



## Appendix 1

# Product Description and/or Approval Condition

Certificate No : CPH06107-AC004

Date of Issue :27th February, 2018

Product Description :

### 1. PPU Power management (PPM)

#### 1) Basic function:

- Power management, Generator/Busbar protection and Engine control

#### 2) PPM consisting of:

- Main unit consists of a number of PCBs mounted in numbered slots.
  - Slot #1 : Power supply board
  - Slot #2 : External Comm. (option)
  - Slot #3 : Load sharing and I/O board
  - Slot #4 : Outputs for governor/AVR
  - Slot #5 : AC measuring
  - Slot #6 : I/O board (option)
  - Slot #7 : Engine interface board
  - Slot #8 : Internal CAN bus
- DU-2 : Operation and display panel
- AOP, AOP-2 : Additional operation and display panel

#### 3) Possible configuration as following:

- system1: Min. : 2 Diesel Generators  
Max. : 8 Diesel Generators
- system2: Min. : 2 Diesel Generators, 1 Shaft Generator  
Max. : 8 Diesel Generators, 1 Shaft Generator
- system3: Min. : 2 Diesel Generators, 1 Shaft Generator, 1 bus tie breaker  
Max. : 8 Diesel Generators, 1 Shaft Generator, 1 bus tie breaker

#### 4) Software:

Image. Ver. : 1.01.2, H8. Ver. : 2.52.0, Webarm. Ver. : 1.02.0

#### 5) Documents and drawings:

Data Sheet No. 4921240291  
Designer's Reference Handbook No. 4189340408  
Installation Instructions No. 4189340409

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## Appendix 2

# Product Description and/or Approval Condition

**Certificate No :** CPH06107-AC004

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### 2. Protection Power Management (PPM-3)

#### 1) Basic function:

- All breakers can be synchronised by choice
- Load-dependent start/stop operation
- Priority selection of gen-sets
- Redundant communication between the controllers
- Plant divided into sections for individual functionality
- Load transfer
- Heavy consumer management
- Multi-master system

#### 2) The plant operational modes supported by the power management options are:

- Diesel generator operation
- Shaft generator operation
- Shore connection operation
- Split busbar(s) operation
- Emergency/harbour generator operation

\* The PPM is a power management system able to handle applications with up to 8 bus tie breakers (BTB), 16 diesel generators (DG), 1 emergency generator (EDG), 2 shaft generators (SHAFT), 2 shore connections (SHORE)

#### 3) Signal Interface :

- Slot #1 : Power supply
- Slot #2 : External Comm.
- Slot #3 : Load sharing, in-/outputs
- Slot #4 : Governor, AVR, in-/outputs
- Slot #5 : AC measuring
- Slot #6 : In-/outputs
- Slot #7 : Engine I/F
- Slot #8 : Engine comm., in-/outputs
- Ethernet : TCP/IP Modbus comm.
- LED I/F : Display connection

\* Additional operator panel : AOP-1, AOP-2

#### 4) Software version 3.0x.x

#### 5) Documents and drawings:

DEIF type certificate PPM-3 : 4124030053C

Document No. : 4921240337A, 4189340447B, 4189340557A, 4189340559A, 4189340460A

Type Test Report : IPA 0272-1

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## Appendix 3

# Product Description and/or Approval Condition

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### 3. Paralleling and Protection Unit (PPU-3)

- 1) Basic function & descriptions :
  - Generator Protection, Synchronization and Governor Regulation
  - Engine Control and Protection (Option)
  - Same Multi-line 2 hardware as PPM-3
- 2) Technical specifications
  - Measuring Voltage : 100/110 V AC ~ 690 V AC ( $\pm 20$  %)
  - Auxiliary Supply Voltage : 12/24 V DC (8 ~ 36 V DC)
- 3) Regulation modes
  - Fixed Frequency
  - Fixed Power
  - Frequency Droop
  - Load Sharing
- 4) Software version 3.1x.x
- 5) Optional function ;
  - Load sharing on CAN-bus (Slot #8, Option G9)
  - Documents : FMEA file no. FMEA PPU-3 jst20111201  
Witness Test Report no. EPC0458-02/03/04  
Data sheet no. 4921240354E  
Spec no. PPU/GPU-3 V3.06.0

### 4. Generator Protection Unit (GPU-3)

- 1) Basic function & Descriptions :
  - Generator Protection
  - Engine Control and Protection (Option)
  - Same Multi-line 2 hardware as PPM-3
- 2) Technical specifications
  - Measuring Voltage : 100/110 V AC ~ 690 V AC ( $\pm 20$  %)
  - Auxiliary Supply Voltage : 12/24 V DC (8 ~ 36 V DC)
- 3) Software version 3.1x.x
- 4) Documents and Drawings (GPU-3 & PPU-3):
  - Document No. : 4921240354, 4124030042, 4189340583, 4189340621 for PPU-3,  
4921240352, 4124030048, 4189340584, 4189340620 for GPU-3
  - Shared document No. : 4189340149, 4189340556, 4189340451, 4189340582, 1000000341uk,  
4189340579, 4189340582, 4910290040, 20100108
  - Test report No. : IPA0272-1, IPA0272-3, IPA0275, 4A-200909024, 13B-200909024,  
15B-200909024, 16B-200909024, 2A-20091013, 12A-20091013,  
14A-20091013, 16A-20091013, 1B-20091013, 2B-20091013,  
20091013, 20091013, 5B0-PPU-3, 6A0-PPU-3, 6B0-PPU-3, 7B0-PPU-3,  
9A0-PPU-3, 14A0-PPU-3, 15A0-PPU-3

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