What is claimed is:

1. A sorption system, comprising:

an evaporator structured to contain a working fluid, and operable to evaporate the working fluid to produce a working fluid gas in the evaporator;

a sorber structured to contain a sorption material to sorb the working fluid gas during a sorption phase;

a flow channel extending between the evaporator and the sorber to provide a gas pathway connecting the evaporator and the sorber;

a vapor control valve positioned to control the rate of vapor flow between the evaporator and the sorber through a flow channel, and being selectively operable to permit the flow of working fluid gas through the flow channel, to next stop the flow of working fluid gas through the flow channel, and after stopping the flow to then permit resumption of the flow of working fluid gas through the flow channel; and

a plunger operable to control the rate of vapor flow between the evaporator and the sorber through the flow channel; and

a vacuum barrier material positioned about the sorber, evaporator, and flow channel to provide a reduced pressure therewithin to promote evaporation of the working fluid at a reduced temperature compared to the temperature required at ambient pressure, the vacuum barrier material being a flexible material; and

a temperature controller to adjust the position of the plunger to control the rate of vapor flow through the vapor control valve.

2. The sorption system of claim 1, wherein the vapor control valve has a contact surface and the temperature controller has a contact surface, the contact surface of the temperature controller being removably dockable to the contact surface of the vapor control valve.

3. The sorption system of claim 1, where the vacuum barrier material includes first, second, and third flexible material portions, the third flexible material portion having a first end portion and a second end portion, the first end portion being in sealed engagement with the first flexible material portion and the second end portion being in sealed engagement with the second flexible material portion to define an internal barrier, the third flexible material portion being positioned to create a stable sealing surface, the plunger protruding through the third flexible material portion, but not through the first flexible material portion or through the second

flexible material portion, the plunger being located proximal to the sealing surface, and the plunger being movable toward the sealing surface by atmospheric pressure.

4. The sorption system of claim 3, further including a temperature sensor positioned to measure the temperature of one of the evaporator surface and the air adjacent to the evaporator surface indicative of an evaporator surface temperature, and generate a temperature signal; and wherein the temperature controller includes:

an inflatable member having a first inflation state and a second inflation state; and

a control unit configured to evaluate the temperature signal and in response control the state of inflation of the inflatable member and thereby the operation of the valve to control the rate of gas flow between the evaporator and sorber through the gas pathway, when the inflatable member is in the first inflation state, the inflatable member causes opening of the valve to increase the rate of gas flow in the flow channel between the evaporator and the sorber through the gas pathway, and when the inflatable member is in the second inflation state, the inflatable member permits closing of the valve to reduce the rate of gas flow in the flow channel between the evaporator and the sorber through the gas pathway.

5. The sorption system of claim 1, further including a temperature sensor positioned to measure the temperature of one of the evaporator surface and the air adjacent to the evaporator surface indicative of an evaporator surface temperature, and generate a temperature signal; and wherein the temperature controller includes:

an inflatable member having a first inflation state and a second inflation state; and

a control unit configured to evaluate the temperature signal and in response control the state of inflation of the inflatable member and thereby the operation of the valve to control the rate of gas flow between the evaporator and sorber through the gas pathway, when the inflatable member is in the first inflation state, the inflatable member causes opening of the valve to increase the rate of gas flow in the flow channel between the evaporator and the sorber through the

gas pathway, and when the inflatable member is in the second inflation state, the inflatable member permits closing of the valve to reduce the rate of gas flow in the flow channel between the evaporator and the sorber through the gas pathway.

6. The sorption system of claim 5, wherein the temperature controller is removably dockable to the vapor control valve.

7. The sorption system of claim 6, wherein the temperature controller includes a plurality of contact surfaces for removably docking the temperature controller to the vapor control valve.

8. The sorption system of claim 5, wherein the control unit includes a microcontroller operatively connected to the temperature sensor and configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the microcontroller changes the inflatable member from the second inflation state to the first inflation state.

9. The sorption system of claim 5, further including an air compressor, wherein the control unit includes a microcontroller operatively connected to the temperature sensor and the air compressor, the microcontroller configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the microcontroller turns on the air compressor to inflate the inflatable member to change the inflation member from the second inflation state to the first inflation state.

10. The sorption system of claim 9, wherein the microcontroller is operatively connected to a memory, and the stored temperature setpoint is stored in the memory.

11. The sorption system of claim 9, wherein the microcontroller is mounted on an electronic circuit board.

12. The sorption system of claim 5, wherein the control unit includes an electronic circuit operatively connected to the temperature sensor and configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the electronic circuit changes the inflatable member from the second inflation state to the first

inflation state.

13. The sorption system of claim 5, further including an air compressor, wherein the control unit includes an electronic circuit operatively connected to the temperature sensor and the air compressor, the electronic circuit configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the electronic circuit turns on the air compressor to inflate the inflatable member to change the inflation member from the second inflation state to the first inflation state.

14. The sorption system of claim 5, wherein the control unit compares the temperature measured by the temperature sensor with a stored temperature setpoint and inflates the inflatable member if the measured temperature is above the stored temperature setpoint.

15. The sorption system of claim 5, further including at least one battery for powering the temperature controller and a display, and wherein the control unit indicates the state of the at least one battery using the display.

16. The sorption system of claim 5, further including an electrical heating circuit, and wherein the control unit activates the electrical heating circuit when the temperature measured by the temperature sensor falls below a preselected temperature.

17. The sorption system of claim 5, further including a memory, and wherein the control unit stores in the memory the data measured by the temperature sensor during operation.

18. The sorption system of claim 5, further including a payload compartment, and wherein the control unit controls the state of inflation of the inflatable member to regulate the evaporation temperature in the evaporator to maintain the temperature measured by the temperature sensor at plus or minus 1 degree Kelvin of a preselected temperature.

19. The sorption system of claim 5, further including an air compressor, an air outlet valve and pneumatic conduits connecting the inflatable member with the air compressor for inflation of the inflatable member and with the air outlet valve for deflation of the inflatable member.

20. The sorption system of claim 19, wherein the air outlet valve is

configured to have a biasing force applied thereto biasing the valve toward a closed state, and the air outlet valve is movable to an open state to deflate the inflatable member, and when in the open state, at least a portion of the biasing force applied to the valve is transmitted to the inflatable member to facilitate changing the inflatable member from the first inflation state to the second inflation state.

21. The sorption system of claim 19, wherein the air outlet valve is manually operable to manually exhaust air from the inflatable member.

22. The sorption system of claim 19, further including a pressure sensor operatively connected to the control unit, the pressure sensor measuring the air pressure in at least one of the pneumatic conduits.

23. The sorption system of claim 22, wherein at least one of the air compressor and the air outlet valve is in operation until the pressure sensor measures a stored pressure setpoint.

24. The sorption system of claim 19, further including a pressure sensor positioned to measure the air pressure in at least one of the pneumatic conduits and generate a pressure signal, and wherein the control unit includes a microcontroller operatively connected to the pressure sensor and configured to read the pressure signal of the pressure sensor, and when the air compressor is inflating the inflatable member, if the pressure signal indicates the pressure in the at least one pneumatic conduit reaches a first stored pressure setpoint the microcontroller terminates inflation of the inflatable member by the air compressor, and when the air outlet valve is deflating the inflatable member, if the pressure signal indicates a pressure in the at least one pneumatic conduit reaches a second stored pressure setpoint the microcontroller terminates deflation of the inflatable member by the air outlet valve.

25. The sorption system of claim 5, further including a pressure plate, and wherein the valve has a plunger which is movable to open the valve, the pressure plate being located between the inflation member and the plunger, and when the inflation member is inflated to the first inflation state, the inflation member is in operable engagement with the pressure plate and applies a force through the pressure plate to the plunger sufficient to cause the plunger to open the valve.

26. The sorption system of claim 5 wherein the pressure plate is a rigid plate.

27. The sorption system of claim 5, wherein when the temperature measured by the temperature sensor exceeds a stored temperature setpoint, the control unit causes inflation of the inflatable member to the first inflation state to open the valve, and when the temperature measured by the temperature sensor is below the stored temperature setpoint, the control unit causes deflation of the inflatable member to the second inflation state to close the valve.

28. The sorption system of claim 27, wherein the control unit has a memory within which the stored temperature setpoint is stored.

29. The sorption system of claim 5, wherein when the temperature measured by the temperature sensor exceeds a first stored temperature setpoint, the control unit causes inflation of the inflatable member to the first inflation state to open the valve, and when the temperature measured by the temperature sensor is below a second stored temperature setpoint, the control unit causes deflation of the inflatable member to the second inflation state to close the valve.

30. The sorption system of claim 5, wherein the temperature sensor forms a portion of the temperature controller.

31. The sorption system of claim 5, wherein the temperature sensor does not form a portion of the temperature controller.

32. A sorption system for use with a temperature controller, comprising:

an evaporator structured to contain a working fluid, and operable to evaporate the working fluid to produce a working fluid gas in the evaporator;

a sorber structured to contain a sorption material to sorb the working fluid gas during a sorption phase;

a flow channel extending between the evaporator and the sorber to provide a gas pathway connecting the evaporator and the sorber;

a vapor control valve positioned to control the rate of vapor flow between the evaporator and the sorber through a flow channel, and being selectively operable to permit the flow of working fluid gas through the flow channel, to next stop the flow of working fluid gas through the flow channel,

and after stopping the flow to then permit resumption of the flow of working fluid gas through the flow channel; and

a plunger operable to control the rate of vapor flow between the evaporator and the sorber through the flow channel; and

a vacuum barrier material positioned about the sorber, evaporator, and flow channel to provide a reduced pressure therewithin to promote evaporation of the working fluid at a reduced temperature compared to the temperature required at ambient pressure, the vacuum barrier material being a flexible material; and

a contact surface removably dockable with the temperature controller to docket the temperature controller to the vapor control valve such that the position of the plunger may be adjusted by the temperature controller to control the rate of vapor flow through the vapor control valve.

33. The sorption system of claim 32, where the vacuum barrier material includes first, second, and third flexible material portions, the third flexible material portion having a first end portion and a second end portion, the first end portion being in sealed engagement with the first flexible material portion and the second end portion being in sealed engagement with the second flexible material portion to define an internal barrier, the third flexible material portion being positioned to create a stable sealing surface, the plunger protruding through the third flexible material portion, but not through the first flexible material portion or through the second flexible material portion, the plunger being located proximal to the sealing surface, and the plunger being movable toward the sealing surface by atmospheric pressure.

34. A temperature controller for a sorption system having an evaporator containing a working fluid to evaporate the fluid to produce a gas, the evaporator including an evaporator surface, a sorber containing a sorption material to sorb the gas during a sorption phase, a flow channel extending between the evaporator and the sorber to provide a gas pathway connecting the evaporator and sorber, a valve located within the flow channel and operable to control the rate of gas flow in the flow channel between the evaporator and the sorber through the gas pathway, and a temperature sensor positioned to measure the temperature of one of the evaporator

surface and the air adjacent to the evaporator surface indicative of an evaporator surface temperature, and generate a temperature signal, comprising:

an inflatable member having a first inflation state and a second inflation state; and

a control unit configured to evaluate the temperature signal and in response control the state of inflation of the inflatable member and thereby the operation of the valve to control the rate of gas flow between the evaporator and sorber through the gas pathway, when the inflatable member is in the first inflation state, the inflatable member causes opening of the valve to increase the rate of gas flow in the flow channel between the evaporator and the sorber through the gas pathway, and when the inflatable member is in the second inflation state, the inflatable member permits closing of the valve to reduce the rate of gas flow in the flow channel between the evaporator and the sorber through the gas pathway.

35. The temperature controller of claim 34, further including a plurality of contact surfaces for removably docking the temperature controller to the valve.

36. The temperature controller of claim 34, wherein the control unit includes a microcontroller operatively connected to the temperature sensor and configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the microcontroller changes the inflatable member from the second inflation state to the first inflation state.

37. The temperature controller of claim 34, further including an air compressor, wherein the control unit includes a microcontroller operatively connected to the temperature sensor and the air compressor, the microcontroller configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the microcontroller turns on the air compressor to inflate the inflatable member to change the inflation member from the second inflation state to the first inflation state.

38. The temperature controller of claim 37, wherein the microcontroller is operatively connected to a memory, and the stored

temperature setpoint is stored in the memory.

39. The temperature controller of claim 37, wherein the microcontroller is mounted on an electronic circuit board.

40. The temperature controller of claim 34, wherein the control unit includes an electronic circuit operatively connected to the temperature sensor and configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the electronic circuit changes the inflatable member from the second inflation state to the first inflation state.

41. The temperature controller of claim 34, further including an air compressor, wherein the control unit includes an electronic circuit operatively connected to the temperature sensor and the air compressor, the electronic circuit configured to read the temperature signal of the temperature sensor, and if the temperature signal indicates an evaporator surface temperature above a stored temperature setpoint, the electronic circuit turns on the air compressor to inflate the inflatable member to change the inflation member from the second inflation state to the first inflation state.

42. The temperature controller of claim 34, wherein the control unit compares the temperature measured by the temperature sensor with a stored temperature setpoint and inflates the inflatable member if the measured temperature is above the stored temperature setpoint.

43. The temperature controller of claim 34, further including at least one battery for powering the control unit and a display, and wherein the control unit indicates the state of the at least one battery using the display.

44. The temperature controller of claim 34 for a sorption system having an electrical heating circuit, wherein the control unit activates the electrical heating circuit when the temperature measured by the temperature sensor falls below a preselected temperature.

45. The temperature controller of claim 34, further including a memory, and wherein the control unit stores in the memory the data measured by the temperature sensor during operation.

46. The temperature controller of claim 34 for a sorption system having a payload compartment, wherein the control unit controls the state of

inflation of the inflatable member to regulate the evaporation temperature in the evaporator to maintain the temperature measured by the temperature sensor at plus or minus 1 degree Kelvin of a preselected temperature.

47. The temperature controller of claim 34, further including an air compressor, an air outlet valve and pneumatic conduits connecting the inflatable member with the air compressor for inflation of the inflatable member and with the air outlet valve for deflation of the inflatable member.

48. The temperature controller of claim 47, wherein the valve is configured to have a biasing force applied thereto biasing the valve toward a closed state, and the air outlet valve is movable to an open state to deflate the inflatable member, and when in the open state, at least a portion of the biasing force applied to the valve is transmitted to the inflatable member to facilitate changing the inflatable member from the first inflation state to the second inflation state.

49. The temperature controller of claim 47, wherein the air outlet valve is manually operable to manually exhaust air from the inflatable member.

50. The temperature controller of claim 47, further including a pressure sensor operatively connected to the control unit, the pressure sensor measuring the air pressure in at least one of the pneumatic conduits.

51. The temperature controller of claim 50, wherein at least one of the air compressor and the air outlet valve is in operation until the pressure sensor measures a stored pressure setpoint.

52. The temperature controller of claim 472, further including a pressure sensor positioned to measure the air pressure in at least one of the pneumatic conduits and generate a pressure signal, and wherein the control unit includes a microcontroller operatively connected to the pressure sensor and configured to read the pressure signal of the pressure sensor, and when the air compressor is inflating the inflatable member, if the pressure signal indicates the pressure in the at least one pneumatic conduit reaches a first stored pressure setpoint the microcontroller terminates inflation of the inflatable member by the air compressor, and when the air outlet valve is deflating the inflatable member, if the pressure signal indicates a pressure in the at least one pneumatic conduit reaches a second stored pressure

setpoint the microcontroller terminates deflation of the inflatable member by the air outlet valve.

53. The temperature controller of claim 34, further including a pressure plate, and wherein the valve has a plunger which is movable to open the valve, the pressure plate being located between the inflation member and the plunger, and when the inflation member is inflated to the first inflation state, the inflation member is in operable engagement with the pressure plate and applies a force through the pressure plate to the plunger sufficient to cause the plunger to open the valve.

54. The temperature controller of claim 53, wherein the pressure plate is a rigid plate.

55. The temperature controller of claim 34, wherein when the temperature measured by the temperature sensor exceeds a stored temperature setpoint, the control unit causes inflation of the inflatable member to the first inflation state to open the valve, and when the temperature measured by the temperature sensor is below the stored temperature setpoint, the control unit causes deflation of the inflatable member to the second inflation state to close the valve.

56. The temperature controller of claim 55, wherein the control unit has a memory within which the stored temperature setpoint is stored.

57. The temperature controller of claim 34, wherein when the temperature measured by the temperature sensor exceeds a first stored temperature setpoint, the control unit causes inflation of the inflatable member to the first inflation state to open the valve, and when the temperature measured by the temperature sensor is below a second stored temperature setpoint, the control unit causes deflation of the inflatable member to the second inflation state to close the valve.

~~58. The temperature controller of claim 34, wherein when the temperature measured by the temperature sensor exceeds a first stored temperature setpoint, the control unit causes inflation of the inflatable member to the first inflation state to open the valve, and when the temperature measured by the temperature sensor is below a second stored temperature setpoint, the control unit causes deflation of the inflatable member to the second inflation state to close the valve.~~