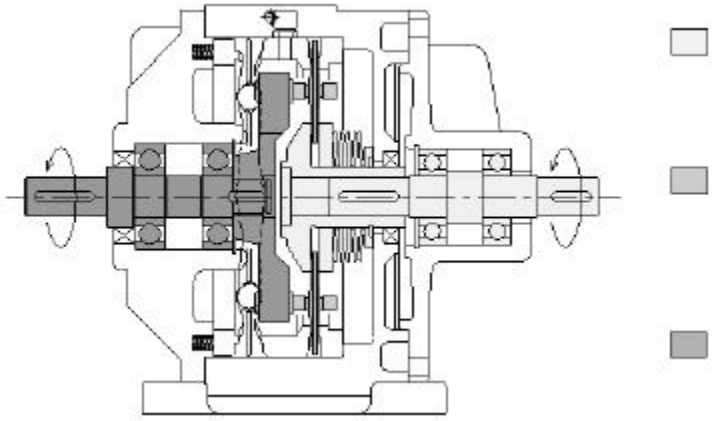
Mechanical Speed Variation

TORQUE TRANSMISSION & SPEED VARIATION



High Speed Mechanism - consists of input shaft, disc springs, and inner suns. These components turn at the high speed.

Speed Reduction Mechanism - planet discs, making contact with inner sun and outer rings, enable the speed reduction and variation to take place.

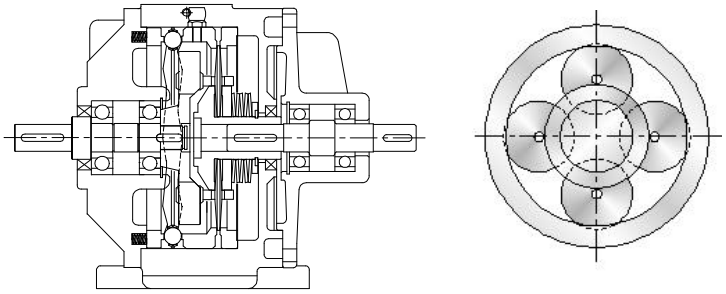
Slow Speed Mechanism - consists of planet discs carrier and output shaft.

◆ As shown in the drawing above, the input speed goes through the high speed mechanism, and the speed reduction takes place with the contact among the inner sun, planet discs, and outer rings. This reduced speed (via viscous traction) then drives the slow speed mechanism and outputs the low speed. The speed variation is achieved by altering the relative position among the inner sun, planet discs, and outer rings. In another word, since the location of the inner sun and outer rings remains unchanged relative to the frame of the variator body, the speed variation is achieved by altering the radial position of the planets discs relative to the shaft center.

The centrifugal force acts on the planet discs as they rotate around the inner sun. Since you can adjust the gap between two outer rings by turning the control wheel, the conical shaped planet discs are free to shift toward or away from the inner sun. As the planet discs shift radially, the contact radius between planet discs and inner sun as well as the contact radius between planet discs and outer rings vary, therefore contributing to speed variation.

Please refer to the illustration below. When planet discs are closest to inner sun (i.e. farthest from outer rings), the reduction ratio is minimum (1.5:1), and the output speed is maximum. On the other hand, when the planet discs are closest to outer rings (i.e. farthest from inner sun), the reduction ratio is maximum (9:1), and the output speed is minimum.

- Minimum Output Speed - Maximum Ratio (9:1)



- **Excellent shock load resistance at low output speed.**
- **When operating at high load, start at low output speed.**
- **Minimum speed hp rating is twice the maximum speed hp rating.**

- Maximum Output Speed - Minimum Ratio (1.5:1)