



Heated Stage Insert

Accurate and reliable specimen temperature control



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INSTRUCTION MANUAL

Serial No. _____

072105

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Warning

It is essential that an isolated power supply be used with the **transparent heated stages**. This is to avoid spark damage to the conductive coating of the glass, should a grounded objective lens contact the underside of the heated glass stage. Use **only** the **supplied** power module with these warming stages.

Warranty

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of one year* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

Claims and Returns

- Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within 10 days after receipt of shipment. Claims for lost shipments must be made within 30 days of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim settles. In some instances, photographic documentation may be required. Some items are time sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container.
- WPI cannot be held responsible for items damaged in shipment en route to us. Please enclose merchandise in its original shipping container to avoid damage from handling. We recommend that you insure merchandise when shipping. The customer is responsible for paying shipping expenses including adequate insurance on all items returned.
- Do not return any goods to WPI without obtaining prior approval and instructions (RMA#) from our returns department. Goods returned unauthorized or by collect freight may be refused. The RMA# must be clearly displayed on the outside of the box, or the package will not be accepted. Please contact the RMA department for a request form.
- Goods returned for repair must be reasonably clean and free of hazardous materials.
- A handling fee is charged for goods returned for exchange or credit. This fee may add up to 25% of the sale price depending on the condition of the item. Goods ordered in error are also subject to the handling fee.
- Equipment which was built as a special order cannot be returned.
- Always refer to the RMA# when contacting WPI to obtain a status of your returned item.
- For any other issues regarding a claim or return, please contact the RMA department.

Warning: This equipment is not designed or intended for use on humans.

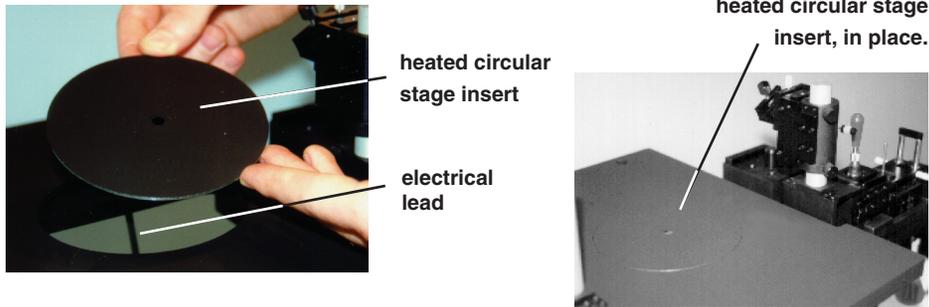
** Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*



Introduction

The heated stage insert (WPI #14417) maintains the temperature of a petri dish or slide on a microscope from ambient to $50^{\circ}\text{C} \pm 0.1^{\circ}\text{C}$. Three transparent heated stage inserts (WPI #502032, #502033, #502034) maintain temperatures from ambient to about 40°C . A 24-element heating array maintains the temperature of the stage. These stages will fit most inverted and standard microscopes with circular inserts.

Installation



Pass the electrical lead (attached to the insert) through the aperture in the microscope stage, then lower the circular insert until it rests on the ledge of the aperture.

Connection

Connect the heated stage insert and the low voltage power adapter into the sockets at the rear of the control unit.

Fast Start*

To change the temperature set-point with the power ON:

1. Press and hold “SEL” until “St1” flashes.
2. Use the up and down keys to adjust the set-point. Press “SEL” again when finished.

Warning

It is essential that an isolated power supply be used with the **transparent heated stages**. This is to avoid spark damage to the conductive coating of the glass, should a grounded objective lens contact the underside of the heated glass stage. Use **only** the **supplied** power module with these warming stages.

* See Addendum for detailed control applications.

APPENDIX III: Troubleshooting / Maintenance / Repairs

MAINTENANCE

Keep stage clean; remove spilt liquids from cooled stage parts.

Do not drop liquid on control box. If you do have a liquid spill, immediately switch off the mains electricity, then thoroughly dry the equipment.

When replacing electrical fuses, ensure that the replacement is correctly rated.

TROUBLESHOOTING

- Q.** Nothing on display.
 - A.** Check the mains power is switched on and fuses are intact.
- Q.** Temperature control failure
 - A.** Incorrect Set Point, or other parameters incorrectly set. Restore all to factory settings.

Error messages

Message	Description	Cause	Solution
Er0	Probe error	Probe cable interrupted or short circuited	Check connections between instrument. & probe or faulty probe -check probe signal.
Er1	Probe error second probe	Not used on the unit	Turn off, unplug cooled inserted stage from control box then turn on the Instrument again holding down PRG key. Then reprogram unit to values in main table prior to plugging cooled insert stage back into control box. If problem persists replace unit.
Er2	Memory error	Supply cut off during programming step	Solution as Er1
Er3	External alarm	Not used on this unit	Check that parameter C29 is set to zero otherwise do as Er1
Er4	HIGH alarm	Input temperature has exceeded P26 for more than P28 seconds	Check parameters P26 and P28
Er5	LOW alarm	Input temperature is below P25 for more than P28 seconds	Check parameters P25 and P28

Warning: In case of alarm condition, the alarm code must be manually reset pressing the PRG key. (**Note:** the alarm code will only disappear if the alarm is not pending).

APPENDIX II: Detailed controller factory settings for specific applications.

Warning: Do not change any parameter without a full understanding that some changes may damage the unit.

CONTROLLER

Parameter	Factory Set Value	Description
St1	37.0	Temperature set pint
C0	4	Function mode Pulse Width Modulated
P1	1.5	Hysteresis of set point 1
P2	Default (2.0)	not used on this device
P3	0.0	Dead band
C5	1	Control action = Proportional + Integral
C6	Default (5)	Not used on this device
C7	Default (0)	Minimum time between "on" routines
C8	Default (0)	Minimum "off" time
C9	Default (0)	Minimum "on" time
C10	Default (0)	All relays de-energized on alarm
C11	Default (0)	Not used on this device
C12	0.2	PWM (PI) cycle time
P14	Variable	Probe calibration offset
C17	14	Probe response time
C18	Default (0)	Units = C (1=F)
C21	30	Minimum set point
C22	50	Maximum set point
C23	Default (-100)	Not used
C24	Default (600)	Not used
P25	15	Lowest absolute alarm temperature
P26	60	Highest absolute alarm temperature
P27	Default (2.0)	Alarm hysteresis (maximum difference between set point and probe temperature before alarm is activated)
P28	0	Alarm delay in minutes
C29	Default (0)	De-activate digital input
C30	Default (0)	Not used on this device
C31	Default (0)	Not used (digital input is deactivated)
C32	Default (1)	Not used (no serial connection of unit to PC)
C33	Default (0)	Pre-programmed modes of control
C50	4	Both keypad and remote control are able to control all parameters
C51	0	Remote control unit code

Specifications

Temperature Ambient to 50°C
 Transparent Versions Ambient to 40°C

Stability ±0.1°C

Accuracy ±0.5°C

Heated Stage Insert

Thickness 3 mm

OD Dependent on microscope

Transparent Heated Stage Insert

Glass Thickness 0.8 mm

Glass Diameter 80 mm

Outer Ring Thickness 3 mm

Outer Ring Diameter Dependent on microscope

Controller Dimensions 75 x 200 x 140 mm

H x W x D (2.3 x 7.9 x 5.5 in)

AC Power 100/240 VAC, 50/60 Hz

DC Power*

Aluminum Stage 12 VDC, 1.5 A

Transparent Stage 24 VDC, 1.5 A

Weight 0.65 kg (1.4 lb)

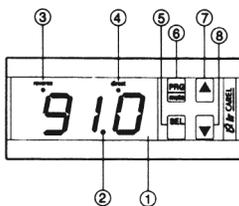
***NOTE: Controllers are not interchangeable.**

APPENDIX I: Detailed controller operations for specific applications

SET POINT TEMPERATURE ADJUSTMENT

The set point can be adjusted from room temperature up to 45°C above ambient.

- Press the SEL key ⑤ for a few seconds: the display shows St1;
- Release the SEL key: the actual value of the Set point will flash;
- Press the up or down arrow keys ⑦ and ⑧ until you reach the desired value;
- Press the SEL key to confirm the St1 value;
- Press the SEL key two more times to scroll through St2 value and save your new temperature setting.



Parameter	Min.	Max	Factory Set Value	Description
St1	10°C	Room temp	User 37°C	Set point temperature
St2	-	-	Default	Not used on this device

OTHER USEFUL PARAMETERS

Higher/Lower limit alarm set: (P25 and P26) allows you to select a maximum and a minimum value for the controlled parameter. When the instrument detects a value which is beyond the threshold, it displays an alarm code. High and low thresholds are absolute values and so, to avoid alarm intervention during normal function, they have to be beyond the “Set point differential” plus “Set point”. If the Set point has been modified, it is necessary to check that the new combined values do not exceed alarm limits.

Alarm differential: (P27) the hysteresis of the alarms. A minimum differential is necessary to avoid consecutive activating/deactivating of the alarm due to small variations in the controlled parameter.

Alarm delay: (P28) allows you to set a time delay in the alarm signal. The regulator activates the alarm only after the selected time delay has elapsed. If during a delay the controlled parameter returns within the allowed limits, the timer will be zeroed.

Calibration offset: (P14) allows you to modify the values displayed by the instrument. This compensates for any errors or differences with other instruments.

TO ACCESS THE STANDARD PARAMETER LIST (“P” VALUES):

- Press the PRG key for several seconds: the display shows P1.
- Release the PRG key: P1 will flash.
- Press the up or down arrow keys ⑦ and ⑧ until you reach the parameter to be changed.
- Press the SEL key to select the parameter; the current value set will be displayed.
- Press the up or down arrow keys to change the value up or down.
- Press the SEL key to confirm your new setting.
- Press the PRG key to end the procedure and memorize the new parameter(s)

Note: if the display “times out” then all this section will need to be repeated to confirm that the altered settings have been saved.

TO ACCESS THE FULL PARAMETER LIST:

- Press and hold the PRG and SEL keys simultaneously for 5 seconds;
- The display shows 0;
- Select the access code by pressing the up arrow key up to 77;
- Press the SEL key to confirm the access code;
- If the selected access code is correct, the display will show the code “C0”, otherwise you will have to repeat the instructions from point a). C0 is the parameter corresponding to the “Function Mode”. To load one of the 9 described Modes it is sufficient to give C0 the chosen mode number, according to the following instructions;
- Press the up or down arrow keys to scroll through all the available parameters.
- When the display shows the parameter required, press the SEL key to confirm;
- Press the up or down arrow keys to change the value of the parameters selected;
- Press the SEL key to confirm your new setting.;
- Press the PRG key to end the procedure and memorize the new parameter(s).

Note: if the display “times out” then all this section will need to be repeated to confirm that the altered settings have been saved.