

Electrical rotating platform

1443

Optika rotating platform allows students not only to verify the relations between the fundamental quantities which characterize rotational motion, but also to perform experiments on an important topic: inertial and non-inertial systems. What is seen by an observer on an inertial system is different from what is seen by an observer on a non-inertial system. In this way students are allowed to understand which is the origin and which are the results of fictitious forces as the centrifugal force and Coriolis force.

Thanks to this platform, you are able to study a lot of fundamental topics as the effects of Coriolis force on solids and liquids and understand why a mathematical instrument as the cross product was so important. By which magnitudes the centrifugal force depends on? Let's perform some experiences with OPTIKA rotating platform.

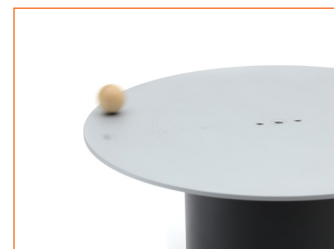
Topics

- The relativity of motion
- Galileo equations
- Invariant and non-invariant quantities
- The principle of relativity
- Non-inertial references
- Systems with tangential acceleration only
- Motion in two dimensions
- Uniform circular motion
- Centripetal force
- Systems with only radial acceleration
- Rotating platform
- Centrifugal force
- Effects of centrifugal force
- Conical pendulum
- Coriolis force
- Examples of Coriolis force
- Properties of Coriolis force
- The Earth: a rotating reference system
- The centrifugal force on the Earth's surface
- Coriolis force on the Earth's surface
- A proof of the Earth's rotation: Foucault pendulum



Feasible experiments

- 1° Centripetal force
- 2° A fictitious force: the centrifugal force
- 3° Lack of centripetal force: what happens?
- 4° Centrifugal forces in equilibrium
- 5° How to use centrifugal force to separate a mixture
- 6° Centrifugal force and Earth shape
- 7° Watt's regulator
- 8° White light: Newton's Disk
- 9° Conical pendulum
- 10° Properties of conical pendulum
- 11° How to verify centripetal and centrifugal forces formula
- 12° Another fictitious force: Coriolis force
- 13° Coriolis force acting on a water jet
- 14° Coriolis force acting on a pendulum
- 15° Observer in a non-inertial system
- 16° How to verify Coriolis law with an experiment
- 17° When Coriolis force is zero
- 18° Foucault's pendulum



1443

Apparatus for measuring centrifugal force for force sensor

1135-SENS

The instrument consists of a rail on which a cylinder can slide.

By putting the # 1443 rotation machine into operation, the device will be able to record the centrifugal force values thanks to the Bluetooth force sensor. For use with sensor # 12943-00.

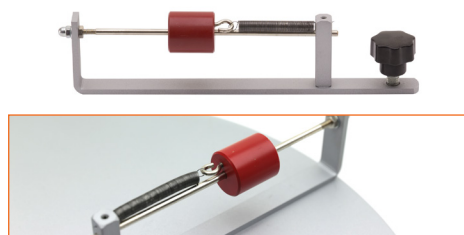
For data acquisition, the use of the Cobra SMARTlink # 12999-99 data logger is recommended.

By processing the data with the free measureAPP application, you will be able to appreciate the dependence of the centrifugal force on angular speed and arm.

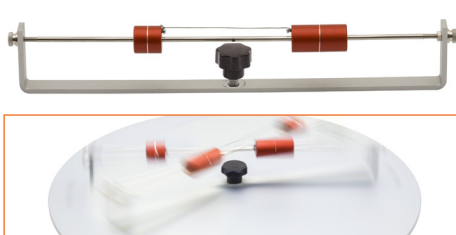


12999-99 + 1443 + 1135-SENS + 12943-00

1135-SENS

Accessories (not included) for Electrical rotating platform
Apparatus for centrifugal force 1445
To perform experiment n° 2


1445

Coaxial cylinders 1447
To perform experiment n° 4


1447

Apparatus with inclined test tubes 1082
To perform experiment n° 5


1082

Apparatus with elastic rings 1094
To perform experiment n° 6


1094

Watt's regulator 1093
To perform experiment n° 7


1093

Newton's Disk 1097
To perform experiment n° 8

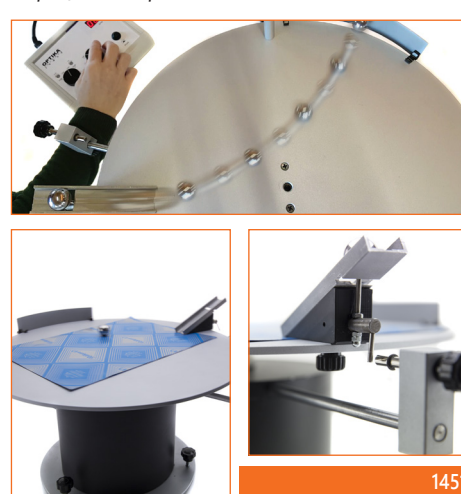

1097

Bowl with dye 1459
To be used with code 1452 and code 1458.

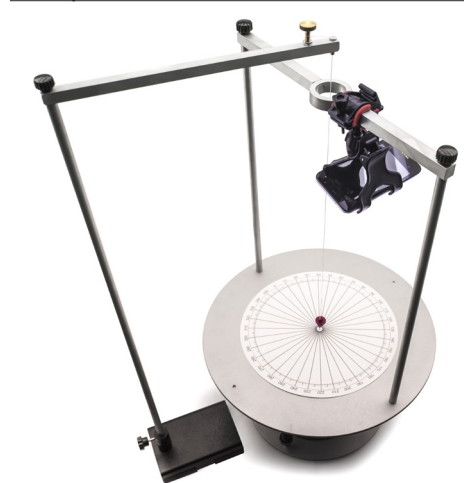

1459

Conical pendulum 1450
To perform experiments n° 9-10-11.


1450

Apparatus for Coriolis force 1451
To perform experiments n° 12-16.


1451

Simple pendulum 1453
To perform experiments n° 14-15-18.
Camera kit 1455
Smartphone 1460


The clamp shown in the photo is a smartphone support. We recommend to use a smartphone provided by our company.

1453 - 1455 - 1460

Apparatus for water jet 1452
To perform experiment n° 13.


Bowl not included

1452

Apparatus for falling water 1458
To perform experiment n° 17.


Bowl not included

1458

Small manual rotating machine

1109

Laminated wood top, 180 x 340 mm. The rotating machine is equipped with a metallic spindle for shafts with 6 mm diameter.



1109

Device to measure centrifugal force

1135



It consists of a rail on which a low-friction cylinder can slide. By rotating the device, it is possible to read on the spring scale, the value of the centrifugal force, and it is possible to check the centrifugal force formula.

1135

Elastic rings

1094

They allow to highlight that the centrifugal force grows with the distance from the axis of rotation. During operation they assume an elliptical shape.



1094

Watt's regulator

1093

It represents a model of centrifugal regulator. During rotation the two masses move away, compressing the spring. To be used with a rotating machine.



1093

Centrifugal force device

1081

By mounting the device on a rotating machine, the more the angular velocity increases, the more the cylinder compresses the spring.

To be used with any rotating machine.



1081

Coaxial cylinders

1092

Since one has twice the mass of the other, during rotation there is equilibrium if the distance of the center of gravity of the greater mass from the center of rotation is half the distance of the smaller mass.



1092

Newton's disk

1097

Divided into colored sectors, while rotating, it allows to verify the additive synthesis of spectral colors.



1097

Device to study rotational motion

8109

With this device it is possible to perform experiments on the dynamics of rotational motion and on the moment of inertia of rotating bodies, by using astopwatch (not included).

10 feasible experiments

Topics

- Uniform circular motion and harmonic motion
- Kinematics of rotational motion
- Similarities between translatory and rotational motion
- The dynamics of rotational motion
- The fundamental law of rotational motion
- Inertia momentum
- The kinetic energy of rotational motion
- Conservation of mechanical energy
- How to use the distance sensor

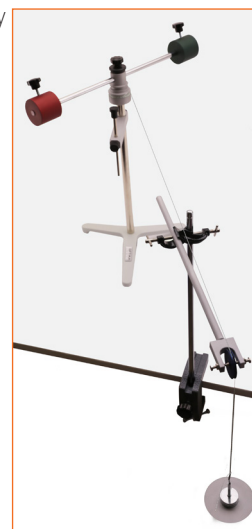
Equipment supplied

- 1 Base
- 1 Rod with chuck
- 1 Clamping device
- 1 Rod with sphere
- 1 Rod for balancer
- 1 Red mass
- 1 Green mass
- 1 Aluminum disk diam. 320mm
- 1 Mass holder
- 5 Slotted masses 10 g
- 5 Slotted masses 20 g
- 1 Clamp
- 1 Bosshead
- 1 Rod with pulley
- 1 Metallic rod 10x470 mm
- 2 String
- 2 Pins
- 1 Folding ruler
- 1 Box



Equipment for online use - not supplied

- | | |
|-------------------|-----------|
| 1 Interface | cod. 9001 |
| 1 Distance sensor | cod. 9041 |
| or | |
| 1 USB | cod. 9066 |



Suitable to be used with sensors

8109

Kit to study translational, rotational and oscillatory motion

8120

This kit has been designed to allow students to perform experiments on translational, rotary and oscillatory motion in real time, using a distance sensor.

Topics

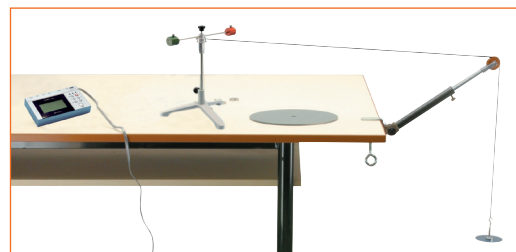
- Rotational motion
- Uniform rectilinear motion
- Uniformly accelerated rectilinear motion
- Measurement of the acceleration due to gravity
- Simple pendulum
- Compound pendulum

Equipment supplied

- 1 String
- 1 Base
- 1 Bosshead
- 1 Folding ruler
- 1 Metallic rod 10 x 750 mm
- 1 Mass-holder 20 g
- 1 Clamp with telescopic arm
- 2 Masses 10 g
- 20 Plumb spheres 0.3 g
- 1 Aluminum disk
- 1 Spindle
- 1 Rod
- 2 Masses
- 1 Compound pendulum
- 1 Simple pendulum
- 1 Spindle support
- 1 Atwood machine support
- 1 Mass-holder
- 1 Pulley for Atwood machine
- 1 Box

**Equipment for online use - not supplied**

- 1 Distance sensor code 9041 + interface code 9001
- or
- 1 USB distance sensor code 9066



Suitable to be used with sensors

8120

Rotating platform

1177

The rotating platform is characterised by a sturdy metal structure and a couple of conical bearings which allow it to rotate ensuring great resistance to stresses and low friction. Thanks to the didactic guide and the several accessories supplied with this collection, students will be able to carry out experiments on non inertial reference frames which otherwise would be impossible to perform. Our rotating platform is a particular and interactive instrument particularly suited to study angular momentum, moment of inertia and centrifugal force.

Platform diameter: 50 cm

Topics

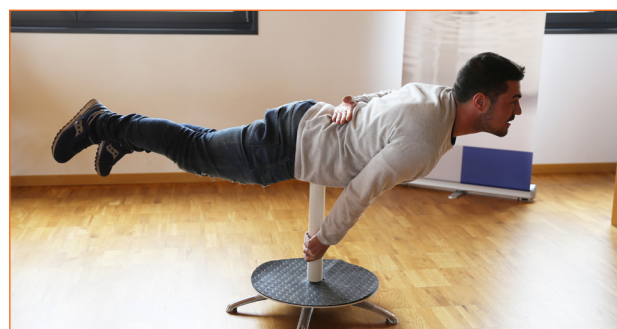
- Action and reaction principle
- Preservation of the angular momentum
- Non-inertial systems: uniform rotatory motion
- Non-inertial systems: free falling
- Centrifugal force and its effects
- Measurement of centrifugal force
- Centrifugal force depending on the rotation radius
- Centrifugal force depending on the angular velocity
- Coriolis force
- Inertia moment

Equipment supplied

- 1 String
- 2 Spring tweezers
- 1 Rotating platform
- 1 Aluminum tube 800x35 mm
- 1 Ring stand for vertical tube
- 1 Ring stand for falling plane
- 1 Complete bicycle wheel
- 1 Plane with cannon
- 1 Falling plane
- 1 Device for measuring the centrifugal force
- 2 Dumbbells 4 Kg
- 1 Inclination protractor
- 1 Metal rod 1200 x 18 mm
- 3 Steel spheres
- 1 Support for launch system
- 2 Clamp for round flasks with bosshead

Equipment not supplied (not necessary)

- 1 Tripod base



1177