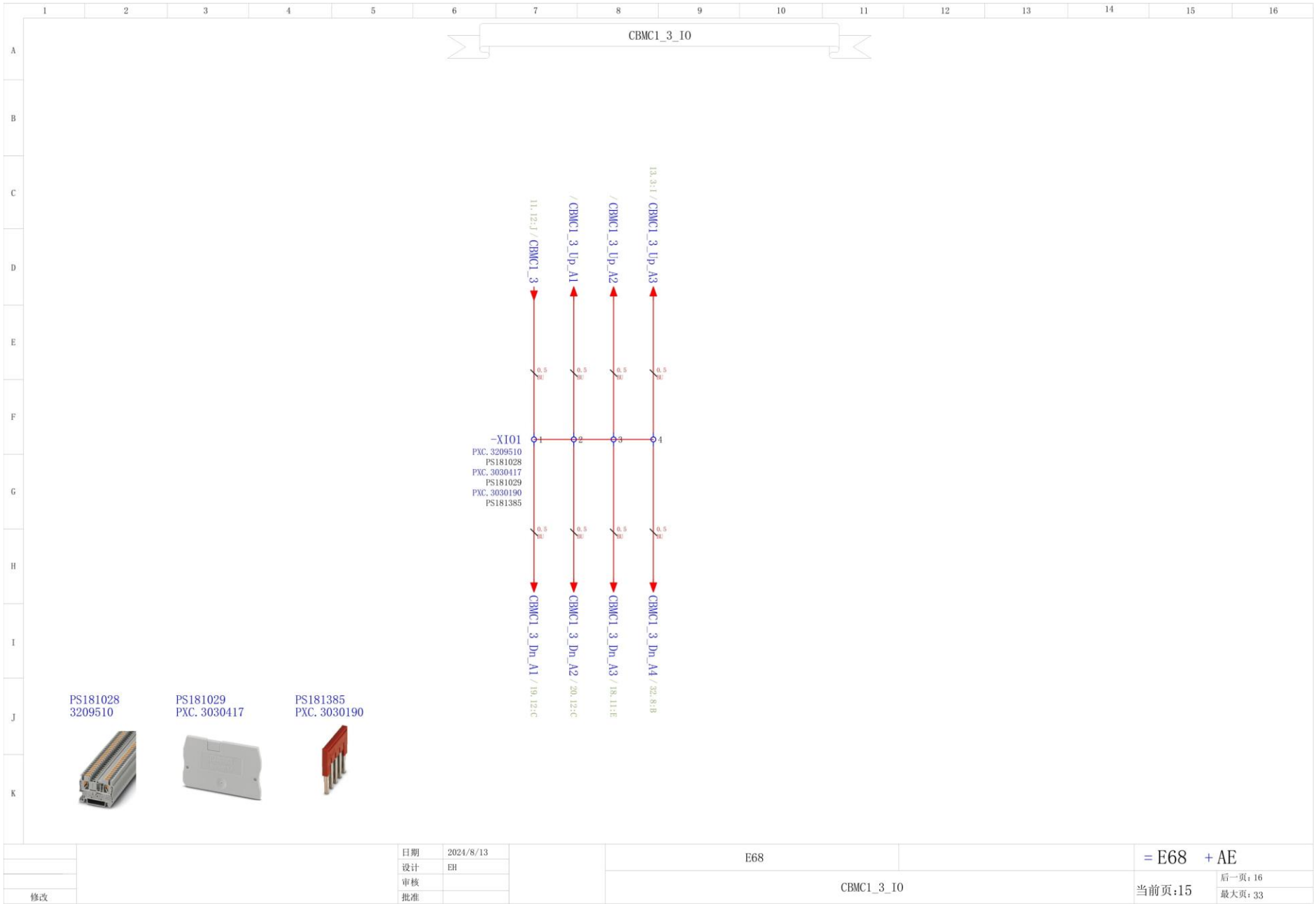


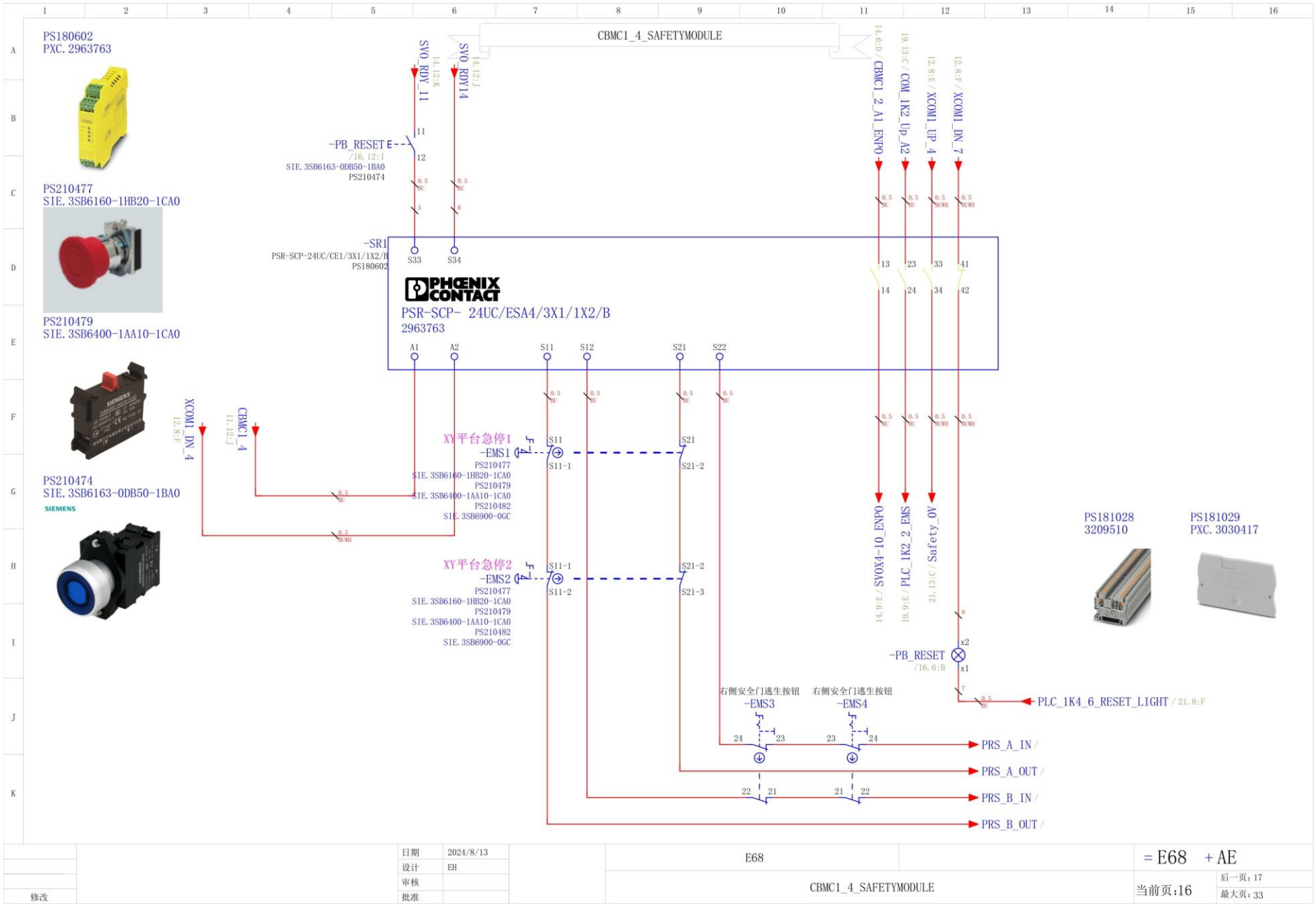





CBMC1_1_COMPUTER
-EtherNet1:1
USB_1
54.10:H
MDS025030005
IMALLIGENT.HTPC6000-4G-SSD128G-8145U-2E
-PC_HMI
-DC_24V
-DC_0V
-DC_GND
CBMC1_1 / 11.11:J
XCOM1_DN_1 / 12.7:F
XPE1_Up_2 / 10.15:C
EtherNet1
MDS024830012
HCFA.Q1-1200-D2
-PAC
39.10:K / PLC_1K2_0_TouchInt
192.168.188.100
ETH1:1
ECAT1:
HCFA_ECOut / 17.2:E
22.13:F / COM_1K12_Dn_B5
192.168.88.100
COM_1K12_Dn_B6 / 22.14:F
-PAC_PW
-DC_24V
-DC_0V
-DC_GND
15.8:D / CBMC1_3_Up_A3
12.8:F / XCOM1_DN_5
10.16:C / XPE1_Up_5
日期 2024/8/13
设计 EH
审核
批准
修改
E68
CBMC1_1_COMPUTER
= E68 + AE
当前页:13
后一页:14
最大页:33


CBMC1_2_SERVO
PS193070
PXC. 1032526
PS193071
PXC. 2908341
PS181028
3209510
PS181029
PXC. 3030417
PS181385
PXC. 3030190
-XSERVO1
PXC. 3209510
PS181028
PXC. 3030417
PS181029
PXC. 3030190
PS181385
CBMC1_2
SVOReady+
CBMC1_2_A1_ENPO
XCOM1_DN_2
XCOM1_UP_7
SVOX4-10_ENPO
F2_2_U4
F2_2_V4
F2_2_W4
XPE1_Up_3
-SERVO1
XCNA
XCND
XCNB
XCN1
POWER
Control circuit power supply input
DC reactor
Input signals
OMRON
R88D-1SN55F-ECT
R88D-1SN55F-ECT
MDS025330013
DRIVE
Brake interlock connector
External encoder
External Regeneration Resistor
Output signals
7-segment LED
CHARGE
USB
EtherCAT
XCNC
XCN12
XCN2
XCNA
XCN1
IN
OUT
S1CNC
S1CN2
SVOReady+
SVO_RDY14
SVO_RDY_11
XCOM1_DN_9
-K3
Ready
Servo1_ECIn
日期 2024/8/13
设计 EH
审核
批准
修改
E68
CBMC1_2_SERVO
= E68 + AE
当前页:14
后一页:15
最大页:33

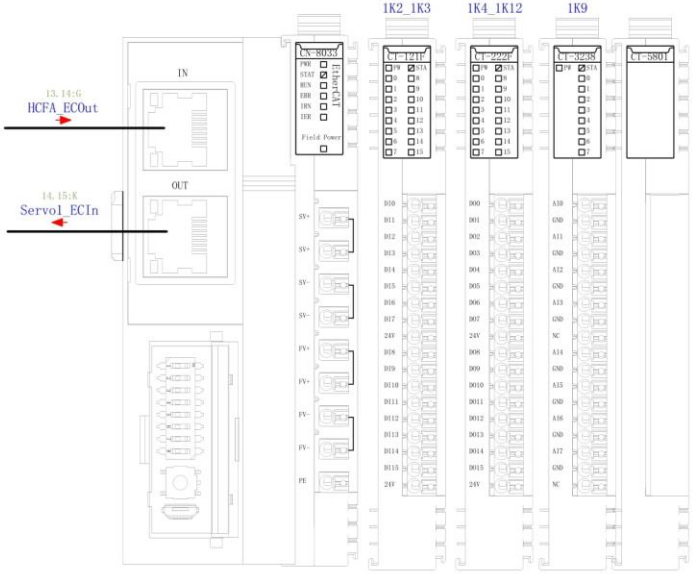

CBMC1_3_IO
11.12:J / CBMC1_3
/ CBMC1_3_Up_A1
/ CBMC1_3_Up_A2
13.3:I / CBMC1_3_Up_A3
0.5 BU
-XIO1
PXC. 3209510
PS181028
PXC. 3030417
PS181029
PXC. 3030190
PS181385
1
2
3
4
CBMC1_3_Dn_A1 / 19.12:C
CBMC1_3_Dn_A2 / 20.12:C
CBMC1_3_Dn_A3 / 18.11:E
CBMC1_3_Dn_A4 / 32.8:B
PS181028
3209510
PS181029
PXC. 3030417
PS181385
PXC. 3030190
日期 2024/8/13
设计 EH
审核
批准
修改
E68
CBMC1_3_IO
= E68 + AE
当前页:15
后一页: 16
最大页: 33



修改	日期	2024/8/13	E68	= E68 + AE	
	设计	EH			
	审核		CBMC1_4_SAFETYMODULE	当前页:16	后一页:17
	批准				最大页:33

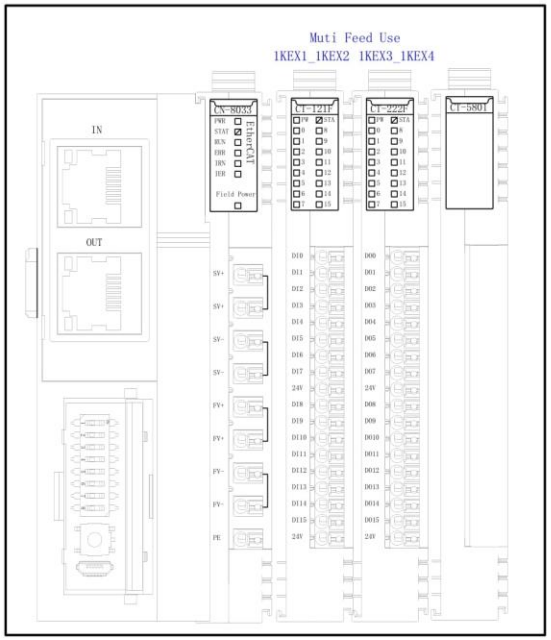
PAC_LIST

E-Drive Standard

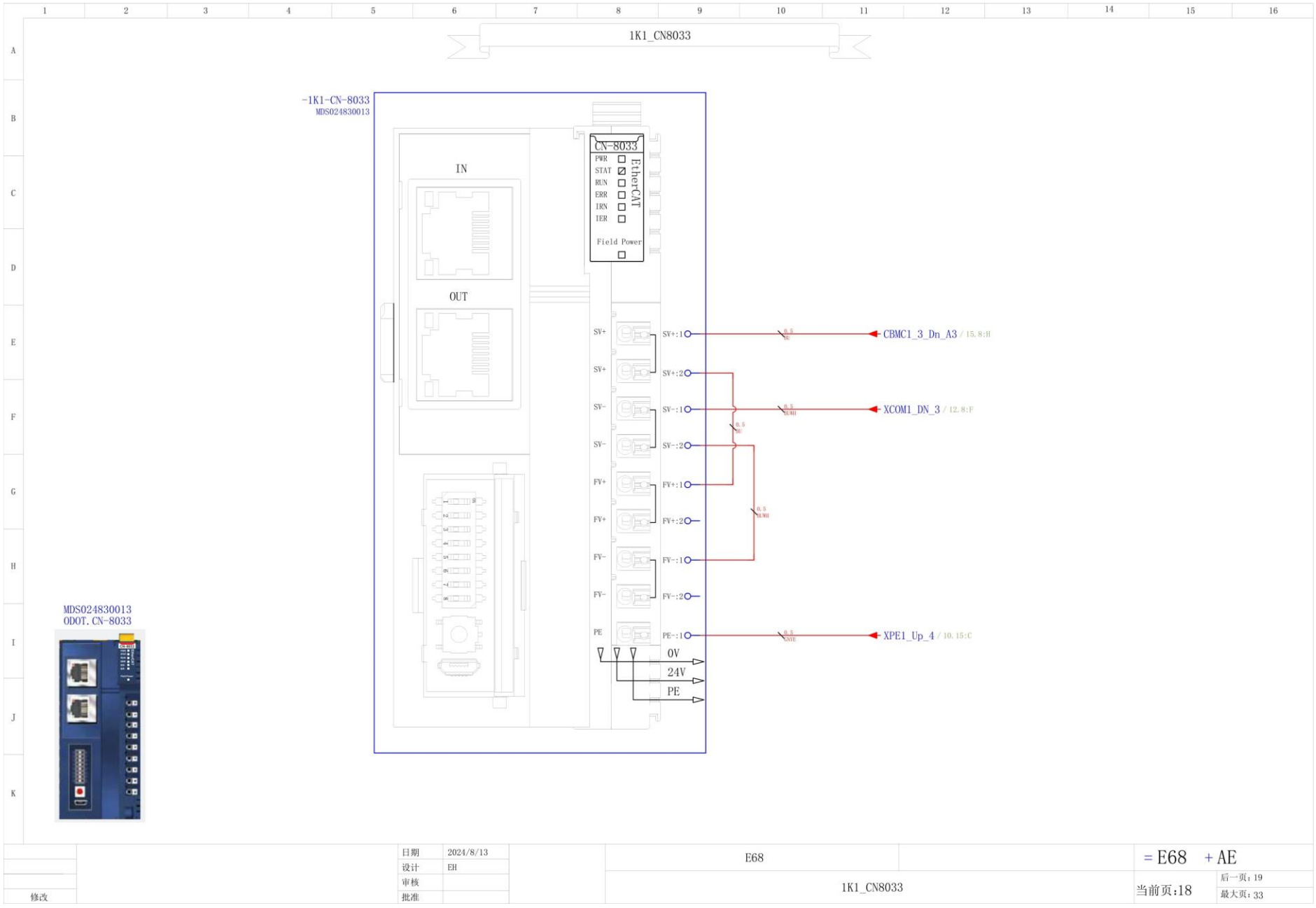


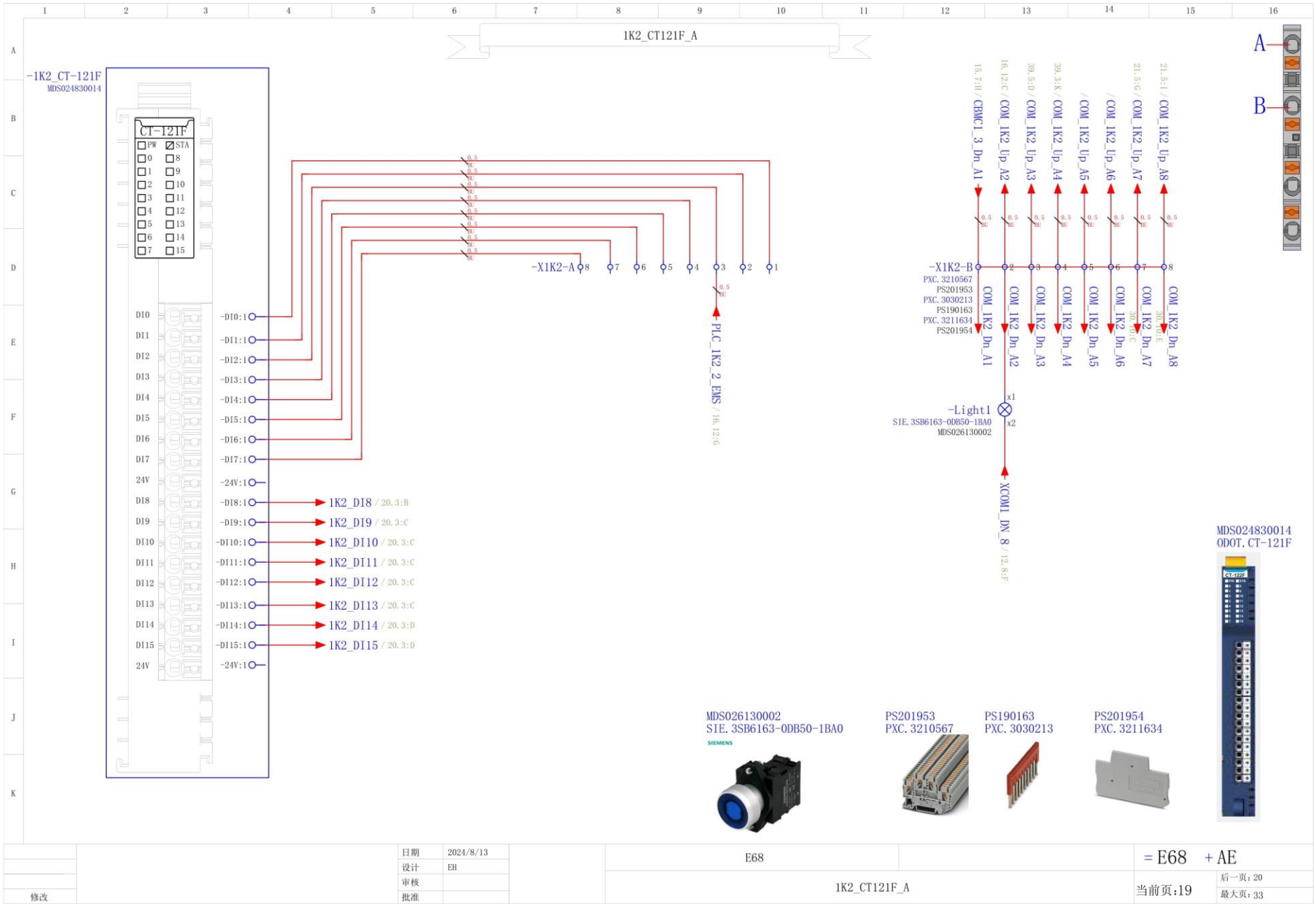
Muti Feed Use

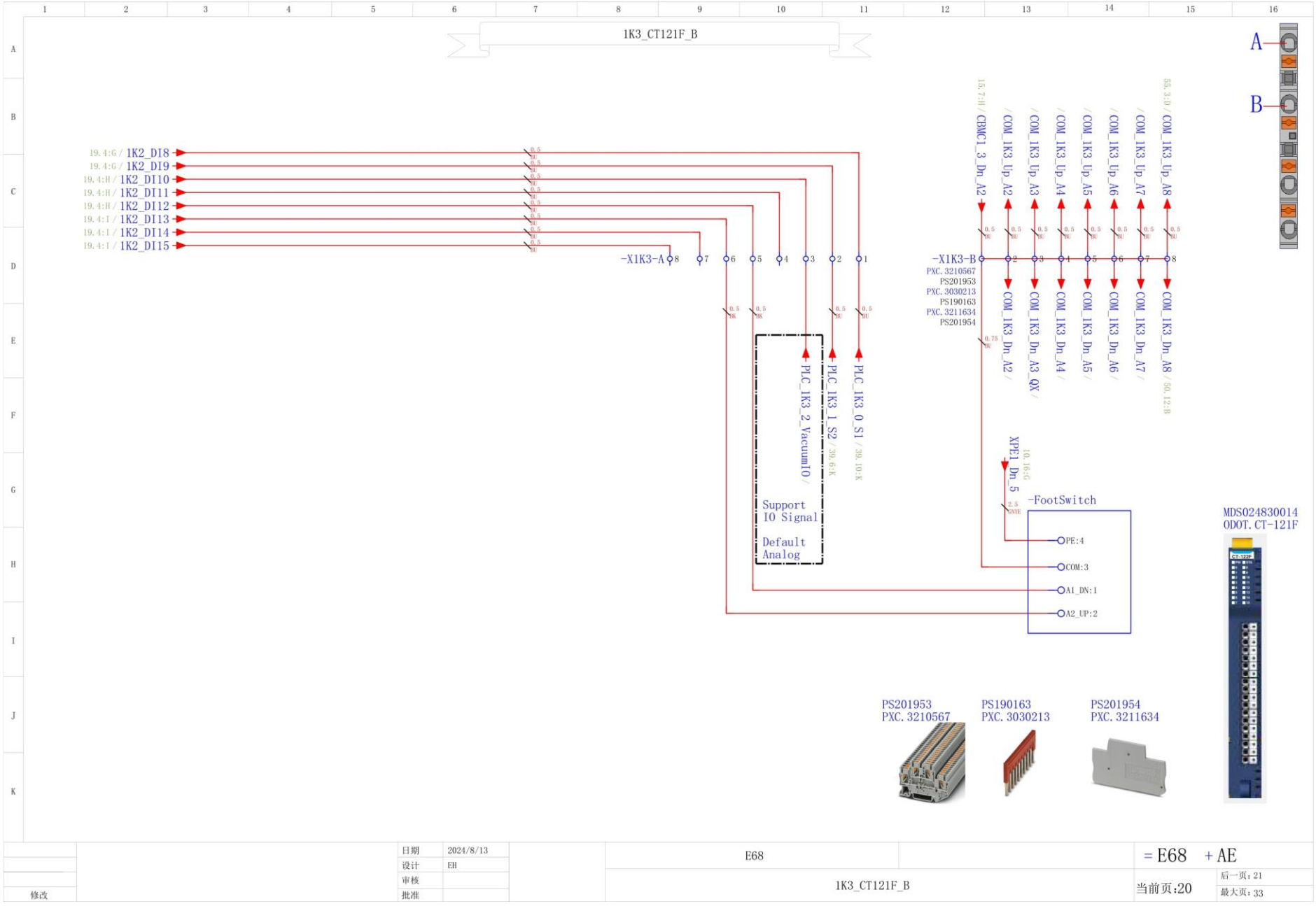
1KEX1_1KEX2 1KEX3_1KEX4

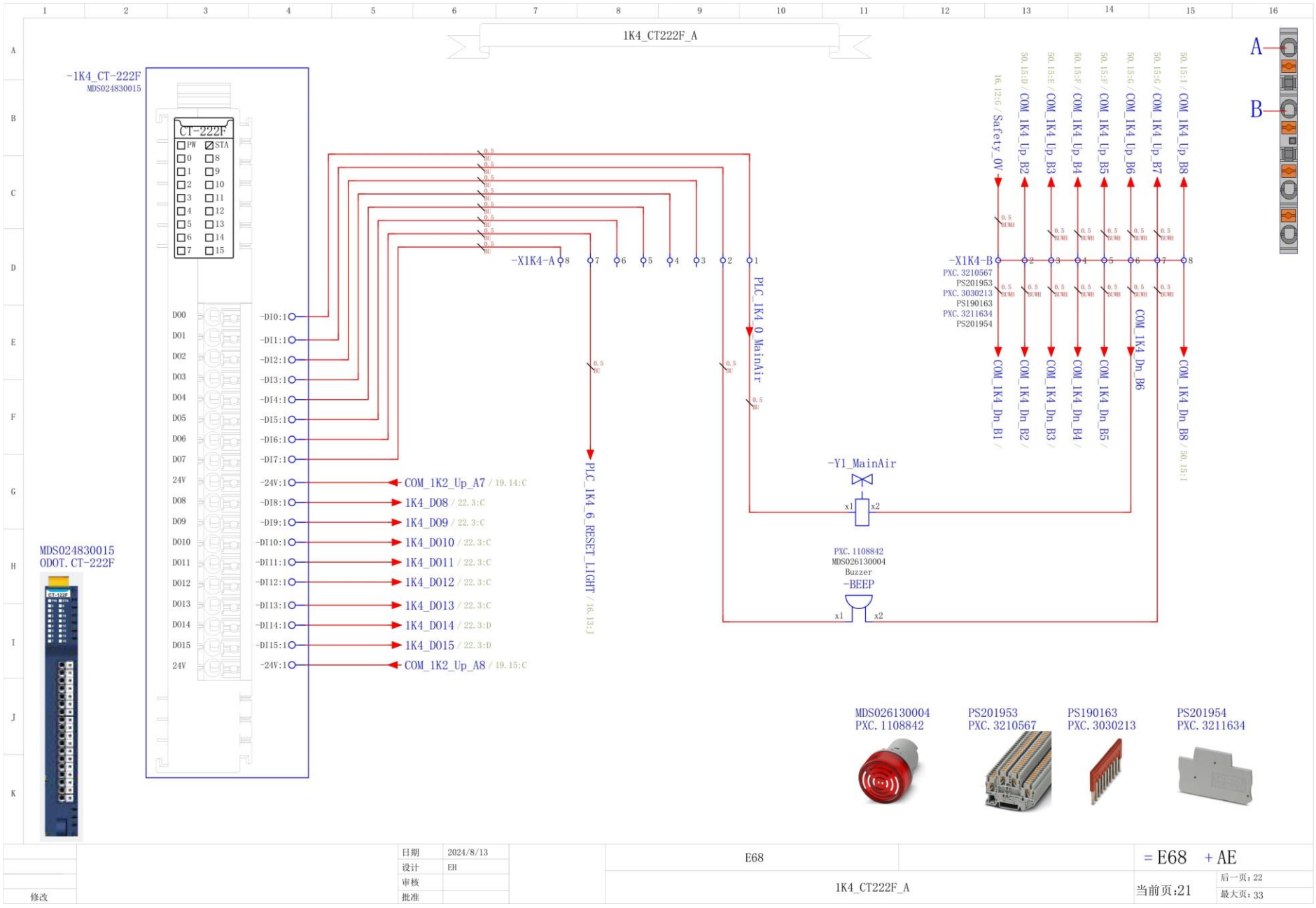


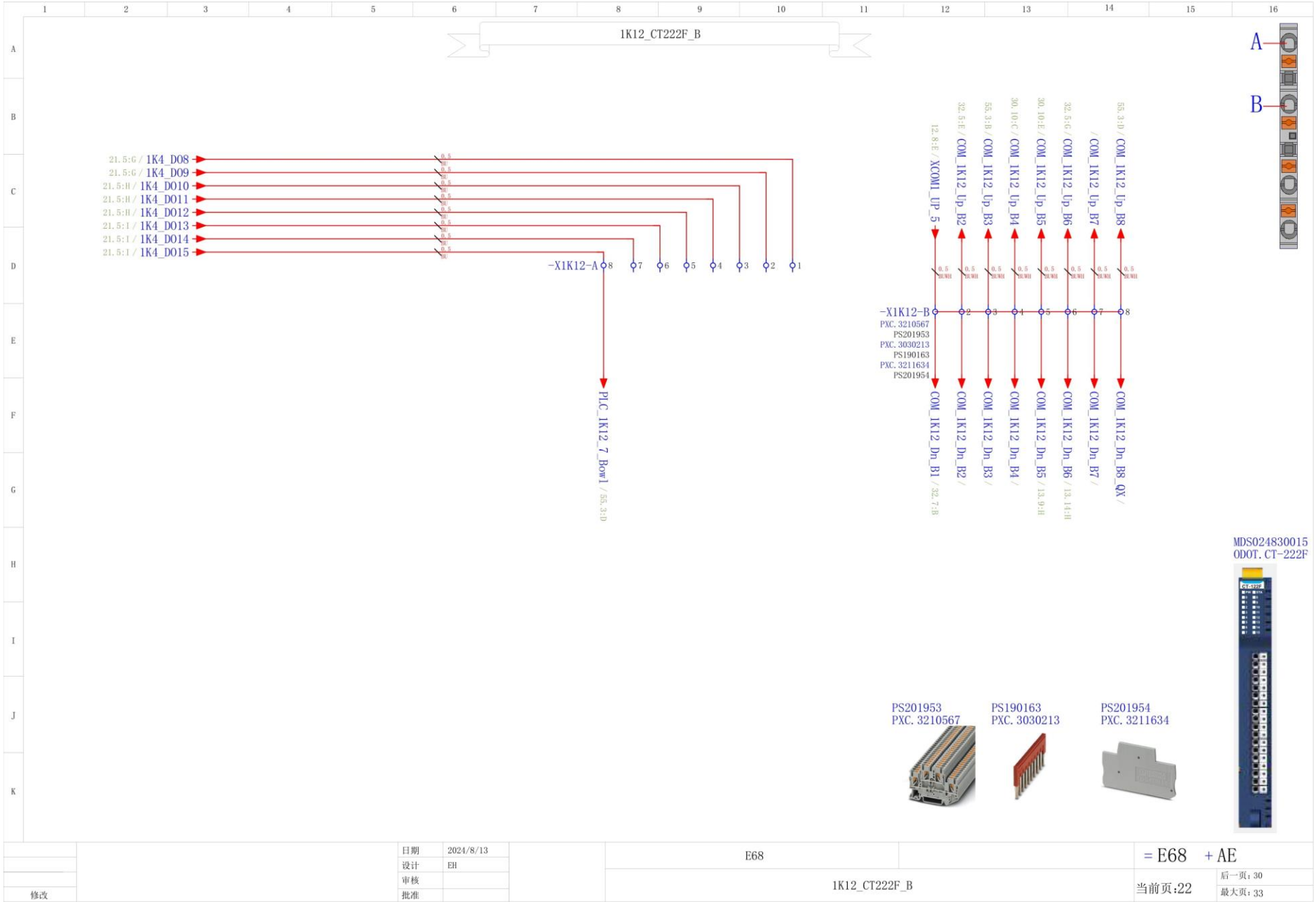
		日期	2024/8/13	E68	= E68 + AE
		设计	EH		
		审核		PAC_LIST	当前页:17 后一页:18
修改		批准			最大页:33

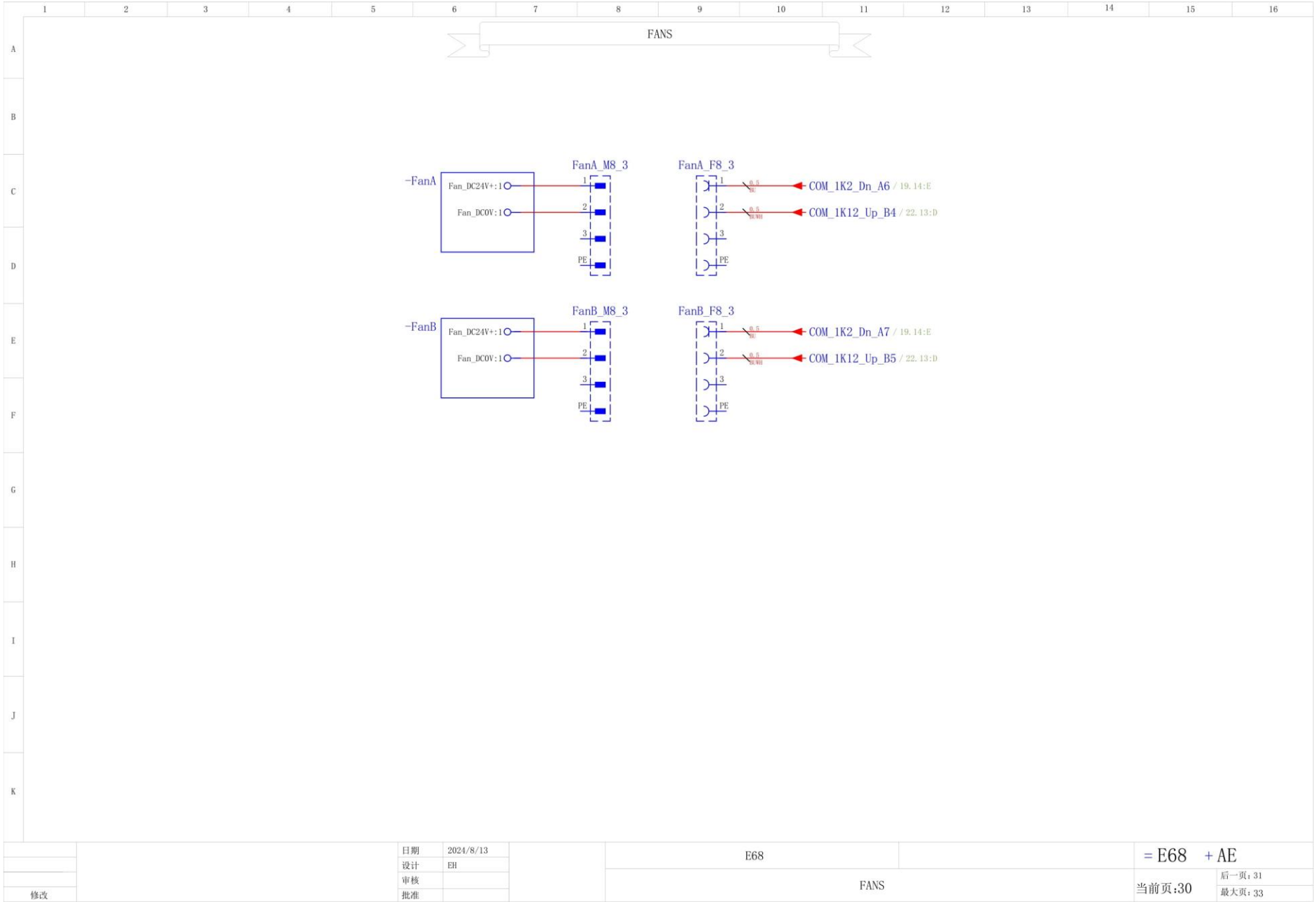

1K1_CN8033
-1K1-CN-8033
MDS024830013
CN-8033
PWR
STAT
RUN
ERR
IRN
IER
EtherCAT
Field Power
IN
OUT
SV+
SV+
SV-
SV-
FV+
FV+
FV-
FV-
PE
SV+:1
SV+:2
SV-:1
SV-:2
FV+:1
FV+:2
FV-:1
FV-:2
PE-:1
0V
24V
PE
CBMC1_3_Dn_A3 / 15.8:H
XCOM1_DN_3 / 12.8:F
XPE1_Up_4 / 10.15:C
MDS024830013
ODOT.CN-8033
日期 2024/8/13
设计 EH
审核
批准
修改
E68
1K1_CN8033
= E68 + AE
当前页:18
后一页:19
最大页:33


1K2_CT121F_A
-1K2_CT-121F
MDS024830014
CT-121F
PW
STA
DI0
DI1
DI2
DI3
DI4
DI5
DI6
DI7
24V
DI8
DI9
DI10
DI11
DI12
DI13
DI14
DI15
24V
-X1K2-A
PLC_1K2_2_EMS / 16.12:G
-X1K2-B
PXC. 3210567
PS201953
PXC. 3030213
PS190163
PXC. 3211634
PS201954
-Light1
SIE. 3SB6163-0DB50-1BA0
MDS026130002
XCOM1_DN_8 / 12.8:F
1K2_DI8 / 20.3:B
1K2_DI9 / 20.3:C
1K2_DI10 / 20.3:C
1K2_DI11 / 20.3:C
1K2_DI12 / 20.3:C
1K2_DI13 / 20.3:C
1K2_DI14 / 20.3:D
1K2_DI15 / 20.3:D
MDS026130002
SIE. 3SB6163-0DB50-1BA0
PS201953
PXC. 3210567
PS190163
PXC. 3030213
PS201954
PXC. 3211634
MDS024830014
ODOT. CT-121F
日期 2024/8/13
设计 EH
审核
批准
修改
E68
1K2_CT121F_A
= E68 + AE
当前页:19
后一页:20
最大页:33




1K4_CT222F_A
-1K4_CT-222F
MDS024830015
CT-222F
PW
STA
-X1K4-A
PLC_1K4_0_MainAir
PLC_1K4_6_RESET_LIGHT
-Y1_MainAir
PXC. 1108842
MDS026130004
Buzzer
-BEEP
-X1K4-B
PXC. 3210567
PS201953
PXC. 3030213
PS190163
PXC. 3211634
PS201954
Safety_0V
COM_1K4_Up_B2
COM_1K4_Up_B3
COM_1K4_Up_B4
COM_1K4_Up_B5
COM_1K4_Up_B6
COM_1K4_Up_B7
COM_1K4_Up_B8
COM_1K4_Dn_B6
COM_1K4_Dn_B8
COM_1K2_Up_A7
1K4_DO8
1K4_DO9
1K4_DO10
1K4_DO11
1K4_DO12
1K4_DO13
1K4_DO14
1K4_DO15
COM_1K2_Up_A8
MDS024830015
ODOT. CT-222F
MDS026130004
PXC. 1108842
PS201953
PXC. 3210567
PS190163
PXC. 3030213
PS201954
PXC. 3211634
日期 2024/8/13
设计 EH
审核
批准
修改
E68
1K4_CT222F_A
= E68 + AE
当前页:21
后一页: 22
最大页: 33


1K12_CT222F_B
21.5:G / 1K4_DO8
21.5:G / 1K4_DO9
21.5:H / 1K4_DO10
21.5:H / 1K4_DO11
21.5:H / 1K4_DO12
21.5:I / 1K4_DO13
21.5:I / 1K4_DO14
21.5:I / 1K4_DO15
-X1K12-A
PLC_1K12_7 Bowl / 55.3:D
12.8:E / XCOM1_UP_5
32.5:E / COM_1K12_Up_B2
55.3:D / COM_1K12_Up_B3
30.10:C / COM_1K12_Up_B4
30.10:E / COM_1K12_Up_B5
32.5:G / COM_1K12_Up_B6
/ COM_1K12_Up_B7
55.3:D / COM_1K12_Up_B8
-X1K12-B
PXC. 3210567
PS201953
PXC. 3030213
PS190163
PXC. 3211634
PS201954
COM_1K12_Dn_B1 / 32.7:B
COM_1K12_Dn_B2 /
COM_1K12_Dn_B3 /
COM_1K12_Dn_B4 /
COM_1K12_Dn_B5 / 13.9:H
COM_1K12_Dn_B6 / 13.14:H
COM_1K12_Dn_B7 /
COM_1K12_Dn_B8_QX /
A
B
MDS024830015
ODOT. CT-222F
PS201953
PXC. 3210567
PS190163
PXC. 3030213
PS201954
PXC. 3211634
日期 2024/8/13
设计 EH
审核
批准
修改
E68
1K12_CT222F_B
= E68 + AE
当前页:22
后一页: 30
最大页: 33


FANS
-FanA
Fan_DC24V+:1
Fan_DC0V:1
FanA_M8_3
PE
FanA_F8_3
COM_1K2_Dn_A6 / 19.14:E
COM_1K12_Up_B4 / 22.13:D
-FanB
FanB_M8_3
FanB_F8_3
COM_1K2_Dn_A7 / 19.14:E
COM_1K12_Up_B5 / 22.13:D
日期 2024/8/13
设计 EH
审核
批准
修改
E68
FANS
= E68 + AE
当前页:30
后一页: 31
最大页: 33

SH_CONNECTOR

PS193066
1411325

PS210401
1182093

PS191684
1424228

MDS026930014
1424220

PS193066
PXC. 1411325
PS210401
PXC. 1182093
-CONNECT_4M_A

F1_FEMALE
PXC. 1424228
PS191684

F2_FEMALE
PXC. 1424228
PS191684

F3_FEMALE
PXC. 1424228
PS191684

F4_FEMALE
PXC. 1424220
MDS026930014

PS180571
PXC. 1411440
PS180570
PXC. 1411461
PS210400
PXC. 1182090
-CONNECT_4M_B

M1_MALE
PXC. 1424246
PS191683

M2_MALE
PXC. 1424246
PS191683

M3_MALE
PXC. 1424246
PS191683

F4_MALE
PXC. 1424221
MDS026930013

PS180571
1411440

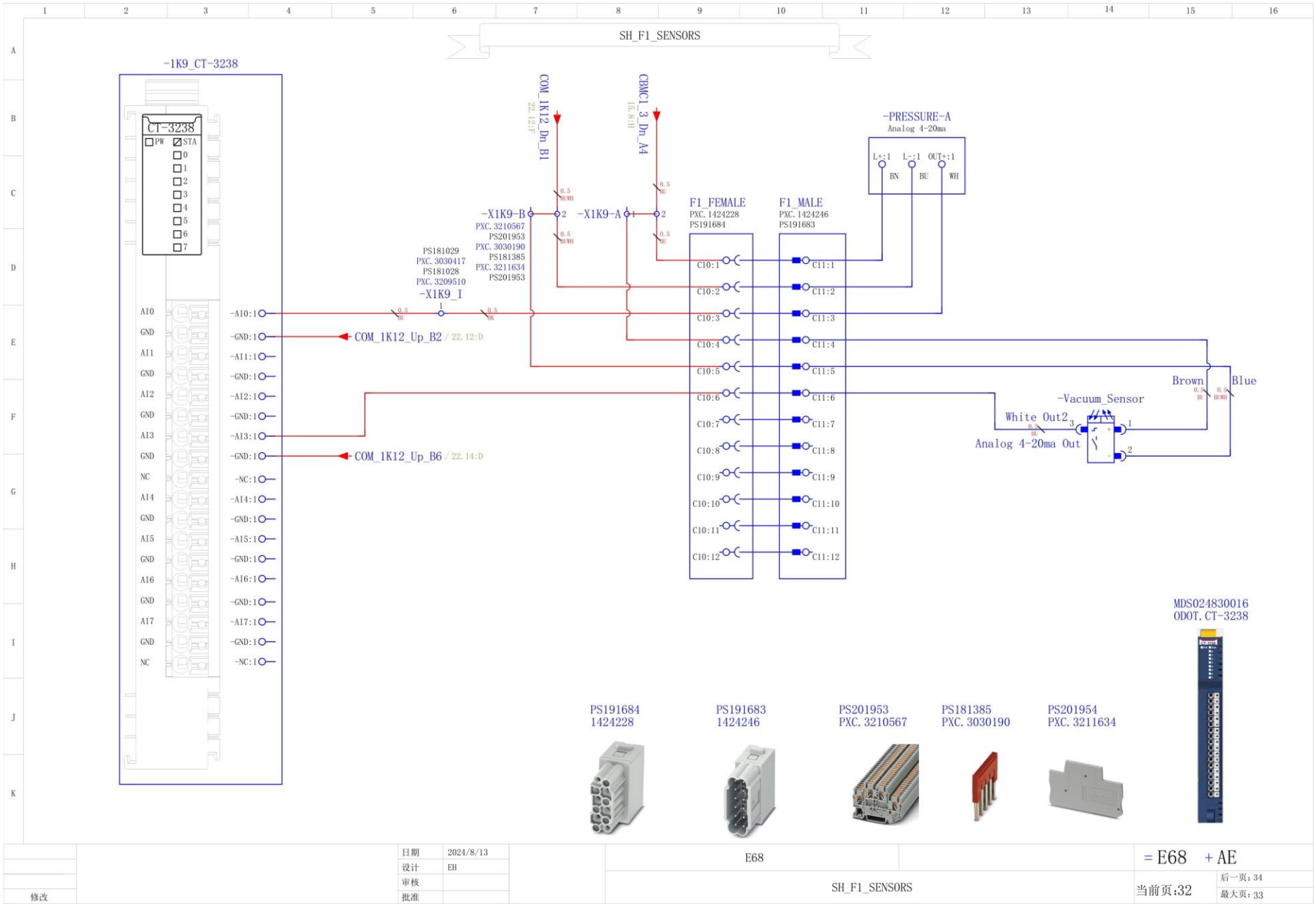
PS180570
1411461

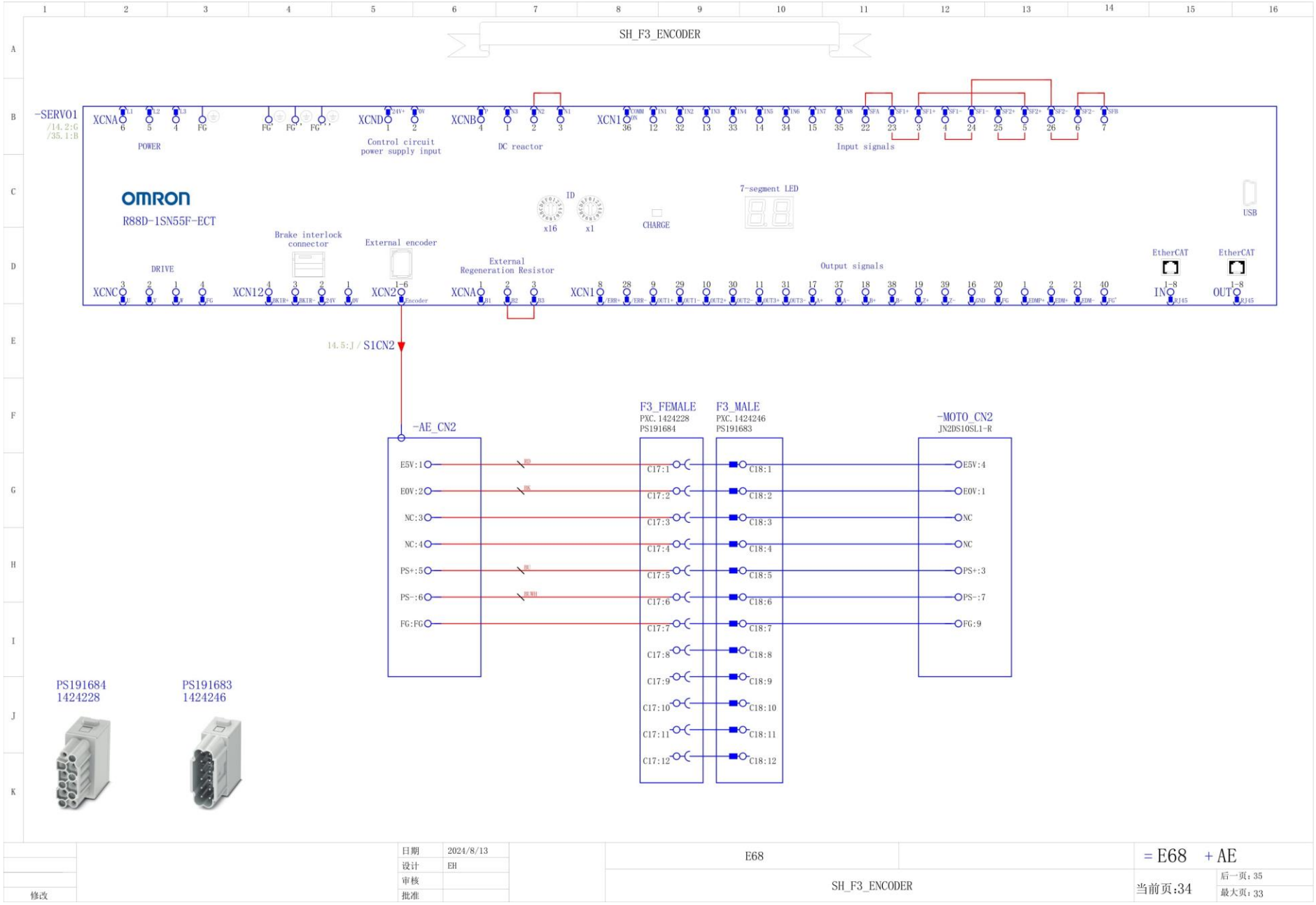
PS210400
1182090

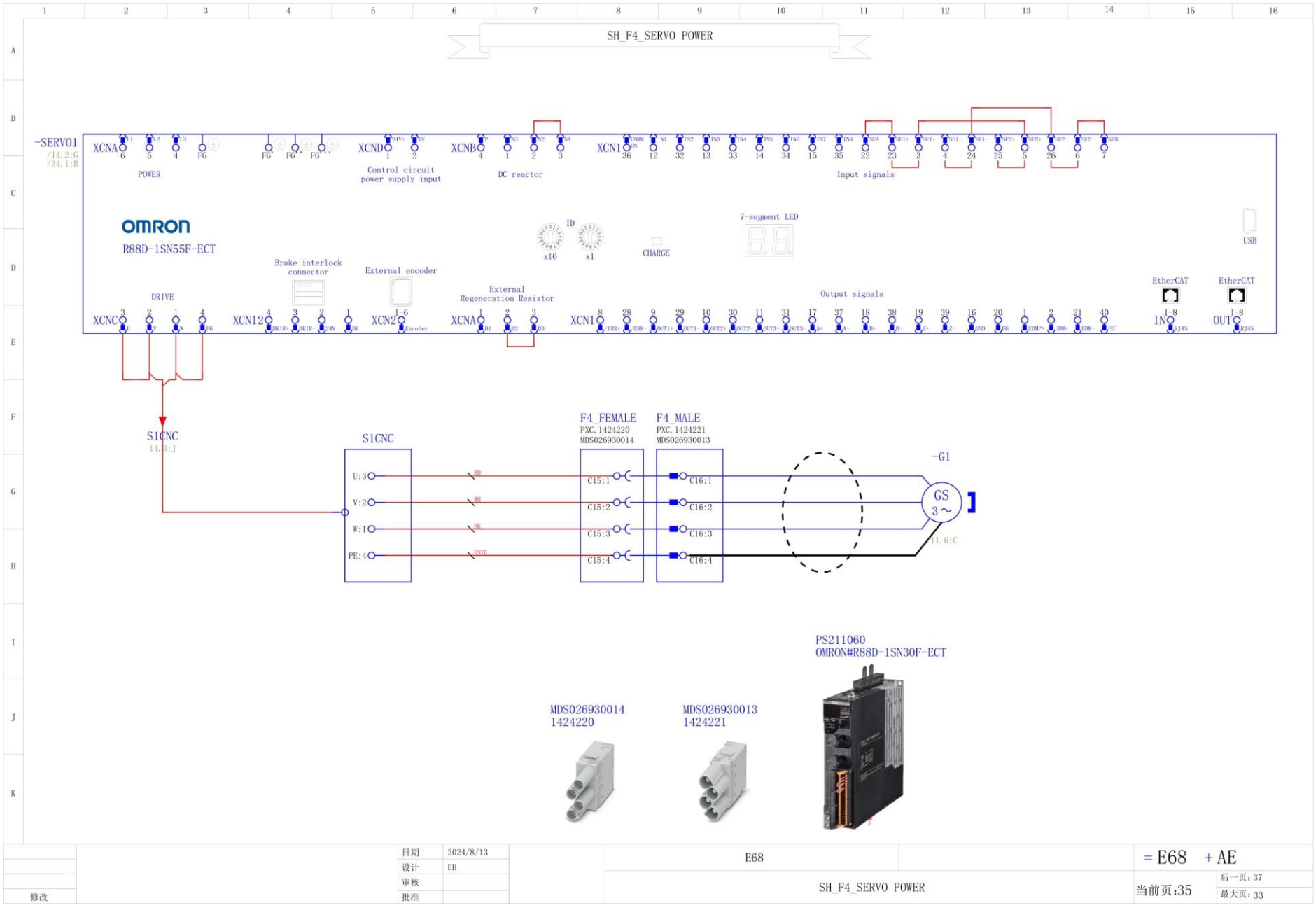
PS191683
1424246

MDS026930013
1424221

修改		日期	2024/8/13	E68	= E68 + AE
		设计	EH		
		审核		SH_CONNECTOR	当前页:31 后一页:32 最大页:33
		批准			




SH_F3_ENCODER
-SERVO1
/14.2:G
/35.1:B
XCNA
POWER
XCND
Control circuit
power supply input
XCNB
DC reactor
XCN1
Input signals
OMRON
R88D-1SN55F-ECT
ID
x16
x1
CHARGE
7-segment LED
USB
Brake interlock
connector
External encoder
External
Regeneration Resistor
DRIVE
Output signals
EtherCAT
EtherCAT
XCNC
XCN12
XCN2
XCNA
XCN1
IN
OUT
14.5:J / S1CN2
-AE_CN2
F3_FEMALE
PXC.1424228
PS191684
F3_MALE
PXC.1424246
PS191683
-MOTO_CN2
JN2DS10SL1-R
E5V:1
E0V:2
NC:3
NC:4
PS+:5
PS-:6
FG:FG
C17:1
C17:2
C17:3
C17:4
C17:5
C17:6
C17:7
C17:8
C17:9
C17:10
C17:11
C17:12
C18:1
C18:2
C18:3
C18:4
C18:5
C18:6
C18:7
C18:8
C18:9
C18:10
C18:11
C18:12
E5V:4
E0V:1
NC
NC
PS+:3
PS-:7
FG:9
PS191684
1424228
PS191683
1424246
日期
2024/8/13
设计
EH
审核
批准
修改
E68
SH_F3_ENCODER
= E68 + AE
当前页:34
后一页: 35
最大页: 33


SH_F4_SERVO POWER
-SERVO1
/14.2:G
/34.1:B
XCNA
POWER
XCND
Control circuit
power supply input
XCNB
DC reactor
XCN1
Input signals
OMRON
R88D-1SN55F-ECT
ID
x16
x1
CHARGE
7-segment LED
USB
Brake interlock
connector
External encoder
External
Regeneration Resistor
Output signals
EtherCAT
EtherCAT
DRIVE
XCNC
XCN12
XCN2
XCNA
XCN1
IN
OUT
S1CNC
14.3:J
S1CNC
F4_FEMALE
PXC.1424220
MDS026930014
F4_MALE
PXC.1424221
MDS026930013
U:3
V:2
W:1
PE:4
C15:1
C15:2
C15:3
C15:4
C16:1
C16:2
C16:3
C16:4
-G1
GS
3～
11.6:C
PS211060
OMRON#R88D-1SN30F-ECT
MDS026930014
1424220
MDS026930013
1424221
日期
2024/8/13
设计
EH
审核
批准
修改
E68
SH_F4_SERVO POWER
= E68 + AE
当前页:35
后一页: 37
最大页: 33

CF_CONNECT

PS193066
1411325

PS210401
1182093

PS191684
1424228

PS193066
PXC. 1411325
PS210401
PXC. 1182093
-CONNECT_5M_A

F1C_FEMALE
PXC. 1424228
PS191684

F2C_FEMALE
PXC. 1424228
PS191684

F3C_FEMALE
PXC. 1424228
PS191684

F4C_FEMALE
PXC. 1424228
PS191684

PS180571
PXC. 1411440
PS180570
PXC. 1411461
PS210400
PXC. 1182090
-CONNECT_5M_B

M1C_MALE
PXC. 1424246
PS191683

M2C_MALE
PXC. 1424246
PS191683

M3C_MALE
PXC. 1424246
PS191683

M4C_MALE
PXC. 1424246
PS191683

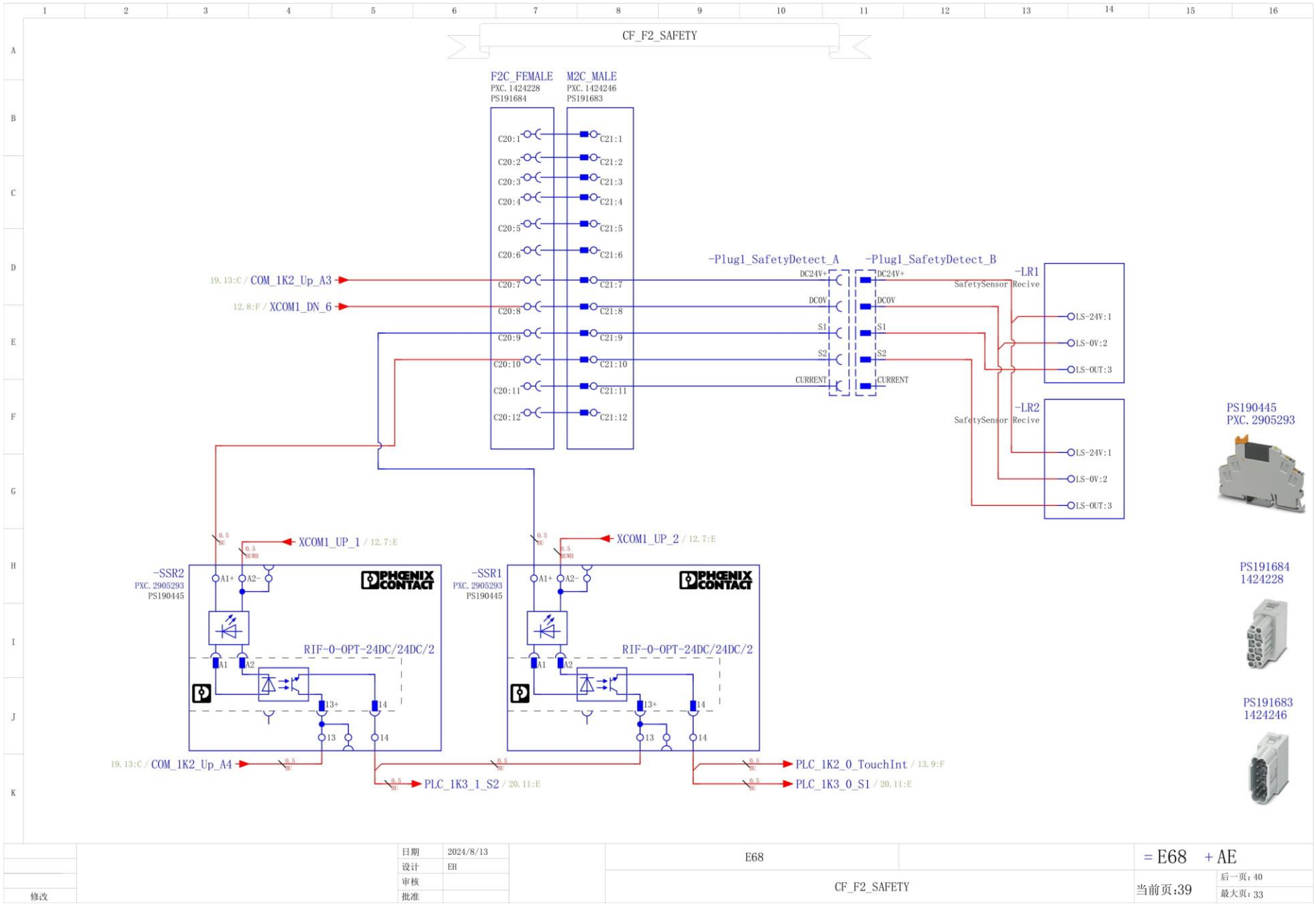
PS180571
1411440

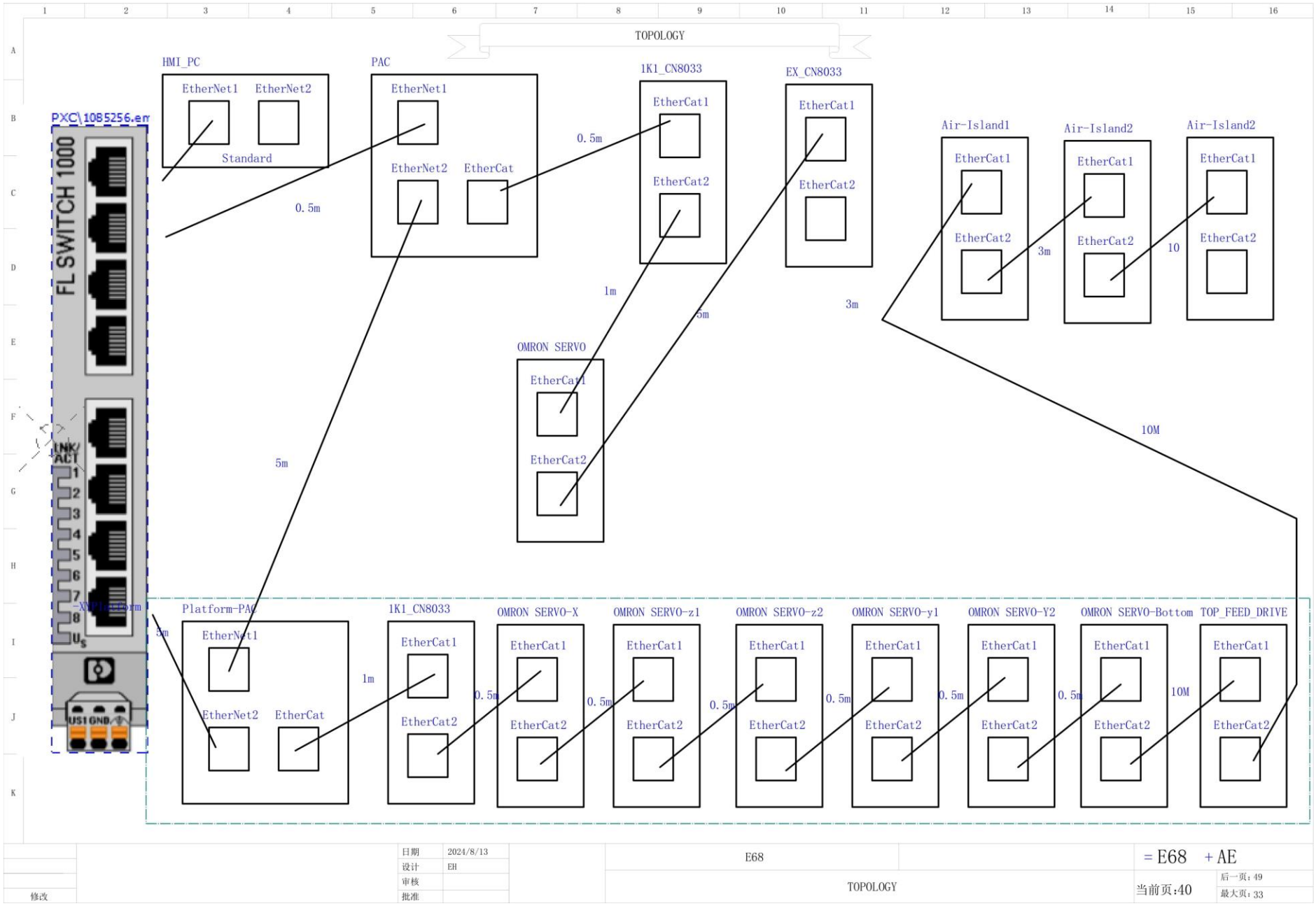
PS180570
1411461

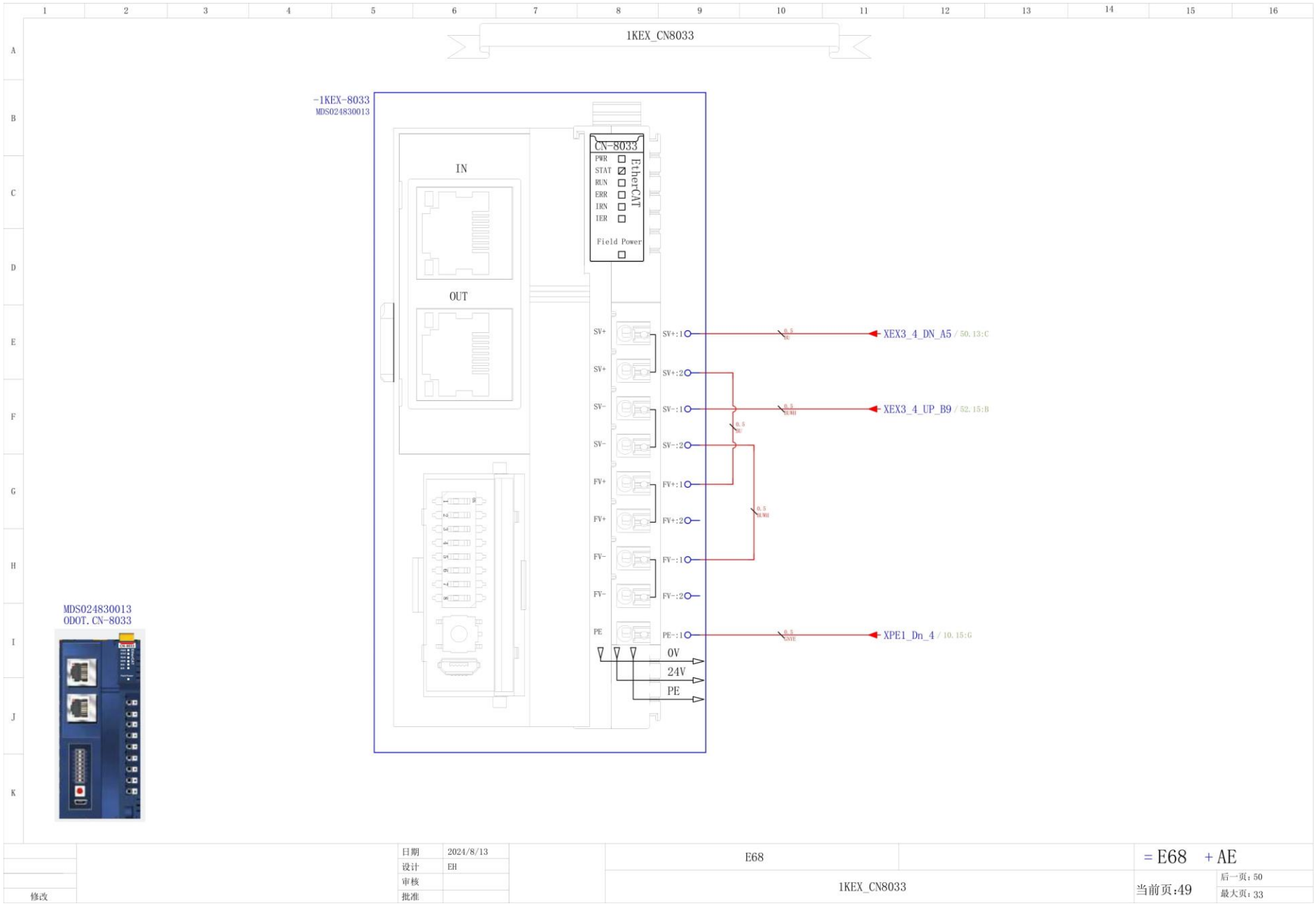
PS210400
1182090

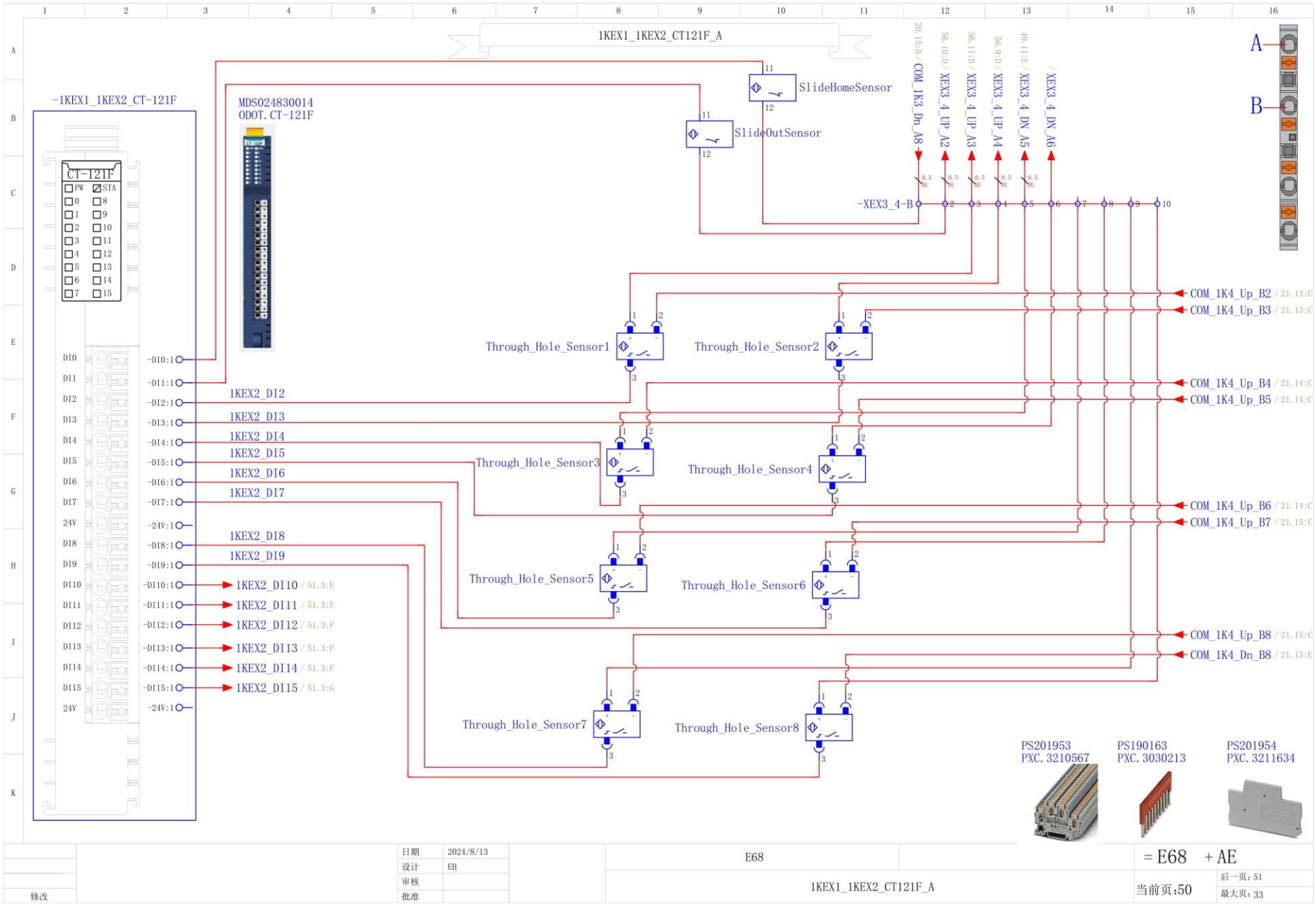
PS191683
1424246

		日期	2024/8/13	E68	= E68 + AE
		设计	EH		
		审核		CF_CONNECT	当前页:37 后一页:39
修改		批准			最大页:33

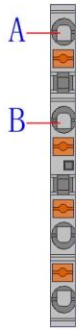



TOPOLOGY
HMI_PC
EtherNet1
EtherNet2
Standard
PAC
EtherNet1
EtherNet2
EtherCat
1K1_CN8033
EtherCat1
EtherCat2
EX_CN8033
EtherCat1
EtherCat2
Air-Island1
Air-Island2
Air-Island2
EtherCat1
EtherCat2
OMRON SERVO
EtherCat1
EtherCat2
0.5m
1m
5m
3m
10M
FL SWITCH 1000
LNK/ACT
Platform-PAC
1K1_CN8033
OMRON SERVO-X
OMRON SERVO-z1
OMRON SERVO-z2
OMRON SERVO-y1
OMRON SERVO-Y2
OMRON SERVO-Bottom
TOP_FEED_DRIVE
日期 2024/8/13
设计 EH
审核
批准
修改
E68
TOPOLOGY
= E68 + AE
当前页:40
后一页: 49
最大页: 33


1KEX_CN8033
-1KEX-8033
MDS024830013
CN-8033
PWR
STAT
RUN
ERR
IRN
IER
EtherCAT
Field Power
IN
OUT
SV+
SV+
SV-
SV-
FV+
FV+
FV-
FV-
PE
SV+:1
SV+:2
SV-:1
SV-:2
FV+:1
FV+:2
FV-:1
FV-:2
PE-:1
0V
24V
PE
XEX3_4_DN_A5 / 50.13:C
XEX3_4_UP_B9 / 52.15:B
XPE1_Dn_4 / 10.15:G
MDS024830013
ODOT.CN-8033
日期 2024/8/13
设计 EH
审核
批准
修改
E68
1KEX_CN8033
= E68 + AE
当前页:49
后一页: 50
最大页: 33


1KEX1_1KEX2_CT121F_A
-1KEX1_1KEX2_CT-121F
MDS024830014
ODOT.CT-121F
CT-121F
SlideHomeSensor
SlideOutSensor
-XEX3_4-B
COM_1K3_Dn_A8
XEX3_4_UP_A2
XEX3_4_UP_A3
XEX3_4_UP_A4
XEX3_4_DN_A5
XEX3_4_DN_A6
Through_Hole_Sensor1
Through_Hole_Sensor2
Through_Hole_Sensor3
Through_Hole_Sensor4
Through_Hole_Sensor5
Through_Hole_Sensor6
Through_Hole_Sensor7
Through_Hole_Sensor8
1KEX2_DI2
1KEX2_DI3
1KEX2_DI4
1KEX2_DI5
1KEX2_DI6
1KEX2_DI7
1KEX2_DI8
1KEX2_DI9
1KEX2_DI10
1KEX2_DI11
1KEX2_DI12
1KEX2_DI13
1KEX2_DI14
1KEX2_DI15
COM_1K4_Up_B2
COM_1K4_Up_B3
COM_1K4_Up_B4
COM_1K4_Up_B5
COM_1K4_Up_B6
COM_1K4_Up_B7
COM_1K4_Up_B8
COM_1K4_Dn_B8
PS201953
PXC. 3210567
PS190163
PXC. 3030213
PS201954
PXC. 3211634
日期 2024/8/13
设计 EH
审核
批准
修改
E68
= E68 + AE
1KEX1_1KEX2_CT121F_A
当前页:50
后一页: 51
最大页: 33

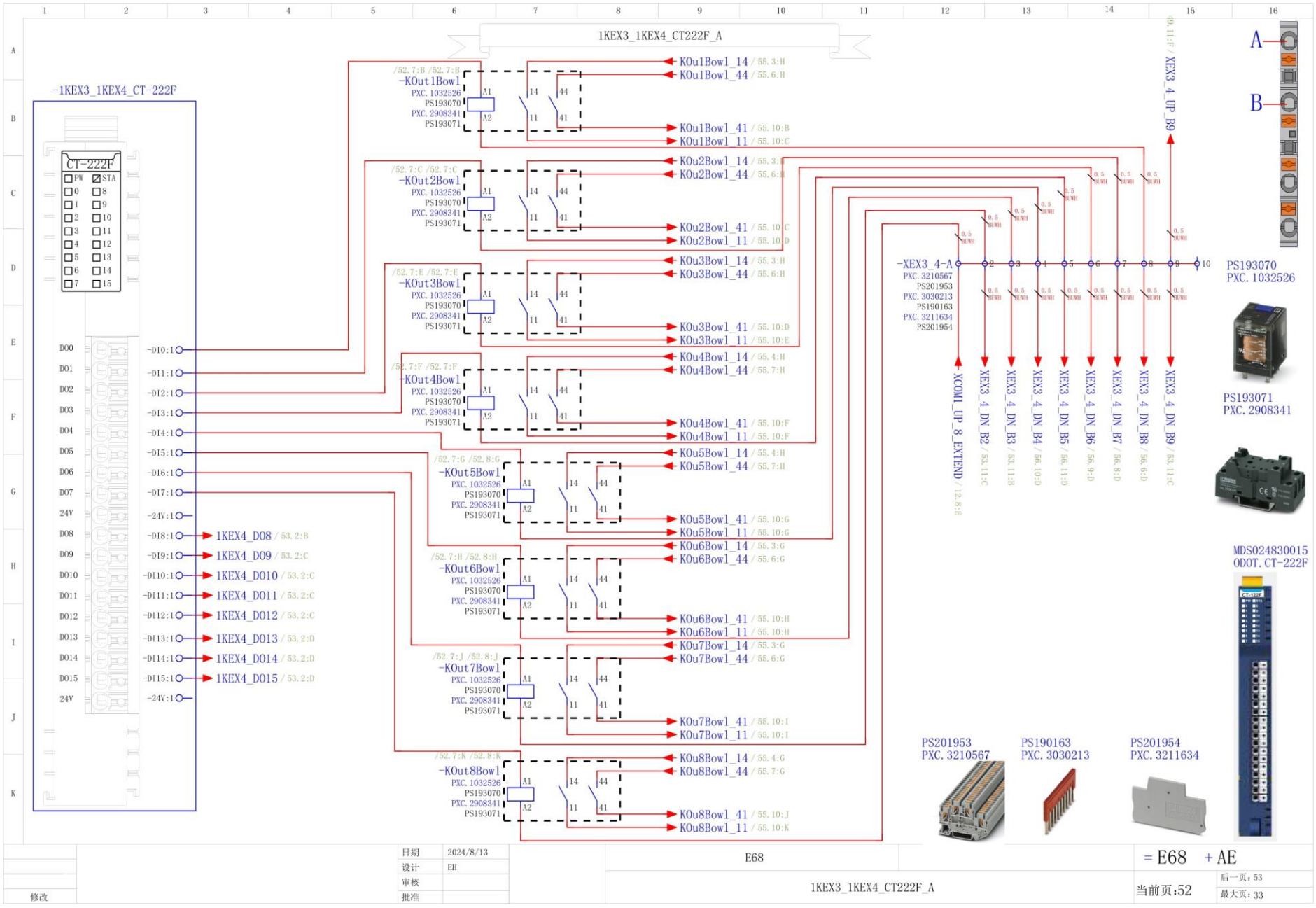
1KEX1_1KEX2_CT121F_B

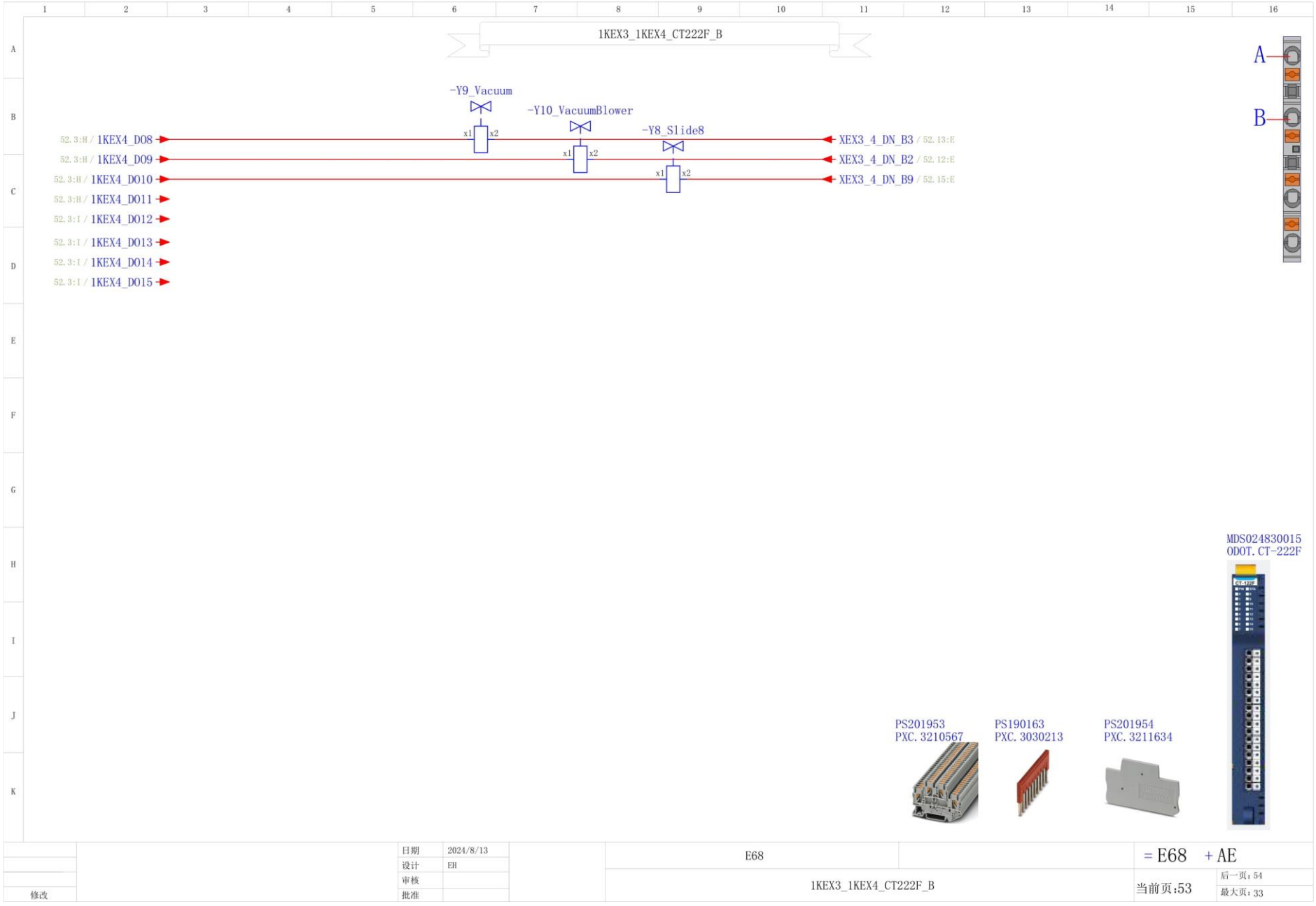


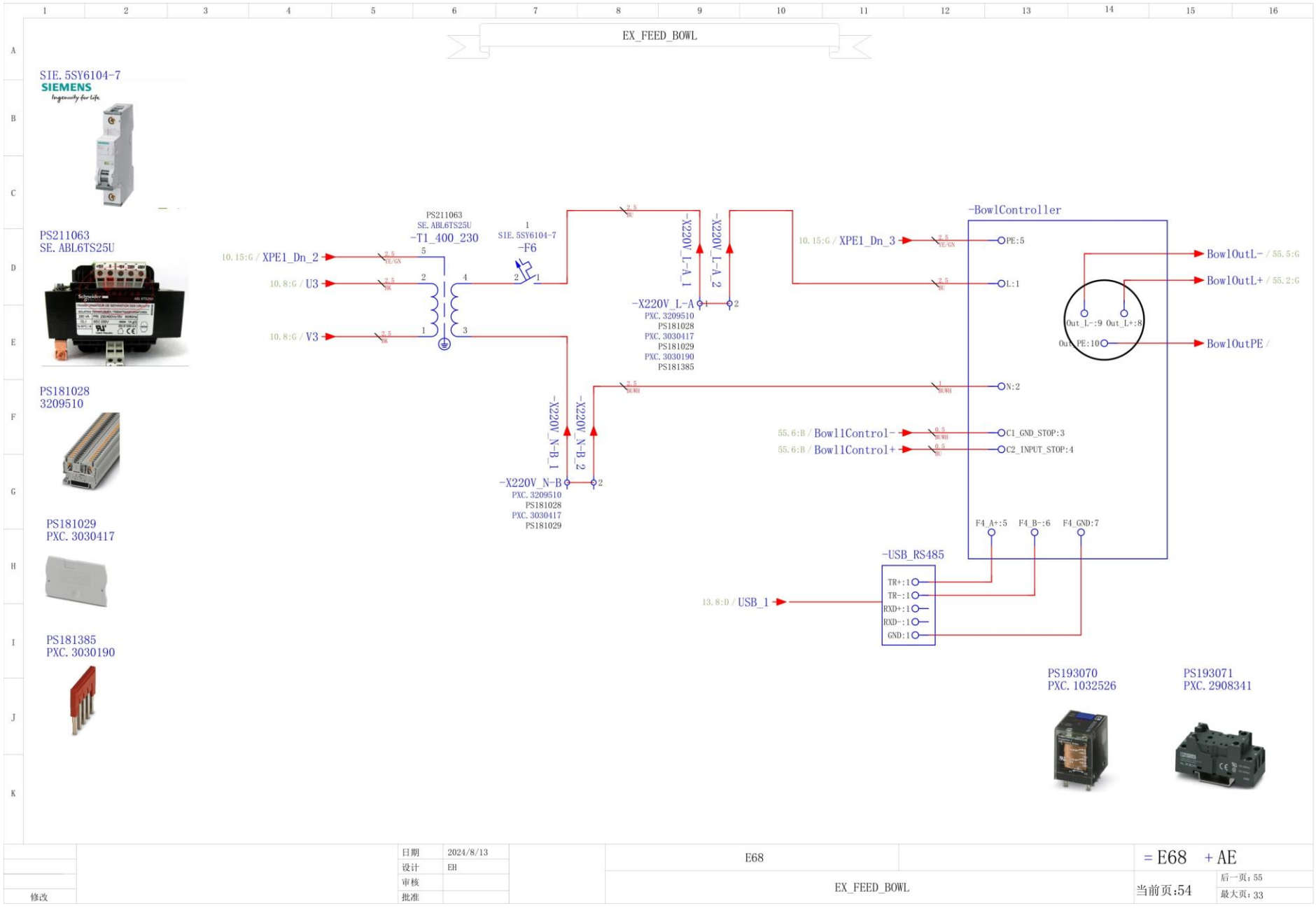
/ 1KEX2_DI9
50.3:H / 1KEX2_DI10
50.3:I / 1KEX2_DI11
50.3:I / 1KEX2_DI12
50.3:I / 1KEX2_DI13
50.3:I / 1KEX2_DI14
50.3:J / 1KEX2_DI15

MDS024830014
ODOT.CT-121F

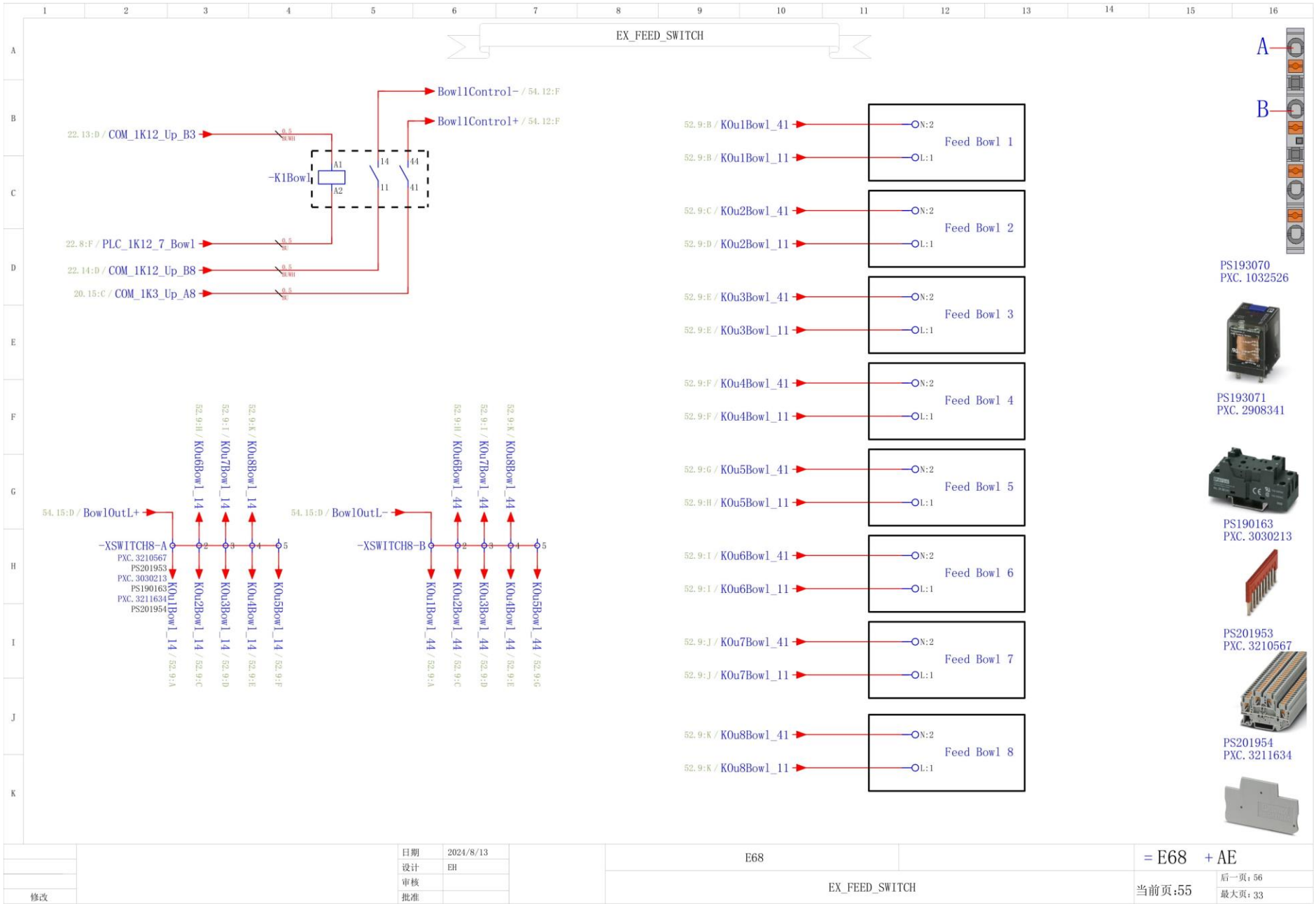
		日期	2024/8/13	E68	= E68 + AE
		设计	EH		
		审核		1KEX1_1KEX2_CT121F_B	当前页:51
修改		批准			后一页:52 最大页:33

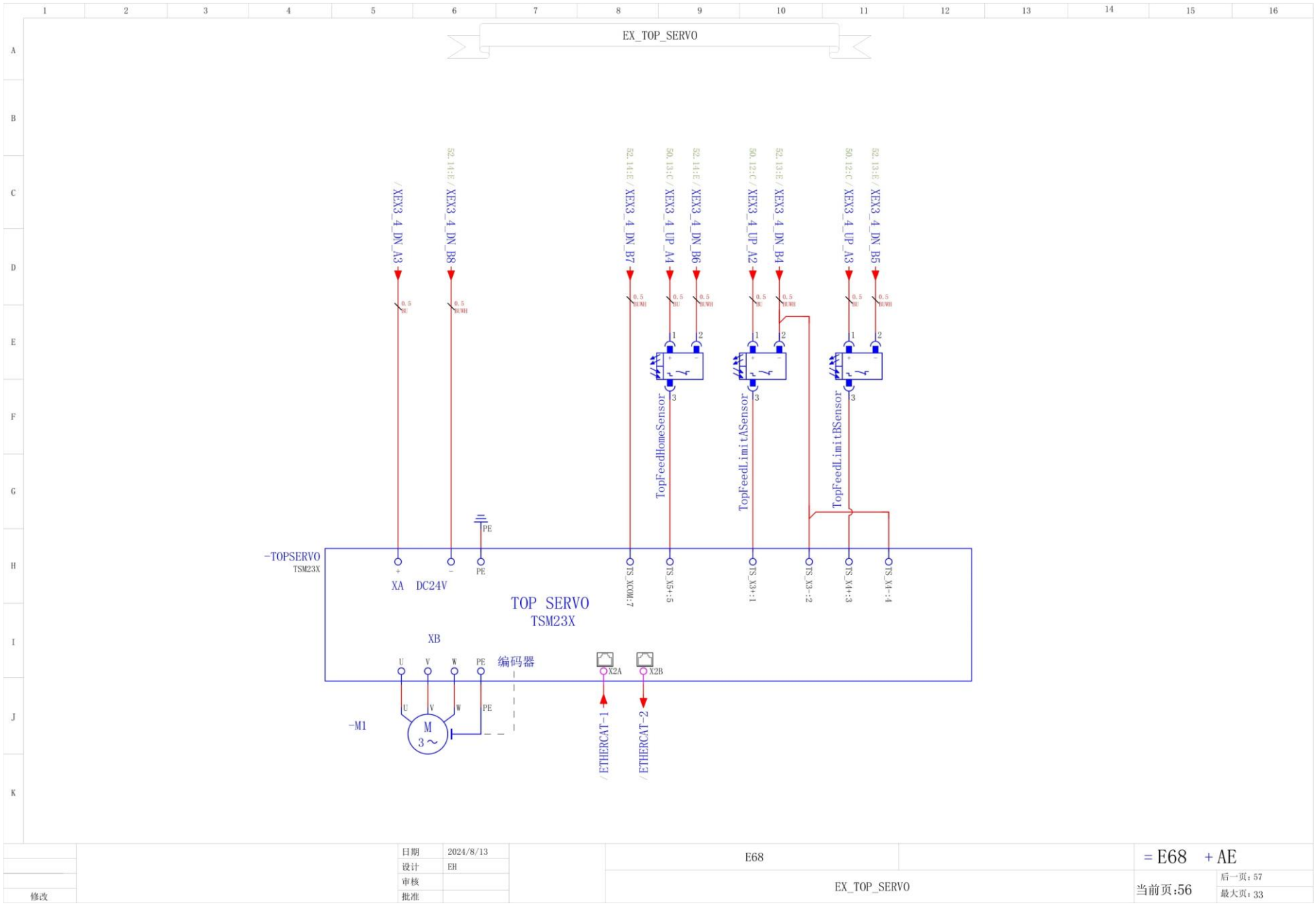

1KEX3_1KEX4_CT222F_A
-1KEX3_1KEX4_CT-222F
CT-222F
-XEX3_4-A
PS193070
PXC. 1032526
PS193071
PXC. 2908341
PS201953
PXC. 3210567
PS190163
PXC. 3030213
PS201954
PXC. 3211634
MDS024830015
ODOT. CT-222F
日期 2024/8/13
设计 EH
审核
批准
修改
E68
= E68 + AE
当前页:52
后一页: 53
最大页: 33


1KEX3_1KEX4_CT222F_B
-Y9_Vacuum
-Y10_VacuumBlower
-Y8_Slide8
x1
x2
52.3:H / 1KEX4_D08
52.3:H / 1KEX4_D09
52.3:H / 1KEX4_D010
52.3:H / 1KEX4_D011
52.3:I / 1KEX4_D012
52.3:I / 1KEX4_D013
52.3:I / 1KEX4_D014
52.3:I / 1KEX4_D015
XEX3_4_DN_B3 / 52.13:E
XEX3_4_DN_B2 / 52.12:E
XEX3_4_DN_B9 / 52.15:E
A
B
MDS024830015
ODOT.CT-222F
PS201953
PXC. 3210567
PS190163
PXC. 3030213
PS201954
PXC. 3211634
日期 2024/8/13
设计 EH
审核
批准
修改
E68
= E68 + AE
1KEX3_1KEX4_CT222F_B
当前页:53
后一页:54
最大页:33



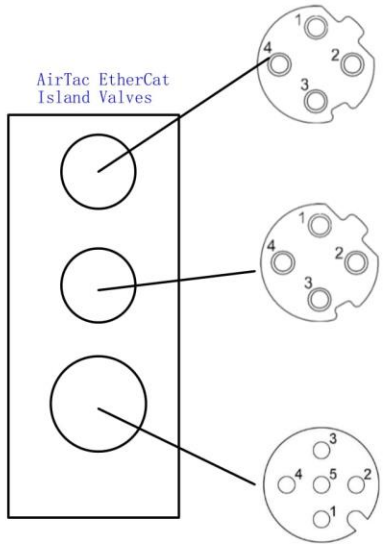
修改		日期	2024/8/13	E68	= E68 + AE
		设计	EH		
		审核		EX_FEED_BOWL	当前页:54
		批准			后一页: 55
					最大页: 33




EX_TOP_SERVO
/XEX3_4_DN_A3
52:14:E/XEX3_4_DN_B8
52:14:E/XEX3_4_DN_B7
50:13:C/XEX3_4_UP_A4
52:14:E/XEX3_4_DN_B6
50:12:C/XEX3_4_UP_A2
52:13:E/XEX3_4_DN_B4
50:12:C/XEX3_4_UP_A3
52:13:E/XEX3_4_DN_B5
TopFeedHomeSensor
TopFeedLimitASensor
TopFeedLimitBSensor
-TOPSERVO
TSM23X
XA DC24V
PE
TS_XCOM:7
TS_X5+:5
TS_X3+:1
TS_X3-:2
TS_X4+:3
TS_X4-:4
TOP SERVO
TSM23X
XB
U V W PE 编码器
X2A
X2B
-M1
M
3~
/ETHERCAT-1
/ETHERCAT-2
日期 2024/8/13
设计 EH
审核
批准
修改
E68
EX_TOP_SERVO
=E68 +AE
当前页:56
后一页:57
最大页:33

1KEX5_ISLAND_VALVE

AirTac EtherCat
Island Valves



P1: M12 4-pin socket,D-coded

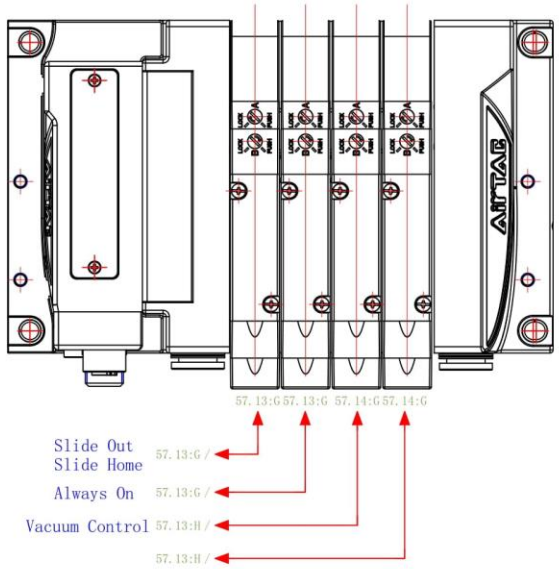
No.	Designation	Description
1	TD+	Transmit Data + (TD+)
2	RD+	Receive Data + (RD+)
3	TD-	Transmission Data – (TD-)
4	RD-	Receive Data – (RD-)

P2: M12 4-pin socket,D-coded

No.	Designation	Description
1	TD+	Transmit Data + (TD+)
2	RD+	Receive Data + (RD+)
3	TD-	Transmission Data – (TD-)
4	RD-	Receive Data – (RD-)

PWR：M12 5-pin plug,A-coded

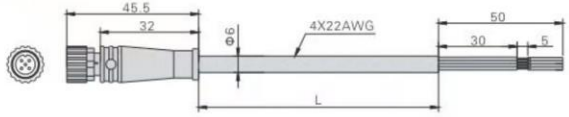
No.	Designation	Description
1	V1 24V	+24V for solenoid valve
2	V1 0V	0V for solenoid valve
3	V2 24V	+24V for V2 unit operation
4	V2 0V	0V for V2 unit operation
5	FE	Functional earth

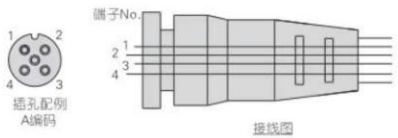


MDSO26930063 M12_5Pin_A编码2m Lumberg#RKT_5-228/2M

接线图（直通型电缆）

电源线缆M12转出线式





电源线缆配置说明

端子No.	Gauge(AWG)	配置说明	颜色配置
1	22	DC24V±10%(电磁阀用电源)	棕
2	22	0V(电磁线用电源)	白
3	22	DC24V±10%(控制用电源)	蓝
4	22	0V(控制用电源)	黑

		日期	2024/8/13	E68	= E68 + AE
		设计	EH		
		审核		1KEX5_ISLAND_VALVE	当前页:57 后一页：58
修改		批准			最大页：33

gs for