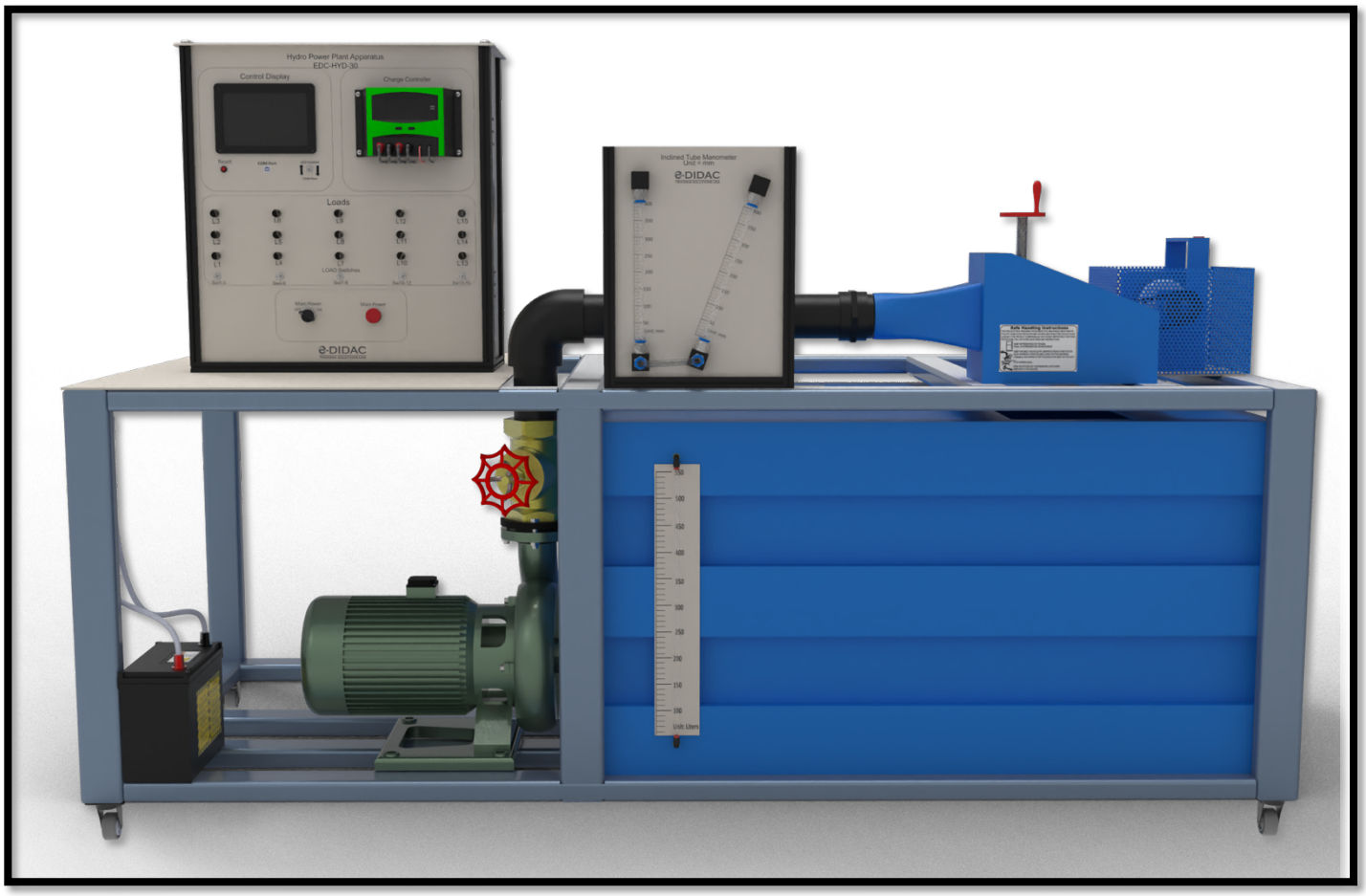
Educational Hydro Energy Power Plant Training Unit (EDC-HYD-30)

EXPERIMENTAL DATA:

- Determination of the operative characteristics of a Cross Flow Turbine.
- Flow calculation.
- Turbine torque vs speed at various heads and flow rates.
- Mechanical power output vs speed for various heads and flow rates.
- Mechanical efficiency vs speed for a given head and flow rate.
- Electrical power output at various heads and flow rates.
- Overall power plant efficiency at various electrical loads.
- Energy consumption with isolated loads.
- Calculation of hydroelectric power plant efficiency.



DESCRIPTION:

Water turbines are turbomachines utilizing water power. Such turbines convert the pressure energy of water into kinetic energy entirely in the distributor. During the conversion, the water jet is accelerated in a nozzle and directed onto the blades of the turbine wheel tangentially. The impulse of the water jet is transmitted to the turbine wheel.

The unit consist of a storage tank and a water pump to simulate a dam reservoir, a Cross Flow turbine, a generator which is connected to the turbine, a lamp load bank a dynamometer, and measuring instrument. Pelton turbine has efficiency greater than Cross Flow, Kaplan and Francis. Unit has

- Standalone LCD with touch panel
- Touch LCD will display the turbine rotor speed, generator output voltage and current, load control and other parameters on the process schematic diagram.

A PC data acquisition (EDSM-30S) is also available (Optional).

TECHNICAL DATA:

- **Turbine**
- Cross Flow type with 170mm dia stainless steel with shaft and nozzle, Stainless steel casing, transparent windows for viewing
- Mechanical Power: 400W
- Digital rpm sensor

- **Generator**
- Rating Max. output: 1hp (0.75kW)
- Electrical Output Max: 300W
- Voltage: 24VDC
- Digital Sensor: voltage, current and rpm
- Spring balance for Torque measurement

- **Water Pumps**
- Power: 2.2kW
- Max Flow: 500lpm
- Over current protection
- Solid State ON/OFF control
- Flow control valve
- Pressure Gauge
- Digital sensor: flow, pressure
- Dynamometer: Mechanical (water cooled)

Load Unit

- Resistive Load Unit
- Digital display of voltage, current and power
- Current and Voltage sensor
- Switches for Load control
- Self-contained HMI software with Touch LCD. This LCD controls the functions of the equipment. It also displays the data of the sensors installed in the equipment. This eliminates the need of expensive PC to interface with the equipment.

A PC data acquisition (EDSM-30S) is also available (Optional).

DIMENSIONS AND WEIGHT:

L x W x H (mm):1500 x 1200 x 1500

Weight: 140 kg

SCOPE OF DELIVERY:

- 1 x EDC-HYD-30
- 1 x Instructional Manual