CLAIMS

1. A respiratory therapy system configured to detect the presence of liquid water in a breathing gases respiratory conduit for use in respiratory treatment of a patient, the system comprising a controller configured to:

a) retrieve at least one first signal associated with or indicative of a gases flow and/or pressure in the respiratory conduit;

b) determine a measure of at least one first parameter associated with gases flow perturbations and/or pressure perturbations for at least one portion of the retrieved at least one first signal;

c) determine the presence of liquid water in the respiratory conduit based at least in part on the measure(s) of the at least one first parameter meeting a first threshold; and

d) upon determination of the presence of liquid water in the respiratory conduit, increase the temperature within the respiratory conduit by controlling one or more operation setting(s) of components of the respiratory therapy system, so as to reduce the presence of liquid water.

2. The respiratory therapy system of claim 1, wherein the controller is further configured to:

a) determine at least one further first parameter associated with flow perturbations and/or pressure perturbations for at least one further portion of the received at least one first signal; and

b) determine the presence of liquid in the respiratory conduit further based at least in part on the at least one further first parameter meeting the first threshold.

3. The respiratory therapy system of claim 1 or 2, wherein the controller is configured to identify the gases flow perturbations and/or pressure perturbations for the associated portion of the retrieved at least one first signal based at least in part on a comparison between that at least one portion of the retrieved signal and a reference.

4. The respiratory therapy system of any preceding claim, wherein the controller is further configured to:

a) retrieve information indirectly related to gases flow and/or pressure;

b) determine a measure of at least one second parameter associated with the retrieved information, and wherein the determination the presence of liquid in the respiratory conduit is further based at least in part on the measure(s) of the at least one second parameter meeting a second threshold.

5. The respiratory therapy system of claim 4, wherein the at least one second parameter is associated with one or more of:

a) a temperature of the gases flow;

b) an ambient temperature;

c) a humidity of the gases flow;

d) an ambient humidity;

e) device geographic location;

f) environment weather forecast; and/or

g) altitude.

6. The respiratory therapy system of any preceding claim, wherein the at least one first parameter is associated with spikes caused by perturbations in gases flow and/or pressure.

7. The respiratory therapy system of any one of claims 3 to 6, wherein the reference is associated with an estimated gases flow and/or pressure of the respiratory conduit.

8. The respiratory therapy system of claim 7, wherein the estimated gases flow and/or pressure is estimated based, at least in part, on a set gases flow and/or pressure profile of a respiratory therapy device operatively connected to the respiratory conduit, in use, and/or one or more properties or characteristics associated with the patient's respiration, such

as any one or more of respiratory pattern/rate, tidal volume, minute volume, lung compliance or lung restriction.

9. The respiratory therapy system according to any preceding claim, wherein the at least one first parameter relates to any one or more of:

a) a frequency,
b) an intensity,
c) an amplitude,
d) a period between peaks,
e) a period of peaks,
f) a location of changes in the breath cycle, and/or
g) a duration of flow perturbations and/or pressure perturbations of the at least one first signal in view of a reference.

10. The respiratory therapy system of any previous claim, wherein at least one of the first parameter(s) is determined based, at least in part, on a frequency analysis of the at least one first signal;

wherein the frequency analysis is optionally based, at least in part, on a Fast Fourier Transform (FFT) of the at least one first signal.

11. The respiratory therapy system of any preceding claim, wherein the system comprises any one of:

a) a humidifier;
b) a flow generator; and/or
c) a breathing gases respiratory conduit.

12. The respiratory therapy system of any preceding claim, further comprising a breathing gases conduit heater wire, or a humidifier heater.

13. The respiratory therapy system of claim 12, wherein the controller is configured to control operation settings of components of the respiratory therapy system by controlling an operation setting of the breathing gases conduit heater wire, or the humidifier heater.

14. The respiratory therapy system of claim 13, wherein the controller is configured to maintain the increased temperature in the respiratory conduit at least until the presence of liquid water is no longer detected.

15. The respiratory therapy system of claim 13 or 14, wherein the controller is configured to control the breathing gases conduit heater wire to heat to a higher power or maximum power, and/or control the humidifier heater to a reduced power or switch the humidifier heater off.