

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electrical Measuring and Protection Relay

with type designation(s)

Uni-line Generator controls

Issued to

DEIF A/S

SKIVE, Denmark

is found to comply with

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

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Location classes:

Temperature D

Humidity B

Vibration A

EMC A

Enclosure Required protection according to the Rules to be provided upon installation on board.

This Certificate is valid until **2019-01-09**.

Issued at **Høvik** on **2017-01-10**

DNV GL local station: **Aalborg**

for **DNV GL**

Approval Engineer: **Bartosz Kabak**

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Odd Magne Nesvåg
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.

Place of system modules manufacture

DEIF A/S

Skive
Denmark

Product description

The uni-line comprising:

RMV-112D/ RMV-122D/ RMV-132D	Voltage relays 3-phase
RMV-142D	Voltage relays 1-phase
RMC-111D/ RMC-122D	Short circuit/ overcurrent relays
RMC-121D	Short circuit current relay
RMC-132D	Double over current relay
RMC-131D	Differential current relays
RMP-111D	Overload relays
RMP-112D	Overload/ reverse power relays
RMP-121D	Reverse power relays
RMQ-111D	Loss of excitation relays
RMQ-121D	Over excitation relay
RMF-112D	Frequency relays
HAS-111DG	Paralleling relay
LMR-111D	Loss of mains relays
FAS-113DG	Synchronizers
FAS-115DG	Synchronizers w/voltage match. (dyn)
FAS-125DG	Synchronizers w/voltage match. (stat)
LSU-112DG	Load sharing unit
LSU-113DG	Load sharing unit (and-P> protectio)
LSU-114DG	Load sharing unit (start/stop outputs)
LSU-122DG	Var Load sharing unit
EPN-110DN	Electronic Potentiometer
RMT-111Q96	Phase sequence indicator/ relay

Application/Limitation

1. The Type Approval is valid for systems made by production facilities listed under Place of Manufacture
2. The Type Approval covers hardware and basic software listed under Product description

Documentation requirement:

For each delivery where the product is included (typically a switchboard) the following information related to Uni-line Generator controls is to be submitted for approval:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)
- List of hardware and software modules as identified in this Type Approval Certificate
- List of implemented alarm and protection functions with proposed limits and time delays

Product certificate

As long as the delivered system is covered by this Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 [1.2.3] is not required. Correct configuration and set up for the delivery to be tested during commissioning after installation onboard.

Software update notification

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.

Type Approval documentation

Tests carried out

Applicable tests according to Standard for Certification 2.4 (report Nos. IPA0175 and IPA0274)

Marking of product

Each module shall be externally marked to enable identification in accordance with the documentation and be marked with the manufacturer's name.

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

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE