

# KI 150

## Kinematic model: Hooke's coupling



### Description

#### ■ investigation of a universal joint shaft

Universal joint shafts are joint shafts that transfer a torque and a rotational motion. A universal joint combines two non-aligned shafts. In a universal joint, the torque and the speed are non-uniformly transmitted. This non-uniform transmission is called the gimbal error. This is remedied by using two universal joints connected to each other by an intermediate shaft. This combination is referred to as the cardan shaft or the universal joint shaft.

The KI 150 unit can be used to study a universal joint shaft. A universal joint is also known as Hooke's coupling. The experimental unit comprises two universal joints with intermediate shafts. The arrangement of the universal joints and the deflection angle can be set using two rotary disks on the base plate.

On the drive side, the input angle is set and read by the drive universal joint. The intermediate shaft transmits the torque to the driven universal joint. The output rotation angle is read. The gimbal error is determined from the difference between the two angles.

The elements are mounted on a base plate. Two handles make it easy to carry the unit.

### Learning objectives/experiments

- representation of the non-uniform transmission of a universal joint
- determine the gimbal error
- how the arrangement of the universal joints and the deflection angle affect the gimbal error

### Specification

- [1] investigation of a universal joint shaft
- [2] adjustment of the layout of the universal joints and the deflection angle via two rotary plates
- [3] adjustment of the input angle of the drive universal joint
- [4] measure the output angle of rotation
- [5] determine the angular difference

### Technical data

#### Universal joint

- quantity: 2
- standard parts to DIN 808
- stainless steel

#### Shaft

- quantity: 3
- diameter: 16mm
- stainless steel
- ball bearings

LxWxH: 360x280x200mm

Weight: approx. 3kg

### Scope of delivery

- 1 kinematic model
- 1 set of instructional material

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Optional accessories

020.30009

WP 300.09

Laboratory trolley