



Worm gear and Wheel Apparatus (SMT-TM-08)

Worm gears are a category of helical rolling gears that are classified as transmission or conversion elements within machine elements. This type of gear comprises the usual driving worm and the driven worm wheel. Worm gears are quiet and have a damping effect. They are smaller and easier to operate than spur gears or bevel gears of the same performance and gear ratios. The SMT-TM-08 experimental unit is used to study their torque ratios and efficiency. The transmission ratio of the gear can be determined. The basic concepts of toothing such as tooth number and gear number, module, pitch and centre distance are illustrated.

TECHNICAL SPECIFICATIONS

Specifications:

- Function and design of worm gears.
- 2 aluminium cable drums.
- Worm, worm wheel and pulleys.
- Mounted on ball bearings.

Technical Data:

- Cable drum:
 - Worm shaft diameter: $\varnothing=40\text{mm}$.
 - Worm wheel shaft diameter: $\varnothing=120\text{mm}$.
- Worm gear:
 - Centre distance: 80mm.
 - Gear ratio: 30:1.
 - Module: $m=4\text{mm}$.
 - Number of gears: 1.
 - Force transmission: 10.
- Weights on the worm side:
 - 1x 50N, 1x 20N.
 - 2x 10N, 1x 10N (hanger with equalising mass).
- Weights on worm wheel:
 - 1x 5N, 4x 2N.
 - 1x 1N, 1x 0.5N.
 - 1x 0.5N (hanger).



Experimental Data:

- Development of the main variables and relationships in a worm gear
- Investigation of transmission ratio, torque, friction and self-locking
- Determine the efficiency