

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Loading and unloading arrangement

with type designation(s)

Container securing equipment: Remote Control Lock RCL C / PRO-168 and Trailer Unit / PRO-163

Issued to

LOX Container Technology AB
Stockholm, Stockholms Län, Sweden

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	D
Humidity	B
Vibration	A
EMC	B
Enclosure	C

Issued at **Høvik** on **2022-04-26**

This Certificate is valid until **2027-04-25**.

DNV local station: **Sweden CMC**

for **DNV**

Approval Engineer: **Ståle Sneen**

Trond Sjøvåg
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.

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

The Remote Container Lock (RCL C) is remotely locked and unlocked through user application and wireless communication. Locking and unlocking can only be performed in the locking/unlocking station with LOX encrypted control system (onshore). The lock is in sleep mode outside the locking/unlocking station (offshore).

RCL C is used for single or double stacking containers on roll-trailers or cassettes. The Trailer Unit is a radio-controlled unit carrying the unique identity of the roll trailer or cassette.

Hardware: PRO-168 RCL C v5.0
PRO-163 Trailer Unit v1.0
Firmware: PRO-162 v1.3.7.1
Supply voltage: 3.6 Vdc by battery

Radio specifications

125 kHz

Type of equipment: Receiver
Model of radio module: ams AS3933-BQFT
Radio protocol: LFMC
Modulation: OOK (On Off Keying)
Radio frequency band: 125 kHz
Channelized system: No
Number of channels: -
Channel separation: -
Max. radiated power: -

2400 MHz

Type of equipment: Transceiver
Model of radio module: TI CC2530
Radio protocol: ROXI by LOX, based on IEEE 802.15.4
Freq. management: Direct Sequence Spread Spectrum (DSSS)
Radio frequency band: 2470-2480 MHz
Channelized system: Yes
Number of channels: 11 channels
Channel separation: 1 MHz
Max. radiated power: 20 dBm (100 mW e.i.r.p.)

Place of manufacture

Lox Container Technology AB
Frihamnsgatan 30, 115 56 Stockholm, Sweden

Application/Limitation

The RCL C and the Trailer Unit are intended to be used on board of RORO vessels and combined RORO / CONTAINER vessels (CONRO vessel).

The Type Approval covers the electric and electronic parts of RCL C. The mechanical parts of RCL C are covered by separate type approval certificate TAS00003DS.

Maintenance including cleaning and battery check needs to be done regularly according to manufacturer's instructions. Manual opening of RCL C is possible in case of emergency. See User Manual PRO-025 for further details concerning maintenance and emergency opening of RCL C.

The type approval does not cover the different administrations requirements for use of the radio frequency band. The applied frequency band 2470-2480 MHz is defined by ITU-R Radio Regulations (2020) as an ISM-band. Any use if the radio frequency band shall be in line with the requirements of the administration concerned.

Type Approval documentation

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.

1 m free fall test (12 drops) according to IEC 60068-2-31:2008.

Applicable tests according to the EMC directive:

- EN IEC 61000-6-2:2019,
- EN IEC 61000-6-4:2019,
- ETSI EN 301 489-1 V2.2.3:2019.

Applicable tests according to the Radio Equipment directive:

- ETSI EN 300 328 V2.2.2:2019,
- ETSI EN 300 330 V2.1.1:2017.

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number

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