DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAE00003V4
Revision No:
1

This is to certify:

That the Frequency Converter

with type designation(s)
LSLV-H100 Series,

Issued to
LS ELECTRIC Co., Ltd. (Cheon-an Plant)
Cheonan-si, Chungcheongnam-do, Republic of Korea

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

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2020-04-21**

This Certificate is valid until **2025-02-25**.
DNV GL local station: **Seoul**

Approval Engineer: **Nicolay Horn**

for **DNV GL**
Digitally Signed By: Alonso Pontes, Marta
Location: DNV GL Høvik, Norway

Marta Alonso Pontes
Head of Section

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.

Product description

Variable speed controller for asynchronous motor. Constant / variable torque applications.

3-phase supply 200 V:

Type designation	Mains supply (V)	Number of phases	Motor power output (kW)
LSLV0008H100	200 - 240	3	0.75
LSLV0015H100	200 - 240	3	1.5
LSLV0022H100	200 - 240	3	2.2
LSLV0037H100	200 - 240	3	3.7
LSLV0055H100	200 - 240	3	5.5
LSLV0075H100	200 - 240	3	7.5
LSLV0110H100	200 - 240	3	11
LSLV0150H100	200 - 240	3	15
LSLV0185H100	200 - 240	3	18.5

3-phase phase supply 400 V:

Type designation	Mains supply (V)	Number of phases	Motor power output (kW)
LSLV0008H100	380 - 480	3	0.75
LSLV0015H100	380 - 480	3	1.5
LSLV0022H100	380 - 480	3	2.2
LSLV0037H100	380 - 480	3	3.7
LSLV0055H100	380 - 480	3	5.5
LSLV0075H100	380 - 480	3	7.5
LSLV0110H100	380 - 480	3	11
LSLV0150H100	380 - 480	3	15
LSLV0185H100	380 - 480	3	18.5
LSLV0220H100	380 - 480	3	22
LSLV0300H100	380 - 480	3	30
LSLV0370H100	380 - 480	3	37
LSLV0450H100	380 - 480	3	45
LSLV0550H100	380 - 480	3	55
LSLV0750H100	380 - 480	3	75
LSLV0900H100	380 - 480	3	90
LSLV1100H100	380 - 500	3	110
LSLV1320H100	380 - 500	3	132
LSLV1600H100	380 - 500	3	160
LSLV1850H100	380 - 500	3	185
LSLV2200H100	380 - 500	3	220
LSLV2500H100	380 - 500	3	250
LSLV3150H100	380 - 500	3	315
LSLV3550H100	380 - 500	3	355
LSLV4000H100	380 - 500	3	400
LSLV5000H100	380 - 500	3	500

Application/Limitation

Supply voltage range:	200 - 500 V, 50/60 Hz
Voltage variation:	-15, + 10 %
Frequency variation:	± 5 %
Output frequency:	0 – 400 Hz.
Temperature range in operation:	0 – 45 °C
Temperature class:	A
Vibration class:	A
Humidity class:	B
EMC class:	A
IP Class:	0.75~185kW: IP20 220~500kW : IP00

The LSLV converter must be regarded as a component. The actual installation to be designed according to LSIS Users Manual and according to the applicable DNV Rules for the actual application.

A DNV GL product certificate is needed for converters above 100 kW. The following documents shall be submitted for approval:
- Reference to this Type Approval Certificate
- Functional description for the intended use, configuration and interface (e.g. alarms, monitoring and auxiliary power supplies)
- Test program for routine tests and functional tests
- If additional components apart from the type approved frequency converter are part of the delivery, documentation in accordance with DNV GL rules Pt.4 Ch.8 Sec.1 table 2 shall be delivered for the additional components.

For IT installations, Earth Monitoring System compatibility, must be investigated prior to installation onboard.

To be installed in an enclosure with an IP degree in accordance with DNV GL Rules w.r.t. location.

Type Approval documentation

Technical info:
Frequency Converter (Inverter-H100 Series) "Specification", revision date: March 2019.

Test reports:
Performance Test Report for LSLV H100 Series DOC No. 2019-MR001-093-002, version 1.0 dated 2019-11-28.
Dt&C Test Reports DREETC1911-0222 & DREETC1911-0223 dated 2019-11-28, DRCREL1911-0859 & DRCREL1911-0867, dated 2019-11-29.

Tests carried out

Visual inspection, Performance / temperature rise, Power supply failure, Power supply variations, Voltage/frequency variation, Vibration, Dry heat, Damp heat, Cold, Insulation resistance, High voltage.

EMC: The following tests are in accordance with the IEC 601800-3 and CN 2.4: Electrical fast transient (Burst), electrical slow transient (Surge), conducted disturbances, electric discharge (ESD), radiated and conducted emission.

Marking of product

LSLV – Power – Type designation – 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 (where practicable)
- Results from Routines (RT) checked (if not available tests RT to be carried out)
- 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.

Survey to be performed at 2 and 3.5 year and at renewal.

END OF CERTIFICATE