Twiflex
Altra Industrial Motion

www.neptunerenewableenergy.com

Product

Twiflex VKSD-FL Spring-Applied, Hydraulically Released Brakes

Application

Vertical Axis Crossflow Tidal Turbine

Highlights

- 2 units provide a total braking torque of 150 kNm

- Dual function: emergency stop and parking brake

- Accommodates axial disc float of ±6mm

- Hydraulic power pack enables fine control of the braking time

Twiflex VKSD-FL 'floating' disc brakes have been installed on the large Proteus tidal turbine designed and built by Neptune Renewable Energy Ltd. The turbine was developed for estuarine locations which can exhibit powerful currents, yet have the advantages of lower access, cabling and maintenance costs than those associated with offshore environments. The unit is moored in the free stream, minimizing environmental impact and operates efficiently for both flood and ebb currents.

The Proteus turbine consists of a vertical axis, crossflow rotor mounted in a 6m x 6m venturi diffuser duct beneath a steel deck and buoyancy chambers. The vertical shaft connects to a 1:200 gearbox and generator in the deck housing. The rotor maintains optimal power output via computer-controlled shutters within the duct and through variable electrical load.

The Twiflex VKSD-FL disc brake caliper is comprised of a single spring module forming the 'active' side of the floating unit and a reactive half. It is ideal for use where space is limited, as in this application, or to accommodate axial disc float of ±6mm. Braking force ratings are achieved through a combination of different springs, shims and air gap settings. Two VKSD-FL brakes act on the vertical shaft mounted disc, housed with the gen-set, in the binnacle over the turbine shaft and provide both parking and emergency stop functions.

While the initial customer request was for brakes, after a careful engineering review, Twiflex was able to provide a complete braking solution including the brake calipers, disc, hub, and power pack.

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