CLAIMS

1. A valve arrangement (1) for injection of an injection fluid in a process fluid tubing, comprising:

- an inlet part (3) connectable to an injection fluid source,
- an outer housing (10) that is connectable to a process fluid tubing and comprising at least one outlet opening (14) that enables a fluid communication between an interior (12) of the outer housing and a process fluid tubing,
- a first valve device (20) comprising a first valve member (22) that is arranged in the outer housing (10) and movable within the outer housing in a longitudinal direction, and said first valve member (22) is arranged to control an inflow of injection fluid into the valve arrangement by being movable between a closed position and an open position,

characterised in that it comprises

a second valve device (40) comprising

- a second valve member (42) that is arranged in the outer housing (10) and movable within the outer housing in a longitudinal direction, and said second valve member (42) is arranged to control the at least one outlet opening (14) by being movable between a closed position, in which the at least one outlet opening (14) is closed and the valve arrangement is in a deactivated state in which injection fluid cannot be injected in the process fluid tubing, and an open position, in which the at least one outlet opening (14) is open and the valve arrangement is in an activated state that enables injection of injection fluid into the process fluid tubing, and
- a locking device (60) that locks the second valve member (42) in the closed position, and the locking device is releasable in order to allow the second valve member be released to move to the open position.

2. The valve arrangement according to claim 1, wherein the locking device (60) is configured to be released at a predetermined pressure difference between a fluid pressure P_{oh} inside the outer housing (10) and a fluid pressure P_{pf} in the process fluid tubing, which fluid pressure in the process tubing exceeds the fluid pressure inside the outer housing.

3. The valve arrangement according to any one of the previous claims, wherein the locking device comprises at least one shear member (62) configured to shear at a predetermined shear force.

4. The valve arrangement according to any one of the preceding claims, wherein the at least one outlet opening (14) in the outer housing (10) is located in a end wall (57) of the valve arrangement.

5. The valve arrangement according to any one of the preceding claims, wherein the second valve device (40) comprises at least one fluid opening (45) that, when the second valve member (42) is in the open position, provides a fluid communication between the process fluid tubing, via the at least one outlet opening (14), and the first valve member (22).

6. The valve arrangement according to any one of the preceding claims, wherein the second valve device (40) comprises an inner housing (44) located inside the outer housing (10), wherein the second valve member(42) is movable inside the inner housing.

7. The valve arrangement according to claim 6, wherein at least one first stop member (50) is arranged in the inner housing (44), against which stop member the second valve member (42) may abut in the open position.

8. The valve arrangement according to any one of claims 6-7, wherein the inner housing (44) has an open end (46) connected to the at least one outlet opening (14) and wherein the inner housing comprises at least one fluid opening (45) for allowing fluid communication between an interior (48) of the inner housing (44) and a surrounding interior (12) of the outer housing (10).

9. The valve arrangement according to any one of the preceding claims, wherein it comprises a holding device (70) that holds the first valve member (22) in an open position when the valve arrangement is in the deactivated state.

10. The valve arrangement according to claim 9, wherein the holding device (70) couples the first valve member (22) to the second valve device (40).

11. The valve arrangement according to any one of claims 9-10, wherein the holding device (70) comprises a connector (72) that connects the first valve member (22) and the second valve member (42).

12. The valve arrangement according to claim 11, wherein the connector is a resilient connector.

13. The valve arrangement according to any one of claims 9-10, wherein the holding device (70) comprises a releasable coupling (74) that couples the first valve member (22) to the inner housing (44) when the valve arrangement is in the deactivated state.

14. The valve arrangement according to claim 13, wherein the releasable coupling (70) is configured to be releasable by means of the second valve member (42), when the second valve member moves to its open position.

15. A side pocket mandrel (80) for use in a hydrocarbon well comprising an annulus (82) and a tubing (84), said side pocket mandrel comprising a valve arrangement (1) according to any one of claims 1-14, wherein the inlet part (3) connectable to an injection fluid source is connectable to the annulus (82) and the at least one outlet opening (14) is connectable to the tubing in the well.

16. A method for operating a valve arrangement according to any one of claims 1-14, which valve arrangement (1) is in a deactivated state in which the second valve member (42) is in its closed position, and which valve arrangement is connected via the inlet part (3) to an injection fluid source and connected via the at least one outlet opening (14) to a process fluid tubing, comprising

- activating (100) the valve arrangement (1) by applying a process fluid pressure in the process fluid tubing to exert a process fluid pressure force on the second valve member (42), whereby, when a predetermined pressure difference between a fluid pressure P_{oh} in the outer housing (10) and a fluid pressure P_{pf} in the process fluid tubing is reached, which fluid pressure in the process fluid tubing exceeds the fluid pressure in the outer housing, the locking device (70) is released and the second valve member (42) is released to move to the open position,
- injecting injection fluid (200) via the valve arrangement (1) into the process fluid tubing, comprising opening of the first valve member (22).