Certificate no.:
TAA00003C0

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Programmable Controller

with type designation(s)
PECe Drive Controller Field Station

issued to
GE Energy Power Conversion UK Ltd.
Rugby, Warwickshire, United Kingdom

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes:

Temperature	**C**
Humidity	**B**
Vibration	**A**
EMC	**A**
Enclosure	**A / IP20**

Issued at **Høvik** on **2023-11-08**
This Certificate is valid until **2028-11-07**.
DNV local unit: **UK & Ireland CMC & VMC**

for **DNV**

Approval Engineer: **Martin Skårerverket**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

PECe Drive Controller Field Station consist of the following hardware:

Item	Description	Ref. No
Industrial PC	GE Intelligent Platform RXI Standard Industrial PC (Four Slot Version)	-
Industrial PC	PECeLite-A10-A10-3902	PC000415666
Media Converter	Korenix Jetcon Converter	1301-M
I/O Module	EtherCat Bus Coupler	EK1100
I/O Module	EtherCat Bus Coupler Fibe Optic	EK1501
I/O Module	2 Channel 24V DC DI 3ms	EL1002
I/O Module	4 Channel Digital Input Terminal 24VDC 3ms	EL1004
I/O Module	8 Channel Digital Input Terminal 24VDC 3ms	EL1008
I/O Module	4 Channel DI 10µSecond	EL1014
I/O Module	4 Chan 24VDC 0.5A DO	EL2004
I/O Module	8 Channel digital output 24V DC 0.5A	EL2008
I/O Module	2 Channel digital output terminals 24V DC, 2A	EL2032
I/O Module	2 Channel OP Relay AC 230, C/O	EL2622
I/O Module	4 Channel relay output terminal 125V AC/30 V DC	EL2624
I/O Module	2 Channel ±10V S.E 12-bit AI	EL3002
I/O Module	4 Channel ±10V S.E 12-bit AI	EL3004
I/O Module	8 channel analog input terminals -10..+10V, single-ended, 12 bit	EL3008
I/O Module	2 Channel analog input terminals 0…20mA, differential input, 12 bit	EL3012
I/O Module	2 channel analog input terminals -10..+10V, differential input, 16 bit	EL3102
I/O Module	4 channel analog input terminals 0…10V, single-ended, 12 bit	EL3064
I/O Module	8 channel analog input terminals 0…10V, single-ended, 12 bit	EL3068
I/O Module	2 Channel analog input terminals 0…20mA, differential input, 16 bit	EL3112
I/O Module	2 Channel analog input terminals 4…20mA, differential input, 16 bit	EL3122
I/O Module	2 Channel 0-20mA S.E 16-bit AI	EL3142
I/O Module	2 Channel Pt100 (RTD) 2-3 wire AI	EL3202
I/O Module	4 Channel universal input terminal for RTD up to 240 kΩ, NTC 20k, 16 bit	EL3204-0200
I/O Module	2 channel analog output terminal 0…10V, 12 bit	EL4002
I/O Module	4 chan. 0-20mA 12 bit AO	EL4014
I/O Module	2 Channel ±10V 16-bit AO	EL4132
I/O Module	Incremental Encoder Interface	EL5101
I/O Module	End Module	EL9011
I/O Module	24VDC Potential Supply With Fuse	EL9200
I/O Module	E-Bus Power Supply Module	EL9400
I/O Module	PIBe SK Interface	20x4578/10
I/O Module	GE PCI Express card with 4 off SFP ports	9791131001
I/O Module	Surge Filter for Field Bus Supply (Digital)	KL9540-0000
I/O Module	Surge Filter for Field & E-Bus Supply	KL9550-0000
I/O Module	PECeLite A10 Interface Board	PC000153035
Filter	Schaffner Multistage Performance EMI Filter	FN2070
PSU	PHOENIX QUINT-PS/1AC/24DC 10A	PS/1AC/24DC 10A

Tested and approved for 230 VAC 50/60 Hz power supply input.

Compass safe distances:

Standard compass:	230 cm
Steering compass:	170 cm

Place of manufacture

DNV ID: 10755717
Unit 3 Rothley Lodge Commercial Park, Rothley,
Leicestershire, LE7 7NL
United Kingdom

DNV ID: 10755715
Unit 4, Pool Road Business Centre,
Pool Road, Nuneaton,
Warwickshire, CV10 9AQ
United Kingdom

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Product certificate

If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. After certification the clause for software control will be put into force.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Type Approval documentation

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.
For the bridge mounted components the 'Acoustic noise and signals' and the 'Compass safe distance' were measured according to sections 11.1 and 11.2 of IEC 60945, 4th edition (2002).
Shock test: 20 15g/11ms half-sine shocks according to IEC 60068-2-27:2008.

Marking of product

The products to be marked with:
- manufacturer name
- model name
- serial number
- power supply ratings

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE