



# HP Metal Jet S100 Powder Removal Station

Product Documentation

Introductory Information

## **SUMMARY**

Introductory information about your product

## About this edition

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Development Company, L.P.

Edition 1

### **Legal notices**

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statement accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

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# 1 HP Metal Jet S100 Powder Removal Station

## Introductory Information

This introductory document includes legal notices and safety instructions, describes the use of the front panel, explains error messages that you may encounter, and gives power specifications.

### What is it?

The HP Metal Jet solution is an integrated system designed to manufacture best-in-class quality metal parts economically at industrial scale.

Prior to printing, the HP Powder Management Station automatically blends, sieves, and loads metal powder into HP Build Units according to the user-defined print job and customized parameters. Once printing and curing are complete, the build unit is manually inserted into the HP Powder Removal Station where loose powder is automatically removed from the printed parts and collected in the HP Powder Collector. The powder removal station includes separate vacuum attachments that enable manual removal of any remaining powder on the printed parts. All reclaimed powder is pneumatically recovered into the powder collector for storage and reintroduced into the powder management station using HP Powder Tanks.

### Documentation

A full set of manuals is provided with your products.

- Site preparation guide
- Introductory information (this document)
- User guide
- Legal information
- Limited warranty

You can download the documentation from the HP website at:

- <http://www.hp.com/go/MetalJetS100/manuals>

Further information is available from:

- <http://www.hp.com/go/MetalJetS100/support>

### Safety precautions

Before using the equipment, read the safety precautions and operating instructions to make sure you can use it safely.

## Introduction

Perform the recommended maintenance and cleaning tasks to ensure the correct and safe operation of the equipment.

You are expected to have the appropriate technical training and experience necessary to be aware of hazards to which you may be exposed in performing a task, and to take appropriate measures to minimize the risks to yourself and to others.

Operations must be supervised at all times.

The equipment is stationary, and should be located in a restricted-access area, for authorized personnel only.

## General safety guidelines

Follow the advice at all times for your personal safety.

Turn off all equipment, using the branch circuit breakers located in the building's Power Distribution Unit (PDU), and call your service representative in any of the following cases:

- The electrical supply cable is damaged.
- The equipment has been damaged by an impact.
- Liquid has entered the equipment.
- The heating subsystem and enclosures are damaged, the glass is missing or broken, or the sealing is defective.
- There is smoke or an unusual smell coming from the equipment.
- The built-in Residual Current Circuit Breaker (Ground Fault Circuit Interrupter) has been repeatedly tripped.
- Fuses have blown.
- The equipment is not operating normally.
- There is any mechanical or enclosure damage.

Turn off the equipment using the branch circuit breakers in either of the following cases:

- During a thunderstorm.
- During a power failure.

Operate the equipment only within the specified ranges of operating temperature and humidity; see the site preparation guide.

The equipment should always be kept in the same environmental conditions.

Use HP-certified and HP-branded agents only. Do not use unauthorized third-party agents.

The area in which the equipment is installed should be free from liquid spillage and environmental condensation.

Users and operators must be trained for explosive atmospheres and associated hazards during cleaning and maintenance operations, according to local laws and company requirements.

Ensure that there is no condensation inside the equipment before turning it on.

Take special care with zones marked with warning labels.

Use HP-certified equipment and accessories only. The use of third-party equipment and accessories can cause safety risks, powder leakages, and malfunctions in the printer; and may affect your system warranty.

In case of unexpected malfunction, anomaly, ESD (ElectroStatic Discharges), or electromagnetic interference, press the emergency stop button and disconnect the equipment. If the problem persists, contact your support representative.

Do not repair or replace any part of the equipment or attempt any servicing unless specifically recommended in the user-maintenance instructions or in published user-repair instructions that you understand and have the skills to carry out.

Do not attempt to repair, disassemble, or modify the equipment by yourself; and do not use any part other than original HP spare parts.

To repair or reinstall the equipment, please contact your nearest service authorized provider; otherwise you may experience electric shock, fire, problems with the product, or injury.

## Final parts/builds

The customer assumes all risk relating to or arising from the 3D printed parts.

The customer is solely responsible for the evaluation of and determination of the suitability and compliance with applicable regulations of the products and/or 3D printed parts for any use, especially for uses (including but not limited to medical/dental, food contact, automotive, heavy industry, and consumer products) that are regulated by US, EU, and other applicable governments.

## Explosion hazard

Your product may produce combustible metal dust.

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**⚠ WARNING!** Combustible dust clouds and flammable vapors can form explosive mixtures with air. Take precautionary measures against static charges, and keep away from sources of ignition (hot surfaces, hot flames or gases, mechanical sparks, electrical equipment, electromagnetic waves, exothermic reactions including self-combustion of solids).

**NOTICE:** The equipment is not intended for hazardous locations or ATEX classified zones: ordinary locations only.

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To avoid the risk of explosion, take the following precautions:

- The customer takes full responsibility for assessing the customer's site according to the Explosion Protection Document (EPD), Dust Hazard Analysis (DHA), or any required document of the local jurisdiction of the country where the equipment is installed, to avoid the risk of explosion.
- Smoking, candles, welding, and open flames should be forbidden close to the equipment or powder storage area.
- Hot surfaces, hot flames and gases, and mechanical and electrical sparks, only can be generated during maintenance or repair operations (use of a permit work system according to the service manual).

- Inside and outside the equipment should be cleaned regularly with an explosion-protected vacuum cleaner to avoid dust accumulation. Do not sweep the dust or try to remove it with a compressed-air gun.
- An explosion-protected vacuum cleaner certified for collection of combustible metal dust is required for cleaning. Take measures to mitigate powder spillage and avoid potential ignition sources such as ESD (ElectroStatic Discharges), flames, and sparks. Do not smoke nearby.
- An explosion-protected vacuum cleaner compliant with the following normative specifications:
  - Europe/International Electrotechnical Commission (IEC): Zone 22 or better, temperature Class 200°C (392°F) maximum.
  - United States/National Electrical Code (NEC): Class II, division 2 or better, temperature Class 200°C (392°F) maximum.
  - Suitable for conductive material.
  - Refer to the material safety data sheet (MSDS) and meet local regulations.
  - Recommended equipment fitted with wet filter (vacuum with submerged flow inches inert liquid) or High Efficiency Particulate Air (HEPA) filter grade.
- The equipment and accessories must be properly grounded at mains outlets only; do not manipulate internal bonding. If static discharges or electrical sparks are noticed, stop operation, disconnect the equipment, and contact your support representative.
- The auxiliary equipment (i.e. the oven for the rebaking process) must be explosion-protected for combustible dust and flammable vapors, according to the explosion protection document (EPD) or explosion hazard analysis covering the probability of an explosive atmosphere and presence of effective ignition sources as per local laws requirements. Refer to the safety data sheet of the material being processed.
- The material collector has to be electrically conductive or dissipative, and the material cannot generate mechanical sparks. In addition, the earthing clamps are necessary to ground the material collector during use.
- Follow the cooling time and ensure a maximum powder temperature of 70°C (158°F) prior to putting it inside the load station.
- Ground the portable tank and drums using static earthing clamps during refilling or unloading.
- HP recommends the use of HP equipment for unpacking 3D parts and refilling the build unit. If other methods are used, read the following notes:
  - Dust clouds generated during handling and/or storage can form explosive mixtures with air. Dust explosion characteristics vary with the particle size, particle shape, moisture content, contaminants, and other variables.
  - Check that all equipment is properly grounded and installed to satisfy electrical classification requirements. As with any dry powder, pouring this powder or allowing it to fall freely or be conveyed through chutes or pipes can accumulate and generate electrostatic discharges, potentially causing ignition of the powder itself, or of any flammable materials which may come into contact with the powder or its container.
- Powder, agents and solvents storage, handling, and disposal as per local laws. See the Safety Data Sheets of your processed powder and solvent powder for adequate handling and storage. Follow your Environmental, Health, and Safety processes and procedures.

- Do not place the equipment in a hazardous location area, keep it separated from other equipment that could create a combustible dust cloud or explosive gas atmospheres during its operation.
- Auxiliary post-processing equipment must be suitable for combustible metal dust.
- Stop operation immediately if sparks, flames, or powder and/or liquid spillage is seen and call your HP service representative before continuing.
- All personnel, when handling combustible dust, should be freed from static electricity by using conductive or dissipative footwear and clothing, and a dissipative floor.
- Keep the safety lid on top of the build unit at all times when it is outside of host equipment

Use powder complying with HP guidelines, as follows:

- Explosion characteristics acceptance criteria:
  - Minimum Ignition Temperature (MIT) 360°C or higher
  - Layer Ignition Temperature (LIT) 375°C or higher
  - Auto Ignition Temperature (AIT) 375°C or higher
  - Minimum Ignition Energy (MIE) 100 mJ or higher at process temperature
  - Minimum Explosion Concentration (MEC) 350 g/m<sup>3</sup> or higher
  - Kst 200 bar·m/s or less
  - ST grade 1 or less
- Minimum particle size (d<sub>10</sub>) > 2 μm
- Non-reactive with other materials or HP agents (see the safety data sheets for the agents on the HP website at the following link: <http://www.hp.com/go/msds>), stable

There is no support for the powder removal station, customers takes full responsibility for it.

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- ⚠ **WARNING!** Dust clouds can form explosive mixtures with air. Take precautionary measures against static charges and keep away from sources of ignition. Unpacking parts can cause dust clouds. Keep a clear area of at least 2 m (78.7 in) around electric/electronic devices or any source of ignition.
  - ⚠ **CAUTION:** As the build unit operates at a high temperature while curing, you must wait for it to cool before extracting the it from the cure station to unpack it. An earth connection from the build unit is required when unpacking parts; you must use static earthing clamps connected to the build unit during the process.
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## Electric shock hazard

The internal circuits of the electrical cabinet, motors, ultrasounds converter, heating systems and build unit operate at hazardous voltages capable of causing death or serious personal injury.

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- ⚠ **WARNING!** High leakage current! The equipment must be connected to earth at all times.
- 

Turn off the equipment using the branch circuit breakers located in the building's Power Distribution Unit (PDU) before servicing. The equipment must be connected to earth at mains outlets only.

To avoid the risk of electric shock:



- Do not attempt to dismantle the internal circuit enclosures, build unit, or electrical cabinet except during hardware maintenance tasks. In that case, follow the instructions strictly.
- Do not remove or open any other closed system covers or plugs.
- Do not insert objects through slots in the equipment.
- Test the functionality of the Residual Current Circuit Breakers (RCCBs) every year.

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**NOTICE:** A blown fuse may indicate malfunctioning electrical circuits within the system. Call your service representative, and do not attempt to replace the fuse yourself.

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## Heat hazard

The vacuum motor enclosure and exhaust, the build unit lid and the portable tanks after rebaking process can operate at high temperatures and may cause burns if touched.

To avoid personal injury, take the following precautions:

- Use of appropriate personal protective equipment (i.e. heat resistant gloves) when manipulating the portable tanks after the rebaking process.
- Follow the cooling times before handling.
- Take special care with zones marked with warning labels.

The top heating, fusing, build chamber and Cure station subsystems operate at high temperatures and can cause burns if touched.

To avoid personal injury, take the following precautions:

- Use of appropriate personal protective equipment (i.e. heat resistant gloves) when extracting the build unit from host equipment
- Take special care when accessing the printing area. Let the equipment cool down before you open the covers.
- Take special care with zones marked with warning labels.
- Do not place objects inside the equipment while operating.
- Do not cover enclosures while operating.
- Remember to let the equipment cool down before performing some maintenance operations.
- Take special care when assembling or removing the safety lid on/from the build unit. Let the built unit cool down before handling the safety lid.

## Fire hazard

The motors, ultrasound converter, and frequency inverters of the equipment operate at high power.

The build chamber and curing station subsystems operate at high temperatures. Call your service representative if the built-in Residual Current Circuit Breaker (Ground Fault Circuit Interrupter) is repeatedly tripped.

To avoid the risk of fire, take the following precautions:

- Use the power supply voltage specified on the nameplate.
- Connect the electrical supply cable to a dedicated line, protected by a branch circuit breaker according to the information detailed in the site preparation guide.
- Call your service representative if the built-in Residual Current Circuit Breaker (Ground Fault Circuit Interrupter) is repeatedly tripped.
- Do not insert objects through slots in the equipment.
- Take care not to spill liquid on the equipment. After cleaning, make sure all components are dry before using the equipment again.
- Do not use aerosol products that contain flammable gases inside or around the equipment. Do not operate the equipment in an explosive atmosphere.
- Do not attempt to modify the electrical cabinet, or any enclosure of the machine.
- Proper maintenance and genuine HP consumables are required to ensure that the equipment operates safely as designed. The use of non-HP consumables may present a risk of fire.
- Take special care with zones marked with warning labels.
- Do not place objects covering the enclosures or air ventilation.
- Do not leave tools or other materials inside equipment after maintenance or servicing.

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**⚠ CAUTION:** Do not use a jet of water, as it could scatter and spread the fire.

**⚠ WARNING!** Depending on the powder used, some unhealthy substances can be released into the air in case of incidental fire. Wear self-contained pressure-demand breathing apparatus and full protective gear. Your EHS specialist should consult the safety data sheet (SDS) about each powder, available on the HP website at the following link: <http://www.hp.com/go/msds>, and advise on the appropriate measures for your location.

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## Mechanical hazard

The equipment has moving parts that could cause injury.

To avoid personal injury, take the following precautions when working close to the equipment.

- Keep your clothing and all parts of your body away from moving parts.
- Avoid wearing necklaces, bracelets, and other hanging objects.
- If your hair is long, try to secure it so that it will not fall into the equipment.
- Take care that sleeves or gloves do not get caught in moving parts.
- Do not operate the equipment with components bypassed.
- Take care when handling the safety lid; take it by the two handles provided and ensure you fix it well to the build unit or securely store it in its storage position.

For more information see and [Personal protective equipment on page 11](#).

## Light radiation hazard

Infrared (IR) radiation is emitted from the top heating area.

The enclosures limit radiation in compliance with the requirements of the exempt group in International Electrotechnical Commission (IEC) 62471:2006 *Photobiological safety of lamps and lamp systems*. Do not modify the top cover enclosure, the glass or the windows.

## Chemical hazard

Sufficient ventilation needs to be provided to ensure that potential airborne exposure to chemical substances is adequately controlled. Consult your usual air conditioning or Environmental Health and Safety (EHS) specialist for advice on the appropriate measures for your location.

Respiratory personal protective equipment may be required throughout the entire operation of these machines. Refer to the Safety Data Sheet of your metallic powder, and consult your Environmental Health and Safety (EHS) specialist for advice on the appropriate measures for your location and application.

To manipulate material (load, unpack, and so on) and green parts, use protective personal equipment according to the Safety Data Sheets of your processed material.

Use HP-branded agents only. Do not use unauthorized third-party agents.

Take special care in any zones marked with warning labels.

## Ventilation

Fresh air ventilation is needed to maintain comfort levels.

Adequate ventilation also needs to be provided to ensure that potential airborne exposure to powders and agents is adequately controlled according to their safety data sheets.

Air conditioning and ventilation should meet local environmental, health, and safety (EHS) guidelines and regulations. Please follow these instructions carefully when designing the air-conditioning installation and placing your equipment in the room.

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**NOTICE:** The ventilation units should not blow air directly onto the equipment.

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## Air conditioning

As with all equipment installations, to maintain ambient comfort levels, air conditioning in the work area should take into account that the equipment produces heat.

Typically, the printer's power dissipation is about 4-6 kW/h (13.65-20.47 kBTU/h) and the curing station's power dissipation is about 3-4 kilowatts per hour (10.24-13.65 kBTU/h). About 70 % of this power is removed throughout the exhaust connection.

Typically, the load station's power dissipation is 7 kW (23.9 kBTU/h).

Air conditioning should meet local Environmental Health and Safety (EHS) guidelines and regulations.

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**NOTICE:** The air conditioning units should not blow air directly onto the equipment.

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## Sound pressure level

Declared dual number noise emission values in accordance with ISO 4871, corresponding to the worst bystander position according to ISO 11202, located at the rear of the product.

## Printer

Sound Pressure Level measured per ISO 11202 at by-standing positions is < 70dB(A).

## Curing station

Declared dual-number noise-emission values in accordance with ISO 4871:

- LpA = 71 dB(A)
- KpA = 5 dB

## Powder management

The emitted sound pressure level could exceed 70dB(A) when filling the load station's input tanks. The maximum emitted sound pressure level is below 80 dB(A) (measurements according to ISO 11201). Hearing protection may be required as per local laws; consult your environmental, health, and safety (EHS) specialist.

Declared dual-number noise-emission values in accordance with ISO 4871:

- LpA = 73 dB(A)
- KpA = 5 dB

## Transport

In case of equipment relocation, remove all material (powder) and consumables.

The customer takes full responsibility for moving equipment, the use of auxiliary lifting/carrying aids, and providing the required personnel. Refer to the *Site Preparation Guide*, "Moving equipment" section for more information.

## Build unit transport

Special care must be taken to avoid personal injury when moving the build unit.

- Always wear personal protective equipment including boots and gloves.
- Keep the safety lid on top of the build unit at all times, except when it is inside another equipment.
- Steer the build unit only using the handle.
- Move the build unit over smooth, flat surfaces without steps.
- Move with care and avoid shocks during transport, which could spill the powder.
- Lock the front casters when not moving the build unit. Remember to unlock them before moving it.
- Before transporting the build unit; check that the safety lid is well attached to it, with the two clamps provided.
- Take care when handling the safety lid; carry it with the two handles provided and ensure to attach it correctly to the build unit or store it securely in the designated way.
- Move the build unit over smooth flat surfaces without steps. Maximum ramp allowed TBD%.

If moving the build unit between different rooms, bear in mind that it should be kept in constant environmental conditions.

## Portable tank transport

Special care must be taken to avoid personal injury when moving the portable tank.

- Always wear personal protective equipment including boots and gloves.
- Always transport the portable tank with the lid properly placed and the clamp closed to avoid generating dust clouds.
- Steer the portable tank only using the handle.

If moving the portable tank between different rooms, bear in mind that it should be kept in constant environmental conditions.

## Ergonomic risk

Operation and maintenance tasks require handling heavy loads. For instance, build unit and portable tank transport, safety lid handling, opening the printer's top cover, consumables, and feedstock material, among others.

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⚠ **CAUTION:** Heavy loads.

⚠ **CAUTION:** Work platform recommended.

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To avoid muscle strain or back injury when moving equipment or handling items, follow proper techniques or use of auxiliary lifting/carrying aids or using more than one person if required.

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**NOTICE:** The build unit, empty or full, is a heavy device. Take into consideration its maximum weight of 552 kg (1217 lb) during daily moving or transport tasks.

The portable tank, empty or full, is a heavy device. Take into consideration its maximum weight of 512 kg (1129 lb) during daily moving or transport tasks.

During daily operations, the build unit and /or portable tank can be moved on a ramp with no more than 2° of inclination.

In case of equipment relocation, remove all material (powder) and consumables. The customer takes full responsibility for moving equipment, the use of auxiliary lifting/carrying aids, and providing the required personnel. Refer to the *Site Preparation Guide*, "moving equipment" section.

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Operation and maintenance tasks may require the use of a ladder or work platform to reach remote parts. For instance, accessing the print-zone area, mixer, and input tank, among others.

The customer takes full responsibility for room layout, auxiliary equipment, personal protective equipment (PPE), and working procedures, among other safety aspects, throughout the entire operation of the equipment. Refer to *Site Preparation Guide* for more information.

## 3D part unpacking

Refer to the safety data sheet and meet local regulations in order to use the appropriate personal protective equipment needed, including heat and chemical resistant gloves when unpacking 3D printed parts.

## Personal protective equipment

It is recommended to use heat and chemical resistant gloves, mask, goggles, safety conductive or dissipative footwear, safety boots, coat, conductive or dissipative clothing, and hearing protection for maintenance tasks, cleaning and powder handling. Refer to the Safety Data Sheet of the powder and agent and meet local regulations.

Respiratory personal protective equipment may be required for the whole operation of these machines. Refer to the safety data sheet instructions of your metallic powder or consult your environmental health and safety (EHS) specialist for advice on appropriate measures for your location and application.

## Use of tools

Maintenance of your product may sometimes require the use of a tool.

- **Users:** No tools are required except those listed in .
- **Maintenance personnel:** Hardware maintenance tasks and replacement of Customer Self-Replaceable (CSR) parts may require a screwdriver.

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**NOTICE:** During installation, the designated personnel receive training for the safe operation and maintenance of the equipment. The equipment should not be used without this training.

**NOTICE:** After using the maintenance key to open a door, remember to lock it afterwards, and return the key to safe and secure storage.

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## Warnings and cautions

Warning and caution symbols are used in this manual to ensure the proper use of the equipment and to prevent it from being damaged. Follow the instructions marked with these symbols.

- 
- ⚠ **DANGER!** Indicates a hazardous situation, that if not avoided, will result in death or serious injury.
  - ⚠ **WARNING!** Indicates a hazardous situation, that if not avoided, could result in death or serious injury.
  - ⚠ **CAUTION:** Indicates a hazardous situation, that if not avoided, could result in minor or moderate injury.


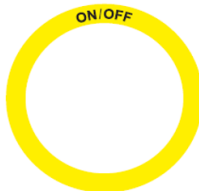



**NOTICE:** Indicates information considered important but not hazard related.

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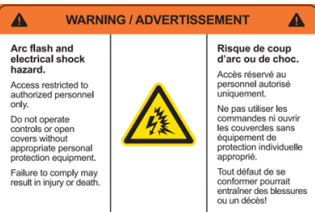
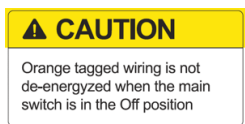
## Warning labels

Labels are placed on the product for your protection. Familiarize yourself with their meaning and heed their warning at all times.

## Warning labels

Label	Explanation
	<p>Equipment serial label, includes the following information:</p> <ul style="list-style-type: none"> <li>• Manufacturer</li> <li>• Product No.</li> <li>• Serial No.</li> <li>• Regulatory Model No.</li> <li>• Regulatory markings</li> <li>• Electrical ratings</li> <li>• Country of origin</li> </ul> <p><b>WARNING!</b> Equipment must be connected to earthed mains outlet only.</p> <p>Configure the building's electrical system used to power the equipment to meet its electrical requirements and the Electrical Code requirements of the local jurisdiction of the country where the equipment is installed.</p> <p>No operator serviceable parts inside. Refer servicing to qualified servicing personnel only.</p>
	<p><b>CAUTION:</b> Main power switch.</p> <p>With emergency switch off function.</p> <p>Disconnect before servicing.</p> <p>Enable lockout/tagout before servicing.</p>
	<p><b>WARNING!</b> Push-button energize hazardous subsystem.</p> <p>Do not operate with guards removed or safety functions bypassed.</p>
	<p><b>CAUTION:</b> Main power switch</p> <p>With emergency switch off function.</p> <p>Enable lockout/tagout before servicing.</p>
	<p><b>WARNING!</b> Emergency stop button.</p> <p>In case of unexpected malfunction, anomaly, ESD (ElectroStatic Discharges), or electromagnetic interference, press the emergency stop button and disconnect the equipment. If the problem persists, contact your support representative.</p>

## Warning labels (continued)

Label	Explanation
 <p><b>ELECTRIC SHOCK HAZARD</b> Heating modules operate at hazardous voltage. Disconnect power source before servicing. <b>Caution!</b> Double pole. Neutral fusing. Refer servicing to qualified service personnel.</p>  <p><b>WARNING</b> High leakage current. Earth connection essential before connecting supply. Equipment to be connected to earthed mains only.</p>  <p><b>READ INSTRUCTIONS</b> Before starting, read and follow the operating and safety instructions. Avant de commencer, lisez et suivez les instructions de fonctionnement et de sécurité. Lesen und befolgen Sie bitte die Bedienungs- und Sicherheitsanweisungen, bevor Sie starten. Antes de empezar, lea y siga las instrucciones sobre funcionamiento y seguridad. 开始之前，请阅读并遵循操作和安全说明。開始之前，請閱讀並遵守操作和安全說明。</p>	<p><b>DANGER!</b> Electric shock hazard</p> <p>Heating modules operate at hazardous voltage. Disconnect power source before servicing. <b>CAUTION:</b> Double pole. Neutral fusing. Refer servicing to qualified service personnel.</p> <p><b>WARNING!</b> High leakage current.</p> <p>Earth connection essential before connecting supply. Equipment to be connected to earthed mains only. <b>IMPORTANT:</b> Read instructions.</p> <p>Before starting, read and follow the operating and safety instructions.</p>
 <p><b>READ MANUALS</b> See installation instructions before connecting to the supply. Read and follow the operating and safety instructions before starting.</p>	<p><b>IMPORTANT:</b> Read manuals.</p> <p>See installations instructions before connecting to the supply.</p>
	<p><b>IMPORTANT:</b> Read instructions.</p> <p>Read and follow repair, maintenance and safety instructions.</p> <p>No operator serviceable parts inside. Refer servicing to qualified servicing personnel only.</p>
	<p><b>DANGER!</b> Electric shock hazard.</p> <p>Authorized personnel only.</p> <p>Disconnect before servicing.</p> <p>Do not operate with guards removed, lockout/tagout before servicing.</p>
 <p><b>WARNING / ADVERTISSEMENT</b></p> <p><b>Arc flash and electrical shock hazard.</b> Access restricted to authorized personnel only. Do not operate controls or open covers without appropriate personal protection equipment. Failure to comply may result in injury or death.</p>  <p><b>Risque de coup d'arc ou de choc.</b> Accès réservé au personnel autorisé uniquement. Ne pas utiliser les commandes ni ouvrir les couvercles sans équipement de protection individuelle approprié. Tout défaut de se conformer pourrait entraîner des blessures ou un décès!</p>	<p><b>WARNING!</b> Arc flash and electrical shock hazard.</p> <p>Access restricted to authorized personnel only.</p> <p>Do not operate controls or open covers without appropriate personal protection equipment.</p> <p>Failure to comply may result in injury or death.</p>
 <p><b>CAUTION</b></p> <p>Orange tagged wiring is not de-energized when the main switch is in the Off position</p>	<p><b>CAUTION:</b> Electrical shock hazard.</p> <p>Orange tagged wiring is not de-energized when the main switch is in the <b>Off</b> position.</p> <p>If required turn off all equipment by using the branch circuit breakers located in the building's power distribution unit (PDU).</p>



## Warning labels (continued)

Label	Explanation
	<p><b>CAUTION:</b> Risk of fire.</p> <p>For continued protection against risk of fire, replace <b>ONLY</b> with same type and rating of fuse.</p> <p>Lockout/tagout before servicing.</p> <p><b>NOTICE:</b> A blown fuse may indicate malfunctioning electrical circuits within the system, refer servicing to qualified servicing personnel only.</p>
	<p><b>WARNING!</b> Crush hazard.</p> <p>Keep hands away from moving or falling parts.</p> <p>Do not operate with guards removed, lockout/tagout before servicing.</p>
	<p><b>WARNING!</b> Crush hazard.</p> <p>Keep hands away from moving or falling parts.</p> <p>Do not operate with guards removed, lockout/tagout before servicing.</p>
	<p><b>WARNING!</b> Hand entanglement hazard.</p> <p>Moving parts can crush and cut.</p> <p>Keep body parts away from moving parts or rotating gears.</p> <p>Do not operate with guards removed, lockout/tagout before servicing.</p>
	<p><b>WARNING!</b> Hazardous moving part.</p> <p>Moving parts can crush and cut.</p> <p>Keep hands away from moving parts or rotating gears.</p> <p>Do not operate with guards removed, lockout/tagout before servicing.</p>
	<p><b>WARNING!</b> Light radiation hazard.</p> <p>Light radiation. Do not stare at the top cover's light, it may be harmful to the eyes.</p>

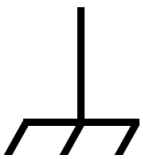
Warning labels (continued)

Label	Explanation
	<p><b>WARNING!</b> Moving fan blades.</p> <p>Hazardous moving parts. Keep hands away from moving fan blades.</p> <p>Do not operate with guards removed, lockout/tagout before servicing.</p>
	<p><b>WARNING!</b> Potentially explosive atmosphere.</p> <p>Combustible dust clouds or flammable vapors can form explosive mixtures with air.</p> <p>Keep the area free from any ignition source, such as static charges, open flames, electrical equipment, etc.</p>
	<p><b>WARNING!</b> Crush hazard.</p> <p>Keep body parts away from moving or falling parts or edges.</p>
	<p><b>CAUTION:</b> Hot surface.</p> <p>Do not touch.</p> <p>Let equipment cool down or otherwise heat-resistant gloves required.</p>
	<p><b>CAUTION:</b> Heavy loads.</p> <p>To avoid muscle strain or back injury while moving equipment or handling items, follow proper techniques or use auxiliary handling aids or more than one person when required.</p>
	<p><b>CAUTION:</b> Forklift point right.</p> <p>Equipment may overbalance resulting in death, severe injury or damage to the equipment.</p>
	<p><b>WARNING!</b> No ignition sources permitted nearby.</p> <p>Dust clouds can form explosive mixtures with air. Take precautionary measures against static charges and keep away from sources of ignition.</p> <p>No smoking, matches, sparks, or open flames close to equipment or material storage area.</p>

## Warning labels (continued)

Label	Explanation
	<p><b>CAUTION:</b> Do not operate with open door. Lockout/tagout before servicing.</p>
	<p><b>CAUTION:</b> Do not step.</p> <p>Do not step over any machine part. It is not intended for this use and could result in broken parts and user injuries.</p>
	<p><b>CAUTION:</b> Do not climb.</p> <p>Do not climb onto the structure or any other machine part.</p>
	<p><b>CAUTION:</b> Personal protective equipment (PPE) required.</p> <p>Use of protective gloves for operating and handling machine, supplies or waste.</p> <p>Refer to supplies safety data sheets (SDS).</p>
	<p><b>CAUTION:</b> Personal protective equipment (PPE) required.</p> <p>Use of safety mask for operating and handling machine, supplies or waste.</p> <p>Refer to supplies safety data sheets (SDS).</p>
	<p><b>CAUTION:</b> Personal protective equipment (PPE) required.</p> <p>Use of safety goggles for operating and handling machine, supplies or waste.</p> <p>Refer to supplies safety data sheets (SDS).</p>
	<p><b>CAUTION:</b> Safety boots required.</p> <p>Feet striking or being struck by objects.</p> <p>Wear anti-static footwear.</p>

## Warning labels (continued)

Label	Explanation
	<p><b>WARNING!</b> An explosion-protected vacuum cleaner certified for collection of metal combustible dust is required for cleaning.</p> <p>Do not sweep the dust or try to remove it with a compressed-air gun.</p> <p>Follow maintenance, cleaning tasks and housekeeping to ensure correct operation and safety. Inside and outside, the equipment should be cleaned regularly to avoid dust accumulation.</p> <p>Refer to the material safety data sheet (SDS) and meet local regulations. Disposal as per local laws.</p> <p>In addition, take measures to mitigate material spillage and avoid potential ignition sources such as ESD (electrostatic discharges), flames and sparks. Do not smoke nearby.</p>
	<p><b>CAUTION:</b> Work platform recommended.</p> <p>Operation and maintenance task may require the use of a ladder or work platform to reach remote parts.</p> <p>Be careful when you step down.</p>
	<p><b>WARNING!</b> Protective conductor connecting point.</p> <p>Protective earth terminal marked with <b>PE</b> for qualified electricians during mains connection.</p> <p>Earth connection essential before connecting supply.</p> <p>Ensure proper bonding after a repair.</p> <p>Protective bonding conductor are identified by bi-color combination GREEN-AND-YELLOW.</p>
	<p><b>NOTICE:</b> Functional bonding conductor connecting point.</p> <p>Bonding connection required against maloperation.</p>

## Emergency stop buttons

There are emergency stop buttons on the powder management station. If an emergency occurs, push an emergency stop button to stop all processes.

The emergency stop buttons on the powder management station are located on the e-cabinet and below the front panel; their effect is to stop the motors, the powder discharge valves, and the station's general air pressure.



A system error message is displayed. Ensure that the emergency stop button is released before restarting the system.

To stop the system completely, turn it off.

## Main power switch

The main power switch is used to turn on the printer/load station, and can be used in emergency to turn it off.

Enable lockout/tagout before servicing.

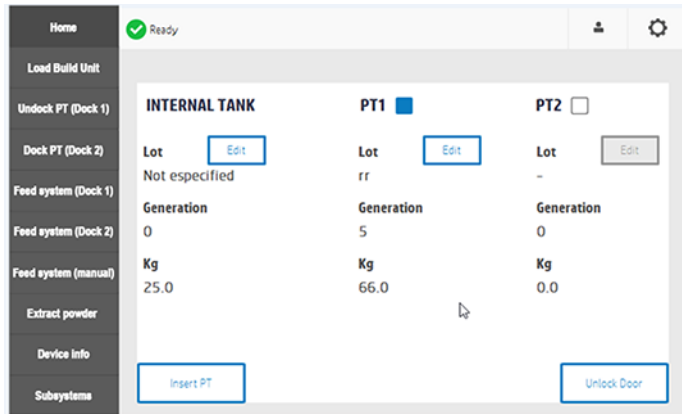


## Front panel

The front panel is a touch-sensitive screen with a graphical user interface. Both the power management station and the powder removal station have front panels.

The front panel gives you complete control of each station: from the front panel, you can view information about the station, change settings, monitor status, and perform tasks such as build-unit loading or unpacking of parts. The front panel displays alerts (warning and error messages) when necessary.

## Powder management station home screen



## Change system options

You can change various system options from the front panel.

## System errors

The front panel may occasionally display a system error, consisting of a numerical code of 12 digits followed by the recommended action that you should take.

In most cases you will be asked to restart the system. When the system restarts, it can diagnose the issue better and may be able to fix it automatically. If the problem persists after restarting, contact your service representative and be ready to give the numerical code from the error message. If the error message contains some other recommended action, follow the instructions.

## Power specifications

Specifications of the powder management station, circuit breaker, and power cable.

### Powder removal station specifications

Description	Specifications
Number of power lines	3 lines + PE
Input voltage (line to neutral)	380-415/480 V ( $\pm 10\%$ )
Input frequency	50/60 Hz
Power consumption (typical)	4 kW
Maximum load current (per phase)	7 A
Europe/International Electrotechnical Commission (IEC) earthing system	TT or TN
United States/National Electrical Code (NEC) grounding system	Solidly grounded wye (star), 3 phases, 4 wires

### Branch circuit breaker specifications

Description	Specifications
Branch circuit breaker	3 poles, 20 A

### Power cable specifications

Description	Specifications
Configuration	3 lines + PE
Cross-sectional area	4 mm <sup>2</sup> 12 AWG
Terminals	Ferrule terminals
External diameter range	8-17 mm (0.31-0.67 in)



**NOTE:** The main disconnect and branch protection should be provided by the installer.