

Rotary Actuators

The World of Rotary Actuators

Servotest produces two types of Rotary Actuators; Dual Vane, and Torque rotary actuators. By virtue of their design, both types of actuators, when used continuously, have a life in excess of 5×10^9 cycles. Rated for operation at 210 bar supply pressure, Servotest actuators can work with pressures of up to 280bar.

Modular in design, they provide many options on stroke, force, flow capacity and accessories for a wide range of dynamic and static test applications.



A world of experience...

Servotest is a World Class Test and Motion Simulation Company, with experience of operating around the globe, for multi national corporations, smaller specialist companies and Government Departments. Since the 1940's our engineers and equipment have been at the forefront of our industry. Product and Service quality is maintained by a program of continuous training and development of our people and equipment.

We operate in all of the key industry sectors for our marketplace, including Automotive, Marine, Civil Engineering, Aviation, Defence, Aerospace and Traction.

The company holds both ISO14001 and 9001 Quality accreditation marks and is a member of many national and international trade organisations.

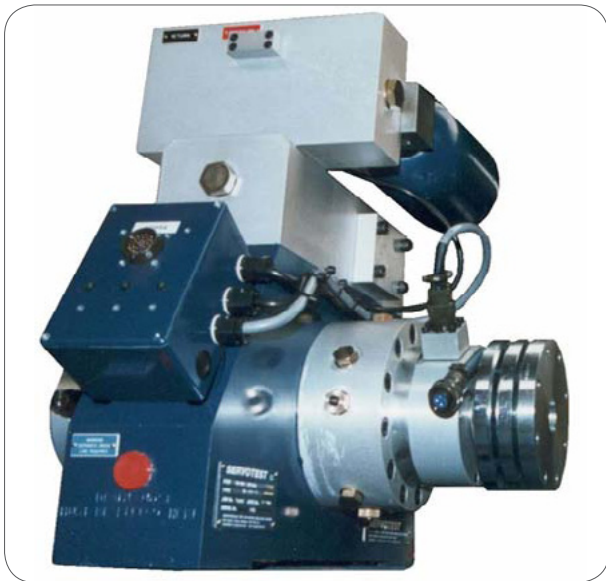


Dual Vane Rotary Actuators

The dual vane semi-rotary actuator consists of two main parts: a rigid precision-machined stator in which a rotor (with integral shaft) is mounted.

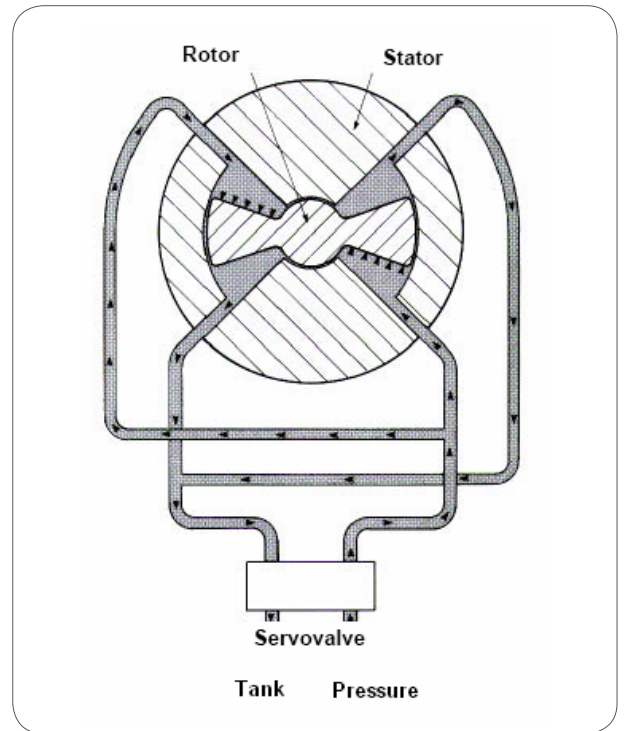
The rotor shaft is supported on special hydrostatic bearings which contribute to the considerable transverse stiffness and load bearing capacity of the actuator.

High-pressure fluid is admitted to the two sides of the rotor from the servovalve mounted on the top of the actuator body. Dynamic power is derived from pressurised mineral based fluid acting on the piston, and controlled by two or three stage proportional servovalves, depending on the performance required, which operates in response to the error signal in the servo loop.



By virtue of their design, the actuators, when used continuously, have a life in excess of 5×10^9 cycles, with only infrequent replacement of the low pressure nitrile seal, fitted to retain the flow from the hydrostatic bearings.

Pressure accumulators are fitted close to the actuators to provide instantaneous flow to meet peak demands. There are also exhaust accumulators close to the actuators to smooth pulsations in the return line.



As a safety precaution, a low pressure switch is fitted to the actuator manifold. It provides an electrical interlock, which prevents the electronics from being switched off while there is still pressure in the system. Also, in the event of mains power failure when the electronics is automatically transferred to UPS for a controlled shut down, the switch detects the safe low pressure level.

The dual vane rotary actuator has been designed for a range of different dynamic thrusts. This range yields two body sizes, the first providing forces from 500Nm to 5000Nm and the second providing forces from 6000Nm to 10,000Nm. As the operating pressure is the same for the whole range, the different forces are obtained with different sizes of rotor.

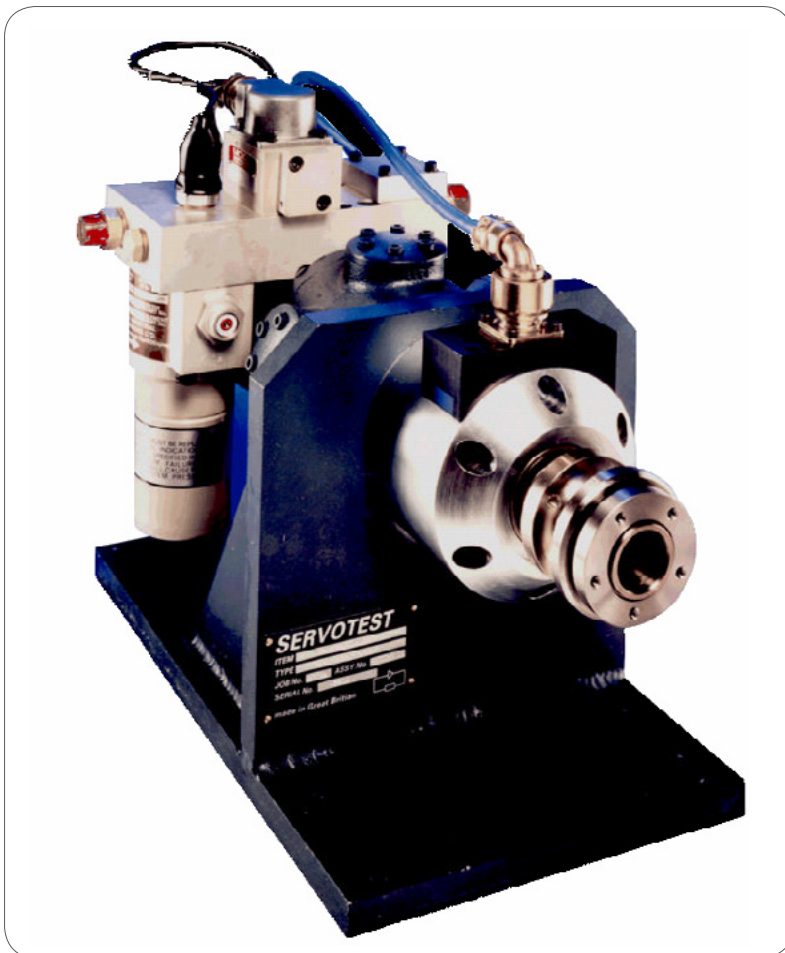
The servovalve flow required depends on the size of the actuator thrust (and hence its rotor face surface area) and the performance required from the actuator. The servovalve configurations given on the next page are guidelines only.

Input Torque Rotary Actuators

The Input Torque Actuator consists of a radial piston motor with a servovalve controlling the flow through it.

The displacement transducer is a digital rotary encoder, which offers great accuracy. The torque actuator has the capacity to turn continuously but is calibrated to 4400°.

The strain gauged torque cell employs a slip ring to transport the signals from the cell back to the electronics.



Specification Table

Dual Vane Rotary Actuators

| Torque Actuator (output) | TAV90-6000 to 10,000 |
|---------------------------------|--|
| Dynamic thrust | 6000 to 10,000 Nm |
| Static thrust | 8100 to 13,500 Nm |
| Supply pressure | 210 bar |
| Stroke | +/- 45 |
| Transducer | Rotary Encoder Integrated Torque Cell |

| Torque Actuator (output) | TAV90-500 to 5,000 |
|---------------------------------|--|
| Dynamic thrust | 500 to 5000 Nm |
| Static thrust | 675 to 6750 Nm |
| Supply pressure | 210 bar |
| Stroke | +/- 45 |
| Transducer | Rotary Encoder Integrated Torque Cell |

| Torque Actuator (output) | TAV270-4,000 |
|---------------------------------|--|
| Dynamic thrust | 4000 Nm |
| Static thrust | 5400 Nm |
| Supply pressure | 210 bar |
| Stroke | +/- 135 |
| Transducer | Rotary Encoder Integrated Torque Cell |

Servotest has also designed and manufactured a number of single vane rotary actuators. The Principle is the same as with the dual vane, but the reduction to one vane allows far greater stroke capabilities while maintaining the high thrust capabilities and performance of the dual vane actuators.

Dual Vane Rotary Actuators

| Torque Actuator (output) | TA4400-78 |
|---------------------------------|--|
| Dynamic thrust | 78 Nm |
| Static thrust | 105 Nm |
| Supply pressure | 210 bar |
| Stroke | +/- 2200 |
| Transducer | Rotary Encoder Integrated Torque Cell |

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