CLAIMS

1. A side pocket mandrel (1) for installation in a production tubing (3) for use in a hydrocarbon well, wherein the side pocket mandrel comprises:

an interior pocket space (6);

a valve arrangement (10) comprising an electrically controlled control valve and a controller having a processor, the valve arrangement being located in the interior pocket space for controlling the flow of an injection fluid from an external injection fluid source into the production tubing; and

an induction coil arrangement (80) connected to a topside controller (90) and connected to the valve arrangement (10) for transmission of signals from the topside controller to the valve arrangement or vice versa and/or for transfer of electric power from topside controller to the valve arrangement,

wherein the valve arrangement comprises an actuator, wherein the induction coil arrangement is configured to send signals from the topside controller to the controller and vice versa, the actuator is configured to move the electrically controlled control valve of the valve arrangement between an open position and a closed position based on the signals,

wherein the actuator is configured to send signals to the controller with information about the open/closed status of the electrically controlled control valve,

wherein the side pocket mandrel further comprises:

a recess provided in an external wall part of a first side wall, and the recess reaches a first compartment, and the recess is configured to receive a first induction coil of the induction coil arrangement for insertion into the first compartment; and

a lid configured to cover the recess.

2. The side pocket mandrel according to claim 1, wherein the induction coil arrangement (80) comprises a first induction coil (81) located at least partly along an interior wall part (33) of the interior pocket space and a second induction coil (82) located along an exterior part of the valve arrangement, and the second induction coil is located inside the first induction coil in a concentric manner.

3. The side pocket mandrel according to claim 1 or claim 2, further comprising a first seal member (28) located between an internal wall (29) of the pocket space and the valve arrangement (10) at a first location and a second seal member (30) located between the internal wall (29) of the pocket space and the valve arrangement (10) at a second location, whereby a first compartment (32) is obtained in the pocket space between the first seal member and the second seal member.

4. The side pocket mandrel according to any one of claims 1-3, further comprising an inlet port (22) for injection fluid provided in the first side wall (20) of the side pocket mandrel, wherein the first side wall is located between the first seal member (28) and the second seal member (30), wherein the inlet port is connectable to the external injection fluid source, and wherein the valve arrangement comprises a flow inlet (13) located in the first compartment (32),
an outlet port (26) for injection fluid provided in a second side wall (24) of the side pocket mandrel, wherein the second side wall is located in a second compartment (34) of the pocket space, wherein the second compartment is separated from the first compartment by one of the first and second seal members, wherein the outlet port (26) connects the second compartment (34) with production tubing (3), and wherein the valve arrangement comprises a flow outlet (14) located in the second compartment (34).

5. The side pocket mandrel according to claim 1, wherein the induction coil arrangement (80) is located in a first compartment (32).

6. A method for operating the valve arrangement (10), installed in the side pocket mandrel (1) of claim 1, wherein the valve arrangement (10) is connected to a downhole control arrangement (60) comprising the induction coil arrangement (80) comprising the first induction coil and a second induction coil, the method comprising:
sending (40) a signal from a topside controller (90), via cabling provided in an annulus, to the first induction coil (81) functioning as a transmitter coil (200),

transmitting a signal by induction to the second induction coil (82) functioning as a receiver coil (210),

transmitting a signal (42) via cabling to the controller (100), (220),

sending a signal (45) from the controller to an actuator (110) to open the electrically controlled control valve, or alternatively to close the electrically controlled control valve (230),

sending a valve status signal from the actuator (110) to the controller with information about the open/closed status of the electrically controlled control valve.

7. The method of claim 6, comprising:

sending a valve status signal (51) from the actuator (110) to the controller (100) confirming that the electrically controlled control valve is open or closed, or using a sensor (130) to check (53) if the electrically controlled control valve is open or closed and send (52) a valve status signal to the controller,

sending (43) the valve status signal from the controller (100) to the second induction coil (82) now functioning as the transmitter coil (250),

transmitting the valve status signal by induction to the first induction coil (81) now functioning as a receiver coil (260),

transmitting the valve status signal via cabling (41) to the topside controller (90), (270).