WHAT IS CLAIMED IS:

1. A breathing assistance apparatus that provides a flow of gases to a patient, the breathing assistance apparatus comprising:

a temperature sensor configured to measure a temperature of the flow of gases; and

a gases flow rate sensing system configured to measure a gases flow rate of the flow of gases,

wherein the gases flow rate sensing system is configured to operate in a first mode based on the measured temperature of the flow of gases being in a first temperature sub-range defined by a first temperature value and a second temperature value, the second temperature value being greater than the first temperature value, and

wherein the gases flow rate sensing system is configured to operate in a second mode based on the measured temperature of the flow of gases being in a second temperature sub-range defined by a third temperature value and a fourth temperature value, the fourth temperature value being greater than the third temperature value, the third temperature value being less than the second temperature value and greater than the first temperature value.

2. The breathing assistance apparatus of Claim 1, wherein the apparatus is configured to operate at the same gases flow rate in the first mode and the second mode.

3. The breathing assistance apparatus of Claim 1, wherein the apparatus is configured to operate at different gases flow rates in the first mode and the second mode.

4. The breathing assistance apparatus of any of Claims 1 to 3, wherein the second temperature value of the first temperature sub-range is 10°C higher than the third temperature value of the second temperature sub-range.

5. The breathing assistance apparatus of any of Claims 1 to 3, wherein the first mode has the first temperature sub-range with the first temperature value of 0°C and the second temperature value of 40°C, and wherein the second mode has the second temperature subrange with the third temperature value of 30°C and the fourth temperature value of 70°C.

6. The breathing assistance apparatus of any of Claims 1 to 3, wherein the gases flow rate sensing system comprises a thermistor circuit, and wherein the thermistor circuit comprises a voltage divider comprising at least a first arm and a second arm.

7. The breathing assistance apparatus of Claim 6, wherein the first mode has a first thermistor target temperature, and wherein the second mode has a second thermistor target temperature, wherein the first thermistor target temperature is lower than the second thermistor target temperature.

8. The breathing assistance apparatus of Claim 7, wherein the first thermistor target temperature is 66°C and the second thermistor target temperature is 100°C.

9. The breathing assistance apparatus of Claim 6, wherein changing a mode of the thermistor circuit comprises changing a resistance value associated with the first arm of the voltage divider.

10. The breathing assistance apparatus of Claim 6, further comprising a buffer stage between the voltage divider and a power supply.

11. The breathing assistance apparatus of any of Claims 1 to 3, wherein the gases flow rate sensing system is configured to change from the first mode to the second mode in response to the measured temperature of the flow of gases exceeding the second temperature value.

12. The breathing assistance apparatus of any of Claims 1 to 3, wherein the gases flow rate sensing system is configured to change from the second mode to the first mode in response to the measured temperature of the flow of gases falling below the third temperature value.

13. The breathing assistance apparatus of any of Claims 1 to 3, wherein the gases flow rate sensing system is configured to operate in more than two different modes based on

the measured temperature of the flow of gases being in more than two temperature sub-ranges.

14. The breathing assistance apparatus of Claim 13, wherein each pair of adjacent temperature sub-ranges overlap such that:

a lower temperature sub-range is defined by a first lower bound temperature value and a first upper bound temperature value, the first upper bound temperature value being greater than the first lower bound temperature value, and

an upper temperature sub-range is defined by a second lower bound temperature value and a second upper bound temperature value, the second upper bound temperature value being greater than the second lower bound temperature value,

wherein the second lower bound temperature value is less than the first upper bound temperature value and greater than the first lower bound temperature value.

15. The breathing assistance apparatus of any of Claims 1 to 3, wherein the gases flow source comprises a blower.

16. The breathing assistance apparatus of Claim 15, wherein the temperature sensor, the gases flow rate sensing system, or both the temperature sensor and the gases flow rate sensing system are upstream of the blower.

17. The apparatus of Claim 15, wherein the temperature sensor, the gases flow rate sensing system, or both the temperature sensor and the gases flow rate sensing system are disposed within a sensor assembly having a housing, the sensor assembly located in a sensor zone within an inlet flow path upstream of the blower.

18. The breathing assistance apparatus of Claim 15, wherein the temperature sensor, the gases flow rate sensing system, or both the temperature sensor and the gases flow rate sensing system are downstream of the blower.

19. The breathing assistance apparatus of any of Claims 1 to 3, wherein the breathing assistance apparatus further comprises at least one gases flow path configured to direct the flow of gases to the patient.

20. The breathing assistance apparatus of any of Claims 1 to 3, wherein the breathing assistance apparatus further comprises a gases flow inlet configured to receive the flow of gases from a gases flow source.

21. The breathing assistance apparatus of Claim 15, wherein the blower is comprised within a blower/sensor module.

22. The breathing assistance apparatus of Claim 21, wherein the blower/sensor module is removable and configured for insertion into a housing of the apparatus.

23. The breathing assistance apparatus of Claim 21, wherein the blower/sensor module is non-removable and configured for insertion into a housing of the apparatus.

24. The breathing assistance apparatus of Claim 21, wherein the blower/sensor module comprises a sensing circuit board.

25. The breathing assistance apparatus of Claim 21, wherein at least a portion of the gases flow rate sensing system is on the sensing circuit board.

26. The breathing assistance apparatus of any of Claims 1 to 3, wherein the breathing assistance apparatus is a Continuous Positive Airway Pressure (CPAP) apparatus, or an apparatus that delivers a noninvasive ventilation (NIV) flow, or an apparatus that delivers a nasal high flow (NHF) flow of gases.

27. The breathing assistance apparatus of any of Claims 1 to 3, wherein the apparatus further comprises a humidifier.

28. The breathing assistance apparatus of any of Claims 1 to 3, wherein the gases flow path is a heated respiratory tube.

29. The breathing assistance apparatus of any of Claims 1-13, further comprising a patient interface selected from at least one of: a face mask, a nasal mask, a nasal pillows mask, a tracheostomy interface, a nasal cannula, or an endotracheal tube.

30. The breathing assistance apparatus of Claim 9, wherein changing a resistance value associated with the first arm of the voltage divider comprises connecting or bypassing a resistor of the first arm of the voltage divider.

31. The breathing assistance apparatus of Claim 10, wherein the buffer stage comprises a transistor.

32. The breathing assistance apparatus of Claim 6, wherein the voltage divider is driven by dual power supplies.