

TEMPERATURE verification.



CENTURION
SCIENTIFIC LIMITED

Temperature verification

All units are tested to -9C +/- 1C. 4C +/- 1C. 40C +/- 1C.

See attached graph as an example

NOTE

All equations for control are based upon the sensor position, simply placing a sensor in the bowl is not accurate. We use a copy sensor next to our control

WHY

- Temperature boundary layers occur
- Mixing is paramount as is speed of mixing, too low and boundary layers occur. Bowl air must be mixed , but within the accepted boundaries of the achievable temps (as stated on the rotor specification (normally 4C max)
- Tests use the following with a micro tube rotor
- Other rotors use different speeds
- -9C at 1000 Rpm
- 4C at 15,000 Rpm
- 40C at 15,000 Rpm

From August 2020 a copy sensor has been included in the centrifuge, access being via a socket Left of the front underside K type sensor Easily accessible , however a calibrated data package must be used with it, further the correct speeds must be used too as shown above

Further a pre mixing program is available to both LED and LCD and should be used as stated as shown in the Instruction manual.

Reason

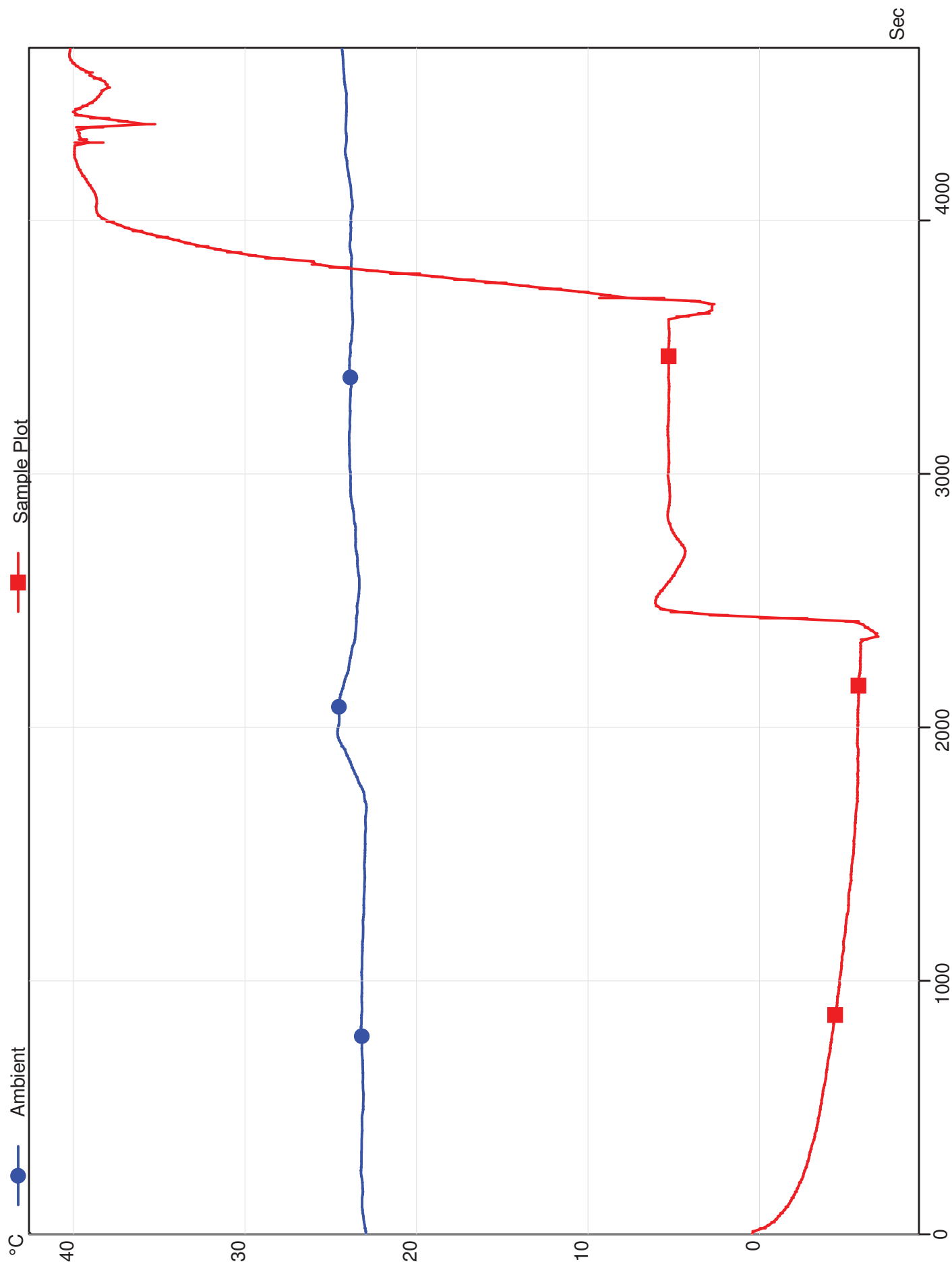
Simply placing samples in a rotor and expecting the samples, rotor and chamber to be at the set temperature within minutes is not possible simply by the laws of Physics.

Equilibration of all is necessary for accuracy

Samples to be at required temperature

Rotor and chamber to be at required temperature

Thank you for your attention. Service Department



Instructions. Pre mix LED models

Notes

The correct method of sample temperature control.

1. Turn on the Refrigerated centrifuge (make sure your required rotor and accessories are fitted and tightened down correctly) CLOSE THE LID
2. Set your desired temperature, speed or Rcf and time for your needs
3. Press Start/Stop button for 5 seconds this will instigate the pre condition run
-9 to 20C half of the maximum rotor speed for 20 minutes
21 to 40C maximum rotor speed for 20 minutes
This ensures the bowl chamber is mixed and the rotor acclimatises to the required temperature (Best practice)
During this Pre condition your samples should be set to your required temperature by either heating or cooling as needed
4. Once pre condition has finished open the lid, add your samples (quickly) loading as per rotor instructions.
5. Close the lid and press start

6. When rotor has stopped, open the lid and retrieve your samples.

NOTE

If your temperature parameter is the same each time just load your samples(must be at set temperature)

Otherwise follow steps 2 - 5

Instructions. Pre mix LCD model

Refrigerated Centrifuges only

K2015R, K241R, K242R and K243R

Centurion Scientific refrigerated centrifuges have a range of **-9°C to 40°C**.

We accurately control this temperature by running the refrigeration unit and pulsing heat via a loop close to the coils.

PID system is used to control.

Imagine a bath at home, to control the temperature accurately you would run both hot and cold taps together. This is far more effective than filling with cold water and topping up with hot as the temperature difference would be enormous.

By using this method our chamber temperature control is unsurpassed.

Note Due to the efficient management of temperature control you may see some ice patches or in turn, notice some slightly hotter areas. This is quite normal and it is the overall chamber temperature that matters.

For accurate temperature control we recommend you use the Pre-cool /pre-run facility.✱

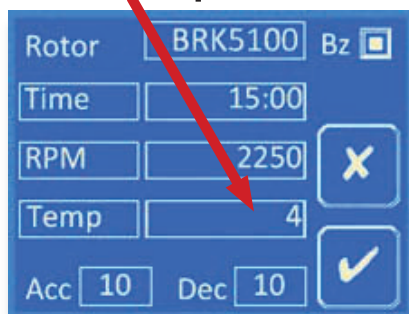
Fit your desired rotor and securely fasten as per our Instructions.

After programming your desired parameters, IE selection of a rotor, speed, time, acceleration & deceleration rates, (as an example). Leave the centrifuge to reach the desired temperature and then press the✱Pre-cool symbol. This will run the centrifuge at 20% of the maximum speed of the rotor for 20 minutes, ✱will show in the Rpm section to show the Pre-cool mode is in operation. It is advisable to let the time run to 20 minutes, but you can stop at any time. Once stopped load your samples (which should be at your set temperature) and press the start arrow button.

For ease it is advisable to set your samples to the desired centrifuge temperature before placing in the centrifuge and separating, otherwise allow sufficient time for them to reach the temperature in the chamber.

TEMPERATURE PROGRAMMING (Refrigerated models only - K2015R, K241R, K242R and K243R)

PRESS Temperature numeric square



Display shown K2015R, K241R, K242R and K243R (all our illustrated screens show a chosen and actual temperature of 4°C)

SET Temp (-9°C...40°C) in numerical form



Note: See rotor appendix for minimum possible temperature at maximum speed per rotor.

PRESS Tick after selection.

Note: Displays illustrated elsewhere in this manual do not show the Temp square or the Temperature numeric square however they will be present on all refrigerated model displays as will set temperature and actual temperature where appropriate (see Key to Displays on page 1)



Pre-cool /pre-run START button.

See instructions above detailing use of this feature - note that this screen will show your selected parameters.

return to page 7 to set Acceleration and Deceleration rates...

PrO-Care

Service, Warranty & Maintenance packages

The lifespan of a centrifuge depends upon how well it is looked after and maintained.

Many of our centrifuges have lived a life of over 15 years.

This is not only due to our stringent manufacturing process and high quality components but also to a yearly servicing package. Making them a cost effective solution of centrifugation.

Whilst our centrifuges come with a confidence giving warranty, yearly services are imperative to ensure your warranty is valid, this also ensures your machine is working to its best ability and lengthens its life span. Also as centrifuges are a dangerous machine, safety checks are required too.

For UK customers we offer a back to base service package including carriage to us and return all within 48 hours. Centrifuge seals , fuses & other parts are replaced, adjustments made, rotor checked for stress cracks, seals changed if necessary (extra charge) PAT (portable appliance test) is included Obligatory in UK.

For worldwide customers we offer a full parts package per model. The designated country distributor services the units accordingly.

Call our Office to discuss or visit our Service website

WWW.ServicePrO-Care.com

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