MICRO HYDROELECTRIC HYDROELECTRIC PLANT

Non contractual photo

SERVICE :

DIMENSIONS : 1400 X 900 X 1800 MM

WEIGHT : 200KG

REFERENCE : MP3000

A micro hydro plant is a power plant that uses hydro power to produce electricity on a small scale. This electricity can be used to feed isolated sites or be returned to a public distribution network (mode studied on the machine)

Its operating principle consists in transforming the energy of a waterfall into mechanical energy by means of a turbine, then into electrical energy by means of a generator. The installed capacity of the plant depends on the water flow and the height of the waterfall.

The MP3000 micro hydroelectric power plant can produce electrical energy from a "TURGO" type turbine and simulate a waterfall.

- Analysis of industrial components (turbine, pump, generator, inverter, rectifier, voltage regulator, power analyzer ...);
- Performance study;
- Measurement of energies
- Study of two types of network coupling;
- Demonstration of electrical and hydraulic laws;
- Study of the regulation of the pressure;
- Visualization of data;

Technical specifications :

The operative part mounted on a stainless steel chassis equipped with wheels and consisting of :

- A tank with emptying.
- A turbine equipped with a "TURGO" wheel and two injectors with changeable nozzles.
- A centrifugal pump.
- A set of high pressure PVC piping that will allow to simulate the cascade in forced pipe.
- A manual valve on the injector line.
- A window opening allowing the observation of the turbine in operation and possibly change the nozzles of the injectors.
- The turbine drives an asynchronous generator.
- A float flowmeter.
- An electronic manometer.
- A speed sensor of the generator.
- An electrical cabinet comprising : Generator speed display; A potentiometer and frequency converter for the speed control of the pump. ; A power analyzer for visualizing: voltage, power, phi cosine and integrating three intensity transformers; On button off; Emergency stop button; A user socket; Pressure regulation (simulation of fixed cascade height). This allows the regulation of pressure (height of the fixed cascade) and the visualization of the data regime, pressure, on displays. ; A regulator acting on the speed of the pump.

Operating mode :

1) Coupling to the network: Direct coupling : The coupling of the generator on the distribution network is done if it is pushed beyond its speed of synchronization. It provides energy that is only injected into the network.

2) Coupling via an inverter : The generator can be coupled to the grid via an inverter. The energy produced is injected into the network and can be used on a user socket.

Main specific components :

- Two energy meters (production and consumption)
- Two capacitor banks
- A converter
- A rectifier