

Stable “Z” System Instructions

Description:

The Stable “Z” is a peripheral heat specimen warmer designed to accommodate any standard 35mm culture dish. It is very stable with respect to “Z” axis movement. It is no more or less accurate with respect to the specimen temperature than any other closed loop “stage heater”. The Stable “Z” specimen warmer transfers heat to the specimen by means of radiation from a heated surface of minimal mass located immediately adjacent to the specimen container. In the case of all “heated stages” there are two components of thermal transfer. The dominate factor is radiation, and to some degree, depending on the footprint of the culture dish, conductivity. Therefore, there is no need to heat a large plate that in turn warms the entire stage causing focus problems. The Stable “Z” has a heated surface thermally isolated from the rest of the stage that has a minimal thermal mass immediately adjacent to the specimen that is regulated by a closed loop control.

Setup Instructions:

1. Mount the controller on its stand by inserting the wire support post into the sockets in the bottom of the heat sink as shown. (Figure 1)
2. Select the appropriate connector for your AC service and attach it to the power supply. Remove the placeholder by depressing the plug retainer tab located on the back side of the power supply, and replace it with the connector of your choice. (Figure 2)
3. Plug the power supply cord into the side of the controller. (Figure 3)
4. Insert the 4 pin mini-DIN connector into the side of the controller. (Figure 3)
5. Plug the Reference thermistor temperature probe into the side of the controller. (Figure 3)
6. Place the stage adapter on the microscope, and insert a culture dish with media or water with the volume you would use for your experiment.

Figure 1



Locations to install controller stand

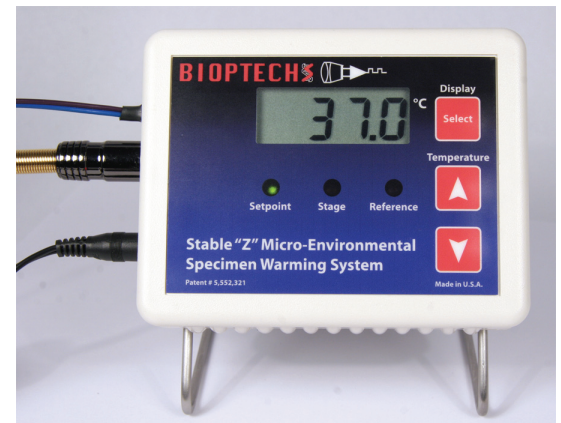
Figure 2



Power adapter and plug adapters

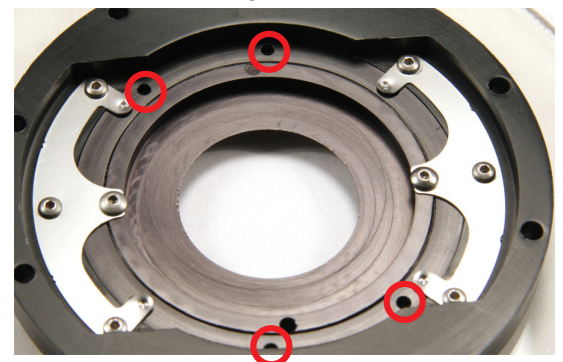
Reference Thermistor
Stage Adapter
4 pin mini-DIN
Power Adapter

Figure 3

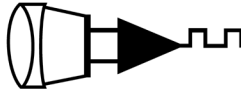


Location and description of cables

Figure 4



Locations to adjust height of specimen plane



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Operation:

Upon powerup the Stable “Z” will default to SETPOINT.

Pressing the SELECT button will cycle through two other display modes.

The operating temperature of the Stable “Z” is adjusted by pressing the select button on the controller to illuminate the “SETPOINT” light on the display, then pressing the “UP and DOWN” arrows on the display to your desired value. The range of adjustability is from ambient to 60 Degrees C.

SETPOINT is the desired temperature you wish to warm the device.

STAGE will display the temperature of the sensor physically located in the heated surface.

REFERENCE will display the temperature of the reference probe when it is plugged into the controller.

Use the reference probe to establish a SETPOINT value for your specimen. This will take some trial and error. A dish that is open to the atmosphere will require a higher temperature setting than a covered dish. Make sure that the temperature setting is appropriate for the manner with which the dish is used. Note, the Stable “Z” is a peripheral heater. Therefore, you can expect to see a gradient across the specimen area. If this is the first time you have used a peripheral specimen warmer you might be surprised at the amount of heat it takes to warm your specimen. The Stable “Z” is designed for those who want an inexpensive method of heating where a high degree of accuracy is not necessary as with our other micro-environmental products; the Delta T, FCS2 or FCS3 systems. However, for many applications the Stable “Z” is ideal for short term observation of warmed specimens. As always, if high numeric aperture objective are used, an objective heater is necessary. In most cases the combination of a Stable “Z” and an objective heater, if you are using high numeric objectives, is all that is needed.

Adjustment:

There are no standards for the height of the specimen plane with reference to the resting surface of culture dishes. Every manufacturer of plastic-ware uses their own offset. The variation in this distance can be compensated on the Stable “Z” by rotating the outer support ring as shown in figure X with the tip of a ball point pen. The Stable “Z” itself does not induce Z axis shift, but the plastic of the dish may induce Z shift. This adjustment ring gives you the ability to offset the null point of the aluminum support to compensate the thermal expansion of the dish. (Figure 4)

Accessories:

Hinged probe adapter - holds needles or probes conveniently around the perimeter of the dish. Easily repeatable, flip in, flip out fixture.

Coverglass Lid - defines an optically flat surface over the top of the media in the dish to eliminate contrast fluctuations when imaging. It also eliminates condensation and prevents atmospheric contamination; made of 303 stainless steel and glass.

Cleaning:

The controller should be wiped with a damp cloth and mild water based cleaner. The stage adapter should also be wiped with a damp cloth and may be wiped with alcohol. Do not immerse either in liquids!



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Patent Pending