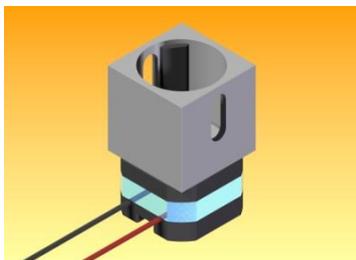
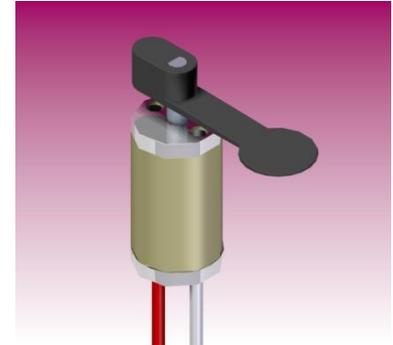




# Shutter Actuation – Small Actuators

## Rotary Actuators

Geeplus offers small rotary actuators in several types suited to actuation of small shutter mechanisms. These typically require rotation of a small 'flag' to block or pass a light beam, or of a small mirror to deflect a light beam down another path.

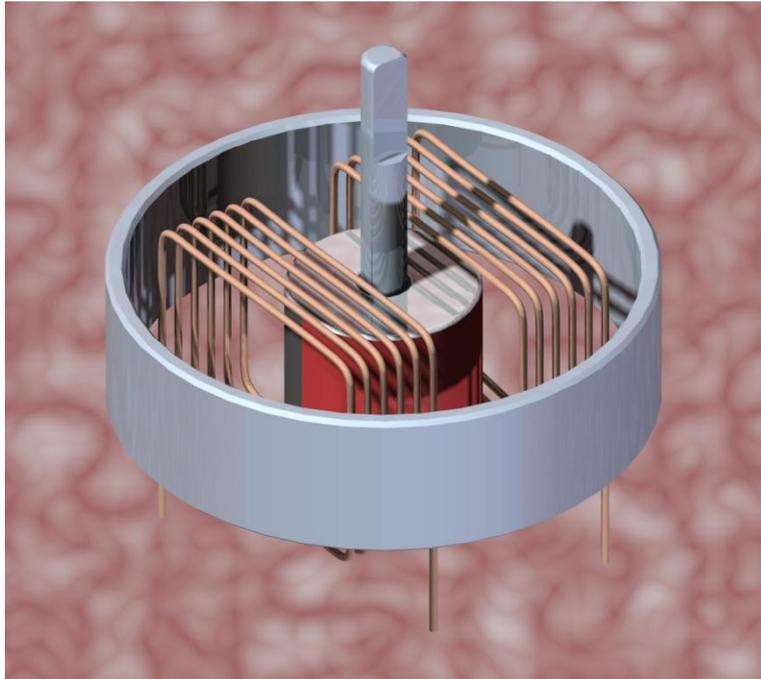


### WHAT APPLICATION/S DOES IT SUIT?

These rotary actuators are suited to small shutter mechanisms where the mass of moving elements is small, and is balanced about the axis of rotation. Fast actuation (<2ms) is possible for small angles and loads

### WHAT DIFFERENTIATES IT FROM OTHER SOLUTIONS?

- These devices are brushless with a fixed coil and moving magnet rotor, so do not exhibit the wear and reliability concerns associated with brushed motors, and can endure high pulse currents without damage for high torque / fast operation.
- Bistable operation allows the device to be driven from open to closed position or vice versa with a short excitation pulse, and then to hold this end position without power being applied.
  - This reduces power consumption in battery powered systems.
  - In applications such as thermal imaging, the reduction of heat dissipation from the actuator reduces disturbance of the sensors in the imaging system.
  - If 'fail-safe' operation is required where the device must return to a known state in the event of power failure, bistable operation may not be appropriate
- By balancing the moving elements about the axis of rotation, the mechanism can be made highly resistant to shock applied in a linear direction, and friction can be minimised with inexpensive bearings.

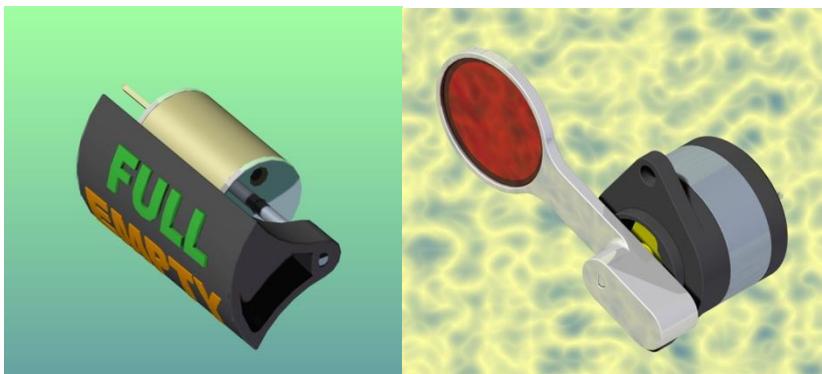


## DESIGN

The most widely used actuators are moving magnet galvanometers or bistable rotary solenoids, the typical construction of these is shown in the accompanying image. A permanent magnet rotor is supported within a coil, when the coil is energised,

the rotor tries to turn to align itself with the field developed by the coil, developing a torque proportional to the excitation current. An iron case helps concentrate the magnetic field, and reduces susceptibility to disturbance by external fields. By modifying the shape of this case, the device can be made bistable, so that it turns away from the centre position towards either end position without power applied – the bistable rotary solenoid is an extreme example of this where proportionality is sacrificed for better efficiency and bistable function.

## KEY PARAMETERS (SIZE / FORCE / POWER / ETC)



Devices are produced in sizes from 7mm diameter as standard, and up to 50mm diameter, smaller or larger sizes may be

possible for high-volume applications