

CLAIMS

1. A meter comprising:
 - a current transformer including a primary winding, a secondary winding and a secondary bifilar winding, wherein the primary winding corresponds to a current coil, the secondary bifilar winding includes a first bifilar winding and a second bifilar winding connected in series, and a start lead of the first bifilar winding is connected to a start lead of the second bifilar winding;
 - a voltage source configured to generate a DC voltage signal, wherein the DC voltage signal is provided to a finish lead of the first bifilar winding;
 - a first sense resistor connected between a finish lead of the second bifilar winding and ground, wherein a temperature coefficient of the first sense resistor is less than a temperature coefficient of a resistivity of a material of the first bifilar winding and the second bifilar winding; and
 - a processing circuit configured to:
 - receive an input that corresponds to a voltage across the first sense resistor;
 - use the voltage across the first sense resistor to determine a temperature associated with the current coil; and
 - when the temperature exceeds a temperature threshold, detect a hot socket condition.
2. The meter of claim 1, further comprising an A/D converter, wherein an input of the A/D converter is connected to the first sense resistor and an output of the A/D converter is connected to the processing circuit and provides the input that corresponds to the voltage across the first sense resistor.
3. The meter of claim 1, further comprising:
 - a second sense resistor connected between the secondary winding and ground,
 - wherein the processing circuit is further configured to:
 - receive an input that corresponds to a voltage across the second sense resistor;
 - and
 - use the voltage across the second sense resistor to determine a current associated with the current coil.

4. The meter of claim 1, wherein a resistance of the first sense resistor is greater than a resistance of the first bifilar winding and the second bifilar winding.

5. The meter of claim 1, further comprising a communication circuit, wherein the processing circuit is further configured to communicate a message indicating the hot socket condition to a remote system via the communication circuit.

6. The meter of claim 5, further comprising a service switch that controls a connection of the meter to a power source, wherein the processing circuit is further configured to control the service switch to disconnect the meter from the power source in response to receiving a message including a disconnect command via the communication circuit.

7. The meter of claim 1, wherein the current coil corresponds to a first phase and a second current coil corresponds to a second phase, further comprising:

a second current transformer including a primary winding, a secondary winding and a secondary bifilar winding, wherein the primary winding of the second current transformer corresponds to the second current coil, and the secondary bifilar winding of the second current transformer includes a first bifilar winding and a second bifilar winding; and

a third sense resistor connected between a finish lead of the second bifilar winding of the second current transformer and ground,

wherein the processing circuit is configured to:

receive an input that corresponds to a voltage across the third sense resistor;

use the voltage across the third sense resistor to determine a temperature associated with the second current coil; and

when the temperature exceeds the temperature threshold, detect the hot socket condition.

8. A meter comprising:

a current transformer including a primary winding, a secondary winding and a secondary bifilar winding, wherein the primary winding corresponds to a current coil, the secondary bifilar winding includes a first bifilar winding and a second bifilar winding connected in parallel, and a finish lead of the first bifilar winding is connected to a start lead of the second bifilar winding;

a voltage source configured to generate a DC voltage signal, wherein the DC voltage signal is provided to the finish lead of the first bifilar winding and the start lead of the second bifilar winding;

a first sense resistor connected between a start lead of the first bifilar winding and a finish lead of the second bifilar winding and ground,

wherein a temperature coefficient of the first sense resistor is less than a temperature coefficient of a resistivity of a material of the first bifilar winding and the second bifilar winding; and

a processing circuit configured to:

receive an input that corresponds to a voltage across the first sense resistor;

use the voltage across the first sense resistor to determine a temperature associated with the current coil; and

when the temperature exceeds a temperature threshold, detect a hot socket condition.

9. The meter of claim 8, further comprising an A/D converter, wherein an input of the A/D converter is connected to the first sense resistor and an output of the A/D converter is connected to the processing circuit and provides the input that corresponds to the voltage across the first sense resistor.

10. The meter of claim 8, further comprising:

a second sense resistor connected between the secondary winding and ground,

wherein the processing circuit is further configured to:

receive an input that corresponds to a voltage across the second sense resistor; and

use the voltage across the second sense resistor to determine a current associated with the current coil.

11. The meter of claim 8, wherein a resistance of the first sense resistor is greater than a resistance of the first bifilar winding and the second bifilar winding.

12. The meter of claim 8, further comprising a communication circuit, wherein the processing circuit is further configured to communicate a message indicating the hot socket condition to a remote system via the communication circuit.

13. The meter of claim 12, further comprising a service switch that controls a connection of the meter to a power source, wherein the processing circuit is further configured to control the service switch to disconnect the meter from the power source in response to receiving a message including a disconnect command via the communication circuit.

14. The meter of claim 8, wherein the current coil corresponds to a first phase and a second current coil corresponds to a second phase, further comprising:

a second current transformer including a primary winding, a secondary winding and a secondary bifilar winding, wherein the primary winding of the second current transformer corresponds to the second current coil and the secondary bifilar winding of the second current transformer includes a first bifilar winding and a second bifilar winding; and

a third sense resistor connected between a finish lead of the second bifilar winding of the second current transformer and ground,

wherein the processing circuit is configured to:

receive an input that corresponds to a voltage across the third sense resistor;

use the voltage across the third sense resistor to determine a temperature associated with the second current coil; and

when the temperature exceeds the temperature threshold, detect the hot socket condition.

15. A meter comprising:

a current transformer including a primary winding, a secondary winding and a secondary bifilar winding, wherein the primary winding corresponds to a current coil, the secondary bifilar winding includes a first bifilar winding and a second bifilar winding, and a start lead of the first bifilar winding is connected to a start lead of the second bifilar winding;

a voltage source configured to generate a DC voltage signal, wherein the DC voltage signal is provided to a finish lead of the first bifilar winding;

a first sense resistor connected between a finish lead of the second bifilar winding and ground, wherein a temperature coefficient of the first sense resistor is less than a temperature coefficient of a resistivity of a material of the first bifilar winding and the second bifilar winding;

an A/D converter connected between the first sense resistor and an input of a processing circuit; and

the processing circuit configured to:

receive a signal from the A/D converter that corresponds to a voltage across the first sense resistor;

use the signal from the A/D converter to determine a temperature associated with the current coil; and

when the temperature exceeds a temperature threshold, detect a hot socket condition.

16. The meter of claim 15, further comprising:

a second sense resistor connected between the secondary winding and ground,

wherein the processing circuit is further configured to:

receive an input that corresponds to a voltage across the second sense resistor; and

use the voltage across the second sense resistor to determine a current associated with the current coil.

17. The meter of claim 15, wherein a resistance of the first sense resistor is greater than a resistance of the first bifilar winding and the second bifilar winding.

18. The meter of claim 15, further comprising a communication circuit, wherein the processing circuit is further configured to communicate a message indicating the hot socket condition to a remote system via the communication circuit.

19. The meter of claim 15, further comprising a communication circuit, wherein the processing circuit is further configured to communicate a message indicating the hot socket condition to a remote system via the communication circuit.

20. The meter of claim 19, further comprising a service switch that controls a connection of the meter to a power source, wherein the processing circuit is further configured to control the service switch to disconnect the meter from the power source in response to receiving a message including a disconnect command via the communication circuit.