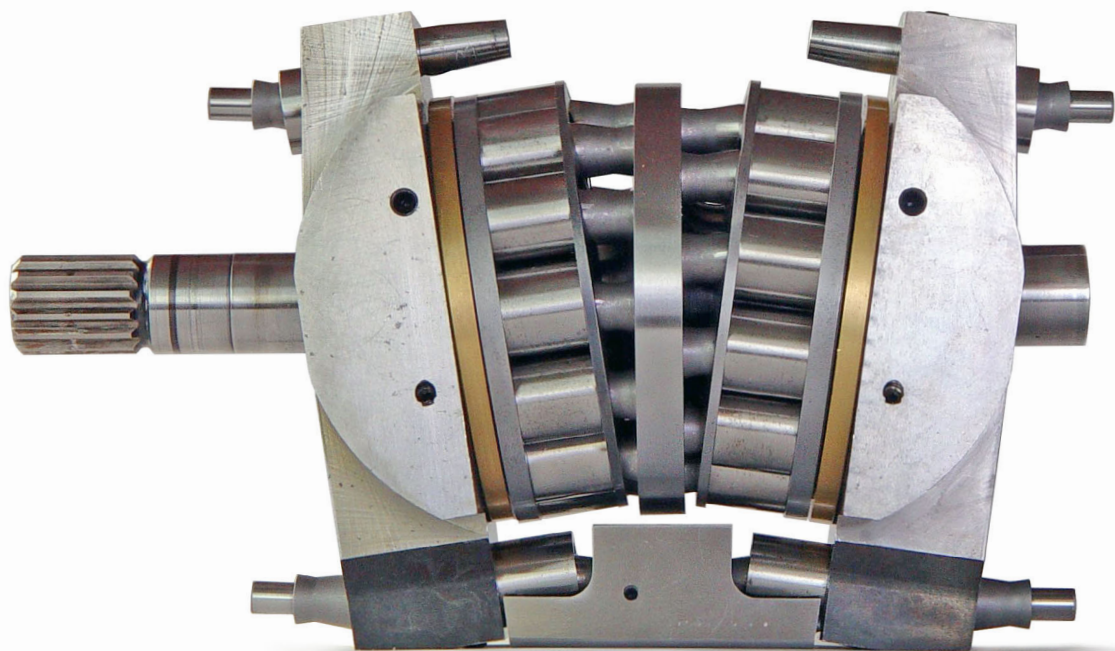


THE VARIABLE FLOATING CUP



Variable floating cup pumps and motors are very efficient. Not only because of the floating cup principle itself, but also because of a new and patented construction which reduces the deformation of the swash plates to a few micrometer, even at high pressures. This is vital for the lubrication gap and hydrostatic bearing between the port plates and

the barrels. The new construction also reduces the axial load on the swash plate bearings. In addition, a new control circuit has been developed. The new control decimates the losses of conventional controls, often improving the average overall efficiency of the pump and its control by 20% or more.

MYRIAD INNOVATIONS

FLOATING CUP SWASH PLATE CONTROL

For the control of the swash plate position, floating cup pistons and cups are applied: the bias and control pistons are the same as of the rotating group.

MINIMIZING DEFORMATION

Any deformation of the swash plate results in a deformation of the port plate. This deformation has a direct effect on the oil film. In order to minimize the friction and leakage of this bearing interface, the deformation of the swash plate needs to be minimized to a few micrometer. For this reason the bias piston and one of the control pistons are positioned at the back side of the swash plate where they create an extra support.

TWO CONTROL PISTONS PER SWASH PLATE

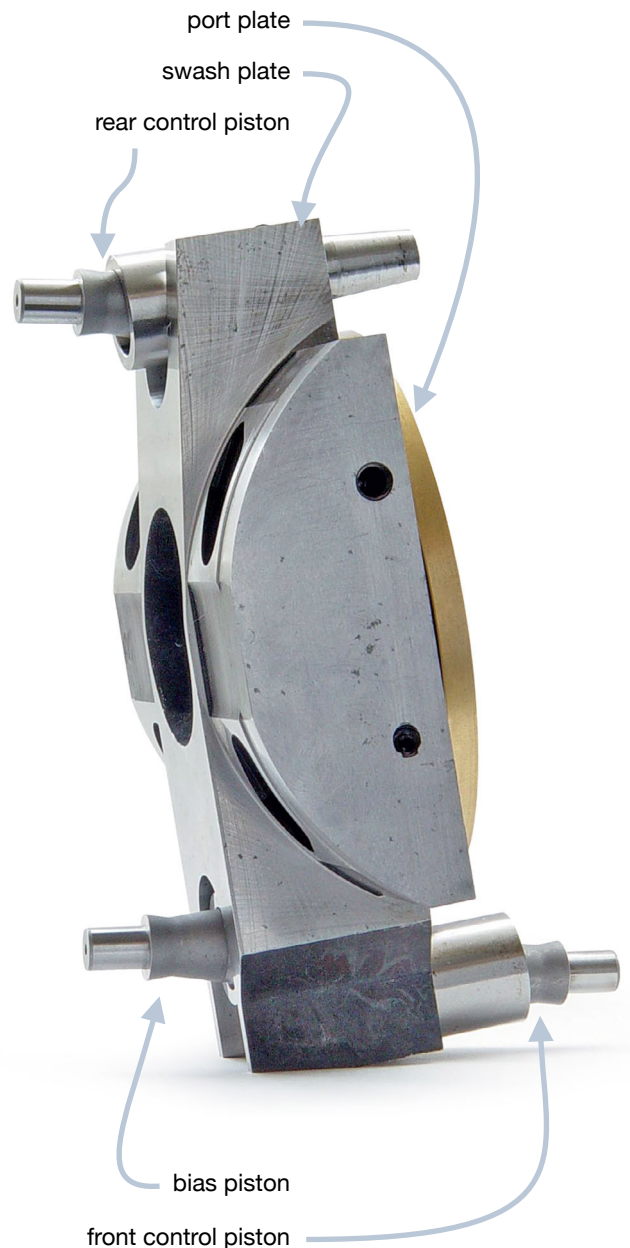
Each swash plate has two control pistons, one on the front side and one at the rear. This way there is no additional axial load of the control pistons on the swash plate. The pair of control pistons only generate a torque load.

NEW PUMP CONTROL

Valves are applied to control the swash plate position and the displacement. In conventional pumps and motors these valves are a major source of losses. For the floating cup pump, a new valve and control circuit is developed, which strongly reduces these losses. Under normal operating conditions the new pump control can improve the average efficiency of the pump and its control by 20% or more.

PATENTS

The design of the variable displacement floating cup is protected by patents. The patents are granted in the US, Europe and Japan. In 2013, patents have been applied for the new pump control. In addition, the design is protected by the base patents of the floating cup principle, which have also been granted.



More information about Innas and the floating cup technology can be found at www.innas.com



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