

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Variable Speed Voltage Controller (VSVC)**with type designation(s)
BlueDrive PlusC

Issued to

Siemens AS
OSLO, Norway

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product approved by this certificate is accepted for installation on all vessels classed by DNV GL.****Temperature A****Humidity B****Vibration B****EMC A****Enclosure Required protection according to relevant rules shall be provided upon installation on board**Issued at **Høvik** on **2020-03-27**This Certificate is valid until **2025-03-26**.for **DNV GL**DNV GL local station: **Trondheim**Approval Engineer: **Nicolay Horn**

Marta Alonso Pontes
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Name and place of manufacturer

Siemens AS
Offshore Marine Center
Bratsbergvegen 5
7031 Trondheim, Norway

Product description

The Variable Speed Voltage Controller (VSVC) is a microprocessor based control device for a synchronous generator. The VSVC regulates the output voltage of the synchronous generator by controlling the excitation current. It also protects the generator and send fault / alarm message to superior control system. The VSVC can also control the speed of the driving engine to optimize power regulation (optional).

Specifications:

Operating power		Communication Port	
Three-Phase	18-270V	Interface	Raw CAN at 1Mbit/sec
Single-Phase	18-270V	Data bits	8
Frequency	25-150Hz	VSVC Tool interface	RS-232 at 115200 bit/s
DC voltage	24-400V	Data bits	8
Fuse / MCCB	10A / 10B		
Generator Voltage Sensing		Field Chopper	
Type	3-phase 690V line voltage or 512V phase voltage	Nominal current	10A DC
Burden	5VA	Maximum current	15A DC (1.5 sec) short circuit protected
Generator Current Sensing			
Type	3-phase		
Burden	5VA		

Application/Limitation

The Type Approval covers hardware and software listed under Product description.

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

Clause for application software control.

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval.

Major changes in the software are to be approved before being installed in the computer.

A Certification of Application Functions may be required for the particular vessel.

Compliance with the requirements given in DNV GL Pt.4 Ch.8 is to be checked for the respective application. Voltage regulation of the vessel's power plant as given in Pt.4 Ch.8 Sec.5 must be ensured and as far as possible it must be possible to verify compliance by review of power system documentation. In addition, for vessels with electric propulsion, the requirements for preventing one defective voltage regulator from tripping the complete power plant as given in Pt.4 Ch.8 Sec.12, 1.5 must be ensured.

Testing onboard should be limited to confirming compliance already verified by design review.

Applicable electrical type tests/product certification must be performed with the actual generator case by case (see DNV GL Pt.4 Ch.8 Sec.1).

Type Approval documentation

Test carried out

Applicable tests according to DNV GL CG-0339, November 2016 (partly).
Type tests in accordance with DNV GL Rules Pt.4 Ch.8 Sec.5, voltage regulation test short circuit test.

Marking of product

Siemens, BlueDrive PlusC, Part Number, Software Version, Year of Production.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE