



CURE XL

# Instructions

Photocentric



Fast post-curing of large 3D  
printed parts

Version 2  
03/02/2025



Photocentric  
CURE XL



## 1. Machine Details

### **Manufacturer:**

Photocentric Ltd.

Titan House

Titan Drive

Peterborough

PE1 5XN

### **Machine Reference:**

Machine type: 3D Printing Post-processing Curing Machine

Machine model: Photocentric CURE XL

**Machine requirements:**

Supply	Connection	Characteristics
Electrical	3Ø N&E (5 wire)	400v, 50Hz

\*Installation of electrics is the responsibility of the customer. This should be carried out by a competent electrician.

## 2. Residual risks



**Caution:**

External areas around the machine may be wet if rinse fluid leaks from machine.



**Caution:**

Every precaution should be taken to prevent electrical shocks.



**Caution:**

Care should be taken when closing doors or barriers.



**Caution:**

As the wash process includes the use of hazardous chemicals, the operator should be fully trained in handling such hazardous material, taking all relevant precautionary measures.



Advised to wear safety boots to reduce risk of slipping.



Advised to wear safety gloves. Chemicals can cause irritation.



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### 3. Machine Description

#### 3.1 Dimensioned Drawing

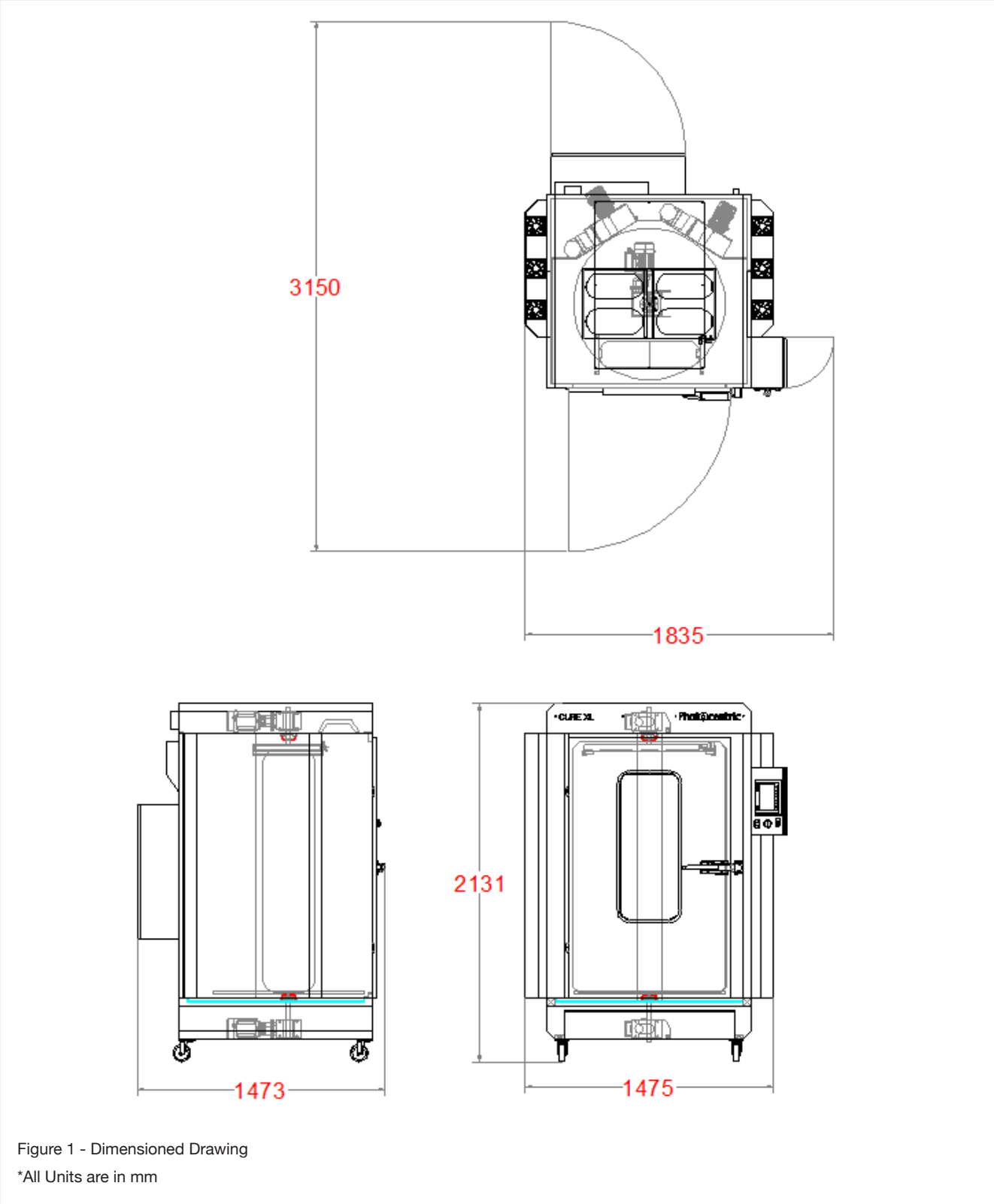
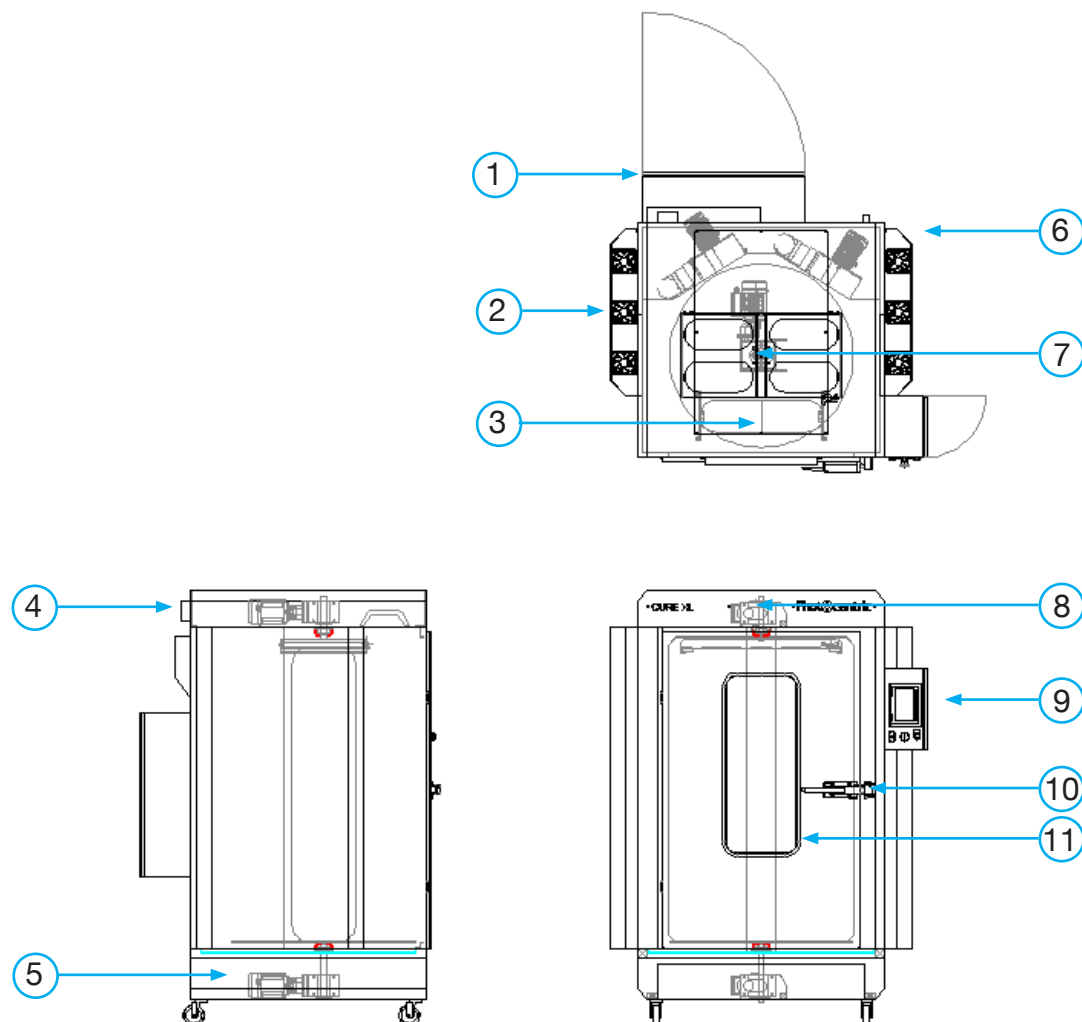


Figure 1 - Dimensioned Drawing

\*All Units are in mm



### 3.2 General Arrangement



Index	Description
1	Electrical Unit
2	Cavity for optional extra UV lightbox
3	Driven Tempered Glass turntable
4	Extraction Duct
5	Motor for floor mounted turntable
6	UV Lightbox
7	Motorized inverted build plate turntable
8	Motor for overhead turntable
9	HMI Control Panel
10	Door c/w slam handle
11	Viewing window

### 3.3 Description

Post-processing (washing and curing) is an essential step in creating items with stereolithography (SLA) LCD 3D printing. After the part has been washed, rinsed and dried the platform needs final post-curing with UV light and heat to finish the photopolymerisation process and deliver final mechanical properties.

Proper post curing not only improves the strength, durability, and temperature resistance of the part, but also enhances its surface finish and overall appearance. The purpose of this manual is to provide instructions on how to operate the Photocentric Cure XL machine.

The Photocentric Cure XL is designed to work with the Titan printer and Titan Wash XL and is compatible with the Titan platform transfer unit. The Cure XL (figure 3) includes two driven turntables that allow the operator to either cure the 3D part upside down attached to the build plate on the platform, or on the floor mounted turntable for curing parts removed from the platform.

After processing in the Wash XL, the build plate is transferred on the transfer platform to Cure XL. The inverted turntable is actuated automatically upon starting the curing operation. Alternatively remove the washed parts from the platform and place them on the Optiwhite™ toughened glass sheet to cure. The door is fitted with a magnetic lock which includes a sensor which deactivates the lights and turntables if the door is opened during curing.

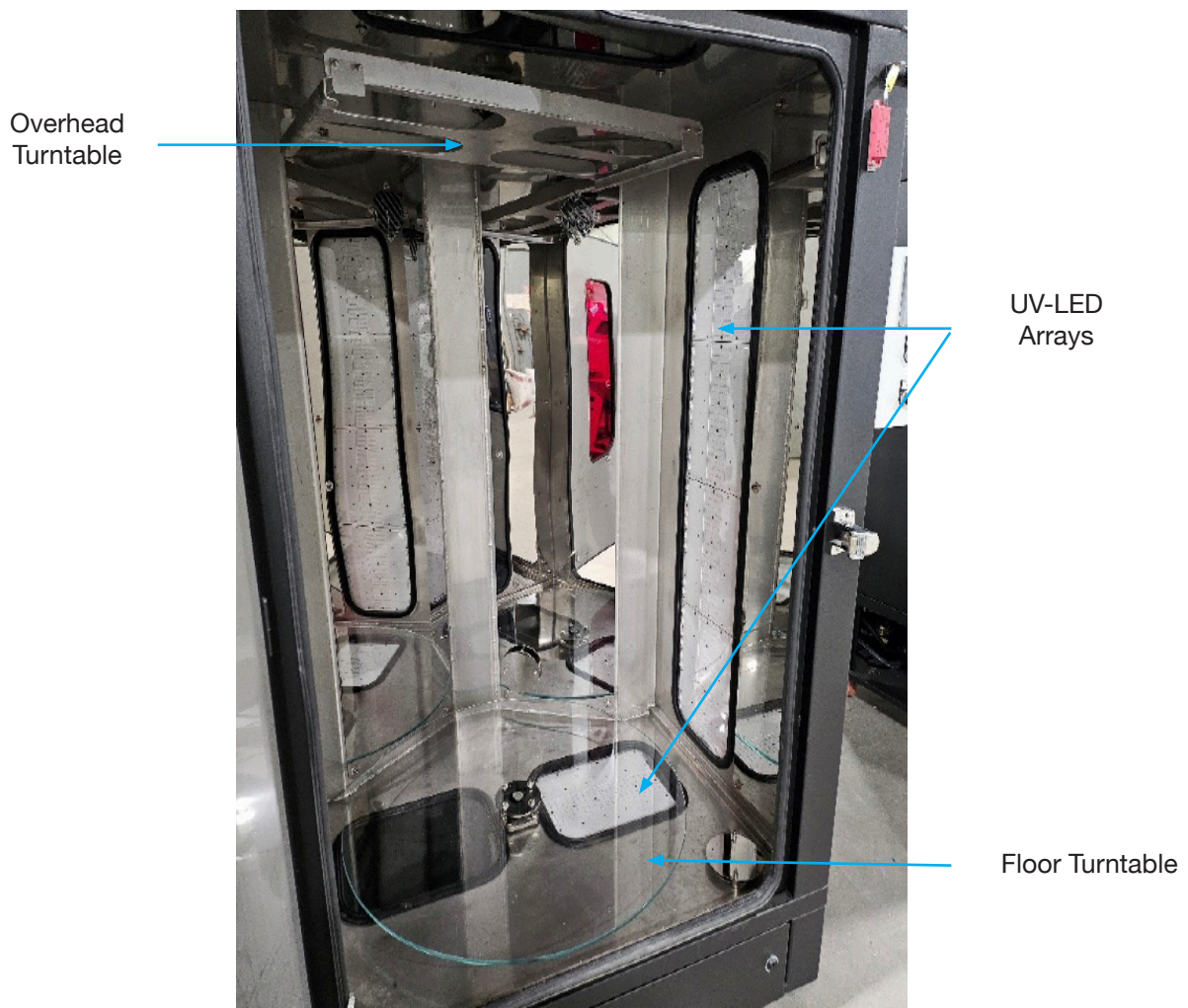


Figure 3 - Cabinet Interior



## 4. Initial Setup

### 4.1 Electrical Installation

The machine will need to be wired up to a three-phase power supply, via the socket (figure 4). **This must be carried out by a qualified electrician.**

It is imperative that the isolator switch (figure 5) located on the back of the electrical unit is **SWITCHED OFF** before electrical installation.



Figure 4  
Three-phase electrical socket

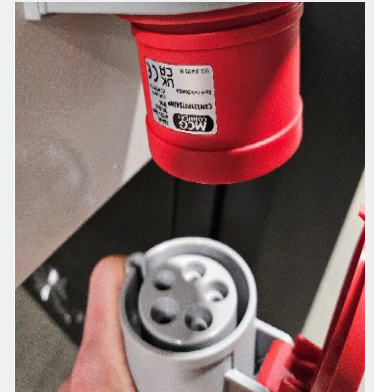


Figure 5  
Lockable Isolator switch

## 5. Getting to know your Machine

### 5.1 Understanding the Human-machine interface (HMI)

#### 5.1.1 Front Control Panel

The front control panel (figure 6) houses controls used to operate the machine. This control panel holds the following:





Figure 6  
Labelled control panel

Label	Name	Function
1	Touch Screen HMI	User-interface for the operator to operate the machine
2	Navigation Buttons	Enables the operator to switch between the several different screens on the HMI
3	Cycle Start	Starts the cure cycle
4	Emergency Stop	Used to stop the machine in the event of an emergency. The button is a latching button and must be released to reset the machine
5	Turntable Speed	Physical potentiometer enables the operator to set the desired turntable speed
6	Reset	Used to reset the system in the event of an emergency stop



### 5.1.2 Navigation

The navigation buttons allow the operator to switch between the different pages on the HMI, they correspond to the following:

Function	Button	Description
F2		Activity/control page
F3		-Parameter settings

### 5.1.3 Activity/Control Page

Shown in figure 7, the activity screen gives an overview of the machine and is the primary screen for everyday use. It also has four separate settings which operate the following functions:

- Pre heat – Sets the temperature which the preheat stage will heat the cabinet up to.
- Dry – Set the amount of time the dry stage will run for following the pre-heat stage.
- Cure – Set the amount of time in minutes the curing stage will run following the dry stage.
- Cool down – Set the amount of time in minutes the final cool down stage lasts following the cure stage.

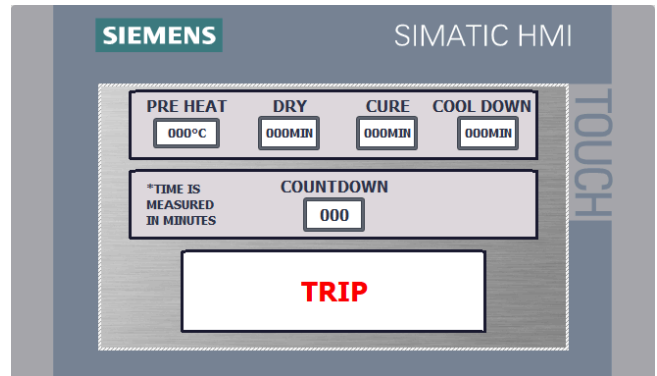







Figure 7 - Activity/control page



The countdown box (figure 8) is a cycle countdown for the total process – this is the combined time of the pre heat, dry, cure, and cool down stages.

The activity screen also shows the status of the machine, the following list shows the messages that may appear on the screen at any given time and their meanings:

Function	Description
	Emergency stop, release the relevant E-stop station and press reset to clear fault.
	The machine has a fault. This could be an electrical trip or a problem with the temperature probe.
	The temperature in the cabinet is over the set temperature.
	Ready, the machine is ready to start.
	Running, the machine is running the selected recipe.



### 5.1.4 Parameter settings

The parameter settings (figure 9) enables the operator to set the target temperature (CABINET SET) and view the actual temperature (CABINET ACT) in the cabinet.

There are also three push buttons on the parameter settings page which allow you to operate the following functions –

- Light – turns the LED lights inside the cabinet on/off.
- Home turntable – the turntable will automatically rotate to the ‘home’/‘zero’ position.
- Nudge upper turntable – when pressed will slightly rotate the turntable until the button is released.



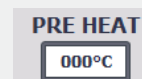
Figure 9 - Parameter settings

## 5.2 Setting Cure Parameters

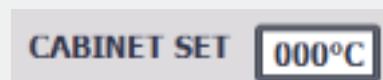
### 5.2.1 Setting Pre-heat temperature

The target cabinet pre-heat temperature can be set by either of two ways:

1. Tapping the “pre heat” box (by default shows value on 000°C) on the activity/control page (figure 7) will allow you to input a temperature that the cabinet will heat up to.

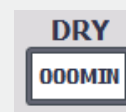


2. Tapping the “cabinet set” box (by default shows value on 000°C) in the parameter settings page (figure 9) will also allow you to input a desired cabinet temperature.



### 5.2.2 Setting Dry Stage Duration

Set the desired dry stage duration by tapping the white box (by default shows value of 000min) under the “DRY” text box on the main activity/control page on the HMI (figure 7). After tapping the box, a numerical input screen will appear allowing the operator to input the desired stage duration.



### 5.2.3 Setting Cure Stage Duration

Set the desired cure stage duration by tapping the white box (by default shows value of 000min) under the “CURE” text box on the main activity/control page on the HMI (figure 7). After tapping the box, a numerical input screen will appear allowing the operator to input the desired stage duration.



### 5.2.4 Setting Cool Down Stage Duration

Set the desired cool-down stage duration by tapping the white box (by default shows value of 000min) under the “COOL DOWN” text box on the main activity/control page on the HMI (figure 7). After tapping the box, a numerical input screen will appear allowing the operator to input the desired stage duration.



### 5.3 Machine Internals

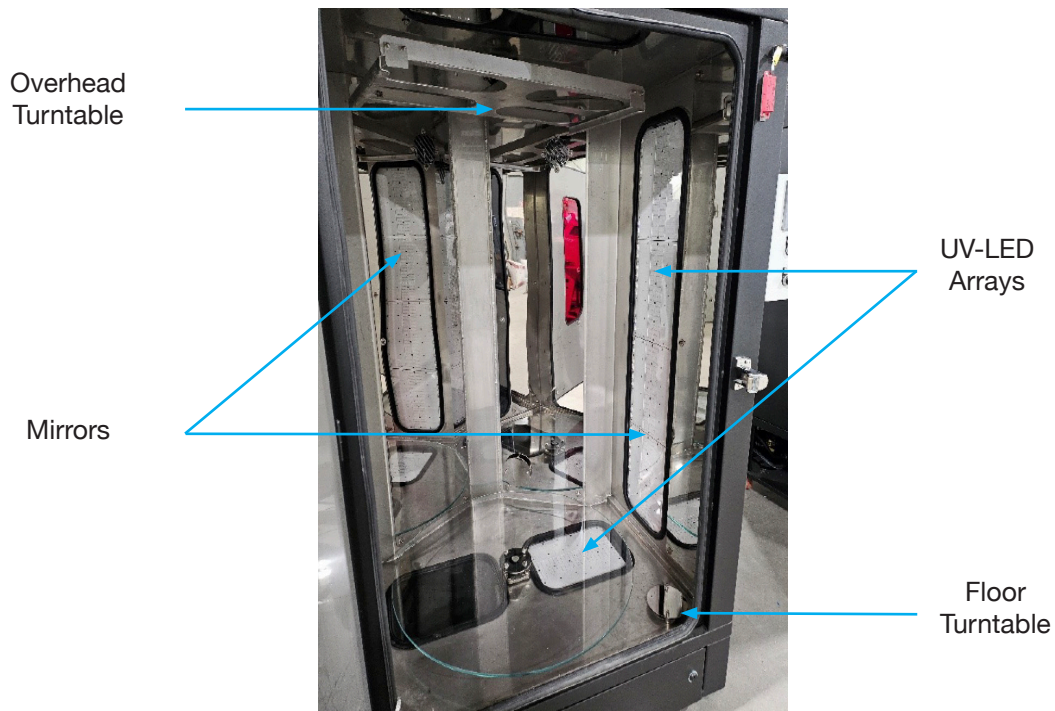


Figure 10 - Cabinet Interior

The interior of the machine has the following components:

#### 5.3.1 Overhead motorized build plate turntable

This is an inverted turntable on the ceiling of the chamber (figure 10) that has rails that fit the profile of the build plate of the Titan printer (figure 10) and the transfer platform. It has a spring-loaded lock to secure the platform in place see the 'Operation' section for instructions on how to operate. This is driven by a motor housed in the roof of the machine.

#### 5.3.2 Floor mounted motorized tempered glass turntable

The chamber also includes an Optiwhite™ tempered glass turntable (figure 10) that allows prints to be cured after removal from the platform. This is driven by a motor housed in the base of the machine.

#### 5.3.3 Under floor and side mounted UV LED arrays

The machine houses two UV LED arrays (figure 10) to cure the prints; one mounted under a window in the floor and the other on the righthand side wall. There are two additional cavities; one the floor, and one on the left-hand side wall for future addition of additional UV LED arrays if required.

#### 5.3.4 Mirrors on back wall

The chamber has two mirrors on the rear wall of the chamber to maximize reflectance of UV light onto the part.



## 5.4 Machine Externals

### 5.4.1 Electrical Unit

The interior of the electrical control unit (figure 12) is situated on the rear side of the machine.

*Any maintenance carried out on this unit must be completed by a qualified electrician.*

### 5.4.2 Door c/w slam handle and magnetic lock

The front view of the machine exterior (figure 13) highlighted in grey is a chrome slam handle which will ensure the door remains shut during curing. The magnetic sensor highlighted in red will deactivate the UV lights and the turntables if the door was to open during the process.

### 5.4.3 Viewing window

The viewing window (figure 14) has been laminated with a protective layer which filters out UV light, protecting the operators' eyes from potentially harmful UV.

### 5.4.4 HMI/Control Panel

The user interface (figure 15) is used to operate the machine, full details on how to navigate the HMI and how to use the HMI to set up the machine before curing are included in sections 5.1-5.2.

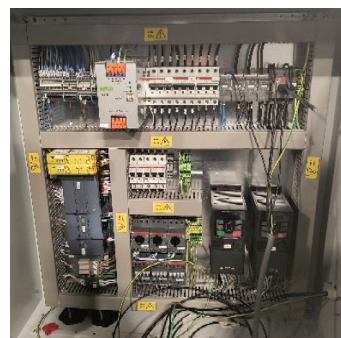


Figure 12 - Electrical unit interior



Figure 13 - Front view



Figure 14 - Viewing window



Figure 15 - Control Panel

## 6. Operation

### 6.1 Turntable Lock

The build plate is locked onto the turntable using a spring-loaded lock, this shows how it is locked/unlocked.

*It is essential this lock is used, if not, the platform could slide out of the frame when in operation.*



1

Lock in "Open" position.

2

Spring pulled back to open lock and release cam.

3

Cam is rotated into "Closed" position.

4.

Lock in "Closed" position.

### 6.2 Operating the machine from Startup

After the initial set up has been completed, the pre heat temperature has been set, and the lengths of time for the Dry, Cure and Cool down stages have been selected, the machine is ready to use.

The following sequence outlines the standard operating procedure of the machine.

1. Activate the cabinet light using the **LIGHT** button in the parameter settings page.
2. If required, reset the overhead turntable to its home/zero position by pressing the **NON TURNTABLE** button.
3. If using the overhead turntable, unlock the spring-loaded lock using the method outlined in figure 16.
4. Carefully remove the print with the build plate intact from the Photocentric WASH XL machine and transfer the build plate into the overhead turntable of the CURE XL.
5. Close the spring-loaded lock using the method shown in figure 16.
6. Alternatively, the floor mounted turntable can be used, before a print can be cured on this turntable the parts are removed from the build platform. Close the door ensuring the slam handle has locked shut.
7. Close the door ensuring the slam handle is locked shut. Press the green "Cycle start" button on the Control Panel.
8. If the Machine status on the main activity page of the HMI is shown as READY, then the process is ready to start. Carefully remove the cured print from the machine, ready for the next step in post processing.
9. Press the green "Cycle start" button on the Control Panel.
10. The machine will now begin to cycle through the four stages of the curing process (Pre-heat, Dry, Cure and Cool down), and the remaining duration of these four stages combined will show in the countdown box shown in figure 7.
11. Carefully remove the platform from the machine, ready for use.

#### **DANGER**

Although the UV lights and turntable will deactivate if the door opens prematurely, there will be a lot of residual heat in the chamber if the cool down stage hasn't started yet.

If the RUNNING machine status message (figure 17) on the HMI is present, do not to open the door until the message finishes.



## 7. Maintenance Schedule

Area	Frequency	Reference
<b>Turntable Bearings</b>	After each use	7.1
<b>Glass Turntable</b>	After each use	7.2
<b>UV LED Arrays</b>	Depends on usage	7.3

### 7.1 Turntable Bearings

The bearings on the turntables will need to be inspected and cleaned of any debris occasionally.

### 7.2 Glass Turntable

Clean the glass turntable (figure 16) of any resin/debris when needed.

### 7.3 UV LED Arrays

It is possible after prolonged usage that the luminosity of the LED arrays (figure 17) may reduce, if this occurs you will need to replace the LED arrays.

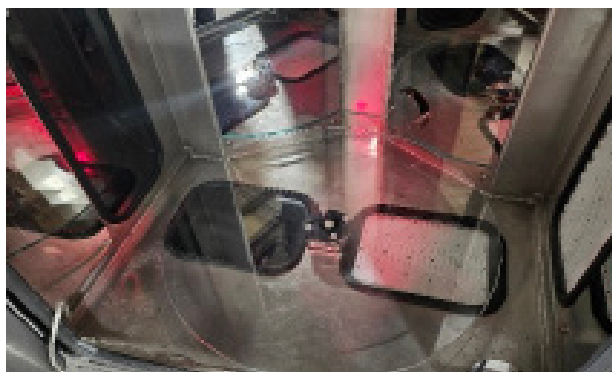


Figure 16 - Glass Turntable



Figure 17 - Glass Turntable

## 8. Fault Finding

If there is a fault with the machine, the following message (figure 18) will appear on the HMI;

There are two possible reasons for this occurring, these are;



Figure 18 - Glass Turntable

### 8.1 Temperature Probe Fault

If the temperature probe is damaged or disconnected due to a loose wire, the fault message will appear. To remedy this, check all electrical connections relating to the temperature probe and if the problem persists, the probe may be damaged and will need to be replaced by a qualified engineer.

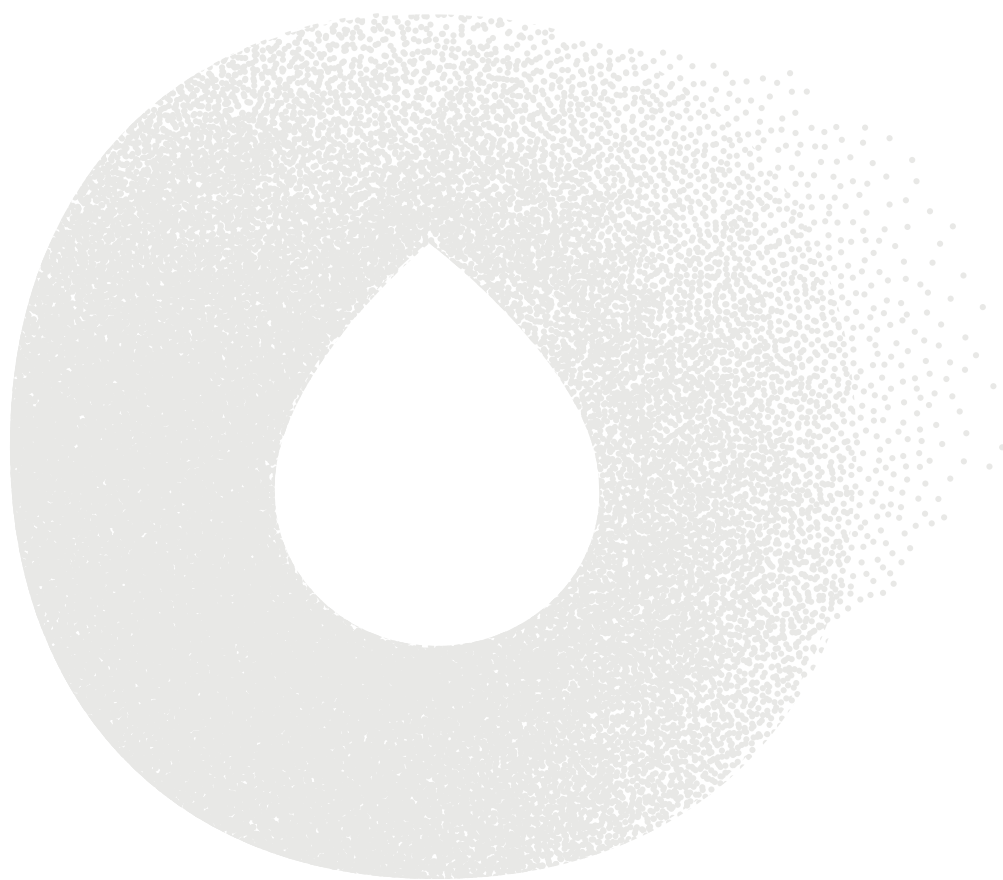
### 8.2 Trip Fault

If any of the breakers or motor controllers inside the electrical unit happen to trip, the fault message will appear. The remedy this, simply open the electrical unit and reset the breaker that has tripped to its “on” position.

*When troubleshooting a fault, it would save time to check for trips first before inspecting the condition of the temperature probe.*



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