



# HybEZ<sup>TM</sup> Hybridization System

User Manual

## **Advanced Cell Diagnostics, Inc.**

HybEZ™ Hybridization System User Manual

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### **Citing HybEZ™ in Publications**

When describing a procedure for publication using this product, please refer to it as the HybEZ™ Hybridization System.

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Although this manual has been prepared with every precaution to ensure accuracy, Advanced Cell Diagnostics, Inc. assumes no liability for any errors or omissions, nor for any damages resulting from the application or use of this information.

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## Section I: Safety

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### The following symbols marked on the equipment mean

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Caution: Read these operating instructions fully before use and pay particular attention to sections containing this symbol.

Attention: Suivre attentivement les instructions avant l'usage et prêtez une attention particulière aux sections comportant ce symbole.

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Caution: Surfaces can become hot during use.

Attention: Les surfaces peuvent devenir brûlantes pendant l'usage.

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Caution: Risk of electric shock. Before attempting any service to this unit remove power cord from the rear of the unit.

Attention: Risque électrique! Débrancher la prise arrière de réparer l'appareil.

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### Always observe the following safety precautions:

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- Use only as specified by the operating instructions or the intrinsic protection may be impaired. After transport or storage in humid conditions, dry out the unit before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.
  - Connect only to a power supply with a voltage corresponding to that on the serial number label.
  - Connect only to a power supply that provides a safety ground terminal.
  - Before moving, disconnect at the power supply socket. Do not remove the plug.
  - Do not check the temperature by touch, but instead use the temperature display.
  - To reduce the risk of eye injury during high temperature operation, use safety goggles or spectacles.
  - Do not touch surfaces that become hot during high temperature operation.
  - Ensure that the operating temperature is less than the maximum operating temperature of your sample material.
  - Ensure that the power switch is easily accessible during use.
  - If liquid is spilled inside the unit, disconnect it from the power supply and have it checked by a competent person.
  - It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilled on or inside the equipment.
  - The Power Cord supplied with the unit is the disconnect means.
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## Section II: Introduction

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**Intended Use** For Research Use Only — Not For Use in Diagnostic Procedures.

The HybEZ™ Hybridization System is designed to conduct hybridization and incubation steps in ACD's RNAscope® assay. It may also be used for other hybridization based assays or any other assay steps where a condition of high humidity with an elevated temperature is required.

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**HybEZ™ System Basics** The HybEZ™ System comprises:

- A HybEZ™ Oven;
- A HybEZ™ Humidity Control Tray;
- A HybEZ™ Slide Rack, and
- HybEZ™ Humidifying Paper

The system can hold up to twenty standard microscope slides on the slide rack. The unit has an advanced PID temperature controller that provides stable and accurate chamber temperatures from ambient plus 10°C to 75°C. The unit utilizes a sealed tray to create a humid environment for overnight runs or weekend runs, depending on the operating temperature.

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## Section III: Assembly

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**Unpacking** Remove packing materials carefully, and retain for future shipment or storage of the unit.

Inspect for damage. Report all shipping damage to the carrier immediately. Shipping damage is covered by the carrier and repair/replacement for shipping damages must be coordinated through the carrier. Complete and return the Warranty Registration Card.

Packs should contain:

- HybEZ™ Oven
- Power Line Cord
- HybEZ™ Hybridization System User Manual
- HybEZ™ Humidity Control Tray (includes a tray with gasket installed and lid)
- Frame Assembly (held in place during shipping with corrugated spacer)
- HybEZ™ Slide Rack (shipped inside the Tray Assembly)
- HybEZ™ Humidifying Paper

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**Installation** Place the HybEZ™ Oven on a flat and stable surface, preferably away from drafts. Fit the power line cord into the IEC power socket on the rear of the unit. Plug power cord into a power supply that matches the voltage listed on the serial number label on the rear of the unit.

The frame assembly is held in place during shipment with a corrugated spacer inside the heating chamber. This corrugated spacer must be removed prior to operation.

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## Section IV: Operation

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### Controls and Indicator Lamps

(Figure 1)

The Power Switch controls power to the unit.

The temperature display shows the chamber temperature in degrees Celsius.

The heater lamp is on continuously while the Oven is heating up. As the required temperature is approached, it starts to flash. When the unit is controlling at the set temperature, the heater lamp flashes intermittently.

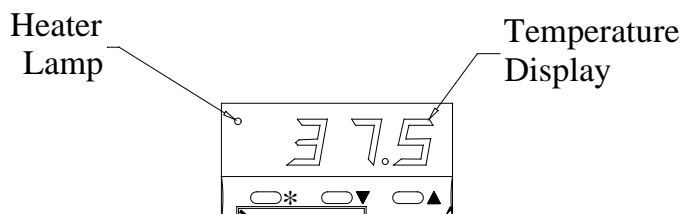


Figure 1

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### Setting the Temperature

The Temperature Controller has three buttons. When the button on the left '\*' is depressed, it will display the set temperature. When the left button '\*' is depressed simultaneously with the middle button '▼', the set temperature value is lowered. When the left button '\*' is depressed simultaneously with the right button '▲', the set temperature value is raised. When all buttons are released, the actual chamber temperature is displayed.

In the event of power loss, the Temperature Controller retains the last set temperature value.

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### Loading Tray with Slides

The tray with the Slide Rack can be loaded with up to 20 standard glass slides (see Figure 2). Use your standard protocol to prepare the slides with probe and buffer. To provide humidity during the heating cycles, place HybEZ™ Humidifying Paper at center on the bottom of the tray and add approximately 50 ml of distilled water or currently used hybridization solution on the paper. If cover slips are used, it is not necessary to seal them; the wetted Humidifying Paper and the sealed Tray maintain a humid environment.

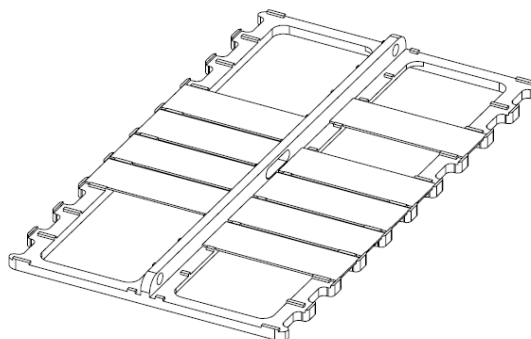


Figure 2 Slides loaded on Slide Rack

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**Loading Tray into Heating Chamber**

Place the Slide Rack loaded with prepared slides into the Humidity Control Tray and insert the tray into the heating chamber of the Oven.

Open the main door, lift the frame, pivot the latch forward (see Figure 3), and slide the Tray into the Frame Assembly until it is fully seated against the rear of the Frame Assembly (see Figure 4). Rotate the latch into a vertical position and position the latch over the keeper on the frame, then rotate the Latch Handle 180° clockwise (see Figure 5). Rotate the Latch Handle down (see Figure 6). Close the main door.

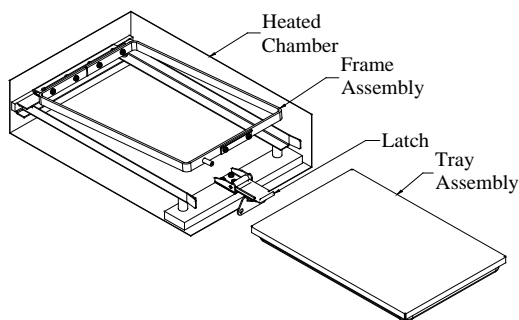


Figure 3. Tray to be inserted

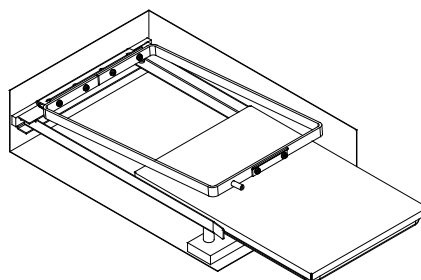


Figure 4. Tray inserted

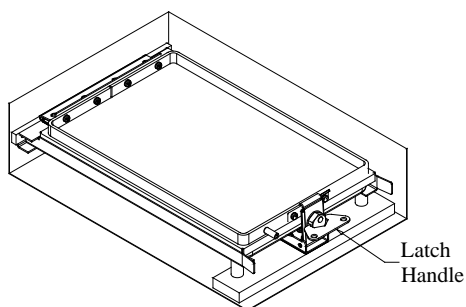


Figure 5. Fully inserted and locked

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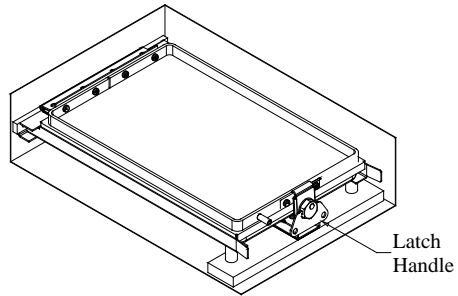


Figure 6. Ready to close main door

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**Removing Tray  
from Heating  
Chamber**

Extreme care must be used when removing the tray due to the potentially high temperature. It may be necessary to use gloves when removing the tray. To remove the tray from the Heating Chamber, open the main door, lift the Latch Handle up and rotate it 180 in a counter clockwise direction. Rotate the latch down, lift the frame up and carefully slide the Tray Assembly out.

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## Section V: Fault Diagnosis

Symptom	Possible Cause	Action Required
Unit does not operate	<ul style="list-style-type: none"> <li>a. Unit not switched on</li> <li>b. Unit not plugged into power supply</li> <li>c. Fuses blown</li> <li>d. Power supply failure</li> </ul>	<ul style="list-style-type: none"> <li>a. Switch on</li> <li>b. Plug in, switch on</li> <li>c. Replace fuses per 8.2</li> <li>d. Check that other electrical appliances on the same circuit are working</li> </ul>
Chamber temperature does not rise when expected	<ul style="list-style-type: none"> <li>a. Actual temperature is higher than set temperature</li> <li>b. Temperature control circuit fault</li> </ul>	<ul style="list-style-type: none"> <li>a. Check set temperature</li> <li>b. Have unit checked by competent person</li> </ul>
Temperature continues to rise when not expected	<ul style="list-style-type: none"> <li>a. Actual temperature is lower than set temperature</li> <li>b. Temperature control circuit fault</li> </ul>	<ul style="list-style-type: none"> <li>a. Check set temperature</li> <li>c. Have unit checked by competent person</li> </ul>
Slides dry out during heating cycle	<ul style="list-style-type: none"> <li>a. Gasket not sealing</li> <li>b. Lid bent</li> <li>c. Insufficient buffer placed in bottom of tray</li> <li>d. Latch not fully engaged</li> </ul>	<ul style="list-style-type: none"> <li>a. Replace Tray and Gasket Assembly</li> <li>b. Replace Lid</li> <li>c. Place more buffer in bottom of tray</li> <li>d. Re-install Tray Assembly into chamber and re-tighten Latch</li> </ul>

## Section VI: Technical Specifications

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**General** This equipment is intended for indoor use and will meet its performance figures within the ambient temperature range of 10°C to 35°C, with maximum relative humidity of 80% (non-condensing). Installation Category II (transient voltages). Pollution Degree 2 in accordance with IEC 664. Suitable for operation at altitudes of up to 6500 feet.

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<b>Specifications</b>	Temperature Range:	(Ambient +10°C) to 75°C
	Setting Range:	0°C to 75°C
	Stability:	+/- 0.5°C
	Overall Accuracy:	+/- 0.5°C at 40°C
	Temperature Display Resolution:	0.1°C
	Supply Voltage Range:	115V +/- 10%, 50/60 Hz 230V +/- 10%, 50/60 Hz
	Power Rating:	155W
	Heating Rate:	Ambient to 40°C within 20 minutes
	Dimensions (WxDxH):	17 5/8" X 17 1/8" X 6"

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## Section VII: Maintenance and Service

**General** The HybEZ™ Oven is designed to comply with IEC1010-1. No routine maintenance is required.

**Cleaning** Disengage power cord prior to cleaning. If a spill occurs, use appropriate clean up procedures as required for radiation or biohazard control. The outer casing may be cleaned with water and a damp cloth. Do not submerge or immerse the HybEZ™ Oven in water. Before using any cleaning or decontamination method except those recommended by the manufacturer, users should check that the proposed method would not damage the equipment.

If a spill occurs in the heating chamber it may be necessary to remove the Frame Assembly. To remove the Frame Assembly, lift the front of the Frame Assembly so that the Frame Legs are out of the mating holes (see Figure 7), then pull the Frame Assembly forward (see Figure 8). To re-install the Frame Assembly, position it in the heating chamber so the pins on the rear of the Frame Assembly align with the holes in the block on the rear wall, and push the Frame Assembly toward the rear until it is fully seated. Then lower the Frame Assembly until the legs are seated into the mating holes in the block on the bottom surface of the Heating Chamber.

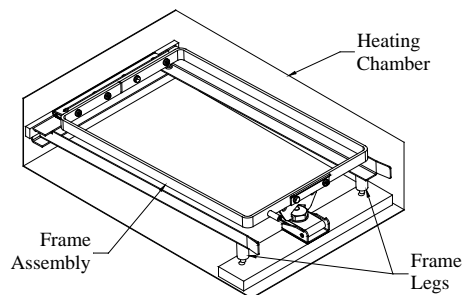


Figure 7.

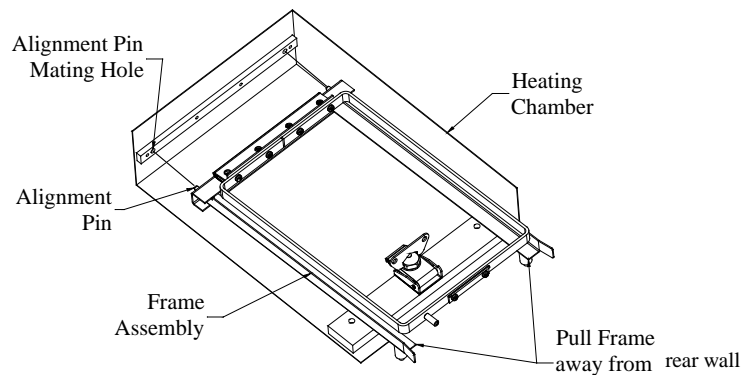


Figure 8.

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## Replacement of Fuses

There are two supply fuses located in the fuse drawer. To replace the fuses:

- Disconnect the unit from the power supply.
- Remove the plug from the socket in the back of the unit.
- Pull back on the fuse drawer (see Figure 9).
- Pull out the fuse drawer.
- Check and replace with the correct fuses if necessary. The fuses must be 5mm x 20mm quick acting, rated 250V.

110V model: -2AF

220V model: -1AF

- Push the fuse drawer back in. Reconnect unit to the power supply.

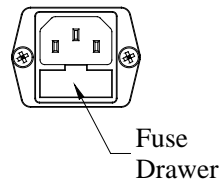


Figure 9.

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## Section VIII: Warranty and Returns

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**Warranty** When used in laboratory conditions and according to this User Manual, Advanced Cell Diagnostics (ACD) warrants this product to be free of defective material and workmanship for a period of two years from the date of manufacture. The liability of ACD for any defective equipment during the warranty period shall be limited to the repair of such equipment or replacement thereof without charge for parts or labor.

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**Returns** A Returned Goods Authorization (RGA) number must be obtained before any ACD products are returned for any reason. A Decontamination Notice must be completed, signed by the user, and returned to ACD prior to receiving the RGA number. Please be sure to mark the outside of the return goods package with this RGA number to ensure prompt handling.

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