

This apparatus consists of two standard epicyclic gear trains. Each gear train consists of a sun gear in the centre, three planet gears, a planet linkage and an internal or ring gear.

The sun gear, ring gear and planet carrier all rotate about the same axis. The planet gears are mounted on shafts that turn in planet carrier and meshes with both the sun gear and the ring gear. Pulleys fitted with protractors are attached to the input and output shaft so that torque and velocity ratios may be determined.

Torques can be applied to the shaft by adding weights on cords wrapped on the pulleys. Bearings are used in the entire unit to minimize friction losses.

The apparatus can be operated in one of a variety of modes. Locking pins are used to hold different parts of the apparatus in position. This gives the user different options on gear ratios that can be applied between the input and output shafts. By changing the combinations between the first and second epicyclic gear sets a wide range of ratios and different output directions can be produced.

Efficiencies can be calculated for the units operation as well as theory tables given for the different gear combinations.

Experimental content

- ▶ Calculate and experimentally observe the angular velocity ratios of gear trains
- ▶ Calculate the efficiencies of gear trains and draw efficiency curve
- ▶ Experimentally obtain the torque ratios of gear trains, gear ratios, efficiencies and velocity ratios can be calculated

Related laws

- ▶ Automotive
- ▶ Epicyclic gears
- ▶ Sun, Planet, Annulus
- ▶ Gears
- ▶ Meshing
- ▶ Ratios
- ▶ Torque
- ▶ Efficiency
- ▶ Mechanical advantage
- ▶ Load and effort
- ▶ Machine performance

Features / benefits

- ▶ Wall mounted dual epicyclic gears
- ▶ Can be mounted to SV100 Bench Mounted Frame
- ▶ Plastic gears for smooth operation and noise reduction
- ▶ Gear ratios can be adjusted
- ▶ Locking devices to stop rotation while setting up weights
- ▶ Transparent gear guards for safety and visibility
- ▶ All weights supplied

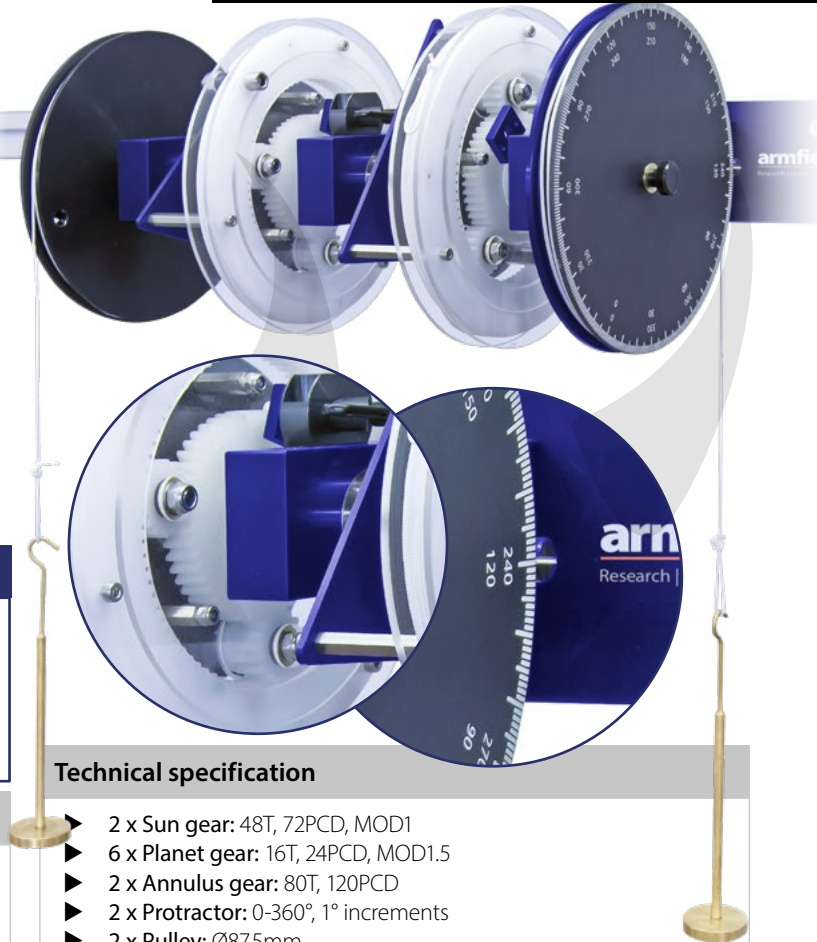
Overall dimensions

Length	0.38m
Width	0.25m
Height	0.20m

Packed and crated shipping specifications

Volume	0.53m ³
Gross weight	57kg

EXPERIMENT TO ALLOW STUDENTS TO OBTAIN THE TORQUE RATIOS OF GEAR TRAINS, GEAR RATIOS, EFFICIENCIES AND VELOCITY USING DUAL EPICYCLIC GEARS



Technical specification

- ▶ 2 x Sun gear: 48T, 72PCD, MOD1
- ▶ 6 x Planet gear: 16T, 24PCD, MOD1.5
- ▶ 2 x Annulus gear: 80T, 120PCD
- ▶ 2 x Protractor: 0-360°, 1° increments
- ▶ 2 x Pulley: Ø87.5mm

Ordering specification

- ▶ 1 x SD-1.56 assembled
- ▶ 1 x Accessories container
- ▶ 4 x Load hanger (100g)
- ▶ 6 x 0.1N, 10 x 0.2N, 3 x 1N weights
- ▶ 4 x 2N, 3 x 5N, 3 x 10N weights
- ▶ 1 x Tape measure
- ▶ Spare cord (10m)
- ▶ Instruction manual
- ▶ Packing list
- ▶ Test sheet

Operational conditions

- ▶ Storage temperature: -10°C to +70°C
- ▶ Operating temperature range: +10°C to +50°C
- ▶ Operating relative humidity range: 0 to 95%, non-condensing

Ordering codes

- ▶ SD-1.56 Epicyclic Gear Train