CLAIMS

What is claimed is:

1. A capacitive manometer assembly comprising:

a diaphragm including a conductive material;

an electrode structure including an inner electrode and an outer electrode, wherein the inner electrode and outer electrode are separated from one another, wherein the diaphragm is movable relative to the electrode structure between (i) a zero position when the pressure on each side of the diaphragm is the same and (ii) a maximum differential position when the maximum measurable differential pressure is applied to the diaphragm;

a support structure arranged so as to support the diaphragm so that the diaphragm is constrained relative to the electrode structure, and the diaphragm is spaced from and axially aligned with the inner and outer electrodes relative to an alignment axis of the manometer;

a baffle with one or more apertures configured to admit gas to a region adjacent the diaphragm, wherein the baffle is configured to reduce effects of surface deformation of the diaphragm due to reactive gas.

2. The capacitive manometer assembly of claim 1, wherein the one or more apertures in the baffle are configured in alignment, along the alignment axis of the capacitive manometer assembly, with a gap between the inner and outer electrodes on the diaphragm.

3. The capacitive manometer assembly of claim 1, wherein the diaphragm comprises a superalloy.

4. The capacitive manometer assembly of claim 1, further comprising a housing having an inlet for admitting gas, wherein the diaphragm, electrode structure, support structure, and baffle are disposed within the housing.

5.. A capacitive manometer assembly comprising:

a diaphragm including a conductive material;

an electrode structure including an inner electrode, an outer electrode, and a guard structure disposed between the inner and outer electrodes, wherein the diaphragm is movable relative to the electrode structure between (i) a zero position when the pressure on each side of the diaphragm is the same and (ii) a maximum differential position when the maximum measurable differential pressure is applied to the diaphragm;

a support structure arranged so as to support the diaphragm so that the diaphragm is constrained relative to the electrode structure, and the diaphragm is spaced from and axially aligned with the inner and outer electrodes relative to an alignment axis of the manometer; and

a baffle with one or more apertures configured to admit gas to a region adjacent the diaphragm, wherein the baffle is configured to reduce effects of surface deformation of the diaphragm due to reactive gas.

6. The capacitive manometer assembly of claim 5, wherein the guard structure comprises a continuous guard.

7. The capacitive manometer assembly of claim 5, wherein the guard structure comprises an inner and an outer guard separated by a gap.

8. The capacitive manometer assembly of claim 7, wherein the guard structure comprises a third guard disposed on the electrode structure adjacent the outer electrode at a greater radial distance from the center of the electrode structure.

9. The capacitive manometer assembly of claim 5, wherein the one or more apertures in the baffle are configured in alignment, in a directed parallel to the alignment axis of the capacitive manometer assembly, with a gap between the electrodes or one of the electrodes and the guard structure on the diaphragm.

10. The capacitive manometer assembly of claim 5, wherein the diaphragm comprises a superalloy.

11. The capacitive manometer assembly of claim 5, further comprising a housing having an inlet for admitting gas, wherein the diaphragm, electrode structure, support structure, and baffle are disposed within the housing.

12. The capacitive manometer assembly of claim 5, wherein the outer electrode comprises a non-continuous electrode having a first end and a second end, wherein the first end and second end are separate.

13. The capacitive manometer assembly of claim 5, wherein the one or more apertures in the baffle are configured in alignment, in a direction parallel to the alignment axis of the capacitive manometer assembly, with the guard structure on the diaphragm.

14. The capacitive manometer assembly of claim 13, wherein the guard structure comprises an inner and an outer guard separated by a gap.

15. The capacitive manometer assembly of claim 14, wherein the guard structure comprises a third guard disposed on the electrode structure adjacent the outer electrode at a greater radial distance from the center of the electrode structure.

16. The capacitive manometer assembly of claim 13, wherein the one or more apertures in the baffle are aligned, in a direction parallel to a longitudinal axis of the capacitive manometer assembly, with an inner third of the guard structure on the diaphragm, wherein the guard structure is divided into inner, middle, and outer thirds in a radial direction from the center of the electrode structure.

17. A capacitive manometer comprising:

a housing:

a diaphragm including a conductive material;

an electrode structure including an inner electrode and an outer electrode, wherein the inner electrode and outer electrode are separated from one another, wherein the diaphragm is movable relative to the electrode structure between (i) a zero position when the pressure on each side of the diaphragm is the same and (ii) a maximum differential position when the maximum measurable differential pressure is applied to the diaphragm;

a support structure arranged so as to support the diaphragm so that the diaphragm is constrained relative to the electrode structure, and the diaphragm is spaced from and axially aligned with the inner and outer electrodes relative to an alignment axis of the manometer;

a baffle with one or more apertures configured to admit gas to a region adjacent the diaphragm, wherein the baffle is configured to reduce effects of surface deformation of the diaphragm due to reactive gas.

18. The capacitive manometer of claim 17, wherein the electrode structure further comprises a guard structure disposed between the inner and outer electrodes.

19. The capacitive of manometer of claim 18, wherein the guard structure comprises an inner and an outer guard separated by a gap.

CLAIMS

What is claimed is:

1. A capacitive manometer assembly comprising:

a diaphragm including a conductive material;

an electrode structure including an inner electrode and an outer electrode, wherein the inner electrode and outer electrode are separated from one another, wherein the diaphragm is movable relative to the electrode structure between (i) a zero position when the pressure on each side of the diaphragm is the same and (ii) a maximum differential position when the maximum measurable differential pressure is applied to the diaphragm;

a support structure arranged so as to support the diaphragm so that the diaphragm is constrained relative to the electrode structure, and the diaphragm is spaced from and axially aligned with the inner and outer electrodes relative to an alignment axis of the manometer;

a baffle with one or more apertures configured to admit gas to a region adjacent the diaphragm, wherein the baffle is configured to reduce effects of surface deformation of the diaphragm due to reactive gas.

2. The capacitive manometer assembly of claim 1, wherein the one or more apertures in the baffle are configured in alignment, along the alignment axis of the capacitive manometer assembly, with a gap between the inner and outer electrodes on the diaphragm.

3. The capacitive manometer assembly of claim 1, wherein the diaphragm comprises a superalloy.

4. The capacitive manometer assembly of claim 1, further comprising a housing having an inlet for admitting gas, wherein the diaphragm, electrode structure, support structure, and baffle are disposed within the housing.

5.. A capacitive manometer assembly comprising:

a diaphragm including a conductive material;

an electrode structure including an inner electrode, an outer electrode, and a guard structure disposed between the inner and outer electrodes, wherein the diaphragm is movable relative to the electrode structure between (i) a zero position when the pressure on each side of the diaphragm is the same and (ii) a maximum differential position when the maximum measurable differential pressure is applied to the diaphragm;

a support structure arranged so as to support the diaphragm so that the diaphragm is constrained relative to the electrode structure, and the diaphragm is spaced from and axially aligned with the inner and outer electrodes relative to an alignment axis of the manometer; and

a baffle with one or more apertures configured to admit gas to a region adjacent the diaphragm, wherein the baffle is configured to reduce effects of surface deformation of the diaphragm due to reactive gas.

6. The capacitive manometer assembly of claim 5, wherein the guard structure comprises a continuous guard.

7. The capacitive manometer assembly of claim 5, wherein the guard structure comprises an inner and an outer guard separated by a gap.

8. The capacitive manometer assembly of claim 7, wherein the guard structure comprises a third guard disposed on the electrode structure adjacent the outer electrode at a greater radial distance from the center of the electrode structure.

9. The capacitive manometer assembly of claim 5, wherein the one or more apertures in the baffle are configured in alignment, along the alignment axis of the capacitive manometer assembly, with a gap between the electrodes and/or the guard structure on the diaphragm.

10. The capacitive manometer assembly of claim 5, wherein the diaphragm comprises a superalloy.

11. The capacitive manometer assembly of claim 5, further comprising a housing having an inlet for admitting gas, wherein the diaphragm, electrode structure, support structure, and baffle are disposed within the housing.

12. The capacitive manometer assembly of claim 5, wherein the outer electrode comprises a non-continuous electrode having a first end and a second end, wherein the first end and second end are separate.

13. The capacitive manometer assembly of claim 5, wherein the one or more apertures in the baffle are configured in alignment, along the alignment axis of the capacitive manometer assembly, with the guard structure on the diaphragm.

14. The capacitive manometer assembly of claim 13, wherein the guard structure comprises an inner and an outer guard separated by a gap.

15. The capacitive manometer assembly of claim 14, wherein the guard structure comprises a third guard disposed on the electrode structure adjacent the outer electrode at a greater radial distance from the center of the electrode structure.

16. The capacitive manometer assembly of claim 13, wherein the one or more apertures in the baffle are configured in alignment, along a longitudinal axis of the capacitive manometer assembly, with an inner third of the guard structure on the diaphragm, wherein the guard structure is divided into inner, middle, and outer thirds in a radial direction from the center of the electrode structure.

17. A capacitive manometer comprising:

a housing:

a diaphragm including a conductive material;

an electrode structure including an inner electrode and an outer electrode, wherein the inner electrode and outer electrode are separated from one another, wherein the diaphragm is movable relative to the electrode structure between (i) a zero position when the pressure on each side of the diaphragm is the same and (ii) a maximum differential position when the maximum measurable differential pressure is applied to the diaphragm;

a support structure arranged so as to support the diaphragm so that the diaphragm is constrained relative to the electrode structure, and the diaphragm is spaced from and axially aligned with the inner and outer electrodes relative to an alignment axis of the manometer;

a baffle with one or more apertures configured to admit gas to a region adjacent the diaphragm, wherein the baffle is configured to reduce effects of surface deformation of the diaphragm due to reactive gas.

18. The capacitive manometer of claim 17, wherein the electrode structure further comprises a guard structure disposed between the inner and outer electrodes.

19. The capacitive of manometer of claim 18, wherein the guard structure comprises an inner and an outer guard separated by a gap.