

Case Study | VACON® NXC series low harmonic drive

# Scheveningen harbor environmentally upgrades with clean **shore power**

In the First Harbor in Scheveningen, Netherlands, a new shore power installation has eliminated air pollution while reducing noise and vibrations from ship engines idling at berth.



**1,000**  
**litres**

less marine diesel  
consumed every day



The shore power supply system is located underground. Here only the entrance is visible.



The VACON® NXC series low harmonic drive delivers a total power of 2 MW.

### A Dutch first in shore power supply

Scheveningen harbor is centrally located on the Dutch coast, providing berths for more than 7,500 vessels each year. It consists of three harbor areas.

While shore power in the Second Harbor already exists for cutters, small fishing boats and pleasure vessels, a major new industrial-scale installation in the other two harbors extends capacity to many more vessels.

The new shore supply system serving the First and Third Harbors is a first for the Netherlands in terms of its large scale, its technology, and its convenience for users.

### Dramatic improvement in air quality

Thanks to the new shore power installation, ships can stop using noisy, polluting diesel generators whilst berthed in harbor. This eliminates air pollution and reduces the noise and vibrations when ship engines are idle. On average, ships in Scheveningen Harbor consume more than 100 MWh per month via the new shore power supply. At an average of one litre per three kWh, this translates to more than 33,000 litres of high quality marine diesel per month are saved. This results in dramatic reductions of air pollution from particulate matter, nitrogen oxides (NOx) and sulphur oxides (SOx) in addition to substantial CO<sub>2</sub> savings.

### 100% renewable energy

The installation of shore power in Scheveningen harbor is a major part of The Hague's Air Quality Action Plan, which outlines what the municipality is doing together with businesses, residents, interest groups and the Dutch State to further improve the air quality in the city. Of course, only 100% Dutch sustainable wind energy is used in the installation.

The system was built by Klaver Technisch Bedrijf B.V. in Obdam using a Danfoss VACON® NXC series low harmonic drive with micro grid functionality to convert grid power from 50 to 60Hz to adapt the frequency to the ship's grids. The system has eight power outlets each with a maximum current of 400 A.

### Power connection for many vessel types

The system has eight power outlets each supplying a maximum current of 400 A. Six connection points have been installed in the First Harbor for large fishing boats and freezer trawlers. The First Harbor is the centre of the fishing fleet, but there is also space for off-shore vessels, large commercial vessels, towing services and the coast guard rescue services .



Maarten Hektor, Managing Director, Involtum.

“The system has been successfully working for two years now, and we’ve had no problems at all with any of the Danfoss components: They’re totally reliable.”  
**Maarten Hektor, Managing Director, Involtum.**

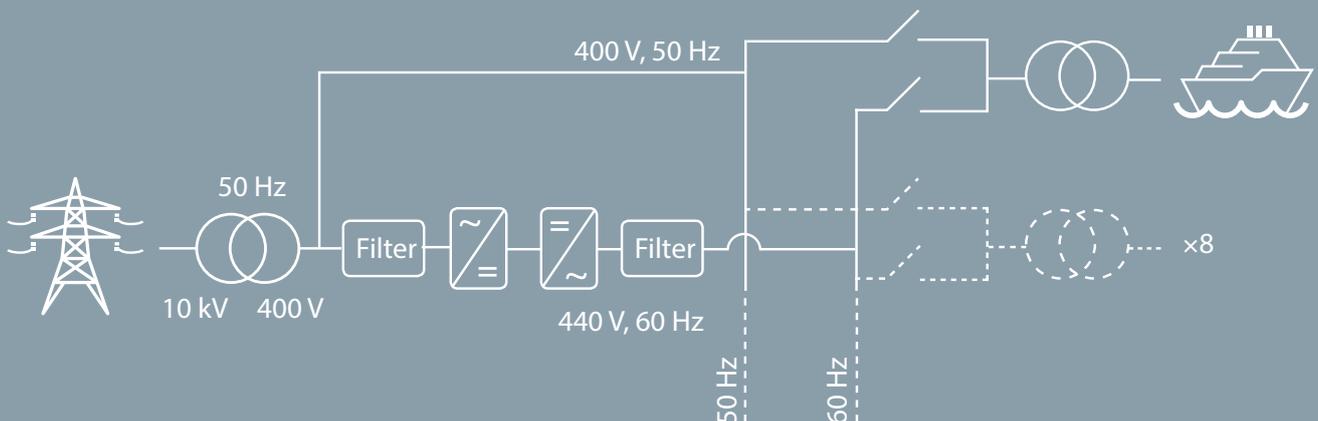
### Automatic frequency adaptation

The system is equipped with a micro grid functionality which generates a 440V, 60Hz clean grid. There are 8 shore connections each with it’s own transformer. The primary side of each transformer can be connected to 400V, 50Hz directly from the grid or 440V, 60Hz supplied from the converter depending on the grid of each ship. Every transformer has thus 2 feed-in circuit breakers: one for the 50Hz grid and one for the 60Hz grid.

### Clean shore power on demand

Each outlet has a communication system allowing the ship’s engineer to connect and pay for power with the user friendly Walstroom app, developed by Involtum Services B.V. Walstroom works 24 hours a day and can be accessed via mobile phone, smartphone, computer or tablet. Involtum have a 10-year agreement with the Port of Scheveningen to operate the shore power system for all ships entering the port.

### Simplified single line diagram of the shore power supply system





*Scheveningen is the Dutch Surfer's Paradise where the citizens and visitors enjoy the clean air and the waves.*



*Maarten Hektor demonstrates one of the shore power connection points which are controlled by Involtum's Walstroomb app.*

## INVOLTUM

**Involtum** is the company behind products like Nomad-Power, Walstroomb, Evenementenstroomb, YoreOn and AanUit.net. The main business of Involtum is invoicing temporary usage for electricity, water and other services.

Involtum has its own smart meter platform to switch and measure devices. With their smartphones, customers can operate the services themselves.

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.