



ECO-Flow

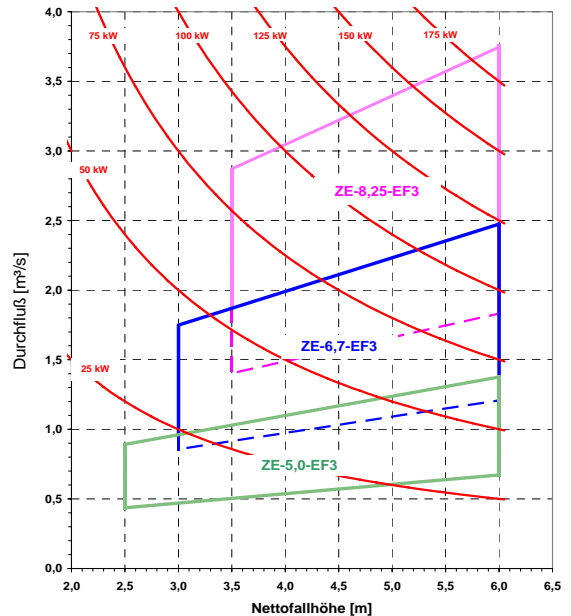


The ECO FLOW turbine of Koessler is kept consciously simple in structure with its highly developed and proven design which allows an application in ranges, where, so far, a use of small turbines was economically impossible. Thus, the ECO FLOW is simple to integrate into existing weir systems, channels or dams without much civil engineering. The ECO FLOW applies perfectly, for example, as residual flow turbine, weir turbine, for irrigation or simply everywhere, where less quantities of water with small head shall be used economically.



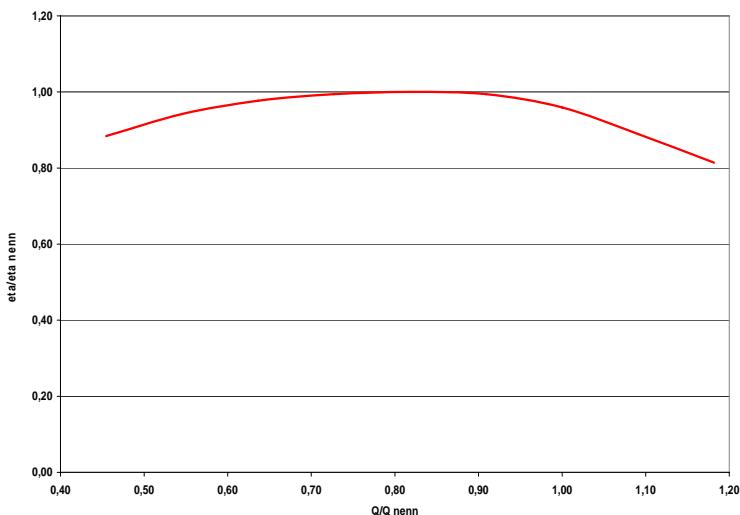
The special hydraulic design of wicket gate and runner is responsible for the self cleaning mechanism

The structure of the ECO FLOW is semiregulated, which means that the wicket gate is fixed, whereas the blades are adjustable. The turbine is developed as Z-Tube or Open Flume Turbine and is divided in 3 groups via blade diameter. Therefore the intake range can be individually adapted according to its application. The standardized turbine structure consists of a static wicket gate, which is designed to move dirt or floating particles to the middle of the turbine. On the



Application of the 3 standardized ECO FLOW turbine groups

centre line, a rotary self cleaning mechanism is installed, which constantly cleans the wicket gate of dirt. The blades of the runner are adjustable in the angle and thus make a regulation of the quantity of water possible. The runner blades, which are either hydraulically or electrically driven, are equipped with an oil-free adjustment mechanism. Cleaning is done by rapid adjustment of the blades during operation. The turbine hydraulic, which was especially developed for the semiregulated use shows a wide regulating range. This means that the efficiency is constant within the entire operating range.



Efficiency curve of the ECO FLOW

Another advantage is the fact that standard components are used to a large extent. Therefore, commercially available generators with 428, 500 and 600 min⁻¹ can be used. With the selection of the protection system IP55, in most cases, a simple roofing of the entire structure is enough. The electrical control is likewise simply implemented by the use of induction generators. It consists of a SPS with integrated display, which shows important data, operating conditions and problems. The connection to the electrical net can be made by an existing power station or by means of a 400 V network level. The necessary generator protection devices are integrated, an energy meter and an operating hour recorder as well.

The integration is completely simple. The ECO FLOW is available as Z-Tube Turbine in vertical or diagonal design or as Open Flume Tube Turbine. The generator and the adjustment mechanism can be installed in such a way that the elevation is for example more than the statistical 100 year flooding level. In order to avoid contamination, it is useful to install a trash rack in front of the turbine inlet. Again it is possible to get along without much mechanics. The cleaning can be done without the use of racks, but with the automatic flushing via flow reversion and the good flow achieved through the perfect design. Altogether the ECO FLOW is completely erected in our works and can basically be installed by oneself, if suitable personnel is available. If not, we are always ready to do the erection and commissioning with our perfectly trained technical personnel.



In summary the ECO FLOW offers a lot of advantages:

- Simple integration into the existing power plant
- Secure operation and almost maintenance-free
- Oil-free within the water and/or with the use of an electrical drive within the entire range
- Self-cleaning effect of the turbine and/or simple trash rack construction without substantial mechanics
- Compact construction but individually adaptable for the integration into the existing plant too
- Little civil engineering necessary

The ECO FLOW, a compact turbine optimized for economic application in the weir field, designed by Kössler, the famous supplier in the sector of small water power.

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