BOSSLASER

QM 855-932 | 9/26/2025 | Rev. 002

BOSS LASER

Boss FC Xtract

Operators Manual

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WELCOME TO THE BOSS LASER FAMILY

Over the years, Boss Laser has provided quality laser solutions, and I am thankful that we have always focused on delivering value not only for our clients but also contributing positively to our community.

Our mission statement is "Boss Laser strives to honor God by positively impacting its clients, employees, and community by providing products and services with Integrity, Honesty, and Value."

Your continued support has allowed us to make an impact not only in our own backyard but yours as well. Boss Laser machines are owned and operated across the world by hobbyists, small businesses, educational institutions, and Fortune 50 companies, just to name a few. But do you know what truly makes Boss Laser successful? You!

You have given us the opportunity to provide for families both locally and around the globe, whether a Boss Laser is being used in a home-based business that enables a family to have financial freedom, allowing college students at the University of Central Florida to make their designs become a reality, or inching the aerospace industry closer to new explorations and discoveries, you as a Boss Laser owner are the reason why.

When you purchase a Boss Laser product, you're not just getting the product, you're getting us, and by us, I mean the 40+ employees who strive to provide top-notch products, services, and support, day in and day out because they want you to be successful.

Owning a Boss Laser machine makes you a part of our family and we are thrilled that you have chosen us to be your laser solution. I can promise you that you now have an army of 40+ people who are rooting for you to succeed and are here to help you along the way.

So, what are you waiting for? Let's get that extractor fired up and put to work!

Dan Fox
Owner & Co-Founder

BOSS FC XTRACT

EXPLORE EVERY WAVELENGTH OF INNOVATION

We’re thrilled you’ve chosen the BOSS FC XTRACT as your fume extracting and dust collecting solution. Designed for ease of use, precision, and reliability, the BOSS FC XTRACT is ready to seamlessly integrate with your laser fiber cutting system, delivering powerful filtration performance to protect both your equipment and workspace. Whether you're cutting metals, plastics, or composites, it ensures cleaner air, improved safety, and extended machine life—so you can focus on what matters most: precision cutting and productivity in a much healthier and safer environment.

We recommend printing this manual for quick and convenient reference during setup and operation. It provides essential guidance for installing and using the fume extractor / dust collector effectively, so we suggest keeping a copy near your machine or workstation.

Please read the manual thoroughly before operating the extractor to ensure a clear understanding of its functions and features. While there may be a brief learning curve with any new equipment, familiarizing yourself with the system will help you operate it confidently and efficiently.

Our team is here to support you every step of the way. If you have any questions while reading the manual or setting up your extractor, feel free to call us at 407-878-0880 or email techsupport@bosslaser.com. A member of our technical support team will be happy to help!

Welcome aboard, and here’s to countless projects and endless possibilities!

BOSS LASER

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Introduction

1.1 Definition of Procedures

This manual provides detailed information specific to your Boss FC Xtract. Designed to support fiber laser cutting systems—particularly when processing materials like steel—the Boss FC Xtract efficiently captures and filters harmful fumes and airborne particles generated during cutting, helping maintain a clean and safe work environment.

To ensure you can operate your extractor with confidence, this manual covers all essential aspects of the Boss FC Xtract. The content is organized into three primary categories: Operation, Maintenance, and Service. Below, you'll find a general overview of each, with in-depth guidance provided throughout the manual.

1.1a Operation

The Boss FC Xtract is a high-performance industrial dust and fume collector engineered to meet stringent environmental emission standards. Utilizing a pulse back blowing system, it delivers large air volume, compact footprint, and reliable performance, making it an ideal solution for applications such as laser cutting, laser welding, plasma cutting, flame cutting, and woodworking.

Before operating the extractor, ensure that all personnel involved are properly qualified and adhere to relevant safety standards and regulations.

During laser cutting operations, the fume extractor actively captures harmful fumes and airborne particles generated at the source. Once the cutting process is complete, remove the finished material and prepare the system for the next job.

Always ensure the extractor operates in a safe environment, away from flammable or explosive materials, to maintain optimal safety and performance.

1.1b Maintenance

The best way to keep your extractor performing optimally is to keep up with maintenance by setting a schedule. Maintenance includes dust removal from the ash hopper, cleaning the spark catcher, replacing the filters, replacing the diaphragm valve and removing any dust or particles.

As a reminder, these procedures are to be performed with the extractor off. Your safety is our number one priority.

1.1c Service

Service includes initial installation of the extractor, as well as repair when needed. Your Boss FC Xtract should arrive mostly ready to go, but you will need some installation assistance from our Boss Laser techs, replacement parts, or to conduct minor repairs in the future. Procedures during service may require the extractor to be turned on.

Boss Laser recommends that only trained service personnel, such as Boss Laser Technicians, complete service or repair unless directed by a Boss Laser Technician. Always call Technical Support if you are unsure what to do when servicing your extractor.

1.2 Warranty Disclaimer

This Limited Warranty applies to the extractor itself, and all parts purchased from Boss Laser, LLC.

This Limited Warranty covers any defects in material or workmanship while the extractor is operating under normal use and for its intended purpose during the warranty period.

During this Warranty Period, Boss Laser, LLC will repair or replace any part or product that has proved defective while the extractor is being used under normal conditions and for its intended purpose. This does NOT include labor and/or on-site tech support.

The Warranty Period for the Extractor will begin on the day of arrival and will be covered for 1 year unless an extended warranty is purchased.

All parts purchased, and replacement parts are under warranty for one year from the time of installation by Boss Laser. The only exception to this warranty is the regular maintenance items that include, but are not limited to, the filters, fuses, and valves which have a 30-day warranty to be free of defects upon arrival.

This Limited Warranty does not cover any problem that is caused by: conditions, malfunctions or damage not resulting from defects in material or workmanship (ex. modifications done to the extractor).

All modifications that are made to the extractor must have written consent from Technical Support or the warranty will be voided.

Lack of proper maintenance of the extractor will also result in a voided warranty.

To obtain a warranty service or part you must first contact Technical Support via phone at 407-878-0880 or email via techsupport@bosslaser.com to determine any issues and the most appropriate solution for the extractor.

2. Safety Information

2.1 Safety Precautions

The Boss FC Xtract is engineered for industrial applications such as laser cutting, welding, and woodworking. To ensure safe and efficient operation, please adhere to the following safety guidelines:

1. Installation, wiring, and inspection should be performed exclusively by trained professionals with appropriate qualifications.
2. Ensure the power cord is not stepped on or pinched. If the cord is damaged, replace it immediately to prevent electrical hazards.
3. Do not handle the power supply connection with wet hands or operate the machine in wet conditions to prevent electric shock.
4. The power supply must be properly grounded, and a circuit breaker should be installed for the main power supply to ensure electrical safety.
5. Do not climb on, stand on, or place heavy objects on the machine during operation to avoid accidents or equipment damage.
6. Do not attempt to repair the equipment yourself. Contact the manufacturer or authorized service personnel for repairs.
7. Always disconnect the power supply before performing any maintenance or servicing tasks.
8. Hoisting and moving the machine should be conducted by professionals following proper procedures to prevent injury or equipment damage.
9. The Boss FC Xtract is not designed to be fireproof or explosion-proof. Special care must be taken when operating the equipment in environments where combustible materials are present.
10. Prevent fire sources such as sparks, cigarette butts, or other burning materials from entering the fume extraction / dust collection system, as this may cause fire or explosion.
11. If combustible substances are present, consult professional installation agencies for appropriate fire hazard assessments and install necessary fire and explosion protection systems in compliance with local regulations.
12. Ensure there are no obstructions at the fan outlet before powering on the dust collector.
13. Confirm that the ash hopper is correctly installed at the ash discharge port.
14. Verify that the maintenance door is securely closed.
15. Open the compressed air valve and adjust the pressure to 0.5MPa–0.7MPa. Ensure the compressed air is clean and dry.

16. Turn on the main switch and press the fan start button. The ash cleaning system will start automatically once all necessary conditions are met.

Adhering to these safety precautions will help ensure the safe and efficient operation of your Boss FC Xtract.

ANSI Z136.1-2000 does not apply directly to fume extractors / dust collectors, but does apply to the laser systems they support, especially regarding air quality, operator exposure, and environmental safety. If your fume extractor / dust collector is used with a fiber laser, you should ensure that it supports compliance with the laser safety requirements outlined in Z136.1, especially around fume control and enclosure safety.

This table provides a cross-reference of relevant ANSI, OSHA, and NFPA standards that intersect when operating a dust collector or fume extractor connected to a laser system, such as a fiber laser cutter.

Safety Aspect	**ANSI Z136.1 (Laser Safety)**	**OSHA (Industrial Safety)**	**NFPA (Fire & Explosion Safety)**
Laser-Generated Air Contaminants (LGACs)	Requires control via exhaust / filtration (Section 4.4.4)	Requires local exhaust ventilation (29 CFR §1910.1000)	Not directly applicable unless combustible particulates are involved
Ventilation System Design	Must ensure capture of laser fumes, protect enclosure integrity	General ventilation requirements (29 CFR §1910.94)	NFPA 91: Standard for Exhaust Systems
Combustible Dust	Not addressed	Must mitigate dust hazards (29 CFR §1910.22, §1910.307)	NFPA 484, 652, 68, 69
Fire Hazard from Spark or Hot Particles	Recommend fire-resistant systems for LGACs (Annex C)	Fire suppression required if hazard exists (29 CFR §1910.160)	NFPA 654, 70
Laser Enclosure Integration	Dust / fume systems must not breach Class 1 enclosure	Must not introduce new hazards	Not applicable

Personnel Safety Training	Requires LSO and training for Class 3B / 4	HazCom training (29 CFR §1910.1200)	Not applicable
Explosion Protection in Ducting / Filters	Not addressed	Must follow general hazard area requirements	NFPA 68 (venting), 69 (explosion prevention)
Electrical Safety for Accessories	Must comply with UL / NRTL and LOTO	LOTO: 29 CFR §1910.147	NFPA 70 (NEC)
System Maintenance & Inspection	Inspect filtration and exhaust regularly	Periodic inspections under general duty clause	NFPA mandates inspection of explosion protection systems
Safe Material Handling	Warns against reactive material exposure	Labeling and containment (HazCom)	NFPA 400 (Hazardous Materials Code)

Copies of ANSI Standard Z136.1-2000 are available from:

Laser Institute of America

12424 Research Parkway

Suite 125

Orlando, FL 32826

(407) 380-1553

2.2 Essential Safety Information Before Using Your Extractor

Before setting up and turning on the extractor, all operators are required to read this manual carefully and adhere to the operating requirements & specifications. We understand that the number of safety precautions can be overwhelming to first-time users, therefore, we have provided a bulleted list below to give you a quick reference guide.

2.2a Trained Personnel & Bystanders

Anyone who has not read this manual should abstain from using the extractor, as it can cause harm to the extractor, the operator, and bystanders.

- If using this extractor in a shared area, allow only qualified personnel or people to operate it, and each person who enters the area while the extractor is in operation should have general safety knowledge and any person who operates the extractor should read this manual first.

2.2b Pre-Operation & Environment Requirements

Prior to operating the extractor, all doors, covers, hoods, and safety mechanisms should be in place.

- The ideal environment for the Boss FC Xtract is dry, free from pollution, vibration, high voltage, or strong magnets, and the extractor should be in an ambient temperature of 50°–104°F (10°–40°C) and a relative humidity of 95% or less with no dew.

2.2c Material Hazards

While a multitude of materials can be cut with laser machines that can be connected to your Boss FC Xtract, it is important to be careful when processing new material.

The Boss FC Xtract, like many industrial filtration systems, does not itself contain hazardous materials under normal operating conditions. However, material hazards arise from the type of dust and fumes it is used to collect—especially when connected to processes like fiber laser cutting, welding, or plasma cutting.

- Do not put flammable or explosive materials near the extractor, this can increase the risk of fire or explosion.
- Combustible Dust Hazards
    - Relevant for:
        - Aluminum dust
        - Magnesium, titanium, and other reactive metals
        - Wood dust
        - Plastic particulates
    - Risks:
        - Dust explosions (per NFPA 484, NFPA 652)
        - Fire in filter media or ducts
        - Secondary explosions if dust is dispersed and ignited
    - Mitigation:
        - Install spark arrestors, flame-retardant filters, and explosion venting if needed
        - Use anti-static grounding and conductive ductwork
        - Regularly clean dust buildup in hoppers and filters
- Toxic Fume Collection (Laser-Generated Air Contaminants - LGACs)
    - Relevant for:
        - Stainless steel (hexavalent chromium)

        - Galvanized steel (zinc oxide fumes)
        - Plastics, acrylics (formaldehyde, VOCs, carbon monoxide)
    - Risks:
        - Inhalation of carcinogens and toxic byproducts
        - Long-term respiratory damage
        - Regulatory exposure limits (OSHA PELs, ACGIH TLVs)
    - Mitigation:
        - Use appropriate HEPA or ULPA filters rated for fume capture
        - Ensure proper air change rate and exhaust ventilation
        - Wear PPE and monitor air quality as needed
- Fire & Spark Hazards
    - Relevant for:
        - Hot slag or sparks from laser or plasma processes
        - Smoldering material drawn into filters
    - Risks:
        - Fire in filter chamber or ductwork
        - Equipment damage or injury
    - Mitigation:
        - Never allow burning particles into the system
        - Use spark traps or spark arrestors upstream
        - Monitor filter temperature and inspect frequently
- Chemical Reaction Hazards
    - Relevant for:
        - Mixing incompatible materials in one extraction system (e.g., aluminum + steel dust)
    - Risks:
        - Violent reactions or explosions
        - Internal corrosion or damage to filters
    - Mitigation:
        - Do not mix materials with incompatible dust profiles
        - Clean system thoroughly between material type changes
        - Use multiple units for different materials if needed
- Best Practices for BOSS FC XTRACT-6L Users
    - Review SDS (Safety Data Sheets) for materials you're cutting
    - Follow maintenance instructions to avoid hazardous dust accumulation
    - Ensure operators are trained in combustible dust and fume safety
    - Use manufacturer-approved replacement filters to maintain safety ratings

2.2d Fire Hazard

Materials within the extractor and surrounding areas can catch fire if not monitored closely. It is important that the extractor and the machine it is connected to are not left unattended while running. If you must leave the area where the extractor and the machine it is connected to are firing, press the “Pause” button, then start where you left off when you return. We recommend

having an ABC fire extinguisher on hand and near the extractor to minimize damage to the extractor and the surrounding area in case of a fire.

2.2e Hazardous Fumes & Proper Ventilation

Ensure there is proper ventilation in the area the extractor will be running in. Smoke, fumes, and particles can be exhausted from the extractor while processing materials.

- Although the Boss FC Xtract is designed to help with these conditions, certain materials can produce toxic fumes and hazardous gases when processed by a laser machine, so it is important to review the MSDS of any material to ensure it is safe to be processed with a laser machine even if the Boss FC Xtract is connected to the said machine.

2.2f Electrical Safety

The Boss FC Xtract uses electricity to power the extractor, which increases the risk of electrical shock if not handled properly.

- Do not disassemble the extractor without prior approval and direction from Boss Laser Technical Support, otherwise, the warranty may be voided and injury or death from electrical shock may occur.
- Ensure all sources of power are unplugged prior to conducting service and maintenance on the extractor.
- The operating voltage of this machine should be 3-Phase, 4-wire, 208V WYE.

3. Fire & Hazardous Materials

⚠ WARNING: At no point should the extractor be left unsupervised while it is in use. Leaving the extractor unattended while in use can result in a fire and substantial damage to the extractor and the building it resides in. Any damage caused by fire that is not due to defects in workmanship, or the extractor itself will NOT be covered by the BOSSLASER, LLC Limited Warranty.

⚠ Hazardous Materials: All materials considered hazardous to the health of the extractor, the health of the individuals operating the extractor and the individuals surrounding the extractor while in use are NOT recommended. These materials can produce toxic fumes or cause the extractor to not function properly and need replacement parts. Processing hazardous materials can void the warranty of the extractor.

Most materials have a Material Safety Data Sheet (MSDS), which can tell you whether materials are safe and / or be exposed to high heat. Any material containing chlorine is not safe for your extractor, the laser machine it is connected to, the extractor operator(s), or bystanders. If you are still unsure about the material after reviewing the MSDS and its properties, contact Technical Support. We would be happy to try and identify the safety of the material and whether it can be processed with a laser machine.

4. Laser Safe Materials

Lasers use heat to cut, engrave and etch. Although the Boss FC Xtract will be connected to your laser machine, some materials react beautifully while other materials can have less than a desirable effect. It is important to know the material with which you are working. Some materials like PVC are easy to cut but give off a chlorine gas that is not healthy for the laser machine, the extractor or the operator.

New materials come out daily. If you are unsure if the material is safe, contact Technical Support, and we will try to identify its properties and determine if it is possible / safe to be processed with a laser.

5. Laser Safety & Policies

First, BE CAREFUL! Laser machines are a powerful tool, and the proper precautions should be taken, just as if you were working with any other high-powered tool or machinery. These machines are designed to cut with highly focused heat energy and can be dangerous. You should never leave your machine unattended while it is in operation and do not let an inexperienced or unfamiliar person operate your machine at any time. Maintenance should be done by professionally trained personnel.

1. Designate a Safety Administrator to determine the scope of their duties and provide training for safe operation and safety protection around the extractor and for using the laser machine it will be connected to.
    a. A Risk Manager and / or Laser Safety Officer are recommended to be part of the safety administration.
    b. The operator of the laser processing machine must be trained to operate the extractor safely with the consent of the safety administrator.
    c. Prohibiting unauthorized persons from entering is recommended, and the name(s) of the safety administration personnel should be common knowledge, especially in the working area of the extractor and the laser machine that it will be connected to.
2. For a fiber laser cutting machine connected to Boss FC Xtract, the safety management area must have clear, standardized warning signs that address laser hazards, dust / fume risks, and electrical / fire dangers. These signs help ensure compliance with ANSI, OSHA, and NFPA guidelines and protect operators and nearby personnel.
    a. This section outlines the required warning signs and their placement for safe operation of a fiber laser cutting system equipped with a connected dust / fume collector. All signage should comply with applicable ANSI, OSHA, and NFPA standards.

Sign Type	Message	Relevant Standard(s)
Laser Warning	DANGER: Laser Radiation – Avoid Eye or Skin Exposure to Direct or Scattered	ANSI Z136.1, OSHA 1910.1096

	Radiation (Class 4)	
PPE Required	PERSONAL PROTECTIVE EQUIPMENT REQUIRED – Eye Protection, Gloves, Respirator	OSHA 1910 Subpart I
Electrical Hazard	WARNING: High Voltage – Authorized Personnel Only	OSHA 1910.303, NFPA 70E
Fire Risk	CAUTION: Fire Hazard – Keep Area Clear of Flammable Materials	NFPA 654, NFPA 484
Fume / Dust Warning	WARNING: Harmful Fumes or Dust – Ensure Ventilation is Operating During Cutting	ANSI Z136.1, OSHA 1910.1000
Combustible Dust	DANGER: Combustible Dust Area – No Open Flames or Sparks	NFPA 652, OSHA Combustible Dust NEP
Lockout / Tagout	LOCKOUT / TAGOUT REQUIRED BEFORE MAINTENANCE	OSHA 1910.147
No Unauthorized Entry	RESTRICTED AREA – Authorized Personnel Only	Generally best practice
Emergency Stop	EMERGENCY STOP BUTTON – PRESS IN CASE OF FIRE OR MALFUNCTION	Machine-specific
Operating Instructions	READ AND UNDERSTAND OPERATOR MANUAL BEFORE USE	ANSI Z535.4, OSHA general duty clause

- Laser Warning & PPE Signs: Post at machine enclosure and entrance to laser-controlled area.
- Dust / Fume Hazard Signs: Place near dust collector, extraction hoods, and ductwork.
- Electrical and LOTO Signs: Mount on power panels and electrical cabinets.

- Fire Risk / Combustible Dust Signs: Display near the dust collection unit and waste containers.
- Emergency Stop Instructions: Affix adjacent to emergency stop buttons and control panels.
- Operating Instruction Signs: Install at the operator station or cell entrance.

Always keep any access covers on and the laser head enclosure closed whenever the extractor is in operation. Notice and understand all the warning labels located on your machine and the extractor.

The Boss FC Xtract should be placed and prepared in accordance with the pre-installation checklist provided by Boss Laser. Care must be used when preparing to install as bending and moving cables on the extractor can cause damage to the equipment.

Only trained operator(s) should operate the extractor. It is recommended that the business establish a safety management area around the extractor and provide warning signs as recommended above. Hazards from this machine include but are not limited to electrical high voltage, LASER radiation, hot metal, compressed gases, lifting and / or moving heavy metal pieces.

Never leave the extractor unattended while it is running. The operator should not leave during the operation of the extractor. If an abnormality occurs during the use of the device, immediately press the Emergency Stop button.

The following safety measures must be strictly implemented and be abided by to ensure the safety of the extractor and the individual operating it. Boss Laser, LLC shall not be held responsible for any damage or injuries resulting from improper use or dismantling of the laser machine.

- NEVER operate laser machinery or an extractor connected to them unless you have been professionally trained.
- ALWAYS use protective eyewear.
- ALWAYS operate the extractor as designed.
- ALWAYS be sure to keep the exhaust fan running while the extractor is in use.
- NEVER leave the extractor or the laser connected to it unattended while it is running.
    - This will ensure that you are able to see or hear any abnormalities / potential hazards.
- ALWAYS maintain the extractor's environment free of heavy pollution, such as strong magnetic electrical interference.
- NEVER use unapproved or unsafe materials, such as Polyvinyl Chloride (PVC) or any materials that emit noxious gases.
    - Unsafe vapor from these materials can cause harm to people.
        - These gases can cause harm to your central nervous system.
- ALWAYS clean out the collection tray(s) to prevent accidental hazards.
- ALWAYS have a clean area around the extractor to allow it to function properly.
- ALWAYS have an appropriate fire extinguisher and method of egress in case of an emergency.

In Case of a Fire:

1. Press the Emergency Stop button located on the front of the extractor.

2. Quickly blow out the flame(s) with an ABC fire extinguisher for serious flames.

Exhaust Safety

Exhaust gases generated during laser cutting may be toxic. Even though the Boss FC Xtract is designed to mitigate these conditions, review the Safety Data Sheet for the material you are using to determine the hazards. Ensure that the exhaust fan(s) is operating normally, and the working site is ventilated.

Electrical Safety

Any time any electrical work is done, it should be done by a trained technician. Do not touch live components in the electrical cabinet during power-on, such as numerical control devices, servos, transformers, fans, etc. Whenever possible any electrical work should be done when the system is deenergized and a Lock Out Tag Out (LOTO) system is in place. If work must be done while the system is energized extreme caution must be used by trained personnel.

Confined Space Safety

The main frame of the extractor is an enclosed space and can be considered as a confined space. You are responsible for ensuring the safety of personnel and following local, state, and federal regulations for a confined space if service is to be completed inside the extractor. At no time shall anyone be inside any of the internal extractor components while it is energized as severe injury or death can occur.

6. Safety Features & Regulatory Compliance

6.1 Safety Features

The Boss FC Xtract includes several built-in safety features designed to meet regulatory compliance standards related to electrical safety, air quality, fire / explosion prevention, and equipment protection, especially in laser cutting environments.

Here's a breakdown of the key safety features aligned with OSHA, NFPA, ANSI, and IEC requirements:

- Safety Features for Regulatory Compliance
  - Grounded Electrical Cabinet
    - Prevents electrical shock and ensures proper current discharge
    - OSHA 1910.303, NFPA 70 (NEC)
  - Main Power Isolation Switch
    - Allows full power cut-off for safe maintenance
    - OSHA 1910.147 (LOTO)
  - Phase Sequence Protection
    - Ensures correct 3-phase wiring, alarms on incorrect wiring
    - IEC 60204-1, CE / UL safety
  - Overload & Overtemperature Alarms
    - Protects the fan motor and internal components from overheating
    - IEC 61010, OSHA 1910 Subpart S

    - Emergency Stop Interface
        - Stops all fan and pulse operations during abnormal conditions
        - OSHA General Duty Clause
- Air Quality & Dust Control Safety
    - Pulse Back Blowing Cleaning System
        - Maintains consistent filter performance and airflow
        - OSHA 1910.1000 (Air Contaminants)
    - High-Efficiency Filter Cartridges
        - Captures fine particulates and fumes generated during laser cutting
        - ANSI Z136.1, ACGIH TLVs
    - Pressure Differential Monitoring
        - Alerts when filters are clogged, reducing fire and efficiency risks
        - NFPA 91, OSHA Ventilation Standards
- Fire and Combustible Dust Safety
    - Non-Sparking Internal Design
        - Minimizes ignition sources in airflow path
        - NFPA 484, 654
    - Isolated Ash Collection Hopper
        - Reduces dust accumulation in air path
        - NFPA 652
    - Compatible with Spark Arrestors
        - Can be equipped upstream with spark traps for laser or plasma cutting
        - NFPA 69 (Explosion Prevention)
    - Supports Explosion Venting Add-ons
        - Optional installation of venting panels for compliance in high-risk zones
        - NFPA 68
- Maintenance and Operator Safety
    - Maintenance Lockout Points
        - Allows safe isolation of power during service
        - OSHA 1910.147
    - Filter Replacement Alarm
        - Reminds users to change filters before airflow becomes restricted
        - Prevents LGAC buildup
        - (ANSI Z136.1)
    - User-Accessible Control Panel
        - Easy monitoring and control of pulse cleaning, fan status, and alerts
        - IEC 61439
- Optional System Enhancements
    - HEPA or ULPA Filter Modules for toxic fume control
        - If cutting stainless steel, plastics, etc.
    - Explosion Isolation Valve
        - If system is in an NFPA-classified hazardous location

- VOC Monitoring or Air Quality Sensors
  - For compliance with ISO / OSHA exposure thresholds

The Boss FC Xtract includes most base-level safety features required for compliance in non-classified (non-hazardous) environments, but it can be customized or enhanced to meet site-specific regulatory needs, including those outlined by:

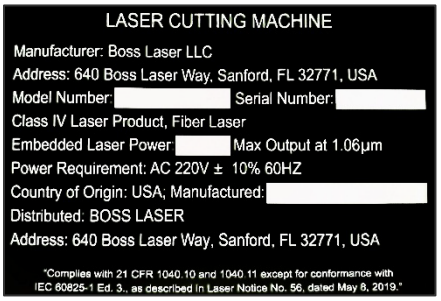
- OSHA (U.S.)
- NFPA (especially 652, 484, 68, 69, 70)
- ANSI Z136.1 (for laser operations)
- IEC / UL / CE standards (for electrical and mechanical design)

6.2 Safety & Regulatory Labels

The labels affixed to the outside of the Boss Laser Boss FC Xtract system are shown throughout the following pages, with their locations specified. These labels are put in place for the safety of the extractor and the operator. It is important that you pay attention to these warning labels and adhere to them. If these warnings are not followed, it could cause severe damage to the extractor and injuries to the operator.

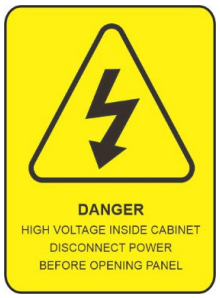
6.2a Certification & Identification Label

The “Certification" and "Identification” labels are combined into one label. The label can be found on the front side of the extractor.



6.2b Electrical Safety

The “DANGER: High Voltage” warning indicates that precautions should be taken when touching or handling any electrical components of the extractor. Please make sure to disconnect the laser from all power sources prior to opening these cabinets or handling the internal electrical components.



6.3 Safety Design Features

6.3a Emergency Stop Buttons

The Emergency Stop buttons, which is located on the front of the extractor, controls the live wire of the main circuit, and when the Emergency Stop Button is pressed, the extractor will power down.

6.3b Warning Indicator Light

The extractor comes equipped with a Warning Indicator Light installed on the top left-hand side of the Control Panel that shows the alarm state status for the extractor. When the extractor is in an alarm state the Warning Indicator light will light up Red. When the alarm is cleared, the Warning Indicator Light will turn off.

6.3c Personal Protective Equipment (PPE)

Masks are also required when operating the extractor to prevent injury from material handling and / or smoke and fumes generated from operations.

7. Accessing Our “How To” Videos and Manuals

We strive to provide support for our customers, which is why we have a variety of videos and manuals to assist our customers during the use or setup of their machine. In this manual, certain pages will contain a QR code. This will indicate that there is a video located on our website that will be able to guide you through this process or give you a better idea of how something is done.

Scan this QR code to access our Instructional Videos.

Scan this QR Code to access our Manuals Online

7.1 How to Access the Manuals on the USB

1. Your Boss Laser Boss FC Xtract will come with a USB that contains our manual. The first step is to plug in the USB that accompanied the extractor.
2. Next, there should be a “USB (For Boss Laser Boss FC Xtract)” folder that will contain the “Boss FC Xtract Manual,” and other various information.

8. Receiving Your Boss FC Xtract

While most of our products arrive unharmed, we urge you to inspect the extractor upon delivery to ensure that no damage has occurred while in transit. Damage can include pierced or broken pallets, smashed sides, or components. If there seems to be any damage to the extractor, take pictures prior to removing any bands.

If no damage is visible on the outside, proceed to removing the plastic wrap covering. If there is damage to the extractor under the plastic wrap covering, contact your Sales Consultant or Client Services Coordinator and send them pictures so we can report that damage to the carrier.

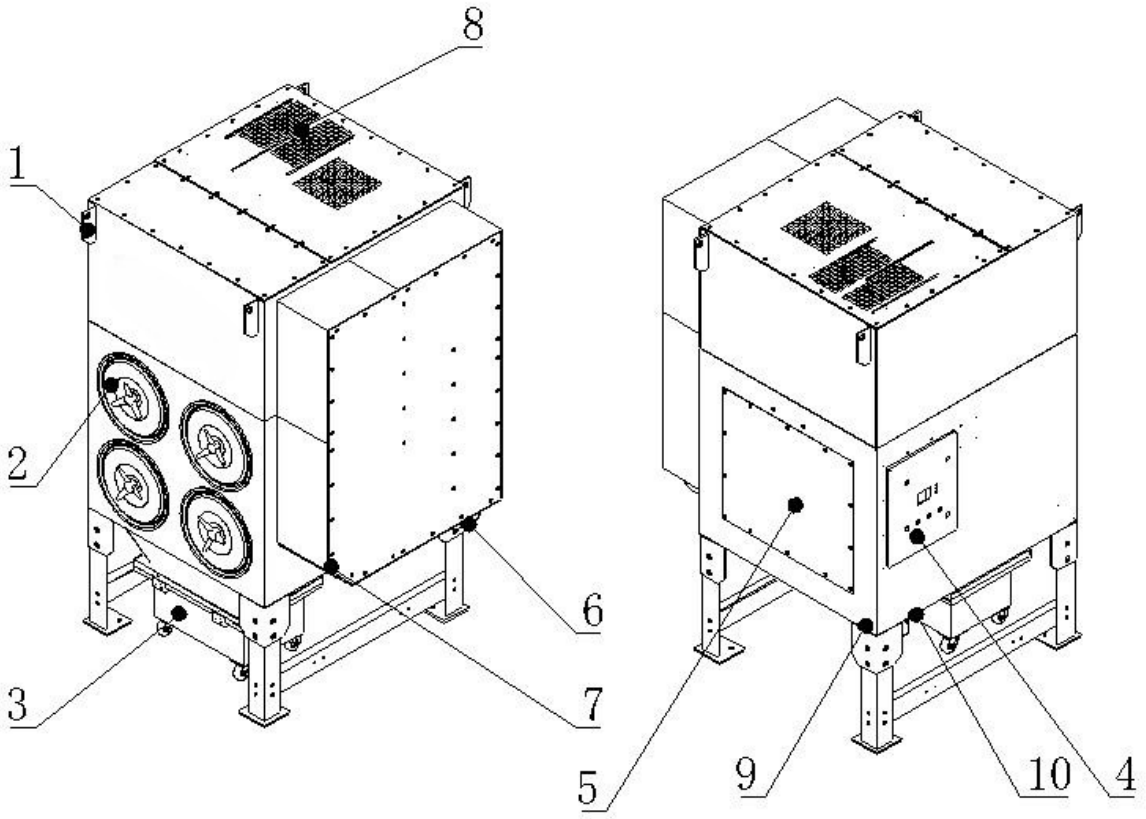
The extractor is ensured for its full value while in transit and if it is damaged to the point of needing parts or replacement, the carriers are particularly good at covering those costs. But the damage must be reported within 24 hours of delivery.

After the extractor has been inspected for damage and all the components / accessories have been accounted for, be sure to remove any foam or padding from inside or outside of the extractor. Remove any plastic / Velcro ties used for securing the laser head from moving while in transit.

9. Operating Your Boss FC Xtract

9.1 Machine Operation

9.1a Appearance Diagram



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

9.1b Safety Precautions

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

1. Personnel participating in wiring and inspection must be professionals with appropriate capabilities.
2. Make sure that the power cord is not stepped on and squeezed, and if the wires are damaged, please dispose or replace them immediately.
3. Do not operate the power supply connection under wet conditions or with wet hands!
4. The ground wire is needed to connect the power supply, and the circuit breaker is also needed for the total power supply.
5. Do not climb, stand or place heavy objects while the machine is running.
6. Do not repair the extractor by yourself. Please contact the manufacturer if needed.
7. Please cut off the power before repairing.
8. The machine needs professional operation when hoisting and moving.

Warning: The dust collector is NOT fireproof or explosion-proof. Consult fire safety experts if using near flammable materials.

Ensure the electrical area is clear and free of debris and plug in or turn on the circuit to the extractor.

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 72.5 Psi~105.5 Psi. Only when the necessary conditions are met will the ash cleaning system start. Pay attention to separate from external flammable and explosive materials.

9.1c Installation of Dust Cover

- Accessories:
  - Operation manual
  - Electric cabinet door key
  - Ash bucket
- Site Requirements:
  - 50A breaker
  - 3-phase, 208V WYE 4-wire power
  - Clean and dry compressed air
    - 72.5 Psi~105.5 Psi (87.02 Psi recommended)
  - G½ 12mm air pipe
  - Air pipe connected to laser cutting machine
  - 3837mm | 151.10 in x 2423mm | 95.39in x 2180mm | 85.83in x 1383mm | 54.45in required footprint
- Installation Steps:
  - Connect power following A / B / C / PE labeling
  - Verify correct phase sequence
  - Connect compressed air and ensure airtight seals
  - Secure ash bucket and close service doors
  - Start the main switch and fan
    - System auto-runs cleaning once all requirements are met

9.1d Power Connection

Fume Extractors with 10 meters of 4-core cable must follow the line mark to ensure that A, B, C, PE connections are correct. Please use the triangular key provided 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, as shown in the phase order error warning below, the interface will give an alarm. Replace any two ends of A / B / C.

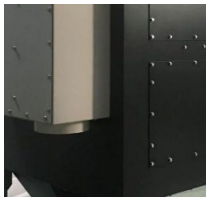
9.1e Compressed Air Connection

Connect the dried and filtered air into the bottom of the machine with Diameter 12mm pipe. Check the pipes and connect fittings after ventilation to ensure that there is no air leakage in all parts. Adjust the air pressure to 72.5 Psi~105.5 Psi (87.02 Psi recommended).

Compressed air must satisfy:

1. Should be adjusted to 87.02 psi (recommended)
2. Dry and NO moisture
3. Guaranteed flow: 3600 cfm
4. There is NO air leakage at the joint

9.1f Pipe Air Inlet Connection

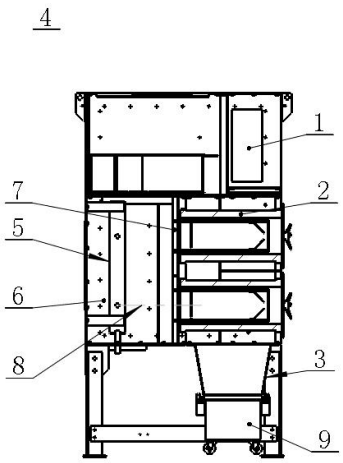


The air inlet is shown in the picture to the right (common:250mm / 300mm). Ensure that all connecting parts of the air pipes are well sealed, if there is any leakage, seal with sealant.

9.1g Startup and Operation

Before starting 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 will the pulse back blowing cleaning system start to work.

9.1h Machine Running Diagram



1. Dirty Air Inlet
2. Filter Elements
3. Ash Hopper
4. Clean Air Outlets
5. Storage Tanks

6. Electromagnetic Pulse Valve
7. Flower Board
8. Pulse Back to Blow Compressed Air
9. Dust Fall

9.2 Working Principle

9.2a Filtration Process

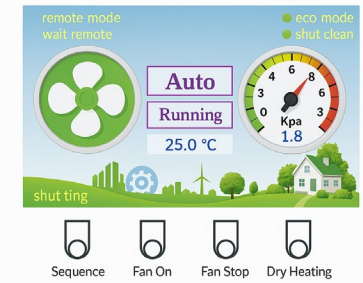
Under the action of the fan, polluted air produced by the equipment enters from the inlet of the dirty air. First, it encounters the spoiler between the inlet air, which acts as a spoiler to the incoming gas and slows down the flow speed. Due to the gravity subsidence, the coarse particle dust directly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

9.2b Cleaning process

As the filtration conditions continue, the dust accumulated on the outer surface of the filter cartridge will increase more and more, which will increase the running resistance of the equipment. When it reaches a certain level, the dust collector will begin to clean. This product is clear ash online for ash removal methods. When the pulse valve opens, the compressed air in the cylinder ejects a high-speed, high-pressure ejector airflow through the pulse valve, causing instantaneous positive pressure in the filter cartridge and generating bulging and micro-motion; and forming a wave transferred from the nozzle to the bottom of the cylinder. Therefore, the dust deposited on the filter material is detached, and the dust is removed. The dust collector enters the cleaning of the next set of filter cartridges according to the control system setting and continuously circulates and repeats.

9.2c Operation Settings

If a warning indicator lights up, please turn off the fume extractor / dust collector and then check it. Warning indicators will light up if a failure occurs for the following conditions:



- Emergency Stop
- Fan Overload
- Filter Blocked
- Abnormal phase sequence
- Lack of Phase
- Over Temperature

9.2d Buttons, Icons and Values

Below is a description of what each button does.

- Emergency Stop Button
    - Stop all operations of the Boss FC Xtract

    - Press the "EMERGENCY STOP" button immediately if there is any abnormal situation when the machine is running, such as the fan is stuck and / or it sounds abnormal
- Blower On Button
    - Starts the fan
    - This button starts the fan when the device is powered on normally
    - This function can't be used when the machine is under "remote control" mode
- Blower Off Button
    - Stops the fan
    - This button stops the fan when the device is powered on normally
    - This function can't be used when the machine is under "remote control" mode
- Manual Clean Button
    - Manual cleaning mode
    - The knob must be turned to the right for this function to take effect
- Fan Icon
    - Will rotate when the fan is running
    - Will NOT rotate when the fan is NOT running
- Dial and Number Value
    - Defines 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 0.435113 Psi, it is necessary to stop the machine and clean the ash hopper
- Stop and Run Value
    - When this value is highlighted in the middle frame it defines the working state of pulse back blowing dust removal

9.2e Function Settings

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
    - Sets the delay fan to start automatically
    - Controlled by parameter F06
        - Set this parameter to 0 to turn off this function
        - Set this parameter to other integers to indicate the power-on delay time
    - The operation startup mode is divided into local mode and remote mode
        - Local Mode
            - Parameter F02 allows for mode selection
            - The local mode startup operation needs to be operated on the control panel

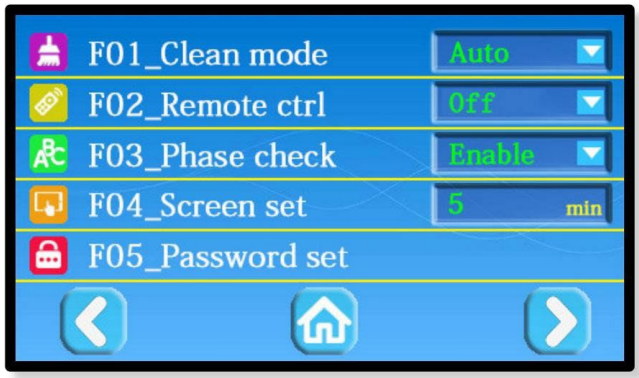
        - Remote mode
            - In this mode, the start-stop button on the machine operation panel cannot be used, and the remote line is shorted to start and disconnected to stop
    - Optional Frequency Converter
        - With an optional frequency converter, the normal and idle operation modes can be controlled by the external button
- 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
            - This is 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
            - Parameter F09 defines startup backflowing time
            - Parameter F10 defines the low pressure-difference value
            - Parameter F22 defines the pulse interval
            - Ash Cleaning Frequency
                - When the condition is reached, the blowing time in each cycle equals to the quantity of filter covers, and then the next cycle starts after a pause time of F23 (cycle interval, 3min by default)
        - Manual Mode
            - Manual mode starts by turning the manual dust removal knob to the right
            - Dust Cleaning Frequency
                - Parameter F22 defines the pulse interval
                - By default, this setting is set to every 15 seconds, always circulating
        - Timely Mode
            - Starts cleaning when the time is up
        - Differential Pressure Cleaning
            - Starts cleaning when the pressure difference value has been reached
- Dust removal after fan stops
    - When the fan stops, pulse back blowing has the best dust removal effect
    - Adopting this function reasonably can keep the dust collector in good operation and prolong the life of the filter cartridge
- Shutoff to Dust Cleaning
    - Shutoff can be divided into the following two situations
        - Manual Shutoff
            - Manually turn off the fan, and start back blowing after delaying parameter F14

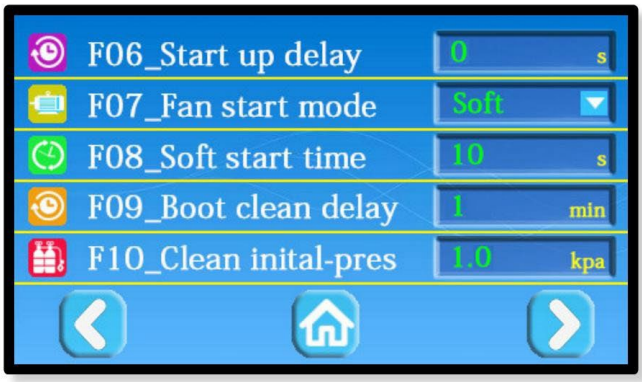
- After completing the set number of times of parameter F15, keep the standby state, and start it again manually

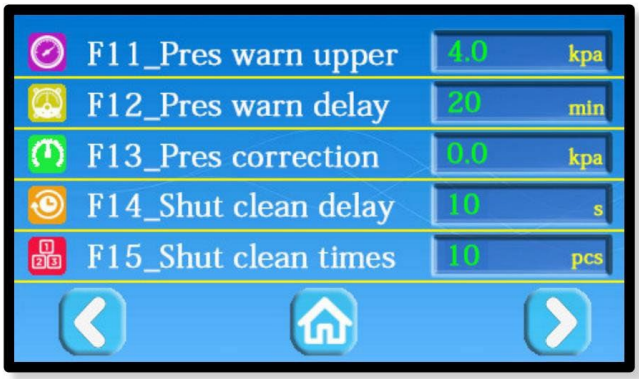
- Parameter Settings
  - When the pressure difference is higher than the parameter F19 setting and the duration is longer than the parameter F20 setting
  - Force the fan to stop and blow back to clean the dust
  - After completing the set number of times in parameter F15, the fan will automatically 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
  - E.g. 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

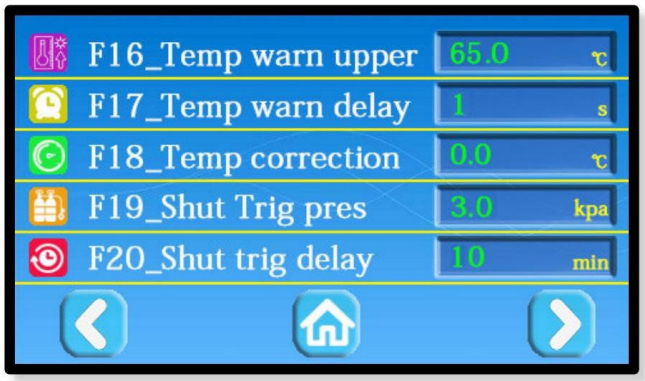
9.2f Parameter Settings

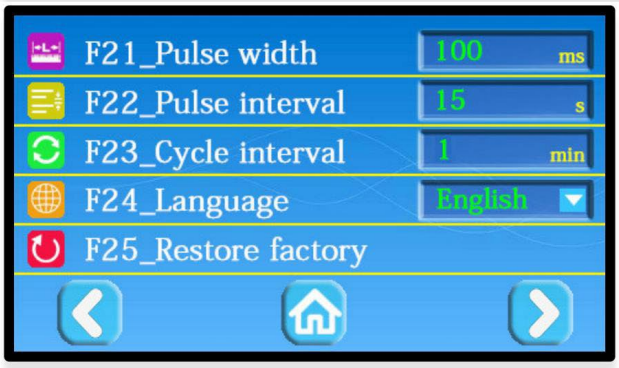
Click the parameters icon pictured on the right to enter the parameters settings menus and then enter password 123456. Please note that the password can be changed at your convenience.











Note: Make sure that you are familiar with the function of each parameter before making any modifications. Select the status query to query the current machine running status and alarm log.

F / 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 will work automatically. If you 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	0.145038 ~ 0.290075	0.145038	Psi	Start back blow valve in automatic ash removal or differential pressure mode
F11	High-pressure alarm valve	0.435113 ~ 0.870226	0.580151	Psi	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		Number of back blowing cycles after 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 continuous high value

					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	0.435113~0.725189	0.435113	Psi	When the specified pressure-difference value is reached, 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 / English		Chinese / English
F25	Return to factory condition				Parameter reset

F26	Reminder to clean the dust		70	h	Reminder to clean the ash hopper when the accumulated time of system operation is reached.
F99	Replace filter cartridge				Reminder to replace with new filter cartridge
P01	Model selection				Reserving parameter
P02	Time for filter cartridge replacement		4000		Reserving parameter

9.2g Tips for Parameter Settings

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*60F22=0.08*60 / 15=0.32m^3 / min
- The back blowing interval can be set reasonably according to the flow rate of air compressor
- The capacity of the air compressor is large enough, and the back blowing interval can be appropriately reduced
- When the amount of smoke and dust is large, the filter cartridge is easily 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 stopping the fan, the number of downtime dust removals shall be appropriately increased
- If the dust collector works abnormally because of the adjustment of parameters, please return to the default parameters

10. Maintaining Your Boss FC Xtract

The easiest way to follow a cleaning schedule is to use a calendar, keep it close to your extractor, and write the dates that you want / need to do maintenance on. Some maintenance is needed on a regular basis while other cleaning could be an immediate requirement after a fire, or a large amount of smoke or fumes as previously stated.

Disconnect the power supply before maintenance. Cut off the supply of compressed air before maintaining compressed air components. Please do not take the filter element out for cleaning. The filter element will be cleaned automatically in sequence.

10.1 Dust Removal

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

10.2 Filter Replacement

Filter replacement reminder: 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.

10.3 Diaphragm Replacement

The valve diaphragm are common spare parts. When the working time exceeds 5000-7000 hours, they must be replaced. When replacing it, pay attention to its front and back sides, not mix them up.

The back blowing 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.

10.4 Fault Handling

Warning! These steps must be followed when handling faults:

- 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

Fault	Cause	Solution
The fan cannot start	1. Line connection is incorrect. 2. Relay alarm. 3. Motor failure	1. Check whether the power supply is out of phase. 2. Reset thermal relay 3. Repair and replace the damaged motor
The fan can start, but it cannot run continuously	1. Overload protection is not installed correctly 2. The door of dust collector is open or not closed 3. Ash hopper is open	1. Check motor overload protection, reset or reset the correct value. 2. Close the door. 3. Install the ash hopper and close the maintenance door.

Noise and vibration of fans are too large	1. There is dust on the fan blade 2. The fan blade is worn out 3. The bearing is worn out	1. Clean the fan blades 2. Replace the fan impeller 3. Replace the bearing
Fault	Cause	Solution
Dust leaks from the air outlet	1. The filter element is not installed correctly 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 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. 2. Replace the filter element 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 2. Refer to control board point bitmap
Man-machine interface touch failure	1. HMI is failed 2. Circuit malfunctions	1. Replace the HMI 2. Check circuit and data line
No showing in Man-machine interface	1. HMI is failed 2. Data line malfunctions	1. Replace the HMI 2. Check if the data line gets loose

The air at the outlet of the dust collector contains dust.	1. The direction of filter cartridge is reversed. 2. Filter elements get broken	1. The end of the filter cartridge with rubber sealing ring faces inward. 2. If the filter cartridge is damaged, there will be obvious black smoke in the inner circle, which needs to be replaced.

11. Common Diagnostics

11.1 Alarm Information Processing

During the operation of the Boss FC Xtract, the following alarm interfaces may appear.

Abnormal Phase Sequence

Fan Overload Alarm

Emergency Stop

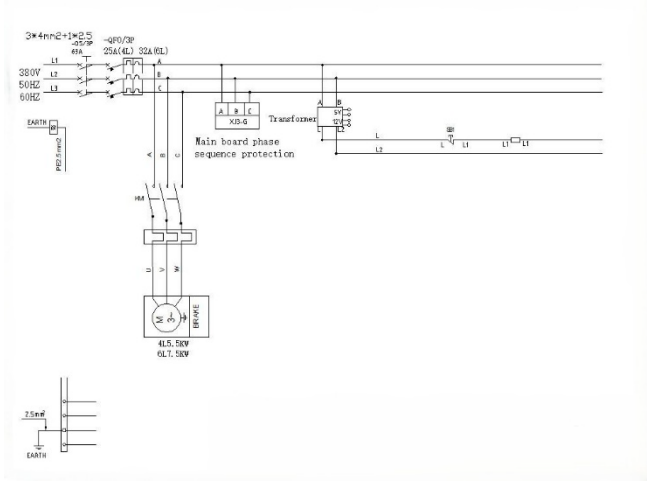
Differential Pressure

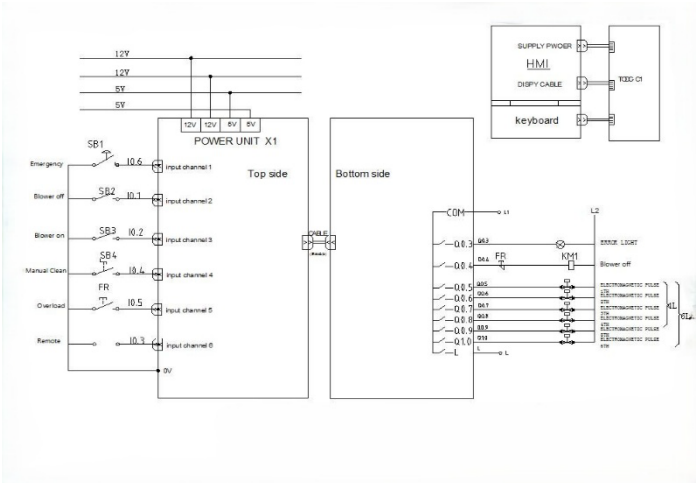
Temperature Alarm

Warning	Cause	Solution
Abnormal phase sequence	1. Line connection is incorrect 2. Phase missing	1. Replace the phase sequence 2. Check the power supply or circuit
Fan overload	1. Motor gets failure 2. Contacting thermal relay failure	1. Replace motor 2. Replace contacting thermal relay
Emergency stop	Press Emergency stop button	Reset Emergency stop button

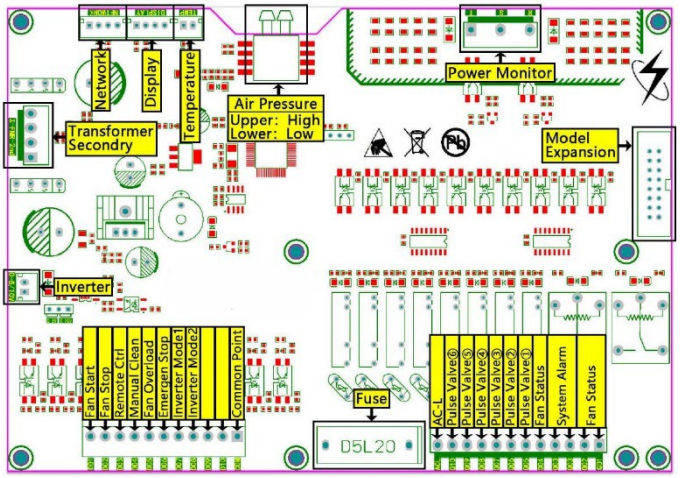
Differential pressure alarm	1. Filter elements get clogged 2. Back blowing compressed gas leakage 3. Check the valve diaphragm 4. Check the leakage of high-pressure air storage 5. Check the pulse signal indicator output	1. Check the condition of the filter cartridge, stop the fan and then blow back. 2. Replace the pulse valve 3. Replace the high-pressure air storage 4. Replace control panel
Temperature alarm	The temperature of the filter cartridge bin is too high.	Check the source of high temperature.

11.2 Control Circuit Diagrams





11.3 Control Panel Points



11.4 Spare Parts List

S / N	Spare part	Part number
1	Filter element assembly	400687
3	Diaphragm valve with solenoid valve	400688
4	Filter cover	400689
6	Control board	800148
7	HMI Panel	800147

12. Storage & Environment Requirements

Keep the extractor in a clean, dry, and warm location with no vibration. Humidity can cause the metal parts of the extractor to rust as all metal at some point can rust. It is best to try and control the humidity level in the extractor work area. The environment should be 50°–104°F (10°–40°C) with a relative humidity of 95% or less, and no dew.

13. Air Duct Installation Instructions

BOSS FC XTRACT Series Industrial Dust Collector Air Duct Installation Instructions

I. Industrial Dust Collector Air Duct Installation Requirements

Air Duct Installation Instructions

Laser Power	Duct Material	Duct Length	Supplementary Notes
Below 3KW (including 3KW)	Galvanized / High-temperature resistant steel wire plastic counter	2–4 meters	
6KW–8KW	Galvanized	3–5 meters	If the pipeline length is not enough, a pipeline-type spark catcher needs to be installed.
12KW–20KW	Galvanized	5–7 meters	If the pipeline length is not enough, a pipeline-type spark catcher needs to be installed. The minimum length requirement of the pipeline after installing the pipeline spark catcher: ≥ 4 meters.
Above 30KW (including 30KW)	Galvanized	6–8 meters	If the pipeline length is not enough, a pipeline-type spark catcher needs to be installed. The minimum length requirement of the pipeline after installing the pipeline spark catcher: ≥ 5 meters.

II. Comparison Between Galvanized Air Ducts, PVC Pipes, and Plastic Hoses

1. Cost Comparison: Based on 300 air ducts at 6 meters each, galvanized air ducts are more cost-effective.
2. High Temperature Resistance and Safety: Galvanized metal resists high temperatures better than PVC or plastic hoses.

- Hoses can catch fire if sparks are sucked into them.
- Burned plastic hoses leave only steel wire and may damage nearby electrical components.
- Avoid hoses for laser sources above 3000W. Use galvanized pipes instead.
- For laser sources below 3000W, use Iron pipes for installation.

III. Description of Air Duct Length

1. Ducts should not be too short. Higher power lasers (e.g., 10,000W) emit very hot slag (500°C+).
2. Short ducts may transfer this directly to the dust collector, causing fires.
3. Ducts should have optimal lengths – too long reduces airflow.
4. Avoid sharp angles; use large-radius elbows and minimize their number.
5. If ducts are short, install spark catchers.

IV. Pipeline Spark Catcher Installation Diagram

1. Pipeline A (Laser to Spark Catcher): ~70% of total length.
2. Pipeline B (Spark Catcher to Dust Collector): ~30% of total length.

V. Spark Catcher Structure: Referenced from Messer plasma systems and domestic manufacturers.

BOSS FC XTRACT – Industrial Dust Collector Electrical Installation

I. Circuit Connection
   - Equipped with 10m 3-phase 4-core cable.
   - Requires 208V WYE external power.
   - Connect A, B, C, and PE correctly, with the appropriate switch.

Model	Power (KW)	Current (A)	Air Switch (A)
BOSS FC XTRACT -4L/4B	5.5	12.1	25
BOSS FC XTRACT -6L/6B	7.5	15.7	32
BOSS FC XTRACT -8L/8B	11	22	63

BOSS FC XTRACT - 12L/12B	15	29.5	63

II. Compressed Air Connection
- Connect dry, filtered compressed air to the bottom air inlet using a 4-piece pipe.
- Set air pressure to 87 Psi.
- Ensure no leakage from pipes or connection fittings.

III. Compressed Air Requirements
- BOSS FC XTRACT -4L/4B: 80 Psi – 87 Psi
- BOSS FC XTRACT -6L/6B, 8L/8B, 12L/12B: 87 Psi – 102 Psi
- Oil-free and water-free air via dryer.
- Ensure 3600 cfm
- No air leaks at joints