Claims

1. A method of operating a refrigeration system comprising:

initiating a compressor shutdown operation;

determining a difference in a saturation temperature at a port of a compressor of the refrigeration system and an ambient temperature; and

comparing the difference in the saturation temperature and ambient temperature with a threshold;

wherein if the difference in the saturation temperature and ambient temperature is less than or equal to the threshold, performing a pump down operation and then completing the compressor shutdown operation;

wherein if the difference in the saturation temperature and ambient temperature exceeds the threshold, completing the compressor shutdown operation; and

wherein performing the pump down operation includes reducing a pressure at an evaporator of the refrigeration system by closing an electronic valve assembly of the refrigeration system.

2. The method of claim 1, further comprising calculating the saturation temperature at the port of the compressor.

3. The method of claim 2, wherein calculating the saturation temperature is performed using the return air temperature to an evaporator of the refrigeration system.

4. The method of claim 1, wherein the threshold is a predetermined limit of about 10 degrees Fahrenheit.

5. The method of claim 1, wherein the compressor includes an intermediate port associated with an economizer heat exchanger and operating the electronic valve assembly of the refrigeration system reduces a pressure at the intermediate port of the compressor.

6. The method of claim 1, wherein the electronic valve assembly is located upstream from a compressor and/or downstream from an inlet of an evaporator.

7. The method of claim 6, wherein the electronic valve assembly is a suction modulation valve.

8. The method of claim 6, wherein the electronic valve assembly is an evaporator expansion valve.

9. A method of operating a refrigeration system comprising:

anticipating operation of the refrigeration system in an economizer mode via a controller;

determining a difference in a saturation temperature at a port of a compressor of the refrigeration system and an ambient temperature; and

comparing the difference in the saturation temperature and ambient temperature with a threshold;

wherein if the difference in the saturation temperature and ambient temperature is less than or equal to the threshold, performing a pump down operation and if the difference in the saturation temperature and ambient temperature exceeds the threshold, initiating operation of the refrigeration system in the economizer mode, wherein initiating operation of the refrigeration system in the economizer mode further comprises opening an economizer expansion valve associated with an economizer heat exchanger; and

wherein performing the pump down operation includes closing an electronic valve assembly of the refrigeration system.

10. The method of claim 9, wherein the compressor is operational during the method.

11. A refrigeration system comprising:

a compressor;

an evaporator fluidly connected to a suction port of the compressor;

an economizer heat exchanger fluidly coupled to an intermediate port of the compressor;

a control valve operable to control fluid flow to or from the evaporator; and

a controller associated with the control valve, the controller being configured to:

determine a difference in a saturation temperature at the suction port of a compressor of the refrigeration system and an ambient temperature; and

compare the difference in the saturation temperature and ambient temperature with a threshold;

wherein if the difference in the saturation temperature and ambient temperature is less than or equal to the threshold, the controller closes the control valve to perform a pump down operation; and

wherein if the difference in the saturation temperature and ambient temperature exceeds the threshold, the controller initiates operation of the refrigeration system in the economizer mode by opening an economizer expansion valve associated with the economizer heat exchanger.

12. The system of claim 11, wherein the compressor is a scroll type compressor.

13. The system of claim 11, wherein closing the control valve to reduce a pressure at the intermediate port of the compressor.

14. The system of claim 13, wherein the control valve is an evaporator expansion valve.

15. The system of claim 13, wherein the control valve is a suction modulation valve.

16. The system of claim 11, wherein the system is operable in a normal mode and the economizer mode.

17. The system of claim 11, wherein in the economizer mode, fluid is provided from the economizer heat exchanger to the intermediate port of the compressor.