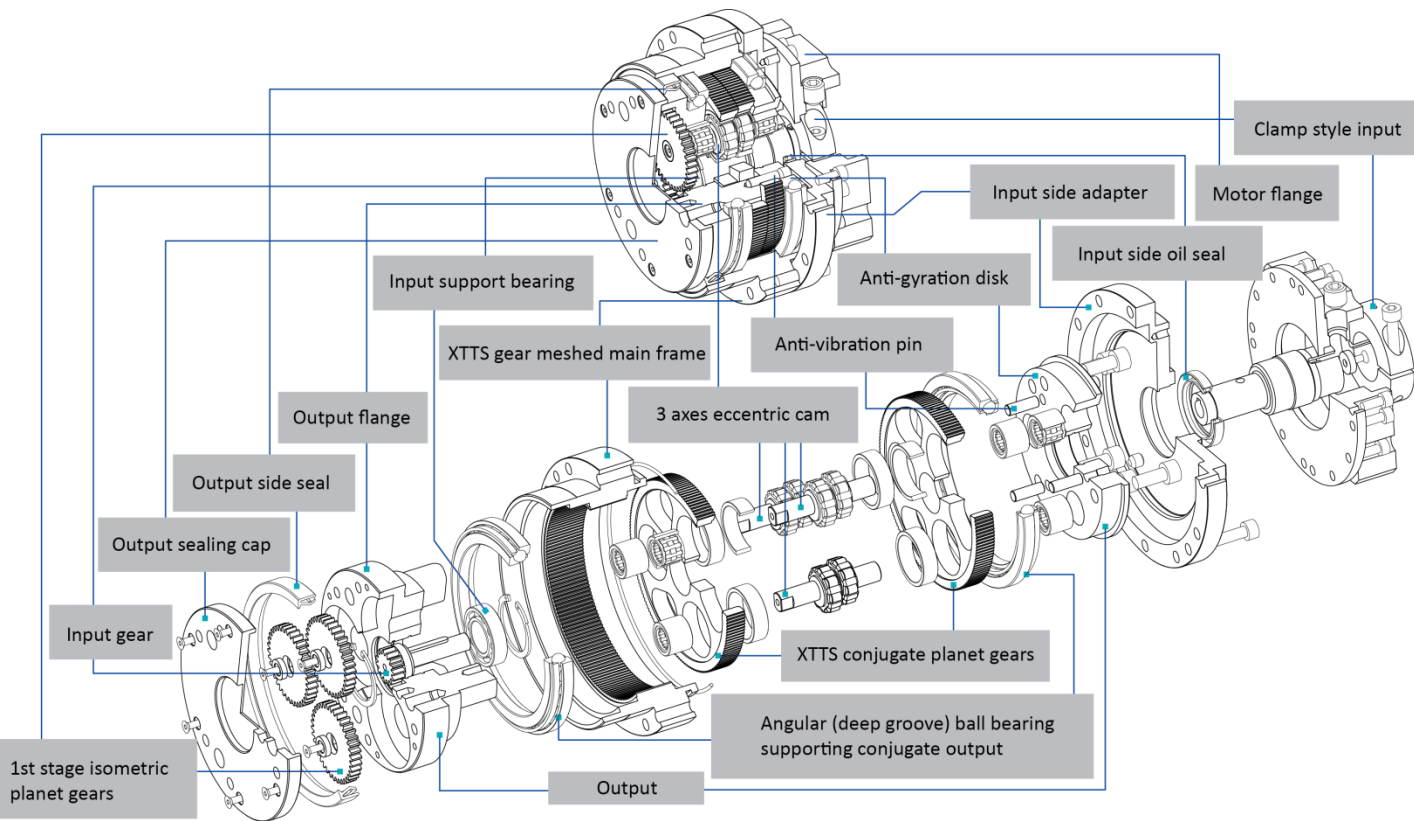


Operating Principle | High Precision Gearbox

LPR's Power Series is composed of two reduction stages with the patented XTTS gear meshed main frame. The first stage has unique planet-like gears without ring gears, and the second stage has XTTS conjugate planet gears. XTTS is the name of the globally patented gear profile we developed. Our patented gear profile achieves **minimum input inertia, higher torsional rigidity, and more compact and rigid structure.**

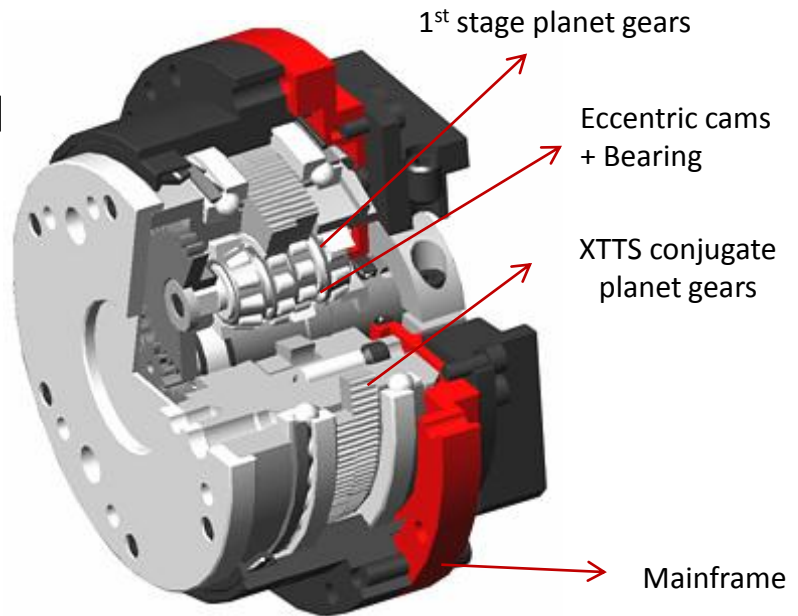


Operating Principle | High Precision Gearbox

When input is given to the sun gear in the first stage, the force is relayed to the planet gears.

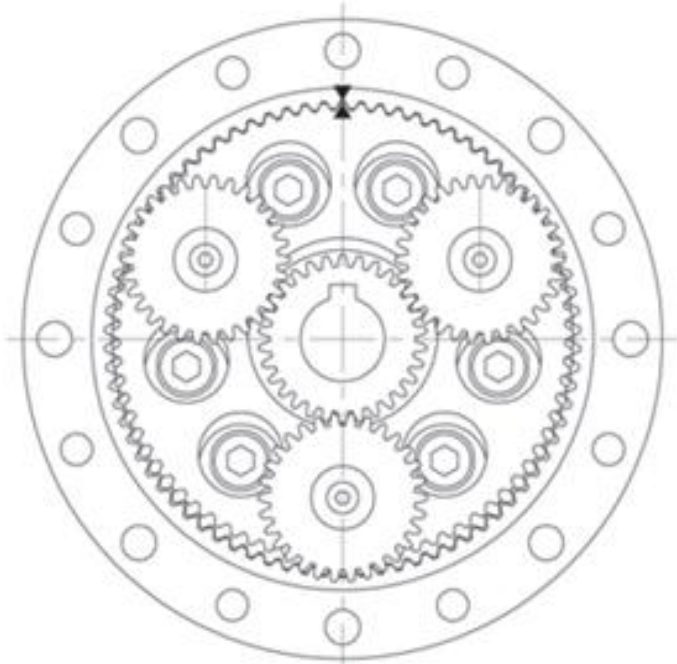
However, Power Series is different from other conventional gearboxes as the reaction force, which moves the planet gears to rotate around the sun gear, comes from

the ring gear in the second stage, not in the first stage. The planet gears in the first stage are coupled with the eccentric cams in the second stage.

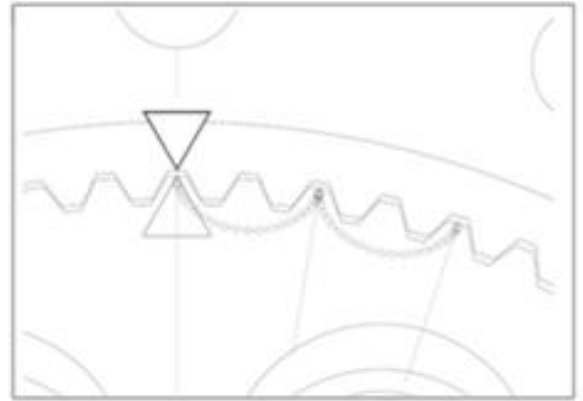


The XTTS gears in the second stage perform **trochoidal motion** at the area where the ring gears and conjugate planet gears are in full mesh. This is due to the contact between the ring gears and conjugate planet gears as well as the motion in the 3 axes eccentric cams, which is driven by the rotation of the planet gears in the first stage.

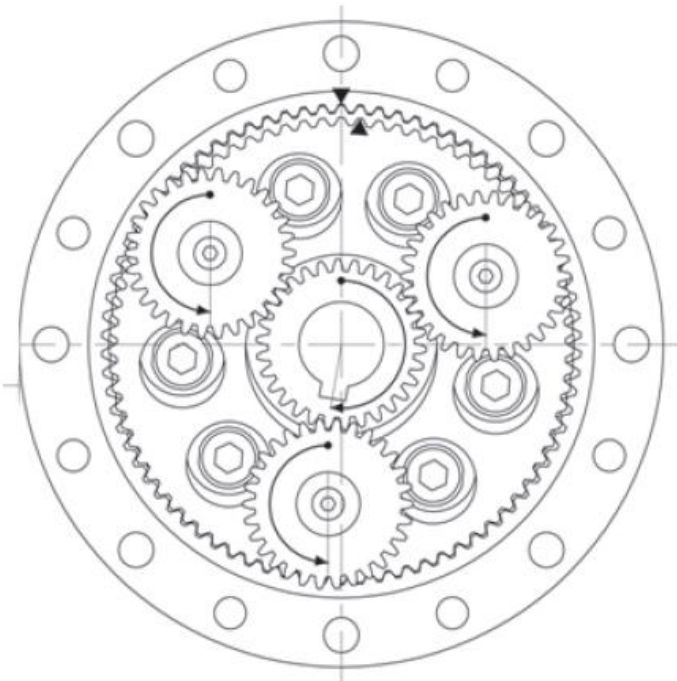
Operating Principle | High Precision Gearbox



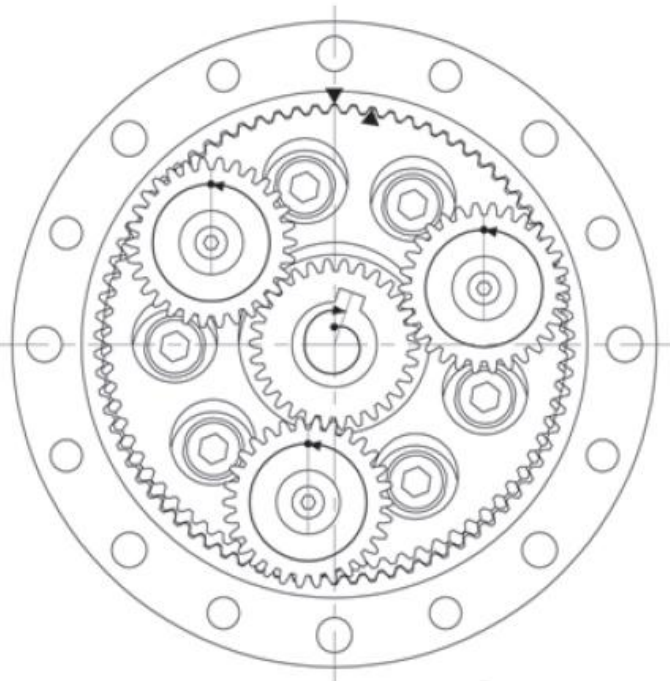
0°



Trochoidal motion of XTTS in the 2nd stage



**Planet gears in the 1st stage
180°**



**Planet gears in the 1st stage
360°**

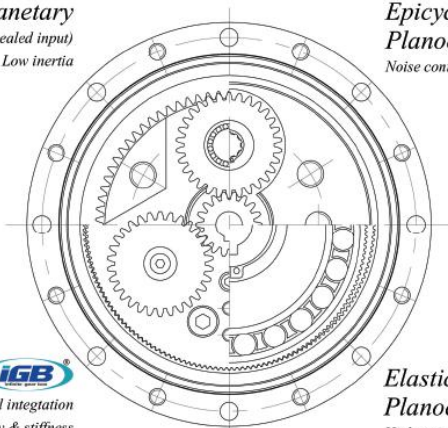
Operating Principle | High Precision Gearbox

The 3 axes eccentric cams reduce speed by moving the conjugate planet gears a distance equal to the difference in the tooth between the ring gears and conjugate planet gears for each rotation. If the 3 axes eccentric cams rotate clockwise and the ring gear is fixed, the conjugate planet gear will rotate (or roll) counterclockwise at a slower speed. It ultimately rotates the output flange through the multi-transmission structure of the isometric layout.

Any one of the three parts – the sun gear in the first stage (the input gear), the XTTS gear meshed main frame, the conjugate planet gears – can be fixed, and the other two can be used interchangeably as input or output.

Xeno-Quadro[®] Diagram

Planetary
Easy to fit (Clamp & sealed input)
Low inertia



Epicyclic Planocentric
Noise control with shortened length




Overall integration
Enhanced rigidity & stiffness
Widest reduction range

Elastic-deformed Planocentric
High ratio. Compactness. Small size. & Bigger input diameter



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