TYPE APPROVAL CERTIFICATE
No. **ELE029020XP**

This is to certify that the product below is found to be in compliance with the applicable requirement of the RINA type approval system.

Description	**Power Management System**
Type	**DELOMATIC-4**
Applicant	**DEIF A/S** **Frisenborgvej 33** **DK-7800 Skive** **DENMARK**
Manufacturer *Place of manufacture*	**DEIF A/S** **Frisenborgvej 33** **DK-7800 Skive** **DENMARK**
Reference standards	**Rules for the classification of ships.- Part C - Machinery, systems and fire protection. - Ch.3, Sect. 6, Table 1.**

Issued in **GDANSK** on **June 25, 2020.** *This Certificate is valid until* **May 10, 2025**

RINA Services S.p.A.
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This certificate consists of this page and 1 enclosure

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DELOMATIC-4

Description:
Delomatic-4 Power Management System is based on:

a) DGUs rack system consisting of the following Hw. modules:

PCM 4.1
Carrying the rack system power supply, system main CPU and I/O router in distributed configurations and various external interfaces (3x CAN, 1x RS485, ARCnet, USB service port)
(Internal communication between DGUs for system calculations, load sharing etc. is performed through ARC net.; the total length of the ARC net (LAN) - RS485 2 wire, without repeaters depends on the number of DGUs nodes)
PCM 4.5
As a substitute of PCM 4.1.
Carrying the rack system power supply, system main CPU and I/O router in distributed configurations and various external interfaces (2x CAN, 2x RS485, 2x ARCnet, Ethernet, USB service port)
(Internal communication between DGUs for system calculations, load sharing etc. is performed through ARC net.; the total length of the ARC net (LAN) - RS485 2 wire, without repeaters depends on the number of DGUs nodes)
IOM 4-1
Universal I/O module for:
16 inputs channels which may be individually configured as a current input (0 / 20mA ,4 / 20 mA), a voltage input (0 / 10V, 2 /10V) or as a binary input (CC / OC)
12 relay output channels
2 analogue output channels (0 /20mA or 4 / 20mA)
SCM 4-1
Multi- transducer for a high precision 3-phase electrical measurement
Integrated syncroniser / breaker control
SCM 4-2
Multi-transducer for high precision 3-phase electrical measurement
Integrated syncroniser / breaker control
Controller board for Speed Governor and Automatic voltage regulator (binary or analogue outputs)

b) Display Units (DU)
Up to three display unit can be connected to each DGU (6 meter max 9 pin display cable), enabling the user interface to be placed at different locations.
A display unit consists of :
Push-buttons for start / stop; - Push-buttons for breaker operations; Information messages
Alarm indication; Start / stop priority change; Programmable set points, timers

c) Additional Operator Panels
AOP-1 for connection up to 0.5 m from the Display Unit
AOP-2 for connection up to 200m from the Display Unit and up to 500m from other AOP-2 units (CAN bus)
An additional operating panels consists of:
8 push buttons for plant mode control ; 16 LED

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Delomatic -4 Test Reports:
Environmental test report IPA 0207 (two folders)
FAT report for PMS Functions doc. n. DEL O4-0706A (06/09/29)

Witness tests
02A DNV GL witness EUT3237 performance.pdf
02A DNV GL witness EUT3238 performance.pdf
13B DNV GL Voltage Variations.pdf
14A LR witness Insulation test.pdf
15B DNV GL witness Voltage Interruptions.pdf
16B DNV GL witness Low-frequency Interference.pdf
4A DNV GL witness Dryheat Test.pdf
5B DNV GL witness Electrostatic Discharge.pdf
6A LR witness DEIF Dampheat test.pdf
6B LR witness Slow transients - Surge.pdf
9A LR witness Vibration Test.pdf
DM-4 DNV GL FAT report 20141113.pdf
DM-4 DNV GL FMEA report 20141113.pdf
DM-4 LR FAT report 20140827.pdf
DM-4 LR FMEA Test report 20140827.pdf
_Submitted documents.pdf

Delomatic - 4 reference documents:
Introduction- doc. n. 4317110101E, The Delomatic system in general doc. n. 4189232111B,
PMS Systems - Basic Functions - doc. n. 4921240294B, Technical Specifications - doc. n. 4189232129C ,
Power Management Unit - doc. n. 4189232116B, The Present Power Management - doc. n. 4317110102A
Generator Set Control - doc. n. 4189232117B, Common Generator Set Protection, HMI Setup,
Software Modules - doc. n. 43xxxx0194A, General Menu System - doc. 4189232115B,
Shore Connection - doc. n. 4189232120B, TIE Breaker - doc. n. 4189232121B,
Alarm Handling - doc. n. 4189232113 B, Internal System Supervision - doc. n. 4189232114A,
Modbus RTU Protocol - doc. n. 4317110107H, FMEA - doc. n. 4317110109A
Installation Instructions doc. n. 4189232125C, Service guide -doc. n. 4189232123B
DM 4 update 4-5 differences JST20140512A.pdf
DM-4 DoC 4910290064A.pdf
DM-4 Type Certificate 4124030060C.pdf

Product documentation IPA0340-04
DM-4 DoC 4910290064A.pdf
DM-4 FPSO control solutions handout UK 20320201A.pdf
DM-4 Marine data sheet 4921240294B UK.pdf
DM-4 Offshore controller systems handout UK 20309001B.pdf
DM-4 Type Certificate 4124030060B UK.pdf

Software documentation IPA0324-04
IPA0324-04 Product Documentation part 1-2.pdf
IPA0324-04 Product Documentation part 2-2.pdf
SQP_Application_SW_DM4_432506.pdf
SQP_BASIS_SW_DM4_423922.pdf

Technical documentation IPA0324-04
IPA0324-04 Technical documentation.pdf

Test data sheet IPA0324-04
IPA0324-04 Test data sheets.pdf

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DELOMATIC - 4

Remarks
- For each installation on board the schematics showing the "as built" system configuration are to be sent for approval, including a detailed description of the system functionality and a FMEA document.
- Redundancy in the PMS automatic controls, may be provided according to the Ship Service Notations Requirements.
- Electrical protection featured in Delomatic - 4 may be used in addition to circuit breaker intrinsic protections.
- Diesel engines are to be provided with an approved overspeed device separate from the PMS.

Any modification / upgrade of the firmware installed in the system is to be communicated;
functional test and spot check are to be carried out and witnessed by a RINA Surveyor,
to give evidence of the correct function of the system.

This certificate annuls and replaces the previous one n° ELE062815XG

GDANSK June 25, 2020

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