Marine & Offshore Division

Certificate number: 47383/A0 BV
File number: AP1
Product code: 2592I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

ABB Oy Drives

Helsinki - FINLAND

for the type of product

FREQUENCY CONVERTERS (Power 50kW and over)

ACS880-x07/1607 and ACS880-x7 series.

Requirements:
Bureau Veritas Rules for the Classification of Steel Ships & Offshore Units.

EC Code: 31.

IEC 61800-5-1 (2007).

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 25 Apr 2022

For BUREAU VERITAS,
At BV HELSINKI, on 25 Apr 2017,
Tommy Andersson

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

The **ACS880-x07/1607 and ACS880-x7** are drives for Marine & Offshore applications:

1.1 - Approval range:

ACS880 single and multi drives	Rated voltage (V)	Rated power (kW)	Rated power (kVA)	Frame sizes
ACS880-207	380-690	-	278 … 5819	R8i … 10xR8i + BLCL … 5xBLCL-XX-X
ACS880-307	380-690	-	430 … 5174	2xD7T, D8T … 6xD8T
ACS880-107	380-690	5 … 5320	-	R5i ... 10xR8i
ACS880-607 (NBRA -types, 1-phase)	380-690	91 … 678	-	NBRA659 … 6xNBRA669
ACS880-607 (nxR8i -types, 3-phases)	380-690	480 … 6180	-	R8i … 5R8i
ACS880-1607	380-690	290 … 2721	-	R8i … 5xR8i (DC output)
Cabinet-built ACS880 single and multi drives				
ACS880-07	380-690	52 … 2660	-	R6 … R11, 2xD7T, D8T … 4xD8T + 2 …5xR8i
ACS880-17/37	380-690	152 … 3040	-	R8i … 6xR8i + R8i … 5xR8i

2. DOCUMENTS AND DRAWINGS :

Drawing No. 3AUA0000098111_RevL.pdf, Catalog:ACS880, single drives 0.55 to 3200 kW, Revision:L, Date: 29.12.2015,
Drawing No. 3AUA0000115037_RevG.pdf, Catalog:ACS880, multidrives 1.5 to 5600 kW, Revision:L, Date: 28.12.2015
Drawing No. 3AXD50000039629_supplement.pdf, Supplement : ACS880 +C132 marine type-approved cabinet-built drives, Revision: A, Date: 19.12.2016
Drawing No. 3AXD10000526346_1 B.pdf, Product configurations, Revision: B
Drawing No. 3AXD10000526346_2 B.pdf, Product configuration Category 2a, Revision: B
Drawing No. 3AXD10000526346_3 B.pdf, Product configuration Category 2b, Revision: B

Drawing No. Circuit diagrams_010.pdf, ACS880-07-2860A-7 circuit diagram, Revision: A, Date: 25.11.2016
Drawing No. Circuit diagrams_011.pdf, ACS880-17-0780A-5 circuit diagram, Revision: A, Date: 25.11.2016
Drawing No. Circuit diagrams_012.pdf, ACS880-37-3310A-7 circuit diagram, Revision: A, Date: 25.11.2016
Drawing No. Circuit diagrams_Medlar-3.0.pdf, ACS880-307-0980A-3 circuit diagram, Date: 25.11.2016
Drawing No. Circuit diagrams_Medlar5.0.pdf, ACS880-207-4150A-5 circuit diagram, Date: 25.11.2016
Drawing No. Circuit diagrams_Medlar7.0.pdf, ACS880-307-4560A-7 circuit diagram, Date: 25.11.2016
Drawing No. Overview diagrams_Medlar-3.1.pdf, ACS880 multidrive schematic, Date: 25.11.2016
Drawing No. Overview diagrams_Medlar-5.1.pdf, ACS880 multidrive schematic, Date: 25.11.2016
Drawing No. Overview diagrams_Medlar-7.1.pdf, ACS880 multidrive schematic, Date: 25.11.2016

Drawing No. 3AXD50000011408.pdf, Hardware manual: ACS880-307 +A018, Revision: A, Date: 02.01.2014
Drawing No. 3AXD0000102559.pdf, Hardware manual: ACS880-607 1-phase, Revision: B, Date: 01.01.2014
Drawing No. 3AXD50000022034.pdf, Hardware manual: ACS880-607 3-phase, Revision: C, Date: 03.06.2016
Drawing No. 3AUA0000105718.pdf, Hardware manual: ACS880-07, Revision: E, Date: 25.06.2015
Drawing No. 3AUA0000102519.pdf, Hardware manual: ACS880-107 Inverter units, Revision: C, Date: 14.07.2014
Drawing No. 3AXD50000023644.pdf, Hardware manual: ACS880-1607 DC/DC converter units, Revision: A, Date: 30.06.2015
Drawing No. 3AXD50000020436.pdf, Hardware manual: ACS880-17 drives, Revision: A, Date: 06.02.2015
Drawing No. 3AUA0000130644.pdf, Hardware manual: ACS880-207 IGBT supply units, Revision: B, Date: 01.07.2014
Drawing No. 3AXD50000020437.pdf, Hardware manual: ACS880-37 drives, Revision: A, Date: 06.02.2015

Drawing No. 3AUA0000131562.pdf, Firmware manual: IGBT supply control, Revision: E, Date: 05.12.2016

3. TEST REPORTS :

Drawing No. FAT-program.pdf, Routine FAT procedure, Revision: A, Date: 07.05.2014
Drawing No. 3AXD10000311678.pdf, Environmental type test report, Revision: B, Date: 29.11.2013
Drawing No. 3AXD10000311717.pdf, Environmental type test report, Revision: B, Date: 07.2013
Drawing No. 3AXD10000311718.pdf, Environmental type test report, Revision: B, Date: 07.2013
Drawing No. 3AXD10000081488.pdf, EMC type test report, Revision: A, Date: 24.08.2012
Drawing No. 3AXD10000321226.pdf, Efficiency and harmonic distortions type test report, Revision: A, Date: 15.04.2014
Drawing No. 3AXD10000335564.pdf, Efficiency and harmonic distortion type test report, Revision: B, Date: 28.04.2014
Drawing No. 3AXD10000338875.pdf, Protective bonding type test report, Revision: A, Date: 26.06.2014
Drawing No. 3AXD10000353320.pdf, Environmental type test report, Revision: B, Date: 31.01.2014
Drawing No. 3AXD10000353323.pdf, Environmental type test report, Revision: B, Date: 01.11.2013
Drawing No. 194949-1.pdf, EMC emission type test report, Date: 30.01.2012
Drawing No. 194949-2.pdf, EMC emission and immunity type test report, Date: 30.01.2012
Drawing No. 194951-1.pdf, EMC emission and immunity type test report, Date: 22.03.2012
Drawing No. 194951-2.pdf, EMC emission and immunity type test report, Date: 22.03.2012
Drawing No. 238150-1.pdf, EMC emission type test report, Date: 15.09.2013
Drawing No. 238150-2.pdf, EMC emission and immunity type test report, Date: 15.09.2013
Drawing No. 239999-1.pdf, EMC emission and immunity type test report, Date: 15.09.2013
Drawing No. 239999-2.pdf, EMC emission type test report, Date: 16.09.2013
Drawing No. 242693-2.pdf, EMC emission type test report, Date: 21.10.2013
Drawing No. 243134-1.pdf, EMC emission type test report, Date: 27.10.2013
Drawing No. 248151.pdf, EMC emission type test report, Date: 26.11.2013
Drawing No. 273767A.pdf, Mechanical type test report, Date: 26.06.2013
Drawing No. 273767B.pdf, Mechanical type test report, Date: 28.06.2013
Drawing No. 273843A.pdf, Mechanical type test report, Date: 28.10.2013
Drawing No. 273885A.pdf, Mechanical type test report, Date: 17.12.2013
Drawing No. 273885B.pdf, Mechanical type test report, Date: 17.12.2013
Drawing No. 273886C.pdf, Mechanical type test report, Date: 19.12.2013
Drawing No. 276203-1.pdf, EMC emission type test report, Date: 27.04.2014
Drawing No. 276203-3.pdf, EMC emission and immunity type test report, Date: 27.04.2014
Drawing No. 276592-1.pdf, EMC emission type test report, Date: 26.05.2014
Drawing No. 276592-2.pdf, EMC emission type test report, Date: 26.05.2014
Drawing No. 21224179_001.pdf, EMC type test report, Date: 13.10.2014
Drawing No. 21225961_004.pdf, EMC type test report, Date: 18.11.2014
Drawing No. 21226183_003.pdf, EMC type test report, Date: 18.11.2014
Drawing No. VTT-S-03600-13.pdf, Tightness test for IPX4, Date: 23.05.2013
Drawing No. VTT-S-04548-16.pdf,
Drawing No. VTT-S-04752-14.pdf, Dust test for IP5X, Date: 16.10.2014

Drawing No. 3AXD10000081410.pdf, Temperature rise type test report, Revision: A, Date: 07.2012
Drawing No. 3AXD10000081411.pdf, Temperature rise type test report, Revision: A, Date: 07.2012
Drawing No. 3AXD10000081532.pdf, Temperature rise type test report, Revision: C, Date: 14.06.2012
Drawing No. 3AXD10000241239.pdf, Temperature rise and abnormal operation type test report, Revision: B, Date: 03.05.2013
Drawing No. 3AXD10000243892.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 05.06.2013
Drawing No. 3AXD10000243893.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 06.06.2013
Drawing No. 3AXD10000243894.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 07.06.2013
Drawing No. 3AXD10000243895.pdf, Temperature rise and abnormal operation type test report, Revision: B. Date: 04.06.2013
Drawing No. 3AXD10000243936.pdf, Temperature rise and abnormal operation type test report, Revision: D, Date: 17.12.2015
Drawing No. 3AXD10000282756.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 12.2013
Drawing No. 3AXD10000081929.pdf, Temperature rise test report, Revision: C, Date: 24.04.2012
Drawing No. 3AXD10000292208.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 11.2013
Drawing No. 3AXD10000313568.pdf, Temperature rise type test report, Revision D, Date: 25.02.2014
Drawing No. 3AXD10000320553.pdf, Temperature rise and abnormal operation type test report, Revision: B, Date: 13.07.2015
Drawing No. 3AXD10000320602.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 17.04.2014
Drawing No. 3AXD10000320954.pdf, Temperature rise and abnormal operation type test report, Revision: B, Date: 21.05.2015
Drawing No. 3AXD10000321019.pdf, Temperature rise and abnormal operation type test report, Revision: B, Date: 22.04.2014
Drawing No. 3AXD10000335744.pdf, Temperature rise type test report, Revision: B, Date: 18.04.2014
Drawing No. 3AXD10000347377.pdf, Temperature rise type test report, Revision: C, Date: 27.05.2014
Drawing No. 3AXD10000370276.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 19.10.2014
Drawing No. 3AXD10000370281.pdf, Temperature rise and abnormal operation type test report, Revision: C, Date: 01.07.2015
Drawing No. 3AXD10000370478.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 20.10.2014
Drawing No. 3AXD10000389612.pdf, Temperature rise and abnormal operation type test report, Revision: A, Date: 20.03.2014
Drawing No. 3AXD10000403167.pdf, Temperature rise type test report, Revision: C, Date: 19.01.2015

Drawing No. 3AXD10000313569.pdf, High voltage and insulation resistance type test report, Revision: C, Date: 20.02.2014
Drawing No. 3AXD10000081898.pdf, High voltage and insulation resistance type test report, Date: 08.2012
Drawing No. 3AXD10000081899.pdf, High voltage and insulation resistance type test report, Date: 07.2012
Drawing No. 3AXD10000081900.pdf, High voltage and insulation resistance type test report, Date: 08.2012
Drawing No. 3AXD10000081901.pdf, High voltage and insulation resistance type test report, Revision: C, Date: 23.08.2012
Drawing No. 3AXD10000335755.pdf, High voltage and insulation resistance test report, Revision: B, Date: 04.2014
Drawing No. 3AXD10000338153.pdf, High voltage and insulation resistance type test report, Revision: B, Date: 10.2013
Drawing No. 3AXD10000338155.pdf, High voltage and insulation resistance type test report, Revision: A, Date: 07.05.2013
Drawing No. 3AXD10000338158.pdf, High voltage and insulation resistance type test report, Revision: A, Date: 03.12.2013
Drawing No. 3AXD10000338160.pdf, High voltage and insulation resistance type test report, Revision: B, Date: 20.02.2014
Drawing No. 3AXD10000338162.pdf, High voltage and insulation resistance type test report, Revision: A, Date: 07.05.2013
Drawing No. 3AXD10000338164.pdf, High voltage and insulation resistance type test report, Revision: A, Date: 11.2012
Drawing No. 3AXD10000362386.pdf, High voltage and insulation resistance type test report, Revision: A, Date: 10.05.2014

Drawing No. 3AXD10000082378.pdf, Safety related electrical type test report, Revision: A, Date: 31.08.2012
Drawing No. 3AXD10000238049.pdf, Electrical safety type test report, Revision: A, Date: 10.05.2013
Drawing No. 3AXD10000241186.pdf, Electrical safety type test report, Revision: B, Date: 14.05.2013
Drawing No. 3AXD10000285180.pdf, Electrical safety type test report, Revision: A, Date: 21.05.2013
Drawing No. 3AXD10000288101.pdf, Electrical safety type test report, Revision: A, Date: 21.05.2013
Drawing No. 3AXD10000320605.pdf, Electrical safety type test report, Revision: A, Date: 17.04.2014
Drawing No. 3AXD10000332702.pdf, Electrical safety type test report, Revision: A, Date: 14.04.2014
Drawing No. 3AXD10000334228.pdf, Electrical safety type test report, Revision: A, Date: 16.05.2014
Drawing No. 3AXD10000334229.pdf, Electrical safety type test report, Revision: A, Date: 30.05.2014
Drawing No. 3AXD10000365732.pdf, Electrical safety type test report, Revision: A, Date: 27.09.2014
Drawing No. 100613B-ELSA.pdf, Safety requirement type test report, Date: 25.04.2013
Drawing No. 100613C-ELSA.pdf, Safety requirement type test report, Date: 07.05.2013
Drawing No. 206332.pdf, Safety requirement type test report, Date: 08.04.2013
Drawing No. 267945-1.pdf, Safety requirement type test report, Date: 04.06.2013
Drawing No. 267945-1 Attachment1.pdf, Safety requirement type test report attachment 1, Date: 04.06.2013
Drawing No. 267945-1 Attachment2.pdf, Safety requirement type test report attachment 2, Date: 04.06.2013
Drawing No. 269768-1.pdf, Safety requirement type test report, Date: 02.01.2013
Drawing No. 270905-1b.pdf, Safety requirement type test report, Date: 15.01.2014
Drawing No. 270905-1b Attachment1.pdf, Safety requirement type test report attachment 1, Date: 15.01.2014
Drawing No. 270905-1b Attachment2.pdf, Safety requirement type test report attachment 2, Date: 15.01.2014

Drawing No. 3AXD10000088270.pdf, Characteristics values type test report, Revision: B, Date: 27.09.2012
Drawing No. 3AXD10000088271.pdf, Characteristics values type test report, Revision: A, Date: 05.07.2012
Drawing No. 3AXD10000088272.pdf, Characteristics values type test report, Revision: A, Date: 07.10.2012
Drawing No. 3AXD10000284709.pdf, Characteristic values type test report, Revision: A, Date: 11.2013
Drawing No. 3AXD10000292406.pdf, Characteristic values type test report, Revision: A, Date: 11.2013
Drawing No. 3AXD10000407607.pdf, Characteristic values type test report, Revision: A, Date: 17.02.2015

4. APPLICATION / LIMITATION :

4.1 - BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships & Offshore Units.
4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**
4.3 - BUREAU VERITAS Environmental Category, **EC Code: 31.**
4.4 - The equipment fulfils the EMC requirements for installation in General Power Distribution Zones.
4.5 - The installation shall comply with the Manufacturer's recommendation described in the above-referenced documentation.
4.6 - The **ACS880-x07/1607 and ACS880-x7 series** use a derating factor as follows**: ambient temperature of 45°C, derating of -5% at +50°C.**

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The **ACS880-x07/1607 and ACS880-x7 series** are to be supplied by **ABB Oy Drives, Finland; ABB AS, Estonia and ABB Drives, China,** in compliance with the type and the requirements described in this certificate.
5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.
5.3 - BV product certificate is required.

6. MARKING OF PRODUCT :

6.1 - Trade name.
6.2 - Date of manufacture and serial number.
6.3 - Equipment type or model identification under which it was type-tested.
6.5 - \ or @conformity marking, as relevant.

7. OTHERS :

It is **ABB Oy Drives** responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

***** END OF CERTIFICATE *****