

KRD200 Series Mass and Center of Gravity Measurement System

The center of gravity (CG) (or center of mass) of an object is the average location of the weight (or mass). It's a crucial mass property in the fields of aerospace, defense, automotive and related industries for the performance and safety of products. An object suspended from its center of gravity in space will be perfectly balanced. The center of mass is a useful reference point for calculations in mechanics that involve masses distributed in space, such as the linear and angular momentum of planetary bodies and rigid body dynamics.

A force not applied through the center of gravity makes the object rotate about its center of gravity. In flight, both airplanes and rockets rotate about their centers of gravity. When it comes to design of aircraft, spacecraft and even automobiles, calculating the center of gravity is an important part of the process.

The mass and center of gravity (CG) measurement system adopts the multi-point support method, so the specimen's mass and center of gravity can be simultaneously measured in the same measurement system. Different fixtures are installed to measure various irregular objects (such as missile launchers, aircraft black boxes, electronic components, etc.); the V-shaped support is installed on the measuring platform to measure various rotations (such as missiles).



KRD200-50

System Features

- ◆ The multi-point support method is applied in the measurement system where there is not a high requirement for leveling. It is necessary to conduct a leveling procedure when the equipment is first installed and not need to level again in the later measurement process, which is easy to operate.
- ◆ The linear guide rail is designed for the table, where the two brackets can move back and forth smoothly and have high positioning accuracy. It is flexible and easy to attach the specimen to anywhere in the bracket.
- ◆ It is convenient to fix the large-diameter and cone specimen to the installation bracket, which can be adjusted horizontally and vertically. Furthermore, the lead screw can adjust the position of the left and right brackets to easily level the conical specimen on the brackets.
- ◆ High-precision calibration software for the measurement system can accurately calibrate and assess sensor location and system precision to implement self-calibration.
- ◆ The mass, center of gravity, and centroidal deviation can be measured as it is necessary to hoist the product once. The operator only needs to turn the specimen to 0° , 90° , 180° and 270° without any other operation in the course of measurement, which takes up a short time, offers efficiency, and requires little labor intensity.



KRD200-200



KRD200-1200



KRD200-2000

High-precision Series

Using electronic balance can have higher measurement accuracy. High-precision series can be used for the measuring range below 200kg. The measurement error of the radial center of gravity is less than 0.02mm, and that of the longitudinal center of gravity is less than 0.05mm.



Measurement and Control System

Measurement and control system includes IPC/business computer, printer, measurement and control box installed in one cabinet, so it is easy to operate and move.

The software is divided into two separate parts, one is mass and center of gravity measurement software, the other is moment of inertia measurement software, which can be combined together.

The Windows-based software which is developed in the Labwindows platform is user interface friendly, easy to operate, reliable and so on.

The measurement and control system can be divided into three modules. KRD200 series uses the mass and center of gravity measurement Module and data management module.



Control cabinet (portable)



Control cabinet (enclosed)

Mass and Center of Gravity Measurement Module

It is mainly used to measure the mass, center of gravity and centroidal deviation of specimen.

The measurement is divided into no-load and load measurements, where the latter will run for 4 degrees which are 0, 90, 180, and 270. The measurement result will appear automatically when all the measurement procedures are done. It provides saving process data, saving result data, applying process data, and other functions in the system.

There is a unit to control the motor to move up and down in the interface, which includes three windows showing partial mass and one window showing total mass, so it is easy for the user to observe the real-time change in every supporting point.

Alarm mode is designed to deal with errors that occur in the rising up and down. If the limit travel switch is damaged or the three-way motor wire is reversely connected, the computer will give an alarm to ensure the safety of the equipment under any misoperation.



Mass and center of gravity measurement module

Data Management Module



Data management module

Data management module is designed to save, apply, delete result data and process data and print the measurement result. Users can easily find the previous measurement records, view the measurement data, and print previous test results in the data management module, where the items in the database can be multi-selected to export to Word/Excel, which is easy for users to file and print centrally.