CLAIMS

What is claimed is:

1. An apparatus, comprising:

a system including a reagent cartridge receptacle;

a flow cell assembly;

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 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 at least a surface of the manifold assembly associated with the reagent selector valve is coupled to a portion of the flow cell assembly.

2. The apparatus of claim 1, wherein the surface of the reagent selector valve is directly mechanically coupled to the flow cell assembly.

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

4. 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.

5. The apparatus of claim 4, wherein the valve drive assembly comprises a brushless motor.

6. The apparatus of any one of the preceding claims, wherein the manifold assembly comprises a flow cell valve coupled between the reagent selector valve and the flow cell assembly, 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.

7. The apparatus of claim 6, wherein the flow cell valve comprises a plurality of outlet ports adapted to be coupled to corresponding channels of the flow cell.

8. The apparatus of any one of claims 6 – 7, wherein the flow cell valve and the reagent selector valve have opposing surfaces, further comprising a valve drive assembly adapted to interface with the flow cell valve and the reagent selector valve at the opposing surfaces to control a position of the corresponding valves.

9. The apparatus of any one of claims 6 – 8, 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 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.

10. The apparatus of claim 9, 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.

11. The apparatus of claim 10, wherein the flow cell valve rotor comprises an arc-shaped groove 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.

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

13. The apparatus of any one of the preceding claims, further comprising a valve drive assembly adapted to interface with and be coupled adjacent to an end of the reagent selector valve.

14. The apparatus of claim 13, further comprising a vibration isolation assembly.

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

16. An apparatus, comprising:

a flow cell assembly; 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 immediately adjacent to the flow cell assembly, the reagent selector valve comprising a surface configured to directly couple to a portion of the flow cell assembly and adapted to selectively flow reagent to the flow cell assembly, wherein the reagent selector valve comprises at least one of a ceramic rotor or a ceramic stator; and

a valve drive assembly operably coupled to the reagent selector valve, the valve drive assembly comprising a brushless motor.

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

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

19. The apparatus of any one of claims 16 – 18, wherein the manifold assembly further comprises a flow cell valve coupled between the reagent selector valve and the flow cell assembly, 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.

20. The apparatus of any one of claims 16 – 19, further comprising a vibration isolation assembly.

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

22. The apparatus of claim 20, wherein the vibration assembly comprises a shock absorber.