



APEX

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Model: XM-15

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XM-15 Mug Heat Press Series User

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Overview

1.1 Equipment Overview

Thank you very much for choosing our 15-Station Mug Heat Press Series equipment!

Please read this instruction manual thoroughly before operation to ensure proper usage.

Keep this manual in a safe place for future reference.

Due to different product configurations, some machines may not feature all functions listed in this manual. Please refer to your specific model's actual operational features for exact details.

1.2 Safety Precautions

NOTICE



The manufacturer is not responsible for damage, injury, production loss, or other losses caused by improper operation, unauthorized modification, incorrect installation, incompatible parts, or service by unqualified personnel.

1.3 Operating Environment

- Storage Temperature: 32°F – 122°F
- Operating Temperature: 41°F – 104°F
- Operating Relative Humidity: 30% – 90% (non-condensing)
- Stable, level, heat-resistant work surface
- Keep away from water, excessive dust, corrosive gases, flammable materials, and explosive vapors

1.4 Equipment Power Supply and Grounding

1.4-2 Grounding Requirements:

To prevent electric shocks or fire hazards caused by electrical leakage, overvoltage, or insulation failure, please ensure that the power control system is reliably grounded.

The grounding resistance must be less than 4 ohms, the wire length must be within 20 meters (approx. 65 feet), and the wire cross-sectional area must be greater than 4 square millimeters.

1.4-3 Technical Parameters:

Parameter	Specification
Model No.	XM-15
Controller	PLC(XD5-60T6-E + SK-102QT)
Amp \ Voltage \ Power \ Phase	28A\220V\6KW, 60HZ

Appearance and Functions

2.1 Exterior View

(Please refer to the images in your original document for labels 1 through 10.)



2.2 Component Names and Their Functions

1. Machine Status Indicator Light:

○ **Green:** The machine is running in Automatic Mode.

○ **Off:** The machine is in Standby or Manual Mode.

○ **Red:** The Emergency Stop button has been pressed, or an abnormality has occurred. Please check the alarm prompt on the touchscreen controller. Once the issue is resolved, press CLEAR.

2. Power Switch: Turns the machine's primary operation power ON and OFF.

3. Start Button: Select Automatic Mode on the main interface and tap the Start Button to initiate automatic operation.

4. Stop Button: While in Automatic Mode, press and hold the Stop Button. The machine will stop feeding new mugs and will proceed to unload all remaining printed mugs from the working stations before halting operation completely.

5. Emergency Stop (E-Stop) Switch: In the event of an emergency or abnormal condition, press this switch to immediately turn off the heating function across all stations. The machine will automatically switch to Manual Mode and prompt you to tap "Homing" to reset to the home position.

6. Mug Infeed Conveyor Belt: Place the mugs into the molds. In Automatic Mode, the conveyor automatically feeds the mugs to the gripper pick-up station.

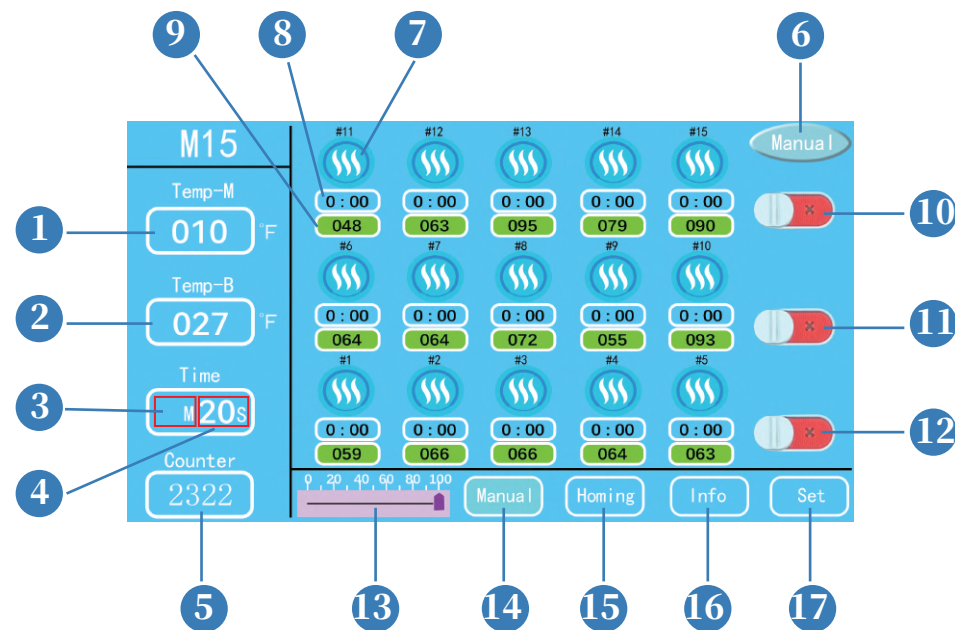
7. Mug Discharge Conveyor Belt: Transfers the printed mugs to the front end after they have cooled down for easy retrieval.

8. Main Power Breaker/Switch: Turns the machine's total main power supply ON and OFF.

9. Power Cord: Supplies the overall electrical power required for the machine.

10. Flexible Gripper: Picks up, moves, and places the mugs .

2.3 PLC Touchscreen Operation Interface and Functions



1. Temp-M (Main Temperature Setting): Tap this area to set the sublimation transfer temperature for the 15 stations. The setting range is 120°F – 400°F. To extend the service life of the mug heating pads, a setting of 356°F – 380°F is highly recommended.

2. Temp-B (Bottom Preheating Temperature): Tap this area to set the bottom preheating temperature for the 15 stations.

3. Time (Minutes): Tap this area to set the sublimation transfer duration (minutes) for the 15 stations. The setting range is 0 – 9 minutes.

4. Time (Seconds): Tap this area to set the sublimation transfer duration (seconds) for the 15 stations. The setting range is 0 – 59 seconds.

5. Counter: Displays the total number of mugs successfully sublimated during the current run. Press and hold this area for 2 seconds to reset the counter to 0.

6. Current Machine Status Display: Flashes to display whether the machine is currently operating in Manual Mode or Automatic Mode.

7. Heating Indicator: Displays the real-time heating status of each of the 15 individual stations; red indicates that the heating element is actively warming up. In Manual Mode, tap this area to test the opening and closing status of the corresponding station's mug pad.

8. Countdown Timer: Displays the remaining sublimation time for each of the 15 individual stations.

9. Actual Temperature: Displays the real-time actual temperature of each of the 15 stations. The readout turns green once the target set temperature is reached.

10. Heating Switch (Stations 11#–15#): Turns the heating function ON or OFF for stations 11 through 15.

11. Heating Switch (Stations 6#–10#): Turns the heating function ON or OFF for stations 6 through 10.

12. Heating Switch (Stations 1#–5#): Turns the heating function ON or OFF for stations 1 through 5.

13. Speed Adjustment Slider: Adjusts the operational travel speed of the gripper when picking up and placing mugs.

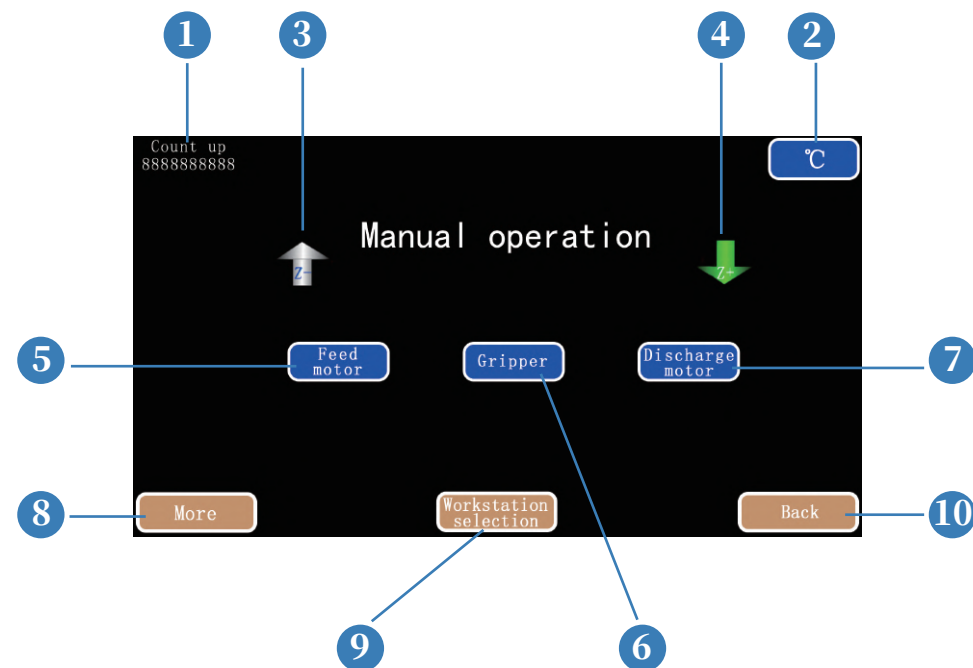
14. Mode Toggle: Tap to switch back and forth between Automatic Mode and Manual Mode.

15. Homing Button: When booting up the machine for the first time or after releasing an Emergency Stop, press and hold this button to command the gripper axis to reset back to its origin/home position.

16. Alarm Information: View active alarm logs and follow the prompts to clear the errors.

17. Set Button: Tap to enter the parameter/function settings interface. **Note: This can only be accessed while in Manual Mode.**

2.4 PLC Touchscreen Parameter Settings Interface and Functions



1. Total Counter (Count up): Logs the lifetime cumulative total of mugs sublimated by the machine. This value cannot be reset.

2. Unit Conversion: Tap to toggle between Celsius (°C) and Fahrenheit (°F).

3. Gripper Up (Z-): Tap and hold to control the upward movement of the gripper.

4. Gripper Down (Z+): Tap and hold to control the downward movement of the gripper.

5. Feed Motor: Tap to run the mug infeed conveyor belt manually to transport mugs.

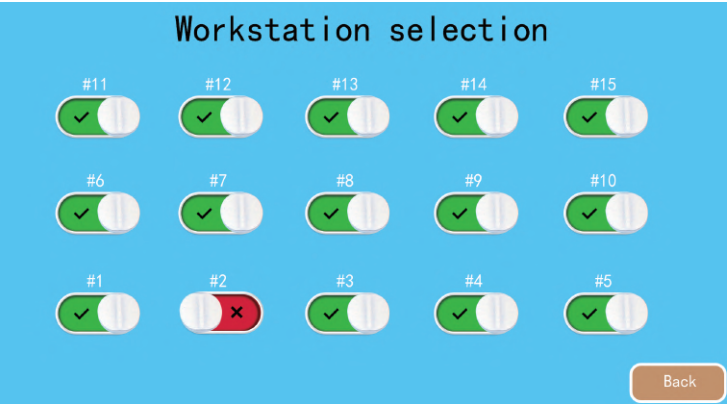
6. Gripper Toggle: Tap to manually command the gripper to open or close.

7. Discharge Motor: Tap to run the mug discharge conveyor belt manually to move completed mugs.

8. More Settings: Tap to enter the advanced settings page (Engineer Mode). The access password is 111111. For detailed functions, please see Section 2.5.

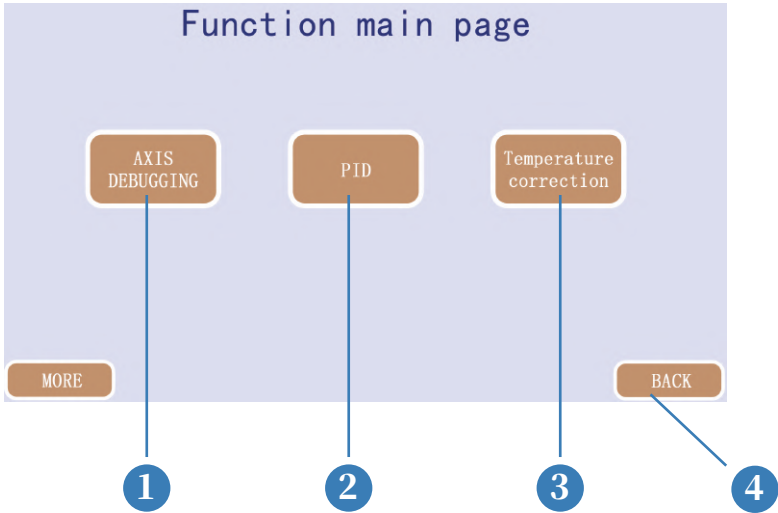
9. Workstation Selection: Tap to enter the station selection menu. If one or multiple stations experience an abnormality, you can temporarily disable those specific stations here.

Example: If Station 2# malfunctions, switch Station 2# to OFF, and leave all other stations ON (as shown in the image below).



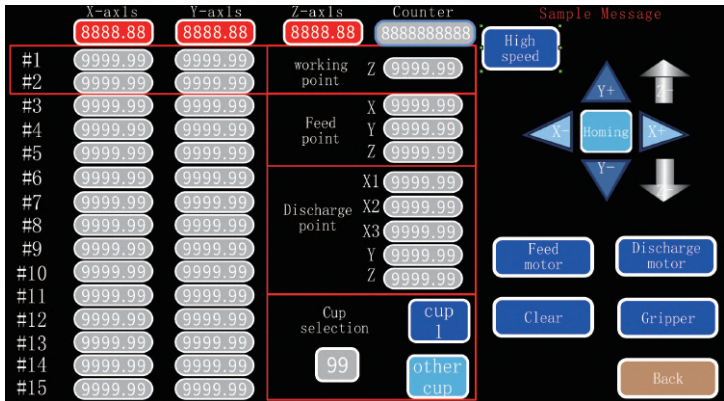
10. Back Button: Returns to the main operation interface.

2.5 PLC Touchscreen Engineer Mode Interface and Functions

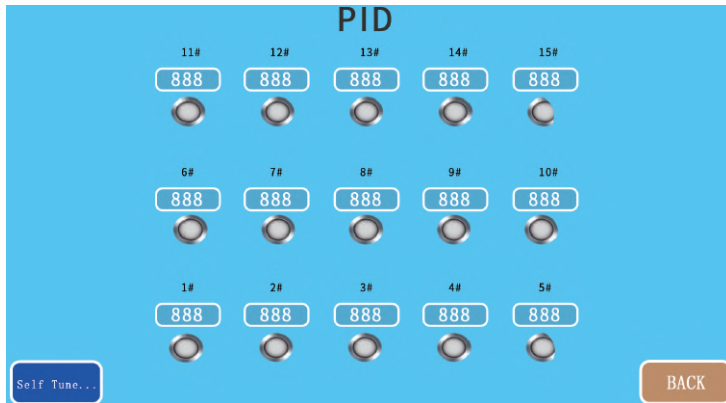


1.AXIS DEBUGGING: Tap to enter the gripper travel axis configuration settings. The access password is 222222.

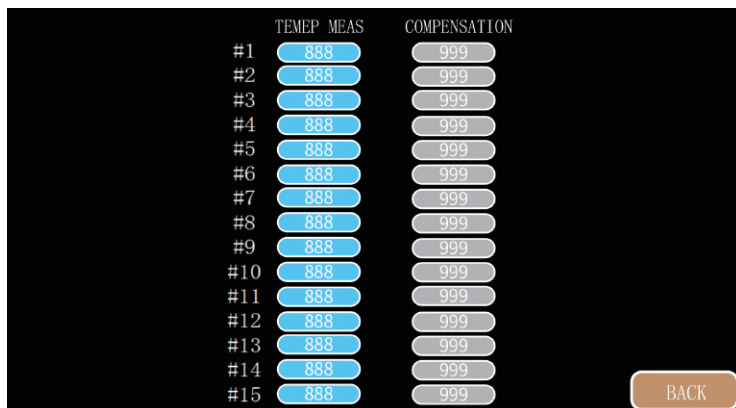
CAUTION: Operations on this page directly impact equipment safety. Please execute modifications only under the direct guidance of the manufacturer!



2.PID Operations: This process is required if the heating pad temperature on one or multiple workstations becomes unstable. Please contact your supplier to request the instructional operation video.



3.Temperature Correction: If the temperature of a heating pad measured with an external thermometer does not match the actual temperature displayed on the operation interface, adjust the offset value on this page.



4.Back Button: After completing configurations, tap back sequentially to return to the main operation interface.

2.6 Pre-production Preparation

1. Verify that the incoming main air supply pressure is regulated between 5 – 7 bar.
2. Adjust the pressure regulating valve for the flexible gripper so that its operating pressure is exactly 0.05 bar.
3. Turn on the main power breaker, then press the Power Button located on the touchscreen control box.
4. In MANUAL mode, press the HOMING button to reset the travel axes to their origin.
5. Ensure there are no mugs left in the gripper. If a mug is present, remove it manually while in Manual Mode.

2.7 Activating Automatic Production Mode

1. Turn on the heating switches for the workstations you intend to use. Wait for them to reach their target values; the actual temperature readout will turn green when ready.



2. Select "Auto" mode on the screen.



3. Press the physical green "START" button; the equipment will begin its automated cycle.

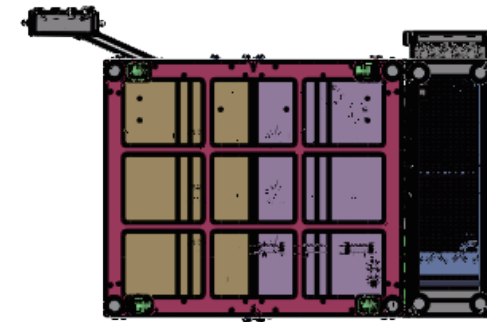
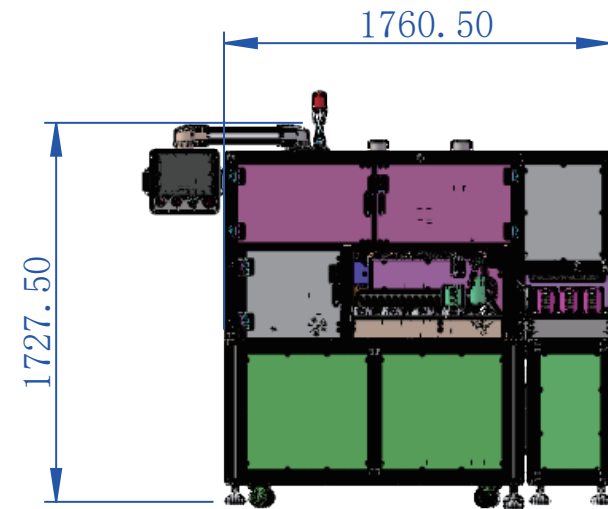
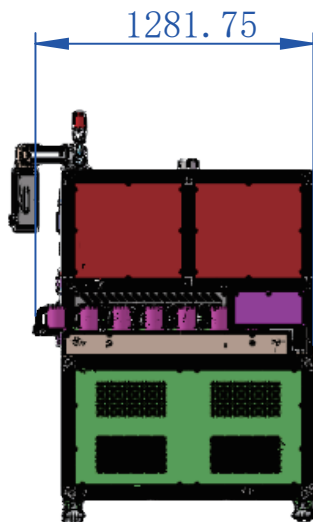
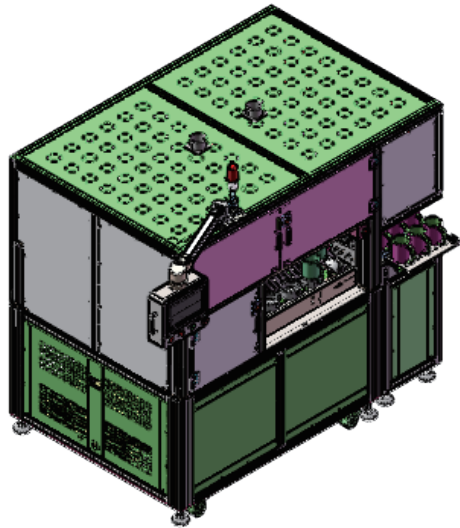
2.8 Automatic Stop After Production



1. Press the physical red "STOP" button on the control box. The machine will immediately stop picking up new mugs, wait for all currently loaded mugs to finish their sublimation cycle, shut off all heating elements, and automatically switch into Manual Mode.

2.9 Equipment Dimension

(Refer to the technical drawings in your original document for specific measurements.)



Troubleshooting and Common Fault Handling

1. Equipment has no power

- Check if the circuit breaker inside the main electrical cabinet has tripped.
- Check if the physical Power Button is functioning normally.

2. Equipment has power, but Automatic Mode will not start

- Verify whether Automatic Mode has actually been selected on the touchscreen interface.
- Check if the axes have been homed. If not, perform a homing routine in Manual Mode.
- The heating switches are not turned on (at least 1 heating zone must be enabled), or the temperature has not reached the target value. Wait for the machine to finish warming up.
- Check if the physical Start Button is functioning properly.
- Check if the Emergency Stop (E-Stop) switch is pressed down/locked.
- Check for active system alarms. Clear all faults and errors before attempting an automatic startup.

3. Equipment Crash/Anti-Collision Alarm

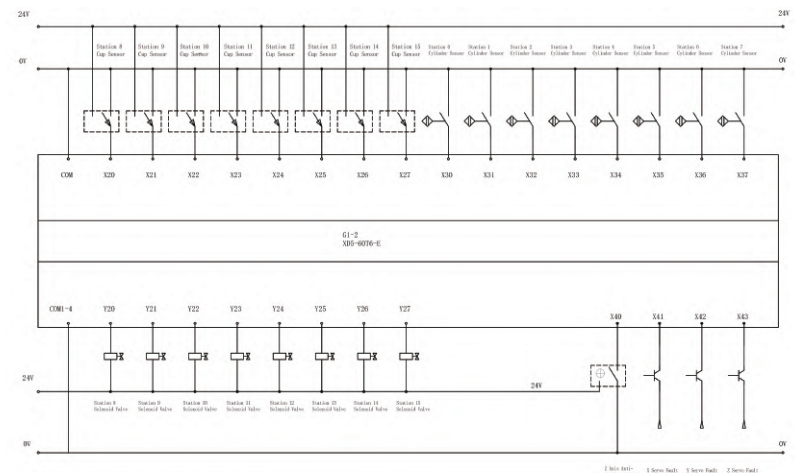
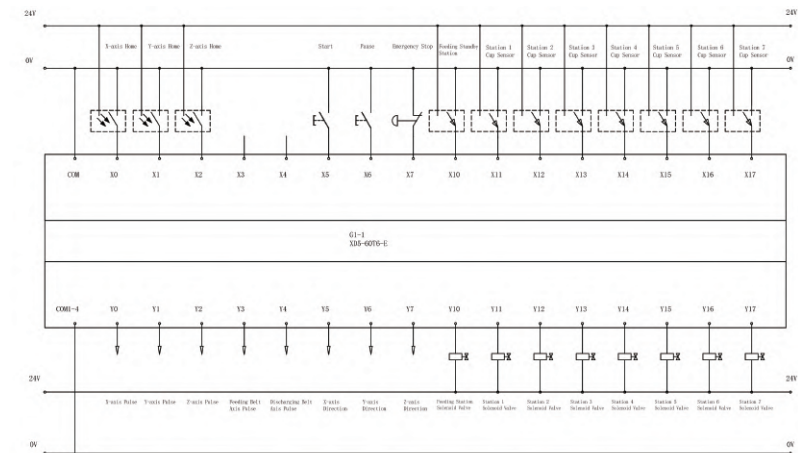
- Check if the system air pressure is within the required 5 – 7 bar range.
- Check if the motor drives/servos are operating normally without errors.
- Check if the position/proximity sensors are operating normally.
- Check if the pneumatic solenoid valves are operating normally.
- Manually adjust the X and Y coordinate values for any misaligned mug station.

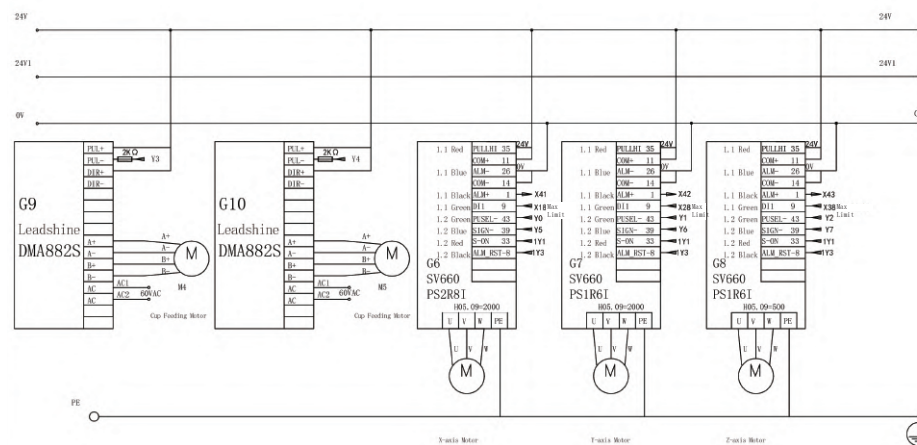
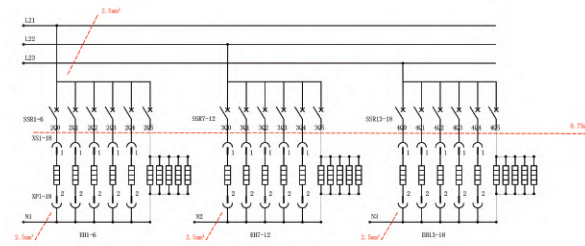
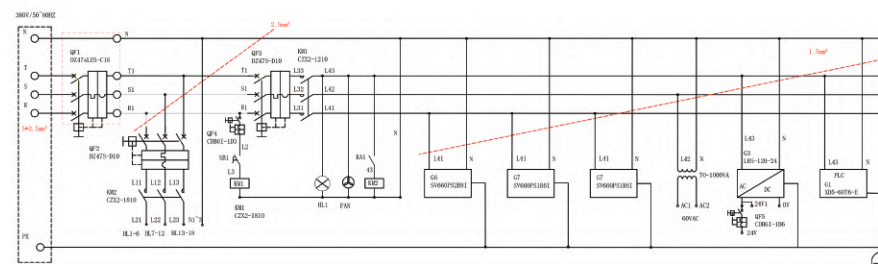
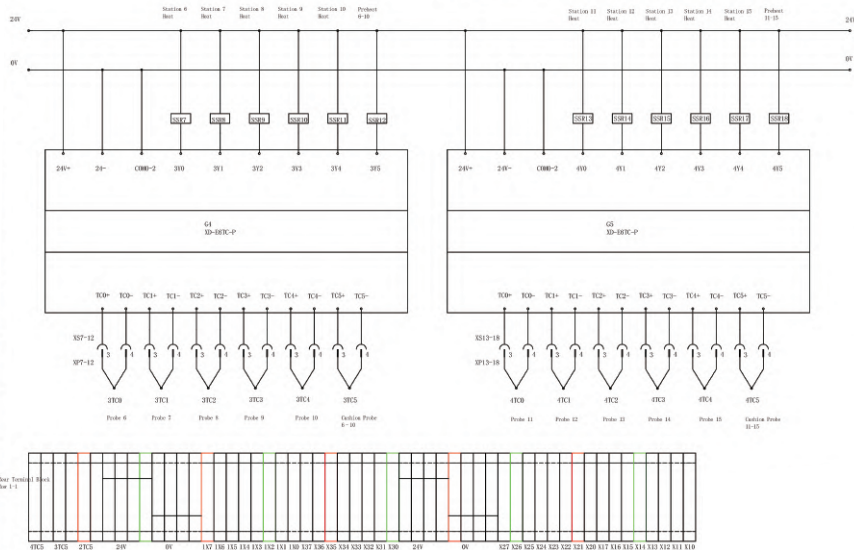
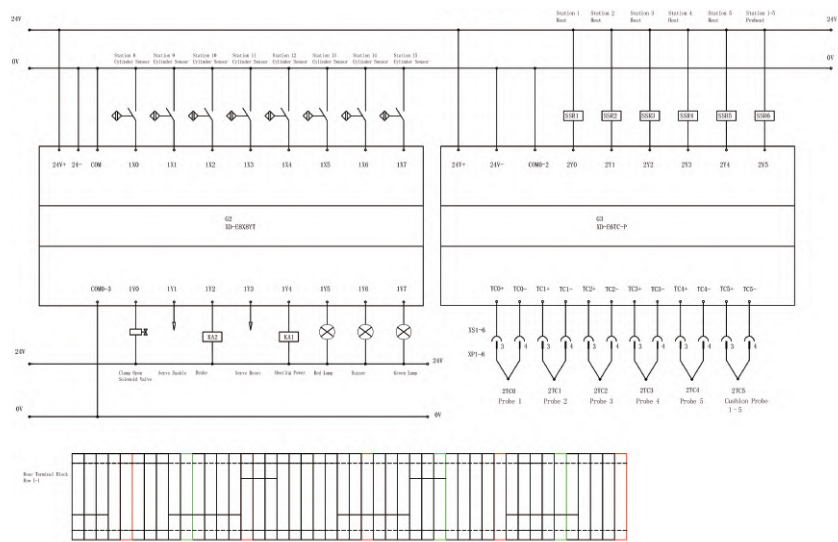
4. Temperature Abnormality Alarm

- Check if the input power voltage to the Solid State Relay (SSR) is normal.
- Check if the temperature sensor (thermocouple) is operating normally.
- Check if the heating element/pad is working or if it has burned out.

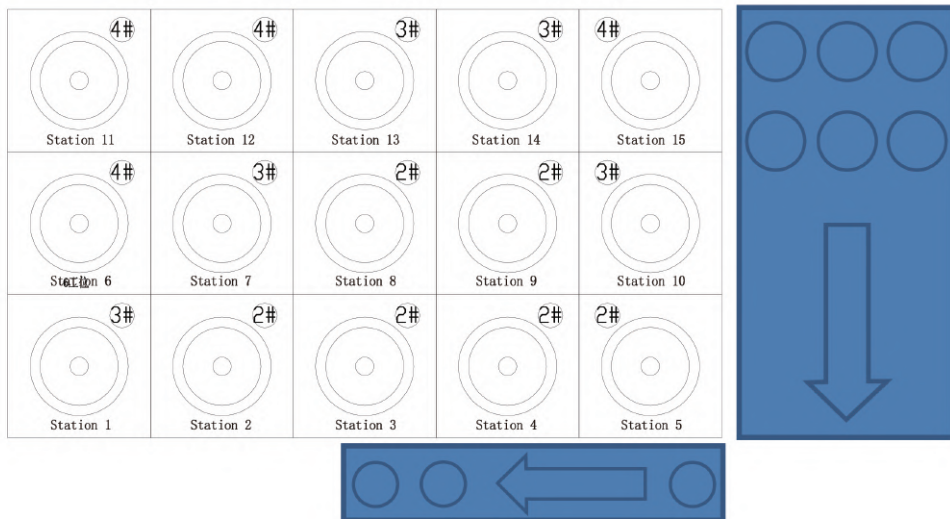
Circuit Diagram

(Refer to your original document for the diagram layout.)



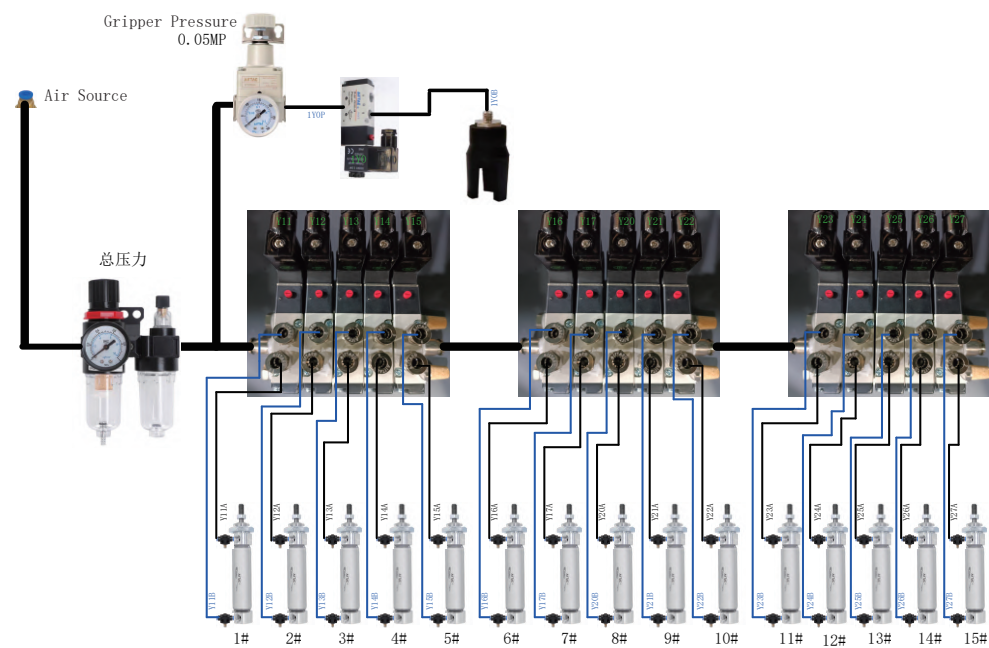


X-Axis Servo Pulses per Revolution: 2000 Y-Axis Servo Pulses per Revolution: 2000 Z-Axis Servo Pulses per Revolution: 2000



Pneumatic Diagram

(Refer to your original document for the diagram layout.)

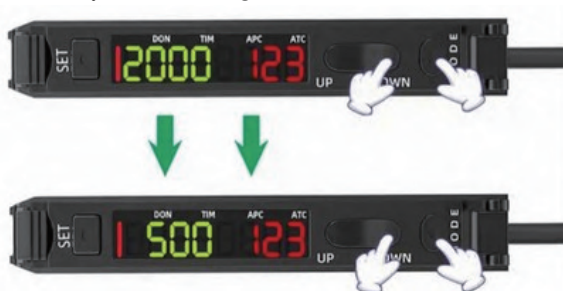


Fiber Optic Sensor Configuration Method

Quick & Convenient Settings

●Restore Factory Defaults

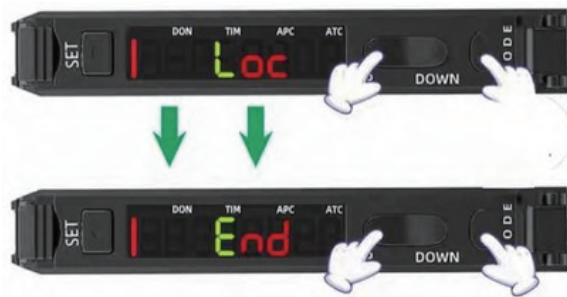
Press and hold the **"MODE"** button and the **"DOWN"** button simultaneously for more than 10 seconds to restore factory default settings.



●Button Lock / Unlock

a. Press and hold the **"MODE"** button and the **"UP"** button simultaneously for 3 seconds or longer. The screen will display **"Loc"** to indicate that the button lock is successful.

b. To unlock, repeat the operation above. The screen will display **"End"**, indicating the button lock is successfully released.



●Threshold Value Settings

1. Manual Threshold Configuration

a. Configuration must be performed while the fiber optic path is completely clear of any workpieces.

b. When no workpiece is passing through, press the **"SET"** button once.



c. Place a workpiece in front of the sensor, and press the **"SET"** button once more to complete the threshold value configuration.



2. Automatic Threshold Configuration

- Configuration must be performed while workpieces are actively passing through.
- Press and hold the "SET" button. The screen will display "Set" and begin flashing. The system will start collecting data automatically. This collection process takes at least 3 seconds; adjust the duration according to the speed at which workpieces pass through the sensor.



1. While setting up, press and hold the "MODE" button for 3 seconds at any time to return to the main interface.

2. During the setup process, tap the "MODE" and "UP" buttons simultaneously to return to the previous menu level.

● Press and hold the "MODE" button for 3 seconds to enter the advanced configuration settings page:

