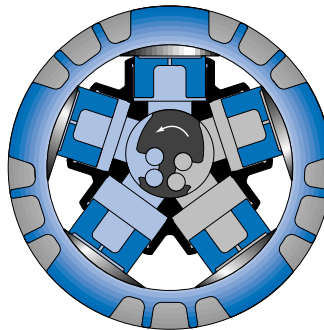


THE SMA MOTOR

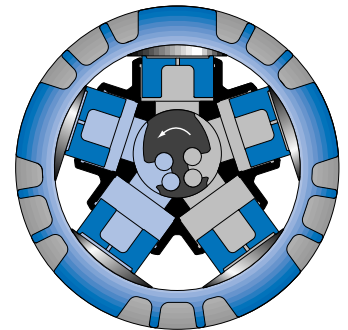
DESCRIPTION OF OPERATION

The motor function is achieved by five piston sleeves carried radially in a cylinder block mounted on an eccentric incorporated in the driveshaft. Hydraulic fluid under pressure is fed to each piston sleeve in turn from axial galleries in the crankshaft through a timing slot in the eccentric. The piston sleeves are supported by flat reaction pads inside the motor case. Pressurising the cylinders therefore produces a resultant turning moment on the eccentric by direct hydraulic pressure, thus eliminating connecting rods or other mechanical linkage between piston and crankshaft and the resultant losses associated with such components. Each piston sleeve is supported at the reaction pad end by a hydrostatic bearing and is free to float sideways to accommodate the orbiting action of the cylinder block. Correct location of the cylinder block relative to the reaction pads is maintained by an Oldham coupling. The crankshaft is supported on large taper roller bearings capable of accepting both radial and axial external loads. Fluid is fed to and from the crankshaft galleries through a rotating distributor system at the non-drive end of the shaft.

Low pressure  High pressure  Re-circulating oil 



Multi-displacement shaft motor



Freewheel operation

ROTATING CASE OPTION

Types : E1,E1 High Power & B1

The SMA motor can be built in rotating case form by incorporating a crankshaft designed for use as the motor mounting point, with hydraulic fluid supplied directly to the internal galleries, eliminating the need for a distributor.

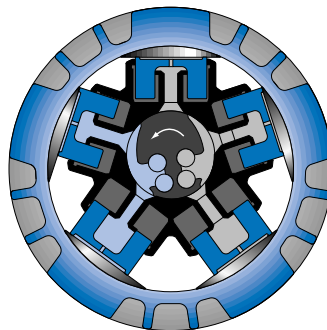
MULTIPLE DISPLACEMENT OPTION

Type C2 :

Multiple displacement is achieved by separating the bore and wall areas of the piston sleeves so that they can be pressurised simultaneously or independently. Pressuring the full area gives maximum torque, while pressuring the wall or bore areas gives intermediate and minimum displacement respectively. Flow is directed to the wall or bore area through dual galleries in the crankshaft, via an integral pilot-operated selector valve mounted on the distributor housing. This valve ensures that the non-pressurised area remains full of hydraulic fluid, thus allowing displacement to be changed while the motor is turning, under load.

FREE-WHEEL ABILITY

The ability to free-wheel is an inherent feature of the SMA range. Only hydraulic system pressure retains the piston sleeves against their respective pads; therefore if the motor is isolated from the rest of the system the piston sleeves are free to retract, thus allowing the cylinder block to orbit without pumping fluid and consequently with negligible resistance. Drive is re-engaged by opening the hydraulic supply to the motor, when the piston sleeves resume their normal working position against their respective pads. During this process the large hydrostatic bearing surface has a dampening effect, preventing harsh contact between each piston sleeve and its pad.



Multi-displacement shaft motor

