



# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAA00002X7**  
Revision No:  
**1**

## This is to certify:

**That the Electrical Control System**

with type designation(s)  
**D350, D550, D700**

Issued to

**Moteurs Leroy Somer**  
**Angoulême Cedex 9, France**

is found to comply with

**DNV rules for classification – Ships, offshore units, and high speed and light craft**

## Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Type	Temperature	Humidity	Vibration	EMC	Enclosure
D350	D	B	B	B	Required protection according to relevant Rules shall be provided upon installation onboard
D550	D	B	B	B	Required protection according to relevant Rules shall be provided upon installation onboard
D700	D	B	B	B	Required protection according to relevant Rules shall be provided upon installation onboard

Issued at **Høvik** on **2022-07-05**

This Certificate is valid until **2026-01-20**.

DNV local station: **France CMC**

for **DNV**

Approval Engineer: **Georgy Abramenko**

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**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



## Name and place of manufacturer

D700 only:  
 SELVA ELECTRONIQUE  
 Z.I Les Dorices, 4 rue des Tonneliers  
 44330 VALLET  
 FRANCE

D350, D550 only:  
 VIDEOTON EAS KFT.  
 BERÉNYI ÚT 72-100, H-8000 SZÉKESFEHÉRVÁR  
 HUNGARY

## Product description

D350, D550 digital automatic voltage regulators are an electronic printed circuit boards, protected with a polyurethane resin. These digital AVR's are a digital voltage regulators, used to control the alternator from the field current or the output voltage regulation loops.

The D700 AVR is a digital voltage regulator used to control the alternator field current using separate control loops. The regulation mode is managed either by parameter-setting, or via the D700 digital inputs, or via the various communication modes.

The various trip, regulation mode and measurement data items can be delivered to the 12 digital outputs and/or 4 analogue outputs (4-20 mA, 0-10 V,  $\pm 10$  V).

In order to simplify wiring operations and exchanges with a higher-level control system, a 100baseT Ethernet link is available. A communication module can be added as an option.

## Specifications:

	D350	D550	D700
Alternator voltage sensing (3-phase range)	0 – 530VAC		0 – 230VAC; 0 – 530VAC (120% max 2 minutes)
Stator current measurement	0 – 5A		
Power supply	AC: 50-277 VAC (4 terminals for PMG, AREP, SHUNT);  DC: 50-400 VDC (preloading not managed)		
Field excitation	Rated: 0 - 5A Short circuit: 10A max	Rated: 0 – 7A Short circuit: 15A max	Rated: 0 – 25A Short circuit: 50A max (25°C)
Frequency	10 – 100Hz	30 – 400Hz	
Regulation accuracy	$\pm 0.25\%$		
Voltage adjustment range	0 – 150%Un		
Auxiliary supply	-	8 – 35VDC	18 – 35VDC

Software version used in digital AVR's: ver.1.1 or higher

## 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 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 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 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 Pt.4 Ch.8 Sec.1).

## **Type Approval documentation**

### **Test carried out**

Applicable tests according to DNV CG-0339, December 2019.

Type tests in accordance with DNV Rules Pt.4 Ch.8 Sec.5, voltage regulation test and short circuit test.

### **Marking of product**

Nidec, Type of AVR (D350, D550 or D700), Software Version, Serial number

### **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