WHAT IS CLAIMED IS:

1. A respiratory support device forming part of a respiratory support system which delivers a flow of gases to a patient, wherein the respiratory support device is configured to receive a humidification chamber containing a volume of liquid, the respiratory support device comprising:

a heater plate configured to transfer heat to the humidification chamber, wherein an inlet of the humidification chamber is configured to receive the flow of gases to be heated and humidified, and an outlet of the humidification chamber is configured to be coupled to an inspiratory tube;

a first sensor configured to measure a current temperature of the heater plate;

at least one or more other sensors configured to measure parameters relating to at least one of the gases flowing through the apparatus, an ambient environment, or hardware within the apparatus, wherein each of the at least one or more other sensors is configured to measure a different parameter than the rest of the at least one or more other sensors;

a user interface configured to receive user input; and

a controller in electrical communication with the heater plate, the first and at least one or more other sensors, and the user interface, wherein the controller is configured to control a heat output of the heater plate in order to adjust the heat transferred to the humidification chamber, wherein the controller is further configured to:

determine a heater plate temperature limit in response to the user input received via the user interface and based, at least in part, on the parameters measured by the at least one or more other sensors; and

calculate a maximum power limit to the heater plate based, at least in part, on the heater plate temperature limit and data from the first sensor.

2. The device of claim 1, wherein the heater plate temperature limit is a temperature at which the heater plate is configured to operate such that a dew point of the gases is below a limit that can result in injury to the patient.

3. The device of claim 1 or 2, wherein the user input comprises at least one of: a temperature set point change, a dew point set point change, a flow rate set point change, or any combination thereof.

4. The device of any one of claims 1-3, wherein the controller is configured to update a current maximum power limit to the heater plate to be the calculated maximum power limit to the heater plate in response to the determined heater plate temperature limit being lower than a current heater plate temperature limit.

5. The device of claim 4, wherein the controller is configured to maintain an existing maximum power limit to the heater plate unless the determined heater plate temperature limit is lower than the current heater plate temperature limit.

6. The device of claim 4 or claim 5, wherein the current heater plate temperature limit is a pre-set temperature limit.

7. The device of claim 6, wherein the pre-set temperature limit is a temperature limit above which a hardware safety feature is triggered.

8. The device of any one of claims 1-7, further comprising a flow generator located in a housing of the device, and wherein the flow generator comprises a blower.

9. The device of any one of claims 1-8, wherein the power provided to the heater plate is dependent on a duty cycle.

10. The device of any one of claims 1-9, wherein the outlet of the humidification chamber comprises a removable outlet elbow for coupling to the inspiratory tube.

11. The device of any one of claims 1-10, wherein the at least one or more other sensors comprises two or more other sensors.

12. A respiratory support system comprising:

the respiratory support device of any one of claims 1-11; and

the inspiratory tube.

13. The system of claim 12, wherein the parameters measured by the at least one or more other sensors comprise at least one of: a flow rate of the gases within a flow path of the system, a temperature measured at the outlet of the humidification chamber, a dew point measured at the outlet of the humidification chamber, a temperature measured at the inlet of the humidification chamber, a dew point measured at the inlet of the humidification chamber,

an ambient temperature, a pressure of the gases within the flow path of the system, or an electrical power, current, or voltage supplied to the heater plate.

14. The system of claim 13, wherein the flow rate of the gases is a mass flow rate, or wherein the flow rate of the gases is a volumetric flow rate.

15. The system of any one of claims 12-14, wherein the inspiratory tube is a heated inspiratory tube, and wherein the controller is configured to control a heat output to a heating element in the inspiratory tube.

16. The system of any one of claims 12-15, further comprising the humidification chamber.

17. The system of any one of claims 12-16, further comprising an unsealed patient interface.

18. The system of any one of claims 12-17, further comprising at least one of a temperature sensor or dew point sensor at or near a patient end of the inspiratory tube.

19. A method of controlling a respiratory support device, wherein the respiratory support device forms part of a respiratory support system and is configured to receive a humidification chamber to heat and humidify the flow of gases, the method comprising:

under control of a controller of the respiratory support device,

receiving data from a first sensor and at least two other sensors, the first sensor configured to measure a current temperature of a heater plate of the respiratory support device and the at least two other sensors configured to measure parameters relating to at least one of the gases flowing through the device, an ambient environment, or hardware within the device, wherein each of the at least two other sensors is configured to measure a different parameter than the rest of the at least two or more sensors;

receiving user input, via a user interface, wherein the user input changes at least one parameter setting for the respiratory support device;

determining a heater plate temperature limit in response to the user input received via the user interface and based, at least in part, on data from the at least two other sensors; and

calculating a maximum power limit to the heater plate based, at least in part, on the heater plate temperature limit and the data from the first sensor.

20. The method of claim 19, wherein the power provided to the heater plate is dependent on a duty cycle.

21. The method of claim 19 or claim 20, wherein the heater plate temperature limit is a temperature at which the heater plate is configured to operate without a dew-point temperature of the gases directed into the user's airway exceeding a value that can result in injury to the patient.

22. The method of any one of claims 19-21, wherein the user input comprises at least one of: a temperature set point change, a dew point set point change, or a flow rate set point change.

23. The method of any one of claims 19-22, further comprising updating a current maximum power limit to the heater plate to be the calculated maximum power limit to the heater plate in response to the determined heater plate temperature limit being lower than a current heater plate temperature limit.

24. The method of claim 23, further comprising maintaining an existing maximum power limit to the heater plate unless the determined heater plate temperature limit is lower than the current heater plate temperature limit.

25. The method of claim 23 or claim 24, wherein the current heater plate temperature limit is a pre-set temperature limit, and wherein the pre-set temperature limit is a temperature limit above which a hardware safety feature is triggered.

26. The method of any one of claims 19-25, wherein the parameters measured by the at least two other sensors comprise at least two of: a flow rate of the gases within a flow path of the respiratory support system, a temperature measured at an outlet of the humidification chamber, a temperature measured at the inlet of the humidification chamber, an ambient temperature, a pressure of the gases within the flow path of the system, or an electrical power, current, or voltage supplied to the heater plate.

27. The method of claim 26, wherein the flow rate of the gases is a mass flow rate, or wherein the flow rate of the gases is a volumetric flow rate.