Contents

1. Back Ground

Conventional 3 blade Turbines is a vital and almost universal component of Renewable Energy Power Generator used to tap into tidal energy. The turbine blade design Principles was Invented about a century ago and after decades of incremental improvements are now saturated at peak Efficiencies. Today the focus is towards extending the length of the Blade and maximize the blade sweep area. This again has its draw back as the cantilever effect increases with Length and the blade root area is highly stressed.

There are other alternative methods but none of these use Positive displacement hydro motors because of increased complexity and frictional resistance.

RVCR is a new principal with Superior Physics that maximizes 'Energy Conversion Factor'; 'Enhances Efficiency' and results in extremely simple Rotary Positive displacement Prime-Mover.

We have formulated know-how for designing RVCR Hydro motors. This document provides a technical overview of the technology applied in wind power generator application and its benefits.

2. RVCR HK mechanism principle

RVCR-HK technology is a derivative of a novel seed kinematic mechanism for Hydro-Kinematic Power Generator application. This document provides the technical overview and is covered under below

RVCR Hydro-Kinematic Power Generator is a Positive Displacement Rotary Mechanism which utilizes pressure differential created by the water current made to flow through a convergent divergent nozzle and the relatively higher-pressure water partially stagnated by obstruction form by support structure

of the Machine at two different areas. The RVCR HK has a Convergent divergent nozzle integrated with it as shown in figure No 1 and is placed in flow path of water current and the water is driven through the nozzle creating a low pressure at the venturi throat. This low pressure is communicated to the back of the vane face plate.

The structure is mounted on base through supporting column and the nozzle support columns have a fluid flow blocking plate that influence direction change and hence building up pressure. This high pressure is communicated through inlet ports in the casing to the opposite face of the vane exposed to the low pressure on the other side which drives the vane. Hence, the fluid flow induced by pressure differential between two different points is routed through the flow channels of RVCR-HK, where in it work's against a rotating vane inside a enclosed chamber by pushing it and creating torque on a shaft to generate continuous output torque.

This document provides the technical overview and is covered under below listed heads.

1. RVCR kinematic mechanism description
2. RVCR vane actuating sequence
3. Drawing with component name description
4. Advantages and benefits

3. RVCR Kinematic mechanism component and structure

The RVCR Kinematic mechanism comprises two vanes (V1 and V2) moving in toroidal (hollow doughnut shaped) casing which are rigidly connected to two intermittently rotating rotors. The vane motion control mechanism controls the intermittent motion and converts it into continuous motion on output shaft. Water is driven through inlet port by the pressure difference created at venturi throat and discharged by the divergent section through the hose pipe. The structure is mounted on base through supporting column.

4. RVCR vane actuating sequence

The vanes (V1 and V2 in the figure No.4) enclosed in toroidal (hollow doughnut shaped) casing and the vane edge geometry is the same as the cross-section of the casing hollow space. The vanes face each other where the vanes are angularly displaced within the chamber and the cycle begins with the vanes positioned initially adjacent to each other and near inlet and outlet port respectively while maintaining a defined minimal angle between them. The vane V2 (Shown in Figure No.4) is held stationary with the action of vane motion control elements while V1 is coupled to the central shaft and rotates. After rotating through a definite angular distance, where in the moving Vane V1 approaches the stationary Vane V2 and it has an inclusive angle same as it had at the initial position with V2 behind it, both vanes are coupled to the central shaft and rotate simultaneously and acquire interchange positions where in the moving vane is at the position where V2 was kept stationary. Now the V1 is stationary and V2 moves and cycle continuous. The vane position inside the chamber is read at space outside of

the casing and motion control mechanism controls the intermittent rotary motion or each vane and converts it into continuous motion on output shaft.

5. Drawing with component name description

Fig. 1 shows the sectional view of RVCR Hydro-Kinematic Power Generator concept
Fig 2(a) & Fig 2(b) shows isometric view of convergent divergent nozzle & RVCR Hydro-Kinematic Power Generator
Fig 3 shows the sectional view of RVCR Hydro-Kinematic Power Generator
Fig 4 shows the sectional view of vane actuating mechanism.

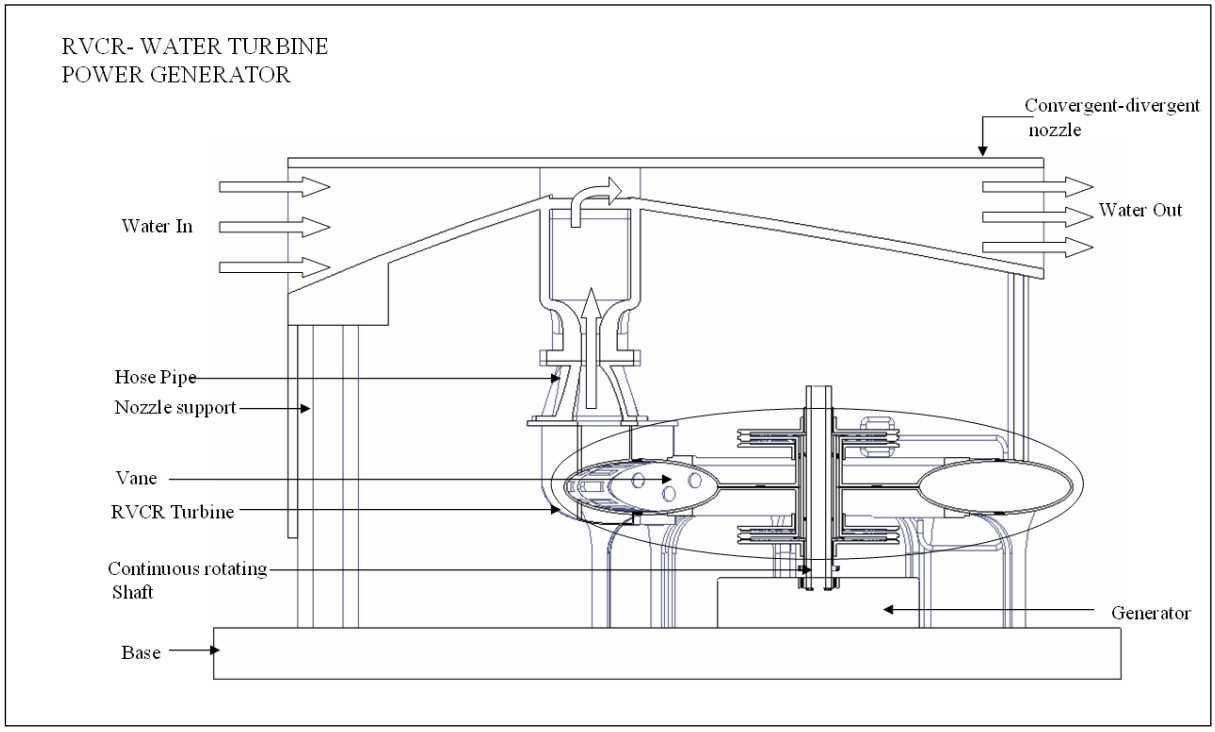


Fig. 1

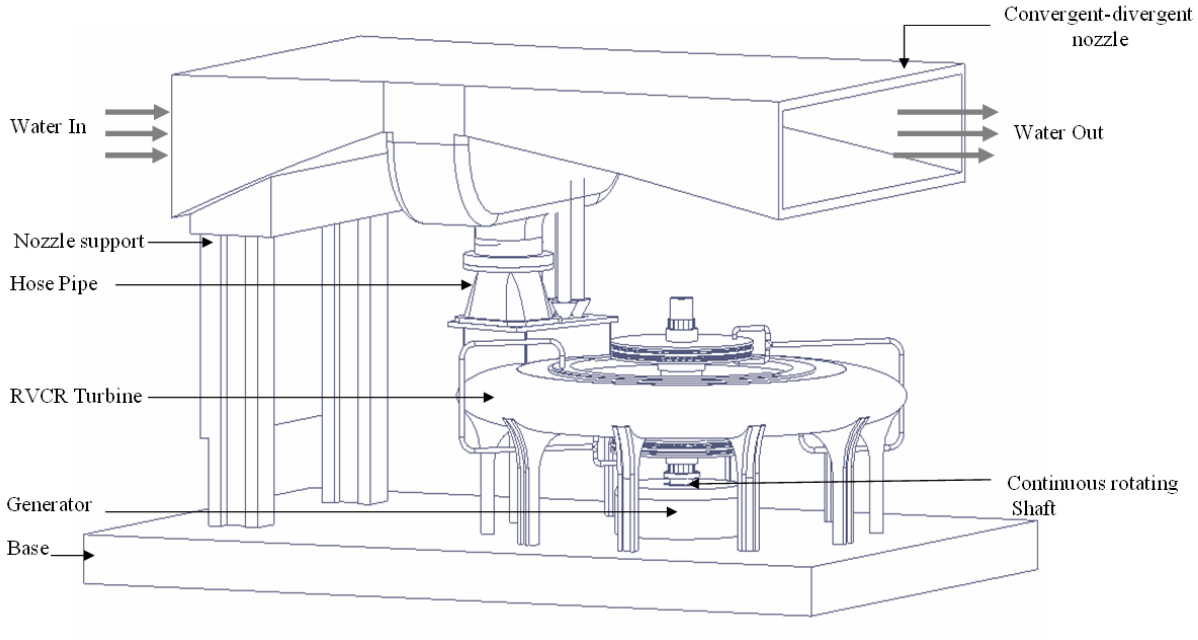

Convergent-divergent nozzle
Water In
Water Out
Nozzle support
Hose Pipe
RVCR Turbine
Continuous rotating Shaft
Generator
Base

Fig. 2(a)

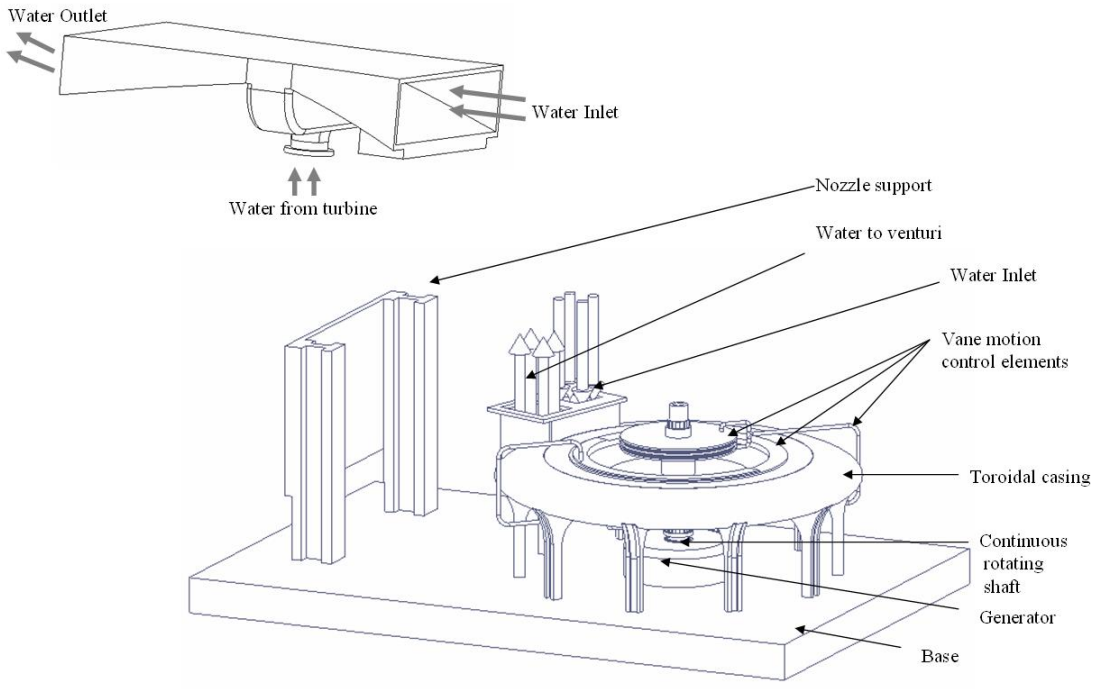
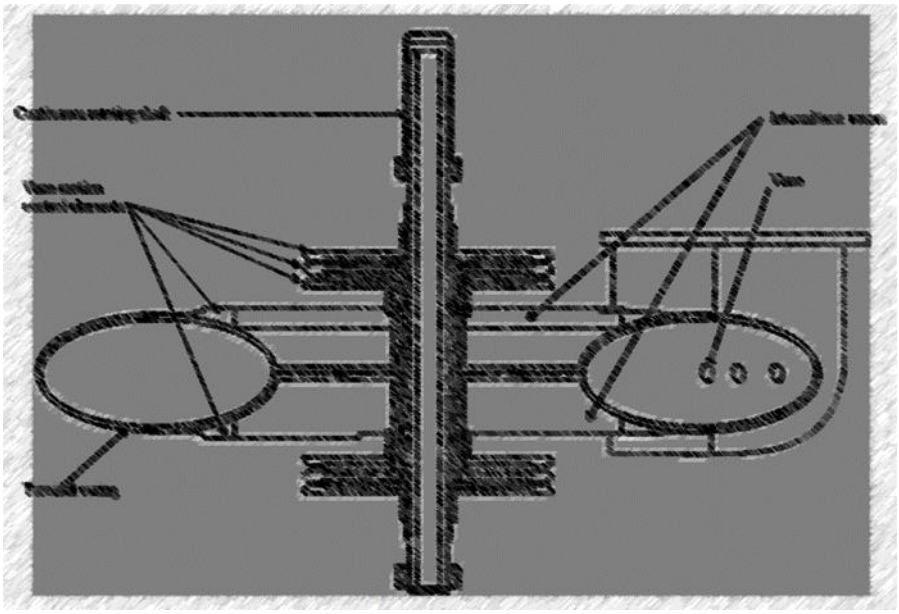

Water Outlet
Water Inlet
Water from turbine
Nozzle support
Water to venturi
Water Inlet
Vane motion control elements
Toroidal casing
Continuous rotating shaft
Generator
Base

Fig. 2(b)



Drawing Subject to Confidentiality

Fig. 3

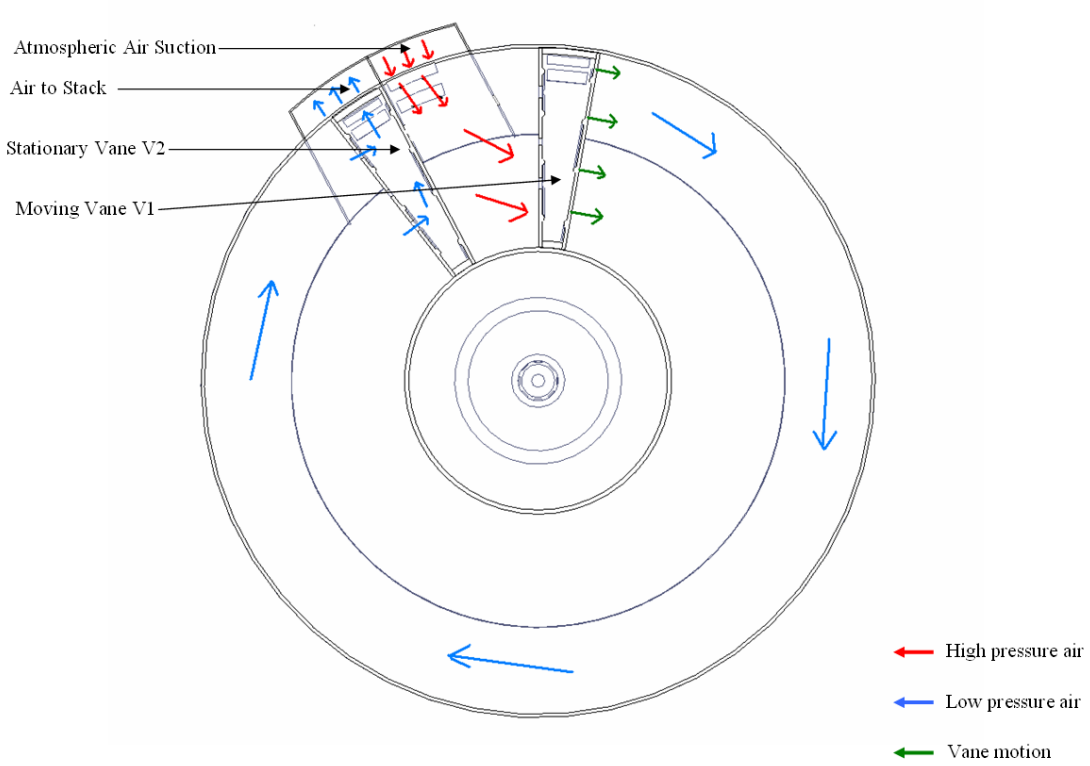


Fig. 4

6. Advantages and benefits

1. High Efficiency positive displacement mechanism
2. Easy Maintenance: No special machineries required for accessing the RVCR Hydro-Kinematic Power Generator as the buoyancy effect can be utilized by inducing compressed air into the machine
3. Fully enclosed Structure
4. Hydrodynamic design
5. Simplified metallurgy of vanes & mechanism parts encased in protective casing
6. Multi-segment assembly hence low level of working stresses
7. Less frictional loss lesser no. of rotating components
8. Easy transportation and handling compared to conventional water turbines.
9. Lesser No. of components: Ease of manufacturing and assembly
10. Lesser mating Parts & contacts
11. Customized sizing advantage
12. Easy scaling: Easy design for scales-up & scale-down versions