B&P Elektromotoren

ENGINEERING TOMORROW

Danfoss

Fact Sheet

# Ensure safe DC-grid selectivity with **VACON® NXP DCGuard™**

VACON® NXP DCGuard™* enables fast disconnection and full selectivity between DC grids.

Utilizing DC grids rather than AC grids enables power distribution with lower power losses. However, ensuring selectivity and limited short circuit energy requires more sophisticated protection devices.

Danfoss Drives has therefore developed the VACON® NXP DCGuard™, a semiconductor protection device that can detect and cut off any faulty DC currents and isolate the faulty part of the system in microseconds.

## Current range:

- 465-800 VDC……3-4140 A
- 640-1100 VDC…...…4-3100 A

## Easy dimensioning

Rated VACON® NXP DCGuard™ DC current = Rated VACON® NXP Inverter AC current.

This means that your primary dimensioning value is the required load through the VACON® NXP DCGuard™, meaning energy transfer from one side to another. It is as easy as that.

## Type approvals:

**DNV-GL, ABS, Lloyd's Register, CCS, Bureau Veritas**

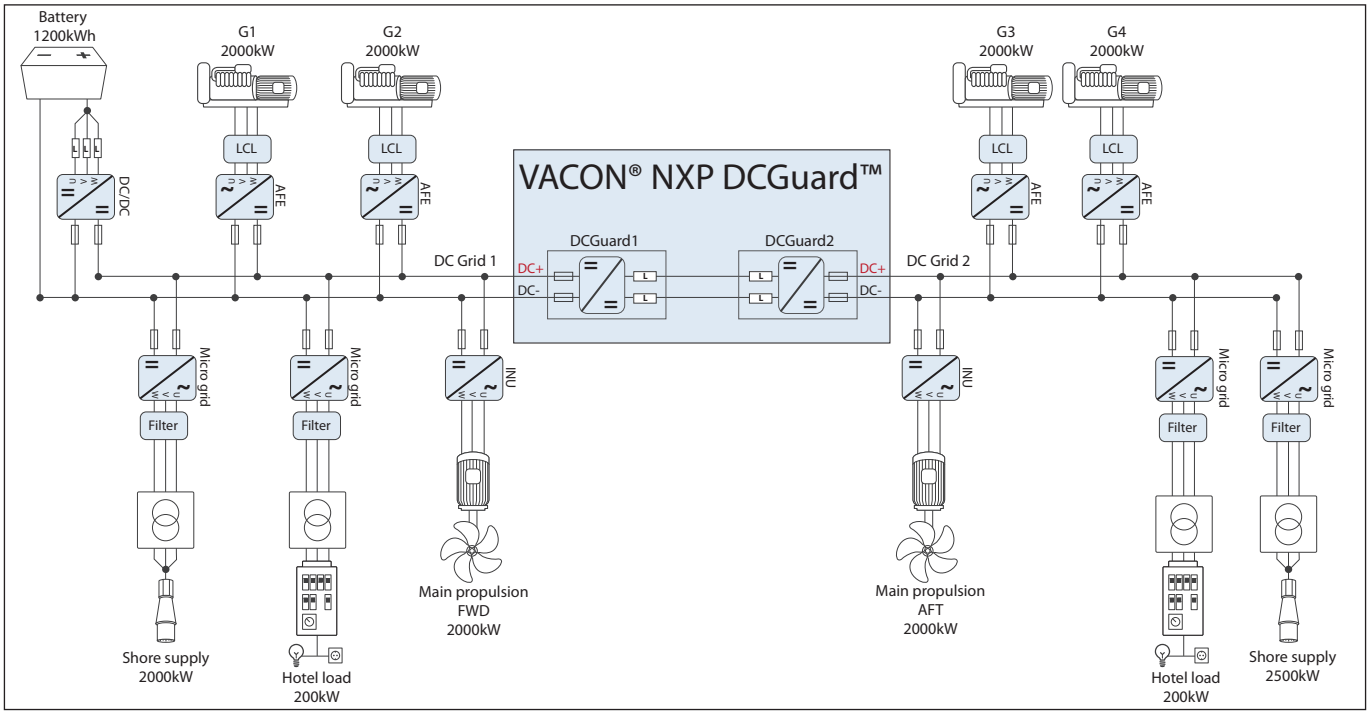
**Current cut-off in**

**<5 µs**

DC Grid 1 — Short Circuit Protection VACON® NXP DCGuard™ — DC Grid 2

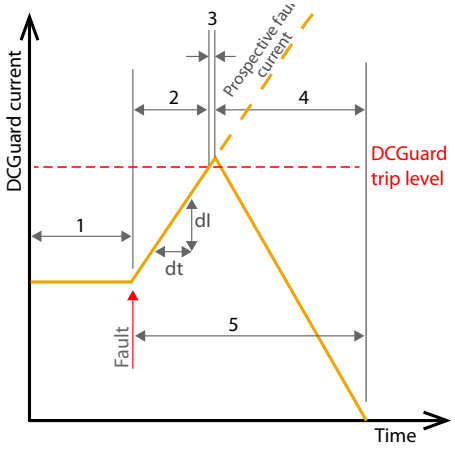
| Feature | Benefit |
|---|---|
| Short circuit protection | Ensure correct system selectivity |
| Cuts off both + and - inside the same unit | No overvoltage spikes related to current cut-off |
| Controlled voltage ramp up | Connect two different DC grids with voltage differences up to full DC voltage |
| Overload detection | Protection of transmission cables |
| Standard NXP hardware | Proven and well known products |

**patent pending*




*Example of hybrid system where VACON® NXP DCGuard™ ensures the required system selectivity*

DC- link voltage on feeding side.
Negligible voltage dip on feeding side.
DC current in connection cables.




## Legend

1. **Normal situation(No fault)**
   Current is within DCGuard nominal current capacity.
2. **Fault current rise time.**
   Current dI/dt=V/L
   V=Feeding DC voltage
   L=Inductance in the circuit
   Typical time:100-150µs*
3. **Current cut off time.**
   DCGuard performs a current cut off by forcing all IGBTs open when current reaches the tripping limit of the DCGuard. Time:<5µs
4. **Energy discharge time.**
   Current dI/dt=V/L
   V=Feeding DC voltage
   L=Inductance in the circuit
   Typical time:100-150µs*
5. **Total fault clearance time.**
   Typical time:200-300µs*

* System dependent