Safety Precautions for User

English

Magnus 400

653-00904A-EN
Internal 731-00351A-EN Rev A

www.creo.com

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RE37,376	5,412,737	5,699,174	6,014,471	6,189,452	6,396,422	6,579,660
D478,608	5,420,702	5,699,740	6,016,752	6,191,882	6,407,849	6,587,211
4,558,302	5,420,722	5,708,736	6,043,865	6,204,874	6,409,331	6,589,710
4,743,091	5,459,505	5,713,287	6,060,208	6,205,364	6,414,755	6,590,635
4,992,864	5,473,733	5,742,743	6,063,528	6,208,369	6,422,801	6,593,064
5,049,901	5,481,379	5,764,374	6,063,546	6,214,276	6,425,565	6,601,888
5,113,249	5,488,906	5,771,794	6,072,518	6,217,965	6,430,136	6,605,407
5,132,723	5,508,828	5,785,309	6,090,529	6,252,241	6,435,091	6,609,459
5,155,782	5,509,561	5,802,034	6,093,447	6,252,522	6,441,914	6,611,363
5,157,516	5,517,359	5,813,346	6,096,461	6,255,033	6,443,571	6,618,187
5,177,724	5,519,852	5,818,498	6,098,544	6,260,482	6,450,092	6,628,435
5,208,818	5,576,754	5,854,883	6,107,011	6,266,080	6,456,396	6,632,584
5,208,888	5,579,115	5,861,904	6,112,663	6,266,134	6,471,335	6,637,329
5,247,174	5,583,551	5,861,992	6,115,056	6,267,054	6,476,342	6,637,860
5,249,067	5,592,309	5,875,288	6,116,160	6,268,948	6,476,931	6,640,713
5,283,140	5,594,556	5,894,342	6,121,996	6,270,204	6,477,955	6,641,772
5,291,273	5,600,448	5,900,981	6,130,702	6,283,589	6,493,064	6,641,978
5,305,091	5,608,822	5,934,196	6,134,393	6,295,076	6,494,965	6,646,669
5,323,248	5,615,282	5,946,426	6,136,509	6,299,572	6,503,691	6,648,468
5,325,217	5,625,397	5,947,028	6,137,580	6,318,266	6,509,903	6,652,088
5,339,176	5,625,766	5,958,647	6,147,789	6,328,408	6,511,163	6,654,147
5,343,059	5,636,330	5,966,504	6,158,345	6,336,708	6,520,084	6,660,997
5,355,446	5,649,220	5,969,872	6,159,659	6,340,817	6,530,317	6,661,561
5,359,451	5,650,076	5,973,801	6,164,637	6,352,816	6,541,181	6,665,048
5,359,458	5,652,804	5,986,819	6,165,658	6,353,216	6,544,336	6,665,121
5,367,360	5,680,129	5,995,475	6,180,325	6,366,339	6,545,772	6,670,986
5,384,648	5,691,823	5,996,499	6,181,362	6,371,026	6,550,388	6,684,783
5,384,899	5,691,828	5,998,067	6,181,439	6,377,739	6,564,018	6,704,123
5,412,491	5,696,393	6,003,442	6,186,068	6,387,597	6,567,713	

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Symbols Used in this Manual



DANGER: This indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury. This does not alert you to a property damage accident unless personal injury risks are associated with the accident.



WARNING: This indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury. This does not alert you to a property damage accident unless personal injury risks are associated with the accident.



CAUTION: This indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. This may also alert you to unsafe practices or potential property-damage-only accidents.



Note: A note provides additional information that you may need to consider.

Introduction

Read the following safety document carefully before operating or maintaining the Magnus 400 platesetter and/or the Magnus 400 with MCU.

These products are **Class 1** laser products, according to IEC60825-1 and USA 21 CFR 1040. This implies that there is no hazardous laser radiation, providing that the user and service safety precautions are followed.

Magnus 400 safety at a glance - how to avoid exposure hazards?



WARNING: The laser beam and radiation are hazardous but are invisible to the eye.

1. Keep all external doors and internal protective barriers of the platesetter complete, unharmed and intact!
2. Never defeat the laser or any other interlock switch!
3. Never leave any object between the laser head and the drum.
4. Do not open any internal doors or covers. Do not use any tools!
5. Do not operate the platesetter if there is any doubt regarding the above. Contact your service engineer.

Extensive means were taken in the design and manufacturing of the platesetter to eliminate the hazards for the operator and service personnel.

Carefully follow the instructions in this document to ensure your safety and the safety of others when operating or maintaining the platesetter.

Device Views

Platesetter



Figure 1: Magnus 400 Manual Loader Platesetter Front View



Figure 2: Platesetter rear view

Figure 3: This figure is left blank intentionally

Platesetter with MCU



Figure 4: Magnus 400 with MCU



Figure 5: MCU with tray opened



Figure 6: MCU with left door opened

Installation Safety Precautions

Installation must be done only by authorized service personnel.

The Magnus 400 platesetter is installed and serviced exclusively by specialized technicians. These technicians are trained, authorized and certified in the proper procedures for working with, and adjusting the laser system, and working with the mechanical and electrical systems of the platesetter.



WARNING: Do not connect the platesetter to the power supply before it is installed by authorized service personnel.



WARNING: Only certified service personnel are allowed to service the Magnus 400 platesetter.



WARNING: Only certified service personnel are allowed to attach the MCU to the Magnus 400 platesetter!
Only certified service personnel are allowed to dismantle the MCU from the Magnus 400 platesetter!

Disconnection from Mains Supply

The platesetter is equipped with a **main circuit breaker,** located on the distribution box on the lower rear panel of the platesetter; and two identical (yellow) **on/standby** pushbuttons located on both sides of the rear panel of the platesetter.

Special circuit breakers for the **drum power** and **drum vacuum pump** are located near the **main power** circuit breaker**.**



WARNING: Total disconnection from the mains supply can only be achieved by deactivating the main power circuit breaker (set to "0"), or by unplugging the main power cable from power outlet.

Disconnection from Pneumatic Air Pressure

Switching the air pressure off is done by switching off the air supply. The Magnus 400 receives pneumatic air pressure through a valve from the filtration unit located on the wall. Turn the valve to shut the air pressure off.

Basic & Laser Safety Precautions

The basic and laser safety precautions section includes the following topics:

- Optical fibers and Fiber welding box
- Laser head
- IALDA laser source
- Enclosures
- Safety interlocks
- Warning labels



WARNING: Use of controls or adjustments, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

The platesetter is equipped with a **highly hazardous laser system** that exposes the media. However, the platesetter as a whole, is a **Class 1 laser product**, according to IEC60825-1 and the USA 21 CFR 1040. This implies that the operator and service engineer cannot access hazardous laser radiation, providing that the user and service safety precautions are followed.



WARNING: The laser beam and radiation of the platesetter are invisible and are hazardous to the eye and skin. **In the presence of flammable material, the laser beam is also a fire hazard! Even brief exposure of the eyes to the laser radiation or beam, or its reflections from shiny or matte objects may cause permanent loss or permanent degradation of eyesight.**



WARNING: Whenever in doubt, the platesetter should never be operated until it is checked and approved for operation by an authorized service engineer.



WARNING: If you **must** enter the room where the platesetter is located when the platesetter is on, and you suspect that any of the following precautions was somehow violated, then you must **disconnect** the power supply to the platesetter before entering the room.

Optical Fibers and Fiber Welding Box

Laser energy is generated in the IALDA type laser source, which included 48 different emitters. The laser energy is then conducted through a bundle of optical fibers, routed inside a plastic tubing to the plotting head. Between the laser source and the laser plotting head, there is a metal box called laser connection box.



WARNING: You are forbidden under any circumstances to move, pull or handle the optical fibers and their protective tubing!



WARNING: You are forbidden to access or open the laser connection box.



DANGER: If the platesetter is on and an optical fiber extends from the enclosure, or if a fiber is damaged inside or outside the platesetter, and even when the doors are closed, invisible laser radiation of up to a watt at a wavelength of 810-860 nanometer may be present. Even brief exposure of the eye to this radiation or its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight!

Laser Head

The optical fibers conduct the laser radiation to the plotting laser head.



DANGER: The laser head must never be activated if it is removed from its position on the guide beam. In addition, the laser head must never be activated when it is not in its proper position facing the drum, and with all the internal protective barriers assembled and all the doors closed.



WARNING: Never place any object in the path of the laser beam between the laser head and the drum.



DANGER: Up to several watts of invisible laser radiation at a wavelength of 810-860 nanometer may be present at the output of the Laser head. This laser radiation is hazardous to the eye and skin. Even brief exposure of the eye to this radiation or to its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight!

Laser Source

The IALDA laser source is located behind the left side door behind the internal barrier. The platesetter must never be activated when the laser source is not in its proper location and the laser source door and barrier are closed and properly fastened and no optical fibers emerge from its enclosure.



WARNING: Do not access the IALDA laser source.

Enclosures

Together with the laser interlock system, the platesetter enclosure is designed to protect anyone in the platesetter vicinity from exposure to the laser radiation by enclosing the laser radiation within the platesetter. The enclosure includes the external doors and panels, and the internal protective barriers. The internal barriers that may be dismantled by service engineer have warning labels on them indicating that the barrier must be in place. The internal protective barriers prevent the laser radiation from escaping through the platesetter loading/unloading openings through the ventilation openings and through the gaps between the external doors and panels. This protection depends upon the completeness and correct assembly of the outer enclosure and the internal protective barriers.



WARNING: You are forbidden, under any circumstances, to dismantle any external door or panel, or internal protective barrier from the platesetter!



WARNING: After performing any service activity and before switching **on** the platesetter, the service engineer must check and ensure that all external and internal enclosures and doors are complete, not broken or cracked, and properly assembled to the platesetter.



DANGER: If the platesetter is ON and the enclosure is damaged or incomplete, and even with the external doors closed, then invisible laser radiation of up to several watts may be present. This radiation is hazardous to the eye or skin. Even brief exposure of the eye to this radiation or its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight!



CAUTION: The opening of the two upper and front doors is controlled by a spring loaded mechanism. Make sure your head is **not near** the door when opening the door.



WARNING: You are forbidden to open any door, barrier, or panel that requires the use of a tool (for example, side doors when the upper rear door is closed, laser source protective barrier, distribution box, and the PC located behind the right door).



WARNING: You are forbidden to use tools.

Safety Interlocks

Safety interlocks provide the **main** protective means against the severe **laser** and **mechanical hazards** involved with the platesetter, providing that you carefully follow all the safety precautions detailed in this chapter.



WARNING: The safety interlock **does not disconnect hazardous electrical voltage** from parts and wires inside the platesetter and MCU. These parts, however, require tools to access.

WARNING: It may take up to two seconds for the laser interlock system to shut off the laser sources. Therefore, when opening a door, do not rush to access inside the platesetter.

Interlock switches are designed to disconnect power from the laser system, drum motor and other motors when:

- the platesetter front door, rear upper door, side doors, or the MCU upper door is opened.
- the platesetter rear or front lower panels are removed
- the MCU is disassembled from the platesetter
- the left or right internal MCU side covers are removed.

WARNING: The user is not, under any circumstances, allowed to defeat **any interlock switch**.

- Even authorized service personnel are forbidden to defeat the write laser interlocks, but are allowed to defeat the drum motor and other mechanical interlocks while keeping the appropriate safety instructions.

The following table is included to provide the operator with information about the safety measures included in the platesetter. The operator is strictly forbidden to defeat any interlock switch or actuate any defeat switch, or use a tool!

Platesetter Interlock Functions and Locations

Location on platesetter	Function	Description	Serviceman bypass
Front door	Disable lasers and motors	2 interlock switches	no
Lower front panel	Disable lasers and motors	1 interlock switch	no
Upper rear door	Disable lasers and motors	2 interlock switches	no
Upper rear door	Enable motors	1 bypass switch	yes

Location on platesetter	Function	Description	Serviceman bypass
Lower rear panel	Disable lasers and motors	1 interlock switch	no
Left platesetter door	Disable lasers and motors	1 interlock switch	no
Right platesetter door	Disable lasers and motors	1 interlock switch	no

MCU Interlock Functions and Locations

Location on MCU	Function	Description	Serviceman bypass
Left internal cover	Disable lasers and motors	2 laser interlock switches	no
Left internal cover	Enable motors	1 motor interlock switch	yes
Right internal cover	Disable lasers and motors	2 laser interlock switches	no
Right internal cover	Enable motors	1 motor interlock switch	yes
Upper door	Disable lasers and motors	2 laser interlock switches	no
Upper door	Enable motors	1 motor interlock switch	yes
Cassette trays	Disable motors	Motor magnetic interlock switch	no



WARNING: It may take up to two seconds for the laser interlock system to shut off the laser sources. Therefore, when opening a door, do not rush to access inside the platesetter.

DANGER: If a door or panel is open and if interlock switch is defeated, or if the interlock system failed, then severe **mechanical hazards** and invisible laser radiation of up to several watts may be present. **The laser radiation is hazardous to the eye and skin**. **Even brief exposure of the eye to this radiation or its reflection from shiny or matte objects can cause permanent degradation or permanent loss of eyesight!**

Note: The **laser** interlock system is equipped with a **buzzer**. If a failure is detected in the operation of the laser interlock system, the buzzer is activated and the laser is shut off. In any case, not every possible failure can be detected, especially failure of a single interlock switch.

WARNING: If the buzzer is activated, shut the platesetter off and do not operate it again until it has been checked and approved for operation by an authorized service engineer.

Warning Labels

The following pages show the warning labels, and their locations.

Make sure that the warning labels are in good order; notify your service engineer if a label needs to be replaced.

Note: The machine supplied to you should have the warning labels provided in your local language.

WARNING: Notify your service engineer if your local language is not provided on the warning labels.

WARNING: The warning labels are provided for user and service personnel safety. Do not fail to comply with the warnings!



Label 1: 382-00888A



Label 1: 382-00889A



Label 2: 382-00956A



Label 5: 382-00980A



Label 5: 382-00981A



Label 8: 382-00905A



Label 8: 382-00906A



Label 9: 382-00922A



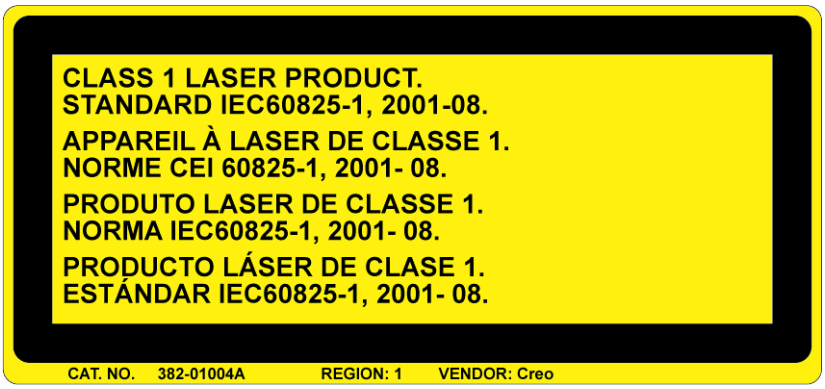
Label 9: 382-00923A



Label 10: 382-00939A



Label 10: 382-00940A



Label 12: 382-01004A



Label 15: 382-00968A



Label 16: 382-01016A



Label 19: 382-01028A



382-01117A



374A7B678



374A9C009



374A7B951



382-01209A

Platesetter Warning Label Locations

WARNING: Some of the figures show protective panels and internal protective barriers removed. The operator is forbidden to dismantle any barrier or cover that require a tool to do so.



Figure 7: Front view, doors open, panels removed, with loading tray

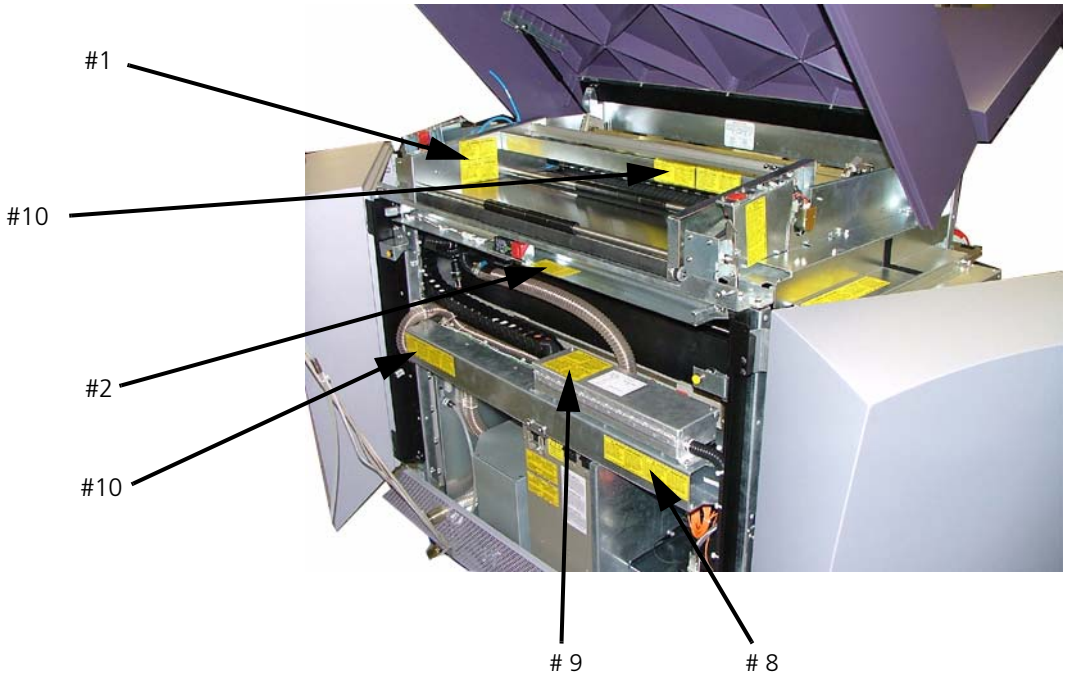


Figure 8: Rear view, upper door open, panels removed, with unloading tray

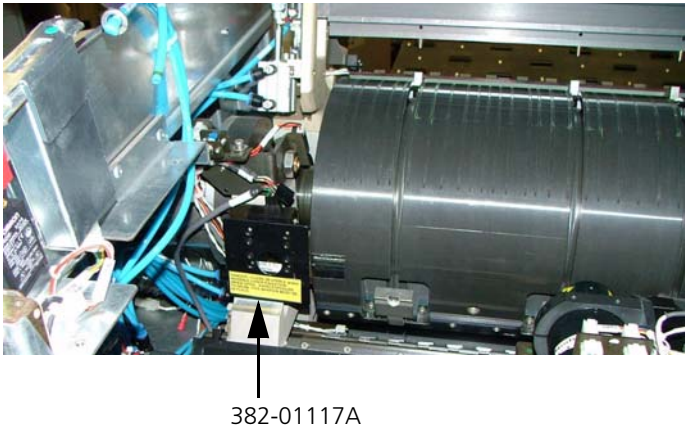


Figure 9: Rear view, upper door open, panels removed, without unloading tray

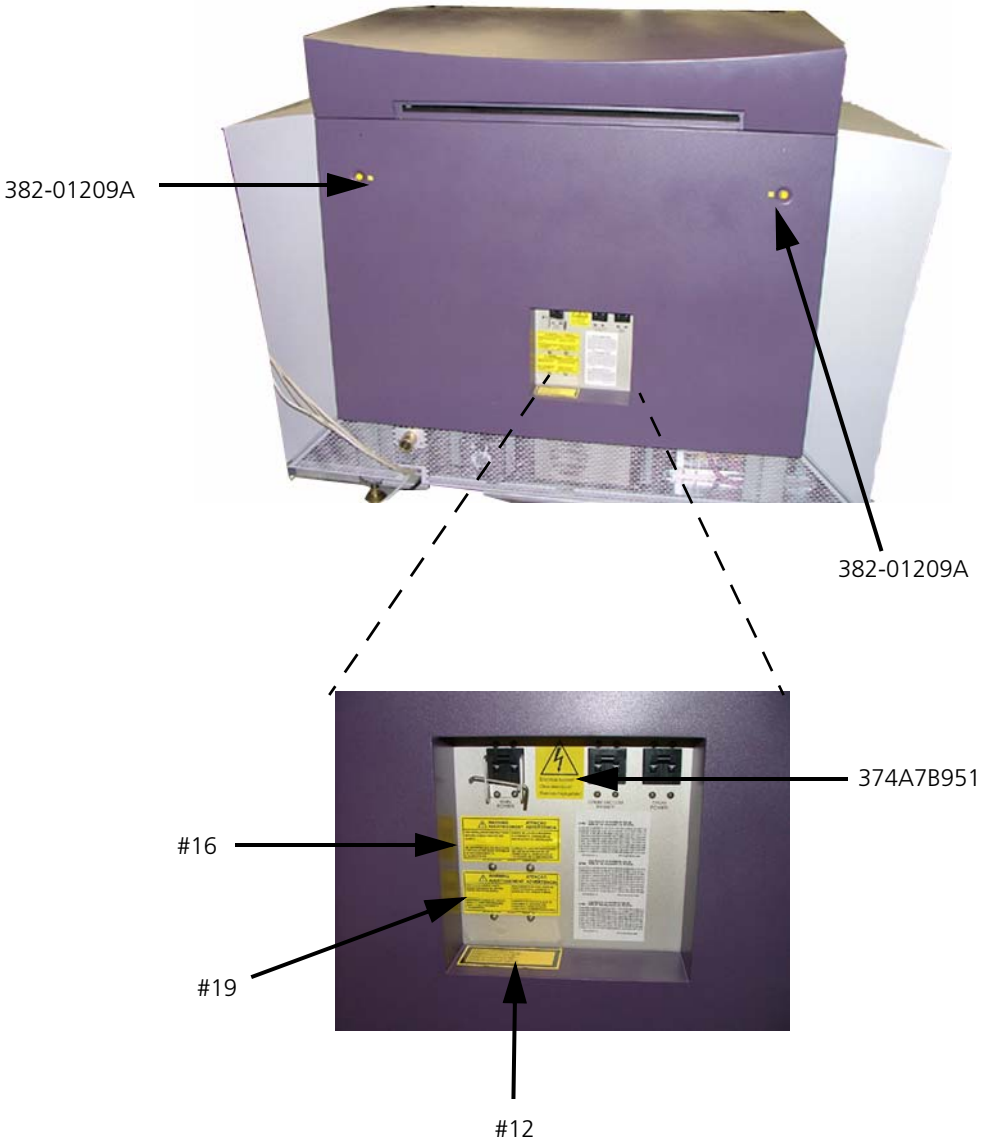


Figure 10: Rear view, panel closed

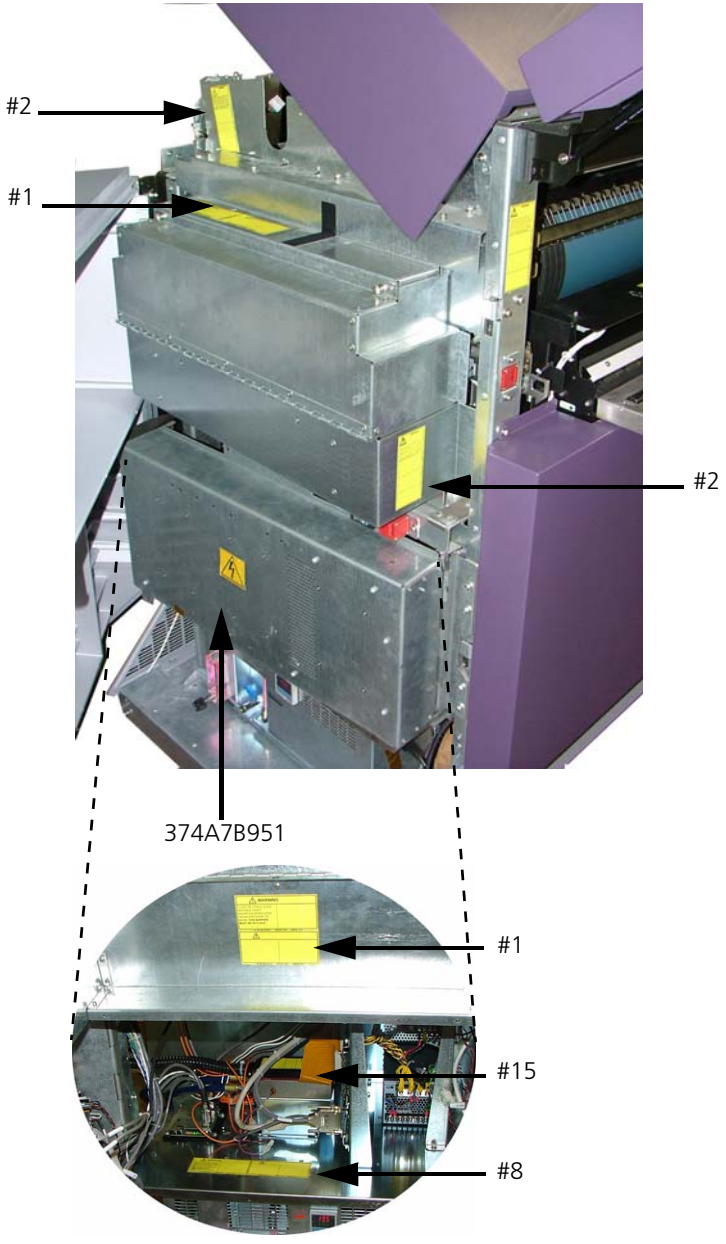


Figure 11: Left side door open

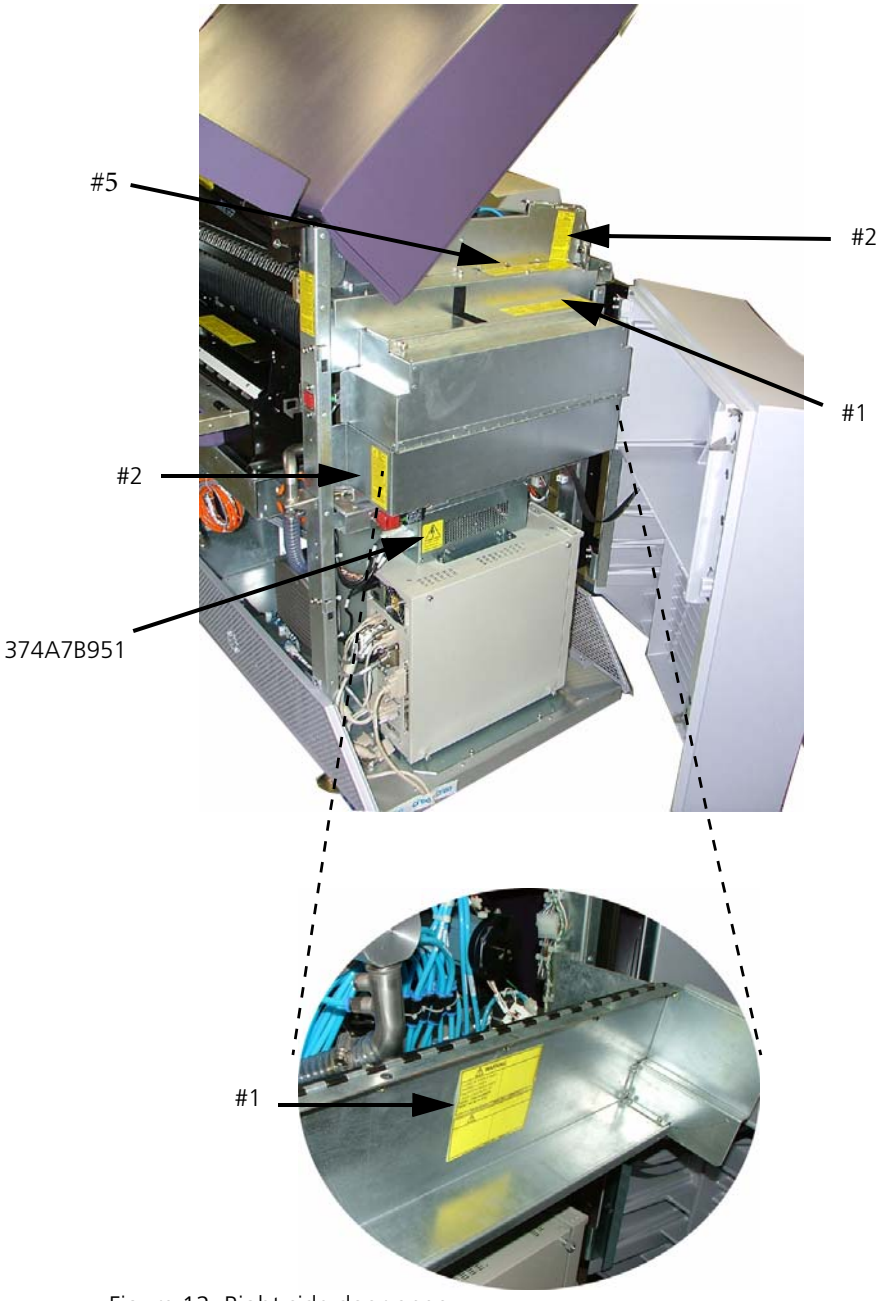


Figure 12: Right side door open

MCU Warning Label Locations



Figure 13: MCU right side door open

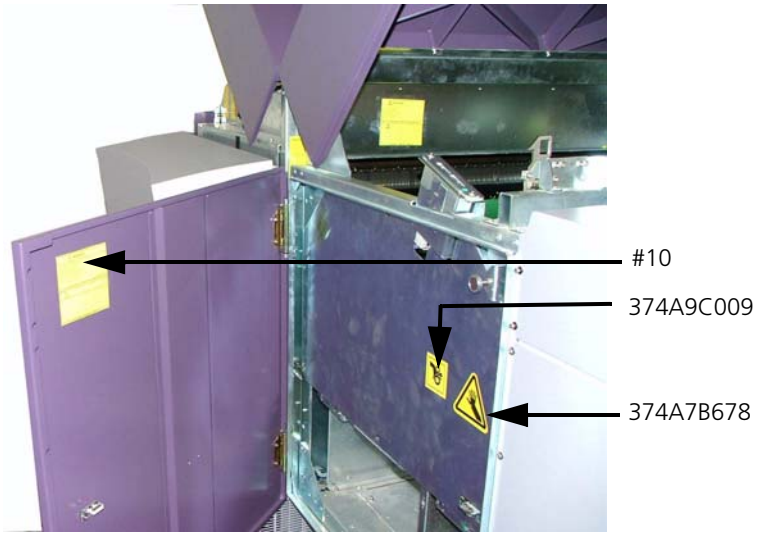


Figure 14: MCU left side door open



Figure 15: MCU right side view, right and upper doors open, right panel removed

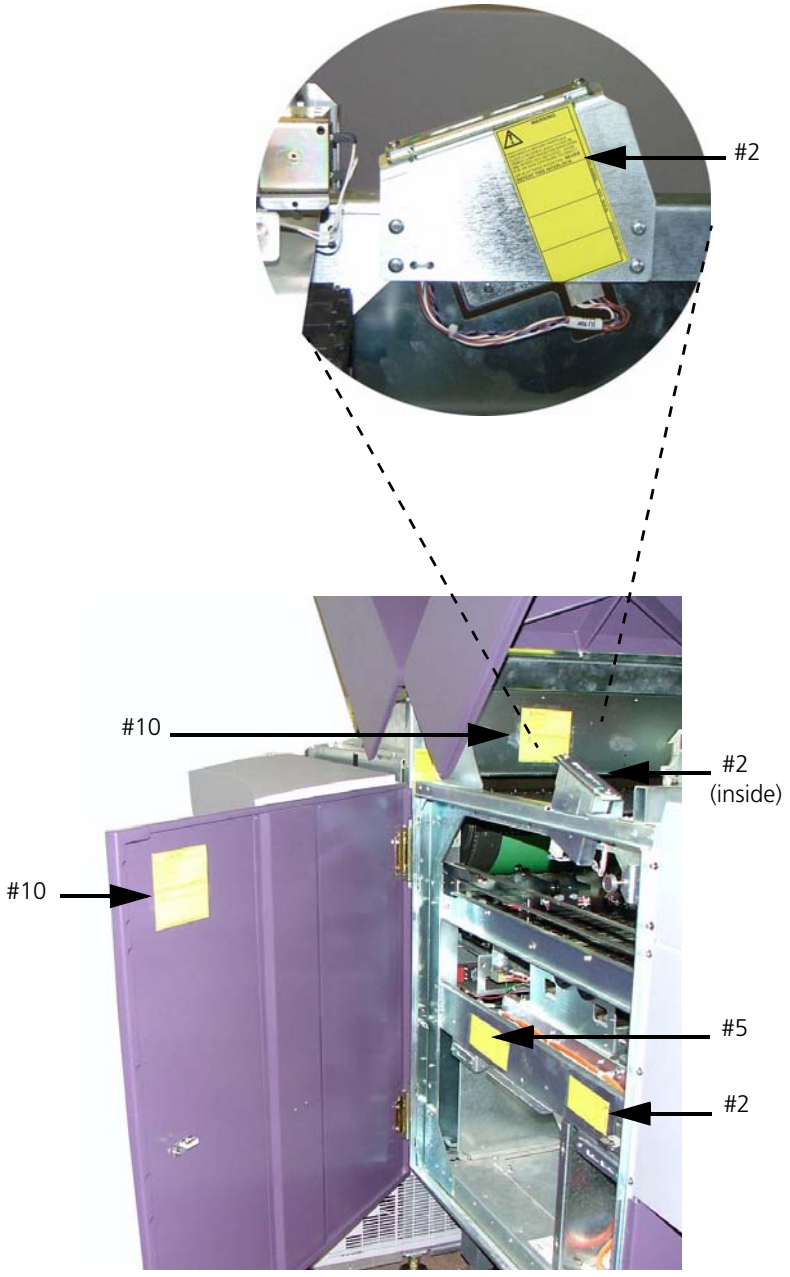


Figure 16: MCU, left side and upper doors open, internal left panel removed

Drum Safety Precautions

The Magnus 400 platesetter contains a drum that revolves inside the platesetter. The plates are loaded, wrapped onto the drum, exposed and unloaded.

The drum revolves normally at **1200** revolutions per minute. If an object hits the rotating drum, the object may get dislodged inside the platesetter and cause damage (including damage to the safety system and optical fibers and laser head), or force the upper doors to open, or penetrate through the doors.

Opening the front, upper rear, and MCU upper doors is initiated from the Magnus Controller. This activates the solenoids that release the door locks, thus enabling the user to open the door. By this time, the drum must be almost stationary.



WARNING: If after a door is unlocked, it takes **more than 3 seconds** for the drum to become completely stationary, the machine must be repaired. Shut off the machine and call your service engineer.

Since serious personal injury to the operator, service engineer or anyone in the vicinity may occur by the revolving **drum**, the following precautions must be followed:



WARNING: Do not insert your fingers or hands anywhere near the drum, as they may get caught in the narrow gaps in the drum area!



WARNING: Be sure not to leave any object, tool or part inside or on the platesetter enclosure. If an object gets lodged, it may cause damage to the platesetter safety systems and endanger user and service personnel.



WARNING: You are **forbidden**, under any circumstances, to defeat any interlock switch!



WARNING: If the service engineer has defeated the drum interlock and a door is open, **do not** stand at any distance in front of the platesetter. **Do not** touch any moving part while it is in motion.



WARNING: If you need to open the cover for releasing stuck plates or other maintenance, remove any piece of clothing or object that may get caught in the revolving drum or other moving parts. Remove ties, roll up long sleeves, remove jewelry and gather long hair.

Universal Debris Removal Cabinet (UDRC)

The UDRC connected to the platesetter is part of the Magnus 400 configuration. The UDRC contains a filtering device that extracts dust, fumes, contaminants and solvent vapors that appear within the platesetter during normal operation and need to be removed.

The filter may be replaced only by the service engineer!



WARNING: The filtering device has been constructed according to recognized technical safety regulations. Nevertheless, danger to life of the user or third parties or damage to property can occur if the filter is not handled properly.

Handling Plates



CAUTION: The plate edges are sharp so they should not be handled with bare hands. Wear gloves if you must handle the plate.



CAUTION: Do not touch the plate after it is placed in the MCU. Close the drawer and the drawer cover to enable automatic plate loading.

When ready to expose, the plate is automatically loaded. After expose, the plate is automatically unloaded from the Plate exit at the rear side.



WARNING: Since the plate is automatically unloaded from the plate exit, be sure not to stand too close to this exit.



CAUTION: Be careful that your fingers do not get caught when closing the cassette drawer.

When working with the MCU, you may need to lift a box of 50 plates. The plates are heavy.



CAUTION: Make sure to lift the plates in a manner that will not cause injury to your back

Removing Stuck Plates

Special precautions are required when removing a plate that got stuck inside the platesetter.



WARNING: Before removing a plate, switch off the **main drum power** switch on the distribution box.



WARNING: Before removing a plate, remove objects or clothing that might get caught in the revolving drum or other moving parts, such as ties and jewelry. Fold long sleeves and gather long hair.

It is recommended to release the entire plate as one piece; do not attempt to cut the plate.

Electrical & Pneumatic Connections



WARNING: Do not change the power supply installed by the service engineer. Do not alter any electric wiring. Do not alter the pneumatic tubes.

Lithium Battery

The platesetter contains a lithium battery. The battery **cannot** be replaced by the user. Only qualified service personnel are allowed to replace it.



WARNING: Danger of explosion if battery is incorrectly replaced.