Marine & Offshore

Certificate number: 21622/D0 BV
File number: AP 4003
Product code: 2658H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

DEIF A/S

Skive - DENMARK

for the type of product

GENERATOR CONTROL AND PROTECTION UNITS

PPM-3 / PPU-3 / GPU-3 - Protection and Power Management System.

Requirements:
Bureau Veritas Rules for the Classification of Steel Ships.

EC Code: 31

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 28 Jan 2027

For Bureau Veritas Marine & Offshore,
At BV FREDERICIA, on 28 Jan 2022,
Jesper JENSEN

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION:

1.1- Hardware characteristics:

Function	PPM-3	PPU-3	GPU-3
Main function	Engine and generator control, protection and power management unit for parallel operation	Engine and generator control and protection unit for single and parallel operation	Engine and generator control and protection unit for single operation
Hardware Software platform ver. 3	X	X	X
Aux. voltage	8-36V DC	8-36V DC	8-36V DC
Meas. voltage	100-690V AC	100-690V AC	100-690V AC
Current transformer	-/1A or -/5A	-/1A or -/5A	-/1A or -/5A
Frequency	30-70Hz	30-70Hz	30-70Hz
Power Management	X	-	-
Start/stop relay output to next generator	-	X	X
M-logic	X	X	X
Synchronising	X	X	X
Load sharing	X	X	-
Voltage control	X	X	X
Var / cos phi control	X	X	-
Protections (ANSI codes)			
- Generator protection			
Reverse power (32)	X	X	X
Overload (32)	X	X	X
Overcurrent (50/51)	X	X	X
Overvoltage (59)	X	X	X
Undervoltage (27)	X	X	X
Overfrequency (81)	X	X	X
Underfrequency (81)	X	X	X
Voltage dependent overcurrent(51V)	X	X	X
Voltage unballance (60)	X	X	X
Current unballance/asymmetry (46)	X	X	X
Loss of excitation (40)	X	X	X
Overexcitation (40)	X	X	X
NEL groups	-	X	X
- Busbar protection			
Overvoltage (59)	X	X	X
Undervoltage (27)	X	X	X
Overfrequency (81)	X	X	X
Underfrequency (81)	X	X	X
Voltage unbalance	X	X	X
NEL groups	-	X	X
- Generator add-on protection			
Negative sequence voltage high (47)	-	X	X
Negative sequence current high (46)	-	X	X
Zero sequence voltage high (59)	-	X	X
Zero sequence current high (50)	-	X	X
Power dependent reactive power import (40)	-	X	X
Power dependent reactive power export (40)	-	X	X
Inverse timer overcurrent (51)	-	X	X
- Loss of mains protection			
Vector jump (78)	-	X	X
df/dt (ROCOF) (81R)	-	X	X
Time dependent undervoltage (27T)	-	X	X
Reactive power dependent undervoltage (27Q)	-	X	X
Positive sequence (mains voltage low) (27)	-	X	X
Directional overcurrent (67)	-	X	X

1.2- FirmWare / SoftWare:

PPM-3	: 3.0x.x
PPU-3 & GPU-3	: 3.1x.x

2. DOCUMENTS AND DRAWINGS:

- Table of Products (4921240209S)
- Description, Installation instruction, Operator's manual 418934
- Application renewal of BV certificate Ref. EPC0557/JST, dated 2014-04-14.

Software quality:

- DEIF SW Life Cycle JST20130916_SM, dated 2013-09-16
- DEIF sw version numbering,
- QI734 Design & Development Ref.: 4037300004C, dated 2013-10-16.

For modification C0 version:

DEIF:

- PPU3 V.3.10.0 Software Update Ref.: PPU3_10 feature update list, dated May 2016.
- Type Certificate PPU - PPU3 No. 4124030042D, dated Sep 24, 2015

For D0 version:

- Software Quality Plan PPU-3 v3.12.3 and GPU-3, Doc no. CP11944, dated 2021-08-26.
- Change log PPM-3, dated 16-06-2016.
- Data Sheet GPU-3, Doc no. 4921240352H, dated 14 August 2017.
- Data Sheet PPM-3, Doc no. 4921240337I, dated 26 November 2018.
- Data Sheet PPU-3, Doc no.4921240354I, dated 19 May 2017.

3. TEST REPORTS:

DEIF:

- Performance and Environmental Test reports IPA0272-1 dated February 9th, 2009 and referenced 2A, 3A, 4A, 6A, 9A, 12A, 14A, 15A, 16A, 17A, 18A, 1B, 2B, 5B, 6B, 7B, 13B, 15B, 16B witnessed by various Class Societies.
- Performance and Environmental Test reports IPA0272-3 dated August 25th, 2009 and referenced 2A, 6A, 9A, 14A, 1B, 5B, 6B, witnessed by various Class Societies.
- Software Performance Test Report 08-45-01 Dated October 10th, 2009
- Paralleling and Protection Unit CAN share Test Report EPC0458-02 Dated February 15th, 2012 witnessed by DNV.

For D0 version:

- 02B RF Electromagnetic Field Immunity Ref no. 4910217502M, dated 2020-02-03.
- 16A Radiated Disturbance Ref. 4910216501M, dated 2020-07-09.

4. APPLICATION / LIMITATION:

4.1 - BUREAU VERITAS Rules for the Classification of Steel Ships.

4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**

4.3 - BUREAU VERITAS Environmental Category, **EC Code: 31.**

4.4 - The equipment fulfils the EMC requirements for installation in General power Distribution Zones.

4.5 - Only Hardware and Firmware / Software successfully tested together in compliance with the regulations as referred to in cover page, according to the declaration of the manufacturer are covered by this certificate.

4.6 - Any modification of the hardware, firmware or software having an impact on the product performance or functionality has to be validated with type testing.

4.7 - In accordance with IACS UR E22 and as applicable to programmable devices for computer based systems of Category II or III, for each ship application:

- Ship specific documentation is to be submitted including software documentation and categorization of the computer based system.
- Inspection and testing before installation onboard is to be performed under the surveillance of the Society.

4.8 - PPU-3: CAN-bus load sharing (option G9) is to be used in ships intended to be granted with the additional class notation **DYNAPOS AM/AT-R**.

4.9 - Equipment covered by this Type Approval certificate has been tested according to requirements of IACS UR E10 rev7.

5. PRODUCTION SURVEY REQUIREMENTS:

5.1 - The above products are to be supplied by **DEIF A/S** in compliance with the type described in this certificate.

5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note NR320 and as such does not require a BV product certificate.

5.3 - **DEIF A/S** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products.

5.4 - **DEIF A/S** has declared to Bureau Veritas the following production site(s):

DEIF A/S
Frisenborgvej 33, DK-7800 Skive
DENMARK

6. MARKING OF PRODUCT:

6.1 - Maker's name or trade mark, Serial number of the units, Equipment type number or model identification under which it was type-tested.

6.2 - The title and version of each software element included in the installed software system shall be either marked or displayed on command on the equipment.

6.3 - When the marking and the title and version of the software are displayed only on the display, such information shall also be included in the equipment manual.

7. OTHERS:

7.1 - It is **DEIF A/S - DENMARK**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

7.2 - This certificate supersedes the Type Approval Certificate No. 21622/C0 BV issued on 13 Jun 2016 by the Society.

***** END OF CERTIFICATE *****