7. The device of claim 6, where one of the passages provides a substantially constant resistance to fluid flow in response to changes in the viscosity.

8. The device of claim 6, where one of the passages provides a greater resistance than the resistance of another passage in response to increasing viscosity.

9. The device of claim 1, where the flow system is in a well tool.

10. A well device for installation in a wellbore in a subterranean zone, comprising: a substantially tubular housing wall dividing an interior of the well device and an exterior of the device, the exterior radially outward from the interior, the exterior defining an annulus with the wellbore upon installation in the wellbore; and a fluid diode in fluid communication between the interior of the well device and the exterior of the well device through the housing wall.

11. The well device of claim 10, wherein the fluid diode is in fluid communication between the interior and the exterior to communicate production fluid from the exterior of the well device to the interior of the well device.

12. The well device of claim 11, wherein the well device comprises a section of a completion string.

13. The well device of claim 10, wherein the fluid diode is in fluid communication between the interior and the exterior to communicate injection fluid from the interior of the well device to the exterior of the well device.

14. The well device of claim 13, wherein the well device comprises a section of a working string.

15. The well device of claim 10, wherein the fluid diode comprises: an interior surface that defines an interior chamber, the interior surface includes a side perimeter surface and opposing end surfaces; a first port through one of the end surfaces; and a second port through

the interior surface and apart from the first port.

16. The well device of claim 15, the side perimeter surface operable to direct flow from the second port to rotate about the first port.

17. The well device of claim 16, a greatest distance between the opposing end surfaces is smaller than a largest dimension of the opposing end surfaces.

18. The well device of claim 17, wherein the first port comprises an outlet of the interior chamber and the second port comprises an inlet of the interior chamber.

19. The well device of claim 10, wherein the fluid diode comprises a cylindroidal chamber for receiving flow through a chamber inlet and directing the flow to a chamber outlet.

20. The well device of claim 19, the cylindroidal chamber promotes a rotation of the flow about the chamber outlet and a degree of the rotation is based on a characteristic of inflow through the inlet.

21. The well device of claim 20, a greatest axial dimension of the cylindroidal chamber is smaller than a greatest diametric dimension of the cylindroidal chamber.

22. A well device for installation in a wellbore in a subterranean formation to communicate flow with the subterranean formation when the well device is installed in the wellbore, the well device comprising: a well device housing defining an interior and an annular exterior of the well device; a fluid diode positioned in a flow path, the flow path extending through the well device housing and between the interior of the well device and the exterior of the well device to receive flow between the interior and the exterior, the fluid diode comprising: an interior surface that defines an interior chamber, the interior surface includes a side perimeter surface and opposing end surfaces, a greatest distance between the opposing end surfaces is smaller than a largest dimension of the opposing end surfaces; a first port through one of the end surfaces; and a second port through the interior surface and apart

from the first port, the side perimeter surface operable to direct flow from the second port to rotate about the first port.

23. The well device of claim 22, wherein the fluid diode resides in a flow path from the interior of the well device to the exterior of the well device to receive a flow of injection fluid.

24. The well device of claim 22, wherein the fluid diode resides in a flow path to the interior of the well device from the exterior of the well device to receive a flow of production fluid.

25. The well device of claim 22, wherein the first port comprises an outlet from the interior chamber and the second port comprises an inlet to the interior chamber.

26. The well device of claim 22, wherein the first port comprises an inlet to the interior chamber and the second port comprises an outlet from the interior chamber.

27. A flow control device for installation in a subterranean wellbore on a downhole tubular, the flow control device comprising:

an interior surface that defines an interior chamber, the interior surface includes a side perimeter surface and opposing end surfaces, a greatest distance between the opposing end surfaces is smaller than a largest dimension of the opposing end surfaces;

a first port through one of the end surfaces for outputting fluid flow to, or receiving fluid flow from, the downhole tubular or the wellbore; and

a second port through the interior surface and apart from the first port, the side perimeter surface operable to direct flow from the second port to rotate about the first port, the second port for outputting fluid flow to, or receiving fluid flow from, the other of the downhole tubular or the wellbore;

a first flow path operable to direct flow through the second port into the interior chamber at a first angle, and

a second flow path operable to direct flow through the second port into the interior chamber at a second, different angle;

a flow ratio defined between the first and second flow paths; and

wherein the fluid flow ratio autonomously changes in response to autonomous changes in a characteristic of the flow entering the flow control device.

28. The flow control device of claim 27, wherein the first port comprises an outlet from the interior chamber and the second port comprises an inlet to the interior chamber.

29. The flow control device of claim 28, wherein the first flow path is operable to direct flow through the inlet in a substantially angular direction about the outlet and along the side perimeter surface.

30. The flow control device of claim 28, wherein the second flow path is operable to direct flow through the inlet in a substantially radial direction toward the outlet and perpendicular to the side perimeter surface.

31. The flow control device of claim 28, wherein the side perimeter surface is operable to promote rotational flow from the first flow path about the outlet.

32. The flow control device of claim 28, wherein the interior chamber is operable to support a substantially non-rotational flow from the second flow path to the outlet.

33. A method of autonomously directing flow in a subterranean wellbore, comprising: receiving an initial flow of a fluid in a well device, and then separating the initial flow of fluid into a first flow and a separate second flow; establishing a flow ratio between the first and second flows; autonomously changing the flow ratio in response to changes in a characteristic of the fluid; then receiving the first and second flows of fluid, the first flow smaller than the second flow, the first flow flowing in a first direction that is different than a second direction in which the second flow is flowing; combining the first flow and second flow into a combined flow; directing the resulting combined flow away from the second direction and towards the first direction; and generating a flow condition that autonomously increases the tendency of the combined flow to flow towards the first direction.

34. The method of claim 33, wherein generating a flow condition comprises directing the combined flow against a surface extending in the first direction that increases the tendency of the combined flow to flow along the surface in the first direction.

35. The method of claim 33, wherein the characteristic of the fluid comprises at least one of density of the fluid, viscosity of the fluid, or velocity of the fluid.

36. The method of claim 33, wherein the flow is bi-stable to flow stably towards the first direction or second direction, and wherein generating a flow condition comprises generating a flow condition that increases the tendency of the combined flow to flow stably towards the first direction.

37. The method of claim 33, wherein the well device comprises a proportional amplifier and generating a flow condition comprises dividing the flow between the first direction and the second direction proportionally based on the flow.