# Operations Manual

## Apogee® X-Pro-II Workstation

**Cost Effective Equipment**

# 1) Introduction

## 1.1 Confidentiality Statement

Information supplied is for the use in the operation and/or maintenance of Cee® equipment. Neither this document nor the information it contains shall be disclosed to others for manufacturing or any other purpose without written authorization from, Cost Effective Equipment, LLC.

## 1.2 Warranty

Cost Effective Equipment, LLC warrants to the original purchaser (Buyer) that equipment is free from defects in material and workmanship under normal use and service in accordance with Cee® instructions and specifications. Buyer shall promptly notify Cee® of any claim against this warranty, and any item to be returned to Cee® shall be sent with transportation charges prepaid by Buyer, clearly marked with a Return Authorization (RMA) number obtained from Cee® Customer Support. Cee's obligation under this warranty is limited to the repair or replacement, at Cee® option, of any equipment, component or part which is determined by Cee® to be defective in material or workmanship. This obligation shall expire one (1) year after the initial shipment of the equipment from Cee®. This warranty shall be void if:

- Any failure is due to the misuse, neglect, improper installation of, or accident to the equipment.

- Any major repairs or alterations are made to equipment by anyone other than a duly authorized representative of Cee®. Representatives of Buyer will be authorized to make repairs to the equipment without voiding warranty, on completion of the Cee® training program.

- Replacement parts are used other than those made or recommended by Cee®.

CEE® MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, WITH RESPECT TO EQUIPMENT. NO WARRANTY IS MADE AS TO THE MERCHANTABILITY OF THE EQUIPMENT NOR ITS FITNESS FOR ANY PARTICULAR PURPOSE. In no event shall Cee® be liable for consequential loss or damages, however caused. No person or representative of Cee® is authorized to assume for Cee® any liability in connection with equipment nor to make any change to this warranty unless such change or modification is put in writing and approved by an authorized representative of Cee® in writing.

This warranty shall be governed by the laws of the state of Missouri, U.S.A.

## 1.3 Returned Materials

Any materials, parts, or equipment returned to Cost Effective Equipment, LLC must be clearly labeled with a Return Material Authorization (RMA) number.

To obtain an RMA number, contact:

    Cee® Customer Support
    Telephone.............................................+1-573-466-4300
    Email....................................................*support@costeffectiveequipment.com*
    Web Address ......................................*www.costeffectiveequipment.com*

## 1.4 Model and Revisions

The model and serial number information for the Cee® Apogee® X-Pro II Workstation are located on the rear panel. Software version information can be found on the *About* screen. See *DataStream™ Manual* for screen shots and a detailed explanation of the system software.

Doc Rev 1.3.20240722

## 1.5 Environmental Considerations

| | | |
|---|---|---|
| | Cee® fosters sustainability through innovation in the durability and reliability of our precision tools and equipment. Individual component modules are engineered for serviceability ensuring long lasting performance. Processes are designed to minimize use & consumption of chemical compounds ensuring accurate, replicable, industry-leading results every time. | Cee® favorise la durabilité grâce à l'innovation dans la durabilité et la fiabilité de nos outils et équipements de précision. Les modules de composants individuels sont conçus pour une facilité d'entretien garantissant des performances durables. Les processus sont conçus pour minimiser l'utilisation et la consommation de composés chimiques, garantissant à chaque fois des résultats précis, reproductibles et à la pointe de l'industrie. |
| | Cee® diligently screens suppliers to ensure conflict-free sourcing of minerals and product components are constructed of recycled materials wherever possible. | Cee® sélectionne avec diligence les fournisseurs pour garantir que l'approvisionnement en minéraux est sans conflit et que les composants des produits sont fabriqués à partir de matériaux recyclés dans la mesure du possible. |
| | Cee® tools and equipment operate without the use of ozone depleting substances (ODSs) including chlorofluorocarbons (CFCs), methyl chloroform, hydrochlorofluorocarbons (HCFCs), carbon tetrachloride, perfluoro compounds (PFCs), or other volatile compounds/organic solvents. | Les outils et équipements Cee® fonctionnent sans utilisation de substances appauvrissant la couche d'ozone (SACO), notamment les chlorofluorocarbures (CFC), le méthyle chloroforme, les hydrochlorofluorocarbures (HCFC), le tétrachlorure de carbone, les composés perfluorés (PFC) ou d'autres composés volatils/solvants organiques. |

## 1.6 General Safety Hazards / Precautions

| | | |
|---|---|---|
| | Read this manual in its entirety before operating or servicing the machine. | Lisez ce manuel dans son intégralité avant d'utiliser ou d'entretenir la machine. |
| | The unit is very heavy and proper precautions should be taken when handling the machine to minimize the risk of injury. Labels are placed on the machine to identify areas where caution is needed during operation. | L'unité est très lourde et des précautions appropriées doivent être prises lors de la manipulation de la machine pour minimiser le risque de blessure. Des étiquettes sont placées sur la machine pour identifier les zones où des précautions sont nécessaires pendant le fonctionnement. |

## 1.7 Electrical

| | | |
|---|---|---|
| | High voltage is present in the machine. Disconnect power before servicing. | Une haute tension est présente dans la machine. Débranchez l'alimentation avant l'entretien. |
| | Stored electrical energy is present in the machine. Before servicing allow sufficient time for discharge. | L'énergie électrique stockée est présente dans la machine. Avant l'entretien, prévoyez suffisamment de temps pour la décharge. |

Doc Rev 1.3.20240722

| | | |
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| ⚡ | This unit must be connected to an outlet with proper grounding. | Cet appareil doit être connecté à une prise avec une mise à la terre appropriée. |

## 1.8 Thermal

| | | |
|---|---|---|
| ♨ | Bake Plates, if equipped, can reach temperatures sufficient to cause severe burns and may remain hot for a long-time following operation. Do not service the machine until all surfaces have cooled to a safe thermal condition (e.g., room temperature). | Les plaques de cuisson, si elles sont équipées, peuvent atteindre des températures suffisantes pour causer des brûlures graves et peuvent rester chaudes pendant une longue période après l'opération. Ne pas entretenir la machine tant que toutes les surfaces n'ont pas refroidi à une température sûre (par exemple, température ambiante) |

## 1.9 Mechanical

| | | |
|---|---|---|
| ⚠ | This machine may contain compressed gases which can provide motive force for components and can expand violently upon decompression. Disconnect N2 or CDA before removing any panels. | Cette machine peut contenir des gaz comprimés qui peuvent fournir une force motrice aux composants et peuvent se dilater violemment lors de la décompression. Débranchez le N2 ou le CDA avant de retirer les panneaux. |
| ⚠ | Ensure that all panels are on and in their correct locations before powering up or operating. | Assurez-vous que tous les panneaux sont allumés et à leur emplacement correct avant la mise sous tension ou l'utilisation. |
| ⚠ | When opening lids be aware of the pinch point at the hinge cover. Open lids only by using the handles on the lids. | Lorsque vous ouvrez les couvercles, faites attention au point de pincement au niveau du cache de la charnière. Ouvrez les couvercles uniquement en utilisant les poignées des couvercles. |
| ⚠ | Machines equipped with spin coaters and/or developers are capable of very high-speed rotation. Ensure all lids and panels are in place before rotating these devices. | Les machines équipées de spin coaters et/ou de développeurs sont capables de rotations à très haute vitesse. Assurez-vous que tous les couvercles et panneaux sont en place avant de faire tourner ces appareils. |

## 1.10 Chemical

Cee® does not supply or dictate chemicals to be used in conjunction with the Cee® X-Pro II Workstation. Material data will be reviewed during equipment design and configuration to ensure compatibility with the customer's proprietary process.

Prior to introducing new chemicals, refer to your chemical supplier's factory specifications and MSDS.

Cee® ne fournit ni n'impose aucun produit chimique à utiliser avec la plaque de cuisson Cee® X-Pro II Workstation. Les données matérielles seront examinées lors de la conception et de la configuration de l'équipement pour garantir la compatibilité avec le processus exclusif du client.

Doc Rev 1.3.20240722

Material Safety Data Sheets (MSDS) contain crucial information regarding chemical safety, including details about hazardous components, physical properties, spill and leak procedures, waste disposal guidelines, and personal protective equipment requirements for handling.

Avant d'introduire de nouveaux produits chimiques, reportez-vous aux spécifications d'usine et à la fiche signalétique de votre fournisseur de produits chimiques. Les fiches signalétiques (MSDS) contiennent des informations cruciales concernant la sécurité chimique, notamment des détails sur les composants dangereux, les propriétés physiques, les procédures en cas de déversement et de fuite, les directives d'élimination des déchets et les exigences en matière d'équipement de protection individuelle pour la manipulation.

| | | |
|---|---|---|
| ⚠️ | Ensure chemical compatibility of all chemicals and materials being used inside the machine. This includes all wetted parts of the storage, supply, dispense, and waste systems. | Assurer la compatibilité chimique de tous les produits chimiques et matériaux utilisés à l'intérieur de la machine. Cela inclut toutes les parties mouillées des systèmes de stockage, d'alimentation, de distribution et de déchets. |
| 🔥 | Potential for flammable Chemicals. No open flames/sparks. | Potentiel de produits chimiques inflammables. Pas de flammes nues/étincelles. |
| ⚠️ | Relieve pressure and shut off chemical valves before servicing supply lines, dispense valves or other components. | Relâchez la pression et fermez les vannes chimiques avant d'entretenir les conduites d'alimentation, les vannes de distribution ou d'autres composants. |
| ⚠️ | Ensure proper ventilation/exhaust is always used. | Assurez-vous qu'une ventilation/évacuation adéquate est toujours utilisée. |
| ⚠️ | Always wear appropriate Personal Protective Equipment. This includes safety glasses, gloves, and other equipment, as needed, to protect from mechanical and chemical hazards. | Portez toujours un équipement de protection individuelle approprié. Cela comprend des lunettes de sécurité, des gants et tout autre équipement, si nécessaire, pour se protéger des risques mécaniques et chimiques. |

Exhaust and fume management is important to prevent the release of hazardous materials and ensure a safe working environment. Users should assume that all fumes are hazardous and take appropriate precautions to ensure system exhaust is functional per the guidelines outlined in section **Error! Reference source not found.** of this manual.

La gestion des gaz d'échappement et des fumées est importante pour empêcher le rejet de matières dangereuses et garantir un environnement de travail sûr. Les utilisateurs doivent supposer que toutes les fumées sont dangereuses et prendre les précautions appropriées pour garantir que l'échappement du système est fonctionnel conformément aux directives décrites dans la section 6 de ce manuel.

## 1.11 Decommissioning & Disposal

The Cee® Apogee® X-Pro II Workstation II requires no special consideration with regard to retiring equipment. Adhere to organizational policy for guidance on decommissioning & disposal to ensure compliance with local, regional, and national hazardous waste regulations.

Doc Rev 1.3.20240722

## 1.12 Lockout/Tagout Procedures and Information

Before servicing, turn off the machine and remove the power inlet cord by disconnecting the plug where it enters the machine.

Note: There are no LOTO (Lock Out/Tag Out) facilities supplied with the Cee® Apogee® X-Pro II Workstation. It is the responsibility of the customer/installer/end-user to ensure that the suitable LOTO devices are provided on utilities being supplied to the Cee® Apogee® X-Pro II Workstation in accordance with applicable laws, regulations, and/or company policies.

For more information, please contact Cee® Customer Support.

## 1.13 Intended Use of Machine

The Cee® Apogee® X-Pro II Workstation is intended for use as a semiconductor/optical application machine.

The Cee® Apogee® X-Pro II Workstation is not intended for use in food or medical applications or for use in hazardous locations.

The Cee® Apogee® X-Pro II Workstation is intended for use only by trained personnel wearing the proper personal protective equipment. Anyone not trained in the proper use of the Cee® Apogee® X-Pro II Workstation and having not fully read this manual, should not operate the equipment.

The Cee® Apogee® X-Pro II Workstation is intended for use in a cleanroom or laboratory environment to provide the proper processing conditions for the substrates. If it is used outside of these environments, substrate cleanliness may be compromised.

The Cee® Apogee® X-Pro II Workstation is not intended for use in a hazardous or explosive environment.

### Normal Operating Conditions

Ambient Temperature......................................................... 10°C - 30°C

Relative Humidity............................................................... ≤80%

Altitude ............................................................................. up to 3000 m

Pollution Degree ............................................................... 2

Overvoltage Category........................................................ II

| ⚠ | If the Cee® X-Pro II Workstation is used in a manner not specified by Cee® or with accessories not provided by Cee® the protection provided by the equipment may be impaired. | Si le poste de travail Cee® X-Pro II est utilisé d'une manière non spécifiée par Cee® ou avec des accessoires non fournis par Cee®, la protection fournie par l'équipement peut être altérée. |
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Doc Rev 1.3.20240722

## 2) Equipment Description

The Cee® Apogee® X-Pro II Workstation is a modular workbench designed to house the industry leading Cee® Apogee® spin and bake process modules in a cleanroom environment suitable for fume control or reduction of airborne particulate contaminates. The Cee® Apogee® X-Pro II Workstation delivers track-quality performance with revolutionary interface capabilities and the utmost in chemical compatibility, in an efficient, space-saving design.

Fully programmable and user-friendly, the Cee® Apogee® X-Pro II Workstation features the accuracy and repeatability need to eliminate processing variability for critical experiments. With its convenient compact footprint, wide array of chemical compatibility, and durability, this easy-to-use benchtop system will provide years of high-performance operation, making your Cee® Apogee® X-Pro II Workstation purchase a smart and cost-effective decision.

### 2.1 User Controls
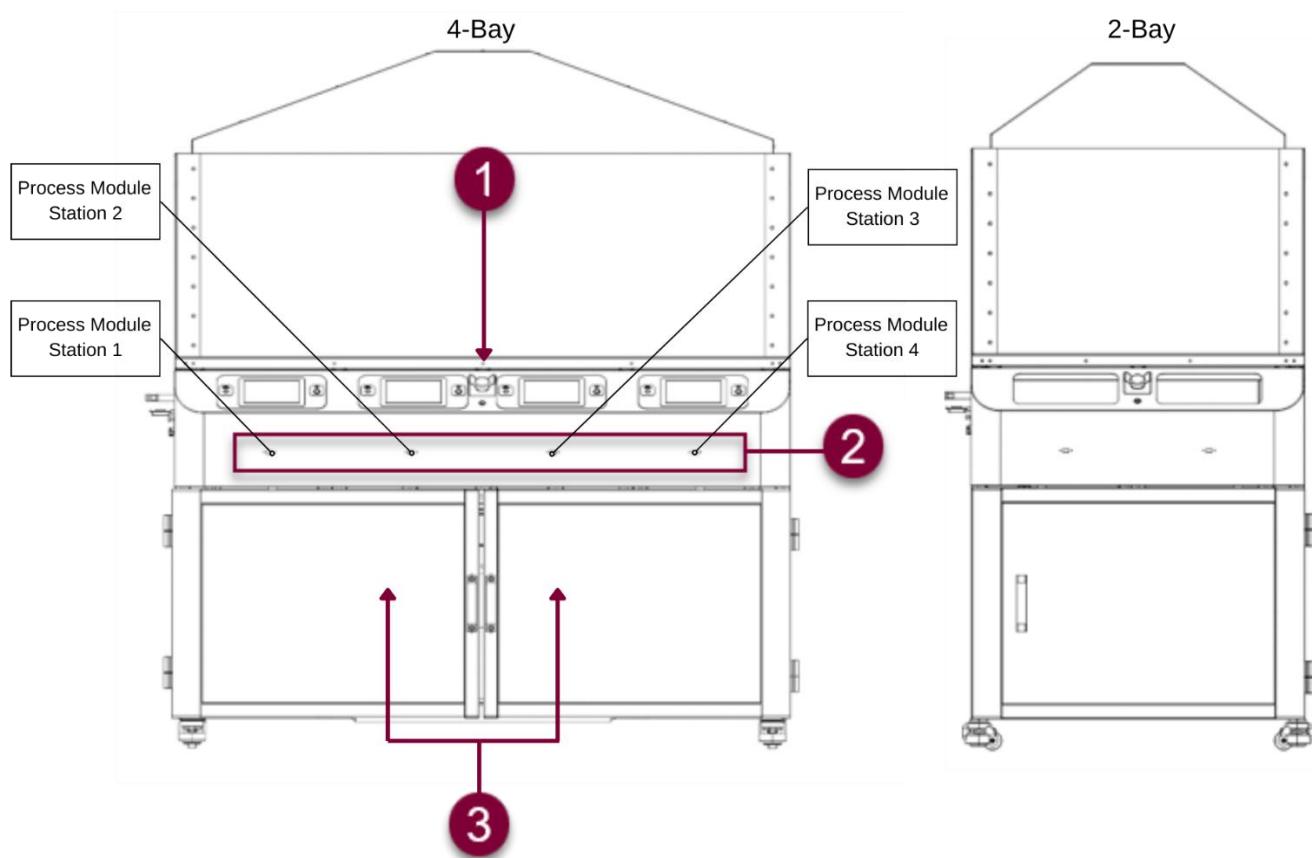


1. emergency machine off (EMO) ............ immediate shutdown of process functions across all process modules
2. process module station 1-4[1] ................. individual Apogee® process modules and user interface controls
3. chemical storage cabinet...................... for storage of (optional) Cee® supplied chemical supply vessels

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[1] All process modules are pre-installed and configured by Cee® during manufacture.

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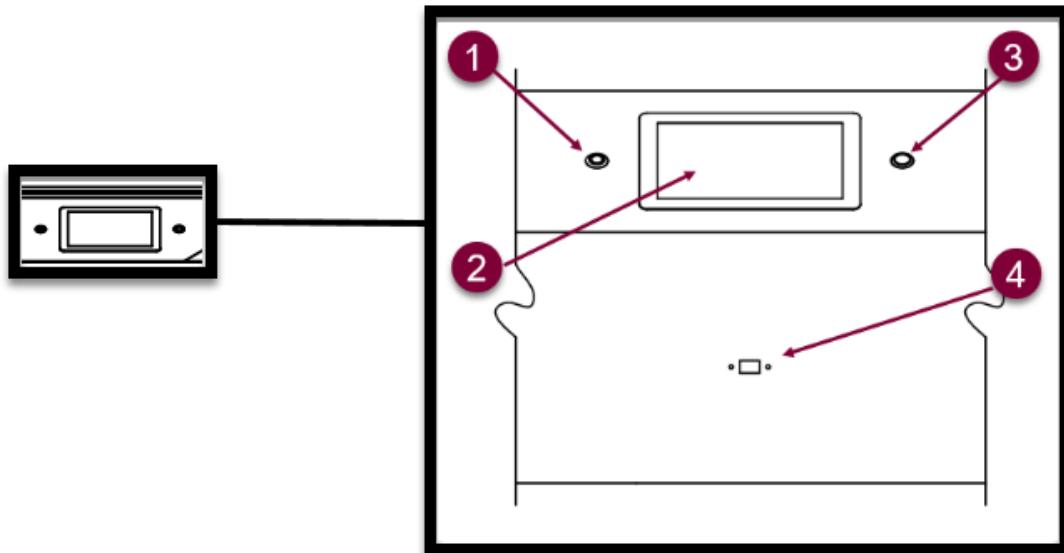
1. **module local presence**[2] ...................... used for remote access
2. **module touch screen interface** ........... touchscreen for interaction with process module functions
3. **module power on/off** ......................... used to turn individual process modules off/on
4. **module USB interface** ......................... facilitates data transfer per individual process module

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[2] See DataStream™ Manual for more information.

Doc Rev 1.3.20240722

### 2.2 Dimensions

**2 Bay X-Pro II Workstation**

35.5" (90.2cm) W x 40" (101.6cm) D x 80" (190.5cm) H

Machine Weight...................................................... 400-800lbs *(varies with process module configuration)*

**4 Bay X-Pro II Workstation**

66" (167.6cm) W x 40" (101.6cm) D x 80" (190.5cm) H

Machine Weight...................................................... 1000-1400lbs *(varies with process module configuration)*

### 2.3 Features

- Plug and play. Be up and running in virtually no time.
- Fully integrated solution: workstation, tools, and service/installation
- Fully customizable to fit your needs
  - Choice of Ducted Exhaust, Ductless Recirculation or Fan Filter Unit (Laminar Downflow)
  - Customizable process module configuration

  | **4 Bay** | **2 Bay** |
  |---|---|
  | • four 200-mm modules | • two 200-mm modules |
  | • two 300-mm modules | • one 300-mm module |
  | • two 200-mm and one 300-mm modules | |

- Hundreds of possible configurations
- Waste bottle containment with optional drain bottles
- Exhausted drawer for material storage, pressure vessels, etc.
- Sash for clean environment, fume containment, and operator safety
- Operator convenience outlets for main voltage and USB charging

### 2.4 Reliability

- Industry-leading Cee® reliability and uptime
- Low maintenance design
- One-year full warranty on parts and labor
- Complimentary remote technical support
- Application process assistance for the life of the product

### 2.5 NRTL

Beginning in November of 2024, all standard North American Cee® X-Pro II Workstation models will proudly showcase the TÜV SÜD NRTL mark, a testament to our commitment to safety and quality.

The TÜV SÜD NRTL mark signifies compliance with North American safety standards, providing assurance of product safety and quality. Recognized by Authorities Having Jurisdiction (AHJs) and code officials throughout the US and Canada, the TÜV SÜD Mark is featured on millions of products sold nationwide. Customers can trust that products bearing the TÜV SÜD Mark meet rigorous safety standards established by independent testing and ongoing inspections.

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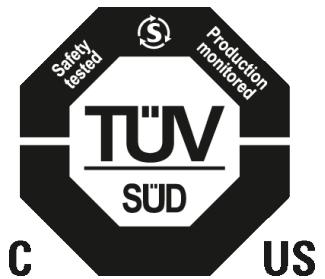
## 2.6 Utilities

voltage ranges[3] .......................................... 208/230 VAC, 50/60Hz
power requirements (max) ........................ 26.2A
circuit breaker ............................................ 30A
interrupt capacity ...................................... 15,000A
X-Pro II drawer exhaust port ..................... 8" OD (4 Bay) | 6" OD (2 Bay)
X-Pro II hood exhaust port ......................... 8" OD (4 Bay) | 6" OD (2 Bay)
vacuum ...................................................... 20-24 inHg
nitrogen or CDA ......................................... 70psi

**If equipped:**
spinner drain port[4] ................................... ¾" OD external (standard)
spinner module exhaust port .................... 1" OD (Apogee Spin) | 1.5" OD (Apogee 450 Spin)
bake module exhaust port ......................... 2" OD

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[3] See data plate on rear of machine for power requirements specific to your X-Pro II configuration.
[4] Not use if equipped with optional internal drain bottle with full sensor.

Doc Rev 1.3.20240722

## 2.7 Safety Package (Optional)

The Cee® X-Pro II Workstation Safety Package enhances operational security by offering customizable features to detect and respond to faults. With automatic shutdown, audible/visual alarms, and a range of sensor options, this package helps prevent hazards and ensures safe, uninterrupted operation in accordance with your process needs.
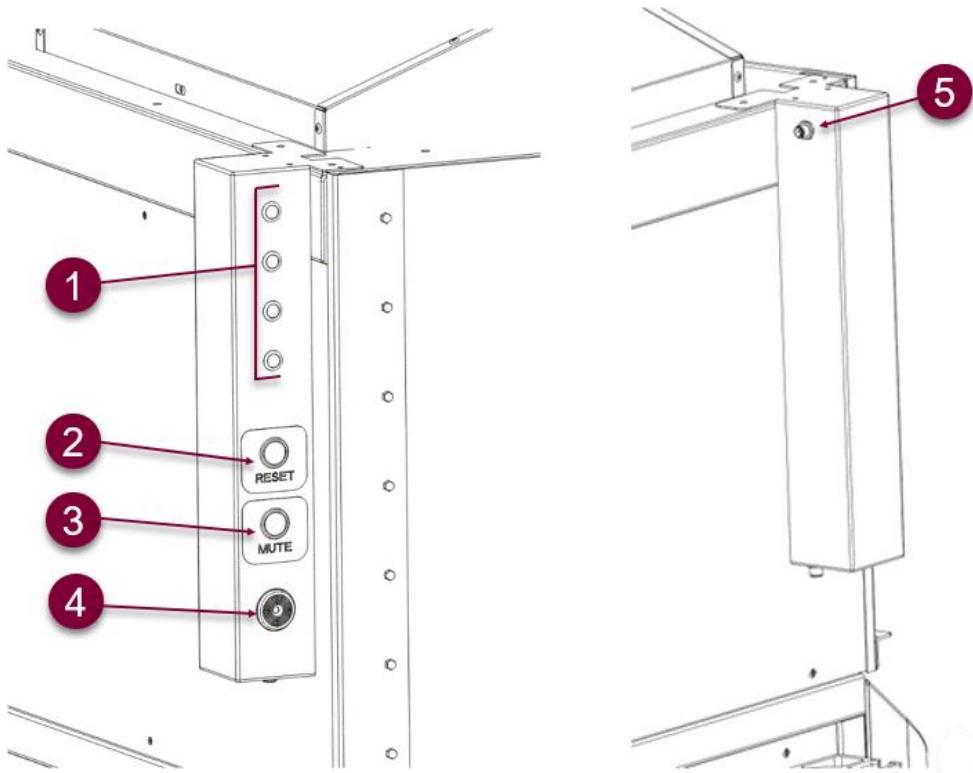


1.  **alarm LEDs**............................................ visual aids to indicate which alarm is in fault
2.  **reset button** ........................................ used to reset when all alarms are satisfied
3.  **mute button**......................................... used to silence audible alarm
4.  **audible alarm** ...................................... piezo buzzer that makes noise when a fault occurs
5.  **dry contact output** .............................. output that can be used for integration with external devices (pins 1 and 3)

## Operation

- On startup, the safety reset button should be blue and no alarms present. Press the blue safety reset button. The blue reset light on the front of the X-Pro will then illuminate. Press to start the Cee® X-Pro II Workstation. If the blue reset light does not illuminate on the front of the X-Pro II Workstation, twist the EMO button to release.

- If a fault occurs, the X-Pro II Workstation and process modules will automatically shut down. The audible alarm will sound, the mute button will illuminate in white, and the corresponding alarm LED will indicate the fault. The mute button can be pressed to silence the audible alarm. Pins 1 and 3 of the dry contact on the back of the safety package will close.

- Once the fault is corrected, the alarm LED will turn off. When all alarms are cleared, the blue safety reset button will illuminate. Pins 1 and 3 of the dry contact will open. Follow startup procedures to power the X-Pro II Workstation.

Doc Rev 1.3.20240722

**Alarm Options:** *Choose up to four available sensors*

-Left Containment Leak Sensor

-Chemcial Drawer Leak Sensor

-Right Containment Leak Sensor

-Exhaust Leak Sensor -3 Leak Sensors (linked into 1 alarm)

-Overtemp Sensor (can be used in exhaust)

-N2/CDA Flow Rate Sensor

-External Sensor (24VDC contact)

-No Senor (blank)


## 2.8  Accessory Outlets

The X-Pro II Workstation is equipped with accessory outlets on the left side and inside the lower cabinet. The accessory outlet installed on the left side of the unit includes a receptacle and USB power (Not a data port).

**Utility Outlet**
Voltage (AC):  ....................................................110VAC (North American), 220VAC (International)
Outlet Current (MAX):  ......................................10A
**USB Outlet**
Voltage (DC):  ....................................................5VDC
Outlet Current (MAX):  ......................................1.5A
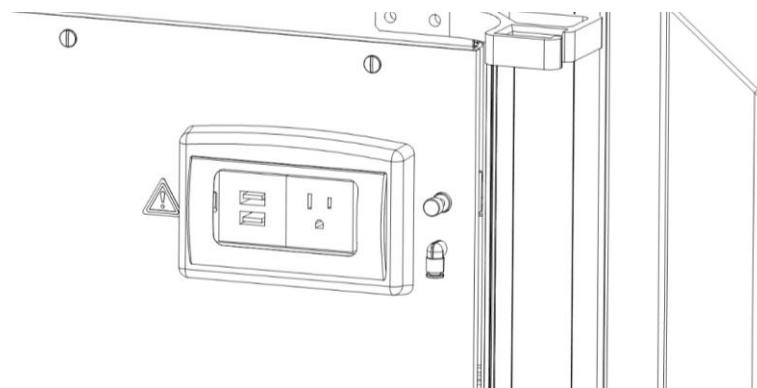


The accessory outlets installed underneath can be switched off and on with the Accessory Power button located at the front. When the switch is illuminated, the outlets are powered.

Voltage (AC):  ....................................... 110VAC (North America), 220V (International)
Combined Outlet Current (Max):  ......... 10A
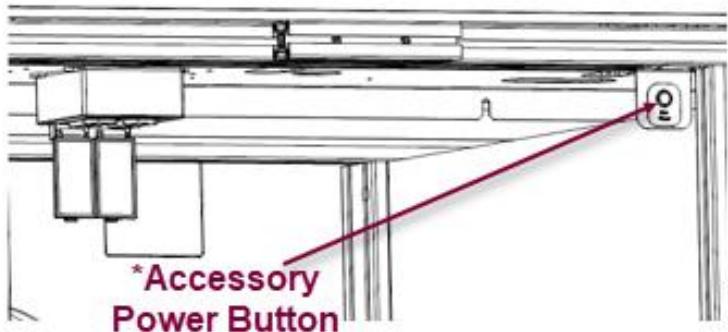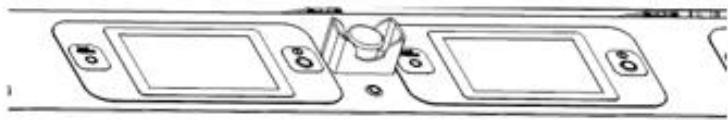
*Accessory
Power Button

# 3) Installation

## 3.1 Clearance Requirements

The Cee® Apogee® X-Pro II Workstation is a freestanding unit that requires a sturdy and level floor for location.

> **Clearance Requirements**:
>
> device rear............................................................ 18" (457mm)
>
> device sides ......................................................... 3" (76.2mm)

## 3.2 Facilities Requirements

The Cee® Apogee® X-Pro II Workstation requires the following utilities for operation.
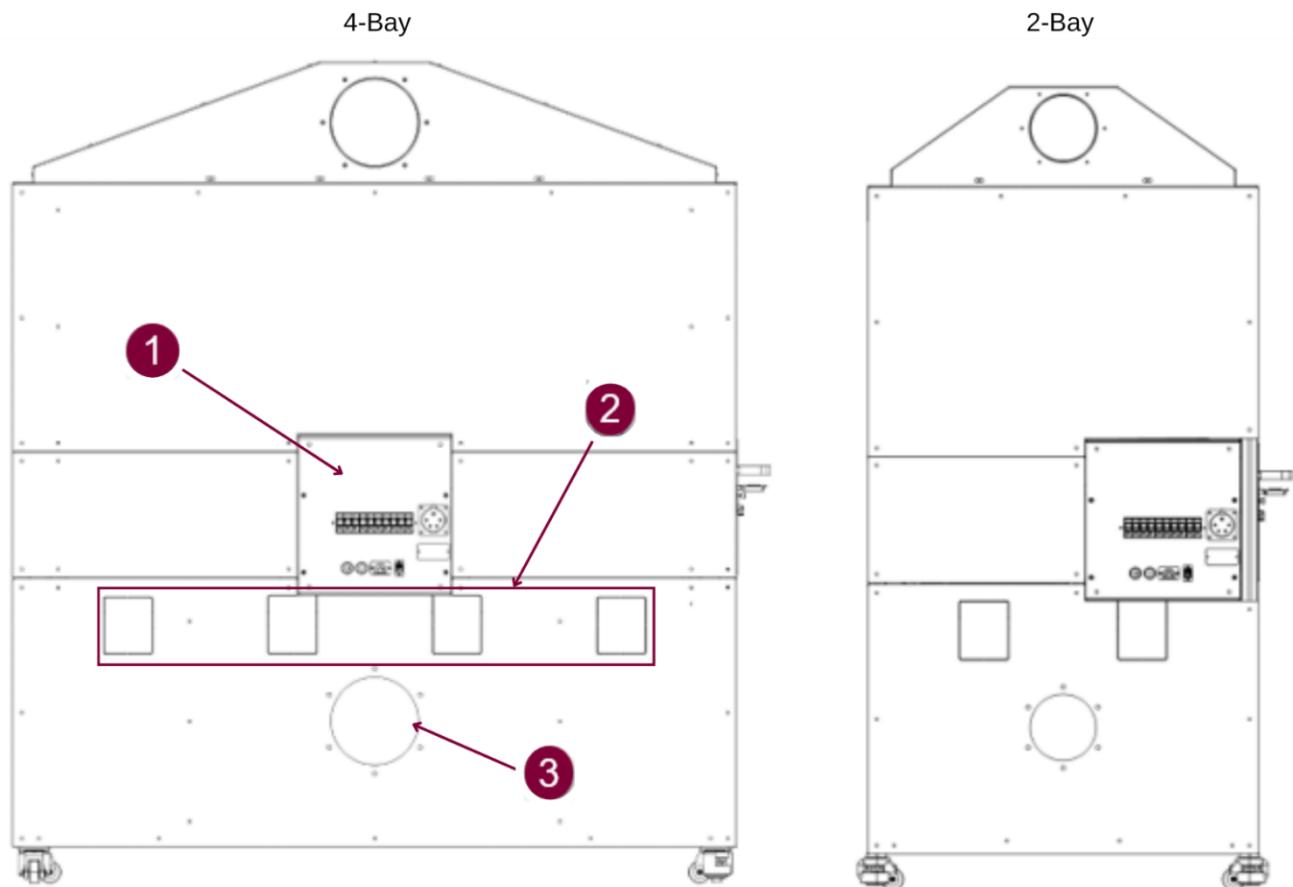


*Figure 1: Facilities Connections for the Cee® Apogee® X-Pro II Workstation*

1. **power connections** .............................. detail below
2. **module exhaust/drain**[5]........................ external port for spin bowl vapors and liquid drain
3. **chemical cabinet exhaust** ................... external port for chemical cabinet ventilation

**Power Connections**

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[5] Figure depicts workstation equipped with four spin modules.

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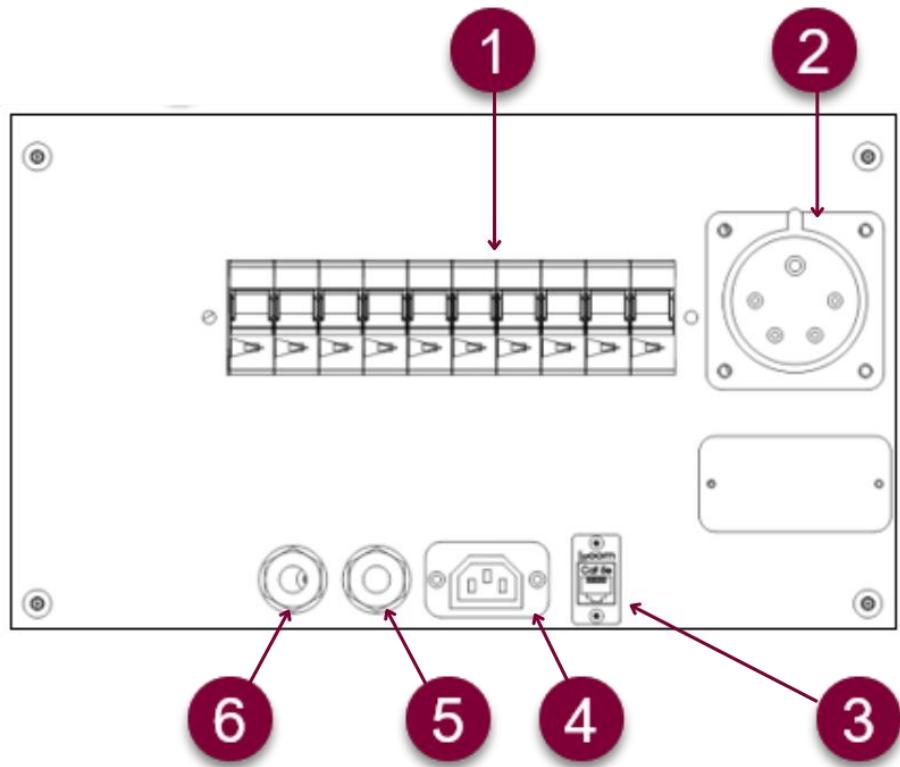
*Figure 2: Power Connections for Cee® Apogee X-Pro II Workstation*

1. system circuit breakers......................... electrical protection for the Cee® Apogee® X-Pro II Workstation
2. power in .............................................. single phase AC power in
3. ethernet.............................................. facilitates remote recipe writing & remote device control
4. powered fan filtered unit ..................... power supply for optional FFU or Ductless Recirculation hood
5. system nitrogen................................... ¼" NPT (National Pipe Taper) threaded connection
6. system vacuum..................................... ¼" NPT (National Pipe Taper) threaded connection

## 3.3 Environment

The Cee® Apogee® X-Pro II Workstation should be operated in a clean, low-humidity environment.

## 3.4 Unpackaging/Inspection

1. Open the packing crate by removing Phillips-head screws and removing side panels.
2. Remove packing foam and plastic wrap.
3. Thoroughly check machine for shipping damage. If physical damage is seen, ***DO NOT APPLY POWER!*** Contact Cee® Customer Support immediately.

**The following items are included with shipment:**

- (1) Cee® Apogee® X-Pro II Workstation
- (1) power connector
- (1) operations manual (USB thumb drive)
- spin and/or bake modules (installed into the workstation)

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**Optionally included items:** *(packed within Cee® Apogee® X-Pro II Workstation)*

- safety package controller
- dispense systems and related components
- spin chucks with screws
- substrate centering equipment
- waste systems
- vacuum pumps
- bake plate stop pins

## 3.5 System Installation & Setup

| ⚠️ | The Cee® Apogee® X-Pro II Workstation is an extremely heavy piece of equipment and will likely require machinery such as a forklift to safely unpackage and move. Do not lift by covers, handles, or protrusions. Do not roll, tip, or turn the unit on its sides or ends. | Le poste de travail Cee® Apogee® X-Pro II est un équipement extrêmement lourd et nécessitera probablement l'utilisation de machines telles qu'un chariot élévateur pour le déballer et le déplacer en toute sécurité. Ne le soulevez pas par les couvercles, poignées ou saillies. Ne faites pas rouler, incliner ou tourner l'unité sur ses côtés ou ses extrémités. |
|---|---|---|

1. Open the bottom doors of the unit. An accessory angle iron is attached for assistance with forking/lifting the unit.
2. Carefully lift the unit off the packing crate base using assistance as required and forking from the front of the equipment.
3. When the Cee® Apogee® X-Pro II Workstation has been removed from the crate base and all lift equipment is clear, raise the leveling feet by turning the orange nuts. Once all four leveling feet are raised, the unit will be free to roll on the casters.
4. Remove and dispose of any remaining packing materials and plastic wrap.
5. *All process modules are pre-installed and configured by Cee® for plug & play usage.
6. Thoroughly clean all process areas of the Cee® Apogee® X-Pro II Workstation modules as well as the exterior of the unit. Refer to section 4.5 for cleaning guidance and follow organizational procedures to prepare the unit for cleanroom or laboratory installation.
7. The rolling cart/drawer is secured with a metal angle. For ease of setup, it is recommended that this brace remains intact until the unit reaches its final placement to avoid damage to dispense plumbing/tubing.
8. Place the Cee® Apogee® X-Pro II Workstation on a floor of sufficient strength so that the process module controls, spin chuck(s), and/or bake surfaces are at the proper ergonomic height.
9. Open the bottom doors of the unit, remove the metal angle removing the 2 screws, and discard.
10. The drawer can then be slightly lifted and pulled out to rest on the floor. 2 bolts and spacers can be found on the sides of the drawer. Remove and discard all. The drawer can now be pushed back into the X-Pro II Workstation.
11. Locate the sash retaining bolt on the right side of the workstation towards the back at eye level. This is place for shipping to keep the sash secured for shipping. There will be a remove tag located with the bolt. Remove the bolt and tag and discard. The sash should now be free to use.
12. Connect utilities according to the reference diagram in section 3.2
    - Connect system vacuum to the vacuum fitting unless supplied with optional vacuum pump.
    - Connect system nitrogen to nitrogen fitting.
    - Connect any supplied spin module drains to the house-supplied drain facility unless optional waste carboys are installed.
    - Connect any supplied spin module exhaust ports to the house-supplied exhaust facility.
    - Connect any supplied bake module exhaust ports to the house-supplied exhaust facility.
    - Connect any supplied spin dispense or other accessory item as indicated in Section 3.2.
13. Identify the supplied electrical plug. A red plug is provided for North American customers the blue plug is for international customers. Wire connectors to the plug as shown in the illustrations below. Cee® only provides the plug to the machine and does not supply wire and connections to the customer's electrical facilities.
    - Allowable cordage diameter for connector strain relief is 0.472" – 0.866" (12mm – 20mm).
    - Maximum conductor size accepted by connector terminals is 10 AWG (4mm)

- Always observe all local wiring codes, colors, and other applicable industry standards.

# Cordage Preparation

All conductors:        2.17" (55mm) "Length"
Ground:                0.59" (15mm) "Strip"
All other conductors:  0.51" (13mm) "Strip"

US/North American
Cee X-Pro II
Version

**Plug is RED in color**

Neutral
(White)

Ground

AC Line Voltage

AC Line Voltage

Not Used

International
Cee X-Pro II
Version

**Plug is BLUE in color**

Neutral

AC Line Voltage
Ground
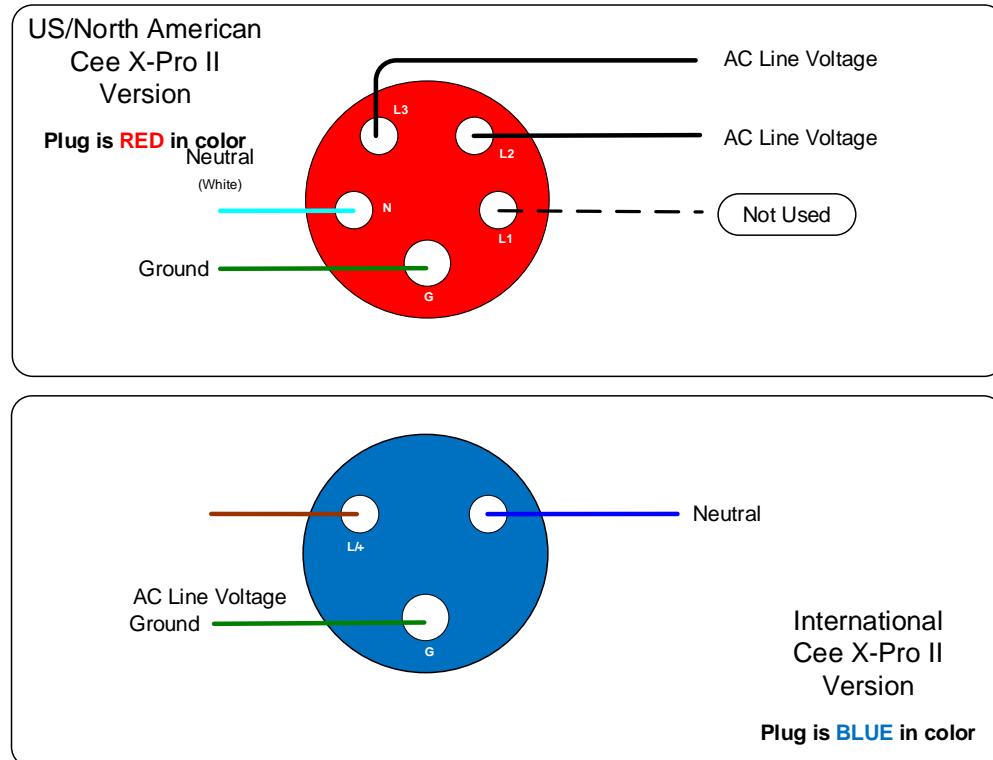
### 3.6 Safety Package Installation *(Optional)*

1. Unpackage side safety controller found packaged inside the bottom of the workstation.
2. Remove the 2 bolts from the top of the workstation, set the controller in place, and refasten the bolts shown in Figure 3: Safety Controller.
3. Plug in the 12-pin connector coming out of the workstation to the bottom of the safety controller (shown by the red arrow).
4. Upon start-up, alarms may fault if the supplied utility is not turn on (exhaust, N2, etc.). All utilities must be turn on and set to recommended setting in order to start the workstation.
5. Once all faults are cleared, the blue reset light will illuminate on the safety controller. Press to reset the alarms.
6. Continue to Section 3.8 to continue the Start-Up procedure.

   Note: During use of the workstation, if any of the monitor items fault, the safety controller will EMO the entire workstation, make an audible alarm, and display which alarm is at fault with a red LED. The mute button can be press to silence the alarm but the fault must be corrected in order to operate the workstation again.
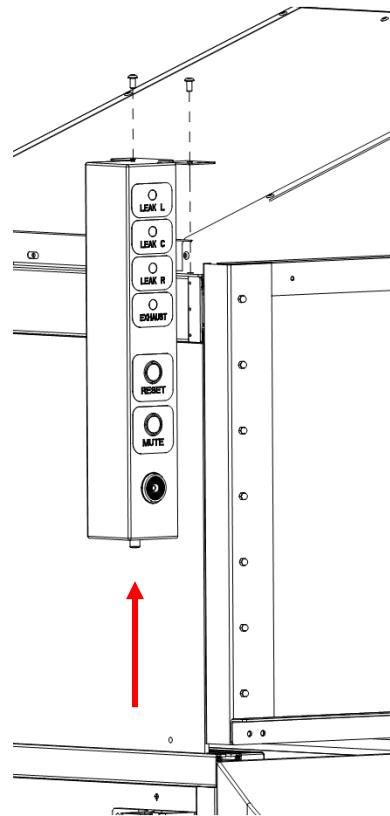


*Figure 3: Safety Controller*

### 3.7 Fan Filter Unit (FFU) Installation *(optional)*

| ⚠️ | DO NOT unwrap cartridges until ready to install. Keep amine cartridges lying flat until ready to install. | NE PAS déballer les cartouches avant d'être prêt à les installer. Gardez les cartouches d'amines à plat jusqu'à leur installation. |
|---|---|---|

7. Attach standoffs to workstation roof with hardware supplied. Place HEPA/ULPA cartridge on workstation roof between standoffs.
8. Install HEPA/ULPA section to top of workstation. Standoffs attach to top surface of workstation. Drop housing over standoffs and attach with supplied screws.
9. Install self-adhesive gasket material along top edge of HEPA/ULPA section.
10. Place amine section on top of HEPA/ULPA section and attach with supplied screws as shown.
11. Unwrap amine cartridge(s) and install in amine section.
12. Install self-adhesive gasket material along top edge of amine section.
13. Place fan section on top of amine section and attach with supplied screws as shown.
14. Connect fan electrical wiring (black 4-pin connector) and attach fans to fan section with supplied screws as shown. Install middle blower first, and then proceed to the two outermost blowers.
15. Install prefilters in the compartment above each blower.

Doc Rev 1.3.20240722

PREFILTERS (3 EA)

BLOWERS (3 EA)

FAN SECTION

AMINE CARTRIDGE (KEEP SEALED UNTIL READY TO INSTALL)

AMINE SECTION

GASKET / SEAL

HEPA/ULPA SECTION

GASKET / SEAL

HEPA/ULPA CARTRIDGE

STANDOFFS (14 PLACES)
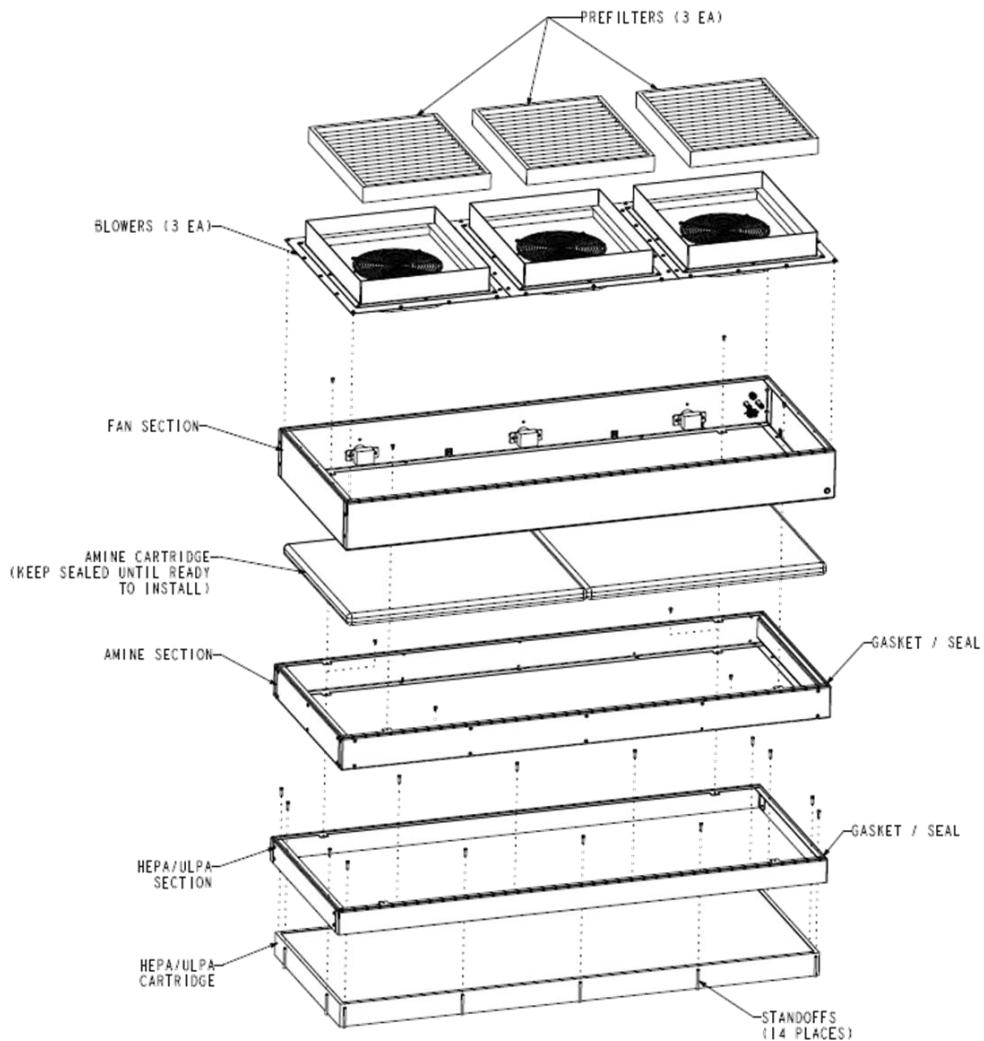
## 3.8 Start Up

Plug in the machine and flip the circuit breakers (back of machine) to the *on* position. Twist the EMO to ensure that it is not engaged and press the reset button to switch the main power on. Power up the individual process modules by pressing the lighted power switch as indicated in section 2.1. Each display will cycle through a series of boot screens and before arriving at the main login screen.

Enter default administrative login credentials:

**Username:** ........................................................ admin
**Password:** ........................................................ admin2

## 3.9 Preliminary Checks

Perform all relevant system checks for each Cee® Apogee® X-Pro II Workstation integrated process module in accordance with each respective manual's instructions.

Once operations have been validated, the Cee® Apogee® X-Pro II Workstation is ready for use. Begin by creating a recipe. See the DataStream™ Manual for more information.

# 4) Preventative Maintenance

This section provides personnel with procedures and guidelines for maintaining a Cee® X-Pro II Workstation.

## 4.1 Service and Repairs

**Safety Notice:** Important Repair Information for Cee® Equipment

| ⚠️ | In order to maintain safety and performance standards, only authorized representatives of Cee® are permitted to conduct repairs or alterations on Cee® equipment. | Afin de maintenir les normes de sécurité et de performance, seuls les représentants autorisés de Cee® sont autorisés à effectuer des réparations ou des modifications sur l'équipement Cee®. |
|---|---|---|
| ⚠️ | When servicing the machine, use only replacement parts made or recommended by Cee®. | Lors de l'entretien de la machine, utilisez uniquement des pièces de rechange fabriquées ou recommandées par Cee®. |
| ⚠️ | Unauthorized repairs may lead to serious risks such as equipment malfunction, damage, personal injury, or even death. | Les réparations non autorisées peuvent entraîner des risques graves tels qu'un dysfonctionnement de l'équipement, des dommages, des blessures corporelles, voire la mort. |

## 4.2 Fault Condition

In the event of a fault condition, power cycle the tool to restore function.

## 4.3 Safety Checks

Inspect the Cee® Apogee® X-Pro II Workstation and included Apogee® Process Modules for the following defects each day prior to use:

### Cee® Apogee® X-Pro II Workstation

- missing or loose exterior panels or guards
- improper operation of sash or other movable guards
- proper connection of utility connection facilities such as system nitrogen, system vacuum, and module exhaust facilities.
- follow all safety checks listed in the operations manuals of the respected modules

Doc Rev 1.3.20240722

## 4.4 Mechanical/Utilities Checklist

| Evaluate | Frequency | Detail |
|---|---|---|
| **Pressure Range** | Daily | Check all pressures for ranges specified in tool manual. |
| **Drains** | Daily | Verify that there is a proper drain facility. |
| **Exhaust** | Daily | Verify that exhaust is functioning. |
| **Connections** | Bi-Annually | Inspect all connections for proper installation. |
| **Power** | Bi-Annually | Verify that AC power is connected and of the proper voltage. |

## 4.5 Cleaning

The Cee® Apogee® X-Pro II Workstation should be cleaned following daily use. Use only water-based cleaner on the labels on the rear of the machine. Use only isopropyl or water-based cleaner on the *Power*, *Cee®* logo, *Caution ... Eye Protection*, and the *Cee® model/serial number* labels. The display may be cleaned with glass cleaner, water, or isopropyl alcohol.

## 4.6 Service Access

| ⚠️ | Please ensure that all electrical power, compressed gasses, and other energy sources are shut off and/or disconnected before removing panels or performing service on the Cee® Apogee® X-Pro II Workstation and/or integrated process modules. Ensure that all panels are fitted and locked into place before restoring utility service. ***Failure to observe these guidelines may result in damage to the Cee® Apogee® X-Pro II Workstation, personal injury, or death.*** | Veuillez vous assurer que toute alimentation électrique, gaz comprimés et autres sources d'énergie sont coupés et/ou déconnectés avant de retirer les panneaux ou d'effectuer un entretien sur le poste de travail Cee® Apogee® X-Pro II et/ou les modules de traitement intégrés. Assurez-vous que tous les panneaux sont correctement installés et verrouillés en place avant de rétablir le service des utilités. ***Le non-respect de ces consignes peut entraîner des dommages au poste de travail Cee® Apogee® X-Pro II, des blessures corporelles ou la mort.*** |
|---|---|---|

The user panel is designed to slide forward for convenient service access to the integrated process modules. To release the panel, open the access doors to the chemical storage cabinet of the Cee® Apogee® X-Pro II Workstation. Identify the two metal clips holding the user interface panel in place and unthread the fixing screws securing them. Once the clips are free, the user interface panel can be extended outward on roller slides providing access to the process modules.
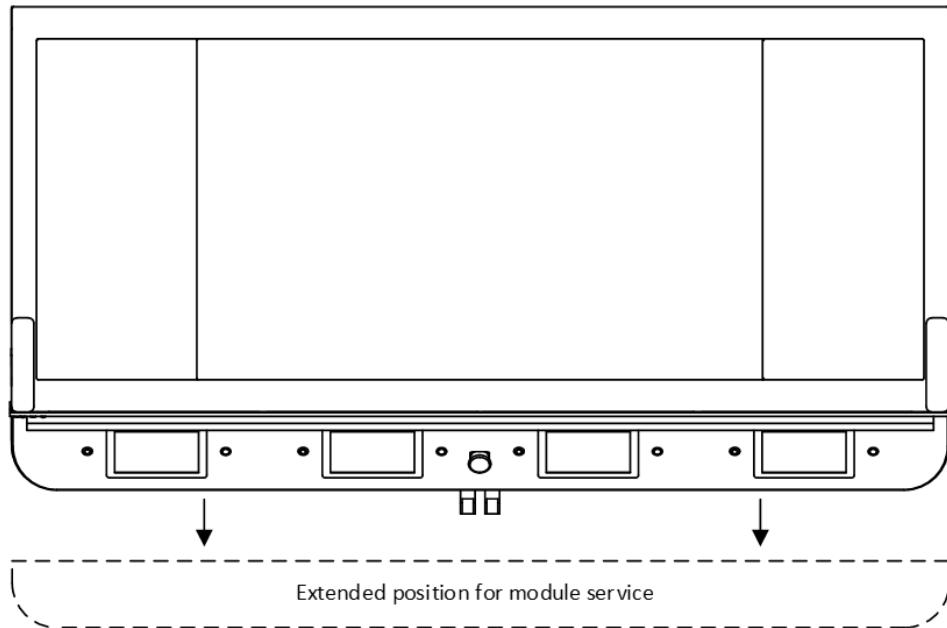


*Figure 4: Service Access to Integrated Process Modules*

Once the necessary maintenance/repairs are complete, push to close the user interface panel and reattach the holding clips and fixing screws. In doing so, ensure that no cables are pinched anywhere along the length of the user interface panel before tightening the fixing screws to hold that clips and panel in place.

Additional service access can be obtained by removing the plastic side panels of the Cee® Apogee® X-Pro II Workstation. The panels can be easily removed with a slotted screwdriver by turning the slotted panel hardware ¼ turn until it releases and pops free from the surface of the panel. Once all fasteners have been released the panel(s) can be pulled from the Cee® Apogee® X-Pro II Workstation frame.

Doc Rev 1.3.20240722

# 5) Table of Revisions

| Doc Rev # | Author | Description of Change(s) | Reviewed/Approved By | Date |
|---|---|---|---|---|
| 1.3 | J. Adams | - Add French Translations for all warnings.<br>- Add Section 2.5 NRTL<br>- Add Section 2.7 Safety Package (Optional)<br>- Removed Sections related to Spin Coating and Wafer Bake – see process module operations manuals for details. | B. Waterworth | 7/22/2024 |
| 1.2 | J. Adams | - Update *Apogee* from ™ to ® post patent changes. | B. Waterworth | 10/05/2023 |