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Starter system for air track

11202-13

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**Operating instructions**

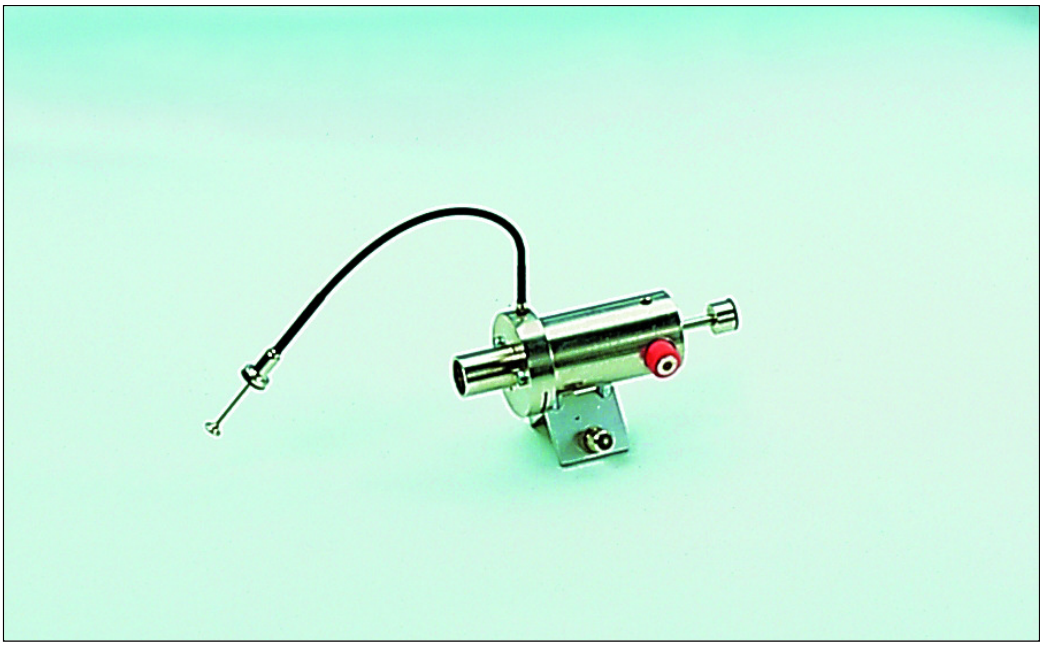

Fig. 1: 11202-13 Starter system for air track

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## 1 SAEFTY PRECAUTIONS

**Caution!**

- Carefully read these operating instructions before operating this instrument. This is necessary to avoid damage to it, as well as for user-safety.
- Do not start up this instrument in case of visible signs of damage to it.
- Only use the instrument for the purpose for which it was designed.

## 2 PURPOSE AND CHARACTERISTICS

The starter system is used in conjunction with air cushion track 11202-17. It may be used either to give the sliding head a defined, constant initial impulse, or can also hold a sliding head in the initial position (without any impulse) and, when a trigger device is actuated, release this and synchronously start an electronic timer. This unit is in the form of a catapult which can be screwed onto the air suction track. A screw spring inside the cylindrical housing of the catapult accelerates a cylinder of ferromagnetic material when the trigger is actuated. The final velocity of the cylinder can be adjusted to one of three settings by varying the tension of the spring. At the time of release, a switch contact is made: this switching action starts a timer. The air cushion track sliding head is fixed to the starter device with the aid of a holding magnet and plug 11202-14, before the start of the experiment. Triggering is effected with the aid of a screw-on cable release, supplied as standard.

## 3 HANDLING

The starter system is secured to one end of the air cushion track with the aid of two knurled screws, supplied as standard with the air cushion track, 11202-17. The starter system may be mounted in varying orientations to suit the particular application.

**2.1 Transmission of initial impulses to the sliding head**

Here the piston-like ram 1 should be pointing to the centre of the track. The ram is pushed in to the required stop location and the sliding head is coupled to the ram with the aid of a slip-on holding magnet. The sliding head can now be launched by actuating the cable release. On repeating the experiment under the same conditions, i.e. with the same sliding head mass and the same spring tension or stop loxation, the same initial velocity will be obtained, within a narrow margin of error.

**2.2 Launching a sliding head with no initial impulse**

If the sliding head is to released with the aid of the starter system but without any initial impulse being applied (e.g. in experiments on uniformly accelerated motion) the starter system should be mounted on the air cushion track so that the pipe connection 2 located opposite the ram points to the centre of the track.

The ram should be inserted to the centre stop location, and the sliding head with the slip-on holding magnet pushed right up to the pipe connection. In this position there is only a very small crack of air between the ferromagnetic cylinder inside the starter system pipe and the holding magnet, so that the sliding head is mechanically secured to the starter system. The restraining force is over 0.2 N, i.e. the sliding head will be held securely in position with attached acceleration weights of up to 20 g. On actuation of the trigger the ferromagnetic cylinder springs back into the initial position and releases the sliding head.

**2.3 Connecting an electronic timer**

Located on the side of the starter system housing are two 4 mm sockets which can be connected to an electronic timer. Under tension, the two sockets are electrically separated. At the moment of triggering, the sockets are electrically short circuited, the short-circuit persisting for as long as the starting system is in the rest position. Any PHYWE digital timer can be used. The starter system should in each case be applied at the “Start” gate input. Care should be taken to conform with the appropriate operating instructions to ensure that the timer is started when the starter system makes contact.

**2.4 Assembly**

The starter system can also be mounted on the earlier version of the air cushion track, 11202-01, fitted with end restraints. In this case, the fixing screws should be loosened on one of the end restraints to allow this to be removed, the starter system then being firmly screwed in place in the same position.

## 4 LITERATURE

Demo advanced Physics Manual
Linear Motion (LMT) 16001-02

## 5 NOTES ON THE GUARANTEE

We guarantee the instrument supplied by us for a period of 24 months within the EU, or for 12 months outside of the EU. Excepted from the guarantee are damages that result from disregarding the Operating Instructions, from improper handling of the instrument or from natural wear.

The manufacturer can only be held responsible for the function and technical safety characteristics of the instrument, when maintenance, repairs and alterations to the instrument are only carried out by the manufacturer or by personnel who have been explicitly authorized by him to do so.

## 6 WASTE DISPOSAL

The packaging consists predominately of environmentally compatible materials that can be passed on for disposal by the local recycling service.

Should you no longer require this product, do not dispose of it with the household refuse.

Please return it to the address below for proper waste disposal.

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