Certificate no.:
TAE00004YH

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Frequency Converter

with type designation(s)
Phasemodule DMR_LV3D1250-57P0PABCD (Details acc. to Product Key see page 2)

issued to
GE Energy Power Conversion GmbH
Berlin, **Germany**

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.

Issued at **Høvik** on **2024-09-24**
This Certificate is valid until **2029-09-23**.
DNV local unit: **Hamburg – CMC North/East**

Approval Engineer: **Maik Gagern**

for **DNV**

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.

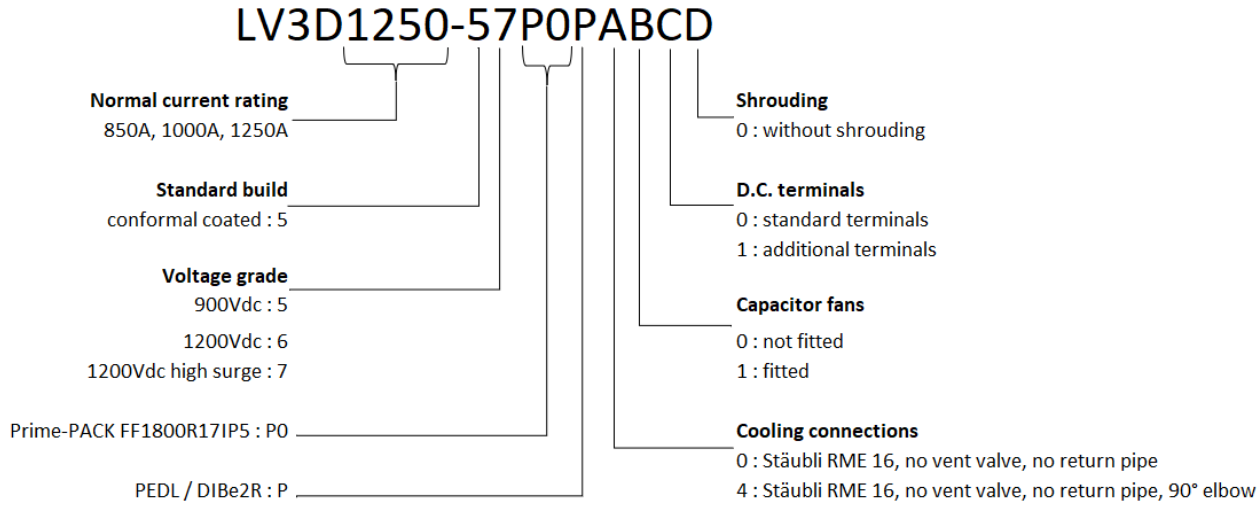
LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the 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 USD 300 000.

Product description

Phase module for implementation into frequency drive installations

Drive type:	LV3D1250-57P0PABCD
Nominal input power:	up to 1500 kVA
Rated voltage:	690 V AC, 50/60Hz
Nominal DC link voltage:	1150 V DC
Nominal / max. input current:	up to 1250 A AC
Pulse frequency:	2,5 kHz
Overload:	110% full load current for 60s/600s
Output frequency range:	3Hz to 200Hz
Degree of protection IP:	00

Type Declaration Key:



- Current ratings of 850A, 1000A, and 1250A
- Build level – 5 =conformal coating
- Voltage grade - 5 = 900Vdc, 6=1200Vdc, 7=1200Vdc high voltage surge
- PrimePACK type – P0 = FF1800R17IP5
- PEDL – P = DIBe2R
- Cooling connections – 0 = Stäubli straight, 4 =Stäubli 90° elbow
- Capacitor fans – 0 = not fitted, 1 = fitted
- D.C. terminals – 0 = standard build, 1 = additional terminals
- Shrouding – 0 = without shrouding

Application/Limitation

The DMR LV3 must be regarded as a component, which is intended for implementation into frequency converter installations. Further components of this installation are not subject of this Type Approval Certificate. The actual installation to be designed according to GE makers instructions and Operating Manual and according to the applicable DNV Rules for the actual application.

Converters with conducted and radiated emission above the DNV required limits can be installed in "special distribution zone" and "general power distribution zone", in accordance with IEC 60533 provided measures are taken to attenuate these effects on the distribution system, so the safe operation is assured. Planned EMC measures shall be submitted for approval prior to installation onboard.

Guidance Note: The EMC measures should be derived from an EMC analysis and plan in accordance with IEC 60533 Annex B and /or IEC 61800-3 Annex E.
End of Guidance note

For product certification / plan approval, the following documents of the semiconductor assembly should be submitted for approval, Ref. to DNV Pt.4 Ch.8 [2024] Sec.1 Table 7 by the end user / final product integrator:

- Reference to this Type Approval Certificate
- (E180) A drawing showing external location of instruments and devices for operation (panel layout)
- (E240) Functional description for the intended use, configuration and interface (e.g. alarms, monitoring and auxiliary power supplies)
- (Z252) Test program at manufacturer for routine tests and functional tests as per DNV Pt.4 Ch.8 [2023] Sec.7, 2.1.1
- Single line diagram (only applicable for multi drive configuration)
- If additional components to the type approved frequency converter are delivered, documentation according to DNV rules Pt.4 Ch.8 Sec.1 Table 2 shall be submitted for review.
- For propulsion converter application the requirements of RU-Ship Pt.4 Ch.8 [2024] Sec.12 shall be observed

During product survey the following routine tests as per DNV RU-SHIP Pt.4 Ch.8 [2024] Sec.7 Table 5 shall be performed:

- No.1 Visual Inspection
- No.2 Light load and function test
- No.5 High voltage test
- No.6 Insulation tests
- No.9 Control and monitoring system
- No.11 Cooling failure test
- No.12 Pressure test of coolant piping/hoses

Location classes acc. to DNV Class Guideline DNV-CG-0339
Temperature class: A
Vibration class: A
Humidity class: A

Type Approval documentation

Tests carried out

Electrical and performance tests (IEC 61800-5-1, IEC 60146-1-1, Scope acc. to test plan as part of the documentation for this TAC), Environmental and vibration tests (DNV Class Guideline DNV-CG-0339 Edition 2021-08)

Marking of product

Maker - Type designation - Power – Voltage

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:
- Inspection on factory samples, selected at random from the production line
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer’s product type marking and 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