Type Approval Certificate

[Frequency Converter]

Initial Approval 16th February, 2022

Manufacturer ABB Oy, Drives
Hiomotie 13, 00380 Helsinki, Finland

Product Description Type : ACS 880LC series

" See Appendix 1 "

* Manufacturing Place :
ABB Oy, Drives
Hiomotie 13, 00380 Helsinki, Finland

ABB AS, Drives
Arukula tee 83, Juri, 75301 Harjumaa, Estonia

Approval Condition " See Appendix 1"

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.

Pt. 6, Ch. 2, Art. 301 of the Rules for Classification, Steel Ships and IEC 61800-5-1.

This Certificate is valid until 15th February, 2027

Issued at Busan, Korea on 16th February, 2022

This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "http://e-cert.krs.co.kr" by using the tracking No(ME22004245219) and certificate No.(HMB23278-AC003).

KOREAN REGISTER

General Manager of
Marine & Ocean Equipment Team

Note : *1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.*
2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Product Description and/or Approval Condition

Date of Issue : 16th February, 2022

A. Product Description

1. Product Specification

1) Product description

The ACS 880LC series are a liquid-cooled cabinet-installed drive for controlling asynchronous AC induction motors, permanent magnet synchronous motors and AC induction servomotors.

Drive Modules / Cabinet

Module : ACS880-104LC, Cabinet : ACS880-107LC

Type	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
Inverter(INU)	690	390~6460	355~6000	1xR8i ~ 8xR8i

Module : ACS880-204LC, Cabinet : ACS880-207LC

Type	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
IGBT supply(ISU)	690	360~5810	426~6874	1xR8i ~ 8xR8i

Module : ACS880-304LC+A019, Cabinet : ACS880-307LC+A019

Type	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
Diode supply(DSU)	690	820~5940	932~6784	1xD8D ~ 8xD8D

Module : ACS880-304LC+A018, Cabinet : ACS880-307LC+A018

Type	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
Diode supply(DSU)	690	490~6000	559~6849	1xD8T ~ 8xD8T

Module : ACS880-604LC, Cabinet : ACS880-607LC

Type	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
Brake unit	525/690	N/A	404~2422	1xNBRW-669 ~ 6xNBRW-669
Brake unit	690	N/A	870~6500	1xR8i ~ 5xR8i

Module : N/A, Cabinet : ACS880-1007LC

Type	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
Liquid cooling unit	400/690	N/A	70~195	N/A

Module : ACS880-1604LC, Cabinet : ACS880-1607LC

Type	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
DC-DC converter	690	400~1800	351~1581	1xR8i ~ 2xR8i

Single Drive

Module	Voltage Un(V)	Rated current IIn(A)	Power PN(kW)	Module configuration
ACS880-07CLC	690	390~6460	355~6000	1xD8D+1xR8i ~ 8xD8D+8xR8i
ACS880-07LC	690	390~6460	355~6000	1xD8T+1xR8i ~ 6xD8T+8xR8i
ACS880-17LC/-37LC	690	390~6260	355~6000	1xR8i+1xR8i ~ 8xR8i+8xR8i

Product Description and/or Approval Condition

Date of Issue : 16th February, 2022

* Configuration Remark
R8i - Liquid cooled multi use inverter module, used as inverter, supply unit, dc converter and brake drive.
D8D - Rectrifier bridge supply unit utilizing diode rectrifiers.
D8T - Rectrifier bridge supply unit utilizing thyristor rectrifiers.
NBRW-669 - Signle phase brake unit.

2. Approved Drawings and Documents

1) Drawings
- 3AXD50000032085 D8T module assembly, 3AXD50000032218 D8T cabinet assembly, 3AXD50000036625 D8D cabinet assembly, 3AXD50000040626 D8D rectifier unit, 3AXD50000038935 NBRW, 3AXD50000042275 LCU 195, 3AXD50000043884 LCU 70, 3AXD50000044181 R8iLC Module assembly, 3AXD50000330188 DDC cabinet assembly, 3AXD50000436279 DBU cabinet assembly, 3AXD50000641420 DBU cabinet assembly

2) Diagrams
- 3AXD10000461740 R8iLC, 3AXD10000540419 D8D, 3AXD10000891714 D8T, ACS880-07LC Schema, ACS880-17LC Schema, ACS880-37LC Schema

3. Test Reports, etc.

1) Test Reports
- 3AXD10000623652(2017.09.04), 3AXD10000631945(2017.08.07), 3AXD10000625359(2017.08.08), 3AXD10000730962(2019.08.02), 3AXD10000608989(2017.06.02), 3AXD10000574977(2017.02.10), 3AXD10000599323(2017.04.25), 3AXD10000587152(2017.01.27), 3AXD10000592161(2017.06.02), 3AXD10000653689(2018.01.04), 3AXD10000552845(2016.10.20), 3AXD10000608272(2017.09.15), 3AXD10000562949(2016.09.30), 3AXD10000562951(2016.10.04), 3AXD10000669435(2017.10.02), 3AXD10000624266(2017.12.14), 3AXD10000796452(2018.08.29), 3AXD10000648620(2017.09.22), 3AXD10000718843(2018.04.18), 3AXD10000673190(2017.12.11), 3AXD10000675445(2018.01.04), 3AXD10000732424(2018.05.04), 3AXD10000659405(2017.12.18), 3AXD10000661945(2018.01.04), 3AXD10000671904(2017.11.09), 3AXD10000675451(2018.01.04), 3AXD10001177088(2020.06.15), 3AXD10001066066(2020.05.11), 3AXD10001159972(2020.05.14), 3AXD10000938359(2019.06.17), 3AXD10001064437(2019.12.05), 3AXD10001257238(2020.11.09), 3AXD10001175718(2020.08.26), 3AXD10000746500(2018.06.15), 3AXD10001046343(2019.11.19), 3AXD10000808563(2019.06.06), 3AXD10000902442(2019.06.06), 3AXD10000930972(2019.06.12), 3AXD10000685663(2018.01.19), 3AXD10000685993(2018.01.24), 3AXD10000932525(2019.05.16), 3AXD10000894763(2019.04.26), 3AXD10000671237(2017.12.08), 3AXD10000671242(2017.10.06), 3AXD10000734137(2018.04.18), 3AXD10000734125(2018.05.16), 3AXD10000908840(2019.07.05), 3AXD10000934205(2020.02.28), 3AXD10000737173(2018.05.28), 3AXD10001090310(2019.09.18)

2) Manuals
- ACS880-07LC(3AXD50000569786 Rev.A, 2020.07), ACS880-17LC(3AXD50000250295 Rev.A, 2019.06), ACS880-37LC(3AXD50000251407 Rev.A, 2019.06), ACS880-204LC(3AXD50000284436 Rev.A, 2019.060), ACS880-207LC(3AXD50000174782 Rev.A, 2019.06), ACS880-304LC(3AXD50000568963 Rev.A, 2020.06), ACS880-307LC(3AXD50000579662 Rev.A, 2020.06), ACS880-604LC(3AXD50000581641 Rev.A, 2020.10), ACS880-607LC(3AXD50000581627 Rev.A, 2020.10), ACS880-1604LC(3AXD50000371631 Rev.A, 2019.06), ACS880-1607LC(3AXD50000431342 Rev.A, 2019.06)

B. Approval Condition

1. Application & Limitation

1) This approval is granted on the basis of the test reports and the approved documentation.

2) The manufacturer should inform this Society of all kinds of revisions of the equipment. If the changes are recognized to affect functionality of the approved equipment, type test to confirm the reliability of the revised equipment may be performed in the presence of our surveyor.

3) Degree of protection shall be complied with Rule Pt.6 Ch.1 Sec.2 201.2.(5).

4) The product shall not be installed in the bridge or on open decks.

Product Description and/or Approval Condition

Date of Issue : 16th February, 2022

5) Converters with conducted and radiated emission above the KR 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 safe operation is assured.

2. Individual Product Cert. and Drawing Approval Requirement

1) If the converters are used as parts of the motor controller which drive essential auxiliaries specified in KR Rule Pt. 5, Ch. 1, 102 and exceed the output 7.5 kW, or for electric propulsion, drawing approval for individual vessel, and/or individual product certification is required for the motor controller.

2) If the converters are used for electric propulsion unit, drawing approval for individual vessel, and individual product certification are required.

3. Marking

1) The product or packing is to be marked with the manufacturer's name and type designation on a suitable position.

4. Others

1) Test condition (IACS UR E10 Rev.8 basis)

Test	Condition	Remark
EMC	All locations excluding the bridge and deck zone	*1
Temperature	+5℃ ~ +55℃	-
Vibration	Acceleration ±0.7g	-

*1 : For details, see B. Approval Condition 1. Application & Limitation 5)

< End of Certificate >