CLAIMS

1. A valve (1, 1') for controlling fluid flow, said valve comprising:

a valve body (10), a chamber (20) arranged inside of said valve body, a fluid inlet (22) for providing fluid to said chamber, and a fluid outlet (24) for receiving fluid from said chamber, wherein fluid upstream of said chamber but downstream of said fluid inlet has an upstream pressure, and fluid downstream of said chamber but upstream of said fluid outlet has a downstream pressure,

a closing arrangement (40) for controlling the flow of fluid from said fluid inlet to said fluid outlet via said chamber, said closing arrangement having, at least one open state in which fluid is allowed to flow through said chamber,

a differential pressure sensor (60) for measuring the differential pressure over said closing arrangement, between said upstream pressure and said downstream pressure, characterized in that

said differential pressure sensor is integrated into said valve body, and wherein said valve comprises a first fluid path (74) enabling a pressurized communication between the differential pressure sensor and fluid at said upstream pressure, and a second fluid path (76) enabling a pressurized communication between the differential pressure sensor and fluid at said downstream pressure, wherein said differential pressure sensor is arranged to measure the differential pressure for at least said open state of said closing arrangement.

2. A valve (1, 1') according to claim 1, wherein said differential pressure sensor (60) is arranged to measure the differential pressure between a first point positioned between said fluid inlet (22) and said chamber (20), and a second point positioned between said chamber and said fluid outlet (24).

3. A valve (1, 1') according to any one of claims 1-2, comprising a wall (70, 70') arranged in said valve body (10), said wall having a cavity (72, 72')

holding said differential pressure sensor (60), a first aperture (74, 74') providing a pressurized communication between the differential pressure sensor and fluid at said upstream pressure, and a second aperture (76, 76') providing a pressurized communication between the differential pressure sensor and fluid at said downstream pressure.

4. A valve (1, 1') according to claim 3, wherein said wall (70, 70') is arranged between said fluid inlet (22) and said fluid outlet (24), and wherein said first aperture (74, 74') is comprised in said first fluid path, and is in pressurized communication with said fluid inlet, and said second aperture (76, 76') is comprised in said second fluid path, and is in pressurized communication with said fluid outlet.

5. A valve (1) according to any one of claims 3-4, wherein said wall (70) together with said closing arrangement (40) in its closed state, fluidly separates said fluid inlet (22) from said fluid outlet (24).

6. A valve (1, 1') according to any one of claims 3-5, wherein said wall (70, 70') is a partition wall separating fluid at said upstream pressure from fluid at said downstream pressure.

7. A valve (1, 1') according to any one of claims 3-6, wherein said cavity (72, 72') of said wall (70, 70') has an opening (78, 78') in said valve body (10), said opening facing an outside of said valve enabling removal of said differential pressure sensor (60) from said cavity.

8. A valve (1, 1') according to any one of the preceding claims, wherein said valve body (10) comprises a first valve body part (12) and a second valve body part (14) sealingly connected to said first valve body part, wherein said second valve body part at least partly houses said closing arrangement (40).

9. A valve (1, 1') according to any one of the preceding claims, wherein said differential pressure sensor (60) comprises a first side (62) facing said first fluid path (16, 74), and a second side (64) facing said second fluid path (18, 76), wherein the differential pressure sensor is arranged and configured to measure the pressure difference between a fluid acting on said first side, and a fluid acting on said second side.

10. A valve (1, 1') according to any one of the preceding claims, wherein said fluid inlet (22) and said fluid outlet (24) are co-axial.

11. A valve (1, 1') according to any one of the preceding claims, wherein said closing arrangement (40) has a closed state in which no fluid, or only a leakage flow, is allowed to flow through said chamber (20), and wherein said differential pressure sensor (60) is configured for measuring the differential pressure over said closing arrangement at said closed state.

12. A valve (1, 1') according to any one of the preceding claims, wherein the pressure difference between fluid at said upstream pressure and fluid at said downstream pressure mainly corresponds to a fluid pressure drop over said closing arrangement (40).

13. A fluid distribution system (100) comprising a valve (101) according to any one of claims 1-12, and

an upstream pipe (152) for delivering fluid to said fluid inlet (22), said upstream pipe having an end portion (153) connected, such as e.g. directly connected, to said fluid inlet upstream of said closing arrangement (40) of said valve,

a downstream pipe (154) for receiving fluid from said fluid outlet (24), said downstream pipe having an end portion (155) connected, such as e.g. directly connected, to said fluid outlet downstream of said closing arrangement of said valve.

14. A method for measuring the differential pressure over a closing arrangement in a valve having a valve body, said method being characterized by the steps of:

providing (S1) a differential pressure sensor integrated in said valve body, wherein said valve comprises a first fluid path enabling a pressurized communication between the differential pressure sensor and fluid at an upstream pressure of said closing arrangement, and a second fluid path enabling a pressurized communication between the differential pressure sensor and fluid at a downstream pressure of said closing arrangement,

measuring (S2) the differential pressure between fluid at said upstream pressure and fluid at said downstream pressure by said differential pressure sensor for at least an open state of said valve.

15. The method according to claim 14, further comprising the step of measuring (S3) the differential pressure between fluid at said upstream pressure and fluid at said downstream pressure by said differential pressure sensor for at least a closed state of said valve.