

Case study | VACON® 3000 Drive Kit

Royal IHC Scheldt River **pioneers new environmental standards in dredging** with flexible MV drives

Dredging's role in the maintenance of safe riverside occupations has become more vital as heavy rain events become more common. As more dredging is undertaken around the world - often in heavily populated areas, the need for energy efficiency and adherence to environmental regulations also assumes more significance.



2018

KNVTS Ship of the
Year award for
achievements in
cleaner dredging

Flexible modular drive solution helps set new environmental standards

The Scheldt River is a 7950 m³ dual-fuel (diesel and LNG) hopper dredger designed and built by Royal IHC in the Netherlands for DEME. It represents the latest in hybrid dredging technology with its “flex fuel” main engine capable of running on natural gas, light fuel oil. The dredger is part of DEME’s innovative Trailing Suction Hopper Dredger fleet.

With its ‘Green Passport’ and a ‘Clean Design’ notation, the vessel complies with the strictest international emission requirements. To help achieve these high standards, Danfoss was asked to contribute a drive solution that could boost an inboard dredge pump and increase energy efficiency with a small footprint, minimum weight and low volume - while being robust enough to withstand the harsh marine environment.

Performance and flexibility

The modular VACON® 3000 Drive Kit qualified for the project for its ability to contribute to the vessel’s overall green

performance and to offer the flexibility of design required by IHC’s engineers and technicians.

As an independent low-voltage (LV) and medium-voltage (MV) drives supplier, Danfoss could offer this MV kit package that enabled IHC to make their own customized, integrated solution, the IHC MV drive.

Based on a modular approach, the compact IHC MV drive helps to save space and weight, optimizing the overall design of the vessel and its equipment.

A partnership of experts

When configuring and installing the VACON® 3000 drive, IHC was able to draw upon the experience of application experts in Danfoss Drives’ Marine Application Development Centre in the Netherlands.

The centre is equipped with a range of testing and demo units, which were used to help and facilitate complete panel testing on load and customer FAT, together with IHC.

The keys to energy efficiency

The boosting of the vessel’s dredge pump with an AC drive was made possible through power take-in (PTI) technology, which allowed load sharing between the VACON® 3000 and the main dual-fuel engine. This resulted in significantly higher energy efficiency.

Using transformer-less AFE technology employing normal water-cooling, the VACON® 3000 drive can run on lower supply frequency and voltage, for constant output power. Energy is saved in the auxiliaries by reducing the engine speed. VACON® NXP LV drive modules are employed for other applications including pumps, thrusters and active filters. The switching of drive control between the inboard dredge pump and the submersible dredge pump of 1700 kW is performed by a medium voltage switchboard, where also the required sinus filter is located.





Replicating award- winning performance

The Scheldt River has been in operation since 2017, and in 2018, IHC was declared winner of the Maritime Award, 'KNVTS Ship of the Year', for taking a major step towards cleaner dredging. To continue setting new standards in environmental performance for the dredging industry, ship owners, DEME, have placed an order with IHC for an additional vessel of the same specifications, the dredger, Meuse River, which utilizes the same VACON® 3000 Drive Kit.



VACON® 3000 Drive Kit

The VACON® 3000 drive fulfilled IHC's requirements for suitability for a marine environment, minimum weight, small footprint and low volume. The power module design was especially well-suited to the harsh environment, being equipped with specific measures to avoid dust of any kind and pollution contaminating the semiconductors during ship construction.

Deliverables:

VACON 3000-4Q-0650-04 Qty. 1

Nominal Power: 4680 kVA

Nominal Voltage 4160 V

Nominal Current: 650 A

Enclosure Size: 2x L20

Options:

- +FCM (Common Mode Filter)
- +SIN (Sinus Filter)
- +RCK (Mechanical Rack)

Application: inboard and submersible dredge pumps

Control Interface: EtherNet I/P