

PELTON TURBINE (FREE JET TURBINE)

MED 12.02



Material

Item-no.	Qty.	Description
DT730-2P	1	Pelton turbine demo, with generator
DE712-02	1	Universal multimeter "inno" II
DG507-50	2	Safety connecting lead, 50 cm, yellow
	1	Water tap
	1	Water basin

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Purpose

To explain the principle of a free jet turbine (Pelton turbine) on a functional model and operation of a generator coupled to the model.

Preparation

Set the measuring range of the universal multimeter to 10 V DC.

Afterwards connect the universal multimeter to the Pelton turbine with generator with the help of the safety connecting leads.

The Pelton turbine is checked whether the paddle wheel runs freely and the belt drives the generator.

Now drive the paddle wheel with one finger. When the wheel moves a voltage must be displayed on the measuring device.



If the pointer moves to the left, the polarity must be reversed.

Experiment

The inlet on the turbine housing is held under the hose connection of the tap. Now open the tap.

The water pressure can be changed by opening the tap further or less.

Result

After opening the tap the jet hits the wings of the turbine and releases its kinetic energy to the wheel; it begins to turn. Voltage is induced in the generator and is displayed on the measuring device.

A higher water pressure and the associated higher flow speed result in a higher voltage on the generator.

Note

With the Pelton wheel (Pelton turbine) only the kinetic energy of the water is used.

Pelton turbines are mainly used in hydropower plants with a high utility gradient (high pressure and high flow velocity), but rather lower flow rates.