

Power station concept

The Danvest systems are designed to utilize energy production to the largest beneficiary extent - based on an efficient and reliable operation and environmentally friendly solutions.

The power plants are designed for automatic “stand-alone” operation. Thus there is no requirement for power connection to a major grid. However, the power station concept is able to cooperate with the existing power generating plants.

Only well-known and proven technologies and components are used. This is a key issue for a safe and reliable operation as well as easy maintenance of the plant.

The power plants are able to cooperate with standard wind turbines and wind farms and to operate with high wind energy penetration as a fully automatically controlled wind/diesel (WD) system.

When applicable, the waste energy from the diesel generator(s) and the wind turbines is utilized for fresh water production, heating, freezing capacity or other applications.

The concept of the system is based on the following

Modular plant design	<p>The plants consist of containerized modules: Generating modules, power panels as well as control module and service module.</p> <p>The plants are built into 20' or 40' standard containers. The containers and the pre-fabricated systems are fully equipped and installed before shipment - facilitating complete test of the components and the systems.</p> <p>The containers are placed on-site so a sheltered area is formed between the containers. Covered with pre-fabricated roof and walls this area is the machinery hall comprising auxiliary equipment and fresh water production systems.</p>
Generating module	<p>The generating module comprises the diesel generator set(s) and auxiliary systems, which are fully integrated in the structure of the container. The container is equipped with an extra steel door, lighting and ventilation. Walls and roof are insulated for reduction of the noise and heat emission.</p>
Control module	<p>The power panel / control module comprises the power panels for generator set(s), consumer outlets and other power components in the systems and control / monitoring systems for the safe, automatic operation of the plant. The container is equipped with heat insulation materials, covering panels inside, windows, doors, ventilation and, if required, air condition.</p>
Service module	<p>The service module has the necessary equipment, spare parts and tools for performing safe and high quality maintenance and repair of the systems and components. The service module is important in connection with the on-site training of the operational staff.</p>
Desalination	<p>Distillers for fresh water production are integrated in the cooling system as a heat exchanger in the cooling process. The capacity of the desalination</p>

	<p>plant is dependent on the desalination concept.</p> <p>Reverse osmosis (RO) systems for higher production of fresh water can be added. The complete RO system can include water intake system, pre-treatment, RO-desalination and post-treatment. The RO system has variable capacity and is specially designed for WD operation. The RO system is delivered as containerized units, where only the buffer tanks for water have to be built on-site as concrete tanks.</p>										
Transport	<p>In order to facilitate easy transport and protection of the materials and equipment during transport all parts are packed into containers and all containers are standard size containers.</p>										
Installation	<p>The containerised concept is applicable for power stations with diesel generating capacities within the range from 100 kW to 1,500 kW <u>for each module</u>. It is recommended to install standby capacity. The capacity of a complete power plant is within the range from 100 kW to a maximum capacity of approximately 9,000 kW.</p> <p>The power plants consist of one or more diesel generating modules, depending on the capacity requirements.</p> <p>Distillers for fresh water production are integrated into the cooling system as a heat exchanger in the cooling process.</p> <p>The capacity of the desalination plant is dependent on the desalination concept according to the requirement.</p> <table style="margin-left: 40px;"> <tr> <td colspan="2">Distillers</td> </tr> <tr> <td>Low performance</td> <td>7-100 m³ per day</td> </tr> <tr> <td>High performance</td> <td>50-1,000 m³ per day</td> </tr> <tr> <td colspan="2">Reverse Osmosis per containerised module</td> </tr> <tr> <td>Plant capacity</td> <td>1,000-3,800 m³ per day</td> </tr> </table>	Distillers		Low performance	7-100 m ³ per day	High performance	50-1,000 m ³ per day	Reverse Osmosis per containerised module		Plant capacity	1,000-3,800 m ³ per day
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Fuel savings	<p>Normally, the most viable wind turbine capacity connected to the Danvest system is larger than the capacity of the diesel generating set(s). Thus the obtained wind energy penetration is larger giving a higher fuel saving.</p> <p>For optimal wind diesel combinations the fuel saving, depending on the actual wind conditions, will be in the range of 50-80%</p>										

Plant applications

The Danvest concept is made for 4 main applications

1.	Diesel Power Stations, Type “DP”	Power supply by containerised diesel generators only.
2.	Diesel Power stations with Desalination, Type “DP-D”	Power supply by diesel generators only. Desalination by utilization of the waste heat from engine cooling. Further fresh water production by reverse osmosis system.
3.	Wind - Diesel Stand - Alone Power Stations, Type “DP-WT”	Power supply as a hybrid solution integrating the power generation from the wind turbines with the power generation from the diesel generators.
4.	Wind - Diesel Stand - Alone Power Stations with Desalination Type “DP-WT-D”	Power supply as a hybrid solution integrating the power generation from the wind turbines with the power generation from the diesel generators. Desalination by utilization of the waste heat from engine cooling. Further fresh water production by reverse osmosis system.
	Special Solutions	Special alternatives and solutions can be supplied according to the customer’s specifications and conditions. Buildings and housings, either existing or supplied by the customer, can be integrated into the plants. Existing power generating facilities (diesel generator(s) and/or wind turbines) can be integrated into the power plants.
	Possible extensions	The above mentioned standard applications can be combined or extended with other systems <ul style="list-style-type: none"> ➤ Plant with solar collectors for desalination process ➤ Plant with fresh water bottling units ➤ Plant with combines heat and power for central district heating ➤ Plant with flake or block ice production ➤ Plant with ice bank conservation of cooling for cold stores ➤ Plant for water pumping, either for agricultural irrigation or water storage ➤ Feeder sub-station if the stand-alone system is connected to a major grid.