WHAT IS CLAIMED IS:

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

~~at least one gases flow path configured to direct the flow of gases to the patient;~~

~~a gases flow inlet configured to receive the flow of gases from a gases flow source;~~

a temperature sensor configured to measure a temperature of the ~~gases~~ 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 ~~at least two different temperature modes,~~ a first mode based ~~upon~~ on the measured temperature of the ~~gases~~ 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.

~~2~~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.

~~3. The breathing assistance apparatus of Claim 2, wherein the temperature sensor and/or the gases flow rate sensing system are upstream of the blower.~~

~~4. The apparatus of any of Claims 2-3, wherein the temperature sensor and/or the gases flow rate sensing system are comprised within a sensor assembly having a housing, the sensor assembly located in a sensor zone within an inlet flow path prior to the blower.~~

~~5. The breathing assistance apparatus of Claim 2, wherein the temperature sensor and/or the gases flow rate sensing system are downstream of the blower.~~

~~6~~21. The breathing assistance apparatus of Claim ~~2 or 5~~15, wherein the blower is comprised within a blower/sensor module.

~~7~~22. The breathing assistance apparatus of Claim ~~6~~21, wherein the blower/sensor module is removable and configured for insertion into a housing of the apparatus.

~~8~~23. The breathing assistance apparatus of Claim ~~6~~21, wherein the blower/sensor module is non-removable and configured for insertion into a housing of the apparatus.

~~9~~24. The breathing assistance apparatus of ~~any of~~ Claim~~s 6-8~~21, wherein the blower/sensor module comprises a sensing circuit board.

~~10~~25. The breathing assistance apparatus of Claim ~~9~~21, wherein at least a portion of the gases flow rate sensing system is on ~~or within~~ the sensing circuit board.

~~11~~26. The breathing assistance apparatus of any of Claims 1~~-10~~ 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.

~~12~~27. The breathing assistance apparatus of any of Claims 1~~-11~~ to 3, wherein the apparatus further comprises a humidifier.

~~13~~28. The breathing assistance apparatus of any of Claims 1~~-12~~ to 3, wherein the gases flow path is a heated respiratory tube.

~~14~~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.

~~15. The breathing assistance apparatus of any of Claims 1-14, wherein the gases flow rate sensing system comprises a thermistor circuit.~~

~~16. The breathing assistance apparatus of Claim 15, wherein the gases flow rate sensing system is configured to change from a first temperature mode to a second temperature mode in response to the measured temperature of the gases flow meeting a predetermined threshold.~~

~~17. The breathing assistance apparatus of Claim 16, wherein the thermistor circuit comprises a voltage divider comprising at least a first arm and a second arm.~~

~~18. The breathing assistance apparatus of Claim 17, wherein changing a target temperature mode of the thermistor circuit comprises changing a resistance value associated with the first arm of the voltage divider.~~

~~19~~30. The breathing assistance apparatus of Claim ~~18~~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.

~~20. The breathing assistance apparatus of Claim 19, wherein changing a resistance value associated with the first arm of the voltage divider comprises connecting the resistor of the first arm of the voltage divider.~~

~~21. The breathing assistance apparatus of Claim 19, wherein changing a resistance value associated with the first arm of the voltage divider comprises bypassing the resistor of the first arm of the voltage divider.~~

~~22. The breathing assistance apparatus of any of Claims 17-21, further comprising a buffer stage between the voltage divider and a power supply.~~

~~23~~31. The breathing assistance apparatus of Claim ~~22~~10, wherein the buffer stage comprises a transistor.

~~24~~32. The breathing assistance apparatus of ~~any of~~ Claims ~~17-23~~6, wherein the voltage divider is driven by dual power supplies.

~~25. The breathing assistance apparatus of any of Claims 1-24, wherein the gases flow rate sensing system is configured to operate in two different temperature modes, based upon the measured temperature of the gases flow.~~

~~26. The breathing assistance apparatus of any of Claims 1-25, wherein the gases flow rate sensing system is configured to operate in more than two different temperature modes.~~

~~27. A system for measuring a flow rate of a flow of gases, the system comprising:~~

~~a thermistor circuit including a thermistor, wherein the thermistor circuit is configured to produce a voltage output and to operate in at least a first target temperature mode and a second target temperature mode;~~

~~a temperature sensor configured to measure a gases flow temperature; and~~

~~a controller coupled to the temperature sensor and the thermistor circuit, wherein the controller is configured to adjust the thermistor circuit to change between the at least first and second target temperature modes, in response to changes in the measured gases flow temperature.~~

~~28. The system of Claim 27, wherein thermistor circuit is a constant temperature circuit.~~

~~29. The system of any of Claims 27-28, wherein the thermistor is positioned to be within the flow of gases.~~

~~30. The system of any of Claims 27-29, wherein the controller is configured to adjust the thermistor circuit to change between at least the first and second target temperature modes by connecting or bypassing a first resistor within the thermistor circuit.~~

~~31. The system of Claim 30, wherein the controller is configured to adjust the thermistor circuit to change between at least the first and second target temperature modes by connecting the first resistor within the thermistor circuit.~~

~~32. The system of Claim 30, wherein the controller is configured to adjust the thermistor circuit to change between at least the first and second target temperature modes by bypassing the first resistor within the thermistor circuit.~~

~~33. The system of any of Claims 30-32, wherein the thermistor circuit is arranged as a Wheatstone bridge configuration comprising a first voltage divider arm and a second voltage divider arm, wherein the thermistor is located on the second voltage divider arm.~~

~~34. The system of Claim 33, wherein the first resistor is located on the first voltage divider arm.~~

~~35. The system of any of Claims 30-34, wherein the connecting or bypassing of the first resistor comprises using a switch to disconnect or connect a low resistance path in parallel with the first resistor.~~

~~36. The system of Claim 35, wherein the connecting of the first resistor comprises using the switch to disconnect the low resistance path in parallel with the first resistor.~~

~~37. The system of Claim 35, wherein the bypassing of the first resistor comprises using the switch to connect the low resistance path in parallel with the first resistor.~~

~~38. The system of any of Claims 30-37, wherein a resistance value of a second resistor located on the second arm with the thermistor in the Wheatstone Bridge is configured to correspond to a geometric mean of a first thermistor resistance of the thermistor corresponding to the first target temperature mode and a second thermistor resistance of the thermistor corresponding to the second target temperature mode.~~

~~39. The system of Claim 38, wherein the first resistor is located on a lower part of the first voltage divider arm and is configured to have a resistance such that:~~

~~when the first resistor is bypassed, a first ratio between an upper part and the lower part of the first voltage divider arm substantially matches a second ratio between the second resistor to the first thermistor resistance; and~~

~~when the first resistor is connected, the first ratio substantially matches a third ratio between the second resistor to the second thermistor resistance.~~

~~40. The system of any of Claims 33-39, wherein the Wheatstone bridge configuration further comprises a buffer stage located between the first and second voltage divider arms and a power supply.~~

~~41. The system of Claim 40, wherein the buffer stage comprises a transistor, a gate of the buffer stage connected to an output of an op-amp of the Wheatstone bridge.~~

~~42. The system of any of Claims 33-41, wherein the Wheatstone bridge is driven by at least two power supplies.~~

~~43. The system of any of Claim 27-42, wherein the voltage output of the thermistor circuit is configured to correspond to a first voltage range when operating in either the first temperature mode or the second temperature mode.~~

~~44. The system of Claim 43, wherein the first voltage range is between about 1V to about 38V.~~

~~45. The system of Claim 43, wherein the first voltage range is between about 5V to about 15V.~~

~~46. The system of any of Claims 43-45, wherein the voltage output of the thermistor circuit is scaled and shifted from the first voltage range to a second voltage range.~~

~~47. The system of Claim 46, wherein the scaling and shifting is performed by an operational-amplifier ("op-amp") circuit.~~

~~48. The system of any of Claims 46-47, wherein the second voltage range is substantially between about 0V to about 5V.~~

~~49. The system of any of Claims 46-47, wherein the second voltage range is substantially between about 0V to about 3.3V.~~

~~50. The system of any of Claims 27-49, wherein the voltage output of the thermistor circuit indicates an amount of power required to keep the thermistor at a constant temperature corresponding to either the first target temperature mode or the second target temperature mode.~~

~~51. The system of Claim 50, wherein the gases flow rate is determined based upon the voltage output and the measured gases flow temperature.~~

~~52. The system of any of Claims 27-51, wherein the thermistor circuit provides a different range of voltage outputs for the each of the first and second temperature modes.~~

~~53. The system of Claim 52, wherein the voltage output of the thermistor circuit is scaled and shifted by a scaling and shifting mechanism, wherein the scaling and shifting mechanism is modified based upon the temperature mode that the thermistor circuit is operating in such that an output voltage range of the scaling and shifting mechanism is substantially the same in either the first or second target temperature mode.~~

~~54. The system of Claim 53, wherein the scaling and shifting mechanism is an op-amp circuit.~~

~~55. The system of Claim 54, wherein the op-amp circuit is modified by connecting or bypassing a resistor.~~

~~56. The system of any of Claims 53-55, wherein the output voltage range of the scaling and shifting mechanism is substantially between about 0V and about 5V.~~

~~57. The system of any of Claims 53-55, wherein the output voltage range of the scaling and shifting mechanism is substantially between about 0V and about 3.3V.~~

~~58. The system of any of Claims 27-57, wherein the first and second target temperature modes comprise a lower temperature mode and a higher temperature mode, and~~

~~wherein the controller is configured to switch the thermistor circuit from operating in the lower temperature mode to the higher temperature mode when the measured gases flow temperature is higher than a first threshold value.~~

~~59. The system of Claim 58, wherein the controller is configured to switch the thermistor circuit from operating in the higher temperature mode to the lower temperature mode when the measured gases flow temperature is lower than a second threshold value.~~

~~60. The system of Claim 59, wherein the first threshold value is higher than the second threshold value.~~

~~61. The system of any of Claims 27-60, wherein the controller is configured to be unable to adjust the thermistor circuit between the first and second target temperature modes for a pre-determined period of time after a previous adjustment.~~

~~62. The system of any of Claims 27-61, wherein the first and second target temperatures modes correspond respectively to between about 50^0C to about 70^0C, and between about 90^0C to about 110^0C.~~

~~63. The system of any of Claims 27-61, wherein the first and second target temperatures modes correspond respectively to between about 60^0C to about 67^0C, and between about 95^0C to about 105^0C.~~

~~64. The system of any of Claims 22-61, wherein the first and second target temperatures modes correspond respectively to about 66^0C and about 100^0C.~~

~~65. The system of any of Claims 27-64, wherein the first and second target temperature modes are associated with gases flow temperature ranges of between about 0^0C to about 60^0C, and between about 20^0C to about 100^0C respectively.~~

66. The system of any of Claims 27-64, wherein the first and second target temperature modes are associated with gases flow temperature ranges of between about 0^0C to about 50^0C, and between about 25^0C to about 85^0C respectively.

67. The system of any of Claims 27-64, wherein the first and second target temperature modes are associated with gases flow temperature ranges of between about 0^0C to about 40^0C, and between about 30^0C to about 70^0C respectively.

68. The system of any of Claims 27-67, wherein the controller is a microcontroller.

69. The system of any of Claims 27-68, wherein the controller comprises a comparator circuit.

70. The system of any of Claims 27-69, wherein the controller is configured to adjust the thermistor circuit to change between more than two different target temperature modes, in response to changes in the measured gases flow temperature.

71. A system for measuring a flow rate of a gases flow, comprising

a thermistor circuit comprising a thermistor, the thermistor circuit having a plurality of different target temperature modes,

wherein the thermistor circuit is configured to output a range of output voltages, the range of output voltages being the same for each of the plurality of temperature modes.

72. The system of Claim 71, comprising a temperature sensor configured to measure a gases flow temperature.

73. The system of Claim 71 or 72, wherein the output voltages by the thermistor represent a power draw of the thermistor circuit and indicate a speed or velocity of the gases flow.

74. The system of Claim 73, wherein the output voltages output by the thermistor represent a power draw of the thermistor circuit and indicate a flow rate of the gases flow.

~~75. The system of any of Claims 71-74, wherein the thermistor circuit has more than two different target temperature modes.~~

~~76. The system of Claim 75, wherein the thermistor circuit is configured to measure gases flow rates of between about 0 L/min to about 200 L/min.~~

~~77. The system of Claim 75, wherein the thermistor circuit is configured to measure gases flow rates of between about 0 L/min to about 150 L/min.~~

~~78. The system of Claim 75, wherein the thermistor circuit is configured to measure gases flow rates of between about 0 L/min to about 100 L/min.~~

~~79. The system of any of Claims 27-78, further comprising a blower.~~

~~80. The system of Claim 79, wherein the thermistor circuit is upstream of the blower.~~

~~81. The system of Claim 79, wherein the thermistor circuit is downstream of the blower.~~

~~82. The system of any of Claims 79-81, wherein the blower is configured to provide a high flow therapy to a patient.~~

~~83. The system of any of Claims 79, 81-82, wherein the blower is comprised within a blower/sensor module.~~

~~84. The system of Claim 83, wherein the blower/sensor module is removable and configured for insertion into a housing of the system.~~

~~85. The system of Claim 83, wherein the blower/sensor module is non-removable from a housing of the system.~~

~~86. The apparatus or system of any of Claims 83-85, wherein the blower/sensor module comprises a sensing circuit board.~~

~~87. The system of Claim 86, wherein at least a portion of the thermistor circuit is on or within the sensing circuit board.~~

~~88. The system of any of Claims 27-87, further comprising a patient breathing conduit configured to be coupled to a gases flow outlet of the system at one end of the conduit and to a patient interface at another end of the conduit.~~

~~89. The system of Claim 88, wherein the patient interface is a nasal cannula, a full face mask, a nasal mask, an tracheostomy interface, a nasal pillows mask, or an endotracheal tube.~~

~~90. The system of Claim 88 or 89, wherein the patient breathing conduit comprises a heater wire configured to heat gases passing through the conduit.~~

~~91. The system of any of Claims 27-90, further comprising a humidifier configured to humidify the gases flow to a patient.~~