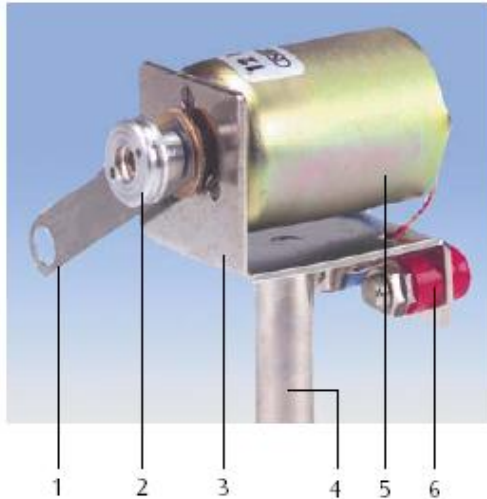


DC Motor, 12 V 1001041

Product Manual

09/26 DML/ALF/HJB



- 1 Lever
- 2 Pulley
- 3 Supporting holder
- 4 Stem
- 5 Motor
- 6 4-mm connectors

1. Safety instructions

- Do not exceed the maximum permissible operating parameters (see Section 3 – Technical data).

Long hair, loose clothing, or jewellery could get caught and entangled in the rotating components.

- To prevent this danger, it is advisable to wear a hairnet in the case of long hair.
- Do not wear unsuitable clothing or jewellery.

While operating with the belt pulley and the drive belt, there is the additional danger that parts of the body, e.g. fingers, may get pulled in or caught between the belt and the pulley.

- Do not touch or hold any rotating components of the experiment set-up.

The DC motor can also be used as a generator.

- In this state, do not connect any power supply to the connectors.

2. Description

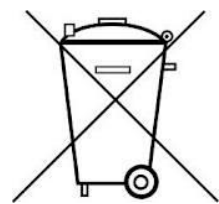
The DC motor is a small, compact motor with a non-ferrous rotor and is used as an excitation unit in experiments on mechanics, simple harmonic oscillation and electricity. It can also be used as a tachometer. Its low moment of inertia, in conjunction with a high starting torque, provides a short acceleration time. Owing to the strong permanent magnet of the stator, the motor is highly efficient. The special brush and commutator arrangement, in conjunction with friction bearings, guarantees a long working life and low running noise.

The axle of the motor is equipped with a threaded bush to which a pulley is attached by means of a thread. This pulley allows other wheels and levers to be attached to the axle for the excitation of mechanical oscillations and waves.

The DC motor is attached to an angled supporting bracket with stem. 4-mm connectors on the bracket are responsible for supplying the equipment with electricity as well as for tapping the output voltage in generator mode.

3. Disposal of Waste (WEEE)

The symbol of the crossed-out wheeled bin means that this device must be collected separately from unsorted municipal waste at the end of its service life. Do not dispose of the device in normal household waste. For return, please use the local free collection and return systems provided by municipalities (e.g., recycling centers) or the take-back options provided by retailers.



Batteries and Lamps: Remove waste batteries and accumulators that are not enclosed by the waste equipment, as well as lamps that can be removed without being destroyed, from the waste equipment prior to delivery to a collection point.

Data Protection: As an end-user, you are legally responsible for deleting personal data from the waste equipment to be disposed of.

Packaging: Dispose of the packaging materials separately at local recycling points (e.g., paper/cardboard in paper waste, plastics in designated recycling bins).

4. Technical data

Rated voltage:	12 V DC	Rated current:	370 mA DC
Rated torque:	10 mNm	Rated speed:	2440 rpm
No-load voltage:	12 V DC	No-load current:	31 mA DC
		No-load speed:	3840 rpm
Starting voltage*:	0,5 V DC	Starting current*:	960 mA DC
Starting torque*:	27 mNm	(* at rated voltage)	
Power consumption:	4.44 W		
Direction of rotation:	reversible		
Dimensions:	54 mm x 29 mm Ø approx.		
Weight:	200 g approx.		

5. Sample experiments

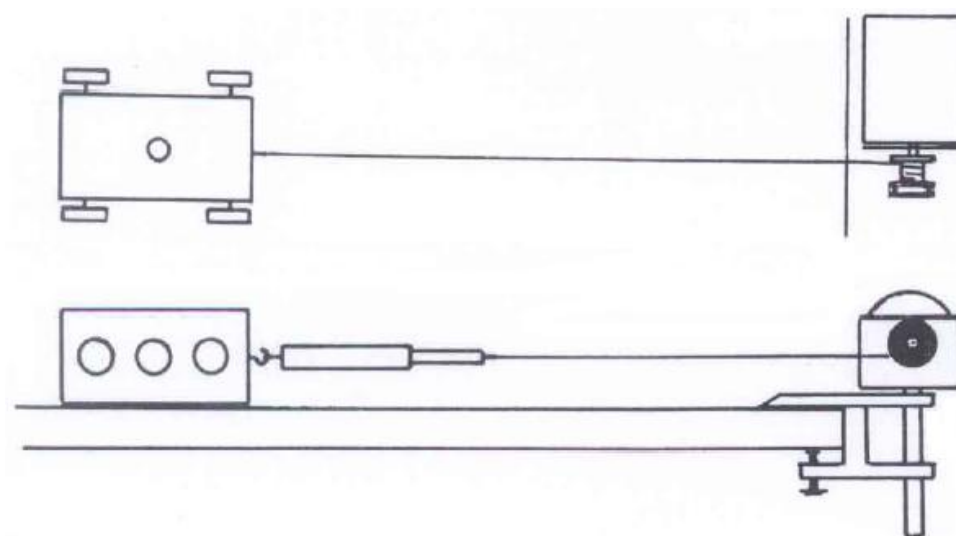


Fig. 1: Experiments on uniform motion (top) and friction (bottom)

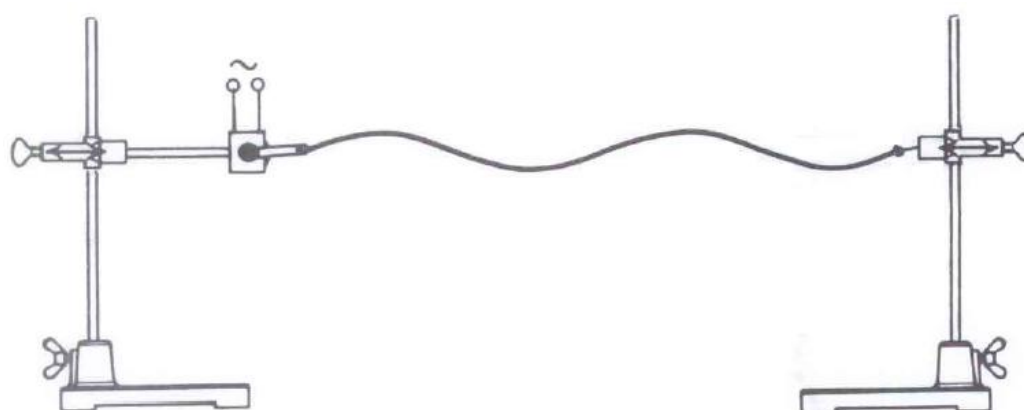


Fig. 2: Excitation of transverse waves in a rubber band using a sine wave generator

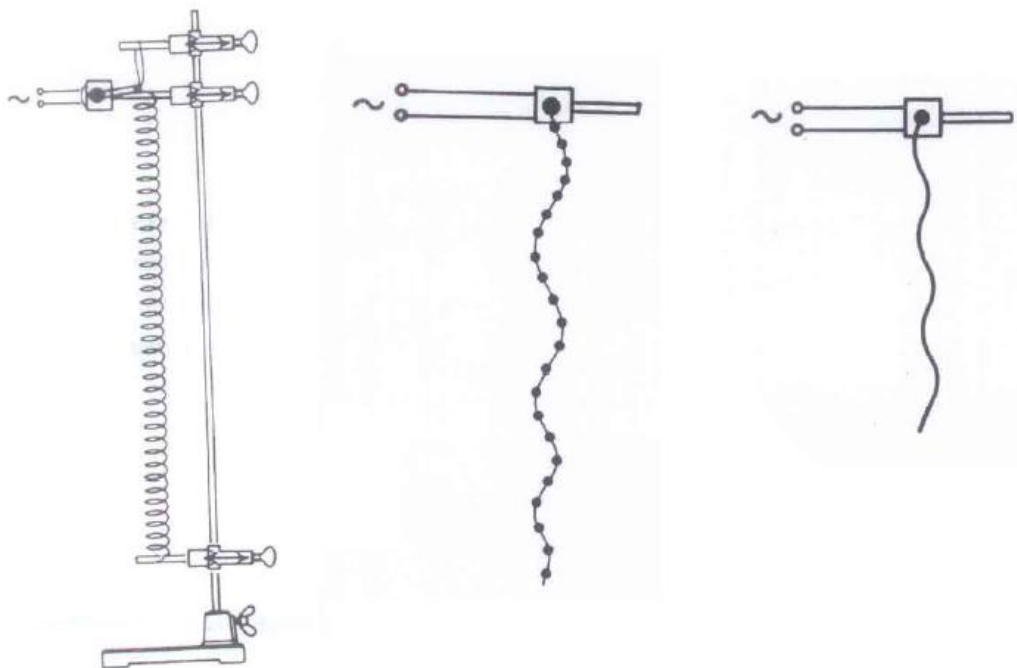


Fig. 3 (left): Excitation of longitudinal waves in a helical spring

Fig. 3 (centre and right): Excitation of transverse waves in a suspended chain and a leaf spring using a sine wave generator

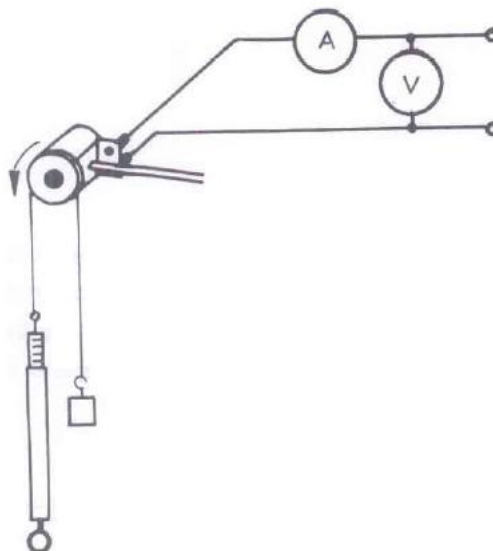


Fig. 4: Determining the efficiency of the motor

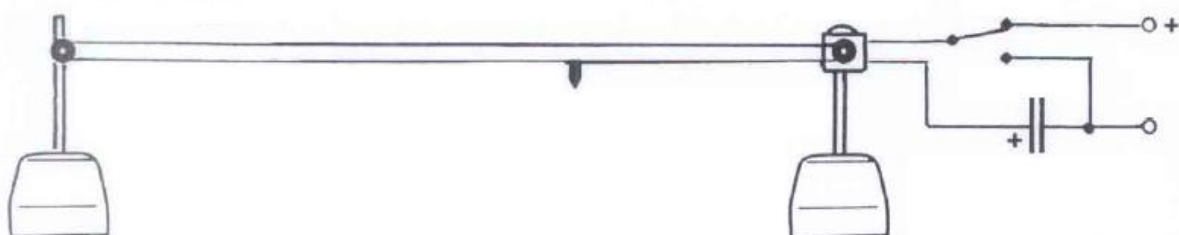


Fig. 5: Energy in a capacitor (energy input is equal to the energy output)

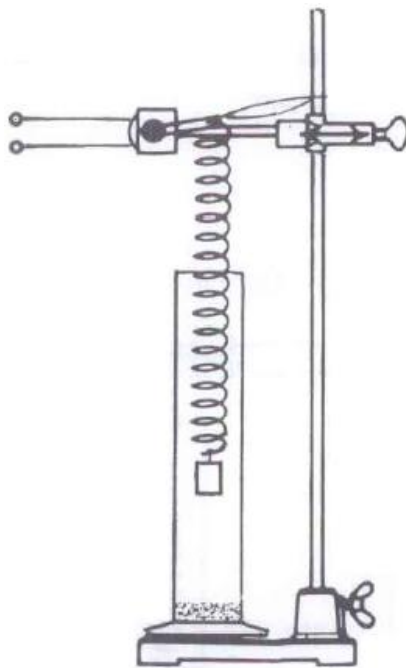


Fig. 6: Forced oscillation in a spring pendulum

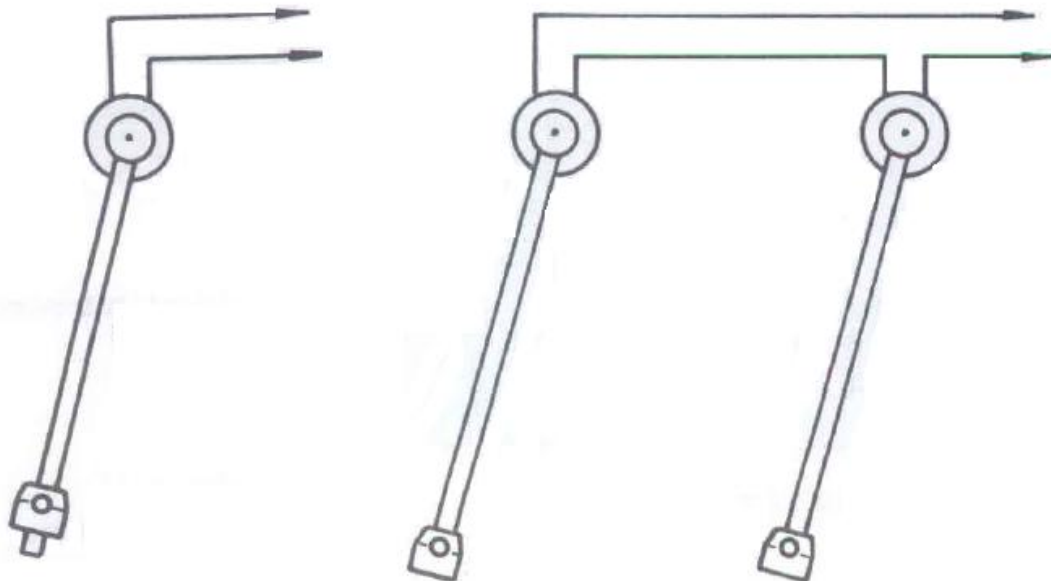


Fig. 7 (left): Recording mechanical oscillations of a rodpendulum with an XY plotter

Fig. 7 (right): Recording the superimposition of synchronised oscillations with an XY plotter