CLAIMS

~~1. A connector for a medical tube, wherein the connector comprises:~~

~~a first portion having a first opening configured to receive a flow of gases,~~

~~a second portion having a second opening, the second portion configured to engage with a medical tube and provide a flow of gases to the medical tube through the second opening,~~

~~a lumen formed by the first portion and the second portion, the lumen providing a gases flow path between the first opening and the second opening,~~

~~wherein the first portion of the connector comprises a sensor port, the sensor port configured to receive a sensor, wherein the sensor port is located on a side of the first portion of the connector,~~

~~wherein the second portion of the connector comprises at least one electrical port, the electrical port configured to provide an electrical connection to at least one wire in the tube, and wherein the electrical port is located on the top of the second portion of the connector.~~

~~2.~~1. A connector for a medical tube, wherein the connector comprises:

a first portion having a first opening configured to receive a flow of gases,

a second portion having a second opening, the second portion configured to engage with a medical tube and provide a flow of gases to the medical tube through the second opening,

a lumen formed by the first portion and the second portion, the lumen providing a gases flow path between the first opening and the second opening,

wherein the first portion of the connector comprises a sensor port, the sensor port configured to receive a sensor,

wherein the second portion of the connector comprises at least one electrical port, the electrical port configured to provide an electrical connection to at least one wire in the medical tube,

and wherein the sensor port is offset about 120 to about 75 degrees, or about 110 to about 80 degrees, or about 90 degrees, about a longitudinal axis of the lumen relative to the electrical port.

~~3.~~2. The connector of ~~any of~~ claim 1 ~~or 2~~, wherein the first portion is angled with respect to the second portion to form an elbow.

~~4.~~3. The connector of any of claim 1 or ~~3~~2, wherein the angle between the first portion and the second portion is about 90 degrees to about 170 degrees, or about 100 degrees to about 150 degrees, or about 110 to about 140 degrees, or about 135 degrees.

~~5.~~4. The connector of any one of claims 1 to ~~4~~3, wherein the first portion provides for a taper fit connection.

~~6.~~5. The connector of any one of claims 1 to ~~5~~4, wherein the sensor port provides an aperture for the sensor to be inserted so as to be in contact with a flow of gases in the first portion of the connector.

~~7.~~6. The connector of any one of claims 1 to ~~6~~5, wherein the sensor is configured to measure flow rate of the flow of gases in the first portion of the connector and/or measure temperature of the flow of gases in the first portion of the connector~~.~~ and/or measure humidity of the flow of gases in the first portion of the connector.

~~8.~~7. The connector of any one of claims 1 to ~~7~~6, wherein said sensor is comprised as part of a probe, the probe for being received by the sensor port.

~~9. The connector of any one of to 8, wherein the sensor port is offset about 120 to about 75 degrees, or about 110 to about 80 degrees, or about 90 degrees, about a longitudinal axis of the lumen relative to electrical port.~~

~~10.~~8. The connector of any one of claims 1 to ~~9~~7, wherein opposite sides of the elbow define internal and external elbow surfaces, and wherein the electrical port is located on the external elbow surface.

~~11.~~9. The connector of any one of claims 1 to ~~10~~8, wherein the sensor port is oriented perpendicular to the first portion.

~~12.~~10. The connector of any one of claims 1 to ~~11~~9, wherein the sensor port is oriented perpendicular to a longitudinal axis of the first portion.

~~13.~~11. The connector of any one of claims 1 to ~~12~~10, wherein the electrical port is oriented perpendicular to the second portion~~.~~ or located tangential to an outer surface of the connector.

~~14. The connector of any one of claims 1 to 12, wherein the electrical port is located tangential to an outer surface of the connector.~~

~~15.~~12. The connector of any one of claims 1 to ~~14~~11, wherein the electrical port is offset from a longitudinal central axis of the second portion of the connector.

~~16.~~13. The connector of any one of claims 1 to ~~15~~12, the sensor port having a longitudinal axis, the sensor port allowing communication with an interior of the connector.

~~17.~~14. The connector of any one of claims 1 to ~~16~~13, wherein the longitudinal axis of the sensor port is oriented substantially perpendicularly to the flow of gases through the first portion of the connector.

~~18.~~15. The connector of any one of claims 1 to ~~17~~14, wherein the longitudinal axis of the sensor port substantially intersects a corresponding longitudinal axis of the first portion of the connector from which the sensor port depends.

~~19.~~16. The connector of any one of claims 1 to ~~18~~15, wherein the sensor port comprises a substantially cylindrical cross-section.

~~20.~~17. The connector of any one of claims 1 to ~~19~~16, wherein a terminal surface of the sensor port distal of an outer surface of the first portion comprises one or more locating features.

~~21. The connector of claim 20, wherein the one or more locating features comprise one or more notches of the terminal surface of the sensor port.~~

~~22. The connector of claim 20 or 21, wherein the one or more notches extend in the direction of the longitudinal axis of the sensor port.~~

~~23. The connector of any one of claims 1 to 22, wherein the connector comprises a grommet, the grommet configured to be located with the sensor port.~~

~~24. The connector of claim 23, wherein the grommet is integrally formed with the sensor port, and/or a jacket.~~

~~25. The connector of claim 23 or claim 24, wherein the locating features comprise a plurality of notches, the notches spaced apart about a perimeter of the terminal surface and at least one of the plurality of notches configured to mate with a corresponding number of projections of the grommet.~~

~~26. The connector of any one of claims 23 to 25, wherein the grommet comprises a sensor orienting notch for receiving a projection of a or the sensor and rotationally orienting said sensor about the longitudinal axis of the sensor port.~~

~~27. The connector of any one of claims 1 to 26, wherein the sensor port comprises a sensor orienting notch for receiving a projection of a or the sensor and rotationally orienting said sensor about the longitudinal axis of the sensor port.~~

~~28. The connector of any one of claims 1 to 27, wherein the or a grommet comprises a sensor locating feature for engaging with a surface of a sensor and locating said sensor at a desired location within the sensor port.~~

~~29. The connector of any one of claims 23 to 28, wherein the sensor locating feature comprises a radially extending lip spaced away from the terminal surface of the sensor port and projecting inwardly towards the longitudinal axis of the sensor port.~~

~~30. The connector of any one of claims 23 to 29, the connector comprises a jacket for the sensor port, the jacket for fitment at least partially about the sensor port, and/or the grommet.~~

~~31. The connector of claim 30, wherein the jacket comprises a sensor orienting notch for receiving a projection of a said sensor and rotationally orienting said sensor about the longitudinal axis of the sensor port and/or grommet, and relative to the jacket.~~

~~32. The connector of claim 30 or 31, wherein the sensor orienting notch is configured to engage with the sensor orienting notch of the grommet and sensor port to allow for the mating of the jacket with the sensor port and grommet in only one relative rotational position.~~

~~33. The connector of any one of claims 30 to 32, wherein the jacket comprises a sensor depth locating feature for engaging with a surface of said sensor and locating the sensor at a desired distance within the first portion of the connector, and/or a desired location on or parallel to the longitudinal axis of the sensor port.~~

~~34. The connector of any one of claims 30 to 33, wherein the jacket comprises two securing members for securing the jacket to either or both of the sensor port and the first portion.~~

~~35. The connector of claim 34, wherein the securing members are for use in securing the jacket to the first portion.~~

~~36. The connector of claim 34 or 35, wherein the securing members at least partially encircle an outer surface of the first portion from which the sensor port depends.~~

~~37. The connector of any one of claims 34 to 36, wherein the securing members at least partially encircle and are configured to frictionally engage with the outer surface of the first portion such as to secure the jacket to the first portion.~~

~~38. The connector of any one of claims 34 to 37, wherein the securing members comprise locking features to engage with corresponding locking features of the respective first portion.~~

~~39. The connector of claim 38, wherein the locking features of the first portion are located on substantially opposite sides of said first portion.~~

~~40. The connector of claim 38 or 39, wherein the locking features of the respective first portion are spaced apart from each other along the lumen.~~

~~41. The connector of any one of claims 38 to 40, wherein the locking features of the first portion are aligned substantially parallel to a longitudinal axis of the second portion.~~

~~42. The connector of any one of claims 1 to 41, the connector comprises a cover for coupling with the sensor port and for sealing the sensor port, the cover comprising a projection for location within and a sealing of the sensor port.~~

~~43. The connector of claim 42, wherein the cover depends from the jacket.~~

~~44. The connector of claim 42 or 43, wherein the cover is connected to the jacket by a tether.~~

~~45. The connector of any one of claims 42 to 44, wherein when the cover is not coupled with the sensor port the tether is configured to be located away from the sensor port.~~

~~46. The connector of any one of claims 42 to 45, wherein when the cover is not coupled with the sensor port the tether is configured to extend substantially perpendicularly to the longitudinal axis of the sensor port.~~

~~47. The connector of any one of claims 42 to 46, wherein the cover comprises a gripping feature to aid in gripping of the cover by a user~~

~~48. The connector of claim 47, wherein the gripping feature is an outwardly extending collar.~~

~~49. The connector of claim 47 or claim 48, wherein the when the sensor port is sealed by the projection the gripping feature is presented set away from the jacket such that the gripping feature may be grasped by a user.~~

~~50. The connector of any one of claims 47 to 49, wherein the gripping feature does not extend laterally past an extent of a portion of the jacket fitted about the sensor port.~~

~~51. The connector of any one of claims 47 to 50, wherein the jacket comprises an upstand to engage with the gripping feature and provide a limit to the passage of the projection within the sensor port.~~

~~52. The connector of claim 51, wherein the upstand is comprised by a or the sensor depth locating feature of the jacket.~~

~~53.~~18. The connector of any one of claims 1 to ~~52~~17, wherein the electrical port is configured to extend in a direction upward and/or away from the humidifier when the connector is connected to a humidification chamber.

~~54. The connector of any one of claims 1 to 52, wherein the electrical port is configured extend in a direction away from the humidifier when the connector is connected to a humidification chamber.~~

~~55. A medical tube assembly, the medical tube assembly comprising:~~

~~a tube, the tube comprising:~~

~~a lumen extending from a first end of the tube to a second end of the tube,~~

~~a first elongate member comprising a hollow body spirally wound to form at least in part said lumen,~~

~~a second elongate member spirally wound and joined between adjacent turns of the first elongate member, and~~

~~wherein a first end of the tube comprises at least one connector,~~

~~the connector comprising:~~

~~a first portion having a first opening configured to receive a flow of gases,~~

~~a second portion having a second opening, the second portion configured to engage with a medical tube and provide a flow of gases to the medical tube through the second opening,~~

~~a lumen formed by the first portion and the second portion, the lumen providing a gases flow path between the first opening and the second opening,~~

~~wherein the first portion is angled with respect to the second portion to form an elbow.~~

~~56. The medical tube assembly of claim 55, wherein the first portion of the connector comprises a sensor port, the sensor port configured to receive a sensor.~~

~~57. The medical tube assembly of claim 55 or claim 56, wherein the second portion of the connector comprises at least one electrical port, the electrical port configured to provide an electrical connection to the or at least one wire in the tube.~~

~~58. A medical tube assembly, the medical tube assembly comprising:~~

~~a tube, the tube comprising:~~

~~a lumen extending from a first end of the tube to a second end of the tube,~~

~~a first elongate member comprising a hollow body spirally wound to form at least in part said lumen,~~

~~a second elongate member spirally wound and joined between adjacent turns of the first elongate member, and~~

~~wherein a first end of the tube comprises at least one connector,~~

~~the connector comprising:~~

~~a first portion having a first opening configured to receive a flow of gases,~~

~~a second portion having a second opening, the second portion configured to engage with a medical tube and provide a flow of gases to the medical tube through the second opening,~~

~~a lumen formed by the first portion and the second portion, the lumen providing a gases flow path between the first opening and the second opening~~

the first portion of the connector comprises a sensor port, the sensor port configured to receive a sensor.

59. The medical tube assembly of claim 58, wherein the second portion of the connector comprises at least one electrical port, the electrical port configured to provide an electrical connection to the or at least one wire in the tube.

60. A medical tube assembly, the medical tube assembly comprising:

a tube, the tube comprising:

a lumen extending from a first end of the tube to a second end of the tube,

a first elongate member comprising a hollow body spirally wound to form at least in part said lumen,

a second elongate member spirally wound and joined between adjacent turns of the first elongate member, and

wherein a first end of the tube comprises at least one connector,

the connector comprising:

a first portion having a first opening configured to receive a flow of gases,

a second portion having a second opening, the second portion configured to engage with a medical tube and provide a flow of gases to the medical tube through the second opening,

a lumen formed by the first portion and the second portion, the lumen providing a gases flow path between the first opening and the second opening

wherein the second portion of the connector comprises at least one electrical port, the electrical port configured to provide an electrical connection to the or at least one wire in the tube.

61. The medical tube assembly of claim 60, wherein the electrical port is located tangential to an outer surface of the connector.

62. A medical tube assembly, the medical tube assembly comprising:

a connector, the connector being the connector of any one of claims 1 to 54.

a tube, the tube comprising:

~~a lumen extending from a first end of the tube to a second end of the tube,~~

~~a first elongate member comprising a hollow body spirally wound to form at least in part said lumen,~~

~~a second elongate member spirally wound and joined between adjacent turns of the first elongate member.~~

~~63. The medical tube assembly of any one of claims 55 to 63, wherein second elongate member forming at least a portion of the lumen.~~

~~64. The medical tube assembly of any one of claims 55 to 64, wherein the first elongate member of the tube forms in longitudinal cross-section a plurality of hollow portions each with a flattened surface forming at least part of the wall surrounding the lumen~~

~~65. The medical tube assembly of any one of claims 55 to 65, wherein the medical tube comprises at least one wire.~~

~~66. The medical tube assembly of claim 65, wherein the wire is located between the plurality of hollow portions and the lumen of the tube.~~

~~67. The medical tube assembly of claim 65 or claim 66, wherein the wire is located within the second elongate member.~~

~~68. The medical tube assembly of any one of claims 55 to 67, wherein the lumen formed by the first elongate member and the second elongate member comprises a substantially smooth bore.~~

~~69. The medical tube assembly of any of claims 55 to 68, wherein an outer surface of the tube is corrugated, and optionally the corrugations are annular or helical.~~

~~70. The medical tube assembly of any of claims 55 to 69, wherein the at least one wire extends along a portion of the length of the medical tube.~~

~~71. The medical tube assembly of any of claims 65 to 70, wherein the at least one wire comprises at least one heater wire.~~

~~72. The medical tube assembly of any of claim 71, wherein the at least one wire comprises a pair of heater wires.~~

~~73. The medical tube assembly of any of claim 65 to 72, wherein the at least one wire comprises at least one sensor wire.~~

74. The medical tube assembly of any of claim 65 to 73, wherein the at least one wire comprises a pair of sensor wires.

75. The medical tube assembly of any one of claims 71 to 74, the heating wire is located within the lumen of the medical tube.

76. The medical tube assembly of any one of claims 71 to 75, the heating wire is attached to an inner wall of the medical tube.

77. The medical tube assembly of any one of claims 71 to 76, wherein the heating wire is embedded within a wall of said medical tube.

78. The medical tube assembly of any one of claims 71 to 77, wherein a wire is embedded within a second elongate member.

79. The medical tube assembly of any one of claims 55 to 78, wherein an internal diameter of the lumen of the medical tube may be about 10 mm to about 25 mm, or about 13 mm to about 20 mm, or about 16 mm to about 18 mm, or about 17.

80. The medical tube assembly of any one of claims 55 to 79, wherein a length of the medical tube is about 1.4 m to about 1.8 m or about 1.5 m to about 1.7 m.

81. The medical tube assembly of any of claims 55 to 80, wherein the medical tube is a respiratory tube or an inspiratory tube.

82. The medical tube assembly of any of claims 55 to 81, wherein a lumen of the tube comprises a substantially smooth bore.

83. The medical tube assembly of any of claims 55 to 81, wherein the connector comprises the features of any one of claims 1 to 54.

84. A medical tube assembly, the medical tube assembly comprising:

a medical tube, the medical tube having at least one wire located in a tube wall of the medical tube, wherein the wire is helically wound,

a connector, the connector located at an end of the medical tube,

wherein the connector comprises at least one electrical port, the electrical port extending outwardly from the connector, the electrical port configured to provide an electrical connection with said at least one wire, optionally the electrical port comprises at least connection point, the connection point configured to provide for connection of the electrical port to the at least one wire,

~~wherein the connector comprises at least one guide feature configured to direct the at least one wire from the tube wall of the tube, and/or a pin connected to said at least one wire, to the electrical port and/or the connection point of the electrical port,~~

~~wherein the electrical port is located tangentially with respect to an outer surface of the connector.~~

19. The connector of any one of claims 1 to 18, wherein the electrical port comprises at least one connection point, the connection point configured to provide for connection of the electrical port to the at least one wire.

20. The connector of any one of claims 1 to 19, wherein the connector comprises at least one guide feature configured to direct the at least one wire from the tube wall of the tube, and/or a pin connected to said at least one wire, to the electrical port and/or the or a connection point of the electrical port.