CLAIMS

1. A cryogenic storage device for storing items in a cryogenic environment, the cryogenic storage device comprising:

a storage tank, the storage tank including an inner tank, an outer tank,

wherein the inner tank is configured to hold a cryogenic liquid;

wherein the inner tank is disposed within the outer tank and spaced apart from an inner surface of the outer tank so as to define a thermal insulative space;

a fluid inlet configured to supply the cryogenic liquid into a fluid reservoir of the inner tank;

a fluid sensor configured to detect a fluid level or a pressure within the inner tank, wherein the fluid sensor is removably disposed within the inner tank so as to allow an ice formation to be thawed without having to thaw the entire cryogenic storage device; and

a collar assembly having an upper collar mounted to the outer tank and a lower collar mounted to the inner tank,

wherein the collar assembly is sealed to the inner tank and outer tank so as to maintain the integrity of the thermal insulative space;

wherein the fluid sensor is removably coupled to the upper collar;

wherein the lower collar and the upper collar each have a cylindrical body having a through hole extending along an axial length of the cylindrical body;

wherein the upper collar and the lower collar each have a slot extending along a radius of the respective upper and lower collar; and

wherein the collar assembly further includes an intermediate tube seated within the slot of the respective upper and lower collar.

2. The cryogenic storage device as set forth in claim 1, wherein the fluid sensor is a capacitance sensor.

3. The cryogenic storage device as set forth in claim 1, wherein the fluid sensor includes a head removably attached to the collar assembly.

4. The cryogenic storage device as set forth in claim 3, wherein the head includes a vacuum port open to the thermal insulative space.

5. The cryogenic storage device as set forth in claim 1, further including a control housing for housing a control unit,

wherein the fluid sensor is configured to detect the fluid level within the inner tank; and

wherein the control unit is configured to process the fluid level so as to determine an amount of the cryogenic liquid within the inner tank.

6. The cryogenic storage device as set forth in claim 1, further including a carousel rotatably mounted within the inner tank.

7. The cryogenic storage device as set forth in claim 1, further including:

a valve assembly;

a control inlet; and

a manual inlet,

wherein the control inlet is fluidly coupled to the valve assembly;

wherein the valve assembly is fluidly coupled to the fluid inlet; and

wherein the manual inlet is fluidly coupled to the fluid inlet.