



NIPPON KAIJI KYOKAI

**TYPE APPROVAL CERTIFICATE
FOR AUTOMATIC DEVICES AND EQUIPMENT/
COMPUTER BASED SYSTEMS**

Certificate No. TA21370M

This is to certify that the undernoted product(s) has/have been approved in accordance with the requirements specified in Chapter 1 and Chapter 8, Part 7 of “Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use” and the relevant Society's Rules.

This certificate is issued to

Manufacturer:	DEIF A/S
Place of Manufacturing:	Frisenborgvej 33, DK-7800 Skive, Denmark
Product description:	Power Management System
Model:	Multi-line 300
Software No.:	As per attached sheet -2/5
Category:	III
Approval No.:	20A023 / 21CP005
Valid until:	5 July 2025

This certificate is subject to the conditions specified in the attached sheet(s).

Issued at Tokyo on 20 July 2021.

T. Shimada
General Manager
Machinery Department

Note: The manufacturer, if desired, is requested to apply to the Society for renewal prior to the expiration date.

Specification & documents:

1. Particulars:

Power Supply DC 12 / 24 V

Software version

GPU 300: 1.0.x.x	ACM 3.2 : 1.0.x.x	PCM 3.1 : 3.0.x.x
PPU 300 : 1.0.x.x	IOM 3.1: 2.0.x.x	EIM 3.1 : 2.1.x.x
PPM 300 : 1.0.x.x	IOM 3.2 : 1.0.x.x	GAM 3.1 : 2.0.x.x
PSM 3.1 : 2.0.x.x	IOM 3.3 : 1.0.x.x	GAM 3.2 : 2.0.x.x
PSM 3.2 : 2.0.x.x	IOM 3.4 : 1.0.x.x	DU 300 : 1.0.x.x
ACM 3.1 : 5.0.x.x		

2. Components and reference drawings:

[Specification]

PPM 300 data sheet 4921240464O UK,

PPU 300 Data sheet 4921240563K UK,

GPU 300 Data sheet 4921240530A UK

[Construction drawings]

PPM 300 Installation instructions 4189340909L UK,

PPU 300 Installation instructions 4189341098H UK,

GPU 300 Installation instructions 4189341031A UK

[Wiring diagram]

4157200501L, 4157200503K, 4157200504K, 4157200505F,

4157200507J, 4157200508F, 4157200509G, 4157200538E,

4157200539F, 4157200544D, 4157200546D, 4157200559E

[Instruction manual]

PPM 300 Designer's handbook 4189340911Q UK,

PPM 300 Operator's manual 4189340910L UK,

PPU 300 Designer's handbook 4189341097I UK,

PPU 300 Operator's manual 4189341099H UK,

GPU 300 Designer's handbook 4189341032A UK,

GPU 300 Operator's manual 4189341034A UK

- To be continued -

Product description

Multi-line 300 product line is built as modular basemounted hardware platform ranging from simple stand-alone units for generator / bus-tie / shore connection / shaft breaker protection to integrated power management systems. Flexible units can be expanded with input and output modules.

The units are designed for the following applications:

GPU 300 (Generator Protection Unit) combines the following basic functions:

- Breaker trip and alarms
- Synchronization check
- Breaker close (external command)
- Breaker position detection

PPU 300 (Paralleling and Protection Unit) has in addition to GPU 300 the following basic functions:

- Breaker open and close (external command)
- Synchronization (dynamic and static) and deloading
- Diesel generator start and stop commands
- Load sharing (isochronous, over DEIF Ethernet ring network)

PPM 300 (Protection & Power Management) has in addition to PPU 300 the following basic functions:

- Load-dependent start and stop of generators
- Generators priority selection
- Automatic blackout recovery
- Heavy consumer function
- Stop of non-connected generator

The hardware building blocks for a Multi-line 300 system are the following modules:

- Power supply module PSM3.1, PSM3.2
- Alternating current module ACM3.1, ACM3.2
- Input output module IOM3.1, IOM3.2, IOM3.3 and IOM3.4
- Engine interface module EIM3.1 (PPU 300 and PPM 300 only)
- Governor and AVR module GAM3.1 and GAM3.2 (PPU 300 and PPM 300 only)
- Processor and communication module PCM3.1
- Display unit DU 300

- To be continued -

[Software]

DEIF Software Quality Plan For PPM300_version_PPM300_V.1.0.14.0,
PPU_300_version_PPU_300_V.1.0.13.2, GPU_300_version_GPU_300_V.1.0.1.1,
Software Quality Plan for ml300 (ACM 3.2) 410007
FMECA ACM3.1, FMECA ACM3.2, FMECA EIM3.1, FMECA IOM3.1, FMECA IOM3.4,
FMECA ANSI 50, FMECA ANSI 87, FMECA PSM3.1, FMECA PSM3.2,
FMECA Safety shutdown, FMECA (Status OK),
ML300 Application SW architecture,
QP 8.3 Design & Development (4028300001C),
Handbook for Software development (4910000011AG),
Service & support test for PPM 300 and PICUS,
PPM 300 PICUS MANUAL (4189341080K),

3. Test Reports:

IPA 311-11 test data(4910211100D),
IPA 331-26 A tests(4910222100A),
IPA 331-26 B tests(4910217501Q),
IPA 331-26 C tests(4910210501C),
IPA 331 Display Unit test data(4910217515E),
IPA 331-05 Rack test data(4910217515E),
IPA0331-05-W1 Witness test data(4910213105F),
IPA0331-05-W2 Witness test data(4910212100F),
13A - Flammability test Rack/DU-(4910214120E),
16B Low-frequency Interference DC supply voltage (4910217516E),
Verification of tests methods in compliance with IACS E10 Rev.7 by DNV-GL (N141ZAT3),
16A Radiated disturbance (4910216501K, E10 Rev.7),
02B RF electromagnetic field immunity (4910217502N, E10 Rev.7),
DEIF A/S TYPE TEST COLD TEST - 3A (4910213100G),
DEIF A/S TYPE TEST DRY HAT - 4A (4910213105G),
DEIF A/S TYPE TEST 6A Damp heat cyclic Marine (4910213115G),
DEIF A/S TYPE TEST Vibration test - 9A (4910214100M),
DEIF A/S TYPE TEST Insulation Resistance - 14A (4910215100I),
DEIF A/S TYPE TEST High voltage test - 15A (4910215105I),
DEIF A/S TYPE TEST RADIATED EMISSION - 16A (4910216501K),
DEIF A/S TYPE TEST Conducted emission AC, DC and tele ports - 17A (4910216502I),
DEIF A/S TYPE TEST Interruptions - DC Power Port - 15B (4910217515H),

- To be continued -

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Attached sheet -4/5 to the Certificate No. TA21370M

DEIF A/S TYPE TEST Electrical Fast Transients (EFT) - BURST 1B (4910217501Q),
DEIF A/S TYPE TEST RF E-FIELD IMMUNITY - TEST 02B (4910217502M),
DEIF A/S TYPE TEST Electrostatic Discharge (ESD) - 5B (4910217505J),
DEIF A/S TYPE TEST Surge - 6B (4910217506M),
DEIF A/S TYPE TEST RF COMMON MODE - TEST 07B (4910217507L),
DEIF A/S TYPE TEST Variations DC Power Ports - 13B (4910217513J),
PPM300 1.0.14.0 release test report

4. Computer based systems:

- The product has been assigned Category III in accordance with the Annex D18.1.1. Part D of the Guidance for the Survey and Construction of Steel Ships, as amended by IACS UR E22 Rev.2.
- The product is satisfied with requirement of the Annex D18.1.1. Part D of the Guidance for the Survey and Construction of Steel Ships, as amended by IACS UR E22 Rev.2.

- To be continued -

Test items & approval conditions:

1. Test items:

(Applied testing items are marked with X.)

ENVIRONMENTAL TESTS (IACS E10 Rev.7 basis)		Mark
External examination		X
Operation test and performance test		X
Electric power supply failure test		X
Power supply fluctuation test	Electric	X
	Pneumatic and Hydraulic	--
Insulation resistance test		X
High voltage test		X
Pressure test (Pneumatic and Hydraulic)		--
Dry heat test (Temperature 70°C × 16 hours)		X
Damp heat test (Temperature 55°C × 12 hours × 2cycles)		X
Vibration test (Acceleration $\pm 0.7g \times 1.5$ hours)		X
Inclination test		--
Cold test (-25°C × 16 hours for DCU, -40°C × 16 hours for Others)		X
Salt mist test		--
Electrostatic discharge immunity test		X
Radiated radio frequency immunity test		X
Conducted low frequency immunity test		X
Conducted high frequency immunity test		X
Burst / Fast transient immunity test		X
Surge immunity test		X
Radiated emission test		X
Conducted emission test		X
Flame retardant test		X

2. Approval condition:

The product is not allowed to be installed in bridge and on open decks.