

CLAIMS

What is claimed is:

1. A system comprising:
 - an interface to fluidically connect with a flow cell that to support analytes of
5 interest in an analysis system, the fluidic interface including a plurality of flow paths
and a plurality of effluent lines, each flow path to fluidically connect with one or more
channels of the flow cell when the flow cell is mounted in the analysis system and
each effluent line to fluidically connect with one of the channels of the flow cell when
the flow cell is mounted in the analysis system;
 - 10 a selector valve fluidically connected with plurality of flow paths, the selector
valve to controllably select one of the flow paths;
 - one or more pumps, each pump fluidically connected with one or more of the
effluent lines;
 - a pressure sensor in fluidic communication with the selected flow path, the
15 pressure sensor to detect pressure in the selected flow path and to generate pressure
data based on the detected pressure; and
 - control circuitry, the control circuitry having one or more processors and a
memory to store computer-executable instructions which, when executed by the one
or more processors, control the one or more processors to:
 - 20 control the one or more pumps so as to pressurize the selected flow path
according to a prescribed test protocol; and
 - access the pressure data and to determine whether the selected flow path
maintains pressure in a desired manner.
- 25 2. The system of claim 1, wherein the one or more pumps comprises at
least one syringe pump.
3. The system of claim 1, wherein the fluid comprises air.
- 30 4. The system of claim 1, wherein the memory is to store further
computer-executable instructions which, when executed by the one or more

processors, further control the one or more processors to cause the one or more pumps to pressurize the selected flow path in a stepwise manner, with each pressure step having a higher pressure than the previous pressure step.

5 5. The system of claim 1, wherein the memory is to store further computer-executable instructions which, when executed by the one or more processors, further control the one or more processors to cause the selector valve to successively select different flow paths of the plurality of flow paths to be pressure-tested in accordance with the prescribed test protocol.

10

 6. The system of claim 5, wherein the plurality of flow paths comprises a first flow path through one channel of the flow cell when the flow cell is mounted to the interface, and a second flow path through a second channel of the flow cell when the flow cell is mounted to the interface, the second flow path different from the first
15 flow path.

 7. The system of claim 6, wherein the plurality of flow paths comprises a third flow path that includes both the first and the second flow paths.

20 8. The system of claim 1, wherein the selector valve is further fluidically connected with a bypass line that bypasses the flow cell, and wherein the memory is to store further computer-executable instructions which, when executed by the one or more processors, further control the one or more processors to cause the selector valve to select the bypass line to be pressure-tested in accordance with the prescribed test
25 protocol.

 9. The system of claim 1, comprising a second valve that is fluidically connected with an inlet to the selector valve, the second valve to seal the selected flow path at the second valve for pressure-testing of the selected flow path between the
30 second valve and the pump.

 10. A system comprising:
 a flow cell to support analytes of interest;

a selector valve fluidically connected with the flow cell, the selector valve to controllably select a flow path through the flow cell from a plurality of flow paths through the flow cell that are selectable by the selector valve;

one or more pumps fluidically connected with the flow cell, the one or more
5 pumps to pressurize a fluid in the selected flow path in accordance with a prescribed test protocol;

a pressure sensor fluidically connected with the selected flow path, the pressure sensor to detect pressure in the selected flow path and to generate pressure data based on the detected pressure; and

10 control circuitry, the control circuitry having one or more processors and a memory to store computer-executable instructions which, when executed by the one or more processors, control the one or more processors to:

cause the selector valve to successively select different flow paths of the plurality of flow paths through the flow cell in accordance with the
15 prescribed test protocol,

cause the one or more pumps to be actuated so as to successively pressurize the selected flow paths in accordance with the prescribed test protocol,

access the pressure data, and

20 determine whether each of the selected flow paths maintains pressure in a desired manner based on the pressure data.

11. The system of claim 10, wherein the fluid comprises air.

25 12. The system of claim 10, wherein the memory is to store further computer-executable instructions which, when executed by the one or more processors, further control the one or more processors to cause the one or more pumps to pressurize each of the selected flow paths in a stepwise manner using a plurality of pressure steps, with each pressure step for each selected flow path having a higher
30 pressure than the previous pressure step for that selected flow path.

13. The system of claim 10, wherein the plurality of flow paths comprises a first flow path through one channel of the flow cell and a second flow path through

a second channel of the flow cell, wherein the second flow path is different from the first flow path.

14. The system of claim 13, wherein the plurality of flow paths comprises
5 a third flow path that includes both the first and the second flow paths.

15. The system of claim 10, wherein the selector valve is further fluidically connected with a bypass line that bypasses the flow cell, the selector valve to controllably select the bypass line to be pressure tested in accordance with the
10 prescribed test protocol.

16. A method comprising:
implementing a stored prescribed test protocol that comprises:
(a) selecting a flow path from a plurality of flow paths through a
15 flow cell in accordance with the prescribed test protocol;
(b) actuating a pump to pressurize a fluid in the selected flow path;
(c) generating pressure data representative of the pressure in the selected flow path; and
(d) processing the pressure data representative of the pressure in
20 the selected flow path to determine whether the selected flow path maintains pressure in a desired manner.

17. The method of claim 16, wherein actuating the pump includes actuating the pump to pressurize the selected flow path in a stepwise manner using a
25 plurality of pressure steps.

18. The method of claim 16, further comprising repeating (a) – (d) for different flow paths through the flow cell to separately determine whether each selected flow path maintains pressure in a desired manner.
30

19. The method of claim 18, wherein the plurality of flow paths comprises a first flow path through one channel of the flow cell and a second flow path through

a second channel of the flow cell, wherein the second flow path is different from the first flow path.

20. The method of claim 18, further comprising selecting a bypass line to
5 be pressure tested in accordance with the prescribed test protocol, actuating the pump to pressurize a fluid in the bypass line, generating pressure data representative of the pressure in the bypass line, and processing the pressure data representative of the pressure in the bypass line to determine whether the bypass line maintains pressure in a desired manner, wherein the bypass line does not flow through the flow cell.

10