



Electronic Micro Systems

Hot Plate Model 1000-3

Operation & Maintenance Manual



Features include:

1. Temperatures from 50°C to 200°C
2. Accurate to $\pm 1\%$ across working surface.
3. A vacuum port ensures intimate contact between substrate and hotplate.
4. Lift Pins to enable easy load / unload of wafers / substrate
5. Substrate size from 10 mm to 150 mm.
6. Computer Temperature Controller with digital readout

Applications

Uses include:

- Curing of photo resist
- Curing of epoxy
- Any work requiring precise temperature.



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Thank you for purchasing your Hot Plate from EMS. This Hotplate has been designed to give many years of accurate service. It has been designed around some of the best materials available.

Services required

1. System is set up for 220/240 V AC
Mains power supply needs to supply up to 5 Amps.
2. Vacuum >> 15" Hg via 6mm OD Tube

Installation

1. Place on flat surface, making sure that the base of the unit has a good airflow around it.
2. Connect vacuum source to 6mm OD Vacuum connector.
3. Connect to the mains power supply 220 / 240 VAC

Quick start Up Guide

System configuration is set up for a Single temperature Set Point and a timed vacuum cycle, with synchronised Lift Pins will allow easy loading and unloading of the wafers / substrate. The Vacuum / Lift Pins cycle is started when the Vacuum momentary switch is pressed. The vacuum will now be pulling through the small holes on the top plate and the pins will lower the wafer / substrate onto the top plate, the duration of the vacuum is displayed in the bottom right of the display, once complete Vacuum will be switched off and the pins return to the top position.

Operator has access to change both the set point temperature and the time period for the vacuum via the four buttons on the controller unit.



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Changing the Set Point Temperature:-

Press  “SP” will appear flashing on the screen, now you can raise or lower the Set Point Temperature with the ↑ or ↓ arrows, press  again to store new value. Wait 10 seconds to return to normal run mode, or press and hold  ~ 3 seconds.

Changing the Vacuum / Lift Pin time period:-

Press  button twice, “tr.t1” will appear flashing on the screen, now you can raise or lower the Time period for the vacuum with the ↑ or ↓ arrows, this is the small green number bottom right, press  again to store new value. Wait 10 seconds to return to normal run mode or press and hold  ~ 3 seconds.

Loading Wafers / samples to be heated.

When the system is switched on it will start to heat up to the “Set point temperature”.

Allow the system to reach desired temperature, the temperature display will be orange when actual temperature is below set point, Green when it is plus or minus 1 degree from set point, Red for above set point, allow the top plate temperature to become uniform. When you are happy with the temperature of the Hot Plate place samples to be heated on to the lift pins, trying to centre the pins under the wafer.

Press the vacuum switch, it will light up and the vacuum is applied while the wafers are lowered on to the Hot Plate. The duration of the vacuum is displayed in the bottom right of the display, once complete Vacuum will be switched off and the pins return to the top position. The display in bottom right will now display “tEnd” for one minute.

Important

Please Note when the vacuum turns off, the heater remains on at the set point temperature.

To maximize the life of the Hot Plate, we recommend when not in use, it should be turned off, or at least the Set Point (SP) value set to a value below room temperature.

Considering the Hot Plate can rise from room temp to 200°C in about 8 minutes, it is a small wait to ensure the longevity of the system.



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Calibrating the Temperature of the Hot Plate.

The thermocouple feedback is placed below the top surface, so there will be a small variation in the readout temperature and the actual value your wafers experiences so you may wish to try and improve this.

The controller allows teaching two points, that is a Low temperature value with an offset and a High value with an offset.

So please pick the extreme values you wish to best control the temperature of your wafer. Set the system to heat up to your lower value and measure the temperature of the top surface, or if possible use a thermocouple embedded inside a Wafer, and record the value measured.

Repeat again with the High Temperature value, now you have the data to go and change some settings in the KR3 controller unit.

EMS Default values are:-

A.L.P	Low Temperature Value	50°C.
A.L.o	Low Temperature Offset Value	0°C.
A.H.P	High Temperature Value	200°C.
A.H.o	High Temperature Offset Value	-2°C.

You can change these values as follows :-

1. Press  and hold for 3 sec.
2. "PASS" appears on the screen, hold \uparrow to enter the value 40, (Use \downarrow if you go passed), Press 
3. You are now in the "Complete Configuration Mode", please be careful, bad value entry can stop the system running.
4. You should see "inP" on the screen, this is the section for editing Input Values, we don't want this section, we need to get to "cAL" Calibration section, this is achieved by hitting  13 times. On route you will see the following screens:-
5. inP, out, AL1, AL2, AL3, LbA, rEG, SP, tin, PrG, PAn, SEr, con, cAL.
6. So you should now see "cAL", enter this section by hitting .
7. A.L.P = 50, change this value with \uparrow or \downarrow arrows, hit  to store and move to next value.
8. A.L.o = 0, change this value with \uparrow or \downarrow arrows, hit  to store and move to next value.
9. A.H.P = 200, change this value with \uparrow or \downarrow arrows, hit  to store and move to next value.
10. A.H.o = -2, change this value with \uparrow or \downarrow arrows, hit  to store and move to next value.
11. With new setting entered you can now come out of Configuration by press and hold  ~5 sec.

For a more complete understanding of the "Complete Configuration Mode" please see the enclosed manual from Ascon Tecnologic KR Series.



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Fault finding

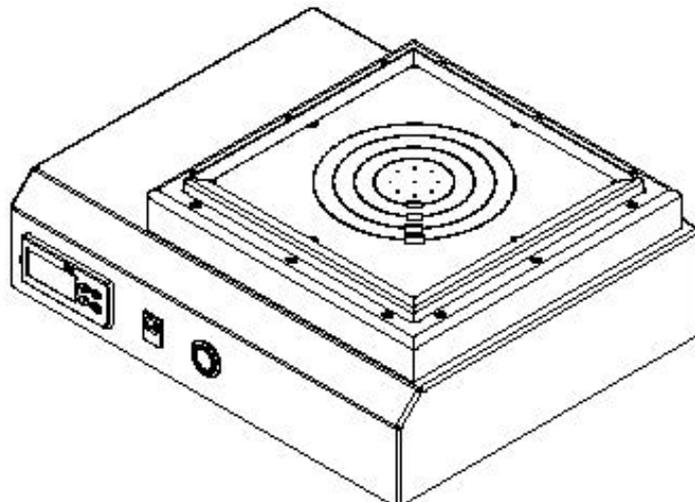
In the unlikely occurrence of a fault, a circuit diagram is included.

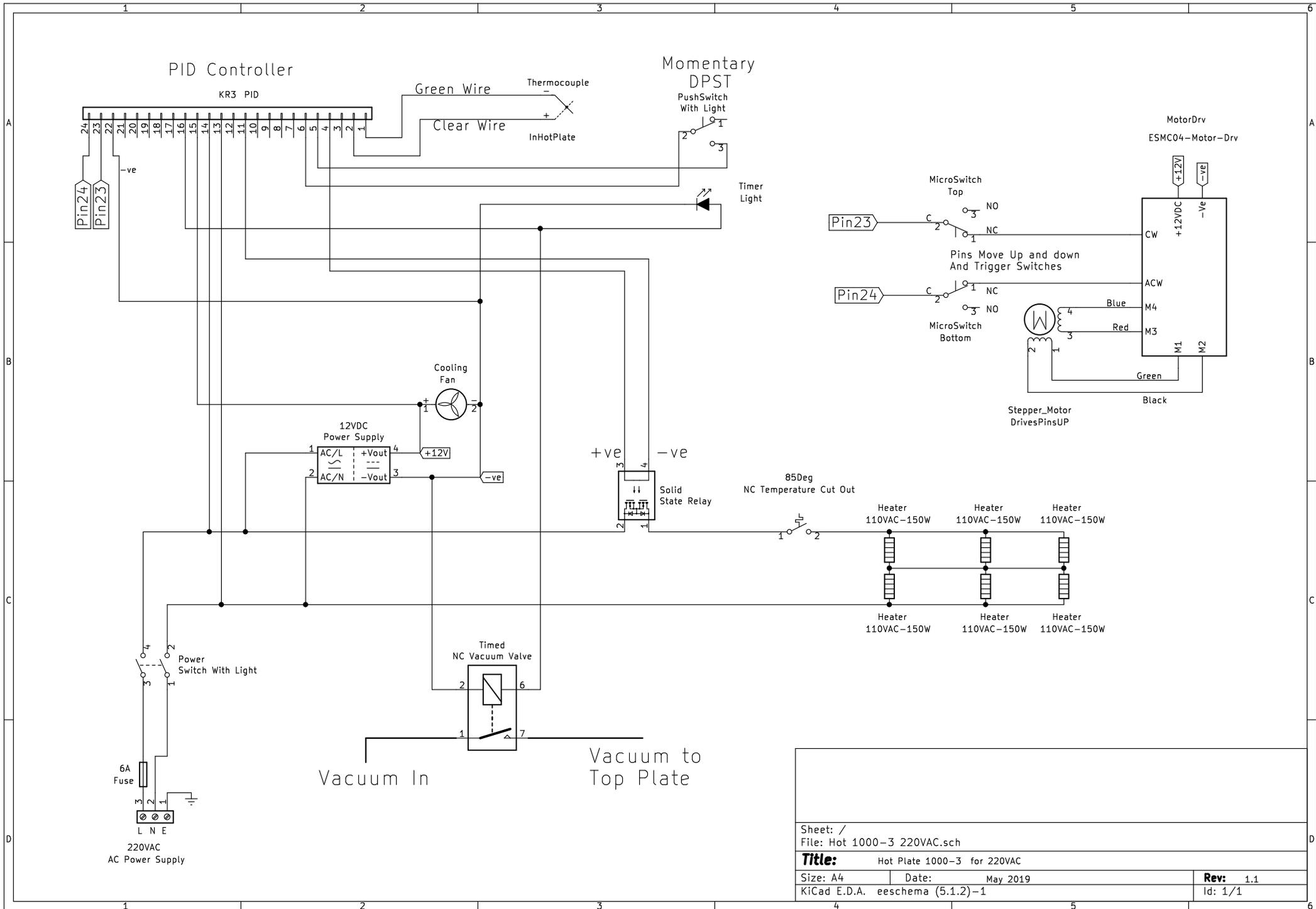
The electronic components inside the system are protected by a thermal cut out switch set to 85°C, if the heater remains on for long periods of time, especially at high temperatures there is a chance the internal temperature will reach this cut off value, it will automatically re-set when cooled down.

The heater plate is a sealed unit and will have to be returned to EMS Base for service. The temperature controller is an Ascon Tecnologic KR3 series, the full set up manual for the controller is enclosed, further details can be found at www.t-uk.co.uk

However please refrain from resetting the controller to “factory settings” as these are Ascon settings and NOT ESM and it could be a long and laborious task to make operational again, probably need returning to ESM !

EMS can be contacted by e-mail at sales@electronicmicrosystems.co.uk





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