Linear Fresnel concentrator Steam Generator schema

Figure 1 – Steam Generator using Linear Fresnel Concentrator

Figure Legend :

Title : Fresnel concentrator Steam Generator

Method: Successive heating of thin layers of water using solar radiations from a Fresnel concentrator

Results: Steam generated to perform water condensation to process the last step in the sea water desalination cycle proposed process.

Explanation of components and their roles in the figure :

Component Identification number	Component Designation and Description	Component Role	Related Components
1	Stator	Standard fixed part of the electrical engine providing rotational motion.	2
2	Rotator	Standard rotational part of the electrical engine providing rotational motion.	3
3	Cross fitting	Has Three (3) hollow pipe from which the water flows to the cylinders 5. The extremities are respectively recessed to the components 2 and 5. The	2 and 5

		Component is in rotating motion following the rotator 2.	
4	Salt water or sea water tank.	Provide necessary sea water to extract steam.	3
13	Lip seals	The dynamic sealing of the system, is ensured by lip seals, and allows sealed rotational motion	2, 4 and 5
5	Hollow cylinders entangled from the base of the connection with the component 3. Water circulates in the annular space between the cylinders. The cylinder material is radiative heat absorber and has good thermal conductivity.	Absorbs radiations from the Fresnel concentrator and transmits heat to thin water layers to efficiently generate steam.	3, 6, 7 and 8
6	Linear Fresnel Concentrator Engine. A line centred reflector mirrors.	Supplies the necessary heat by reflection of solar radiation to component 5.	5

7	Air compressor. the compressed air is injected upstream of the manifold 8 and the first cylinder of the device 5 at the outlet of the sea water tank 4.	Permet l'évacuation de la vapeur et de l'eau salée résiduelle dans le collecteur 8 vers le séparateur vapeur liquide 11.	8 and 5
8	Transparent cylindrical collector.	Contains generated steam and residual salt water.	7 and 11
9	Intel Diffuser	Separates steam from residual salt water.	9 , 10 and 11 are parts of standard liquid-vapor separator.
10	De-entrainment mesh pad	Separates steam from residual salt water.	9 , 10 and 11 are parts of standard liquid-vapor separator.
11	Liquid-Vapor separator container.	Contains the parts of the separator , the extracted steam and residual salt water.	8
12	Residual salt water		11
	Red arrows are solar radiations.		
	Blue arrows is the symbol of salt water or residual salt water.		

	Yellow Arrows is the symbol of the generated steam.		

References :

touzani, s. (2019, March 28). Desalination of seawater by successive heating of thin layers of water using solar radiations from a Fresnel concentrator. <https://doi.org/10.31219/osf.io/dvr9y>