

Claims

1. A sensor assembly (1) comprising:
a housing (3a, 3b) comprising a tubular portion (3b), a membrane (4), a cable (7), an ultrasonic sensor (6), and a further sensor (2);
5 wherein the tubular portion (3b) comprises a first end;
wherein the tubular portion (3b) connects to the membrane (4) at the first end of the tubular portion (3b);
wherein the ultrasonic sensor (6) comprises a piezoelectric transducer and a wrap-around electrode;
10 wherein the piezoelectric transducer comprises a first side and a second side, the second side of the piezoelectric transducer being disposed opposite the first side of the piezoelectric transducer;
wherein the first side of the piezoelectric transducer is mounted to the membrane (4);
wherein the wrap-around electrode comprises a first portion and a second portion, the second
15 portion of the wrap-around electrode connecting to the first portion of the wrap-around electrode;
wherein the first portion of the wrap-around electrode is arranged at the first side of the piezoelectric transducer and the second portion of the wrap-around electrode is arranged at the second side of the piezoelectric transducer;
wherein the second side of the piezoelectric transducer, the second portion of the wrap-around electrode, and the further sensor (2) connect to the cable (7); and
20 wherein the tubular portion (3b) comprises inner walls and the further sensor (2) is arranged in between the inner walls of the tubular portion (3b).
2. The sensor assembly (1) according to claim 1,
25 wherein the further sensor (2) comprises a temperature transducer; and
wherein the temperature transducer connects to the cable (7).
3. The sensor assembly (1) according to any of the claims 1 to 2,
wherein the first side of the piezoelectric transducer is mounted to the membrane (4) via a
30 layer of polymeric resin; and
wherein the layer of polymeric resin is less than 500 micrometres thick.
4. The sensor assembly (1) according to any of the claims 1 to 3,
wherein the first portion of the wrap-around electrode electrically connects to the first side of
35 the piezoelectric transducer.
5. The sensor assembly (1) according to any of the claims 1 to 4,
wherein the further sensor (2) electrically connects to the cable (7); and
wherein the further sensor (2) is disposed at the second portion of the wrap-around electrode.

6. The sensor assembly (1) according to claim 5,
wherein the further sensor (2) is mounted to the second side of the piezoelectric transducer.
7. The sensor assembly (1) according to claim 5,
5 wherein the further sensor (2) is mounted to the cable (7).
8. The sensor assembly (1) according to any of the claims 1 to 7,
wherein the further sensor (2), the piezoelectric transducer, and the wrap-around electrode
are arranged in between the inner walls of the tubular portion (3b).
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9. The sensor assembly (1) according to any of the claims 1 to 8,
wherein the tubular portion (3b) comprises a second end, the second end of the tubular
portion (3b) being disposed opposite the first end of the tubular portion (3b);
wherein the inner walls, the first end of the tubular portion (3b), and the second end of the
15 tubular portion (3b) define a space; and
wherein the further sensor (2), the piezoelectric transducer, and the wrap-around electrode
are arranged inside the space.
10. The sensor assembly (1) according to any of the claims 1 to 9,
20 wherein the tubular portion (3b) comprises a second end, the second end of the tubular
portion (3b) being disposed opposite the first end of the tubular portion (3b);
wherein the housing (3a, 3b) comprises a brim portion (3a);
wherein the brim portion (3a) connects to the second end of the tubular portion (3b); and
wherein the brim portion (3a) projects radially from the tubular portion (3b).
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11. The sensor assembly (1) according to claim 10,
wherein the sensor assembly (1) comprises a seal member (5) arranged adjacent the brim
portion (3a).
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12. The sensor assembly (1) according to claim 11,
wherein the brim portion (3a) comprises a groove; and
wherein a portion of the seal member (5) is arranged in the groove.
13. The sensor assembly (1) according to any of the claims 1 to 12,
35 wherein an annular, air-filled gap envelopes the piezoelectric transducer; and
wherein the annular, air-filled gap is disposed between the piezoelectric transducer and the
tubular portion (3b).
14. The sensor assembly (1) according to any of the claims 1 to 13,

wherein the sensor assembly (1) comprises a cover (8) arranged in between the inner walls;
and

wherein the second side of the piezoelectric transducer faces the cover (8).

- 5 15. The sensor assembly (1) according to claim 14,
wherein the cover (8) comprises an opening; and
wherein the cable (7) extends through the opening of the cover (8).