

Grün Series PET Infrared Sorter

User Manual

Lauffer Vision Technology Co.,Ltd.



Please read the user manual carefully

After-sale Service Hotline: 86-400-676-1266

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Chapter I Product Profile

1.1 Product Brief Introduction

Grün I Series PET Infrared Sorter machine is a kind of selective equipment with infrared camera and visible light camera. The latest near infrared sensor is used in the color machine. The latest multicolor CCD sensor, tailor-made lens and FPGA system in addition to the high-speed electromagnetic mechanism have been adopted in the machine, and also the touch screen have been installed therein, so it is a high-tech product combined with technology of optics, mechanics, electronics and pneumatics. The machine can automatically reject contaminant or colored grains, featuring high sorting accuracy, great efficiency, simple operation, easy maintenance, compact structure and elegant appearance. We reserve the rights to have other models under this series without prior notice.

1.2 Declaration and Product Standard

Grün I Series PET Infrared Sorter is a high-tech product combined with technology of optics, mechanics, electronics and pneumatics. Taking account of the machine's characteristic, we strongly suggest that the operator should get well trained according to Lauffer's training demand, and refer to related instructions strictly.

Please feel free to contact our after-sale service number: 400-676-1266 if any issues not included herein, or go to official website : www.lauffervision.com for more details.

We reserve the rights to change design and specifications without prior notice.

Product implement GB standard China National Standard: GB/T29884-2013

1.3 Product Specification and Technology Parameters

Model	Capacity (T/H)	Voltage	Power (kw)	Size (L*W*H)	Weight (kg)
I4	0.8-3.0	180-240 (50HZ)	3.5	2150*1928*2385	1250
I6	1.0-4.0	180-240 (50HZ)	5.5	2825*1928*2385	1850
I8	2.0-6.0	180-240 (50HZ)	6.5	3518*1928*2385	2300

Note: Above parameters are subject to change without prior notice.

1.4 Product Parts and Related Definitions

Vibrator: the device in-feed the materials through vibration

Observation Cabinet: the device for collecting, detecting and sorting material

Ejector: the device rejects bad material

Material Output: vibratory magnitude of vibrator

Sensitivity: the thresh old of sorting accuracy/quality

Ejector Time: includes delay time and blowing time

Delay Time : the time distance from the camera catches the material to ejector acts

Lasting Time/ Bio wing Time: the time ejector works once

Sorting Mode: the way/solution of sorting material

Chapter II Installation Instructions

2.1 Safety Regulations and Installation Instructions









Grün I Series PET Infrared Sorter is a high-tech product combined with technology of optics, mechanics, electronics and pneumatics, so it requires strictly during installation, running, operating and maintenance, especially the using of air supply and power supply. There are some warning and notice labels printed both in this manual and on the machine. All operators must read this manual carefully to fully understand all the safety regulations; strictly follow the regulations and instructions during operation.

2.1.1 Safety Marks

Safety marks consist of four types, naming prohibiting mark, warning mark, instructing mark and reminding mark, suitable for all contents of this manual. There are clear marks in the dangerous zone of the Grün I Series PET Infrared Sorter, two common marks are as below:

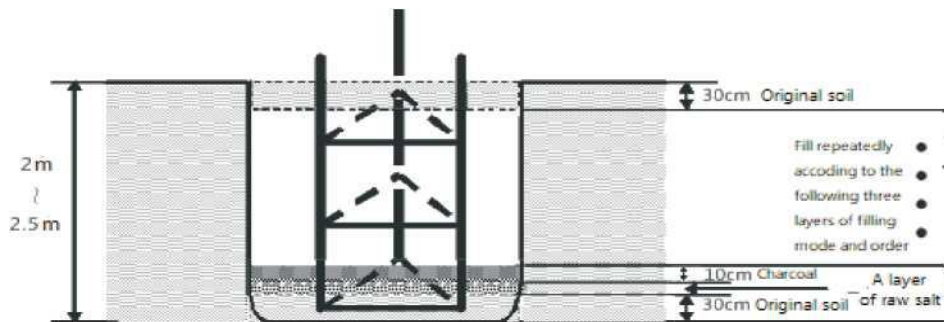
- ① Red : to prohibit some dangerous behavior;
- ② Yellow: to warn of danger.

2.1.2 Safety Mark Contents

NO.	Marks	Contents
1		<p>Warning!</p> <p>1: Electric Shock! 2: This device only by professionals to operate, maintain.</p>
2		<p>Warning!</p> <p>Hands Pinching! It appears in the place where hand or finger may get hurt.</p>
3		<p>Caution!</p> <p>1: Input Voltage: 220V 2: Danger High Voltage!</p>
4		<p>Warning!</p> <p>Please maintain equipment regularly, so that the equipment can maintain efficient and long lifetime.</p>
5		<p>Keep ground wire connected.</p> <p>It is pasted on the bottom of the equipment to remind chassis earth.</p>
6		<p>Read the Manual!</p> <p>Please refer to the manual before use or replace the parts.</p>
7		<p>Electricity!</p> <p>Voltage here or nearby, be careful when operating.</p>
8		<p>Note high temperature!</p> <p>This mark appears in the place which may get hot, caution hot.</p>

2.1.3 Installation Instructions

- ① After receiving the machine,unpack it carefully to avoid unnecessary damage to the components,check all the spare parts according to packing list,and keep properly in case of lost.
- ② Please check the lifting hoof to keep it tight with the machine before lift,immediately tight it if loose in case of any accidents.
- ③ This equipment should work in well-ventilated places rather than places of low or high temperature,or with high humidity,or strong magnetic or strong light,or many particulate matter.
- ④ This equipment must be turned off for cleaning the dust after work lasting every 8 hours.
- ⑤ The way of connecting ground wire: Weld the copper core screw,welding pot must be wrapped in asphalt, the details as the following diagram:



- ⑥ In case of electrostatic interference,in-feed pipe and air draft pipe must be made of iron, plastic and other nonmetal pipe is prohibited.
- ⑦ Air compressor which is necessary for users must comply with related laws and standards.
- ⑧ Power supply end must be under dustproof device to avoid dust get inside.

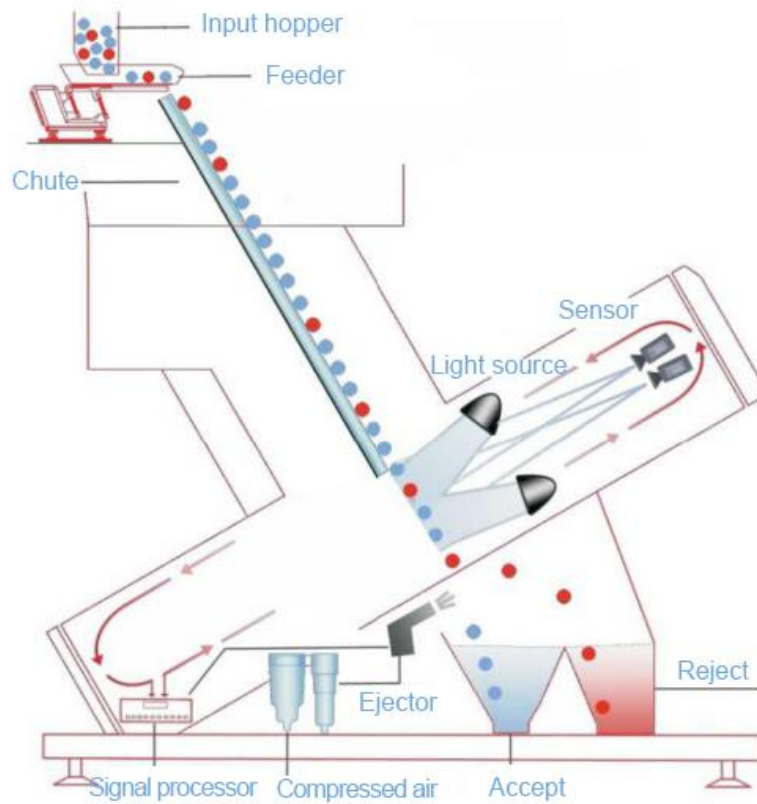
2.2 Work Principle and Machine Structure

2.2.1 Work Principle Of Grün I Series PET Infrared Sorter

The working principle of Grün I Series PET Infrared Sorter is as below: The raw material will come into the machine from the input hopper and then falling down into the chute from vibrator through vibration. It will fall into the observation section of sorting cabinet acceleratedly and then pass the detector and background plate.

Under the action of light source, the CCD sensor can receive the synthesis light of selected material and transfer it to image recognition module, and decision signal transforms to output signal after processed by control system, which drive the

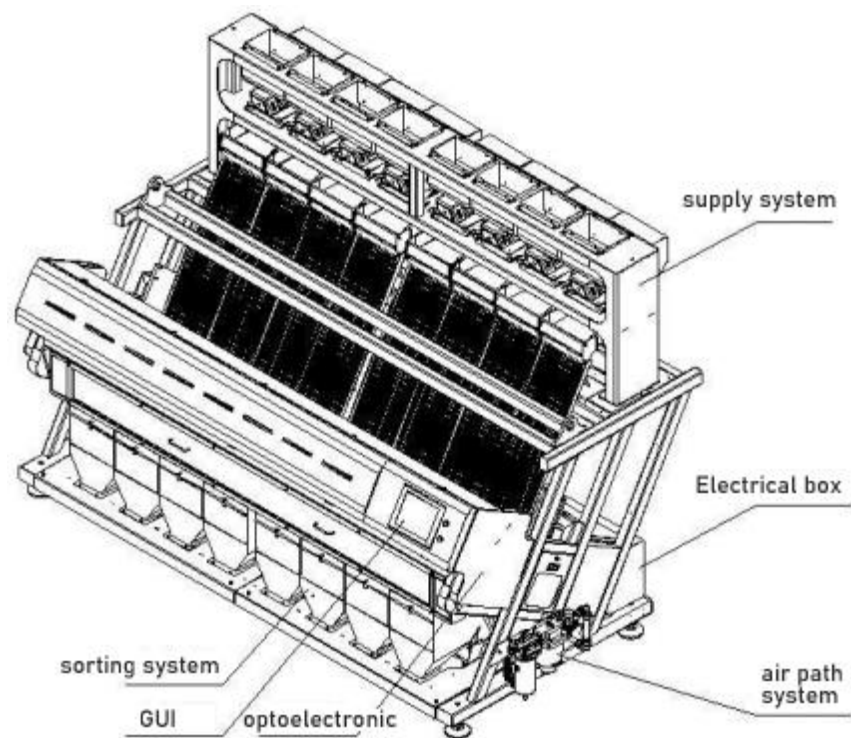
ejector to blow the discolor material into waste cavity of the receptacle. And the accepted material will keep falling into good products cavity to reach fine sorting.



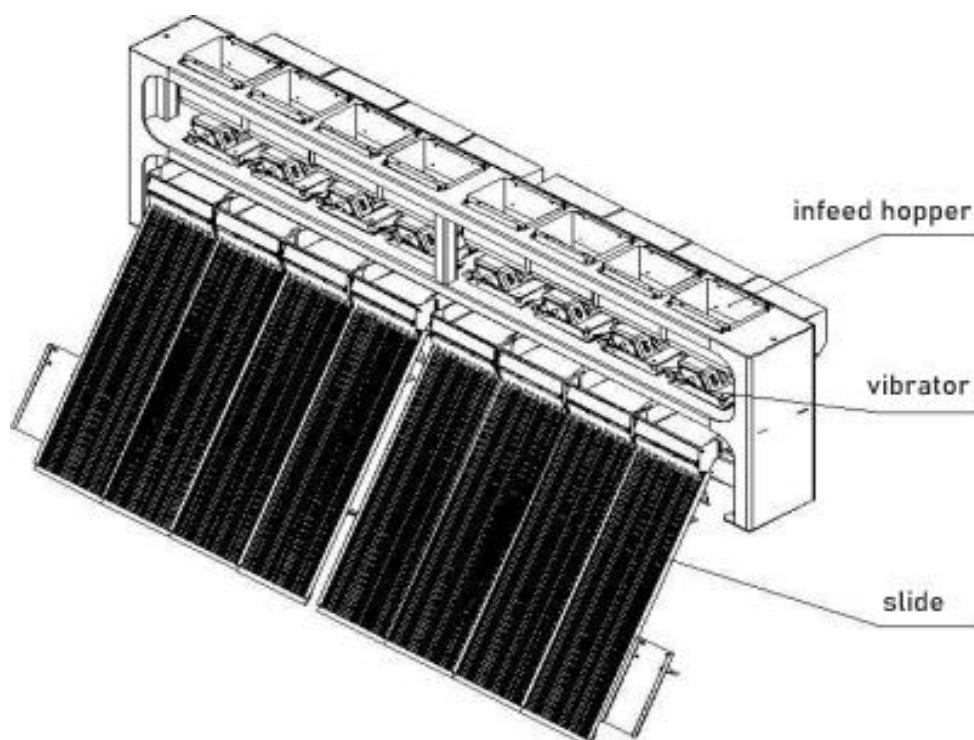
2.2.2 Grün I Series PET Infrared Sorter appearance product structure



2.3 Main Components



2.3.1 Material Supply System

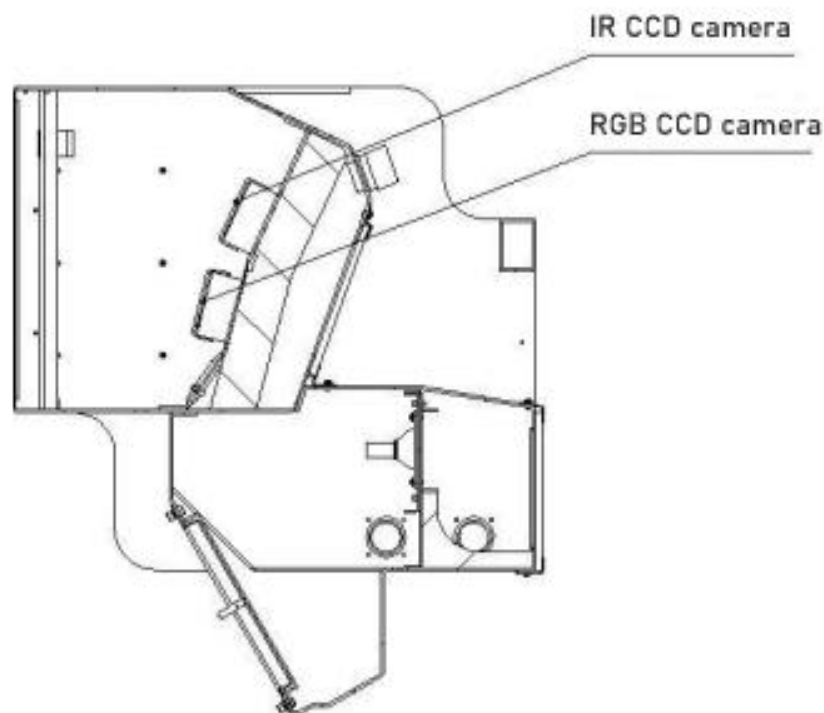


Supply System is composed of in-feed hopper,vibrator,upper dedusting(optional) and other components.

The elevator conveys the materials to the vibrator.The output of the machine can be controlled through adjusting the vibration of the vibrator.

The in-feed device such as hopper is installed on the frame of the vibrator and separated from the machine by quakeproof spring to reduce the resonance.Supply system can provide material tube sorted,as well as realize the function of controlling the output through adjusting the vibration of the vibrator and the flow control board of the in-feed hopper. After supplied by vibrator,raw material flows down through the chute in order to enter the observation cabinet smoothly.

2.3.2 Optoelectronic System

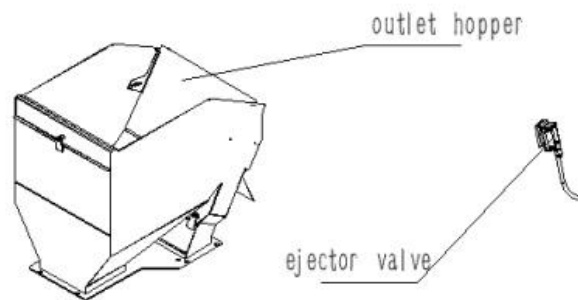


Optoelectronic System the core part of the the whole machine,composed of RGB LED light resource, IR LED light resource, background board, RGB CCD camera, IR CCD camera and related auxiliary devices.

RGB LED light resource and IR LED light resource provide stable and smooth light for the function of color recognition and shape recognition under RGB light.

Background board provides reference signal for electrical control system, it is equivalent to the accepts and has great different with rejects regarding reflection properties, and complements the function and performance of color recognition.

2.3.3 Sorting System



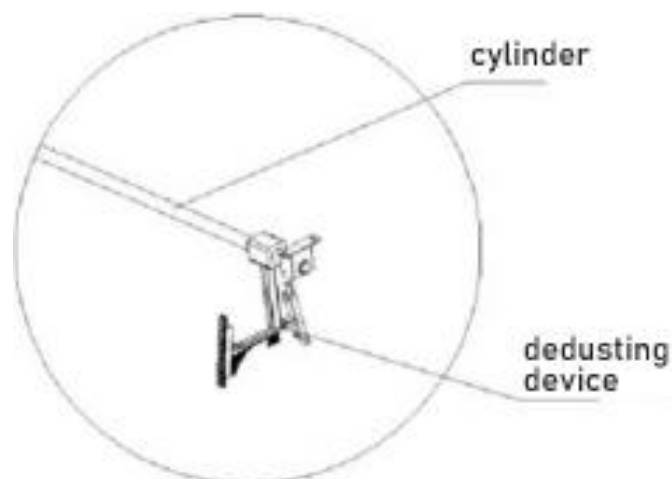
Sorting System is composed of outlet hopper, High Speed Ejector valve and other accessories.

Outlet Hopper is combined by front and back cavities, and separates the material into accepts and substandard material according to related sorting solution.

Due to the reject has high kinetic energy after shot by high speed ejector valve, there must be enough space and some necessary damping solutions on the contact surface of the outlet hopper in case of mistake sorting when reject bounces to CCD scan area for the second time.

High speed ejector valve jets compressed air and blow reject immediately receives execution. It is proved by tests that delay time, jetting time and the quantities of ejector valves are the key factors affecting the performance of optical sorter.

2.3.4 Dedusting System

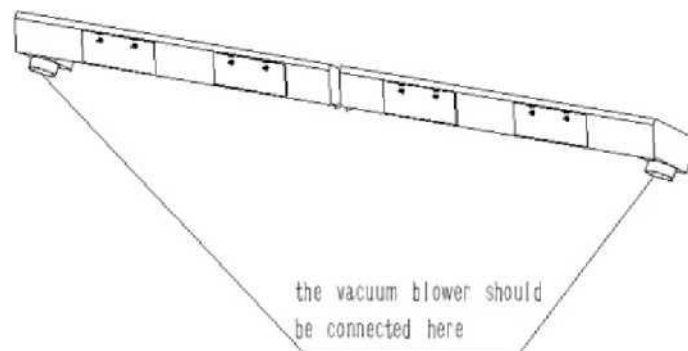


Dedusting System is composed of rod less cylinder, dedusting device and other accessories.

There will be dust and other impurities easily adhere to the glass during sorting procedure.

Chain problems will occur if optoelectronic system easily makes misjudgement when there are lots of dust and impurities accumulating on the view window. Such problems will affect sorting accuracy and loss ratio, or shorten lifespan even burn the control system board of ejector valve if overworking.

The dedusting device is installed on the rodless cylinder, and the general control system pushes the cylinder piston to slide by controlling the cylinder valve switch according to the preset time to achieve the effect of regularly cleaning the dust and impurities on the glass.



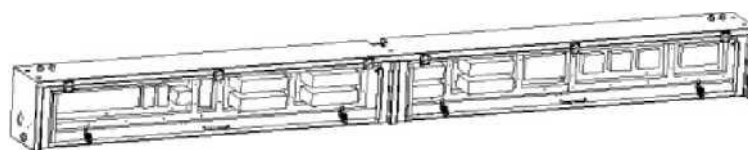
Caution:

The user must prepare the dust pipeline to avoid too much dust accumulated in the closed machine body as it may affect lifespan and sorting performance of the machine directly.(dust blower is equipped by user)

2.3.5 Man-machine Interface

Operation platform carries the color touch screen in big size and wide viewing angle, and preset multiple sorting mode for users. Friendly man-machine interface can be adjusted conveniently and rapidly according to the actual material. Moreover, visual interface of image capture and simulation is beneficial for users to operate, teach machine relevant algorithm. According to the settings by user, the machine can automatically choose proper sorting solution to achieve the better performance, so that it dramatically improves the performance of ease operability.

2.3.6 Electrical Control Cabinet

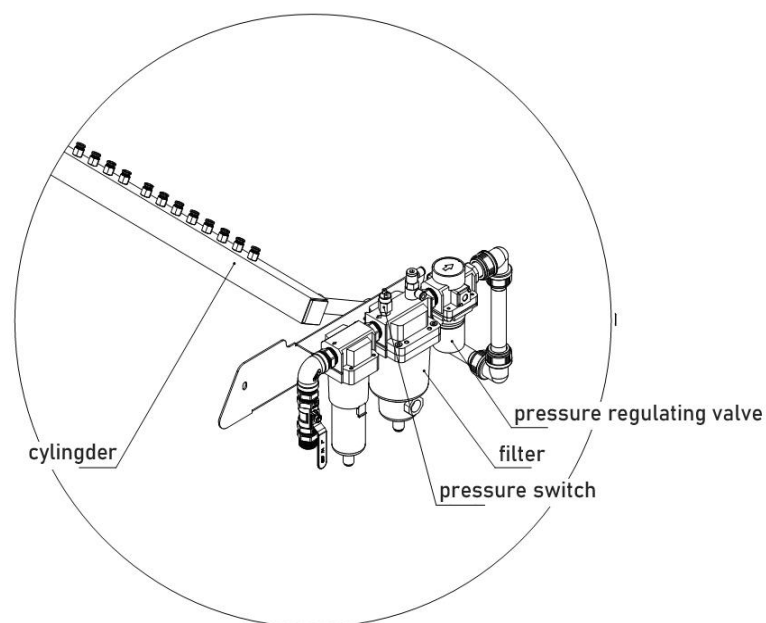


electrical control cabinet

Electrical Control Cabinet is fully sealed to achieve the effect of preventing from lightning, short circuit, electricity leakage and so on. And it is a control system and the core of the machine, composed of micro system. This control system is responsible for collecting, amplifying and processing digital signal, issuing the instructions through control system to jet the compressed air, blow the rejects, accomplish sorting function and achieve the purpose of accurate sorting.

Electrical control cabinet can achieve the function of accuracy adjustment, flow control, timing of dedusting, pre-warning of air pressure, heater control, self - detection of error, detection of ejector valve and so on.

2.3.7 Air Path System



Air Path System has the accessories of filter, pressure regulating valve, cylinder and so on to supply the whole machine with high-purity compressed air. It is also with pressure switch, will automatically gives early warning and show the info to check on the screen when input air pressure below 0.4MPa.

Chapter III Installation Instructions of Machine Platform

3.1 Preparation Work before Installation

We suggest that make adjustment of the installation site as required below before machine installation in order to avoid problems.

Requirement of Installation Location :

① Requirement of site and environment

The machine must be installed on a level surface. If additional support brackets are installed, they should be located according to the position of machine feet and fixed by set screws. No ground shaking should occur at installation site. Installation should be made in well - ventilated places rather than places of low or high temperature, or with high humidity or many particulate matters.

Prevent it from interference of strong electromagnetic on site or in the vicinity, such as electric welding, high frequency transmitters etc.

Grün I Series PET Infrared Sorter must have good grounding to avoid static electric. The material inlet and outlet that connect to the machine should be made of metal and be well grounded, same as the dust sucking pipe.

All the welding work at the site should be finished before installing the machine.

② Requirement of light

Don't expose the machine to sunlight or light emitted from lighting equipment. But enough light for machine operation and maintenance is required.

③ Requirement of maintenance space

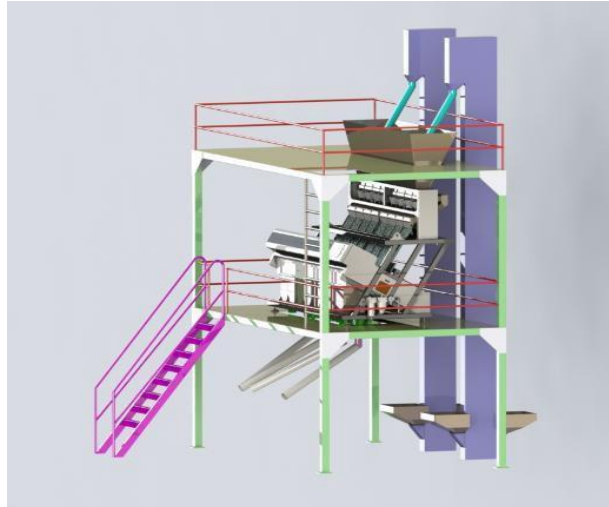
There should be enough space around the machine in order to facilitate the operation and the maintenance or inspection, especially in front and rear. It is very important to leave enough space for replacing light sources as well as maintaining the components in the electric box. In terms of receptacle, sufficient space should be left to ensure disassembling of receptacles of accepted and rejected material. At the same time, special attention should be paid on leaving sufficient space to meet the maintenance requirements of ejectors.

3.1 Installation Instructions of Platform

The machine feet can't be removed for installation, and it must be leveled up on the horizontal platform. The levelness of the machine shall be adjusted to 2/1000 mm or less by a leveling instrument.

There should be working paths around the machine (at least keep 0.8m for each side) in order to operate, maintain and inspect it. According to the working site, upper input hopper must be in line with in-feed pipe from the elevator which should be with adjusting board and storage of material flow. Special attention should be paid on that the in-feed pipe should not pressure on the hopper to avoid any vibration affecting the performance. Related two pipes matched with output hopper are for accept and reject separately.

3.2 Installation Diagram of Platform



A Warning --For the safety of human and machine:

1 : Please choose level ground during installation. There should not be vibration,electromagnetic disturbance, etc. at installation place.

2: Please make sure the lifting hoof is stable before lifting, pay special attention to safety.

Chapter IV Requirement of Electric Installation and Introduction of Circuit Board

4.1 Air Supply Installation

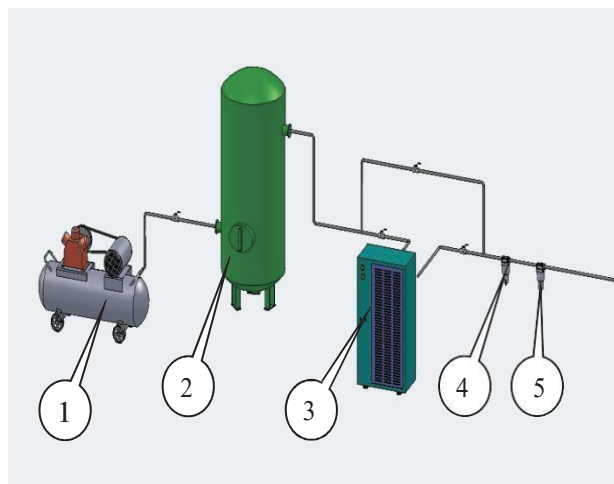
The user must adopt an oil - less and waterless air compressor matched with a water diversion filter (Multistage and high precision filter system must be used for some users choose twin screw air compressors, and replace filter element regularly). The joints between the air passage elements shall be linked with Dg25 mm galvanized pipes or another higher grade pipes. It's advised that the air compressor be installed in a separate neighboring room close to the machine (the maximum distance is 20m) so as to reduce noise and secure sufficient supply of air pressure to the PET Infrared Sorter.

Warning— For consideration of human and machine safety, one must ensure that air supply being cut off when connecting or disconnecting pipes or their spare parts.

Notices for air supply system installation and operation:

①Clearance of the blockages in the pipelines shall be done before connecting the pipelines. Moreover , properly pump it empty when connect to the main pipeline of sorter to avoid dust and impurities enter inside.

- ② In order to avoid the pipeline vibration, please use high energy soft pipe line connecting to a i r compressor and to sorter.
- ③ The air filter of the machines is only a complementary of the engineering air filtration system. The air supply should be turn off when linking or cutting the pipes.
- ④ The working temperature range of air compressor and filters is 0°C-40°C. When indoor temperature is below 0°C, in case the filter and pipelines gets frozen, the operator shall air dry it after turning off the machine and take proper measures to keep it over 0°C. Otherwise, the frozen pipeline will block the air and damage the filter components, costly maintenance charge will occur.
- ⑤ Air compressor shall be put in a place with good ventilation, flat ground, low moisture. Keep the working temperature below 4 0°C. Reserve a 0.5M passage clearance for maintaining purpose. Keep out of direct ray of sunlight. Shelter from the rain.
- ⑥ The tube between air compressor and air tank should be longer than 3.5m and they two should be installed in different places.
- ⑦ The preliminary filter system shall keep distance from the air compressor, otherwise it be used to utmost.
- ⑧ If the pressure gauge of the machine indicates that the air pressure is below 0.1 M Pa . You should replace the filter of the



preliminary filter. Removing without replacement will lead to the ruin of the components in the secondary filter system.

Diagram 4.1 Air Supply Installation

1. Air Compressor 2. Air Tank 3. Cool Driver(optional) 4. Main Line Filter 5. Water Separator

4.2 Electrical Installation

4.2.1 Main Isolator Switch

Some countries have the rule that it must be through a independent isolator switch for sorter connecting with main power wire. Please try to install the independent isolator switch in advance if user doesn't have existing one.

4.2.2 Power Regulator and Grounding Pole

The following preventive measures are suggested to use the sorter reliably where the voltage is not stable may caused by supply, heavy machinery affection or other factors.

1.Installation power regulator integrated separator device between power supply and PET Infrared Sorter.

2: For the security of electricity providing and reliability of machine operation, high quality grounding connection is required. Grounding resistance should be as low as possible ($< 1 \text{ ohm}$). Every machine or machine group must have dedicated groundings.

I. Installation of Power Regulator

Choose the right power regulator according to the power voltage of the machine, and installed it before the machine connect to the power supply.

II. Installation of Grounding Pole

In order to make reliable grounding, following conditions are required:

- ① High - quality connection between connect grounding pole and ground wire is required ;
- ② The residence of grounding wire is required to be possible low.
- ③ All parts of machine like the frame and metal accessories, the machine, the power regulator, the isolation transformer should be well ground;
- ④ Separation from the grounding of other machinery is required

User must choose high-quality material as earth rod, and keep the surroundings moist. Dry and isolating surroundings can't provide grounding in low residence. The earth rod resistance should be checked after installation, and the residence value may increase in dry weather. With time passing by, the earth rod should be changed timely in case it gets rusty.

All powers and groundings must be accomplished by qualified electrician,basic grounding(in the location of power supply inlet)should be high-quality and full grounding;All parts of the machine should be grounded independently or by connecting to the machine frame.Any conductor devices near the machine should be earthed; The material inlet and outlet,dust sucking pipe that supplied by the user should be made of metal and be grounded properlyin case of static electricity.

For the security of electricity providing and reliability of machine operation, high quality grounding connection is required. Grounding resistance should be as low as possible and theoretical value should be less than 1 ohm. Every machine or machine group must have dedicated groundings

How to achieve all above conditions:

①. The connection of Grounding Pole and Grounding wire

The connection of grounding pole and grounding wire is rolling grounding wire to a loop fixed to grounding pole by screws and nuts. The connection spot should be treated in corrosion resistance and seal.

②. The Grounding Wire

The grounding wire connected machine and grounding pole is required to be independent and insulative, also the twisted wire in copper core is demanded in common.

③. The connection with machine frame

It is better to tight one time between grounding wire and machine frame, and tight it to the hole site with M8 screw and gasket.

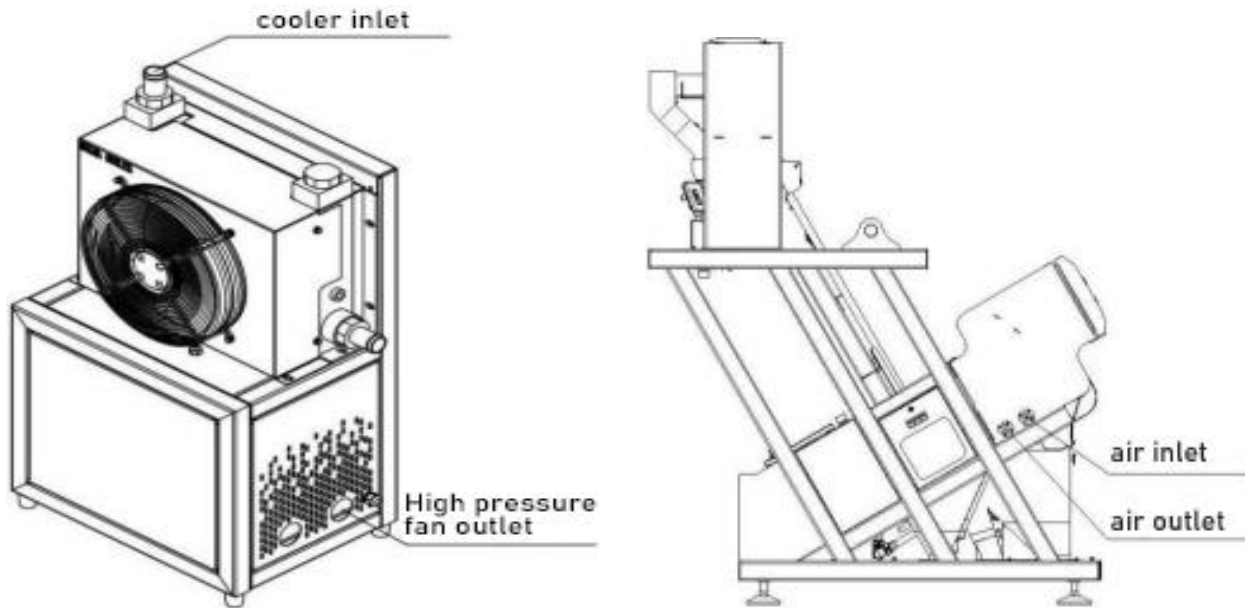
④. The connection of metal accessories near

It is necessary to connect grounding screw on the machine and near metal accessories, better to tight the connection with screw and nut.

4.2.3 Power Supply of the Machine

The power supply of this machine is single phase, $220V \pm 10\%$, 50HZ, power control cabinet should be installed within 5m from the connection of incoming power line and machine cord.

4.2.4 Radiator installation



(1) The external power supply of the radiator is single-phase AC 220V±10%, 50HZ.

(2) The air outlet pipe of the high pressure fan at the lower end of the radiator is butted with the air inlet pipe on the side of the machine, and the air inlet pipe of the cooler at the upper end of the radiator is butted with the air outlet pipe on the side of the machine.

4.3 Instruction of boards

4.3.1 Board Types

There are Camera Board,Signal Interface Board,Ejector Drive Board,vibrator Drive Board,Panel Light Board,Peripheral Control Board and Constant Flow Source Board of this machine.

4.3.2 Board Functions:

①.Camera Board: Receive CCD signal CCD,AD transformation,FPGA algorithm implementation, receive configuration parameter from screen,output ejector valve signal,transponder panel light parameter.

②.Signal Interface Board:integrate the commands from all camera boards and transpond to screen and transponder screen serial port info.

③.Ejector Drive Board: control and drive ejector valve.

④.Peripheral Control Board: control vibrational frequency of vibrator and feedback the dedusting info of the brush and peripheral error info.

⑤. Panel Light Board: real-time display the status of back and front ejector valve.

⑥. Constant Flow Source Board: control the luminance of LED light.

⑦. Vibrator Drive Board: control to start or stop and vibration frequency of the vibrator.

Chapter V Operation Instruction of the Machine

5.1 Operation Instruction

5.1.1 Summarization

Warning: Warning notice is a kind of command, failure to follow this notice may lead to personnel injury and unnecessary damage to the machine.

Caution: Caution notice is a kind of suggestion, failure to follow this notice may lead to machine damage or unnecessary processing.

5.1.2 Warning

①. Before dis-assembly and assembly of all parts or maintenance of the machine, one must ensure that air supply and power supply being cut off, unless otherwise specified in the instructions.

②. There is high voltage on the circuit of internal machine, any repairs regarding circuit must be accomplished by professional after-sales people.

③. Do not move any protection device when the power supply is in service, replacement of protection device should be taken before operation the machine, unless otherwise specified in the instructions.

④. Operation and maintenance must be taken by qualified people after training and read operation instructions and well understand all the safety marks such as control, warning, caution, etc.

5.2 Operational Guidance

5.2.1 Introduce

We are introducing how to start machine and operate it at a clean and tidy working site, how to use "operation interface" and related devices is also included in this chapter. We strongly suggest to carefully read this chapter before use the machine.

The machine can be used for sorting if installed properly, for more detail operations please refer to the operational guidance as below.

5.2.2. Summary

Some common parameters has been set before the machine leave factory, and accordingly stored in the machine by different mode. Only some simple interface operations is required, the machine can automatically sort for users, no need too much manual operation.

(1) Note

The machine is debugged, tested and confirmed qualified before leave factory, because transportation shaking and other factors may affect some adjusted values of the machine. Our Engineer will adjust the machine again according to the specific circumstances of the scene and selected materials. After debugging, non-repairing/disassembly the machines by others, otherwise it will affect the use-life of the machine and good running. If it happens, any expenses regarding this matter will be borne by users.

(2) Preparation Work before Operation

①. Make sure the grain flow path is clean.

②. Turn on the air compressor, and wait until the pressure meter indicates above 0.6MPa (the maximum air pressure)

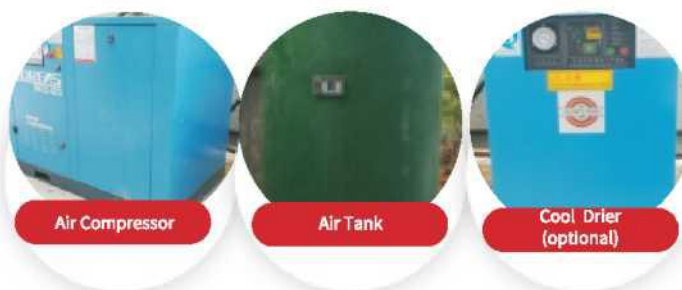
should be 0.7 MPa at first test).

- ③. Each time before turning on the air compressor, the waste liquid in it shall be drained up. When indoor temperature is below 0°C, in case the filter and pipelines get frozen and block the air and damage the filter components. The operator shall use some heat sources (< 45°C) to toast it. To avoid any damages to the components inside pressure regulating valve, do not regulate the valve excessively.
- ④. Check if there is any air leakage in the air passage. Any leakage could be solved by tightening the adapter at the leakage position; Somehow the slight airflow at the ejector is normal.
- ⑤. Check if the waste liquid of filter can automatically drain up.
- ⑥. Check if there are any impurities on the vibrator trays, channels or the glass of the observation cabinet; if yes, clean it with an air gun or cloth but never use hard articles for cleaning in case of damage to the surface of the chute. It is prohibited to wipe the channels with hard articles. Otherwise the surface of the channels may be seriously hurt and the sorting performance will be damaged.
- ⑦. Check if the AC power supply has been properly plugged.

5.3 Procedures of Machine On/Off

5.3.1 Procedures of Machine on

- (1) Switch on air compressor, cool drier (optional), and make sure air tank gets to the working pressure.



Caution:

Air Compressor → Air Tank → Cool Drier → Sorter

Please make sure that the air supply system can work well before turning on the machine.

- (2) Make the machine connect to power



Turn on air switch



Turn on power regulator

- (3) Use the air gun to clean the dust and impurities inside/outside the machine.
- (4) Use the air gun to clean the air compressor, cooling grid of cool drier (optional) .

Air Compressor





(5) Turn off the power supply of air compressor and cool drier(optional), drain up all the air and water inside the compressor, drier and tank.

Note:

Please disregard this procedure if the optional equipment can automatically drain up the water.



**Open the ball valve and
drain up the air and water
inside tank.**

5.4 User interface



5.4.1 Capacity Control

Click "Feed" turn to capacity setting page to adjust it. Capacity can be adjusted according to different sorting times(One could use this function if the machine is divided into three sorting times, first time sorting, second time sorting or third time sorting) and different vibrators. The capacity increases as the value increasing. The diagram is as below:



5.4.2 Select/ Accuracy

Click "Accuracy" to the adjustment page, user can make the decision if activate the corresponding solution by choosing the left boxes. The values in the edit box can be adjusted to control the good in bad and bad in good rate accordingly. As the value increasing, more material will be sorted, bad in good rate of accept will decrease. This value is efficient for every chutes, user can make the micro adjustment of each chute by clicking the right button.



Click "more" turn to solution control/display page, solution will display on last page after chosen. Please refer to next diagram.



5.4.3 Valve Settings

Click "Valve" turn to the page of valve settings, there are some related parameters

Blow time: how many microseconds blow one time

Chute: the valve to be tested belong to which chute, start from the left side,1,2,3...

Index/Code: the serial number of the valve

Single Test: choose the number of the chute and valve code/index, the chosen valve keep blowing.

Cycle test: valve will blow one by one from the first to the last

Stop/Test Stop: stop valve test



5.4.4 Mode/Model

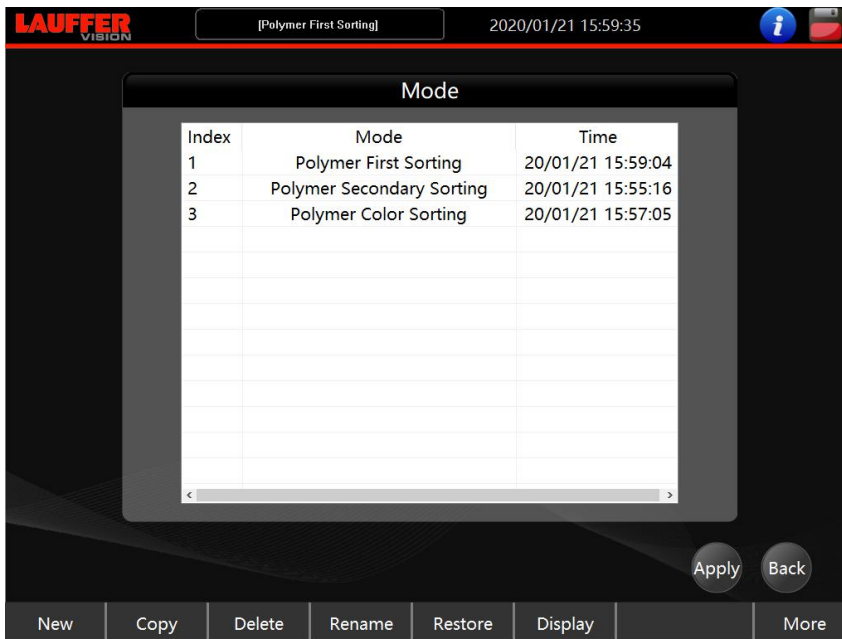
Click "mode/model" turn to the mode settings page, different modes can be stored based on different material.

New : create one new mode by using current parameters.

Copy: copy current mode to a totally new mode.

Delete: the chosen mode will be deleted.

Rename: give a new name of current mode.



Index	Mode	Time
1	Polymer First Sorting	20/01/21 15:59:04
2	Polymer Secondary Sorting	20/01/21 15:55:16
3	Polymer Color Sorting	20/01/21 15:57:05

Click "clean" turn to the setting page, the critical parameters are as below.

Time: how long of the brush cleaning the glass one round trip,unit is second.

Interval: the time distance between the brush cleans two times,unit is minute.

Enable: cleaning function will be closed after chosen.

Timing: adjustment of interval time.

Team/Auto-mode: the machine will automatically make decision of cleaning or not.

Clean: the brush will start to work once click this button.



5.4.5 Set/Settings

Usually we suggest that the parameters under this function are accomplished by engineers from Lauffer.

Chapter VI After-sales Service

6.1 Routine Maintenance of PET Infrared Sorter

Important Notice:

It is an efficient way of prolong lifetime of the machine to keep the machine clean and tidy, as well as keep working site healthy and ventilative. Please maintain and clean the machine strictly according to the following instructions.

Per Shift

Before maintenance, use the air gun to clean the channels and the observation cabinet, and pre-run the machine;

Notice: When cleaning the observation cabinet with an air gun, never blow it in a way of aiming the gunpoint at the ejector nozzle in case of blocking by human.

Inspect the signal indication (including work indication and alarm indication) and actuation of ejectors during the running of the machine;

Check the air compressor, such as air pressure, oil temperature and the sound. The air compressor shall be drained at least 3 times per shift at regular time (properly more times to drain when it is in hot weather);

Power off the machine by pressing “shutdown” button on the touch panel, wait for 10 minutes then turned off the power supply of the machine and the compressor. Drain the compressor.

Clean the ejectors, chutes and observation cabinet with air gun;

Clean the vibrators, inside of the machine frame, receptacles and wiping brush with air gun.

Per month:

Check the filter element, clean it every season and replace it every year.(It is an efficient way of prolonging the lifetime of jet nozzle to dean and replace the filter element regularly, and affect the machine performance accordingly).

Check the cleanliness of the brush and replace it if it can' t meet the demand of cleaning).

Per Half-year:

Replace the oil of air compressor.

6.2 Maintenance of the Sorter

6.2.1 Maintain and Clean the Glasses of Observation Cabinet

Firstly use air gun blow away the dust and impurities on the chutes and glasses of observation cabinet.And then Clean the glass surface of observation cabinet with soft cloth dipped in alcohol.



Purchase some medicaid alcohol and gauze or mask,fold the gauze or mask flat and a little longer than brush;



①Fold the gauze or mask flat;

②Make the folded gauze or mask longer than brush leather.



Dipped the folded gauze or mask into the alcohol.

Sandwich the gauze or mask dipped into alcohol between the wiping brush and glass surface, then run wiping program to get better cleaning effect.



Loose this screws

Sandwich the gauze or mask flat to the both brushes

And start to clean automatically refer to the "clean" Procedure 5.4.5

6.2.2 Clean and Maintain the Vibrator & Tray

①: Clean the dust on the vibrator platform



Per day after work: Clean the dust and Impurities on the vibrator platform by air gun.

②. Clean the dust in the vibrator tray;



Per day after work: Clean the dust and Impurities in the vibrator platform by air gun.

③ Use Use scoop if there are dirt and material agglomeration accumulate on the vibrator tray.



6.2.3 Clean and Maintain the Chute

- ①: Clean the dust on the chute by using air gun ;
- ②: Use gauze or mask dipped into alcohol if any dirt on the chute although.

Caution:

In case of any damages to the chute, it is forbidden to use sharp objects or iron material to clean the chute.

6.2.4 Clean the Output Hopper

Clean the dust and dirt inside the hopper by air gun.

6.2.5 Clean the Under Air Passage

- ①: Switch the lock on the front wicket,remove the wicket, and open the wicket gate on the out hopper;
- ②: Use the air gun to clean the dust and other foreign material in the cavities of out hopper and air draft board.

Cleaning Requirement:

at least once one week to avoid the sorting performance.

6.2.6 Clean and Maintain the Dedusting Cylinder

Caution:

Make sure the air supply is cut off and empty the air pressure through air gun before this procedure.

- ①:Clean the dust and dirt inside the cover.

Cleaning Requirement: at least once one week.

②: Use gauze or mask dipped into alcohol to wipe.



Cleaning Requirement: Wipe the cylinder clean by using gauze or mask with alcohol every week.

6.2.7 Clean and Maintain the Air Filter & Usage of Air Pressure Regulator Valve

6.2.7.1 Clean and Maintain the Air Filter from Sorter Accessories



Screw off the four screws on upside of the filter



Filter element

Inspection Demand: disassemble the filter and check if any aging and damages of the filter element every half year or working 2,000 hours in total.

6.2.7.2 Usage of Air Pressure Regulator Valve

The way of adjusting air pressure : Rotating the black knob adjusts the air pressure.

Normally Air pressure range:
0.3Mpa-0.4Mpa Clockwise rotation will increase the air pressure.



6.2.8 Clean and Maintain the Air Compressor and Cool Drier

①: Maintain and replace the air filter element of the air compressor regularly according to the supplier;



②: Drain up all the air and water inside the compressor, cool drier(optional) and tank. (Please disregard this procedure if the optional equipment can automatically drain up the water)



Every day after work, Open the ball valve and drain up the air and water inside tank and air compressor.

③: Routine Maintenance and Cleaning of Air Compressor



1.The last work of every day, open the door panel from the side and use air gun to blow air grid from inner to outer.

2.Every day switch on to drain up the water, and check if contains oil in water, if yes replace the filter element possible soon.

3.Replace the filter element regularly according to the requirement from supplier.

④:Routine Maintenance and Cleaning of Cool Drier(optional)



The last work of every day, open the door panel of cool drier from the side and use air gun to dean cooling grid. It proves efficient of the function of getting rid of water for the cool drier if air inlet is hot and air outlet is cook Regularly open the drain outlet and drain up the dirty water.

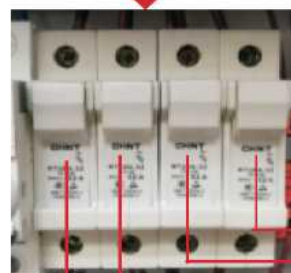
6.3 Identify and Replace the Fuse of the Sorter

6.3.1 Identify the Fuse of the Sorter

Identify and disassemble the fuse on inside the terminal block.



fuse protector (FP) from terminal block



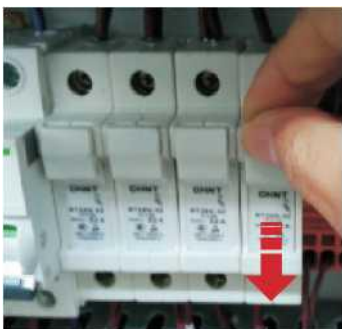
FP4 (vibrator 5A)

FP3 (LED 10A)

FP2 (ejector valve 20A)

FP2 (ejector valve 20A)

6.3.2 Replacement of the Fuse



Pull down the FP



Take out the fuse inside FP



You can find the ampere info from the label stuck on the ceramic fuse.

Caution: It is the principle that the specification and model of the new fuse must be the same as the old one.

6.4 Troubleshooting

Thank you for choosing Lauffer. This machine has the function of self-detection of faults and there are also alarms of faults parts. Sometimes the faults might lead to breakdown of the machine. When any faults occur, please remedy the machine according to the table below. Contact our service department if they cannot be fixed. Normally customers can fix all the faults except of the ones in micro system.

Normal faults and remedies are listed as follows:

Symptoms	Fault	Remedy
Air leakage at ejector valve	Impurities went into the ejectors; the ejectors are Damaged. The temperature is lower than 5°C, and water flowed into the ejectors.	Ejector valve has some certain requirement for the air flowing through, it will cause air leakage at ejector valve if there too much moisture and impurities with air. It will decrease the sorting quality when air leakage at ejector valve, and also affect the stability of air circuit. Once the air leakage of ejector was found, it indicates ejector has hard problem for user to repair, please contact after-sale service department and our engineer will replace the damaged ejector valves.
Non-actuation of ejector valve	Bad connection between ejector valve and ejector holder; Ejector wire broke; Open circuit in control circuit.	Check the connection between the ejector and ejector circuit. If any loose connection is found, disconnect the power supply of the machine and re-connect the loose connector. Check the ejector drive circuit (including the fuse). But as the high voltage power supply is involved in this case, it is not suggested that the users check by themselves, please contact our after-sales service for professional solution.
Ejectors blow air weakly, or no air blown	Air pressure is too low.	Check if the working air pressure of sorter is normal; Check if the air pressure pipe switch on.
Material bounces on chutes	The raw material temperature is too high; Chutes are dirty.	Material bouncing will cause the sorting quality decreasing, it is common for the new debugging machine. Check if there are any damages of the chute, then check if there are dirt and agglomeration on the chute. If yes, clean the chute refer to the instructions above.
The sorting quality gets worse and worse	The glass surface of observation cabinet is dirty; LED lamps are broken; Sensitivity, background plate or feeding capacity changed improperly	There are many reasons for this symptoms. Firstly check if dedusting device works well, then check if there are too much change for the raw material, sorting parameters need to be re-adjusted if bad ratio of raw material changed a lot.
No sorting at all	Sensitivity value is set too low; Parameters of the control system changed or in error; Background plate position is improper No compressed air enter into the machine	Firstly check if sorting solution and related machine parameters are proper refer to the situation of indicator light and ejector are not working well; Exclude all the possibilities above, it might be fault in the control circuit board, please contact after-sale service department to handle it if difficult for you.
Panel light keeps on	It may be too high for the sensitivity value; There are dirt on the background.	Firstly down the threshold of sensitivity; Then wipe and clean the glass and background.
Rod less cylinder was blocked when sliding	Resistance exists during sliding.	Firstly check if there are too much dust on the rod less cylinder, if yes clean it using soft cloth dipped into alcohol; Then check if there are any damages on the surface of the cylinder, push the brush by hand, if the brush doesn't move, please contact after-sale service engineer for handling.

Chart 6.1 Normal faults and remedies

6.5 List of Wearing Parts

Wearing parts of this machine is as below:

	Model	Description	Note
1		Brush Leather	
2		Brush	
3		Back Curtain	
4		Front Curtain	
5		Curtain	
6	ø28/11064(L type)	L Bend	
7	ø28	Pipe Strap	
8	ø28/11065	Plastic Pressing Ring	
9	ø354	O Ring	
10	ø28/11066	Screw Cap	
11	ø28/11064(Ttype)	T Type Adapter	

6.6 Sheet of Installation/Debugging/Acceptance

Customer:	
Customer Address:	
Contact Person:	Mobile No.:
Machine Name/Model:	
Acceptance Place:	Acceptance Time:
Completion Status of Installation/ Debugging	<p style="text-align: right;">Engineer: Date:</p>
Completion Status of Training	<p>Main Content:</p> <ol style="list-style-type: none"> 1、 Brief description the main part and related function of the machine; 2、 Explain and demonstrate how to operate the machine; 3、 Explain how to maintain the machine; 4、 Guide the user to operate the machine; 5、 Others. <p>Acceptor:</p>
Acceptance Conclusion:	
Acceptor:	Signature and Stamp of Customer: Date:
Remark:	

LAUFFER VISION

Lauffer Vision Technology Co.,Ltd.

Address:NO.123,Ziyun Road,Economic-Development Zone,Hefei,Anhui,China

Fax: 86-0551-65144631

Email: lauffer@lauffervision.com

Website: www.lauffervision.com

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