

ANDRITZ

Hydrodynamic screw turbines

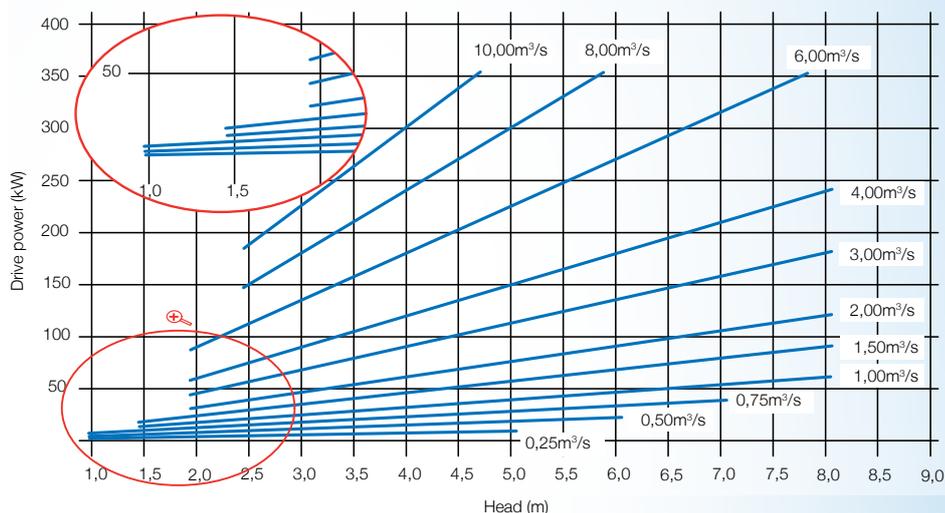


ANDRITZ Atro hydrodynamic screw turbines

Efficient, rugged, and environmentally friendly

Do you own water rights as an individual, a company, or a local authority? Then a lucrative source of energy is available to you at no cost. Don't let this potential simply run down the drain any longer.

An ingenious idea from Greek antiquity was the source of inspiration for this technology: The Archimedean screw made water flow uphill. The hydrodynamic screw turns that principle around and uses the position and energy difference of falling water to generate power.



The facts

- Water flow up to 10 m³/s
- Head up to 10 m
- Efficiency up to 92%
- Output up to 500 kW
- Fish-friendly

Your advantages

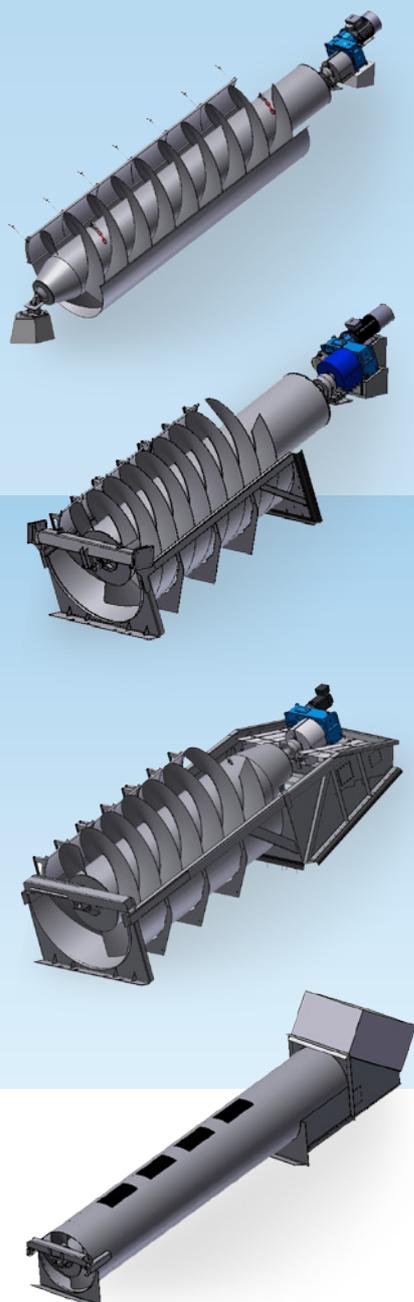
- Rapid amortization thanks to small investment and low operating costs
- High efficiency, even with fluctuating water levels and low volumes of water
- Efficient use as from an output of 1 kW, even with low hydropower potential
- Rugged, wear-resistant, trouble-free, and durable technology



- Self-regulating system that adapts automatically to the water volume and mains frequency
- Low-maintenance plant that requires very little cleaning
- Operates with coarse screen only (no fine screens needed)

Fields of application

- As substitute for waterwheels and turbine plants
- As residual water screw turbine in an existing spillway or a weir system
- At former irrigation weirs
- At the clear water outlet from sewage treatment plants
- At the cooling water outlet from thermal power stations
- At diversion power plants on flowing water



Back-filled steel trough (WU)

In a hydrodynamic steel turbine with a back-filled steel trough, the screw turbine body is placed in a concrete structure together with the trough, and the trough shell is back-filled with concrete. The drive unit and switchgear are mounted on a concrete structure. This design provides for maximum operating reliability with low cost for maintenance and care.

Self-supporting trough (WUF)

In a self-supporting trough variant, there is no need to back-fill the steel trough with concrete. The lower bearing is mounted on the trough and the forces are transferred to the trough structure. The drive unit and switchgear are mounted on a concrete structure.

Compact system (WKU)

In this case, the hydrodynamic screw turbine is placed in a self-supporting trough. The complete unit is a self-supporting steel structure with integrated drive unit. The baffle plate is already integrated into the steel trough, which has an open top. Thus compact system is secured to strip foundations prepared by the customer. A central support must be provided as from a blade length of approximately 11.0 m. The customer then only needs to provide the inlet and outlet areas for the screw turbine.

Compact tube screw (WKR)

In this case, the body of the screw turbine rotates in a closed tubular shell. The complete unit is a self-supporting steel structure with an integrated drive unit. The customer must provide the inlet and outlet areas for the screw turbine. Particularly suitable for low heads, e.g. clear water outlet from sewage treatment plants.

Sustainability

Every kilowatt-hour generated by a hydrodynamic screw means around 1 kg less CO₂ polluting the environment. Fish, other creatures, and floating particles pass through the hydrodynamic screw unharmed. What is more, the quality of the water in deeper bodies of water is improved thanks to oxygen enrichment.

Fish friendly

In addition to being very suitable for adapting the screw turbine and trough to the natural surroundings, the hydrodynamic screw turbine also allows fish to pass through it without coming to any harm. There is no need for the filter screens needed in small turbine systems as protection against floating objects. All that is required is a coarse screen through which floating particles and, more importantly, fish can pass unharmed.

Conclusion by the experts

“The efficiency of the hydrodynamic screw turbine compared to other small hydropower systems of this magnitude (turbines, waterwheels) is [...] similar or better. However, the partial load efficiency can be considered a special advantage that still makes very efficient use of the hydraulic energy available, even at low inflow volume. This is not easy to achieve in plants of a comparable size.”

Source: Extract from an expert opinion on determination of efficiency by the Technical University of Kaiserslautern



Automation

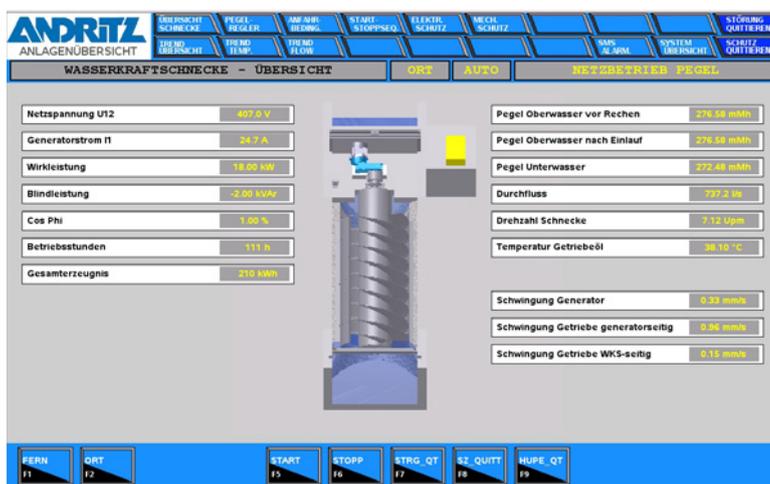
Reliable, economic and safe

Your hydropower plant should operate fully automatically and reliably without any personnel present, and you would like to check the plant status and your power generating data online on your smartphone?

This is possible both with a standardized design (compact, premium line) and with a complete customized solution, e.g. with integration of the entire weir system.

Our competence

A team with decades of experience in generating electricity from hydropower will develop the best solution for your specific case. With the complete engineering work, high-grade materials, manufacture in our own works, commissioning, customer training, and service features, you have a whole range of resources at your disposal to guarantee that your hydropower plant is highly profitable.

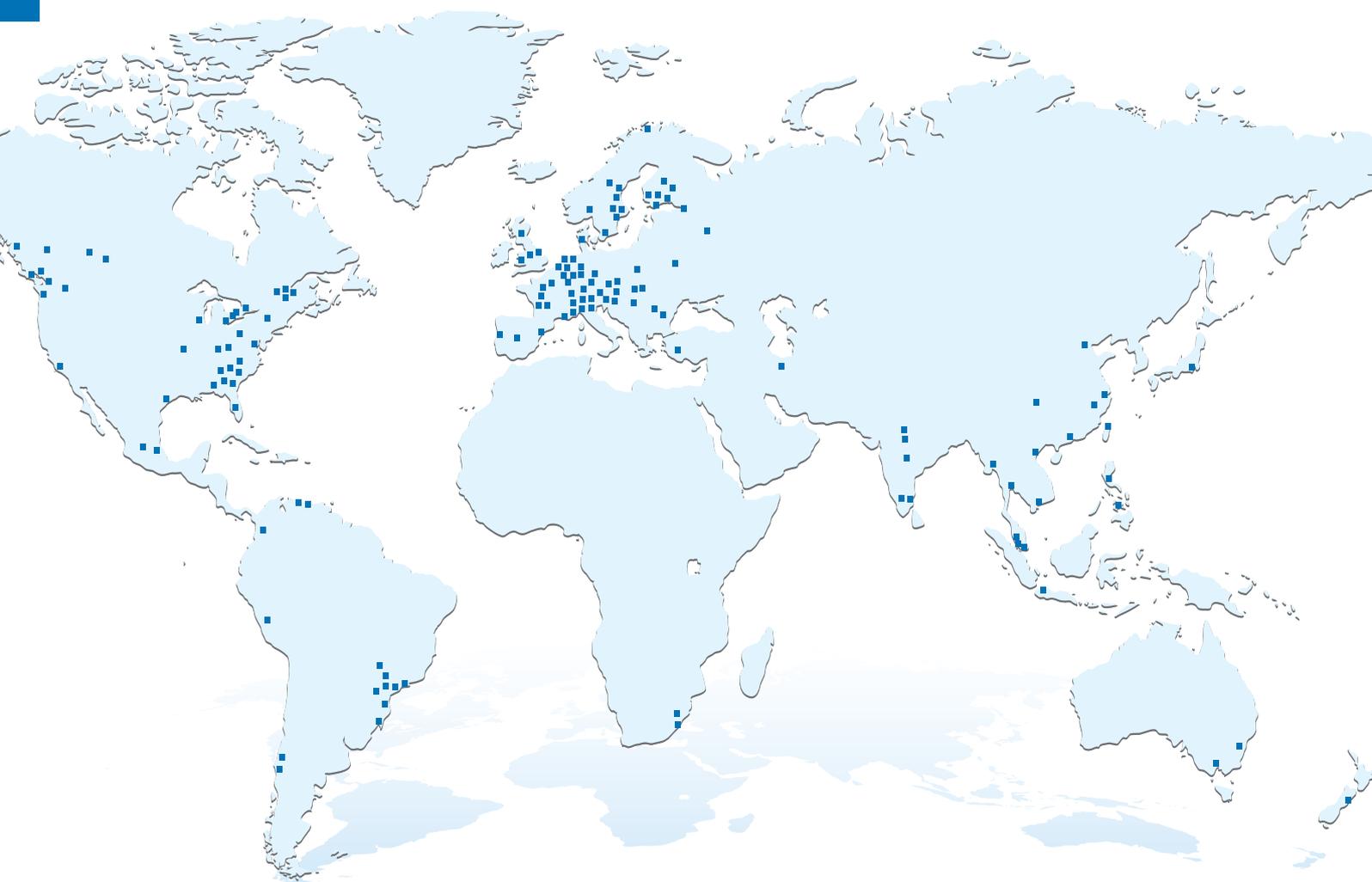


ANDRITZ hydrodynamic screw turbine controller AHC

This unit controls and protects advanced, scalable technology on an industrial scale. The following modules can be integrated into this unit if required:

- Integrated vibration monitoring to detect undesirable situations
- High-resolution, long-term archiving for status analysis
- Integrated logging of electrical measurements
- Webcam integration
- Alerts on mobile phone by SMS
- Reliable remote access, remote maintenance facility
- Detailed process visualization

Close to our customers



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