**CLAIMS**

1. A flow choke for use with a subterranean well, the flow choke comprising:

a variable flow restrictor configured to restrict flow through a flow passage extending through the flow choke, in which, in open and intermediate configurations of the flow choke, a longitudinally displaceable closure member of the flow restrictor is pressure balanced in a longitudinal direction due to well pressure acting on opposite ends of the flow restrictor;

a first external port in communication with the flow passage upstream of the flow restrictor;

a second external port in communication with the flow passage downstream of the flow restrictor; and

at least one sensor in communication with the first and second external ports.

2. The flow choke of claim 1, in which the at least one sensor comprises first and second pressure sensors, the first pressure sensor being in communication with the first external port, and the second pressure sensor being in communication with the second external port.

3. The flow choke of claim 1, in which the at least one sensor comprises first and second density sensors, the first density sensor being in communication with the first external port, and the second density sensor being in communication with the second external port.

4. The flow choke of claim 1, further comprising:

an actuator including a displaceable stem, a restriction to the flow through the flow passage being varied in response to displacement of the stem; and

a stem seal that sealingly engages the stem and isolates the actuator from fluid pressure in the flow passage.

5. The flow choke of claim 4, in which the stem seal isolates the actuator from the fluid pressure in the flow passage downstream of the flow restrictor, in a closed configuration of the flow choke.

6. The flow choke of claim 4, further comprising a third external port in communication with a stem chamber surrounding the stem, the third external port being isolated by the stem seal from the fluid pressure in the flow passage.

7. The flow choke of claim 6, further comprising a fourth external port in communication with a sleeve chamber, the sleeve chamber being positioned external to a sleeve in which a closure member of the flow restrictor is slidingly and sealingly received, and the sleeve chamber being isolated from the flow passage by a sleeve seal.

8. A method of controlling flow of a well fluid, the method comprising:

flowing the well fluid through a flow passage formed through a body of a flow choke, the flow choke including a flow restrictor, the flow restrictor being operable to variably restrict flow through the flow passage, and in open and intermediate configurations of the flow choke, a longitudinally displaceable closure member of the flow restrictor is pressure balanced in a longitudinal direction due to well pressure acting on opposite ends of the flow restrictor;

measuring a pressure differential between first and second external ports of the flow choke, the first and second external ports being in communication through the body with respective upstream and downstream sides of the flow restrictor; and

operating the flow restrictor, thereby varying a restriction to the flow through the flow passage, in response to the measured pressure differential.

9. The method of claim 8, in which the varying further comprises varying the restriction to the flow through the flow passage in response to a change in the measured pressure differential.

10. The method of claim 8, further comprising determining a flow rate of the well fluid through the flow passage, based on the measured pressure differential.

11. The method of claim 8, further comprising:

connecting at least one pressure sensor to the first and second external ports;

receiving an output of the at least one pressure sensor by a control system; and

the control system operating an actuator of the flow choke.

12. The method of claim 11, in which the at least one pressure sensor comprises first and second pressure sensors, the connecting comprises connecting the first and second pressure sensors to the respective first and second external ports, and the output comprises outputs of the first and second pressure sensors.

13. The method of claim 8, in which the operating comprises displacing an actuator stem of the flow choke, and further comprising sealing about the actuator stem, thereby isolating the actuator from the flow passage.

14. The method of claim 8, further comprising measuring density of a fluid in the flow passage.

15. The method of claim 14, in which the density measuring comprising measuring the density upstream and downstream of the flow restrictor.

16. A method of controlling flow of a well fluid, the method comprising:

flowing the well fluid through a flow passage formed through a body of a flow choke, the flow choke including a flow restrictor, the flow restrictor being operable to variably restrict flow through the flow passage;

measuring a pressure differential between first and second external ports of the flow choke, the first and second external ports being in communication through the body with respective upstream and downstream sides of the flow restrictor; and

operating the flow restrictor, thereby varying a restriction to the flow through the flow passage, in response to the measured pressure differential,

in which the operating comprises longitudinally displacing a closure member of the flow restrictor, and further comprising balancing pressure across the closure member in a longitudinal direction when the closure member is disengaged from a seat of the flow restrictor.

17. A well system, comprising:

a pump that pumps a well fluid;

a flow choke comprising a variable flow restrictor that restricts flow of the well fluid through a flow passage extending through the flow choke, the variable flow restrictor being operable by an actuator that includes a displaceable stem, and the flow choke further comprising a stem seal that isolates the actuator from the well fluid in the flow choke, in which the stem seal is exposed to fluid pressure in the flow passage downstream of the flow restrictor, in a closed configuration of the flow choke; and

a control system that operates the actuator,

in which the flow choke further comprises a first external port in communication with the flow passage upstream of the flow restrictor, a second external port in communication with the flow passage downstream of the flow restrictor, and at least one sensor in communication with the first and second external ports.

18. The well system of claim 17, further comprising a third external port in communication with a stem chamber surrounding the stem, the third external port being isolated by the stem seal from fluid pressure in the flow passage.

19. The well system of claim 18, further comprising a fourth external port in communication with a sleeve chamber, the sleeve chamber being positioned external to a sleeve in which a closure member of the flow restrictor is slidingly and sealingly received, and the sleeve chamber being isolated from the flow passage by a sleeve seal.

20. The well system of claim 17, in which the at least one sensor comprises first and second density sensors, the first density sensor being in communication with the first external port, and the second density sensor being in communication with the second external port.

21. A well system, comprising:

a pump that pumps a well fluid;

a flow choke comprising a variable flow restrictor that restricts flow of the well fluid through a flow passage extending through the flow choke, the variable flow restrictor being operable by an actuator that includes a displaceable stem, and the flow choke further comprising a stem seal that isolates the actuator from the well fluid in the flow choke,

in which, in open and intermediate configurations of the flow choke, a longitudinally displaceable closure member of the flow restrictor is pressure balanced in a longitudinal direction, and

in which the flow choke further comprises a first external port in communication with the flow passage upstream of the flow restrictor, a second external port in communication with the flow passage downstream of the flow restrictor, and at least one sensor in communication with the first and second external ports.

22. A flow choke for use with a subterranean well, the flow choke comprising:

a body;

a variable flow restrictor configured to restrict flow through a flow passage extending through the body;

an actuator configured to displace a closure member of the flow restrictor relative to the body;

an adapter that connects the actuator to the body; and

a sensor in communication with a chamber formed between the adapter and the body, in which a seal isolates the chamber from the flow passage, in which the chamber is positioned external to a sleeve in which the closure member is slidingly and sealingly received, and in which the sleeve extends into the flow passage.

23. The flow choke of claim 22, in which the sleeve is a portion of the adapter.

24. The flow choke of claim 22, in which the sensor detects whether a fluid is present in the chamber.

25. The flow choke of claim 22, in which the sensor detects pressure in the chamber.

26. The flow choke of claim 22, in which the sensor detects fluid leakage past the seal from the flow passage to the chamber.

27. A flow choke for use with a subterranean well, the flow choke comprising:

a body;

a variable flow restrictor configured to restrict flow through a flow passage extending through the body;

an actuator configured to displace a closure member of the flow restrictor relative to the body;

an adapter that connects the actuator to the body; and

a sensor in communication with a chamber formed between the adapter and the body,

in which the sensor is in fluid communication with the chamber via a fluid line extending through the body.