Custom BioGenic Systems

Tech Guide #7

CBS Isothermal -190°C Dry Storage Freezers
Standard Fill Cycle Temperature Study

August 17, 2009

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Study

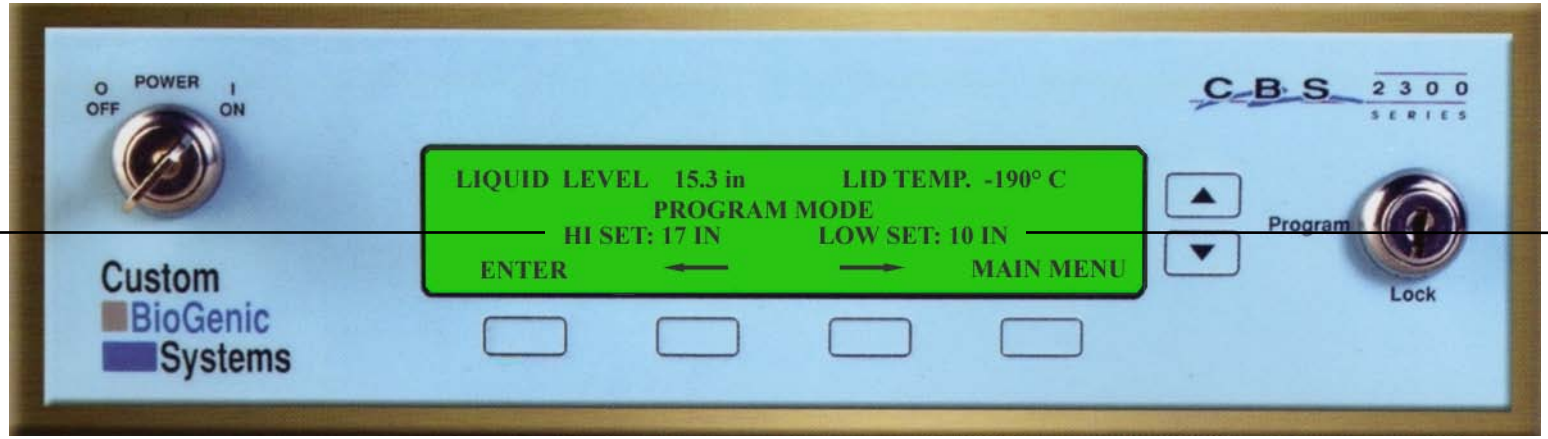
Liquid nitrogen will evaporate during normal operation and must be replaced to maintain normal operating temperature. This study illustrates how the temperature inside your CBS Isothermal Freezer will be affected as liquid nitrogen evaporates and is re-filled.

The 2300 controller is set to start the re-fill process when the liquid nitrogen level reaches the low set point of 10” (25cm). When the liquid nitrogen reaches the high set point of 17” (43cm) the filling will stop.

To monitor the liquid nitrogen vapor temperature, six temperature probes were placed at various levels in an aluminum freezer rack (see slide #4).

Liquid Level Filling Set Points

Your CBS Isothermal Freezer is delivered with factory pre-set liquid level filling set points.



- The low set point (start fill) should be set at 10 inches (25 cm).
- The high set point (stop fill) should be set at 17 inches (43 cm).

These filling set points will provide excellent operating parameters. However, they can be changed to suit your specific requirements.

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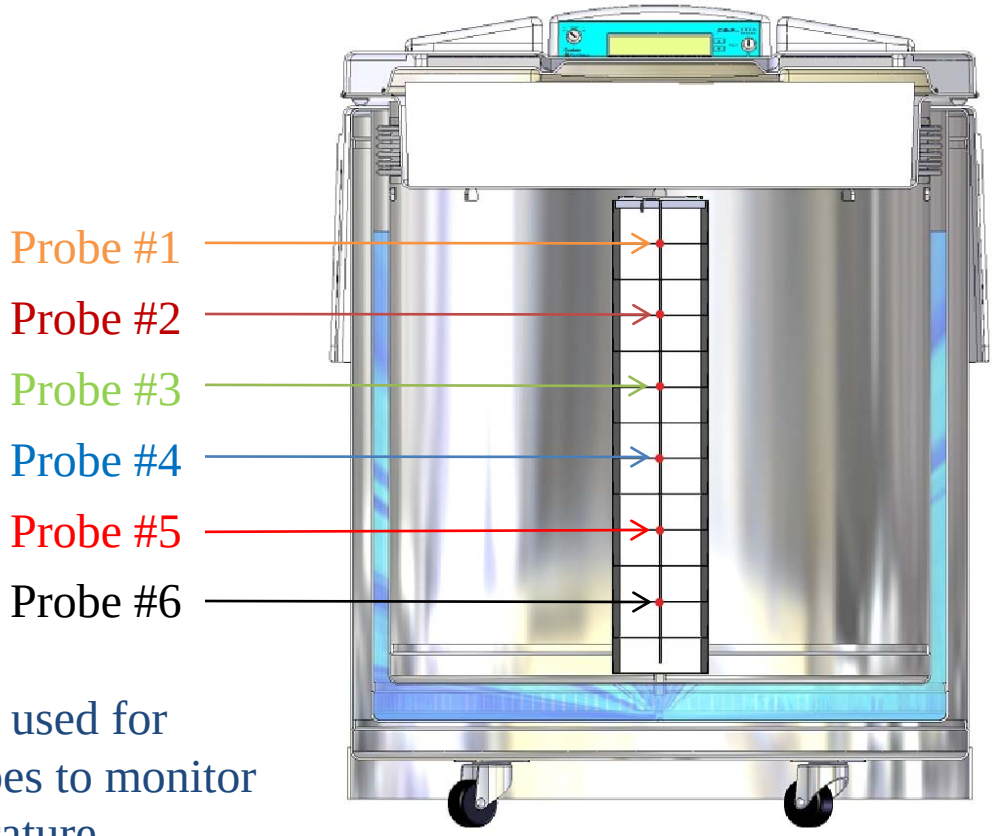
Probe Placement



An aluminum freezer rack is used for attaching 6 temperature probes to monitor liquid nitrogen vapor temperature. Spacing between the probes is approximately 4 inches (10 cm).

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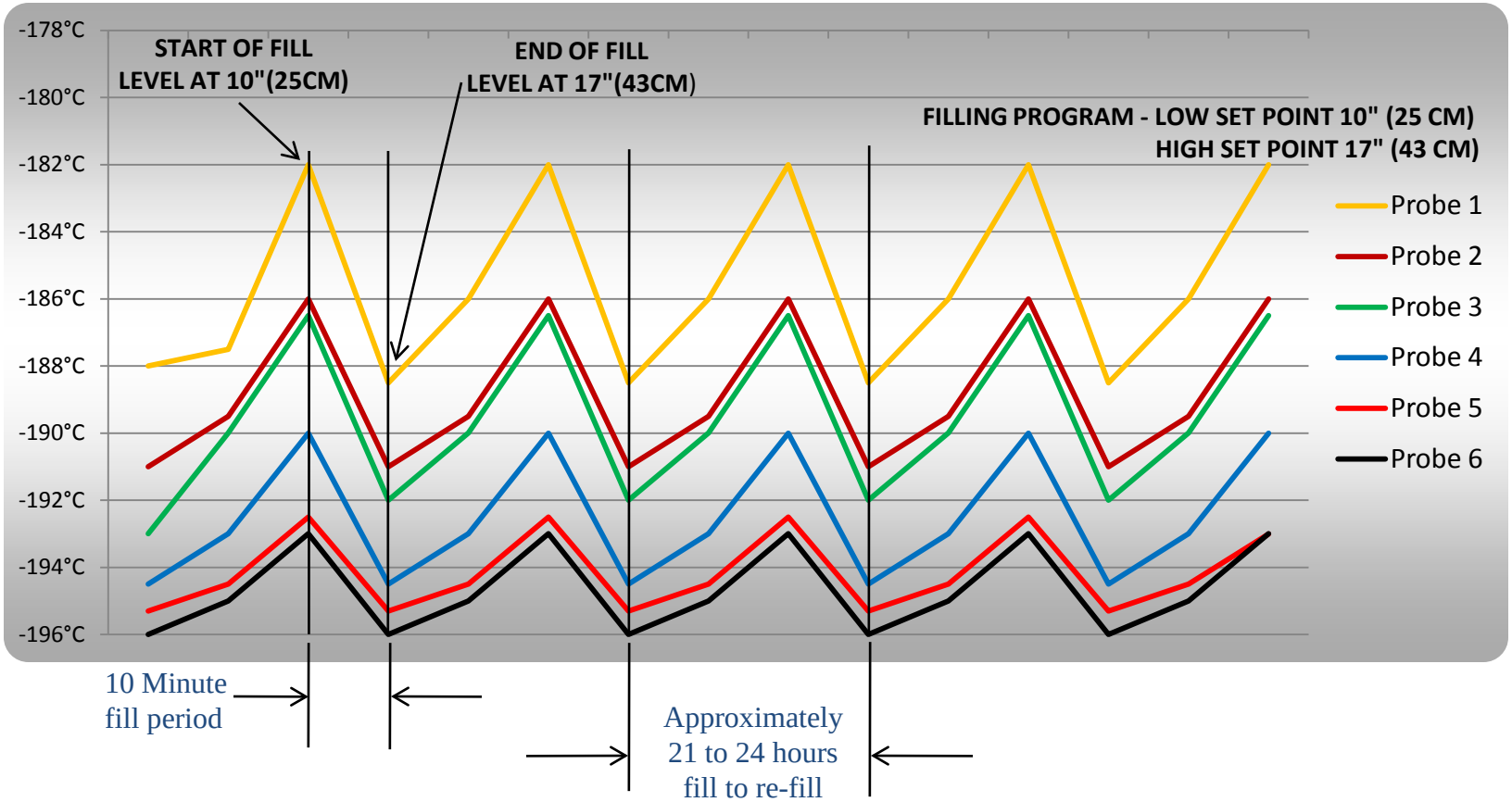
Fill to Fill Temperature Study



6 Temperature probes are placed in a 13 shelf aluminum freezer rack, equally spaced from top to bottom.

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Conclusion

This study shows that as the liquid nitrogen in your CBS Isothermal Freezer evaporates, the internal temperature at probe #1 will rise slightly to -182°C. As the re-fill process starts, the temperature at probe #1 will return to the normal operating temperature in the -189°C range.

The temperature of the other 5 probes increases very little, ranging between -186°C to -196°C. Therefore, 85% of the freezer storage space remains below -186°C and only the top15% of the space will be slightly warmer in the -182°C range.

This study provides temperature data that confirms samples stored in a CBS Isothermal Freezer will be well below critical temperatures.

Your CBS Isothermal Freezer is pre set to re-fill when the liquid nitrogen level reaches a low set point of 10” (25cm) and stop filling when the liquid nitrogen reaches the high set point of 17” (43cm). These filling set points will provide excellent operating parameters. However, they can be changed to suit your specific requirements.

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Thank you for choosing Custom BioGenic Systems

For more information please visit www.custombiogenics.com
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