CLAIMS

What is claimed is:

1. An apparatus, comprising:

a system including a reagent cartridge receptacle;

a flow cell assembly comprising a flow cell comprising a channel having a flow cell inlet and a flow cell outlet;

a reagent cartridge receivable within the reagent cartridge receptacle, the reagent cartridge comprising a plurality of reagent reservoirs; and

a manifold assembly, the manifold assembly comprising a reagent selector valve comprising a reagent selector valve body, wherein the reagent selector valve is adapted to be fluidically coupled to the reagent reservoirs and to selectively flow reagent from a corresponding reagent reservoir to the flow cell assembly, wherein a surface of the reagent selector valve body of the reagent selector valve is directly and mechanically coupled to a portion of the flow cell assembly so that the reagent selector valve of the manifold assembly supplies reagent contained in one reagent reservoir selected from the plurality of reagent reservoirs to the flow cell.

2. The apparatus any of the preceding claims, wherein the reagent selector valve comprises at least one of a ceramic rotor or a ceramic stator.

3. The apparatus of any one of the preceding claims, wherein the manifold assembly further comprises a valve drive assembly operably coupled to the reagent selector valve.

4. The apparatus of claim 1, wherein the manifold assembly further comprises a valve drive assembly operably coupled to the reagent selector valve, wherein the valve drive assembly comprises a brushless motor.

5. The apparatus of any one of the preceding claims, wherein the manifold assembly comprises a flow cell valve, wherein the flow cell assembly comprises a flow cell having a plurality of channels, wherein the flow cell valve is adapted to selectively flow reagent to corresponding channels of the plurality of channels.

6. The apparatus of claim 1, wherein the manifold assembly comprises a flow cell valve, wherein the flow cell assembly comprises a flow cell having a plurality of channels, wherein the flow cell valve is adapted to selectively flow reagent to the corresponding channels, wherein the flow cell valve comprises a plurality of outlet ports adapted to be fluidically coupled to corresponding channels of the flow cell.

7. The apparatus of claim 6, wherein the flow cell valve and the reagent selector valve have opposing surfaces facing away from one another, a valve drive assembly is adapted to interface with the flow cell valve and the reagent selector valve at the opposing surfaces to control a position of the flow cell valve and the reagent selector valve.

8. The apparatus of claim 7, wherein the flow cell valve comprises a flow cell valve body having a flow cell valve stator and a flow cell valve rotor, the flow cell valve body having a common fluidic line and a plurality of flow cell valve fluidic lines, the common fluidic line fluidically coupled to the reagent selector valve, and wherein the flow cell valve rotor interfaces with the flow cell valve stator to fluidically couple the common fluidic line and one or more of the flow cell valve fluidic lines.

9. The apparatus of claim 8, wherein the flow cell valve rotor comprises a radial groove adapted to fluidically couple the common fluidic line and the one or more of the flow cell valve fluidic lines.

10. The apparatus of claim 9, wherein the flow cell valve rotor comprises an arc-shaped groove fluidically coupled to a distal end of the radial groove and adapted to allow the common fluidic line to be fluidically coupled to more than one of the flow cell valve fluidic lines.

11. The apparatus of any one of the preceding claims, wherein a reagent valve body comprises a flow cell interface and the flow cell assembly is mechanically coupled to the flow cell interface.

12. The apparatus of claim 1, further comprising a valve drive assembly adapted to interface with and be operably coupled adjacent to an end of the reagent selector valve.

13. The apparatus of claim 1, further comprising a valve drive assembly adapted to interface with and be operably coupled adjacent to an end of the reagent selector valve,further a gear box comprising gears to provide a gear reduction between the valve drive assembly and the reagent selector valve, the gear box coupled between the valve drive assembly and the reagent selector valve and adapted to reduce vibrations affecting the flow cell assembly, wherein a longitudinal axis of the valve drive assembly is offset relative to a longitudinal axis of the reagent selector valve to allow the flow cell assembly to be coupled to the flow cell interface without the valve drive assembly obstructing the coupling.

14. The apparatus of claim 13, further comprising a vibration isolation assembly, wherein the vibration isolation assembly comprises a housing rotationally coupled to the reagent selector valve and the valve drive assembly.

15. An apparatus, comprising:

a flow cell assembly <u>comprising a flow cell comprising a channel having a flow cell inlet and a flow cell outlet</u>; and

a system including a manifold assembly and a flow cell receptacle adapted to carry the flow cell assembly, the manifold assembly comprising:

a reagent selector valve disposed adjacent to the flow cell assembly, the reagent selector valve comprising a surface adapted to selectively flow reagent to the flow cell assembly, at least one of a ceramic rotor or a ceramic stator; and

a valve drive assembly operably coupled to the reagent selector valve to drive the reagent selector valve and, comprising a brushless motor, wherein said surface of the reagent selector valve is directly and mechanically coupled to a portion of the flow cell assembly so that the reagent selector valve supplies the reagent to the flow cell.

16. The apparatus of claim 15, wherein the reagent selector valve of the manifold assembly is disposed within the flow cell receptacle.

17. The apparatus of any one of claims 15 – 16, wherein the surface of the reagent selector valve is adapted to be directly mechanically coupled to the flow cell assembly.

18. The apparatus of any one of claims 15 – 17, wherein the manifold assembly further comprises a flow cell valve, wherein the flow cell assembly comprises a flow cell having a plurality of channels, wherein the flow cell valve is adapted to selectively flow reagent to corresponding channels of the plurality of channels.

19. The apparatus of any one of claims 15 – 18, further comprising a vibration isolation assembly.

20. The apparatus of claim 15, further comprising a vibration isolation assembly, wherein the vibration isolation assembly comprises a magnet and is adapted to magnetically levitate the manifold assembly.

21. The apparatus of claim 15, further comprising a vibration isolation assembly, wherein the vibration isolation assembly comprises a shock absorber.