CLAIMS

1. A displacement pump comprising a delivery chamber connected to a pressure and a suction connection, a displacer element which determines the volume of the delivery chamber and which can be reciprocated between a first position in which the delivery chamber is of a smaller volume and a second position in which the delivery chamber is of a larger volume, wherein the pressure connection is connected to the delivery chamber by way of a pressure valve and the suction connection is connected to the delivery chamber by way of a suction valve, characterised in that a reservoir which can be filled with delivery fluid is connected to the delivery chamber by way of a gas venting valve.

2. A displacement pump as set forth in claim 1 characterised in that the gas venting valve is so adapted that during the suction stroke movement it can be opened or opens automatically if the pressure in the delivery chamber is less than the pressure in the reservoir.

3. A displacement pump as set forth in claim 1 or claim 2 characterised in that the displacement pump is so adapted that delivery fluid can be transported from the suction connection into the delivery chamber by way of the suction valve without flowing through the reservoir.

4. A displacement pump as set forth in one of claims 1 through 3 characterised in that the gas venting valve in the direction from the reservoir to the delivery chamber has a through-flow coefficient which is less than the through-flow coefficient of the suction valve, wherein preferably the through-flow coefficient of the gas venting valve is less than 1%, particularly preferably less than 0.2%, of the through-flow coefficient of the suction valve.

5. A displacement pump as set forth in one of claims 1 through 4 characterised in that the gas venting valve is a throttle non-return valve which provides a permanent throttled communication and if the pressure in the delivery chamber is greater than the pressure in the reservoir an unthrottled communication.

6. A displacement pump as set forth in claim 5 characterised in that in the unthrottled condition the throttle non-return valve has a through-flow coefficient which is less than the through-flow coefficient of the pressure valve, wherein preferably the through-flow coefficient of the unthrottled gas venting valve is less than 15%, particularly preferably less than 5%, of the through-flow coefficient of the pressure valve.

7. A displacement pump as set forth in one of claims 1 through 6 characterised in that the gas venting valve is a non-return valve which opens when the pressure in the delivery chamber is less than the pressure in the reservoir.

8. A displacement pump as set forth in one of claims 1 through 7 characterised in that the reservoir is connected to the pressure connection.

9. A displacement pump as set forth in claim 8 characterised in that the gas venting valve is connected in series with the pressure valve, the gas venting valve being arranged closer to the delivery chamber.

10. A displacement pump as set forth in one of claims 1 through 9 characterised in that the reservoir is connected to an accumulator.

11. A metering installation comprising a pressure line in which delivery fluid is contained at a pressure p_2, a suction line in which delivery fluid is contained at a pressure $p_1 < p2$, and a displacement pump as set forth in one of claims 1 through 10, wherein the pressure line is connected to the pressure connection and the suction line to the suction connection.

~~12. A metering installation as set forth in claim 10 characterised in that the reservoir contains delivery fluid at a pressure p_3, wherein $p_1 < p_3 < p_2$.~~

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CLAIMS

1. A displacement pump comprising a delivery chamber connected to a pressure and a suction connection, a displacer element which determines the volume of the delivery chamber and which can be reciprocated between a first position in which the delivery chamber is of a smaller volume and a second position in which the delivery chamber is of a larger volume, wherein the pressure connection is connected to the delivery chamber by way of a pressure valve in the form of a non-return valve and the suction connection is connected to the delivery chamber by way of a suction valve in the form of a non-return valve, characterised in that a reservoir which can be filled with delivery fluid is connected to the delivery chamber by way of a gas venting valve, wherein the gas venting valve is a non-return valve which opens when the pressure in the delivery chamber is less than the pressure in the reservoir.

2. A displacement pump as set forth in claim 1 characterised in that the gas venting valve is so adapted that during the suction stroke movement it can be opened or opens automatically if the pressure in the delivery chamber is less than the pressure in the reservoir.

3. A displacement pump as set forth in claim 1 or claim 2 characterised in that the displacement pump is so adapted that delivery fluid can be transported from the suction connection into the delivery chamber by way of the suction valve without flowing through the reservoir.

4. A displacement pump as set forth in one of claims 1 through 3 characterised in that the gas venting valve in the direction from the reservoir to the delivery chamber has a through-flow coefficient which is less than the through-flow coefficient of the suction valve, wherein preferably the through-flow coefficient of the gas venting valve is less than 1%, particularly preferably less than 0.2%, of the through-flow coefficient of the suction valve.

5. A displacement pump as set forth in one of claims 1 through 4 characterised in that the gas venting valve is a throttle non-return valve which provides a permanent throttled communication and if the pressure in the delivery chamber is greater than the pressure in the reservoir an unthrottled communication.

6. A displacement pump as set forth in claim 5 characterised in that in the unthrottled condition the throttle non-return valve has a through-flow coefficient which is less than the through-flow coefficient of the pressure valve, wherein preferably the through-flow coefficient of the unthrottled gas venting valve is less than 15%, particularly preferably less than 5%, of the through-flow coefficient of the pressure valve.

7. A displacement pump as set forth in one of claims 1 through 6 characterised in that the reservoir is connected to the pressure connection.

8. A displacement pump as set forth in claim 7 characterised in that the gas venting valve is connected in series with the pressure valve, the gas venting valve being arranged closer to the delivery chamber.

9. A displacement pump as set forth in one of claims 1 through 8 characterised in that the reservoir is connected to an accumulator.

10. A metering installation comprising a pressure line in which delivery fluid is contained at a pressure p_2, a suction line in which delivery fluid is contained at a pressure $p_1 < p2$, and a displacement pump as set forth in one of claims 1 through 9, wherein the pressure line is connected to the pressure connection and the suction line to the suction connection.

11. A metering installation as set forth in claim 9 characterised in that the reservoir contains delivery fluid at a pressure p_3, wherein $p_1 < p_3 < p_2$.