relatively high voltage and current ratings. For example, many refrigerated shipping containers operate at 480 volts AC and 8-15 amps.

SUMMARY

[0005] In general, in one aspect, there is provided an electrical connector testing system, the system comprising: a first plug connector end; a controller coupled to first plug connector end, wherein the controller is disposed between the first plug connector end and a power source configured to provide power; and an electrical load coupled to the first plug connector end, wherein the electrical load comprises an electrical cable and a second plug connector end coupled to an end of the electrical cable, wherein the controller determines whether an adverse electrical condition exists with respect to the electrical load before allowing the power to flow between the first plug connector end and the second plug connector end, wherein the first plug connector end and the second plug connector end are removably coupled to each other, and wherein the adverse electrical condition comprises a phase-to-phase fault.

[0006] In another aspect, there is provided a reefer receptacle comprising: a plug connector end configured to couple to an electrical load comprising an electrical cable and an electrical connector of a reefer container; an electrical interlock coupled to the plug connector end; a breaker coupled to the electrical interlock; a power supply coupled to the breaker; and a controller coupled to the power supply, wherein the controller is configured to perform at least one test to determine if an adverse electrical condition exists prior to putting the reefer container in service, wherein the controller is configured to determine that no adverse electrical condition exists with respect to the electrical load before allowing power to flow between the plug connector end and the electrical connector of the reefer receptacle, wherein the adverse electrical condition comprises at least one of a group consisting of a phase-to-phase fault, a loss of phase, and a phase-to-ground fault, and wherein the adverse electrical condition exists at any point along the electrical load.

[0007] These and other aspects, objects, features, and embodiments will be apparent from the following description and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The drawings illustrate only example embodiments and are therefore not to be considered limiting in scope, as the example embodiments may admit to other equally effective embodiments. The elements and features shown in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the example

CLAIMS

What is claimed is:

1. An electrical connector testing system, the system comprising:

   a first plug connector end;

   a controller coupled to first plug connector end, wherein the controller is disposed between the first plug connector end and a power source configured to provide power; and

   an electrical load coupled to the first plug connector end, wherein the electrical load comprises an electrical cable and a second plug connector end coupled to an end of the electrical cable,

   wherein the controller determines whether an adverse electrical condition exists with respect to the electrical load before allowing the power to flow between the first plug connector end and the second plug connector end,

   wherein the first plug connector end and the second plug connector end are removably coupled to each other, and

   wherein the adverse electrical condition comprises a phase-to-phase fault.

2. The system of Claim 1, wherein the first plug connector end and the controller are part of a reefer receptacle, and wherein the electrical load further comprises a reefer container.

3. The system of Claim 1, wherein the controller evaluates whether the adverse electrical condition exists after allowing the power to flow between the first plug connector end and the second plug connector end.

4. The system of Claim 3, wherein the controller prevents power from continuing to flow between the first plug connector end and the second plug connector end until the adverse electrical condition has been eliminated.

5. The system of Claim 3, wherein the controller reports the adverse electrical condition to a user.

6. The system of Claim 5, wherein the adverse electrical condition is communicated using a display communicably coupled to the controller.

7. The system of Claim 1, wherein the controller comprises a self-test circuit, wherein the self-test circuit comprises at least one switch for controlling when test power is sent by the controller into the electrical load.

8. The system of Claim 7, wherein the at least one switch further controls when a signal is received by the controller from the electrical load.

9. The system of Claim 1, wherein the controller comprises an energy metering module that is coupled to a first portion of the electrical load, and wherein a remainder of the controller is coupled to a second portion of the electrical load.

10. The system of Claim 9, wherein the energy metering module is coupled to a first portion of the electrical load, and wherein remaining modules of the controller are coupled to a second portion of the electrical load.

11. The system of Claim 10, wherein the controller identifies an electrical open between the first portion of the electrical load and the second portion of the electrical load.

12. A reefer receptacle comprising:

a plug connector end configured to couple to an electrical load comprising an electrical cable and an electrical connector of a reefer container;

an electrical interlock coupled to the plug connector end;

a breaker coupled to the electrical interlock;

a power supply coupled to the breaker; and

a controller coupled to the power supply, wherein the controller is configured to perform at least one test to determine if an adverse electrical condition exists prior to putting the reefer container in service,

wherein the controller is configured to determine that no adverse electrical condition exists with respect to the electrical load before allowing power to flow between the plug connector end and the electrical connector of the reefer receptacle,

wherein the adverse electrical condition comprises at least one of a group consisting of a phase-to-phase fault, a loss of phase, and a phase-to-ground fault,

and wherein the adverse electrical condition exists at any point along the electrical load.

13. The reefer receptacle of Claim 12, wherein the controller and the electrical interlock are electrically coupled in series with each other.

14. The reefer receptacle of Claim 12, wherein the controller and the electrical interlock are electrically coupled in parallel with each other.

15. The reefer receptacle of Claim 12, wherein the breaker comprises a first lug port and a second lug port, wherein the controller is coupled to the first lug port, and wherein a power conductor is coupled to the second lug port.