CLAIMS

1. A breath sensor apparatus, comprising:

a sampling unit having a housing configured to receive a sample breath from a user;

a sensor positioned within the housing and in fluid communication with the sample breath when received within the housing;

a processor in electrical communication with the sensor,

wherein the processor is configured to determine a dissipation time when the sensor is exposed to a near-constant concentration level of CO detected from the breath sample down to an ambient level of CO detected,

wherein the processor is further configured to calculate a time constant based on the dissipation time and a reduction from the near-constant concentration level to the ambient level; and

wherein the processor is further configured to apply the time constant to a transient response of the sensor to account for drift in calibrating the sensor.

2. The apparatus of claim 1 wherein the processor is further configured to apply an aging factor to the sensor prior to calculating the time constant to account for sensor degradation over time.

3. The apparatus of claim 2 wherein the aging factor is dependent upon an exposure of the sensor to temperature and humidity over a period of time.

4. The apparatus of claim 3 wherein the aging factor ranges from 2% to 5% per year.

5. The apparatus of claim 1 wherein the processor is configured to calibrate the sensor to account for drift in the transient response and in a steady state response.

6. The apparatus of claim 1 wherein the processor is further configured to provide instructions to the user to hold their breath for a predetermined period of time prior to exhaling the breath sample.

7. The method of claim 6 wherein the processor is further configured to provide instructions to the user to dissipate the breath sample from the sensor.

8. A method for calibrating a sensor, comprising:

receiving a breath sample from a user until the sensor detects a near-constant concentration level of CO from the breath sample;

determining a length of time for the near-constant concentration level of CO to dissipate to an ambient level of CO;

calculating a time constant based on the length of time and a reduction from the near-constant concentration level to the ambient level; and

calibrating the sensor to account for drift by applying the time constant to a transient response of the sensor.

9. The method of claim 8 further comprising applying an aging factor to the sensor prior to calculating the time constant to account for sensor degradation over time.

10. The method of claim 9 wherein the aging factor is dependent upon an exposure of the sensor to temperature and humidity over a period of time.

11. The method of claim 10 wherein the aging factor ranges from 2% to 5% per year.

12. The method of claim 8 further comprising calibrating the sensor to account for drift for a steady state response.

13. The method of claim 8 wherein receiving the breath comprises receiving the breath into a sampling unit in which the sensor is positioned.

14. The method of claim 8 wherein receiving the breath further comprises instructing the user to hold their breath for a predetermined period of time prior to exhaling the breath sample.

15. The method of claim 14 further comprising instructing the user to dissipate the breath sample from the sensor.