



MICRO - HIDROELECTRIC POWER PLANT WITH ELECTRIC ENERGY STORAGE



SYSTEM PRESENTATION

The micro-hydroelectric power plant is composed of three hydro-aggregates (turbine + electric generator) mounted on a common support. The main elements which compose the micro-hydroelectric power plant are:

- ≥ the catching and transfer circuit which comprises the system of ducts, cocks, the delivery channel, water inlet;
- ≥ the turbine and the electric generator;
- ≥ the system of distribution, command and control of the voltage;

Each hydro-aggregate provides a power of max. 1kW at a waterfall comprised between 3 and 60 m and a flow rate between 0.6 and 10 l/sec.

The generator of the turbine is of continuous current. The voltage at the input varies around the nominal value of 24VD.C. depending on the flow rate and fall.



1. Assembly of hydro-aggregates

- ≥ Turbine: TURGO ;
- ≥ Rated power: 1000 W ;
- ≥ Diameter of turbine rotor: 200 mm ;
- ≥ Efficiency: min – 45%. max – 60% ;

2. AC Distribution cabinet fully equipped (DCA)

DC – AC Inverter – from SW series manufactured by XANTREX company with P_N 3300 W.

Main technical characteristics:

- ≥ rated voltage: 24 VD.C. ;
- ≥ output voltage: 230 VA.C, 50Hz ;
- ≥ efficiency: 94% ;
- ≥ waveforme: purely sinusoidal.

The cabinet contains also measurement and protection equipment.

The storage batteries composed by 4 storage batteries with $U_N = 6$ V and a capacity of 330 Ah.



3. DC Distribution cabinet fully equipped

It carries out the connection of the 3 generators to the D.C. network with the rated voltage of 24VD.C. It carries out also the buffer connection of the storage batteries, it delivers the power take off for the A.C. distribution cabinet and it deliveries the voltage for D.C. users.

4. Voltage regulator cabinet fully equipped

The charging regulator provides the constant voltage to the bars of 24 VD.C., in the case when the voltage delivered by the hydro-generator is not constant because of the variation of water flow rate. It has also the role to direct the energy overplus to the 4 power resistances mounted outside the cabinet.

The charging regulators are of C40 type from the XANTREX company and they have the following technical data:

- ≥ rated voltage : 12, 24 VD.C., configurable;
- ≥ maximum output voltage: 55 VD.C.;
- ≥ rated load current: 40 A;
- ≥ peak current: 55 A;
- ≥ automation functions.

