

Hydraulic Vane Pumps

Adjustable Vane Pump PV7



Suction and displacement procedure: The chambers required for the transport of hydraulic fluid are formed by the vanes, the rotor, the stator ring, and the control plate. To ensure pump function on commissioning, the stator ring is held in its eccentric position (displacement position) by the spring behind the large floating stroking piston. The chamber volume increases as the rotor rotates and the chambers are filled with hydraulic fluid through the suction channel. When the greatest chamber volume is reached, the chambers are separated from the suction side. As the rotor continues to rotate, the connection to the pressure side is opened, and the chambers decrease in size and force the hydraulic fluid into the system through the pressure channel (P).

Adjustment: As pressure builds in the system, the back of the small floating stroking piston is always pressurized through a channel. In the flow position, the back of the large stroking piston is also pressurized through a bore in the regulator spool. The large stroking piston, with the larger surface, holds the stator ring in its eccentric position. The pump displaces fluid at a pressure that is below the zero-stroke pressure set on the pressure controller. The regulator spool is held in a certain position by the spring.

Pressure relief: If the force FP produced by pressure \times area exceeds the counterforce FF of the spring, the regulator spool is pushed against the spring. This connects the space behind the large floating stroking piston to the tank, relieving pressure. The small set piston, which is always under system pressure, moves the stator ring to virtually the centre position. The pump maintains pressure, flow returns to zero, leakages are replaced. Power loss and fluid heating are minimal. The characteristic curve qV - p runs vertically and moves parallel to various high pressures that are set.

PV7-A



Suction and displacement process: The chambers which are required for the transport of the hydraulic fluid are formed by the vanes, the rotor, the stator ring, the control plate and the cover plate. The chamber volume increases as the rotor rotates and the chambers are filled with hydraulic fluid via the suction channel (S). When the largest chamber volume is reached, the chambers are separated from the suction side. As the rotor continues to rotate the connection to the pressure side is opened, the chambers decrease in size and force the hydraulic fluid into the system via the pressure port (P).

Pressure control: The stator ring is held in its initial excentric position by spring. The maximum operating pressure required in the system is set at the adjustment screw via the spring. The pressure which builds up due to the work resistance acts on the pressure side of the inner running surface of the stator ring, against the force of the spring. When the relevant pressure is reached, which is determined by the set spring force, the stator ring is moved out of its excentric position in the direction of the zero position. The flow adjusts itself to the value which is being demanded at that time. When the maximum pressure, which has been set at the spring, has been reached then the pump regulates the flow back to virtually zero. The operating pressure is maintained and only the case drain is replaced. Losses and heating of the hydraulic fluid is thereby minimized.