Claims

1. A device (1) for measuring a temperature at one or more locations in an organ or tissue inside the human or animal body, the device comprising:
   - a catheter tube (2) having a distal end and a proximal end, in which the distal end is adapted for inserting into the body in or on the organ or tissue while the proximal end is adapted for remaining outside the body in use of the device,
   - at least one resistive temperature sensor (3) in the tube,
   - a plurality of electrical wires (4) in the tube that are connected to the at least one resistive temperature sensor (3), and
   - a connector (21), at the proximal end of the tube (2), for electrically connecting the at least some of the plurality of electrical wires (4) to an external device,

   wherein the resistive temperature sensor (3) comprises a thermal resistor (11) and a first terminal (12) and a second terminal (13) between which a temperature dependent resistance of the thermal resistor can be measured, wherein each of the two terminals (12,13) of the resistive temperature sensor (3) is directly connected to at least one of said plurality of electrical wires (4), wherein the device further comprises n+3 wires (4) for n sensors (3) in the tube.
2. The device of claim 1, wherein said electrical wires (4) are twisted around each other in helices.
3. The device of any of the previous claims, wherein said thermal resistor (11) is a platinum resistor, a PT100 resistor or a PT1000 resistor.
4. The device of any of the previous claims, wherein the resistive temperature sensor (3) comprises a thin-film substrate and wherein said thermal resistor (11) is an elongate conductive metal trace arranged in a meandering pattern on said substrate.
5. The device of any of the previous claims, wherein said resistive temperature sensor (3) comprises a thermal resistor dimensioned such as to fit into said catheter tube (2), wherein said electrical wires (4) have a diameter in the range of 10 µm to 100 µm or in the range of 30 µm to 80 µm, wherein said catheter tube (2) has an outer diameter in the range of 463 µm to 820 µm and an inner diameter in the range of 260 µm to 514 µm.
6. The device of any of the previous claims, wherein the at least one resistive temperature sensor (3) is a plurality of resistive temperature sensors.
7. The device of claim 6, wherein a first plurality of electrical wires (41,43) connects the plurality of resistive temperature sensors (3) in series such as to let a current run through the plurality of resistive temperature sensors in operation of the device, the first plurality of electrical wires comprising or consisting of:
   - a first wire running from the proximal end of the tube to the first terminal of a first resistive temperature sensor in the series,
   - a second wire running from the proximal end of the tube to the second terminal of a last resistive temperature sensor in the series, and

- a plurality of wire segments (43) each connecting the second terminal of a previous resistive temperature sensor in the series to the first terminal of a next resistive temperature sensor in the series.

8. The device of claim 7, wherein at least one of the two terminals (12,13) of each resistive temperature sensor (3) is directly connected to at least two electrical wires of the plurality of electrical wires running from the proximal end of the tube (2) such as to allow the resistive temperature sensor to be read out using a three-wire readout configuration.

9. The device of claim 7, wherein a second plurality of electrical wires (42), for measuring voltage differences, runs from the proximal end of the tube (2) and connects to the plurality of resistive temperature sensors (3), the second plurality of electrical wires consisting of :

- a first wire running from the proximal end of the tube to connect to the first terminal of the first resistive temperature sensor in said series,
- a second wire running from the proximal end of the tube to connect to the second terminal of a last resistive temperature sensor in the series, and
- a plurality of wires running from the proximal end of the tube to connect to respectively each of the wire segments (43) or a terminal to which the wire segment is connected.

10. The device of any of the previous claims, comprising a structural wire (5) in the tube (2) to increase the axial stiffness of the tube (2), and/or a filler material (6) that fills the tube (2).

11. The device of claim 10, wherein said structural wire (5) is composed of tungsten or a tungsten alloy and/or has a thickness in the range of 40 µm to 150 µm.

12. The device of any of the previous claims, comprising an integrated circuit for storing data, operably connected to the connector (21) to provide said data to the external device when connected, wherein said data comprises identification information and/or calibration information and/or sterilization information and/or sensor logging information.

13. The device of any of the previous claims, further comprising at least one optic fiber to deliver a light signal to the organ or tissue, in use of the device, and to collect a return light signal coming from the organ or tissue, such that, in addition to temperature, one or more other physiological parameters of the organ or tissue can be monitored via the optic fiber.

14. A kit comprising the device (1) of any of the previous claims, and one or more selected from:

- a needle for puncturing through the skin,
- a guiding sheath for inserting the tube (2) into the body through a skin puncture,
- a readout device (30) for providing temperature values based on currents and/or voltages measured by means of the plurality of electrical wires (4) when the readout device is operably connected to the connector (21).

15. A method for manufacturing a device in accordance with any of the claims 1 to 13, the method comprising:

- fabricating or obtaining one or more resistive temperature sensors (3), each resistive temperature sensor comprising an elongate conductive metal trace on a thin-film substrate, the metal trace being arranged in a meandering pattern between a first terminal (12) and a second terminal (13),

- connecting a plurality of electrical wires (4) to the one or more resistive temperature sensors (3),
- inserting the one or more resistive temperature sensors and the plurality of electrical wires into a catheter tube (2) such that at least some electrical wires remain accessible at a proximal end of the tube, and
- mechanically connecting a connector (21) to the proximal end of the tube and electrically connecting the connector to the plurality of electrical wires such that an external device can be operably connected to the one or more resistive temperature sensors via the connector (21).