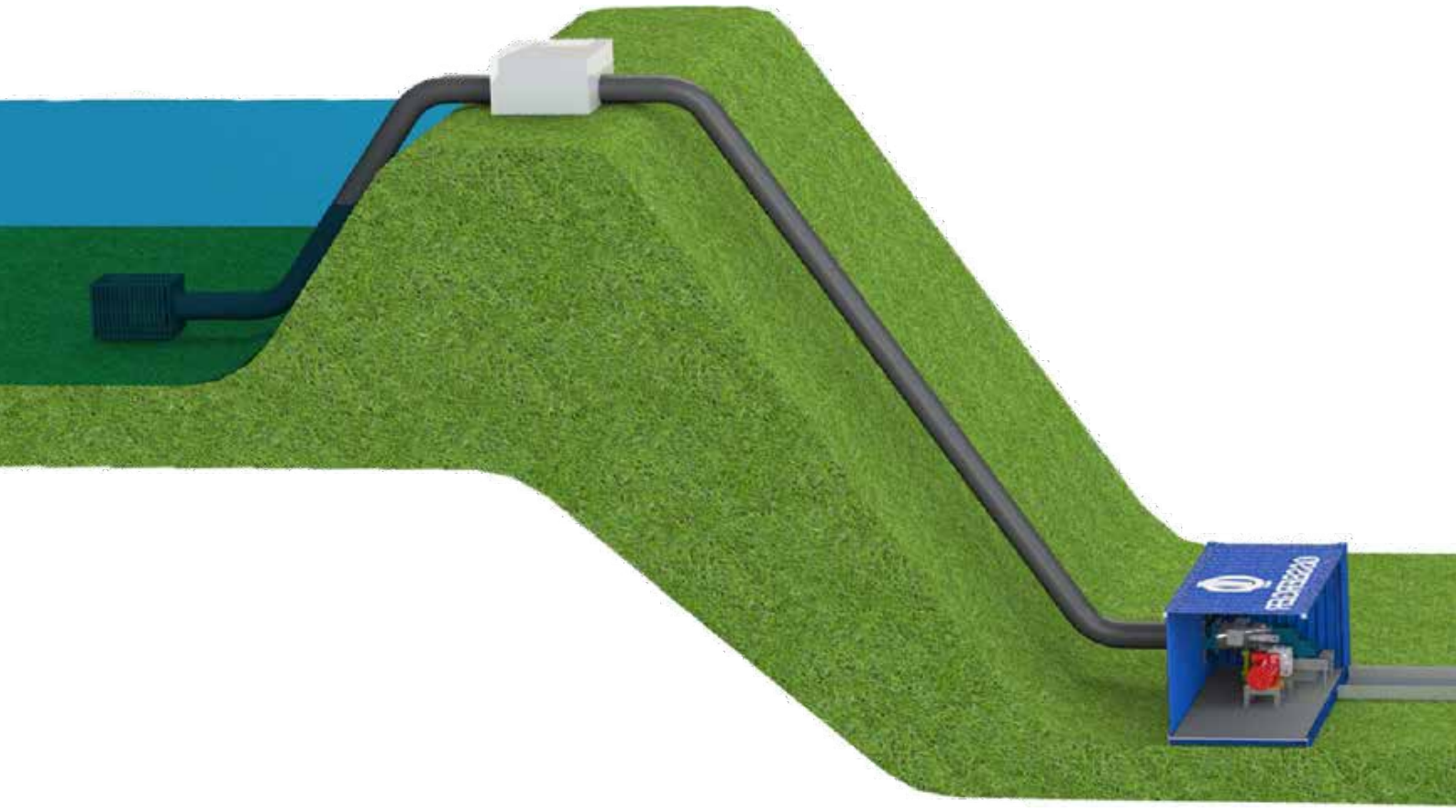
OSSBERGER

Special Applications



Siphon Turbine · Containerized Turbine · Water Management

Siphon Turbine

The energy potential remains unused at many dams; it can be costly to retrospectively install a new penstock to recover this as hydropower.

With a siphon turbine, Ossberger offers a simple solution to this opportunity: An above ground penstock assembly is laid over the dam, any surplus water can be utilised through this as a siphon. A vacuum pump provides the initial siphon priming of the penstock & hydro turbine, the negative pressure in the pipeline subsequently ensures a steady flow of water. The energy generated from this enables an income from otherwise unused assets; with reduced civil engineering costs and quick returns on your investment.

A siphon turbine also offers an emergency drain down function (with an additional flow by-pass to turbine) for added storm protection to impoundments due to climate extremes.

Requirements

- Butterfly valve
- Vacuum pump with vent valve
- Bypass (optional;
  in addition to an emergency system)

First start

- Close butterfly valve and guide vane of the turbine
- Turn on the vacuum pump, which is located at the highest point (vertex) of the penstock, to pump the water upstream
- The water runs over the top of the penstock and fills the turbine-side pipe down the butterfly valve.
- The vent valve on the vacuum pump connection piece allows the excess air to escape during the filling process.

When the penstock is completely filled, the vacuum pump switches off automatically and the butterfly valve on the turbine opens, allowing the water to reach the turbine.

The turbine automatically opens the guide vane for the start-up process and the generator is synchronized with the grid and switched on.

Stopping the turbine

Controlled stop

Butterfly valve and guide vane of the turbine must be closed. The water remains in the penstock. To restart the turbine, only the butterfly valve need be opened and the turbine starts automatically.

Emergency stop (in the event of power failure)

The turbine briefly goes into overspeed until the turbine guide vanes are automatically closed by means of the closing weights. The turbine comes to a standstill and the water remains in the filled penstock. To restart the turbine, only the butterfly valve need be opened and the turbine starts automatically.

Emergency stop by venting the penstock

The penstock is vented manually via the vent valve of the vacuum pump, thus interrupting the water flow at the vertex of the dam. As soon as the penstock is drained, the turbine closes, gets disconnected from the grid due to reverse power, and comes to a standstill.

To restart the turbine, the penstock must be refilled by means of the vacuum pump. See “First start”.

Containerized Turbine

The simple, fast and compact way to your own hydropower plant: The Containerized Turbine is a complete power plant that is delivered to you in a container with all the necessary components ready for connection. This then serves as the turbine house, which means that structural measures are limited to the connection to the driving water.

The Containerized Turbine can be equipped with different types of turbines and is therefore adaptable to individual requirements. The stable construction is ventilated and can also be supplied insulated on request.

Scope of delivery

- Turbine
- Generator
- Hydraulic power unit
- Control system
- Steel frames
- All cablework
- Lighting
- Sockets
- etc.

Water management

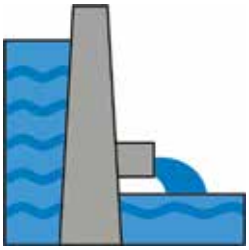
Industrial plants that regularly move large quantities of water during operation often allow existing energy potential to flow away unused. The uncomplicated and cost-effective installation of OSSBERGER Crossflow Turbines, even in existing plants, enables the recovery of energy and, in addition to a rapid amortisation of the investment, also ensures an improvement of the ecological footprint and a significant cost reduction of the facility.

The design in high-quality and corrosion-resistant steel grades such as stainless steel and Super Duplex also allow operation with brine or other highly aggressive solutions. In addition, as the main bearings are located outside of the water and therefore cannot contaminate the drive water, the Crossflow turbine is ideal for use in drinking water plants.

Treatment plants for:

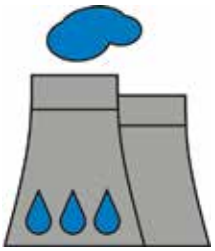
Waste water

Drinking water



Residual water plants

Seawater desalination plants



Cooling water

Residual water plant in Swizerland

Turbine in effluent outfall in Canada

For more detailed information on our products and services, please feel free to contact us or visit our website.

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