



**NAZWA PRODUKTU/PRODUCT NAME: DANSPRINT ERGOMETER**

**DOSTĘPNE KOLORY/COLORS: n/d**

### **OPIS/DESCRIPTION:**

#### Technical information

##### *Kayak simulation*

When paddling a kayak the resistance felt during a stroke is composed primarily by two components. Inertia from accelerating during the stroke and the Drag resistance from the kayak moving through water.

The dansprint ergometer has a unique ability to simulate the feel of kayak paddling. This has been achieved by carefully adapting the physical characteristics of the dansprint to match those experienced while paddling a K1 kayak.

The moment of inertia of the rotating parts on the ergometer corresponds to the inertia (weight) of paddler and boat combined. This has to be a fixed value. We have chosen to fix the moment of inertia corresponding to a 75 kg. paddler.

The resistance of the rotating fan plus various bearing resistances corresponds to the drag and wave resistance on the kayak hull.

The true relation between kayak speed and hull resistance is complex. It varies mainly with the weight of the paddler and boat and somewhat with hull design as well. In the figure below you can see the result of drag measurements in a towing tank on an Olympic style K1 loaded with various weights.

The dansprint fan has been custom developed to provide a resistance characteristic similar to the K1 results. The resistance comparison chart documents this fact. Especially in the speed region of 3 – 5 m/s, which is the dominating kayak speed range for training and competition, the resemblance is outstanding.

Notice that the dansprint range of settings covers a spectrum of resistance far beyond the actual K1 range. This means that paddlers of all strength levels will be able to adjust the dansprint to give just the right paddle feeling.

To create the right feeling paddlers will typically want to set the dansprint to a somewhat harder resistance than is indicated by the resistance comparison chart. This is due to the fact that paddling efficiency is higher on the ergometer than on water.

##### *Power calculation*

The dansprint has a very accurate way of measuring the performance of the athlete.

Many less advanced ergometers will simply measure the rotational speed of the flywheel and from that make a rough assumption of the power developed.

The dansprint continuously measures the breaking forces on flywheel and keeps track of the kinetic energy stored and is thus able to calculate the power input of the paddler.

The great advantage of this method is that it is totally independent of resistance setting, mechanical wear and environmental factors such as temperature and humidity. It needs no calibration to stay correct, as long as the resistance flywheel is not modified.

##### *Kayak Speed*

The dansprint uses an "equal power" algorithm to calculate the simulated paddling speed. For each measured point (\*) of the stroke the corresponding power input is calculated. This power value is used to lookup in a table, at which speed the simulated K1 would have travelled, provided the same amount of power input. In this lookup the weight of the paddler is taken into account, implicating that a lighter paddler will go faster for the same power input, than a heavy one.

This way of calculating kayak speed is the only consistent method that does not depend on any settings or environmental factors, but only on the kayak model chosen.

The speed lookup table is based on K1 towing tank experiments and thus the actual hydrodynamic drag and wave resistance of the kayak is reflected in the speed obtained.

(\*) There is app. 80 points resolution pr. Stroke

##### *Computer display*

The dansprint ¼ -VGA LCD display provides easy readable relevant numeric and graphical information to the athlete while training on the ergometer. The following quantities are updated for each individual stroke.

- Paddling time
- Distance
- Speed / Power
- Stroke rate / Water-air ration /Max. speed/power
- Heart rate\*
- Average speed / power
- Graphic Right / Left power balance or graphic pacer

For the speed values, it is possible to choose from one of several units

- m/s
- km/h
- time / 500 m
- time / 1000 m

Also included is a countdown facility, which enables the paddler to record the exact time to travel a certain distance. The dansprint computer continuously records the power input values of the last 16 min of paddling. The values can be displayed as a power vs. time graph on the display in order to study details in performance.

\* Requires serial interface to polar chest ribbon or similar.

## ZDJĘCIA/PHOTOS:

