Meet the Needs of the SMT Age

Please read this user manual carefully before running

Unloader

(An user manual)

This manual suitable for Models:SUL250 / SUL330 / SUL390 / SUL460

PHONE   : 0755-83203237
WEBSITE: WWW.SMTHELP.COM
ADD   : Room 1806,Block 3,Jinyun COFCO,Qianjin 2nd Road,Baoan District,Shenzhen City, China

Introduction:

Thank you for using the electronic device provided by our company.

This manual provides the relevant precautions for installation, operation, abnormal failure diagnosis and elimination and routine maintenance. In order to correctly install and operate this device, please carefully read this manual and properly preserve and hand it to the user of this device.

Contents

I.   Introduction to Application

Unloader is extensively applied at the end of the SMT production line to load PCBs into the magazine one by one and can also unload boards for one single SMT device.

II.   Structure   Principle   and   Operating Instructions

A.   Structure principle

The structure of the unloader is as shown in the attached figure and it is mainly composed of loading conveyer, unloading conveyor, elevator and electric cabinet.

1. The loading conveyer is mainly for sending the magazines without PCB to the elevator to store materials for the elevator.

2. The unloading conveyor is for recycling the empty magazines full of PCBs in the elevator.

3. The elevator is for raising the magazines without PCBs step by step to assist the push rod to store the PCB into the magazine. When the magazine is fully filled with PCBs, the magazine will be automatically transmitted to the unloading conveyor. Afterwards, the elevator will rise and enter the next empty magazine to repeat the above procedures after rising to the maximum limit position.

4. The controller is for controlling coordinated and assisted operation of each part to realize automatic circulation.

B. *Operating instructions*
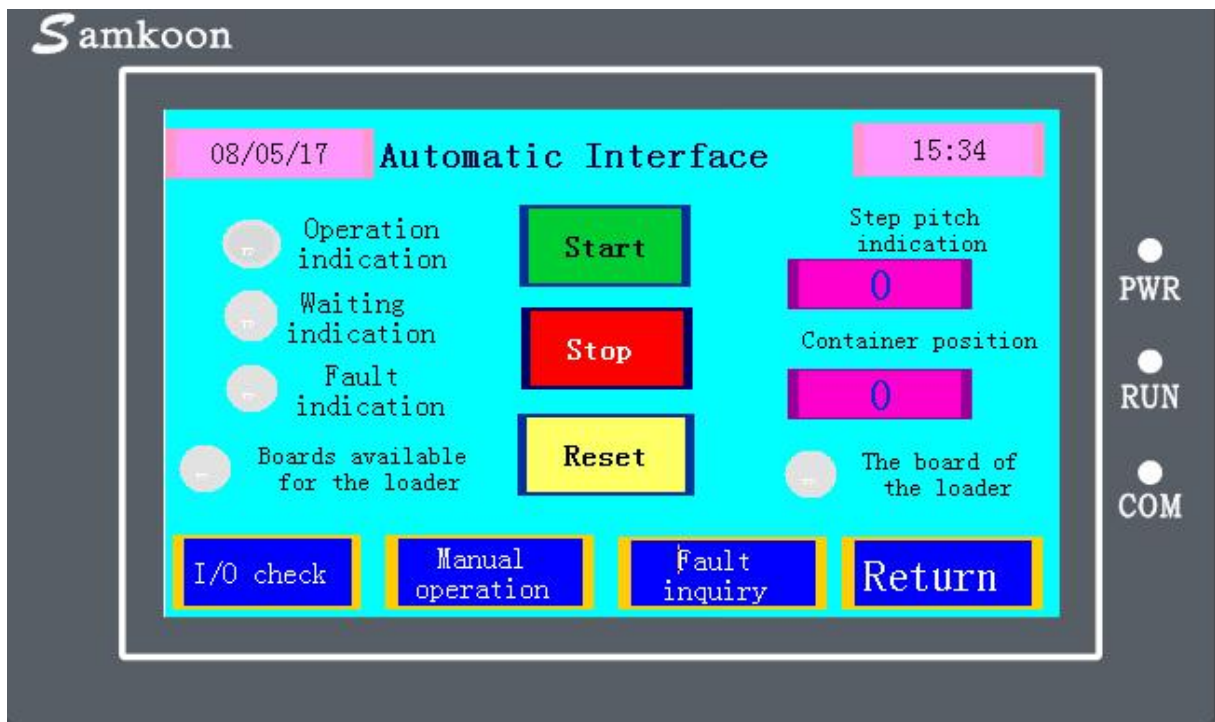

Start Interface

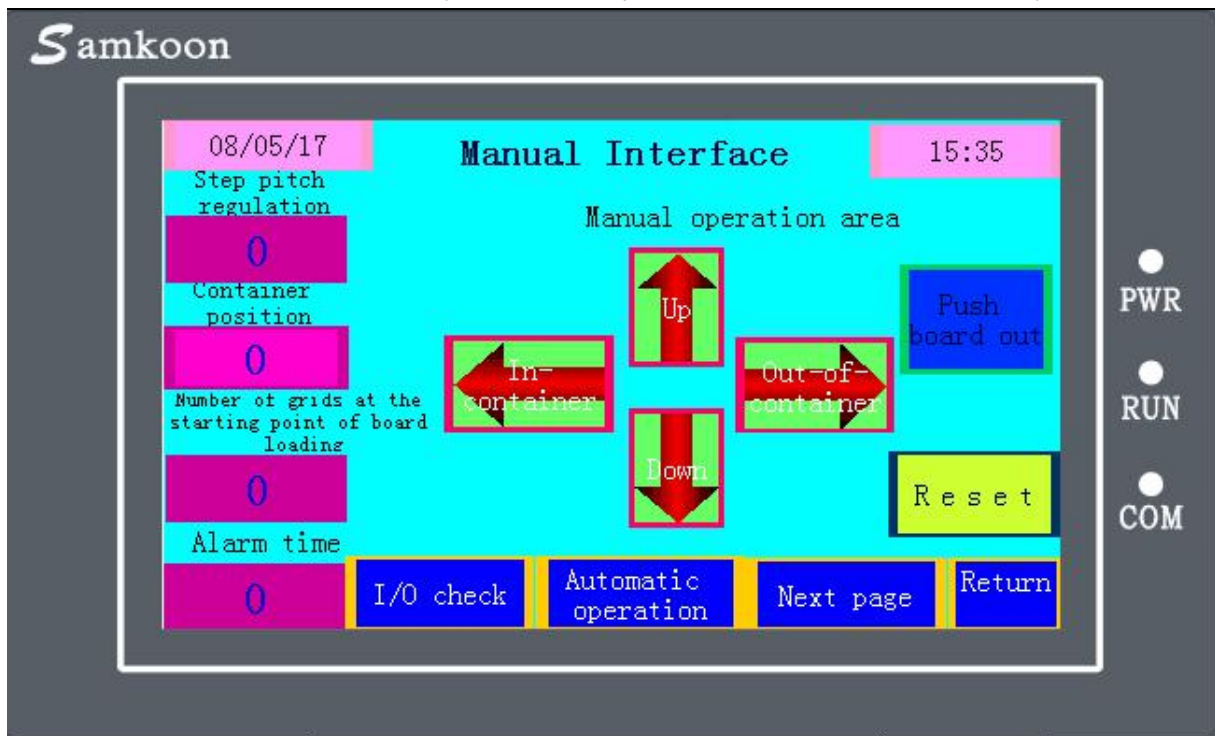

Figure (1) Automatic Interface
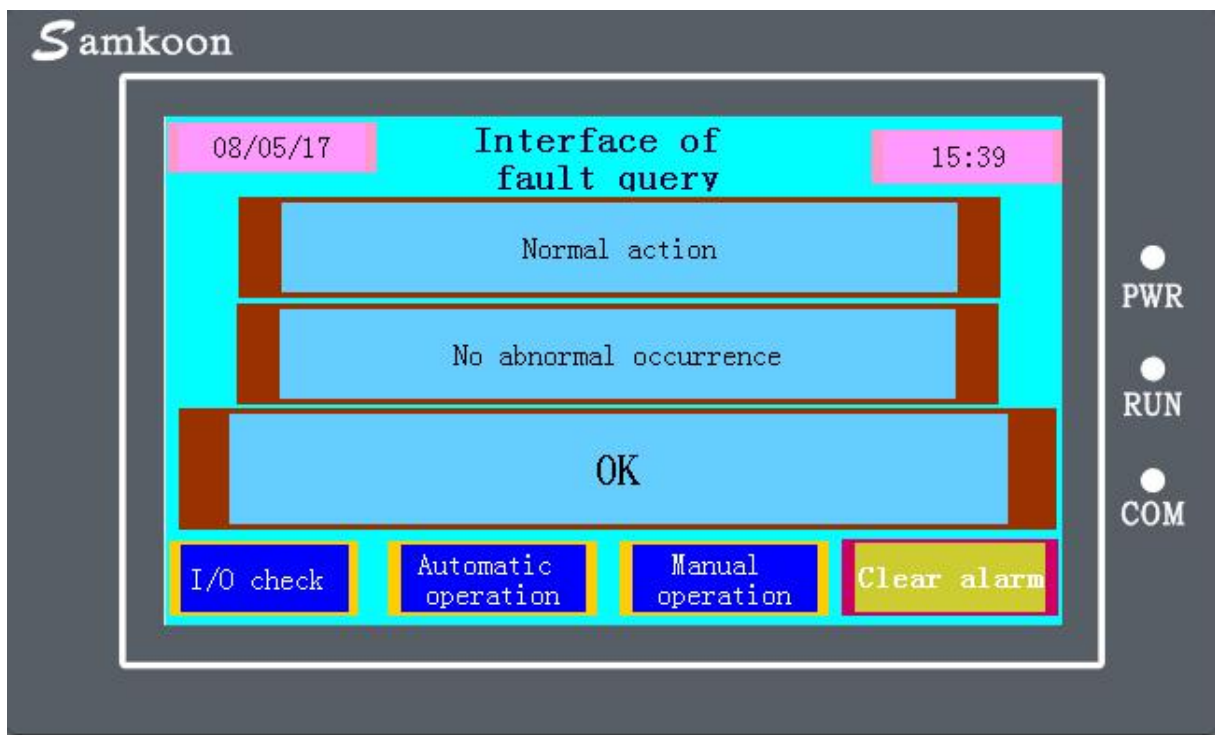
Figure (2) Manual Interface
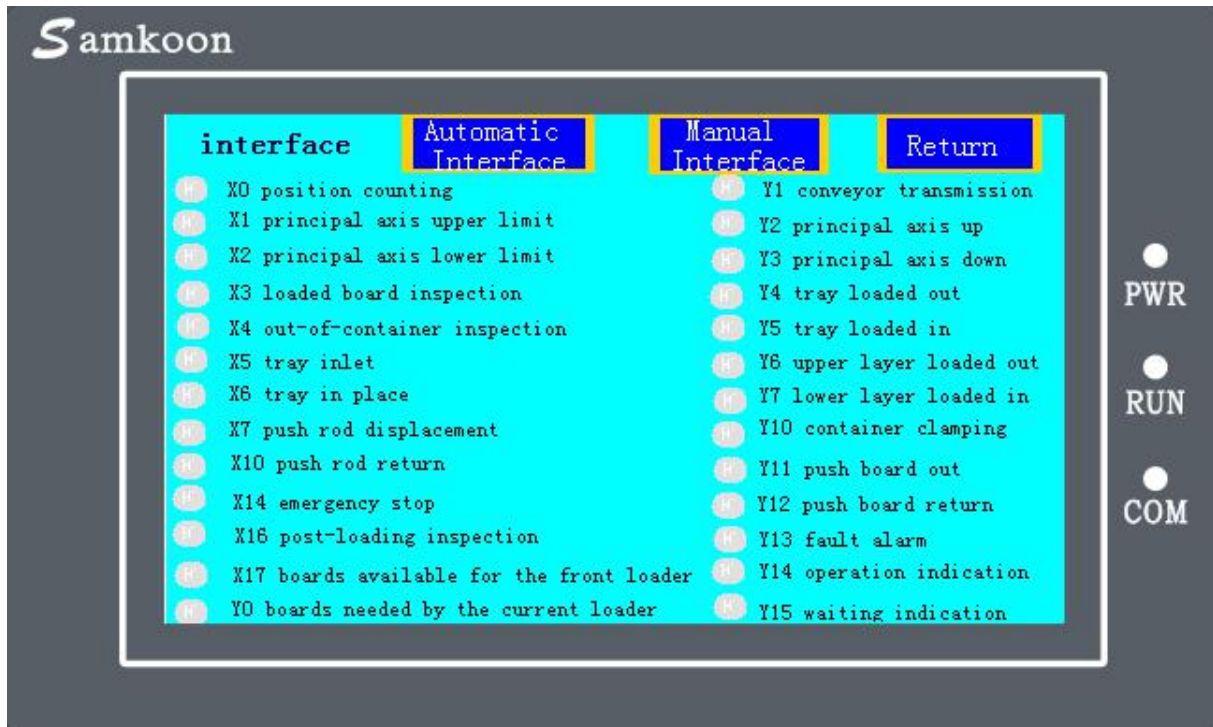

Figure (3) Fault Query Interface

Figure (4) IO Interface

Manual function

1. After power on, the touch screen shows and enters the startup interface as shown in Figure (1). Click the manual operation button to enter the Manual Interface as shown in Figure (3) and then the corresponding manual operation and setting can be carried out.

2. Tray up - The tray and container will rise by one grid at the step pitch after clicking the "Up" button. After pressing the "Up" button for 5s, the tray and container will rise by long distance until reaching the upper limit. To stop its their rise, please click the "Down" button. When the tray rises to the notch of a certain rack, it will stop automatically. (When operating this function, the light sensors of unloading protection, at the tray inlet and upper limit of tray of the unloader have no reaction and the push board out-of-container cylinder is at the retraction limit position. Only when the above two conditions meet the requirements can the tray rise and the tray dropping button has no action.)

3. Tray down - The tray and container will drop by one grid at the step pitch after clicking the "Down" button. After pressing the "Down" button for 5s, the tray and container will drop by long distance until reaching the lower limit. To stop its their dropping, please click the "Up" button. When the tray drops to the notch of a certain rack, it will stop automatically. (When operating this function, the light sensors of unloading protection, at the tray inlet and upper limit of tray of the unloader have no reaction and the push board out-of-container cylinder is at the retraction limit position. Only when the above two conditions meet the requirements can the tray drop and the tray rising button has no action.)

4. Container loaded in - After pressing the "In-container" button, the tray chain and container guide chain will enter loading in and conveying at the same time. When the tray enters the container in place and is sensed, the container guide chain will stop conveying (to prevent simultaneous conveyance of tray into the two connected containers) when the tray conveying chain continues to convey for complete and in-place conveying to the conveyor. (When operating this function, the tray of the unloader must be at the upper limit and the "Out-of-container" button has no action).

5. Container loaded out - After pressing the "Out-of-container" button, the tray chain and the container guide chain will perform loading out and conveying at the same time. When the out-of-container guide rail container is in place and sensed by the light sensor, the in-container guide chain will stop loading, if the light sensor at the tray inlet or the tray in-place light sensor is sensed, the tray conveying chain continues to convey for complete and in-place conveying to the conveyor. (When operating this function, the tray of the unloader must be at the lower limit and the "In-container" button has no action).

6. Push board entering the container - After pressing the "Push board out" button, PCBs in the track will be loaded to the magazine. When the "Push board out" button remains pressed and the push rod reaches its extrusion limit position, it would not retract automatically and not until the button is released, it would not retract automatically and stop at the retraction limit position. (When operating this function, the tray of the unloader shall not be at the upper limit and lower limit positions and the tray shall stop at the board-in position (at the notch position of the rack) (when the rack has no up and down operation).

7. Step pitch setting-Press the input box below the "Step pitch regulation" to enter digits from 1 to 4 and then four kinds of step pitches will be available for option (10mm, 20mm, 30mm and 40mm).

8. Function resetting-Click "Reset" position to eliminate alarm.

9. When the tray is not at the upper and lower limit positions, the container will clamp automatically.

Auto functions

1. After power on, the touch screen shows and enters the startup interface as shown in Figure (1). Click the unloader button to enter the main operating interface as shown in Figure (2).

☆   Click the "Star" button for starting.

    (1)   If there is no container on the tray, the tray will rise to the upper limit position automatically and the self-inspection will be stopped to enter the automatic

state.

(2) If there is container on the tray and the tray is at the lower limit position, the tray and the lower guide chain will convey the container out of the tray and when the container is conveyed to the out-of-container inspection position of the lower guide rail, self-inspection will be stopped to enter the automatic state.

(3) If the tray is not at the upper and lower limit positions, there is container on the tray and the tray is at the notch position of the rack, the unloader will get over the self-inspection and directly enter the automatic state.

☆ Click the "Reset" button for starting.

(1) If the tray is not at the automatic stop position (yellow light flickers), the tray will recover to the automatic stop position automatically, stop self-inspection and turn to the automatic state.

(2) If the tray is at the automatic stop position, the unloader will get over the self-inspection and directly enter the automatic state.

5. At the automatic state

(1) If there is no container on the tray, the tray will rise to the upper limit position automatically and then the tray and loading guide chain will begin to convey the container to the tray (if there is no container conveyed to the tray after 15s, the unloader will stop and give an alarm to remind the operator to load in containers, after which the "Start" button should be clicked for restart).

(2) When the tray receives containers, it will drop to the number of grids at the starting point of push board.

(3) At this moment, the unloader will send board needing signals and the front loader's pcb is conveyed to the outlet sensor in the track when the push rod extrudes to the extrusion limit position and withdraws automatically.

(4) When the push rod retracts to the rear limit position, the tray will rise by the set grids at the step pitch and when it drops to the set place, it will turn to Item (3) for operation until the tray rises to the upper limit position.

(5) When the tray drops to the lower limit position, the tray and the out-of-container guide chain will begin to convey the containers out of the tray and to the loading-out limit position of the out-of-container guide rail container and then turn to Item (1) for repeating.

Remark: When the tray is not at the upper and lower limit positions, the container will clamp automatically. If there are containers in the tray and it is at the upper limit position in upon startup, the containers must be dragged out of the tray for restart.

6. Function resetting-Click "Reset" position to eliminate alarm.

III. Device Features

1. PLC
2. Three material racks can be placed
3. Four kinds of sections (10mm-40mm) for option.
4. Flow direction: From right to left
5. Multi-item sound-light alarm function.
6. The push board is driven by stepping motor.
7. Magazine clamping is completed by cylinder, which is reliable.

IV. Main Technical Parameters

Model	SULD330
Overall Dimension	2065mm(L)*860mm(W)*1250mm(H)
Control System	PLC
PCB Size	Max L450*W330
PCB Conveyor Direction	Left to Right (Option Right to Left)
Conveyor Height	900±20(mm)
Pitch Selection	10mm,20mm,30mm,40mm
Size of magazine	460mm*400mm*565mm
No. of magazine	1 pieces
Capability of magazine	50Nr./container
Magazine change time	35 seconds
Power	110 VAC,50/60HZ
Weight	220kg
Power Consumption	300VA max

V. Service and Maintenance

In order to ensure normal operation of the device and avoid failure, regular safety check and lubrication should be made for it.

1. Lubricate the ball screws, guide rails, drive bearings and chain wheels by oiling.

2. Maintain the inside of the guide rails and chain wheels clean, tidy and free from foreign matters.

3. Make regular check on tightening screws at each position, which should be free from loosening.

4. Clean the light sensor regularly to avoid failure to work normally caused by contamination by foreign matters.

5. PCB turnover frames should not be handled from the side of the guide rail to avoid damaging the light sensor.

6. The PLC program should not be modified at will to avoid program disorder.

7. Clear away dirt and impurities on the ball screws and guide bars timely.

    Recommended lubricating oil

    ➢ Ball screws: Lubricating grease Mobil MOBLUX2

    ➢ Guide bars: Lubricating grease Mobil MOBLUX2

    Or engine oil Mobil VACTRANO 2

    ➢ Chain wheels and bearings: Lubricating grease Mobil MOBLUX2

VI. Common Fault Elimination

Fault reminder	Fault cause	Inspection and troubleshooting methods
Abnormal tray lifting	(1) Abnormal supply voltage (2) Principal axis transmission mechanism stuck (3) Counting light sensor abnormality (4) Out-of-limit position acts	(1) Check whether the power source meets the requirements; in case of incompliance, please connect to power source meeting requirements. (2) Check each lifting and transmission mechanism and clear or replace stuck elements. (3) Click "Fault reset" button and then the tray will reset automatically. (4) Check and eliminate causes leading to out-of-limit position action.
In- and out-of-container abnormality	(1) The power source is abnormal. (2) Whether the in- and out-of-container transmission mechanism gets stuck. (3) Counting light sensor is abnormal.	(1) Check whether the power source meets the requirements; in case of incompliance, please connect to power source meeting requirements. (2) Check whether the motor or chain gets stuck and whether the chain slips and needs to be repaired or replaced. (3) Check whether each inspection light sensor of the container is abnormal and in case of any abnormality, repair or replace it.

| Board conveying abnormality	(1) The gas source is abnormal. (2) Rear unloader board needing signal is abnormal. (3) PCBs are stuck or the inspection light sensor is abnormal.	(1) Check whether the gas source meets the requirements; in case of incompliance, please connect to gas source meeting requirements. (2) Check whether the signal wire connection of the rear loader is abnormal. (3) Check whether the light sensors at the inlet and outlet of the conveyor are abnormal; in case of any abnormality, repair or replace it. If the PCB is stuck, adjust and adjust it.
Emergency stop is pressed.	Emergency stop is pressed or switch contact is abnormal.	Please switch on the emergency stop button or inspect whether the switch contact has not been completely separated.
Initial sensor is abnormal.	(1) Push rod's retraction to the limit position is abnormal. (2) Sensor at the inlet of tray is abnormal. (3) Sensor at the inlet of rear conveyor is abnormal.	Check or adjust the light sensor or magnet switch leading to faults.

VII.   Electric Wiring Diagram and I/0 Table
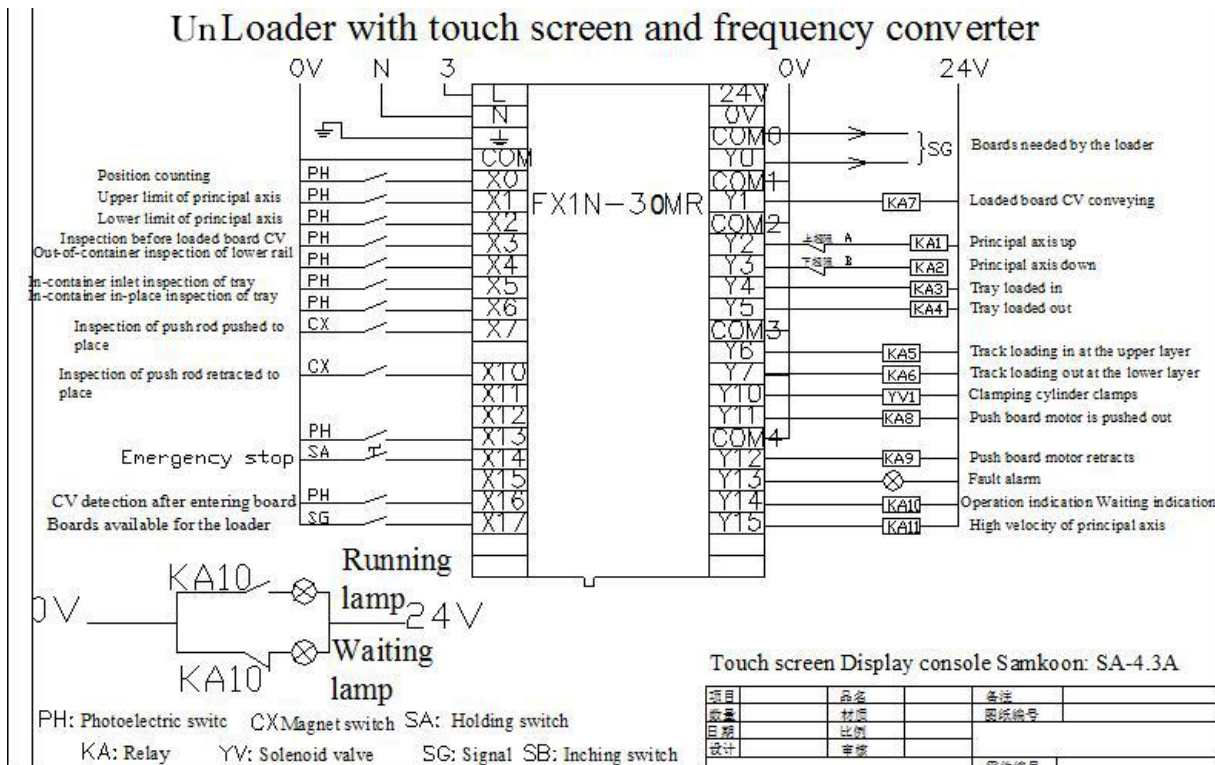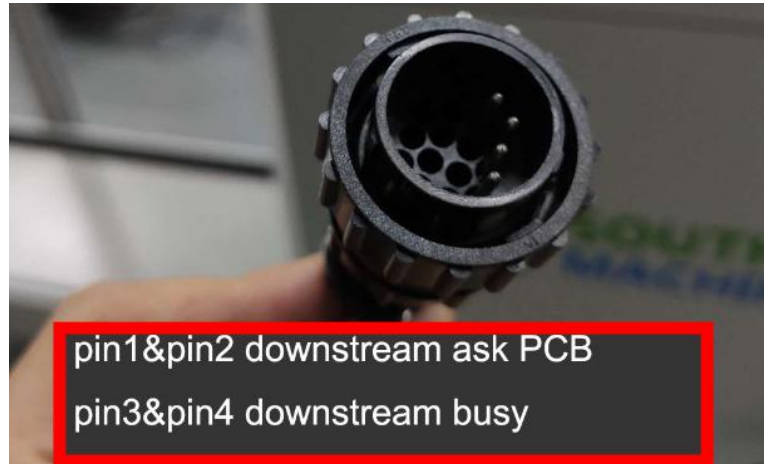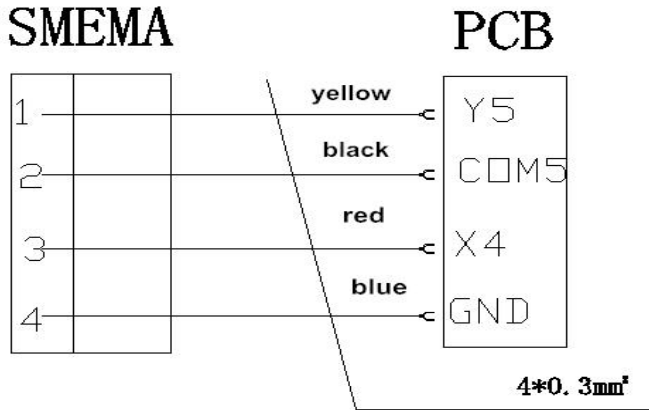
UnLoader with touch screen and frequency converter
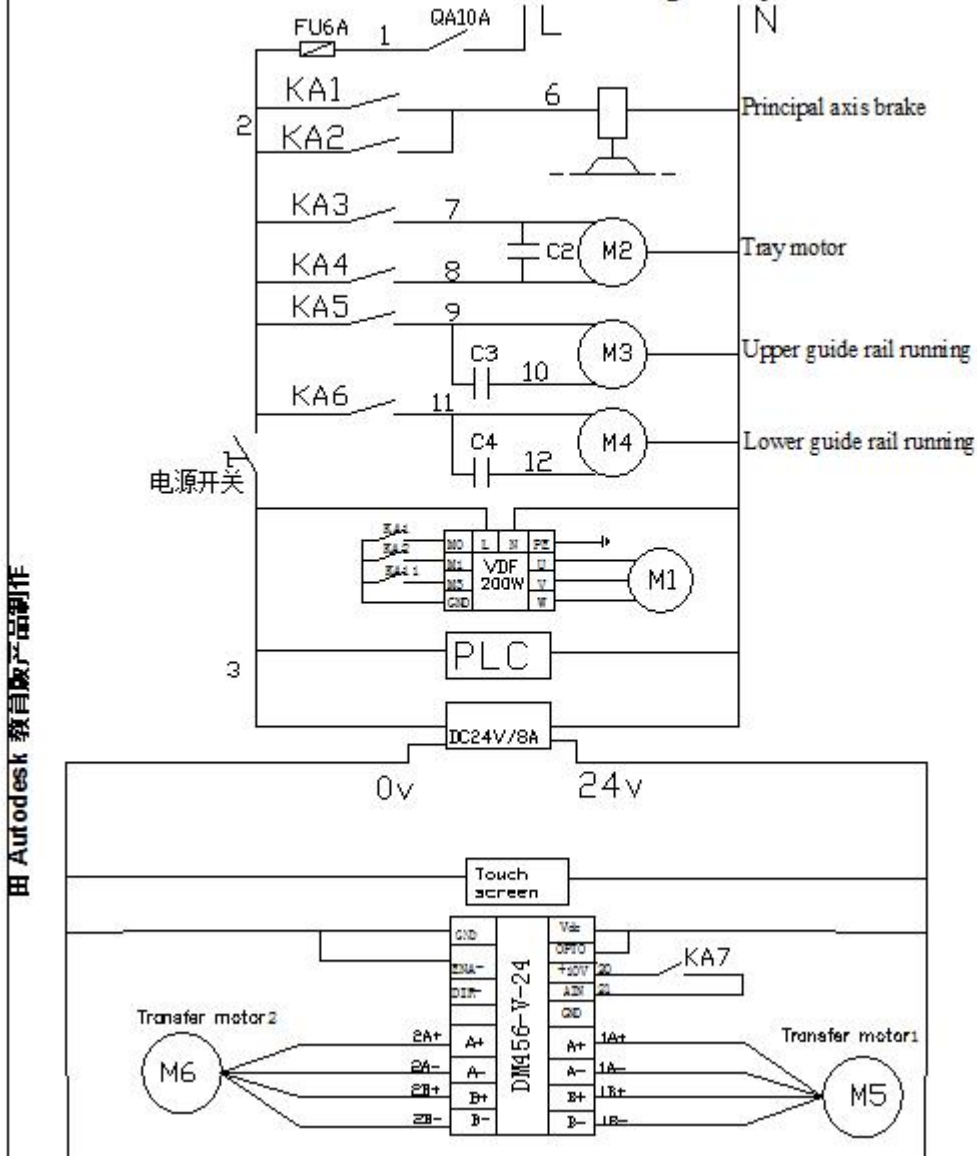
Remark: Signal connection

Signal plug for connection with rear engineering machine
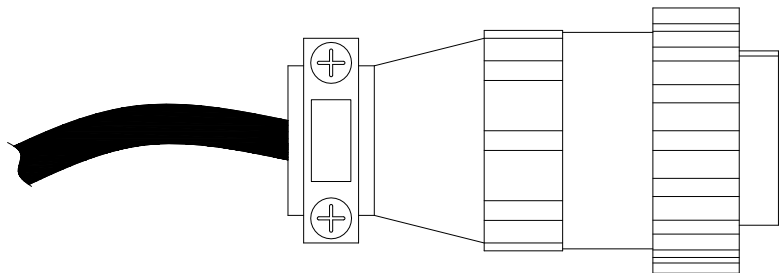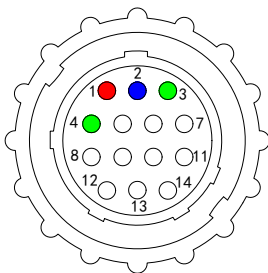
EMA connection

VIII. Precautions

1. In order to ensure normal work of the device, the foot cup must be adjusted in installation to make the device remain level.

2. If the device is handled by the customer, the device should be handled by handing equipment with load capacity of 200kg at least.

3. In case of need to put hands into the elevator in maintenance, power source must be turned off to avoid danger.

4. If this device is interrupted in the automatic mode or stops due to sudden power outage, the loaded PCBs should be taken out and resetting pressed before restart.

5. This device should be installed in position meeting the following environment requirements.
    a. Environments with temperature lower than 60℃ and humidity less than 90% without any dew.
    b. Environments with little vibration.
    c. Environments free from dust and smog.
    d. Position with sufficiently firm ground to near the weight of the device.
    e. Positions without interference of electromagnetic wave.
    f. Surrounding environments free from inflammable, explosive and corrosion-prone gas elements.