

LEMI-23 Pohl's Pendulum-Forced Oscillations

- *Good system stability and small amplitude attenuation at free oscillation*
- *Obvious resonant effect and clear physical phenomena*
- *Rich experiment contents, easy operation and high measurement accuracy*
- *Affordable*



This apparatus consists of a mechanical resonant vibration unit and an electric control unit. A copper circular balance wheel is installed on a rack. One end of the spring is connected to the shaft of the balance wheel and the other end is fixed on the rack post. Under the impact of the spring force, the balance wheel swings freely around its shaft. There is a pair of permanent magnets beneath the rack with the balance wheel located in the magnet gap. Due to electromagnetic induction, when the balance wheel cuts magnetic lines, it is subject to an electromagnetic damping force. The damping magnitude is changed by changing the location of the magnets. To change from a forced vibration to a balance wheel rotation, an eccentric wheel is mounted on the motor shaft through a connect-rod mechanism to drive the balance wheel. A plastic glass wheel with engraved marker line is mounted on the motor shaft and rotates with the motor. The phase difference ϕ can be read out on the disk. The rotation speed of the motor can be precisely adjusted by the control box.

When forced vibration occurs, the phase difference between the balance wheel and the external force is measured using a flash lamp. When the black marker line passing the photoelectric gate, a flash is caused.

Experimental Contents

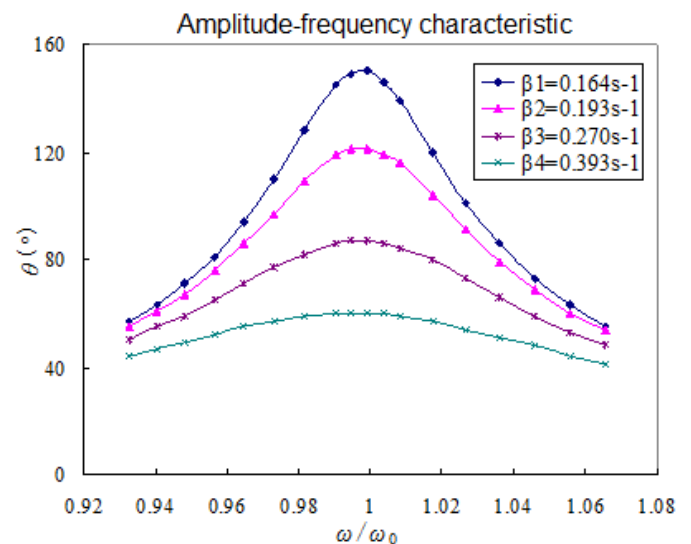
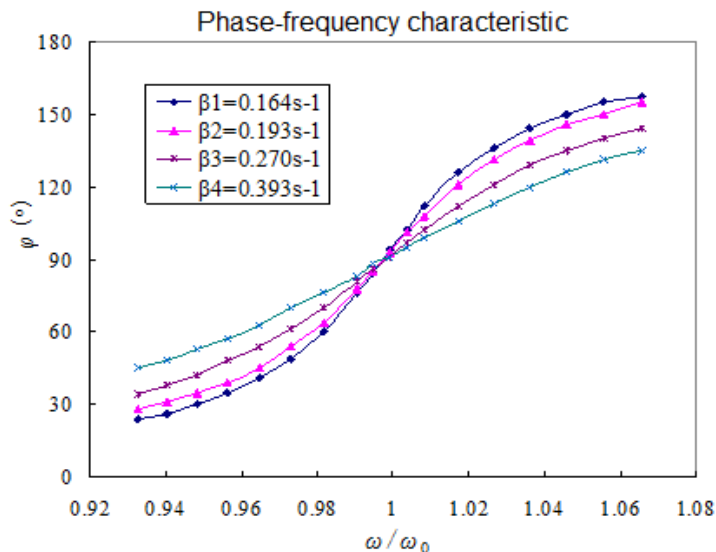
1. Determine amplitude and phase-frequency characteristics of forced vibration.
2. Study influence of damping coefficient on forced vibration.
3. Observe resonant vibration phenomenon.
4. Determine properties of a moving object using frequency-flash method.

Specifications

Item	Specifications
Spring stiffness coefficient K	Variation of free vibration period: <1%
Time measurement	Accuracy: 0.001 s; error of period: 0.2%; 4-digit display
System damping	Amplitude attenuation <2% without electromagnetic damping
Amplitude measurement	Error: $\pm 1^\circ$
Motor rotational speed	Range: 15 ~ 50 r/min; period adjustable: 0.2 ~ 4 s
Phase difference measurement	Error < 2° when phase difference between $40 \sim 140^\circ$

Part List

Description	Qty
Main unit	1
Electric control unit	1
Wire and cable	3
Manual	1



Note: above product information is subject to change without notice.