Claims

1. A trailer refrigeration unit comprising:

a plurality of power sources (102, 104, 108), wherein the plurality of power sources are selectively coupled to a power converter (112) and at least one compressor (116); and

wherein the power converter (112) is coupled to at least one fan (118); and

a first switch (122) configured to selectively couple the power converter (112) to the plurality of power sources; and

a second switch (126) configured to selectively couple the power converter (112) to the at least one compressor (116); and

a microcontroller circuit (110), wherein the microcontroller circuit is configured to:

selectively operate the trailer refrigeration unit in one of a plurality of modes based on an environmental parameter within the trailer refrigeration unit, wherein the plurality of modes includes:

a first mode where the at least one compressor (116) is directly powered by at least one of the plurality of power sources (102, 104, 108) such that power is routed to the compressor from a power source other than the power convertor (112), in which the microcontroller circuit (110) is configured to utilize the first switch (122) and the second switch (126) to control a pull down to come from one of the plurality of power sources, and

a second mode where the at least one compressor (116) and at least one fan (118) are powered by the power convertor (112), in which the microcontroller circuit (110) is configured to utilize the second switch (126) to route power to the at least one compressor (116) through the power converter (112).

2. The trailer refrigeration unit of Claim 1 further comprising at least one sensor adapted to determine the environmental parameter within the trailer refrigeration unit.

3. The trailer refrigeration unit of Claim 1, wherein at least one of the plurality of power sources (102) is a diesel generator.

4. The trailer refrigeration unit of Claim 3, wherein at least one of the plurality of power sources (108) is an onboard diesel engine.

5. The trailer refrigeration unit of Claim 3, wherein at least one of the plurality of power sources (104) is a mains power supply.

6. The trailer refrigeration unit of Claim 3, wherein at least one of the plurality of power sources (102) is an axle generator.

7. The trailer refrigeration unit of Claim 1 further comprising at least one battery (106) coupled to the power converter (112).

8. The trailer refrigeration unit of Claim 1, wherein the power converter (112) comprises:

at least one alternating current to direct current converter;

at least one direct current to direct current converter; and

at least one direct current to alternating current converter.

9. A refrigeration system (20) comprising:

the trailer refrigeration unit of claim 1, wherein the trailer refrigeration unit includes an evaporator, and the at least one fan (118) is operable to move air towards the evaporator.