Safety Precautions for User

English

ThermoFlex Mid

731-00305A-EN

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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731-00305A-EN

Revised October 2004

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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 this chapter carefully before operating or maintaining the ThermoFlex Mid platesetter.

This product is a **Class 1** laser product, according to IEC825-1 and USA 21 CFR 1040. This implies that there is no hazardous laser radiation, providing that the user and service safety precautions are followed.

ThermoFlex Mid safety at a glance - how to avoid exposure hazards?



WARNING: The laser beam and radiation are hazardous, but 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. 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.

Installation Safety Precautions

Installation must be done only by authorized service personnel.

The ThermoFlex Mid 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, cooling 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 ThermoFlex Mid platesetter.

Disconnection from Mains Supply

The platesetter is equipped with a **Main power circuit breaker**, located on the Distribution box on the lower front panel of the platesetter; and two identical (yellow) **On/Off** pushbuttons located on both sides of the front panel of the platesetter.



Note: Users who are acquainted with the Creo Lotem Family devices should be aware that the front of the ThermoFlex platesetter is the side where plates are loaded and unloaded, and the rear of this platesetter is the side that usually rests against a wall (as opposed to the Lotem CTP devices).

Special circuit breakers for the **Drum power** and **Drum vacuum pump** are located near the **Main power circuit breaker.** An additional circuit breaker for the **L-box** is located internally on the L-box cover.



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 the 3 phase power connector.

Basic & Laser Safety Precautions

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

- Optical Fibers
- Laser Head
- Laser Box
- Enclosures
- Safety Interlocks
- Warning labels



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



DANGER: The above CAUTION note must be included in this manual according to USA 21CFR regulations. However, the hazards involved include not moderate, but SERIOUS bodily injury - especially to the eye!

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 IEC825-1 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 were somehow violated, then you must **disconnect** the power supply to the platesetter before entering the room.

Optical Fibers

Laser energy is generated in the laser diodes, located in the laser box and conducted to the plotting head through optical fibers.



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



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 in the platesetter from the Laser box 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 Box

The Laser diodes are located in the Laser box locates behind the side door of the platesetter. The platesetter must never be activated when the Laser box is not in its proper location and the Laser box door closed and properly fastened and no optical fibers emerge from its enclosure.



WARNING: After performing any service activity and before switching **on** the platesetter, the service engineer must check and ensure that no optical fiber extends from the Laser box enclosures or is damaged.

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 protective barriers prevent the laser radiation from escaping through the ventilation openings on the side doors or lower 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 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 internal doors (for example, Laser box, Distribution box, and Electronic box).



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.

Interlock switches are designed to disconnect power from the Laser system, Drum motor and other motors when the upper doors or the left or right doors are open, or the upper rear panel is removed.



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

Even authorized service personnel are forbidden to defeat the laser interlocks, but are allowed to defeat the Motor interlocks while keeping the appropriate safety instructions.

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

Interlock Functions and Locations

Interlock Location	Interlock Function	Description of interlock Switches	Serviceman only Defeat Allowances
Upper front door (loading/unloading side)	Disable Lasers and Motors	2 interlock switches 1 defeat switch	Defeat switch only - to operate motors
Upper rear door	Disable Lasers and Motors	2 interlock switches	None
Upper front panel	Disable Lasers and Motors	1 interlock switch	None
Lower front panel	Disable Lasers and Motors	1 interlock switch	None
Left door	Disable Lasers and Motors	1 interlock switch	None
Right door	Disable Lasers and Motors	1 interlock switch	None



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.

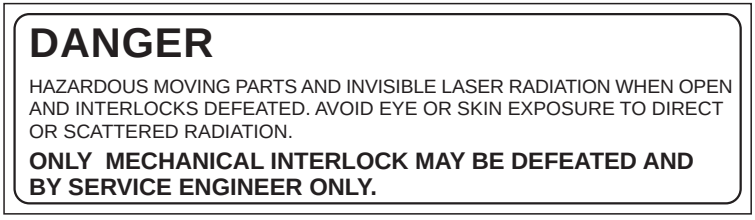
Warning Labels

The following pages show the laser and other 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: When a language other than English is spoken, the service engineer should stick the translated labels (supplies with the platesetter) in the relevant locations.

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



K7B830



K7B831



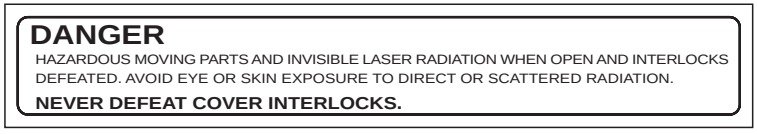
K7B832



K7B833



K7B834



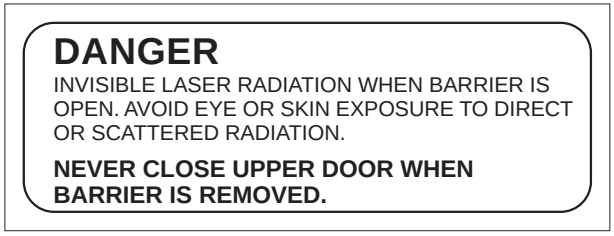
K7B836



K7L405



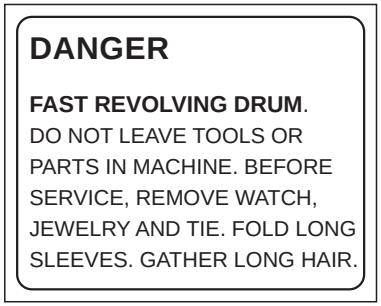
K7L407



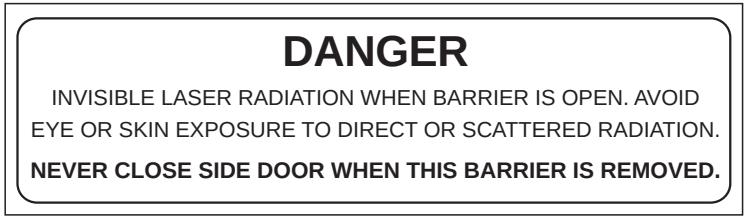
K7L408



K7L411



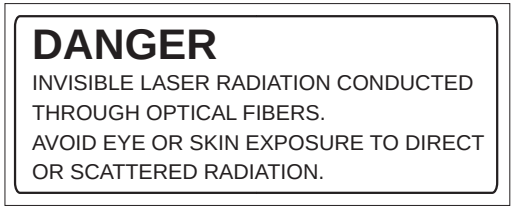
K7L413 (also K7L412A)



K7L416



K7L417



K7L420

CAUTION

THIS PLATESETTER HAS INVISIBLE LASER RADIATION INSIDE THAT IS HAZARDOUS TO THE EYE AND SKIN. THE PLATESETTER WAS TESTED FOR LASER SAFETY AND APPROVED AS CLASS 1 (SAFE) LASER PRODUCT, ACCORDING TO SAFETY STANDARD EN60825-1

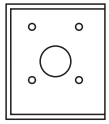
NOTE-
- READ USER SAFETY INSTRUCTIONS PRIOR TO OPERATING THE PLATESETTER
- ALWAYS REFRAIN FROM LOOKING INSIDE THROUGH THE PLATESETTER OPENINGS, USE DOORS TO GAIN INSIDE ACCESS
- USE OF ANY TOOLS AND DEFEATING INTERLOCKS IS FORBIDDEN!

K7L666

DANGER
INVISIBLE LASER RADIATION. **KEEP THIS BARRIER IN PLACE**

K7L667

DANGER
INVISIBLE LASER RADIATION WHEN OPEN. AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.
THIS BARRIER MUST BE IN PLACE

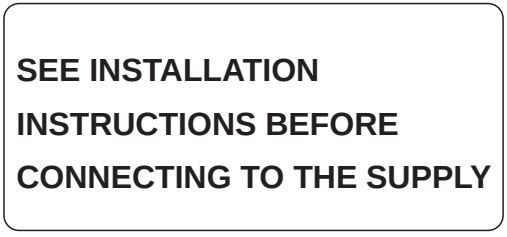


K7L668

K7L668



K8L535



K1F658



K2G957



374A7B951 (374A30170)

Warning label Locations

See the following figures for locations of warning labels on the ThermoFlex Mid platesetter.

Make sure that all warning labels are in good order; renew warning labels if needed.

Note: When a language other than English is spoken, the service engineer should stick the translated labels (supplied with the platesetter), in the relevant locations.

ThermoFlex Mid

See the following figures for locations of warning labels for the ThermoFlex Mid.

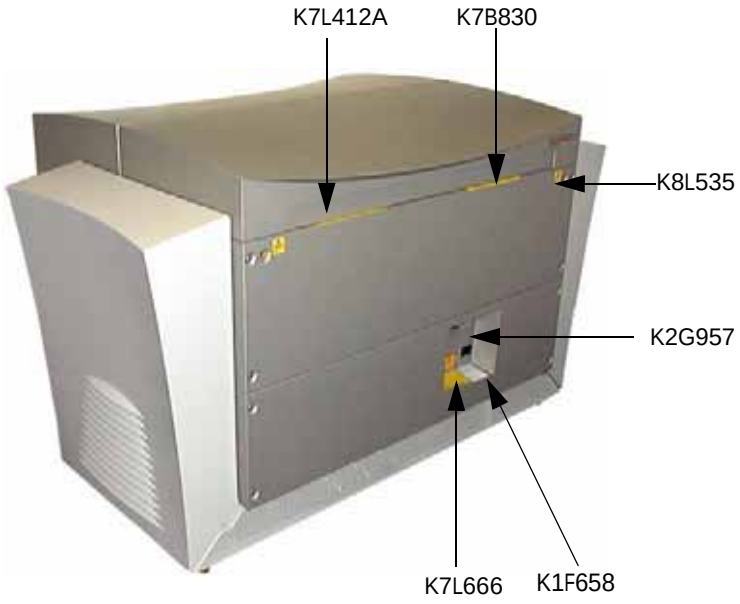


Figure 1: Front view, door closed

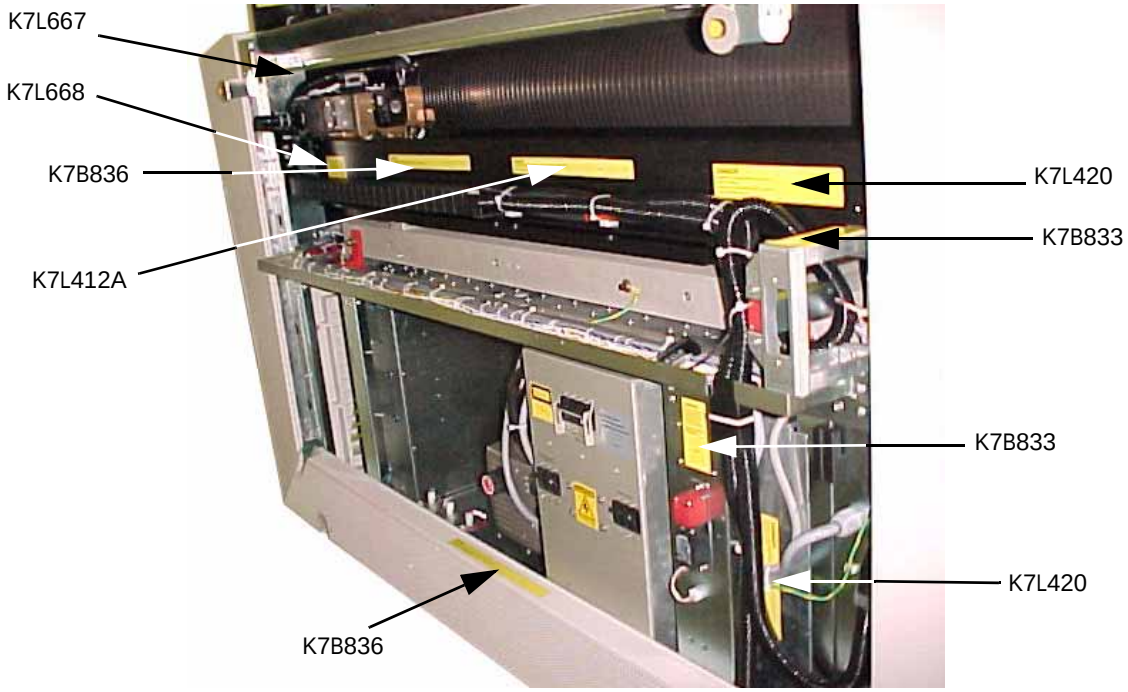


Figure 2: Front view, panels removed

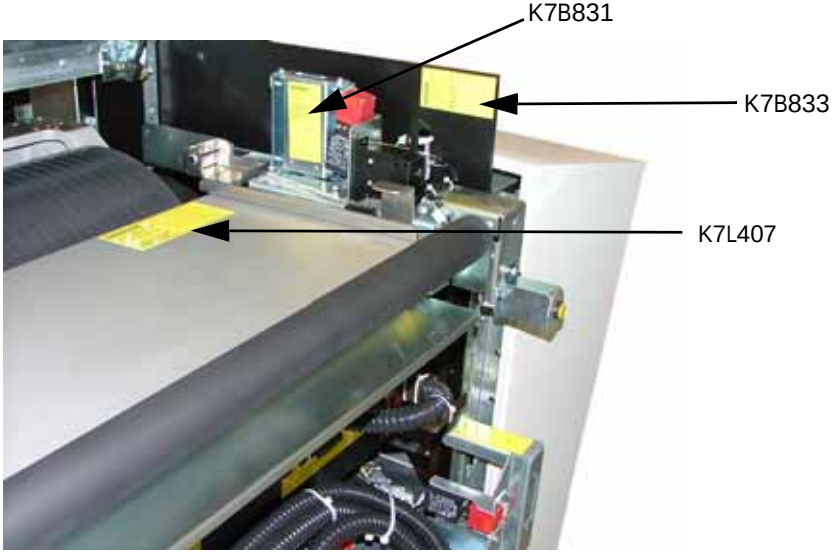


Figure 3: Front view, door open, right side

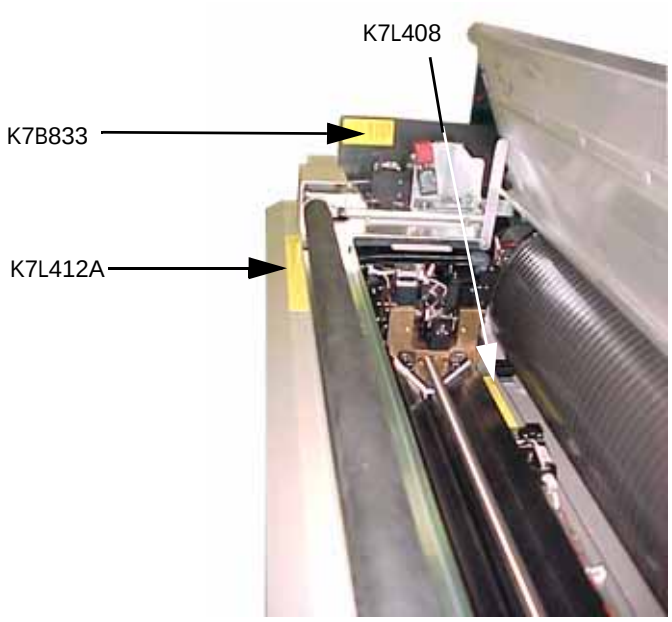


Figure 4: Front view, door open, left side

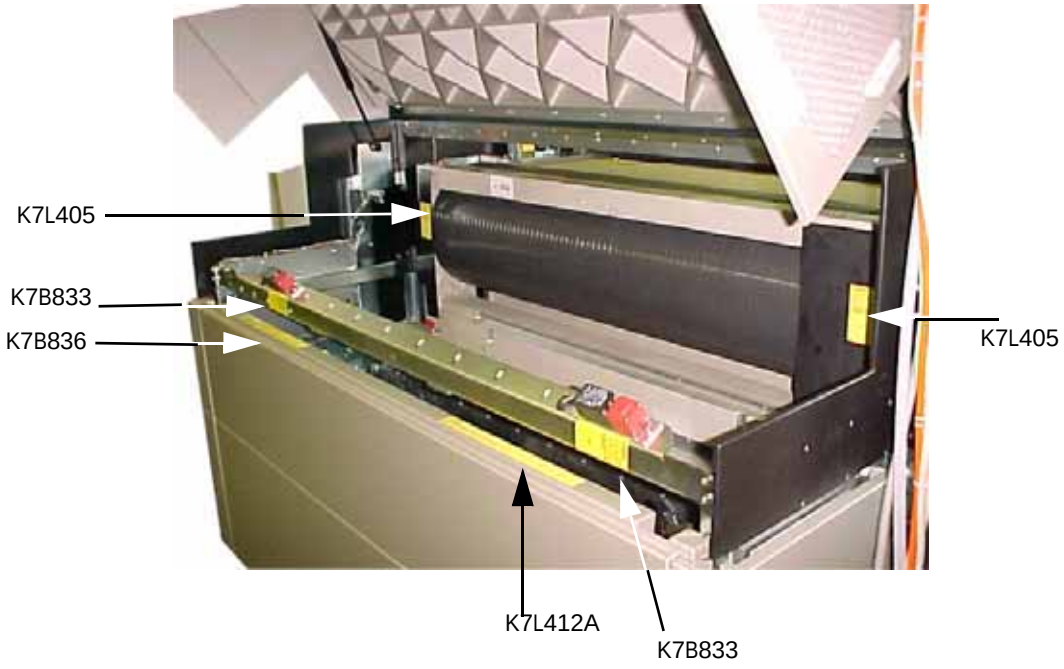


Figure 5: Rear view, door open

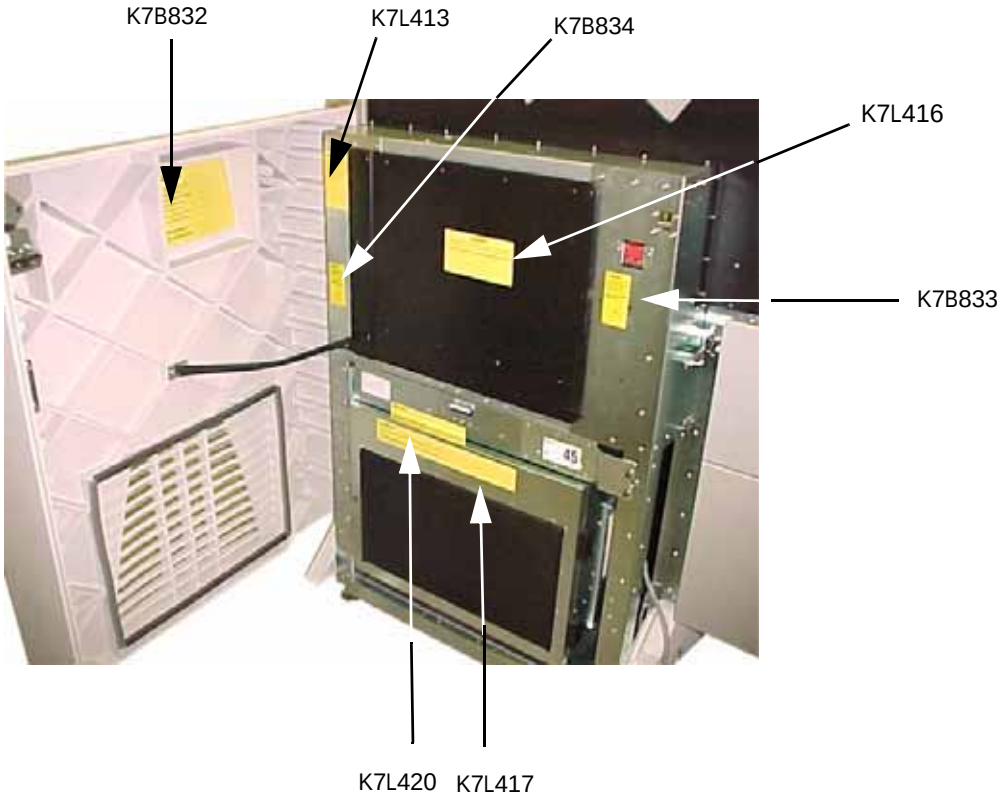


Figure 6: Right side door open, panel closed

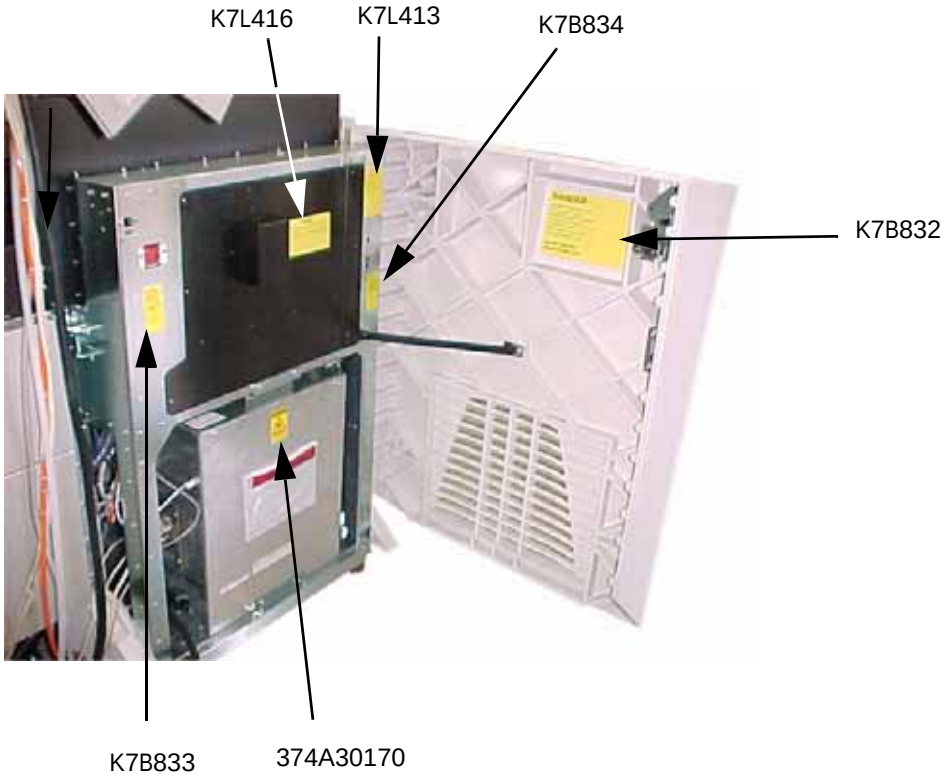


Figure 7: Left side door open, panel closed

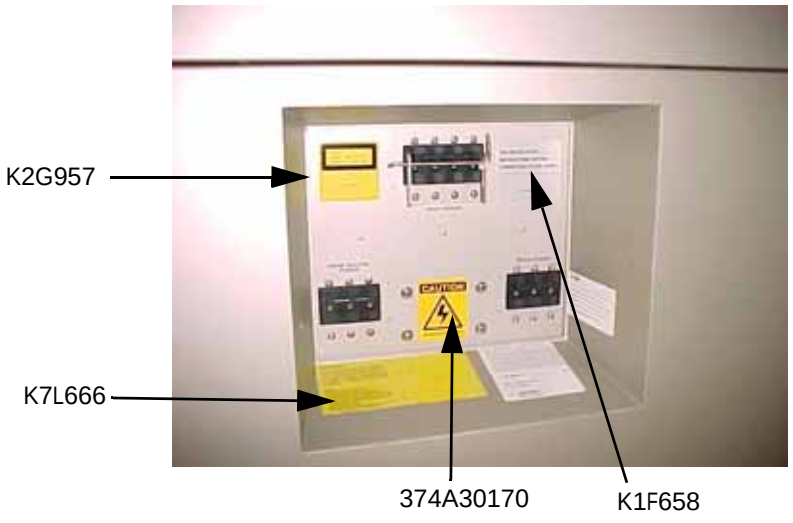


Figure 8: Distribution box

Drum Safety Precautions

The ThermoFlex Mid platesetter contains a drum that revolves inside the platesetter. The plates are loaded and unloaded manually onto the drum. Special safety precautions are implemented in the platesetter in order to prevent rotation of the drum while the user is loading or unloading media.



WARNING: Opening the upper front or rear door is initiated from the PC controller. This releases the solenoids that lock the door. You can then open the door, but you must first make sure the drum is stationary. **If 5 seconds after the door is unlocked the drum is not stationary, shut off the machine and call your service engineer.**



WARNING: If the buzzer is activated this indicates that the drum interlock or laser interlock system has failed. Do the following: remove your hands from the drum, shut down the machine and call your service engineer.

The drum revolves at approximately **200** 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, optical head or optical fibers), or force the upper doors to open, or penetrate through the doors.



WARNING: Do not leave any loose object, tool or part inside or on the platesetter enclosure. A loose object inside the enclosure may penetrate through the enclosure and injure a person standing nearby.



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

Debris Removal System

The Debris removal system, a separate componant connected to the platesetter, is part of the ThermoFlex Mid configuration. The Debris removal system 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.

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.

WARNING: Please refer to the Debris Removal System Manufacturer's Operating and Safety Instructions.

Handling Plates

Loading and Unloading Plates

CAUTION: The plate material may be irritating so it is recommended that you wear gloves when loading plates into the cassette.

CAUTION: Be careful that your fingers do not get caught between the drum and other objects.

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 (shown in Figure 8 on page 24).



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.

ThermoFlex Mid platesetter connections:

- The connector is supplied by the customer (male & female).
- One 3Ph outlet - 208V/120 Vac ±10%, 3 phase (Star) 20A. Frequency – 50/60 ±2%.
- For customers with line power of 230 Vac, a step-down transformer is used, from 346/200, 380/220, 400/230 or 415/240 to 208/120V (3Ph).
- To protect the transformer, a 3-pole circuit breaker must be provided in the power line that feeds the transformer. The circuit breaker must be rated: 10KA IEC 947.2, 230/400 VAC, 16A, tripping curve D or K.

Vacuum pump connection for the ThermoFlex Mid:



Note: The following information pertains to the Fuchs filtering device, if you have a UDRC, please see the *UDRC Site Preparation Guide.*

- One 3Ph outlet – 400/230 Vac 3-phase 16A slow reacting fuse. The connector is supplied by customer (male & female).
- For customers with 230 Vac line power, the vacuum pump is connected to the wall connector. For customers with 110 Vac, a 3Ph 230V transformer is connected to the wall connector and to the vacuum pump (connectors are supplied).
- To protect the transformer, a 3-pole circuit breaker must be provided in the power line that feeds the transformer. The circuit breaker must be rated: 10KA IEC 947.2, 230/400 VAC, 10A, tripping curve D or K.

Other electrical connections for the ThermoFlex Mid:

- Two (2) power supply connections for workflow workstationand ThermoFlex Controller monitor – 120V +6% -10% or 230V ±10%, 16A.
- An additional isolated single-phase outlet for service purposes.

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.