CLAIMS

We claim:

1. A sensor assembly (200) for a vibrating meter (50), comprising:

one or more conduits (103A, 103B);

one or more sensor components including one or more of a driver (104), a first pick-off sensor (105), and a second pick-off sensor (105') coupled to the one or more conduits (103A, 103B); and

a flexible circuit (201) including:

a body (202); and

one or more sensor component flexures (210-212') extending from the body (202) and coupled to a sensor component (104, 105, 105') of the one or more sensor components.

2. The sensor assembly (200) of claim 1, wherein the flexible circuit (201) provides electrical communication between a meter electronics (20) and the one or more sensor components.

3. The sensor assembly (200) of claim 1, wherein each of the sensor component flexures includes at least one coupling aperture (330, 330') adapted to receive at least a portion of a sensor component pin (312, 312').

4. The sensor assembly (200) of claim 3, further comprising a strain relief (440) coupled to a sensor component flexure such that a portion of the flexure coupled to the stain relief and the coupling aperture (330, 330') remains substantially stationary with respect to one another.

5. The sensor assembly (200) of claim 4, wherein the strain relief (440) is coupled to a sensor component (104, 105, 105').

6. The sensor assembly (200) of claim 5, wherein the strain relief (440) comprises a plate coupled to a conduit bracket (405A) of a sensor component (104, 105, 105') with at least a portion of the sensor component flexure positioned between the plate and the conduit bracket (405A).

7. The sensor assembly (200) of claim 3, further comprising a tubular rivet (331, 331') received in each of the coupling apertures (330, 330') of the sensor component flexure.

8. The sensor assembly (200) of claim 7, wherein the tubular rivet (331, 331') received in the coupling apertures (330, 330') is further coupled to the sensor component pin (312, 312').

9. The sensor assembly (200) of claim 1, wherein each of the sensor component flexures comprises one or more electrical traces (512, 512').

10. The sensor assembly (200) of claim 1, further comprising a redundant flexure (350) coupled to the at least one sensor component flexure.

11. The sensor assembly (200) of claim 10, wherein each of the sensor component flexures comprises a primary electrical trace (512A, 512'A) and a redundant electrical trace (512B, 512'B).

12. A method for assembling a sensor assembly, comprising steps of:

positioning one or more conduits within a case;

coupling one or more sensor components to the one or more conduits, the sensor components including one or more of a driver, a first pick-off sensor, and a second pick-off sensor;

positioning a flexible circuit within the case; and

coupling one or more sensor component flexures extending from a body of the flexible circuit to a sensor component of the one or more sensor components.

13. The method of claim 12, further comprising coupling the flexible circuit to a meter electronics to provide electrical communication between the meter electronics and the one or more sensor components.

14. The method of claim 12, wherein the step of coupling the one or more sensor component flexures comprises inserting a sensor component pin extending from a sensor component into a coupling aperture formed in the sensor component flexure.

15. The method of claim 14, further comprising a step of coupling a sensor component flexure to a strain relief such that a portion of the sensor component flexure coupled to the strain relief and the coupling aperture remain substantially stationary with respect to one another during vibration of the one or more conduits.

16. The method of claim 15, wherein the strain relief is coupled to a sensor component.

17. The method of claim 16, wherein the strain relief comprises a plate and the step of coupling the sensor component flexure to the strain relief comprises positioning a portion of the sensor component flexure between the plate and a conduit bracket of the sensor component.

18. The method of claim 14, further comprising a step of inserting a tubular rivet into each of the coupling apertures formed in the sensor component flexure.

19. The method of claim 18, further comprising a step of coupling the tubular rivet to the sensor component pin.

20. The method of claim 12, wherein each of the sensor component flexures comprises one or more electrical traces.

21. The method of claim 12, wherein the flexible circuit further comprises a redundant flexure coupled to the at least one sensor component flexure.

22. The method of claim 21, wherein each of the sensor component flexures comprises a primary electrical trace and a redundant electrical trace.

CLAIMS

We claim:

1. A sensor assembly (200) for a vibrating meter (50), comprising:

one or more conduits (103A, 103B);

one or more sensor components including one or more of a driver (104), a first pick-off sensor (105), and a second pick-off sensor (105') coupled to the one or more conduits (103A, 103B); and

a flexible circuit (201) including:

a body (202);

one or more flat sensor component flexures (210-212') extending from the body (202) and coupled to a sensor component (104, 105, 105') of the one or more sensor components; and

a redundant flexure (350) coupled to the at least one sensor component flexure, wherein each of the sensor component flexures comprises a primary electrical trace (512A, 512'A) and a redundant electrical trace (512B, 512'B), wherein the traces (512A, 512'A, 512B, 512'B) are disposed between at least two flexible substrates.

2. The sensor assembly (200) of claim 1, wherein each of the sensor component flexures includes at least one coupling aperture (330, 330') adapted to receive at least a portion of a sensor component pin (312, 312').

3. The sensor assembly (200) of claim 2, further comprising a strain relief (440) coupled to a sensor component flexure such that a portion of the flexure coupled to the stain relief and the coupling aperture (330, 330') remains substantially stationary with respect to one another.

4. The sensor assembly (200) of claim 3, wherein the strain relief (440) is coupled to a sensor component (104, 105, 105').

5. The sensor assembly (200) of claim 4, wherein the strain relief (440) comprises a plate coupled to a conduit bracket (405A) of a sensor component (104, 105, 105') with at least a portion of the sensor component flexure positioned between the plate and the conduit bracket (405A).

6. The sensor assembly (200) of claim 2, further comprising a tubular rivet (331, 331') received in each of the coupling apertures (330, 330') of the sensor component flexure.

7. The sensor assembly (200) of claim 6, wherein the tubular rivet (331, 331') received in the coupling apertures (330, 330') is further coupled to the sensor component pin (312, 312').

8. A method for assembling a sensor assembly, comprising steps of:

positioning one or more conduits within a case;

coupling one or more sensor components to the one or more conduits, the sensor components including one or more of a driver, a first pick-off sensor, and a second pick-off sensor;

positioning a flexible circuit within the case; and

coupling one or more sensor component flexures extending from a body of the flexible circuit to a sensor component of the one or more sensor components, wherein the flexible circuit further comprises a redundant flexure coupled to the at least one sensor component flexure, and each of the sensor component flexures comprises a primary electrical trace and a redundant electrical trace, wherein the traces are disposed between at least two flexible substrates.

9. The method of claim 8, further comprising coupling the flexible circuit to a meter electronics to provide electrical communication between the meter electronics and the one or more sensor components.

10. The method of claim 8, wherein the step of coupling the one or more sensor component flexures comprises inserting a sensor component pin extending from a sensor component into a coupling aperture formed in the sensor component flexure.

11. The method of claim 8, further comprising a step of coupling a sensor component flexure to a strain relief such that a portion of the sensor component flexure coupled to the strain relief and the coupling aperture remain substantially stationary with respect to one another during vibration of the one or more conduits.

12. The method of claim 11, wherein the strain relief is coupled to a sensor component.

13. The method of claim 12, wherein the strain relief comprises a plate and the step of coupling the sensor component flexure to the strain relief comprises positioning a portion of the sensor component flexure between the plate and a conduit bracket of the sensor component.

14. The method of claim 10, further comprising a step of inserting a tubular rivet into each of the coupling apertures formed in the sensor component flexure.

15. The method of claim 14, further comprising a step of coupling the tubular rivet to the sensor component pin.