



Marine & Offshore
Division

Certificate number: 21622/C0 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 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: 13 Jun 2021

For BUREAU VERITAS,

At BV FREDERICIA, on 13 Jun 2016,

Jesper Jensen



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 October 2014

This certificate consists of 4 page(s)

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:

- Data sheets 4921240337A, 4921240352A
 - 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
- Data sheet Paralleling and Protection Unit, PPU-3 No. 4921240354H, dated Apr 2015
- Type Certificate PPU - PPU3 No. 4124030042D, dated Sep 24, 2015

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.

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 - Each application and configuration is to be submitted to the Society's examination prior to fitting on board.
- 4.6 - The equipment, once installed on board ship, is to be tested in accordance with the above referred Regulations under the supervision of a Society's Surveyor.
- 4.7 - Only Hardware and Software and/or Firmware successfully tested together in compliance with the regulations as referred to in page one, according to the declaration of the manufacturer are covered by this certificate.
- 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.**

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.

6.4 - 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/B0 BV issued on 22 Jul 2014 by the Society.

*** END OF CERTIFICATE ***