



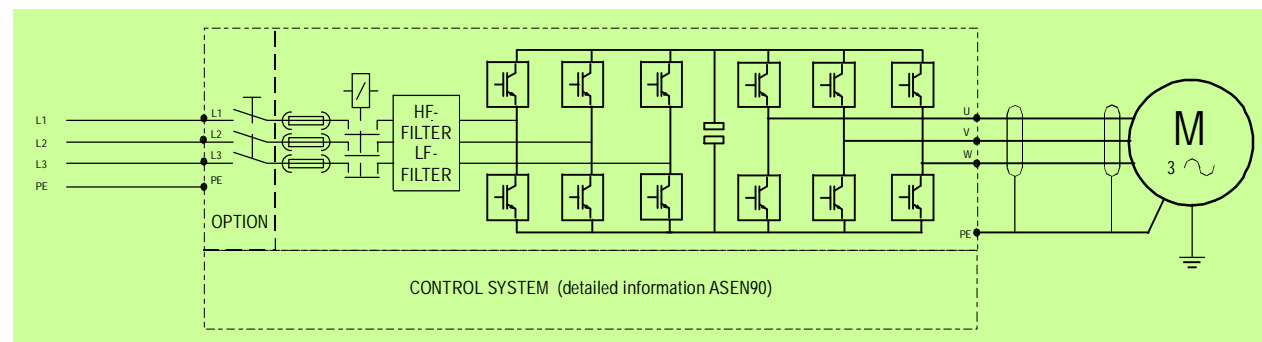
Propulsion & Dredging



Technical specifications

EVE690/ . . .	1300DTW
max. motor output	1,1 MW
max. output current	1188 A
overload (60s)	150 %
manufacturer	EEKELS ELEKTROTECHNIEK B.V.
input line voltage	2 x 3 x 690V +10 - 15%
input line frequency	50/60 Hz
line current	2 x 590 A
cos phi	ca. 0,96
output line voltage	3 x 0-690V
frequency range	0-100,00Hz / 0-200,00Hz
efficiency	higher than 98%
max. power loss	16,5 kW
water flow [m3/h] (type DW)	2,01
max. ambient temp.	40°C (up to 50°C with reduction)
max. water temp. (input)	45°C
degree of protection	IP-20 (up to IP-55 on request)
max. length motor cable	150 m (> 150m optional)
communication	MODBUS-RTU RS 232, RS485, fieldbus interface)
interference protection	IEC 61800-3 (EN 55011 optional)
line disturbance	According Energiedirective with internal AC-choke

Eekels can deliver frequency converters in the range of 5,5 kW up to 2,6 MW.



Characteristics of the project

- 4 x 1MW water-cooled frequency converters
- Synchronised Active Front End's
- Low harmonic distortion
- High starting torque
- Quick response time (1ms)
- Designed for shallow water conditions
- High efficiency-level of the drive
- Common DC-bus
- Fieldbus Profibus-DP and Modbus-RTU integrated
- Optical Interfaces for synchronization
- Programmable in- and outputs
- Integrated setpoint PID
- Touch panel control
- Reliable

For the Belgium contractor 'Jan de Nul' Eekels designed a dredging and redundant propulsion solution consisting of four separate 1MW water-cooled frequency converters.

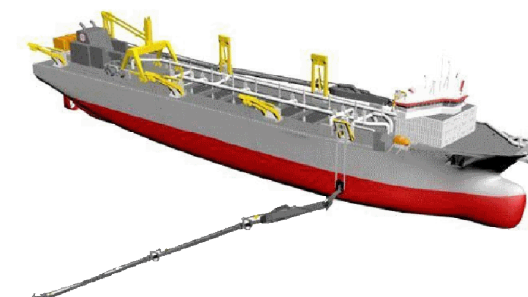
By using state of the art 'Active Front End' and water-cooling solutions, Eekels was able to minimize the required space on board and also reduce harmonic distortion to a minimum.

The in-house designed hardware and software provided the flexibility to meet the requirements of Jan de Nul and the class bureau.

The solution was implemented on two 3400m³ 'hopper dredgers' The 'Alvar Nuñez Cabeça de Vaca' and the 'Sebastiano Caboto' These dredgers are specifically designed to operate in shallow waters and have a loaded draught of only 5m.

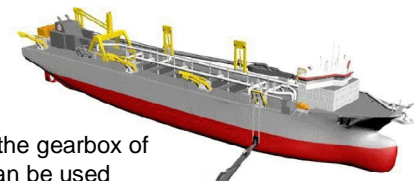
Product range ship electronics:

- Electronic emergency telegraph
- Alarm system
- Signal Column
- Bow thruster control
- Frequency converters for bow thrusters and cargo pumps
- Power Management System
- Ballast Control System



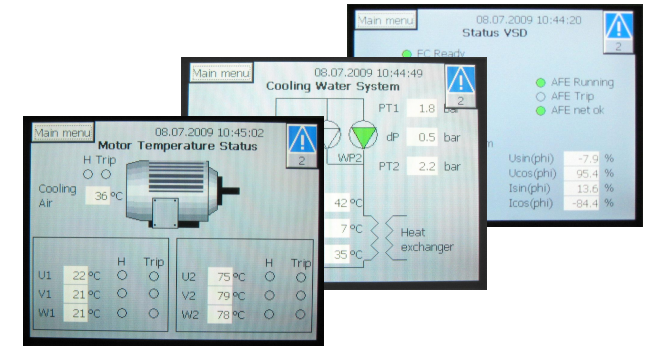
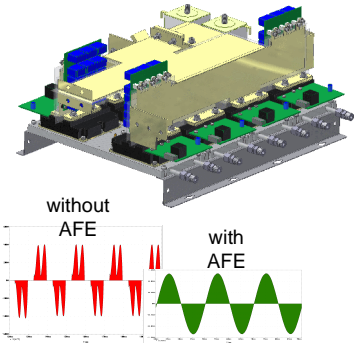
Multi Redundant Propulsion & Dredging Solution

Designed for the Belgium contractor Jan de Nul

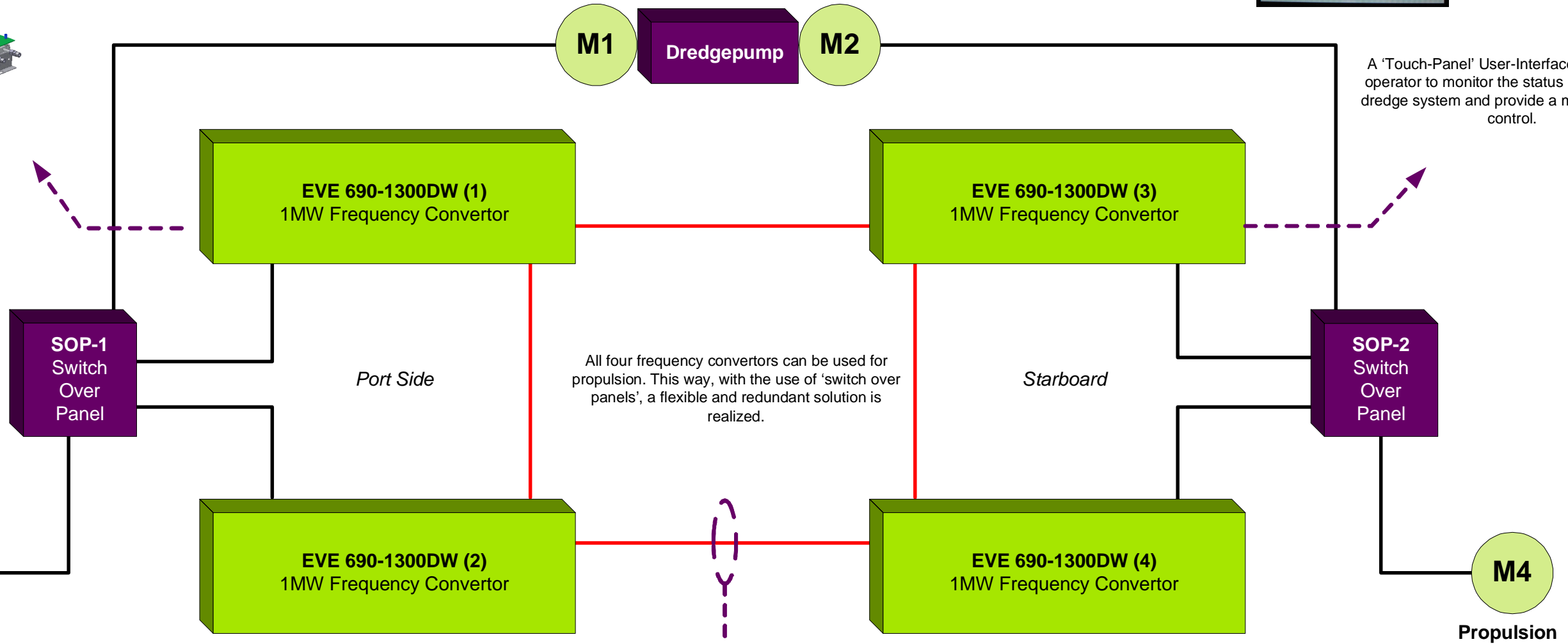


The two 1MW motors are coupled to the gearbox of the dredge pump, these motors can be used together or separately resulting in a redundant dredging solution, with a maximum power of 2MW.

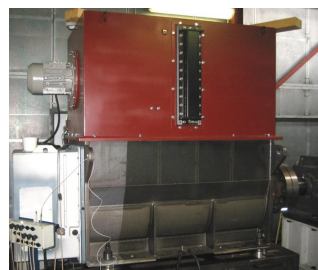
Frequency converters with active front end's (AFE) were chosen to provide a solution with low harmonic distortion and a small cabinet footprint. Ideal for ship applications.



A 'Touch-Panel' User-Interface enables the operator to monitor the status of the drive or dredge system and provide a means for local control.



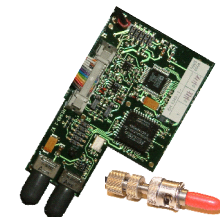
All four frequency converters can be used for propulsion. This way, with the use of 'switch over panels', a flexible and redundant solution is realized.



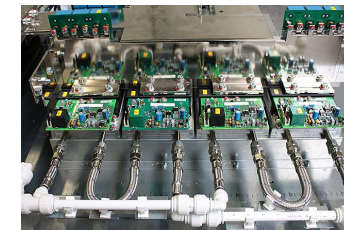
690V 1MW Water-cooled E-Motor



Cabinet Overview



The Frequency converters are linked and synchronised together, using high grade industrial fibre optics



Water cooling is used to maximize the cooling efficiency and reduce the size of the cabinets.

