CLAIMS

What is claimed is:

1. A modular power unit having a form factor enabling mounting in one of a plurality of component locations of an equipment rack, to provide direct current (DC) power to a DC bus of the equipment rack which is supplying DC power to one or more equipment components mounted in other ones of the component locations of the equipment rack, the modular power unit comprising:

a chassis having a form factor enabling the chassis to be inserted into any one of the component locations of the equipment rack, the chassis defining a plurality of slots into which a plurality of DC power supplies may be inserted, the chassis further having a front portion into which the DC power supplies are inserted and removed, and a rear portion;

a plurality of alternating current (AC) modules disposed within the chassis for receiving AC power from an external AC power source, the plurality of AC modules being disposed at the rear portion of the chassis so as not to interfere with use of any one of the slots of the chassis and being spaced apart laterally from one another;

a first DC bus bar disposed between the AC modules and the slots, and disposed rearwardly of the slots so as not to interfere with use of any of the slots;

a second DC bus bar disposed between the first DC bus bar and the slots, disposed rearwardly of the slots so as not to interfere with use of any of the slots;

a plurality of independent, modular DC power supplies each having a common form factor enabling insertion and mounting in one of the slots of the chassis;

a controller in communication with the plurality of DC power supplies, and housed within the chassis, the controller having a form factor enabling it to be mounted in one of the slots of the chassis;

a DC bus housed within the chassis and in communication with the DC power supplies for supplying DC output power from the DC power supplies to a separate DC bus housed within the equipment rack.

2. The modular power unit of claim 1, wherein at least one of the DC power supplies comprises a battery backup unit (BBU) module for providing DC output power.

3. The modular power unit of claim 1, wherein at least one of the DC power supplies comprises a rectifier module for supplying DC output power.

4. The modular power unit of claim 1, wherein the plurality of DC power supplies comprises at least one rectifier module and one battery backup unit (BBU) module.

5. The modular power unit of claim 1, wherein the controller has a form factor enabling it to be mounted in one of the slots of the chassis.

6. The modular power unit of claim 1, wherein:

at least one of the power supplies comprises a rectifier module;

at least one of the power supplies comprises a battery backup unit (BBU) module; and

wherein the BBU module is configured to provide DC power on the DC bus of the modular power unit during transient ride though instances to thus supplement the DC power being provided by the rectifier module.

7. The modular power unit of claim 6, wherein the DC output power from the BBU module is limited to an amount which is less than what the BBU module is capable of generating.

8. The modular power unit of claim 1, wherein:

at least one of the power supplies comprises a rectifier module;

at least one of the power supplies comprises a battery backup unit (BBU) module; and

wherein the BBU module is configured to provide DC power on the DC bus of the modular power unit when AC power to the modular power unit is lost.

9. The modular power unit of claim 8, wherein the BBU module is configured to provide a level of DC power equal to the DC power output of the rectifier module for a duration of up to about 90 seconds, when AC power to the modular power unit is lost.

10. The modular power unit of claim 1, wherein:

at least one of the power supplies comprises a rectifier module;

at least one of the power supplies comprises a battery backup unit (BBU) module; and

wherein the rectifier module and the BBU module each provide an output of about 3KW.

11. The modular power unit of claim 1, further comprising a connector assembly having a first connector component associated with a given one of the power supply modules, and a second connector component mounted within the chassis, the first and second connector components being connectable when the given one of the power supplies is inserted into the chassis and operative to:

transmit the DC output from the given one of the power supplies to the DC bus mounted within the chassis; and

enable a connection to be made between a control bus in communication with the controller and the given one of the power supplies.

12. A modular power unit having a form factor enabling mounting in one or more of a plurality of component locations of an equipment rack, to provide direct current (DC) power to a DC bus of the equipment rack which is supplying DC power to one or more equipment components mounted in other ones of the component locations of the equipment rack, the modular power unit comprising:

a chassis having a form factor enabling the chassis to be inserted into any one of the component locations of the equipment rack, the chassis defining a plurality of parallel arranged slots having a common form factor into which a plurality of independent DC power supplies may be inserted;

a plurality of alternating current (AC) modules disposed within the chassis along a rear portion of the chassis for receiving AC power from an external AC power source, the AC modules being positioned behind the slots so as not to interfere with use of any of the slots;

a plurality of independent, modular DC power supplies having a common form factor enabling insertion and mounting in any one of the slots of the chassis, the modular DC power supplies including at least one rectifier module;

a controller in communication with the plurality of DC power supplies, the controller having a form factor enabling it to be housed in one of the slots of the chassis; and

a DC bus housed within the chassis and in communication with the DC power supplies for supplying DC output power from the DC power supplies to a separate DC bus housed within the equipment rack.

13. The modular power unit of claim 12, wherein the plurality of DC power supplies includes at least one battery backup unit (BBU) module for providing a DC power output to the DC bus within the chassis.

14. The modular power unit of claim 13, wherein the rectifier module and the BBU module provide the same level of DC power output.

15. The modular power unit of claim 13, wherein the BBU module is configured to supply DC power to the DC bus of the chassis when a transient ride through instance is experienced, to thus supplement the DC power being provided by the rectifier module.

16. The modular power unit of claim 13, wherein the BBU module provides its DC power output to the DC bus within the chassis for up to about 90 seconds when the AC power from the external AC power source is lost.

17. The modular power unit of claim 15, wherein the DC power provided by the BBU module is limited to an amount which is less than what the BBU module is capable of generating.

18. A method for providing direct current (DC) power to a DC bus of an equipment rack having a plurality of component locations therein, and wherein the equipment rack is designed to accommodate one or more equipment components mounted in ones of the component locations of the equipment rack, and to power the one or more equipment components using the DC power provided on the DC bus of the equipment rack, the method comprising:

using a modular DC power unit having a form factor enabling it to be inserted into at least one component location to provide DC power to the DC bus of the equipment rack, the modular DC power unit having a chassis having a plurality of slots with a common form factor;

using a plurality of DC power supplies that are mounted in the plurality of slots of the chassis of the modular DC power unit to generate the DC power applied to the DC bus of the equipment rack, the DC power supplies having a common form factor enabling any the DC power supplies to be inserted into different ones of the plurality of slots ;

using a controller having a form factor enabling it to be inserted into one of the plurality of slots of the chassis to communicate with and control the DC power supplies; and

using a plurality of AC input modules to interface an external AC power source to the modular DC power unit, to provide AC power to the modular DC power unit, the AC input modules being arranged along a rear portion of the chassis behind the slots so as not to interfere with insertion or removal of the DC power supplies or the DC power unit from any one of the slots.

19. The method of claim 18, wherein the operation of using a plurality of DC power supplies comprises using at least one rectifier module and at least one battery backup unit (BBU) module, with the rectifier module and the BBU module having a common form factor.

20. A power unit system comprising adapted to be used with an equipment rack having a plurality of component locations:

a modular main power unit having a controller and being of dimensions enabling it to be inserted in a first one of the component locations within an equipment rack;

a modular supplemental power unit having dimensions enabling it to be inserted into a second one of the component location within the equipment rack;

each of the modular main power unit and the modular supplemental power unit including:

a chassis defining a plurality of slots into which a plurality of DC power supplies may be inserted, the chassis further having a form factor enabling it to be inserted into any one of the component locations;

a plurality of independent, modular DC power supplies each having a common form factor enabling insertion and mounting into different ones of the plurality of slots of the chassis; and

a DC bus housed within the chassis and in communication with the DC power supplies for supplying DC output power from the DC power supplies to a separate DC bus housed within the equipment rack; and

a plurality of AC input modules for receiving AC input power from an external AC power source, the AC input modules being arranged along a rear portion of the chassis behind the slots so as not to interfere with insertion or removal of the DC power supplies from any one of the slots.