Full Spectrum LASER

# Industrial Dust Collector Installation and Operation Instruction

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**Please read this section carefully before using the industrial dust collector to ensure proper and safe operation.**

## Safety guide for industrial dust collector:

- All wiring and inspection must be performed by qualified professionals.
- Ensure the power cord is not stepped on or crushed. If wires are damaged, replace them immediately.
- Do not connect the power supply with wet hands or in wet conditions.
- The power supply must be grounded. A dedicated circuit breaker is required for the main power supply.
- Do not climb, stand, or place heavy objects on the machine while it is running.
- Do not repair the dust collector by yourself. Please contact the manufacturer if needed.
- Please cut off the power before repairing.
- The machine needs professional operation when hoisting and moving.

## Warning !

## Application of the industrial dust collector:

- This dust collector is not equipped with fire suppression or explosion-proof systems. If collecting combustible or explosive materials (such as polished fiber, paper shavings, sawdust, aluminum/magnesium dust, or iron dust), consult with a professional fire protection agency to install appropriate safety systems compliant with local regulations.

such fire hazards or similar fire hazards, and install fire-fighting and explosion- proof systems as required in accordance with the relevant local regulations on fire and explosion protection Combustible substances (such as polished fiber shavings, paper shavings, sawdust, aluminum dust, magnesium aluminum dust or special iron dust), or combustible solvents can cause the risk of fire or explosion. Therefore, if there is combustible substances that may cause fire or explosion, special care must be taken in the course of operation to protect workers and property from any damage caused by fire or explosion. Keep away from other flammable and explosive materials around the dust collector or fume extractor, the location and operation of the dust collector must follow the relevant national and local fire and explosion regulations and other relevant regulations. Strictly prevent sparks, cigarette stub and other burners from entering the pipes and filter cavities of dust collectors or smoke collectors, otherwise they may cause fire or explosion. The dust substances produced by different materials during cutting and welding are different, which may lead to explosion when the external factors change. The dust inside the dust collector must be cleaned during operation to avoid the mixing of the two substances Please use the special replacement parts of our company.

# Installation of Dust Collector

**Warning: please ensure that the operator complies with the standards and regulations of electricity and air during installation.**

## Accessory :

operation manual * 1,

electric cabinet door key * 2, ash bucket * 1

## The site needs to provide:

1. The power supply requires 3-phase and 4-wire
2. Compressed air is not less than 0.5MPa~0.7Mpa, clean and dry
3. G1/2（12mm）air pipe
4. Air pipe connect to laser cutting machine


Fig. 1 Dust Collector

## I. Power connection

Dust collector with 10 meters of 4-core cable, please follow the line mark to ensure that A, B, C,PE connection is correct. Please use the key provided by the accessory to open the panel and close the air switch in the cabinet. The controller is equipped with a phase sequence protector. When the phase sequence is abnormal(Picture 3), the interface will give an alarm and replace any two ends of A / B / C.

Fig.2 Electric Cabinet


Fig.3 Phase Order Error

## II.Compressed air connection

Connect the dried and filtered air into the bottom of the machine with Diameter 12mm pipe. Check the pipes and connecting fittings after ventilation to ensure that there is no air leakage in all parts. Adjust the air pressure to 0.5MPa~0.7MPa.

**Compressed air must satisfy:**

1. Should be adjusted to 0.5-0.7Mpa
2. Dry and NO moisture.
3. Guaranteed flow : 0.32m ³/ min.
4. There is NO air leakage at the joint.

Fig.4 Compressed Air Connection

## II. Pipe air inlet connection

The air inlet is shown in picture 5 (common:250mm/300mm),Ensure that all connecting parts of the air pipes are well sealed,if there is any leakage,seal with sealant.

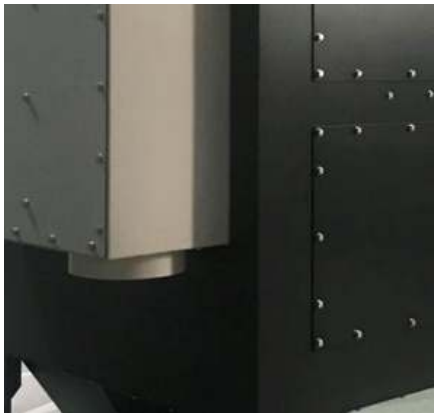
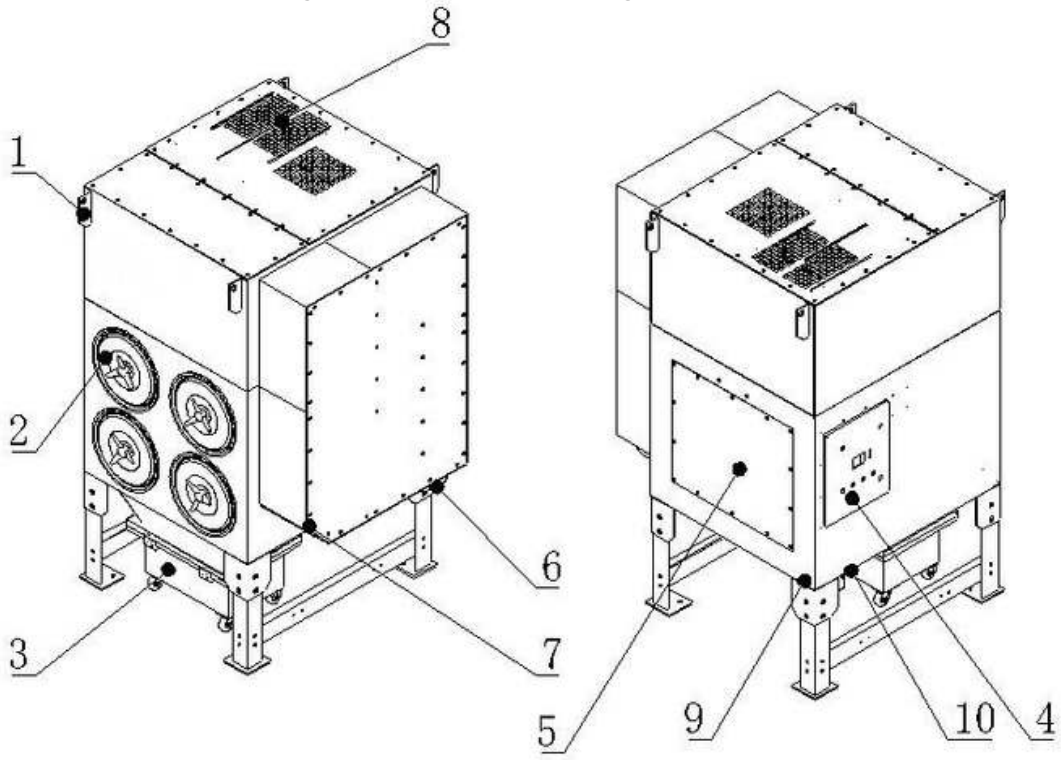


Fig.5 Airinlet

## IV.Start up and operation

Before start-up, make sure that the ash hopper is properly installed at the ash discharge port. Check that the service door is closed. Check whether the compressed air pressure is up to 0.5-0.7MPa. Open the electric cabinet door, open and close the main switch, and press the fan start button. Only when the necessary conditions are satisfied, the pulse back blowing cleaning system will start to work.

Fig.6 AppearanceDiagram




1. Lifting ear
2. Filter barrel cover
3. Ash barrel
4. Control panel
5. Maintenance door
6. Air inlet
7. Large particle dust port
8. Fan air outlet
9. Power cord inlet
10. Compressed air

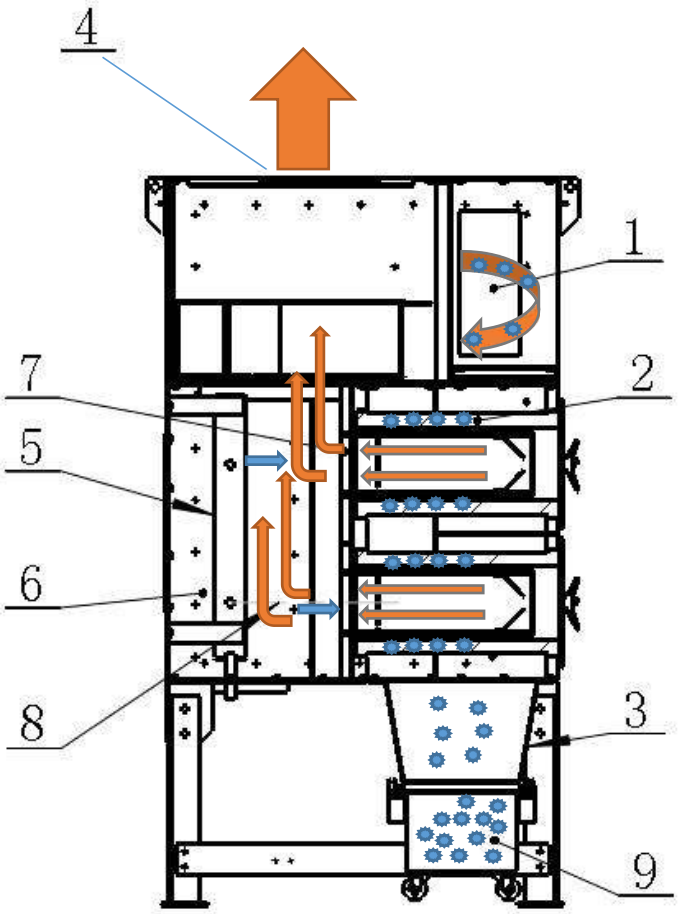



Fig.7 Machine Running Diagram

| | | |
|---|---|---|
| 1. Dirty air inlet | 4. Clean air outlets | 7. Flower board |
| 2. Filter elements | 5. Storage tanks | 8. Pulse back to blow compressed air |
| 3. Ash hopper | 6. Electromagnetic pulse valve | 9. Dust fall |

# 1. Product introduction

The TODC series industrial dust collector is a pulse backblowing industrial dust collector developed in combination with environmental emission requirements. It has the characteristics of large air volume, pulse backblowing, reliable reliability and small floor space. The dust collector is used for the collection of dust and particles, whether it is used for air pollution control or as part of the production process, and suitable for laser cutting, laser welding, plasma cutting, flame cutting, woodworking equipment, etc.

# 2. Working principle

## 2.1 Filtration process

Under the action of the fan, polluted air produced by equipment enters from the inlet of the dirty air. First, it encounters the spoiler between the inlet air, which acts as a spoiler to the incoming gas and slows down the flow speed. Due to the gravity subsidence, the coarse particle dust directly falls into the dusty mouth of the large particles, which plays the role of pre-dust removal. After dust particles with the fine size and small density enter.

## The Cleaning Process

- A pulse valve opens, releasing a sudden burst of high-speed, high-pressure compressed air from the storage tank (cylinder).
- This burst, known as the ejector airflow, travels through a venturi and into the filter cartridge.
- The high-pressure air creates an instantaneous positive pressure inside the cartridge, causing the filter material to momentarily bulge and undergo a slight micro-motion.
- This action generates a shockwave that travels from the top to the bottom of the cartridge, effectively detaching the layer of deposited dust from the filter material.
- The detached dust falls into a hopper below.

The control system then directs the cleaning to the next set of filter cartridges, continuously circulating and repeating this process as needed to maintain optimal operating resistance

## 3.Installation instructions

Please ensure that relevant personnel comply with relevant standards and regulations when performing the installation, and have corresponding qualifications. Before power on the dust collector, check whether there are sundries at the outlet of the fan. Ensure that the ash hopper is

correctly installed at the ash discharge port. Check whether the maintenance door is closed. Turn on the main switch and press the fan start button. Open the compressed air valve and adjust the compressed air pressure to 0.5Mpa~0.7MPa. Only when the necessary conditions are met will the ash cleaning system start. Pay attention to separate from external flammable and explosive materials.

## 4.Operation setting

### 4.1 Operational panel and function

**WARNING Indicator** 🚨

The WARNING indicator light illuminates to signal that a failure has occurred in the dust collector system.

Possible Causes for Illumination

If the WARNING indicator lights up, the fault is caused by one of the following conditions:

1. Emergency Stop activated.
2. Fan Overload (excessive current draw).
3. Filter Blocked (high differential pressure).
4. Abnormal Phase Sequence (incorrect motor rotation direction).

5. Lack of Phase (phase loss/single-phasing).
6. Over Temperature (internal component overheating).

Required Action

If the WARNING indicator illuminates, follow these steps immediately:

1. Power Off the dust collector completely.
2. Check the system to identify and resolve the specific fault from the list above.
3. Do not attempt to restart the collector until the cause of the failure has been corrected.

① Press the "EMERGENCY" button immediately if there is any abnormal situation when the machine is running, such as the fan is stuck and the it sounds abnormally. After this button takes effect, all operation of the device stops. ② "BLOWER ON" button, press this button to start the fan when the device is powered normally. It cannot use this function when the machine is under “remote control” mode. ③ "BLOWER OFF" button. When the device is powered normally, press the button to stop the fan. It cannot use this function when the machine is under “remote control” mode. ④ "MANUAL CLEAN" button. When the knob is turned to the left, this function will not take effect. When the knob is turned to the right, this function will take effect. This function only takes effect when the machine is under “Manual Cleaning Mode”. ⑤ "FAN ICON", when the fan is running, the fan icon rotates, the fan stops running, and the fan icon is still. ⑥ "Dial and number" means the pressure difference between the two sides of the filter cartridge. The larger this number, the more serious the filter cartridge blockage. If it exceeds 3KPa, it is necessary to stop the machine and clean the ash. ⑦ Stop and run highlighted in the middle frame, showing the working state of pulse back blowing dust removal.

## 4.2 Function Setting


Fig.9 Default display


Fig.10 Backblowing mode selection

By default, the HMI displays control mode (local or remote), stop and ash cleaning, pressure difference, fan status, back blowing mode, back blowing status, function setting key and version information key.

### Running mode

1. set the delay fan to start automatically. It is the parameter F06, set it as 0 to turn off this function, and set other integers to indicate the power-on delay time.

2.The operation startup mode is divided into local mode and remote mode. The F02 is for mode selection.

The local mode startup operation needs to be operated on the control panel. In remote mode, the start-stop button on the machine operation panel cannot be used, and the remote line is shorted to start and disconnected to stop.

3. Optional frequency converter, normal operation and idle operation. The external button can control the operation mode.

## Dust cleaning mode

Touch the "AUTOMATIC"icon to enter the function selection table shown as Fig.10, then select the mode as per users' demand.

- **Automatic dust cleaning: the combined functional mode of timely ash cleaning and pressure difference ash cleaning. If any condition is met, it starts to conduct back blowing and ash cleaning.**

  **Parametersetting: F09** (startupbackblowingtime)**F22**(pulseinterval)
  **F10** (low pressure-difference value)

  **Ash cleaning frequency**: when reach the condition, the blowing times in each cycle equals to the quantity of filter covers, and then the next cycle is started after a pause time of F23 (cycle interval, 3min by default).

- **Manual mode：Turn the manual dust removal knob to the right to start dust removal.**

  **Dust cleaning frequency：** F22（pulse interval ,onceevery15seconds by default, always circulating.

- **Timely mode：** start cleaning when time is up

- **Differential pressure cleaning：** start cleaning when reach the pressure difference value

**Dust removal after fan stops:** when fan stops, pulse back blowing has the best dust removal effect. Adopt this function reasonably can keep the dust collector in good operation and prolong the life of the filter cartridge.

**Shutoff to dust cleaning can be divided into the following two situations:**

- Manually turn off the fan, and start back blowing after delaying the parameter F14. After completing the set number of times of F15, **keep the standby state, and start it again manua**lly.
- When the pressure difference is higher than the parameter F19 and the duration is longer than the parameter F20. Force the fan to stop and blow back to clean the dust. After completing the set number of times in F15, **the fan will automatically start running**.

**Note: If users want to turn off the high differential pressure shutoff and dust removal, please set the parameter F15 shutoff and dust removal times to 0.**

**Calculation of downtime and dust removal time:**
**F14+(F22+F21/1000)*F15*quantity of filter cover**
**Eg., default parameters F14=10,F22=15.F21=100,F15=10**
**6 dust-removal time of filter cover=10+（15+100/1000）*10*6**
**=916s≈15 min**
**4 dust-removal time of filter cover=10+（15+100/1000）*10*4**
**=614s≈10 min**

## 4.3 Parameter setting

Clicktheicon  ,selectnormalsettings,inputpassword(123456) then enter the parameter setting interface.


Fig.11 General settings


Fig. 12 Enter password

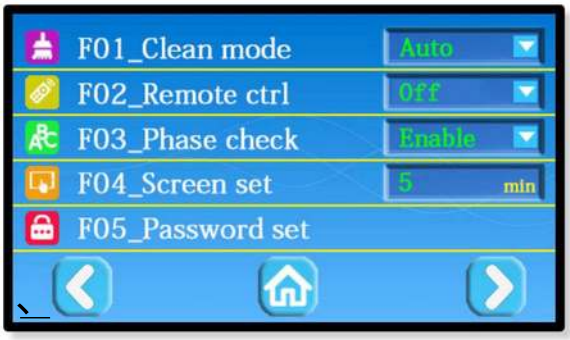



Fig.13 Parameter setting 1

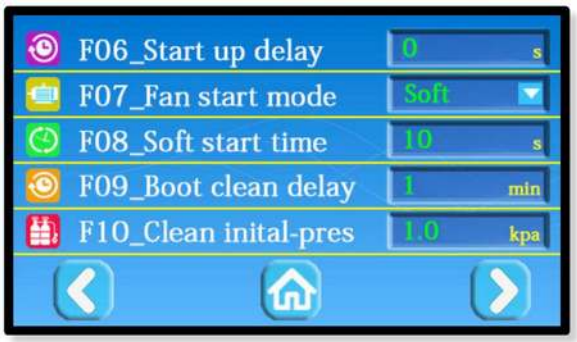



Fig. 14 Parameter setting 2

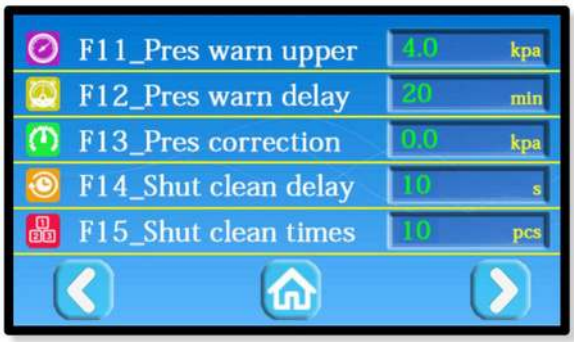



Fig.15 Parameter setting 3

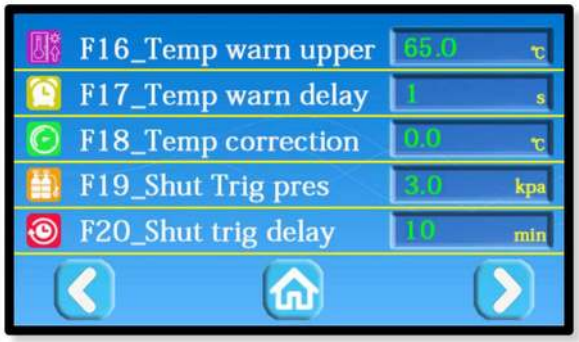



Fig. 16 Parameter setting 4


Fig. 17 Parameter setting 5


Fig. 18 Parameter setting 6

**Note: Make sure that you are familiar with the function of each parameter before making any modification.**

Select status query to query the current machine running status and alarm log.


Fig.19 State query


Fig. 20 State query

| S/N | Parameter | Scope | Default | Unit | Function Description |
|---|---|---|---|---|---|
| F01 | Dust cleaning mode | | Auto | | Auto, manual or timely dust cleaning mode for options. |
| F02 | Remote control | | Off | | Start or stop the remote-control function |
| F03 | Phase order detection | | Enable | | If the fan is rotating clockwise within 5 minutes, that means it is OK. |
| F04 | Screen time | | 5 | min | How long the screen sleeps if no operation |
| F05 | Password settings | | 123456 | | Password to enter the parameter setting menu |
| F06 | Boot start delay | 0-99 | 0 | s | Power on the dust collector, the delay function works automatically Set the parameter to “0”, the function is closed. |
| F07 | Fan start mode | | Soft start | | Direct start, soft start, variable frequency start |
| F08 | Star conversion time | | 10 | s | Time required for star startup to delta startup |
| F09 | Dust-cleaning delay after machine booting | 0-99 | 1 | min | How long does the fan start then the dust-cleaning function starts |
| F10 | The starting pressure difference of dust removal | 1~2 | 1 | Kpa | Start backblow valve in automatic ash removal or differential pressure mode |
| F11 | High-pressure alarm valve | 3~6 | 4 | Kpa | Beyond the normal operating pressure difference in the system |
| F12 | High-pressure alarm delay | ＞10 | 20 | Min | The pressure difference lasts beyond the F11 time |
| F13 | Pressure difference offset correction | | 0 | Pa | The pressure difference is shown to be corrected |
| F14 | Shut off the machine and ash-cleaning function delay | 0-10 | 10 | s | Fan stop and delay dust removal |
| F15 | Number of downtime and ash removal | ≥0 | 10 | | Numberof backblowingcyclesafter the fan is off. When set to 0, turn off this function. |

| | | | | | |
|---|---|---|---|---|---|
| F16 | High-temperature alarm valve | 50~120 | 65 | ℃ | The maximum temperature is allowed in the dust clearing bin |
| F17 | High temperature alarm delay | 0-60 | 1 | s | Set a value of continuous high temperature, and if it reaches this value, it gives an alarm. |
| F18 | Temperature offset correction | | 0 | ℃ | Temperature display correction |
| F19 | High-pressure valve to stop the fan | 3~5 | 3.0 | Kpa | When reach the specified pressure-difference value, the fan stops |
| F20 | Shutoff trigger delay | 10~99 | 10 | Min | With the pressure difference greater than F19 duration, stop the fan to clear the ash |
| F21 | Pulse length | 80~200 | 100 | ms | Pulse recoil time width |
| F22 | Pulse interval | >10 | 15 | s | Pulse interval time in the cycle |
| F23 | Cycle interval | 0~10 | 1 | min | Time between the two cycles |
| F24 | Language Settings | | Chinese | | Chinese / English |
| F25 | Return to factory condition | | | | Parameter reset |
| F26 | Remind to clean the dust Replace filter | | 70 | h | Remind to clean the ash hopper when the accumulated time of system operation is reached. |
| F99 | cartridge Model selection | | | | Remind use to replace with new filter cartridge |
| P01 | Time for filter | | | | Reserving parameter |
| P02 | cartridge replacement | | 4000 | h | Reserving parameter |

## Tips for parameter setting:

Adjust the parameters appropriately according to the gas source, pipeline and working intensity on site.

Calculation of nominal volume flow with air supply pressure of 6bar and parameter F22=15 (blowback interval)**=0.08*60/F22**

**Nominal volumetric flow=0.08*60/F22=0.08*60/15=0.32m³/min**

The backblowing interval can be set reasonably according to the flow rate of air compressor. The capacity of the air compressor is large enough, and the backblowing interval can be appropriately reduced.

- When the amount of smoke and dust is large, the filter cartridge is easy to be blocked and the wind force is reduced, in this condition, the automatic back blowing can be changed into manual back blowing.

  If necessary, the fan can be turned off, and the system will automatically turn on the manual back blowing. and then turn on the fan manually after the back blowing is completed.
- When the dust removal effect is not good after stop the fan, the number of downtime dust removal shall be appropriately increased.
- If the dust collector works abnormally because of the adjustment of parameters, please return to the default parameters.

# 5.Maintenance

Disconnect the power supply before maintenance. Cut off the supply of compressed air before maintain compressed air components.

The filter element will be cleaned automatically in sequence. Please do not take the filter element out for cleaning.

## 5.1 Dust removal

Do not overfill the dust in the ash hopper, otherwise it will affect the performance of the dust collector.

In the system, dust-cleaning reminding will be popped out after the dust collector runs for 70 hours.

Spark catcher: Don't forget to clean it up, use a vacuum cleaner to clean it through the dust cleaning port regularly.


Fig.21 Dust-cleaning reminding


Fig. 22 Filter replacement reminding

## 5.2 Filter replacement

**Fig.17 Filter replacement reminding, replace the manufacturer filter element, and contact the manufacturer to provide the matching password.**


## Warning

When the air volume is too low or the pressure difference is too high, the filter element must be replaced. When the dust collector runs over 5000-7000 hours, the filter must be replaced. All filter elements must be replaced simultaneously. Do not put the new filter element on the ground or on a hard surface. It is necessary to clean the dust around the orifice so that the gasket is well sealed.

Slide the new filter element along the filter rack to ensure that the sealing gasket faces one side towards the clean air chamber. Reinstall the filter cover and tighten the fixed handle clockwise on the filter rack. Make sure to tighten it to prevent leakage of dust.

### 5.3 Replace the diaphragm valve

The valve diaphragm are common spare parts. When the working time exceeds 5000-7000 hours, they must be replaced. When replacing, pay attention to its front and back sides, not to mix up. The backblowing port on the diaphragm valve should be aligned with the hole and bonnet on the valve body, and the external contours of the diaphragm, valve body and bonnet should be aligned.

# 6.Fault handling

## Warning

- Disconnect power before maintenance to prevent personal injury and other damage. Compressed air can cause serious injury to the human body, so the compressed air supply unit should be disconnected from compressed air before maintenance. If the system power supply is automatically turned off, it means that some control components may fail. Please follow the local regulations to have qualified personnel checked all circuits.

### 6.1 Fault

| Fault | Cause | Solution |
|---|---|---|
| **The fan cannot start** | 1.Line connection is incorrect.<br>2. Relay alarm.<br>3.Motor failure | 1.Check whether the power supply is out of phase.<br>2. Reset thermal relay<br>3. Repair and replace the damaged motor |
| **The fan can start, but it cannot run continuously** | 1.Overload protection is not installed correctly<br>2. The door of dust collector is open or not closed<br>3. Ash hopper is open | 1.Check motor overload protection, reset or reset the correct value.<br>2.Close the door.<br>3.Install the ash hopper and close the maintenance door. |
| **Noise and vibration of fan are too large** | 1.There is dust on the fan blade<br>2. The fan blade is worn out<br>3. The bearing is worn out | 1. Clean the fan blades<br>2. Replace the fan impeller<br>3. Replace the bearing |

| Fault | Cause | Solution |
|---|---|---|
| **Dust leaks from the air outlet** | 1. The filter element is not installed correctly<br>2. The filter element is damaged, the cover of filter element is deformed, the seal ring is damaged, or there is leakage with crevice between the seal ring and filter element<br>3. The door is not closed well | 1. Check whether the sealing ring of the filter element is pressed against the ceiling, and the fixed handle on the filter element must be tightened by hand.<br>2. Replace the filter element<br>3. Close the door and check the sealing ring |
| **The working light on the control panel is not on.** | The is malfunction with control panel | 1. Check whether the power supply of the control board is normal. The AC 220V needs to have a zero line<br>2. Refer to control board point bitmap |
| **The HMI/touchscreen is failing (not showing anything).** | 1. HMI is failed<br>2. Circuit malfunctions | 1. Replace the HMI<br>2. Check circuit and data line |
| **Backlight Failure (Less Likely if Working Light is Off)** | 1. HMI is failed<br>2. Data line malfunctions | 1. Replace the HMI<br>2. Check if the data line get loose |
| **The air at the outlet of the dust collector contains dust.** | 1. The direction of filter cartridge is reversed.<br>2. Filter elements get broken | 1. The end of the filter cartridge with rubber sealing ring faces inward.<br>2. If the filter cartridge is damaged, there will be obvious black smoke in the inner circle, which needs to be replaced. |

## 7.Alarm information processing

During the operation of the equipment, the following alarm interfaces may appear.


Fig. 23 Abnormal phase sequence alarm

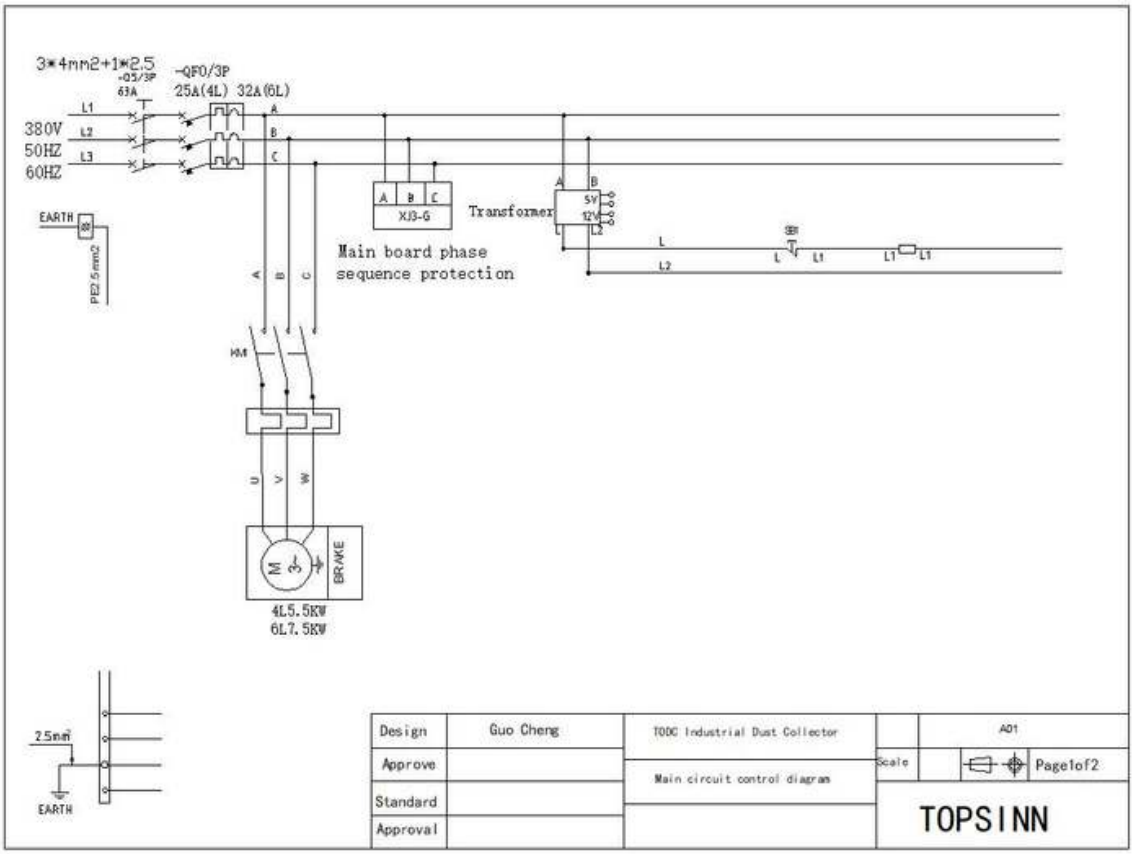

Fig. 24 Fan overload alarm


Fig. 25 Emergency Stop


Fig. 26 Differential Pressure Alarm


Fig.27 Temperature alarm

| Warning | Cause | Solution |
|---|---|---|
| **Abnormal Phase Sequence** | 1. Line connection is incorrect<br>2. Phase missing | 1. Replace the phase sequence<br>2. Check the power supply or circuit |
| **Fan Overload** | 1. Motor gets failure<br>2. Contacting thermal relay failure | 1. Replace motor<br>2. Replace contacting thermal relay |
| **Emergency stop** | Press Emergency stop button | Reset Emergency stop button |
| **Differential pressure alarm** | 1. Filter element get clogged<br>2. Backblowing compressed gas leakage<br>3. Check the valve diaphragm 4. Check the leakage of high-pressure air storage<br>5. Check the pulse signal indicator output | 1. Check the condition of the filter cartridge, stop the fan and then blow back.<br>2. Replace the pulse valve<br>3. Replace the high-pressure air storage<br>4. Replace control panel |
| **Temperature alarm** | The temperature of the filter cartridge bin is too high. | Check the source of high temperature. |



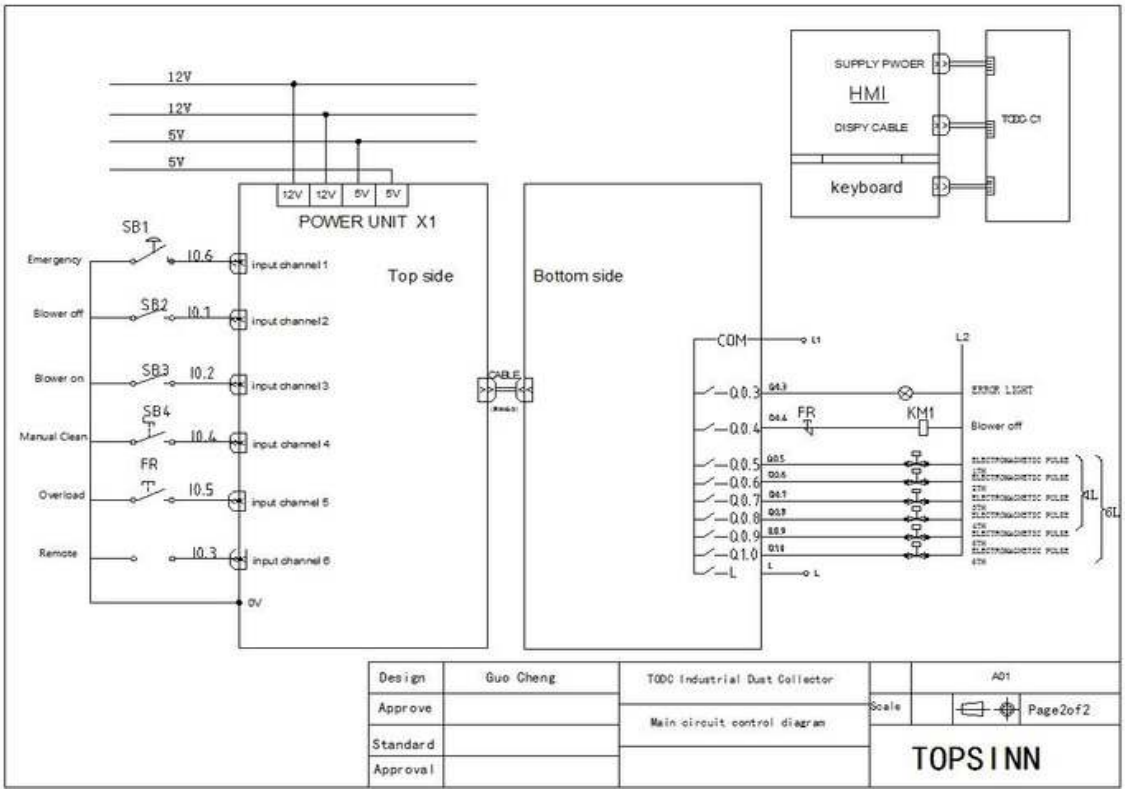
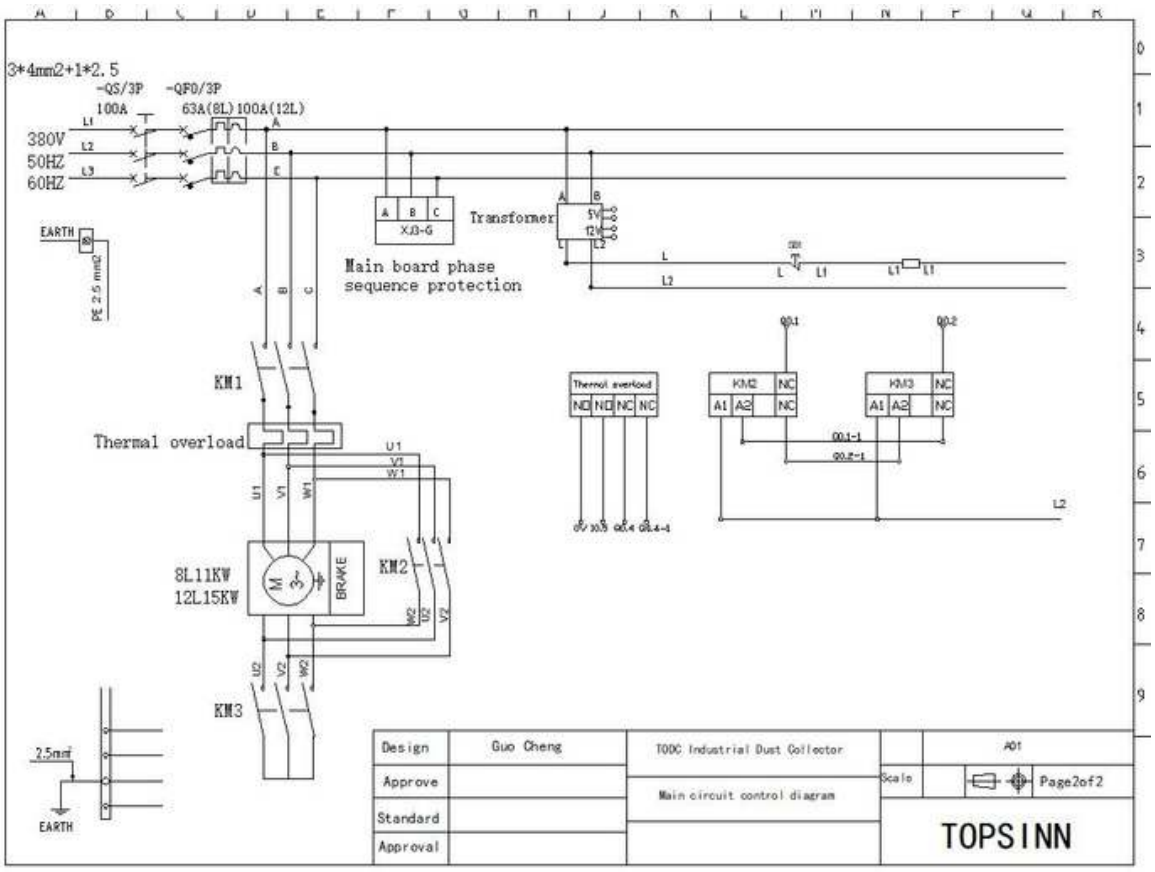




Fig. 28 Control circuit diagram 1（TODC-4L/6L）



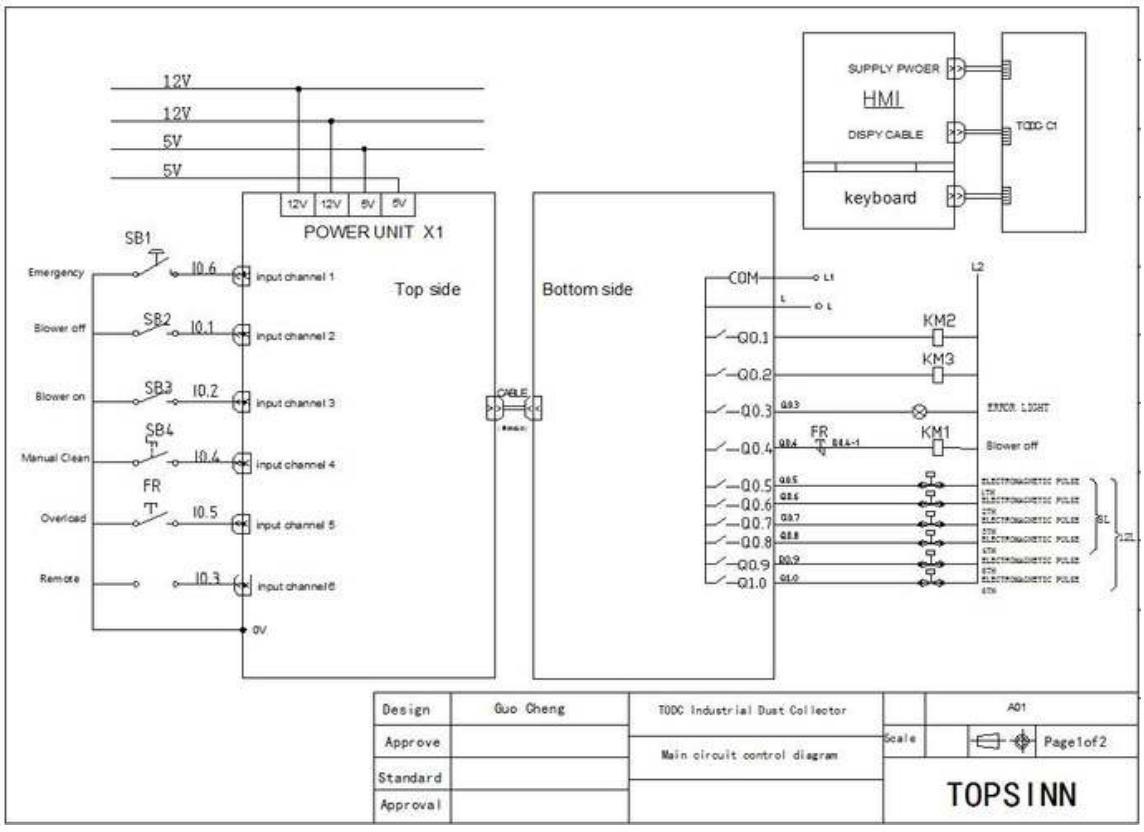




Fig. 29 Control circuit diagram 2（TODC-8L/12L）

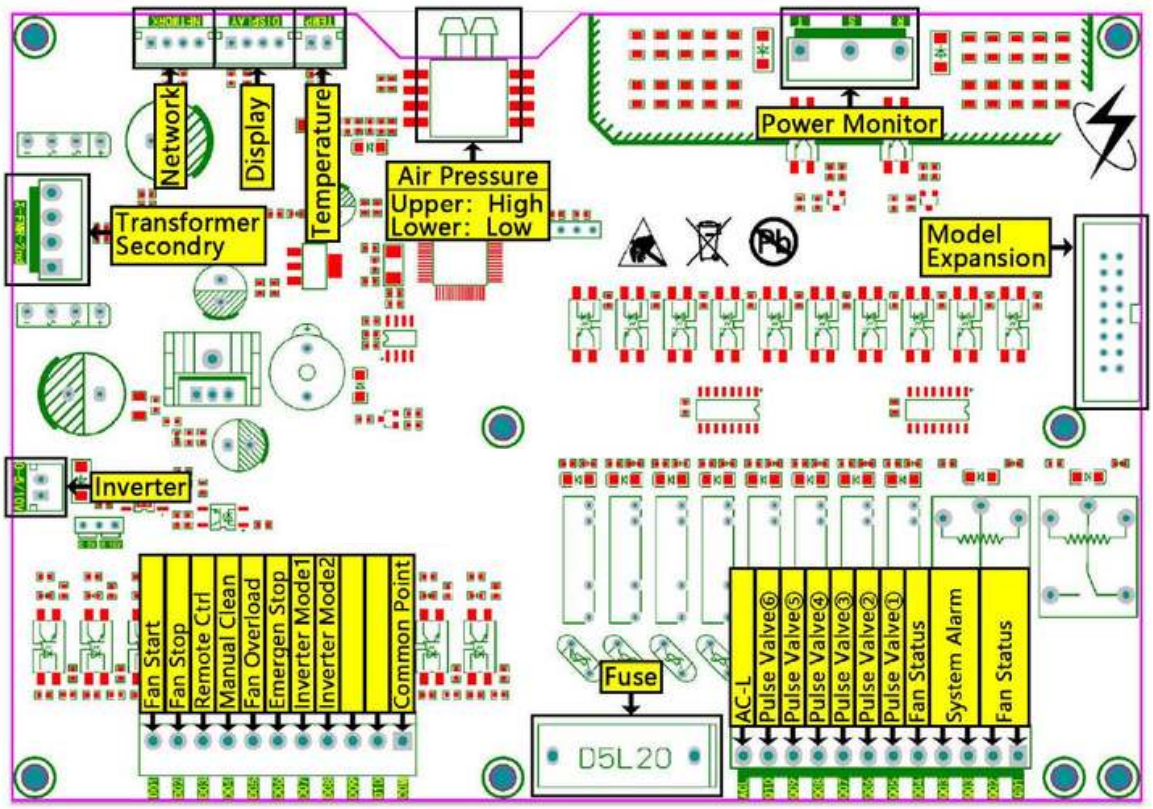



Fig.30 Control panel point bitmap

## 8· Spare parts

| S/N | Sparepart | Part number | Remark |
|---|---|---|---|
| 1 | Filterelementassembly-Topsinn brand | TODC00092 | Suitable for TODC-4L/6L TODC-8L/12L |
| 2 | Filterelementassembly-Topsinn brand | TODC00093 | Suitable for TODC-8L/12L |
| 3 | Diaphragmvalvewithsolenoid valve | TODC00110 | |
| 4 | Filterelementcover | TODC00170 | |
| 5 | Sealinggasketofmaintenance door | TODC00180 | |
| 6 | TopsinncontrolboardTODC-D1 | TODC00073 | |
| 7 | TODCHMI | TODC00060 | |

Industrial Dust Collector Installation and Operation Instruction

Full Spectrum LASER

Product and Technical Support:

Support Hours: M-F 8am-5pm PST, excluding holidays

Request Assistance 24/7:

Live Support Chat available during business hours

Phone: (702) 802-3103