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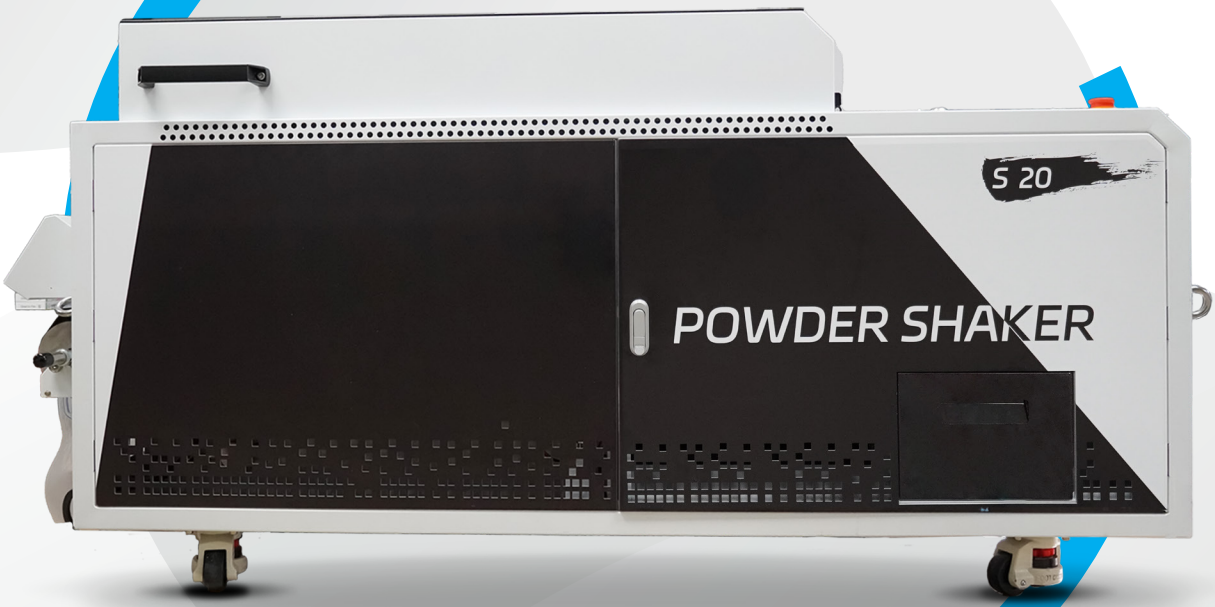
Color is in Our DNA



S-20 POWDER SHAKER

OPERATIONS MANUAL

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TABLE OF CONTENTS:

THIS IS THE FIRST ITERATION OF THE S-20 SHAKER MANUAL, UPDATES WILL BE MADE TO THIS MANUAL.

INTRODUCTION

Thank you for purchasing the STS S20 DTF Powder Heater Shaker.

CAUTION

STS REFILL TECHNOLOGY, STS INKS is in no way liable for any damage whatsoever (including but not limited to lost profit, indirect damage, special damage, or other monetary damage) arising from using or inability to use the machine, except as provided in STS warranty provisions.
This applies even if STS has been informed of the possibility of such damage.
For example, we cannot be held liable for any loss of media or other materials from using the machine, nor are we liable for any indirect loss caused by printed materials. Please note that we are not liable for any financial damage or lost profits resulting from the use of the machine, or for any claims from third parties.

REQUESTS

This manual describes the operations and maintenance of the machine.
Illustrations in the manual may be different from the appearance of some models.
Read this manual carefully and make sure you understand it before using it.
Although every effort has been made to ensure the accuracy of the information in this manual, if you find any issues, contact your dealer, our service office, or our call center.
This manual is subject to change without notice for improvement.
You can also download the latest manual from our website.

SAFETY PRECAUTIONS

WARNINGS AND PRECAUTIONS IN USE

• The set of power cables provided with the machine is for use only with the machine. It cannot be used with other electrical devices. Do not use any power cables other than the ones provided with the machine. Failure to observe these instructions may result in fire or electric shock.
• Do not attempt to modify the cable and avoid damaging or breaking it. Placing heavy objects on, heating, or pulling the cable may damage it, which may result in fire or electric shock.
• Avoid use in humid places. Additionally, do not pour water on the machine. Failure to observe these instructions may result in fire, electric shock, or failure.
• Use of the machine under an abnormal condition, as when it is emitting smoke or fumes, may result in fire or electric shock. Turn off the power switch immediately, and then be sure to unplug the machine from the outlet. Once you have confirmed that smoke is no longer being emitted, request repair from your dealer or service office. Never attempt to repair the machine yourself. Doing so is hazardous.
• Never disassemble or modify the machine. Failure to observe these instructions may result in electric shock or failure.
• Do not use extension cords. Failure to observe these instructions may result in fire or electric shock.
• Keep foreign objects such as pieces of metal away from the power plug prongs. Failure to observe these instructions may result in fire or electric shock.
• Do not overload electrical outlets by using too many pieces of equipment. Failure to observe these instructions may result in fire or electric shock.
• If the power cable is damaged or the core wire is exposed or broken, ask your service representative to replace it. Using it as is may result in fire or electric shock.
• Do not handle the power plug with wet hands. Failure to observe these instructions may result in electric shock.
• Always hold the power cable by the plug when unplugging the machine. Do not unplug by holding the power cable Failure to observe these instructions may damage the cable or result in fire or electric shock.
• Do not use a voltage other than the indicated voltage. Failure to observe these instructions may result in fire or electric shock.
• Do not use a power frequency other than the indicated frequency. Failure to observe these instructions may result in fire or electric shock.
• If metal, water, liquid, or other foreign objects enter the machine, turn it off immediately. After that, be sure to unplug the machine and contact your service representative. Using it as is may result in fire or electric shock.
• If ink leaks, turn off the main power switch, unplug the machine, and contact your dealer, service office, or call center.
• Keep the heater on the media transport surface free of dust and debris. Failure to observe these instructions may result in sparks or fires.
• Keep children away from this machine.
• Do not use a flammable spray or solvent inside or around the machine. Failure to observe these instructions may result in fire or electric shock from ignition.
• Do not place vases, pot plants, cups, cosmetics, containers of chemicals or water, or small metal objects on

top of the machine. Liquid or foreign objects may get inside the machine, leading to fire or electric shock.

HANDLING OF THE POWER CABLE

• Plug into a polarized electrical outlet.
• Always plug the power cable into an outlet near the machine, and make sure the power cable can be easily unplugged.
• Regularly (at least once a year) unplug the cable and remove any dust on or near the power plug. Failure to remove dust may result in fire.
• Do not use a voltage other than the indicated voltage.
• Before plugging in the machine, check the outlet supply voltage and circuit breaker capacity. Plug each cable into a power source with an independent breaker. If you plug more than one power cable into outlets that share the same circuit breaker, it may trip the breaker.

NOTES ON MAINTENANCE

• Pay close attention to ventilation and be sure to wear safety glasses, gloves, and a mask when handling consumables, maintenance liquid, waste, or other solutions used with the machine. Wastes may adhere to the skin or get into the eyes or mouth.
• Gloves are consumable. Purchase and use commercially available gloves.

MOVING PART PRECAUTIONS

• Keep fingers and other body parts away from hazardous moving parts.
• Do not touch the roller moving parts when it is rolling. Failure to observe these instructions may result in finger injury such as torn skin or fingernails.
• Keep your head and hands away from moving parts during operation. Failure to observe these instructions may result in injury such as your hair becoming caught in the machine.
• Wear suitable clothes. (Do not wear loose-fitting clothes or accessories.) Keep long hair bound.

HEATER

• Do not pour liquid on the media transport surface. Failure to observe these instructions may result in heater failure or sparks.
• Do not touch the media transport surface with bare hands while the heater is hot. Failure to observe these instructions may result in burns.

MACHINE HANDLING PRECAUTIONS

• Do not use in unventilated or poorly ventilated rooms.
• Provide sufficient ventilation when the machine is in use.
• For assistance with cleaning the inside the machine, contact your service representative. Failure to clean the machine over extended periods when dust has accumulated inside may result in fire or failure

INSTALLATION PRECAUTIONS TO AVOID

Places exposed to direct sunlight.
Places with uneven surfaces.

Places where vibration is generated.
Places directly exposed to air conditioning.
Places subject to significant changes in temperature or humidity use the machine under the following environmental conditions:

OPERATING ENVIRONMENT:
20–30°C (68–86 °F)
35–65% RH

Places where open flames are present.

SHAKER SPECIFICATIONS:

PLACE OF INSTALLATION

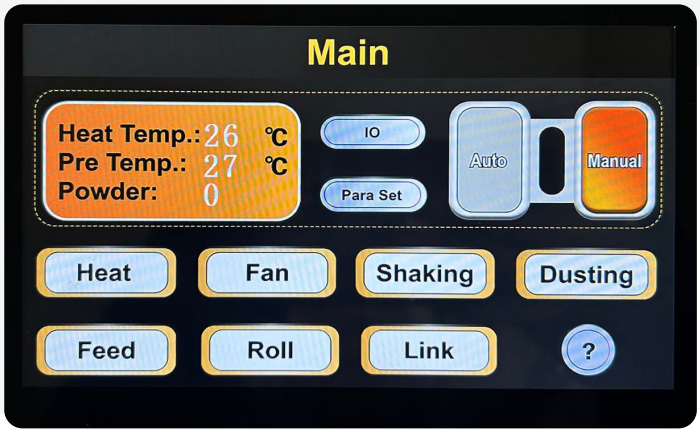
Before installing the machine, ensure that the required amount of space is available in the place under consideration. The place of installation must have enough space for the machine as well as workflow tasks.

	MACHINE DIMENSIONS
Width	989.18 mm - in
Depth	1920.26 mm - in
Height	908.54 mm - in
Weight	370kg - 815lb
Voltage	08/220V 50/60Hz Single-Phase 30Amp
Power	6KW

TEMPERATURE AND HUMIDITY OF WORKING ENVIRONMENT

To ensure reliable printing, use the machine in an environment of 20–30°C (68–86 °F) and 38–65% RH.

MAIN HOME SCREEN OVERVIEW



NOTE: ALL THESE SELECTIONS ARE THE ON AND OFF FUNCTION FOR THEIR PROCESS.

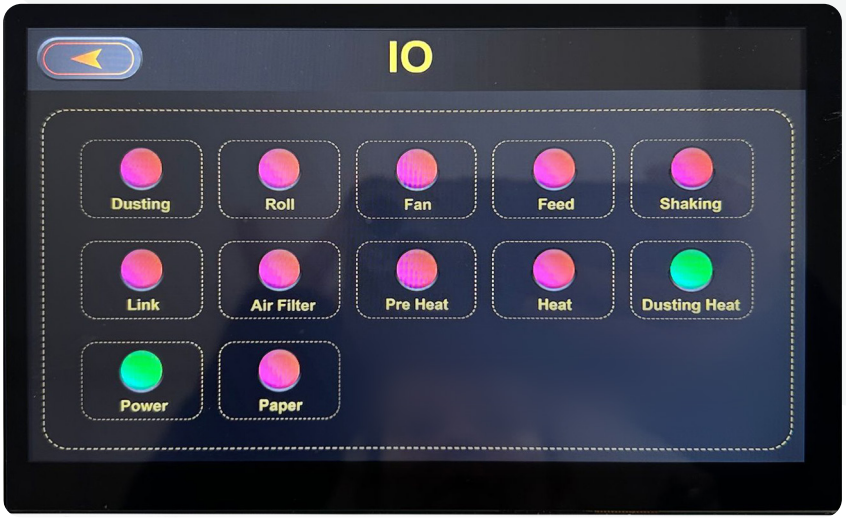
1. **HEAT:** heat tunnel toggle button
2. **FAN:** Suction function for the Belt
3. **SHAKING:** Beater bar that shakes the excess TPU from the images
4. **DUSTING:** the function that allows TPU to fall from the reservoir to the basket
5. **FEED:** Belt control function
6. **ROLL:** Take up roll at the end of the machine
7. **LINK:** Logic switch (this allows the machine to communicate with other features in the machine)
8. **IO MENU:** Sensor reading menu (the trouble shooting menu)
9. **PARA SET MENU:** Settings menu
10. **AUTOMATIC MODE:** This mode allows Automation & Communication from the different parts.
11. **MANUAL MODE:** This mode disables all sensors and should not be used if substrate is still attached to the printer.

Heat Temp is the temperature in the heat tunnel

Pre Temp is the heat for the media ramp into the basket area

Powder is the current Weight of the TPU basket (How much powder is on your substrate when sitting in the basket)

IO SCREEN (TROUBLE SHOOTING SCREEN)



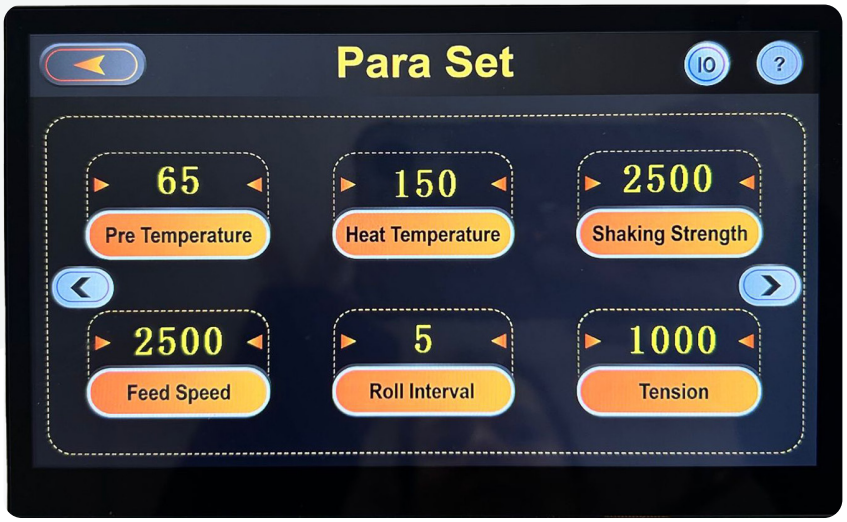
On this screen, you will be able to see input/output status that relate to Page 1.

EXAMPLE:

The front Paper sensor when not reading substrate should be Red, when reading Sub straight it should turn Green to show that the sensor is working appropriately, if it is not reading when the media is in front of it, then you would know that this needs to be Adjusted.

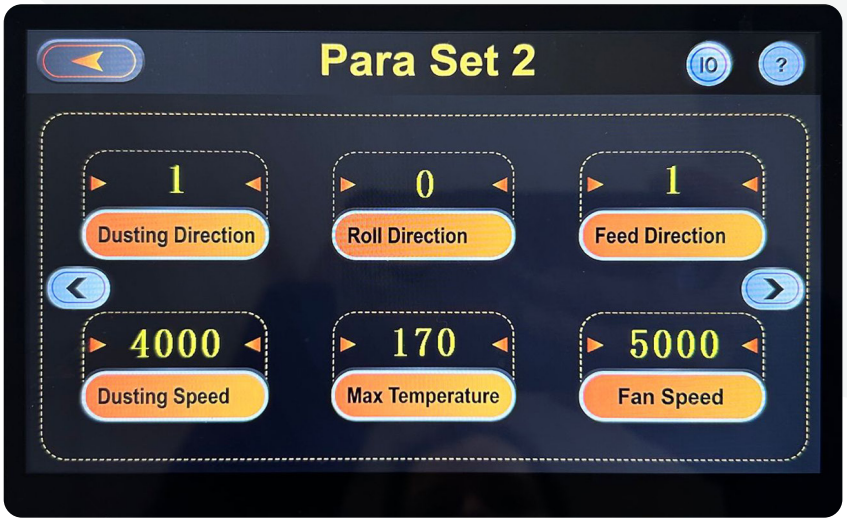
PARA SET SCREEN (SETTINGS MENU)

MINIMUM MAXIMUM VALUES



Pre-Temp:	Temperature for the Powder resevoir	45-65
Heat Temp:	Temperature for the Heat tunnel	100-170
Shaking Strength:	Beater bar interval speed	2500
Feed Speed:	Belt movement speed	1500-3500
Roll Interval:	Roll timer	1-10
Tension:	Roll Speed	500-1000

PARA SET SCREEN 2 (SETTINGS MENU)



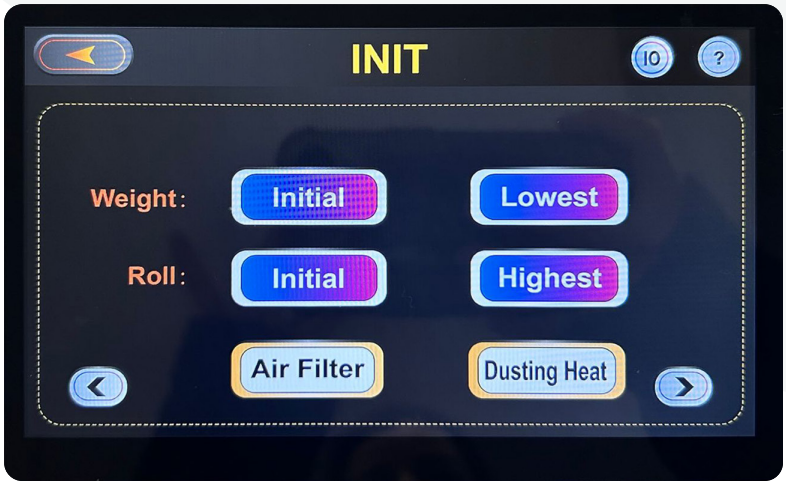
FOR THE TOP ROW; PARA SET 2
1 = FORWARD 0 = REVERSE

Dusting Direction:		The Reservoir feed direction
Roll Direction:		Take up roll direction
Feed Direction:		Belt Direction
Dusting Speed:	Reservoir dusting speed	4000
Max Temperature:	Heat limiter	170
Fan Speed:	Suction pressure	5000 (must be this number for vacuum fan)

PARA SET SCREEN 3 (SETTINGS MENU)

Purify: Internal Fan speed (exhaust fan) Value should be set to 5000 for unit to operate optimally

MAIN HOME SCREEN OVERVIEW



INIT MENU: CALIBRATION MENU –
PRIOR TO CALIBRATING SET ALL THESE BUTTONS TO GREY OUT BY CLICKING ON THEM, EXCLUDING AIR FILTER / DUSTING HEAT

WEIGHT = POWDER BASKET

Weight Initial is to set the native position of the basket (when there is no powder or substrate on it) you would then hit the Initial button.

Weight lowest is to be performed to set the basket to the lowest position, then hit the lowest button to complete the calibration for the basket as you are holding the basket in its "Lowest" position.

ROLL = TAKE UP ROLL

Roll initial is to be set when the take-up bar is in its native position, you would hit Initial button.

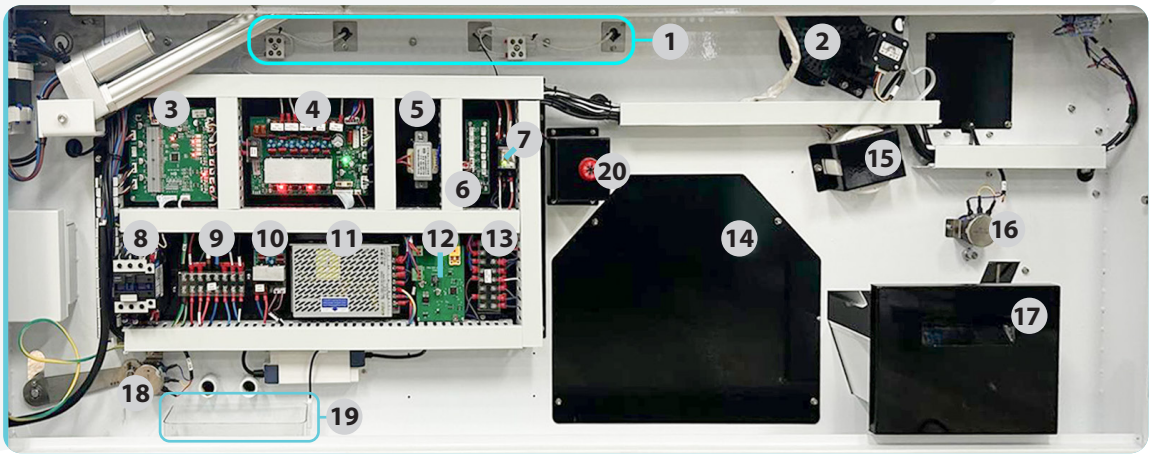
Highest would require you to prop up the Take up bar, then to hit Highest (or have someone help you lift it while you hit the Highest button) That would complete the calibration for the take-up roller bar.

AIRFILTER: Should be on, this controls the Exhaust fan.

DUSTING HEAT: This is the heater for the powder reservoir.

SHAKER PART LOCATION GUIDE

LCD SIDE



1. **Bottom bulbs, metal trays (under belt) x4+ Ceramic wire blocks x2**
   220V heater elements located under the belt, placed on a metal tray individually and interconnected with ceramic blocks on both sides.

2. **Feed belt roller motor**
   24V DC motor which moves the belt and feeds the film forward through the heater chamber.

3. **Main control board**
   Contains the main firmware and controls main inputs and outputs signals.

4. **Six-way heater board**
   Interface to power signals to different AC voltage components.

5. **Small Transformer**
   Transformer to power the shaking motor.

6. **Waste Sensor Relay board**
   Waste oil overflow alarm interface board interconnect the overflow sensor and alarm devices.

7. **Air filter relay**
   24V Relay power the air filter exhaust blower fan

8. **220V AC power contactor**
   Enable the 220V AC power

9. **220V AC Main power terminal block**
   Distribute 220V AC connection

10. **Two-way board**
    Interface to power signals to different AC voltage components.

11. **24V DC Power supply**
    Generate 24V DC power to different components and board

12. **Temperature safety sensor board**
    Safety sensor board system which triggers OFF the whole machine in case inside chamber temperature reach 170C – 338F.

13. **24V DC power terminal block**
    Distribute 24V DC connections

14. **Vacuum blower fan cover and housing**
    Access to the vacuum blower fan which is used to hold the film to the belt and be fed through the heater chamber.

15. **Shaking bar motor**
    DC motor which moves the shaking bar

16. **Powder scale potentiometer/sensor**
    Sens the position of the powder basket

17. **Powder tray**
    Removable powder tray, used to recycle the excess of powder on the film operator should pour it back into the powder dusting chamber on top.

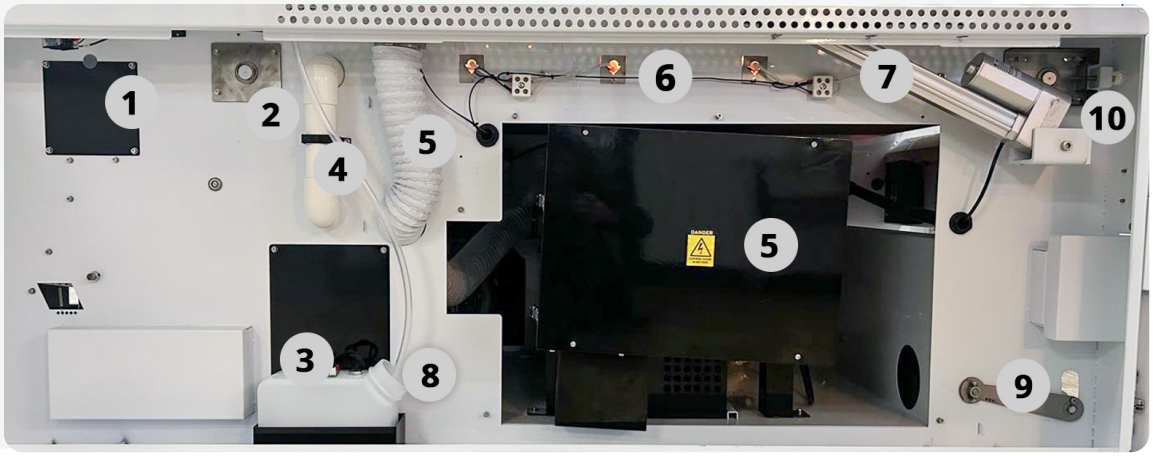
18. **Take up roll dance potentiometer/sensor**
    Sens the position of the take up roll dance bar used control the take up roll ON/OFF automatically.

19. **Waste tray and overflow sensor**
    Collecting the waste and sense when is full, will trigger the audible and light alarm

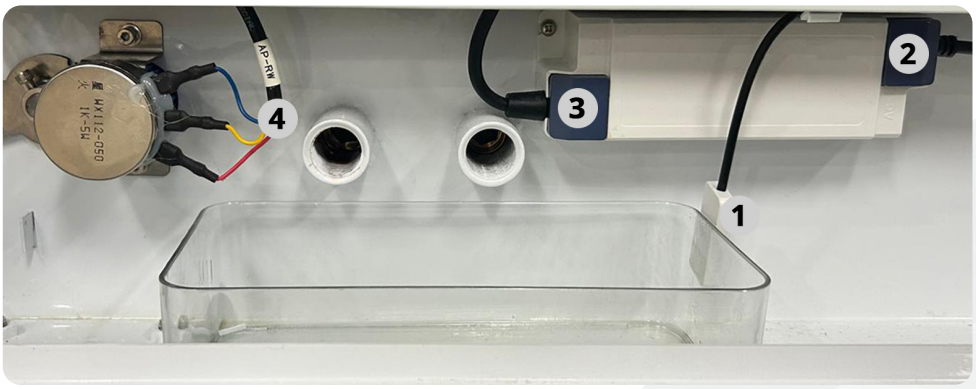
20. **Waste audible and light alarm.**
    Alert that the waste tray is full, operator should empty the waste.

SHAKER PART LOCATION GUIDE

OPPOSITE LCD SIDE



1. Dusting access port
2. Roller belt bearing
3. Reservoir sensor
4. Suction pvc pipe
5. Filtration exhaust hose
6. Under belt bulb housing
7. Ceramic wire blocks
8. Glycerin reservoir
9. Take-up roller arm
10. Hydraulic arm base



1. Overflow liquid sensor
2. Hydraulic lift AC Voltage in
3. Hydraulic lift DC Voltage out
4. Potentiometer Connection

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SHAKER PART LOCATION GUIDE

FRONT OF SHAKER

1. Power Button
2. LCD Panel
3. Pre-temp cooling fan assembly
4. Powder reservoir
5. Suction fan / Belt assembly
6. Powder Basket / Beater bar
7. Power Cut off switch
8. Front Media Sensor (There's a Small flat head adjustable screw on the back of this to adjust length, or retract the length)

SHAKER PART LOCATION GUIDE

BACK OF SHAKER

1. Hydraulic arms
2. Quartz heating element bulbs
3. Opening / closing switch for heating bay
4. Cooling fans
5. Take up bar

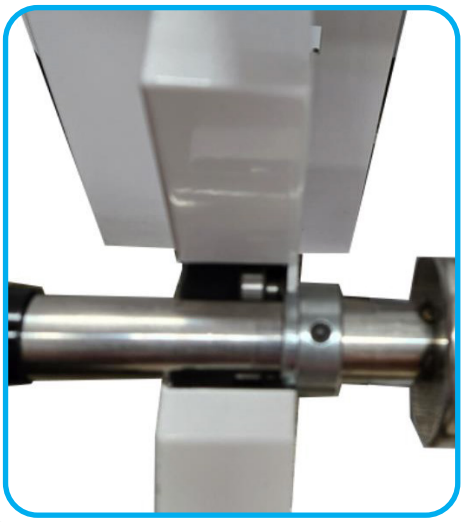
SAFETY NOTICE:

Avoid keeping any objects in the way of the unit whenclosing and opening the lid, the arms can exert excess pressure which can cause injury.

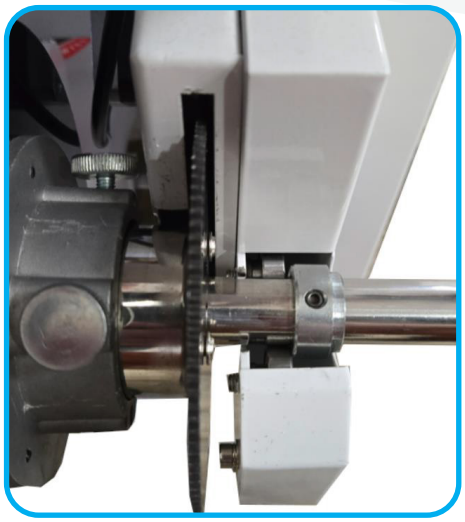
MEDIA SPINDLE CORRECT ORIENTATION

The spindle orientation can be adjusted by adjusting this piece on each side.

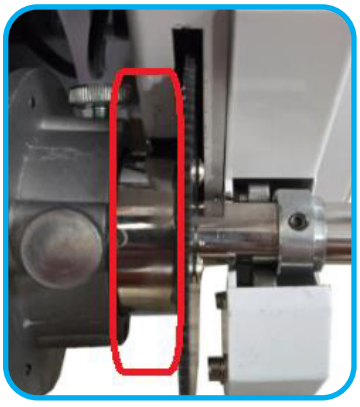
LEFT



RIGHT

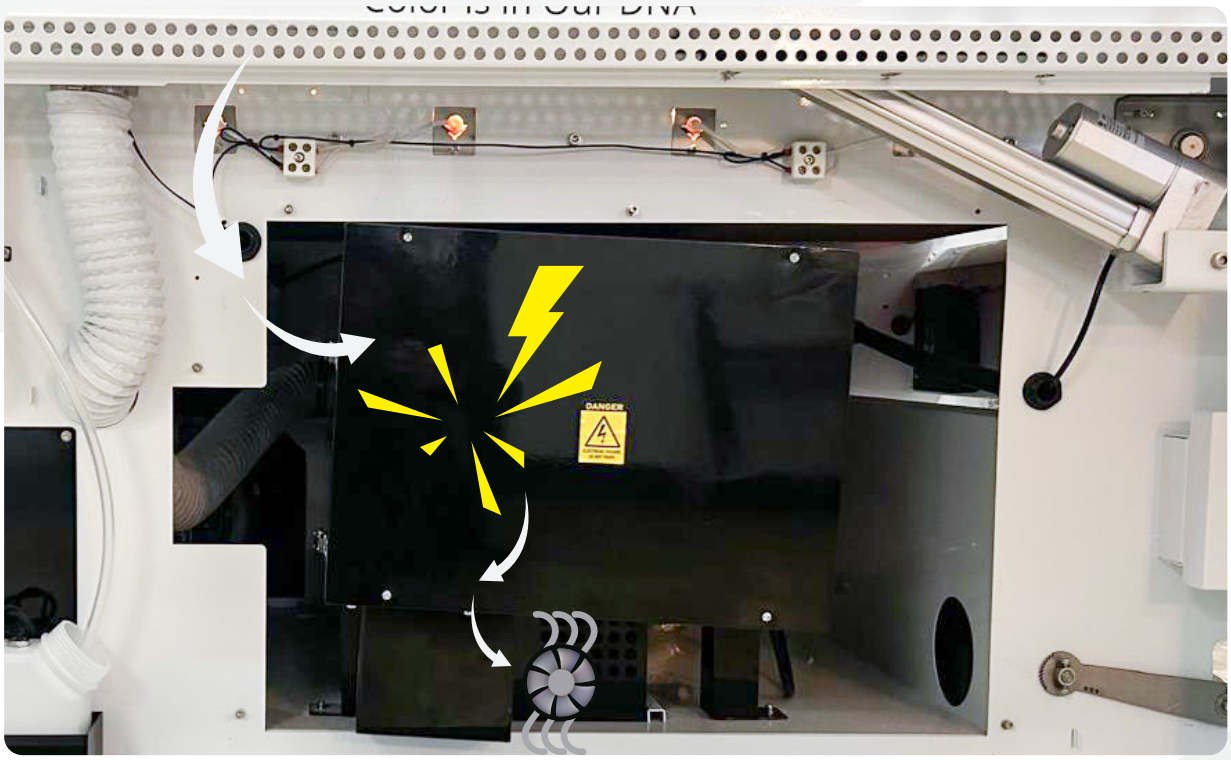


MAKE SURE THAT THERE IS A GAP BETWEEN THE FLANGE AND THE GEAR TO ENSURE SPACING.



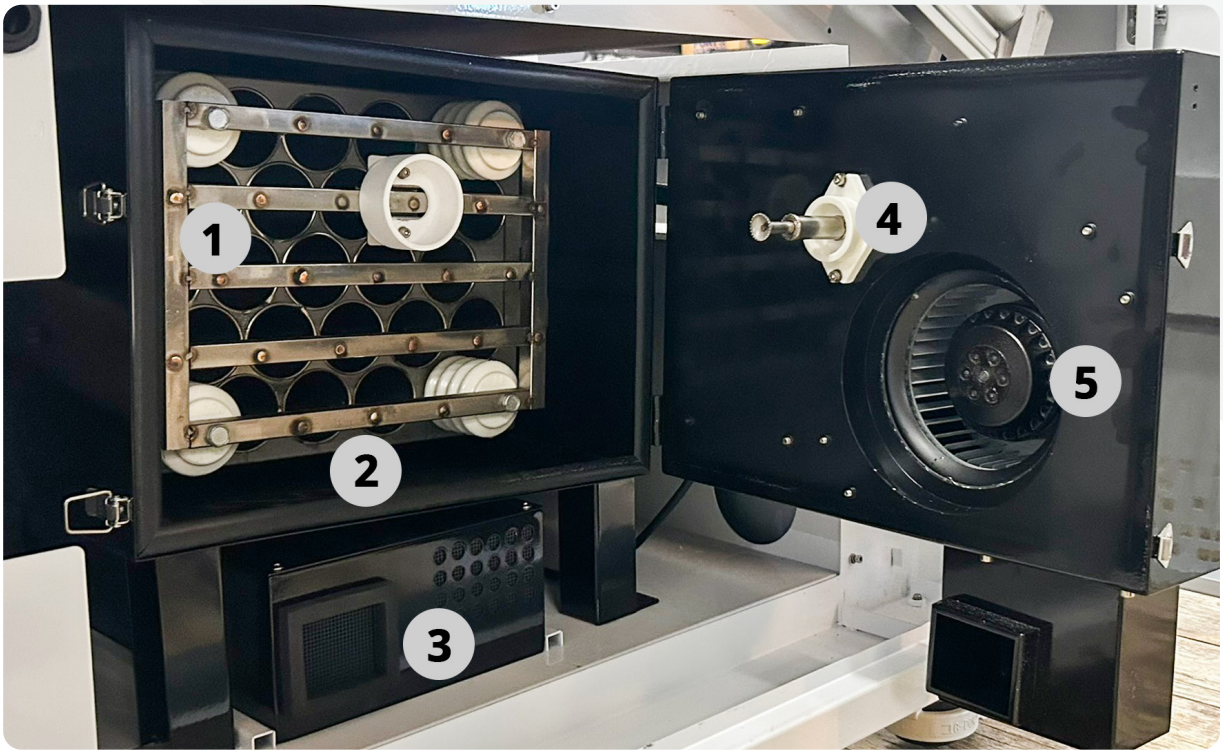
FUME HOOD CHAMBER / STATIC DEVICE / EXHAUST FILTER BOX

Fume Hood Chamber design – How it works.



As the TPU and water-based ink prints travel through the heat tunnel, fumes begin to accumulate. The fume hood exhaust fan then draws these fumes into the static chamber, where a static device rapidly converts them into liquid form. The chamber is tilted to funnel the liquid towards the glycerin exhaust. Meanwhile, the remaining fumes pass through a filter box containing four charcoal filters and two HEPA filters, ensuring thorough filtration.

FUME HOOD CHAMBER / STATIC DEVICE / EXHAUST FILTER BOX



1. Fume dispersion rack
2. Tilted liquid chamber
3. Filter box
4. Static device
5. High power filtration fan

FILTER BOX CORRECT ORIENTATION

To open the filter box, you can remove 3 of the screws from the top, then slide the top off.
The filter box consists of 3 Charcoal filters 1 Hepa filter two sponge filters and 3 charcoal tray filters

FILTER BOX

SPONGE LAYER

CHARCOAL FILTER TRAY

CHARCOAL FILTER

HEPA FILTER

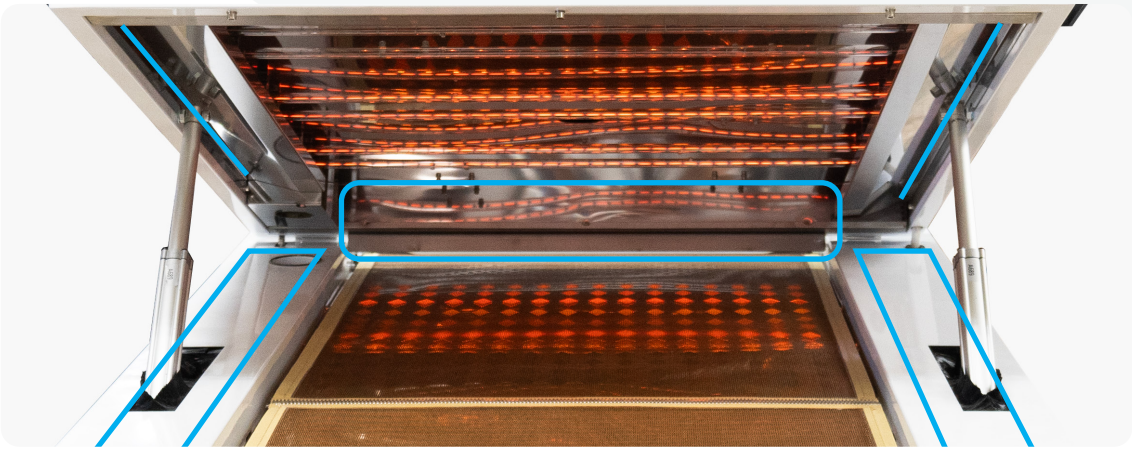
Each of these filtration methods has its strengths, so using them together makes for the ideal Filtration system.

Charcoal filters are exceptional for removing chemical contaminants and odors. HEPA filters excel in capturing particulates, improving air quality by removing physical allergens.

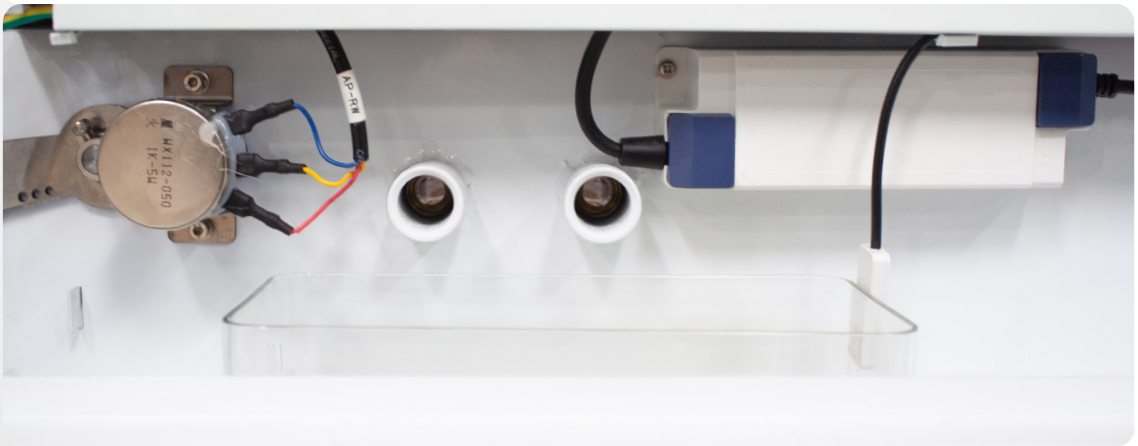
Charcoal sponges offer a versatile, often more accessible option for both odor control and particulate filtration in smaller or less formal settings.

Combining these methods in air purification systems can provide comprehensive filtration, addressing both particulate and gaseous pollutants for a cleaner, healthier environment.

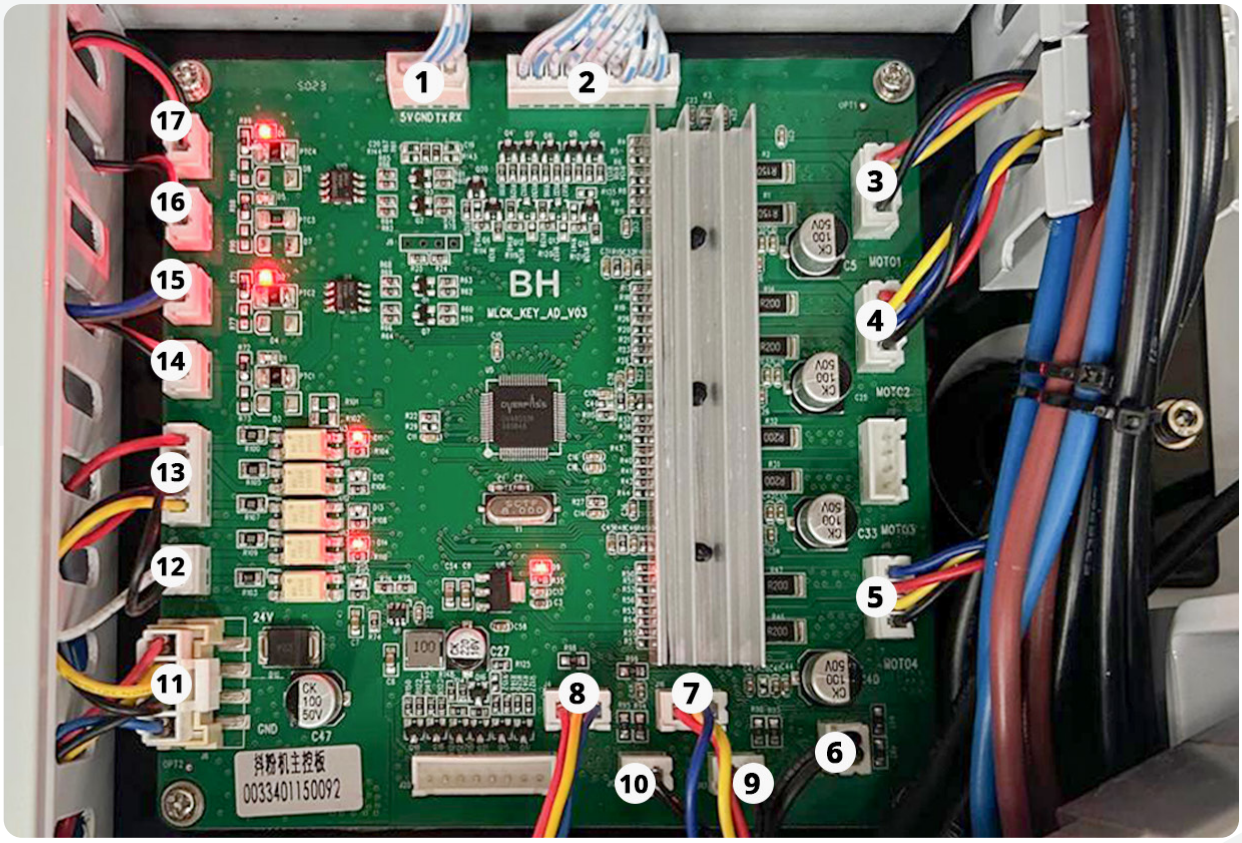
MAINTENANCE GUIDE



Daily wipe down of the indicated green areas will ensure that no buildup of glycerin causes unwanted smoke. Unlike previous models, the S-20 requires much less maintenance due to iterations of the unit and adjustments to the internals. Glycerin from inside the machine will accumulate in this section. The exhaust tubes will slowly secrete glycerin, and when they are full or need disposal, the unit will start to beep.

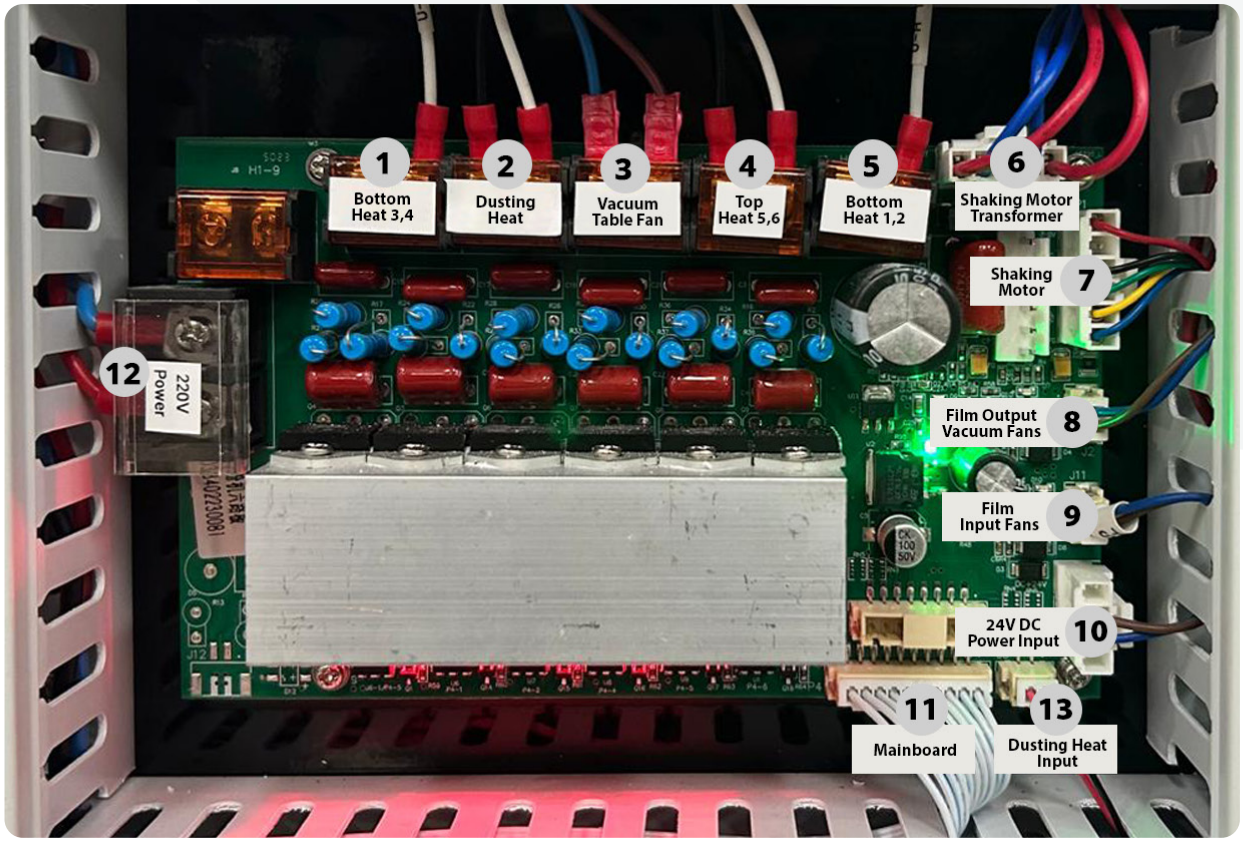


MAINBOARD BREAKDOWN



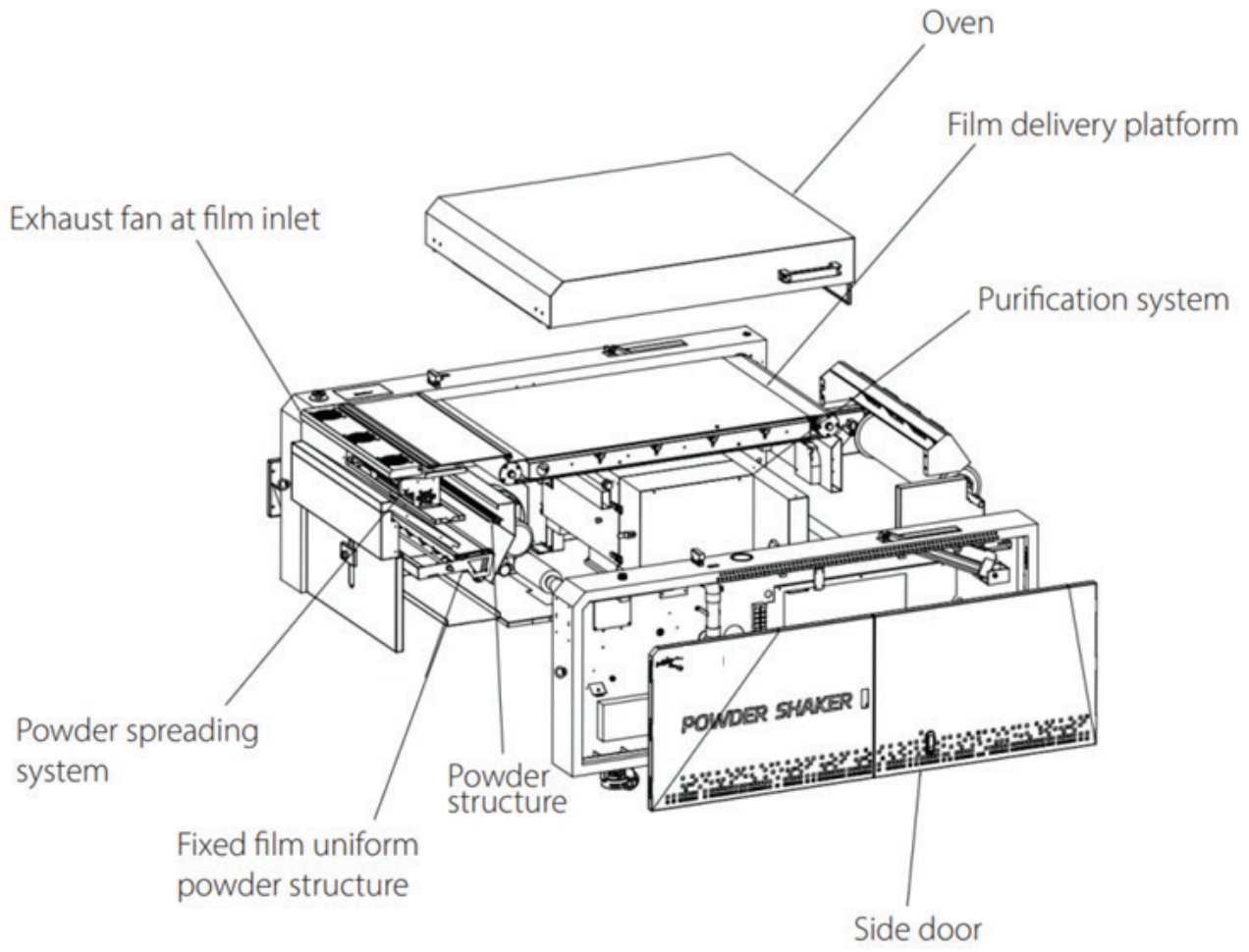
1. LCD Display screen output (J21)
2. 6 way board output (J1)
3. Dusting motor output (J2 MOTO 1)
4. Take up motor output Output (J17 MOTO 2)
5. Feed belt motor output (J19 MOTO4)
6. Preheat sensor temperature sensor output (J14)
7. Powder weight scale potentiometer sensor input (J16)
8. Take up dancing bar potentiometer sensor input (J4)
9. Dusting temperature sensor input (J13)
10. Main heat temperature sensor input (J12)
11. 24V DC Power input (J6)
12. Powder chamber safety switch interlock input (J15)
13. Film sensor input (J5)
14. Top heat 1,2,3,4 lamps output (J3)
15. Air filtration blower fan relay output (J8)
16. Dusting heat output (J10)
17. Preheat output (J11)

6 WAY HEATER BOARD

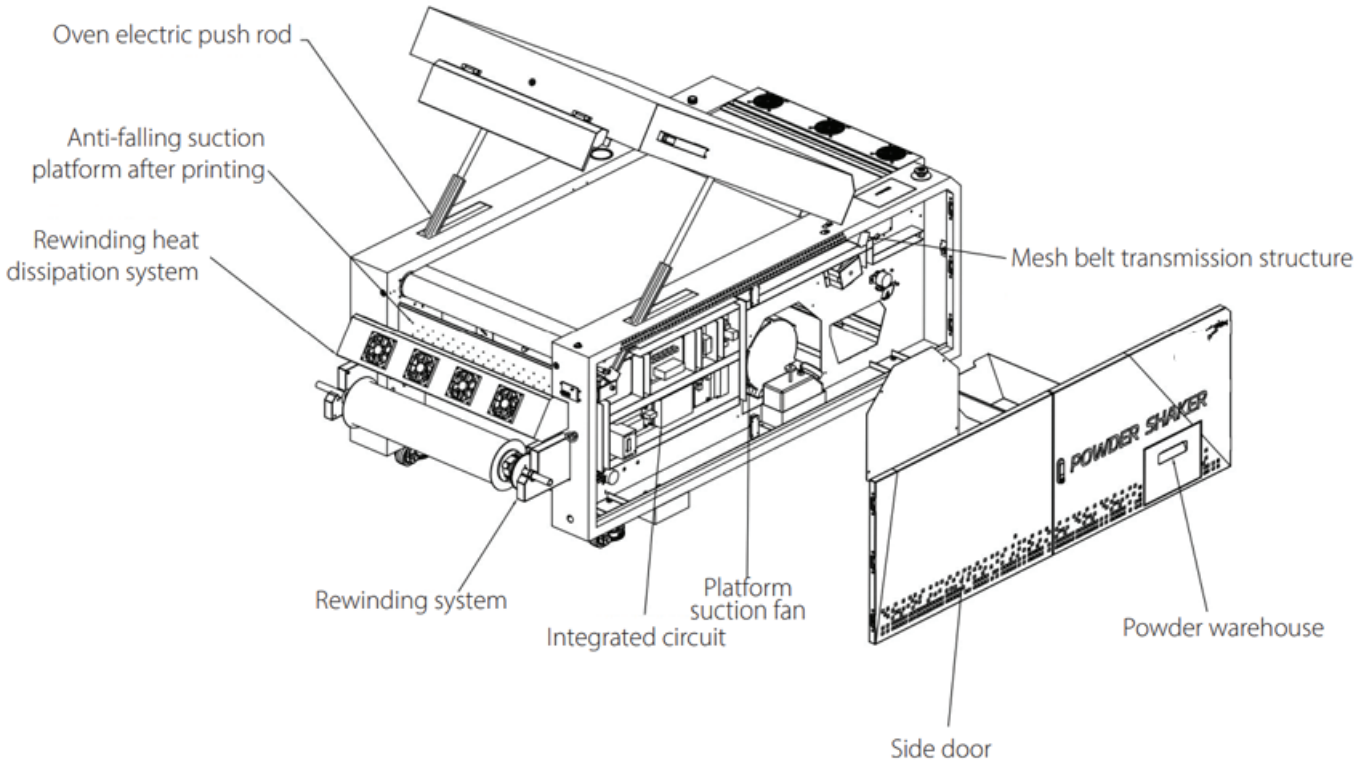


1. Bottom heat 3,4 lamps output (J16)
2. Dusting heat lamp output (J13)
3. Feed belt vacuum table fan output (J17)
4. Top heat 5,6 lamps output (J14)
5. Bottom heat 1,2 lamps output (J18)
6. Shaking motor power transformer input / output (J9)
7. Shaking motor output (P1)
8. Film output vacuum plate fans output (J2)
9. Film input fans output (J11)
10. 24v DC power input (J10)
11. Mainboard input/output (P4)
12. 220v input AC power input (J1)
13. Dusting heat input (J6)

EXPLODED VIEW

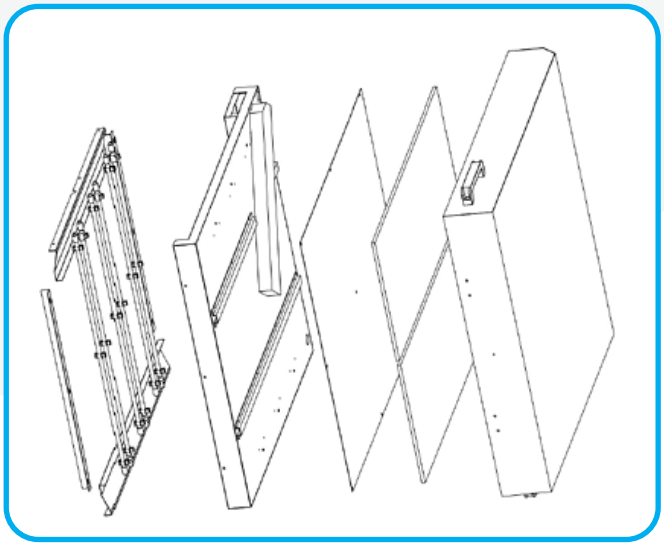


EXPLODED VIEW

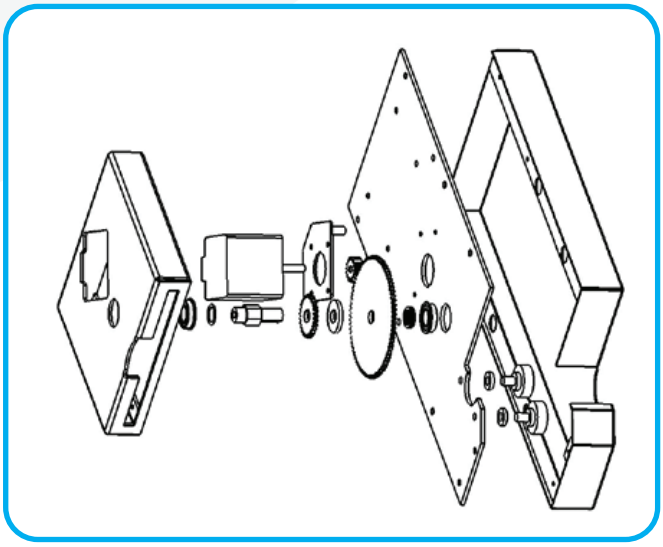


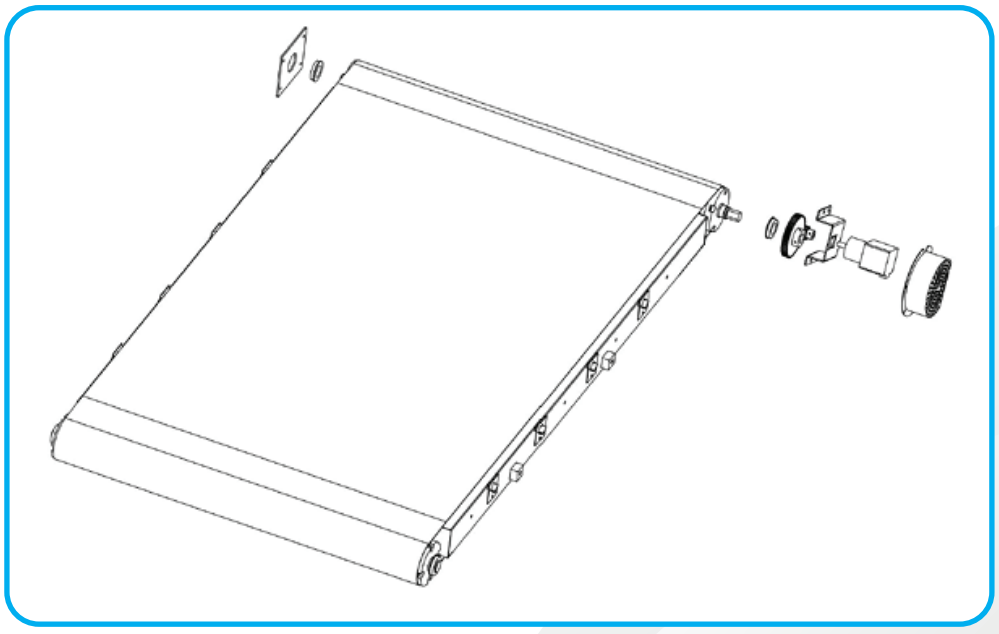
EXPLODED VIEW

OVEN



RECEIVING STRUCTURE





MESH BELT TRANSMISSION STRUTURE

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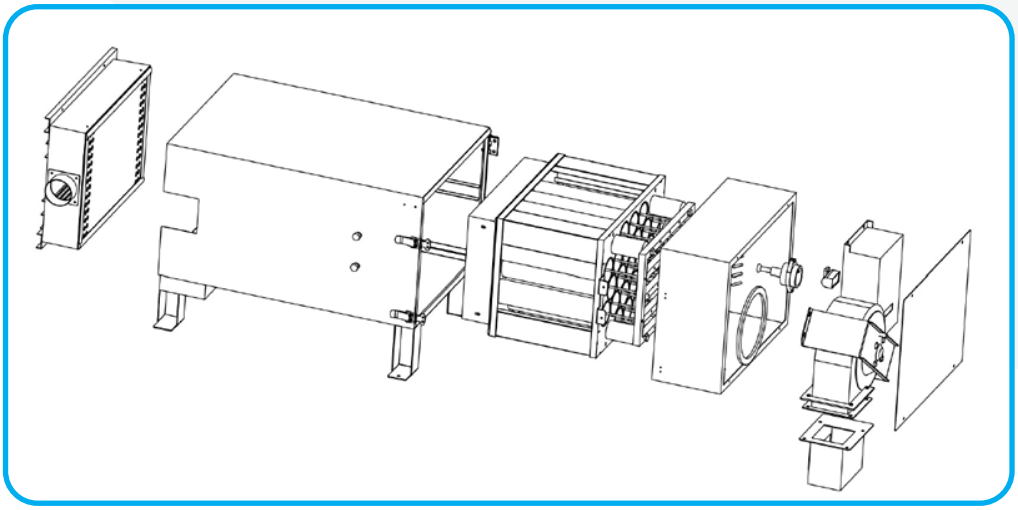
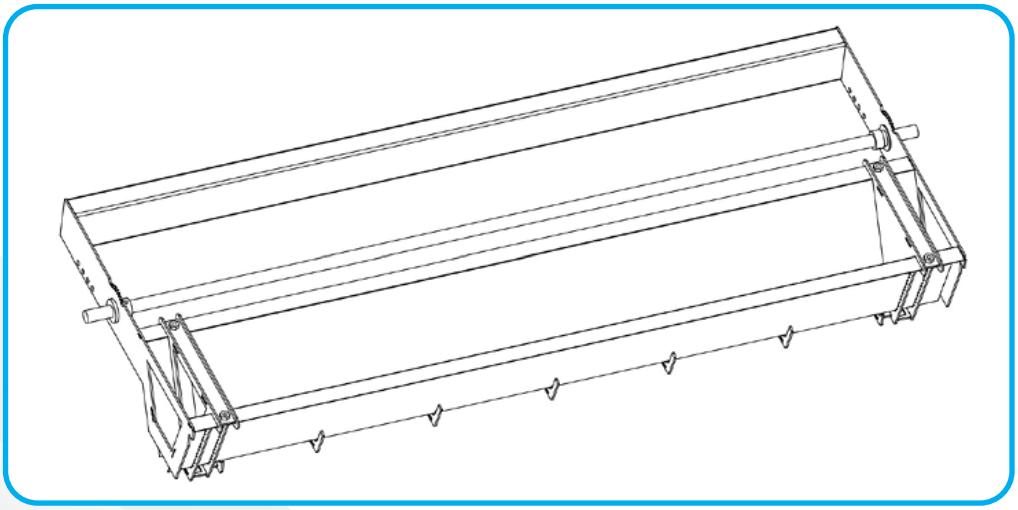
EXPLODED VIEW

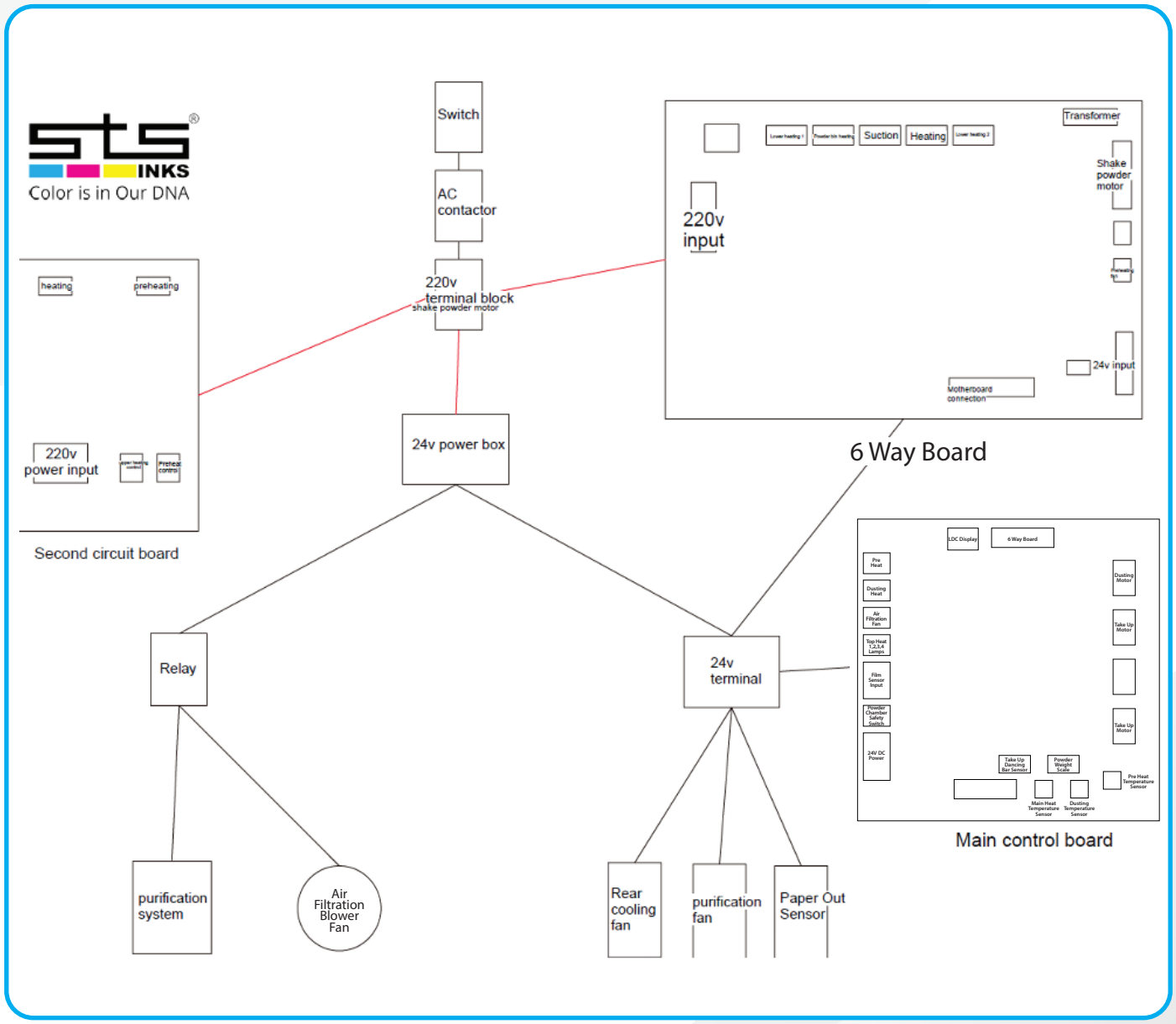
PURIFICATION SYSTEM



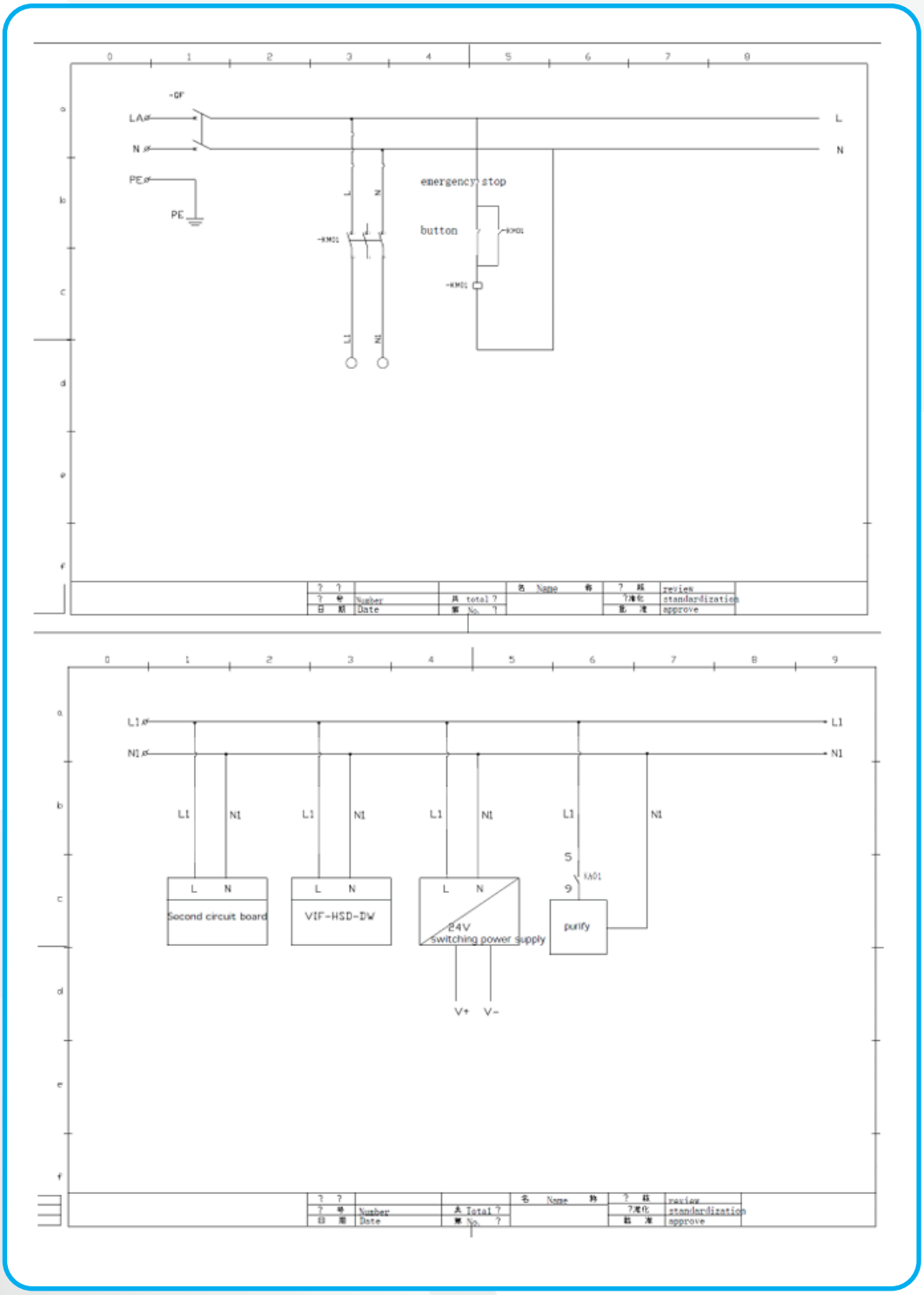
FIXED FILM UNIFORM POWDER STRUCTURE



BOARD LAYOUT SCHEMATIC



SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM